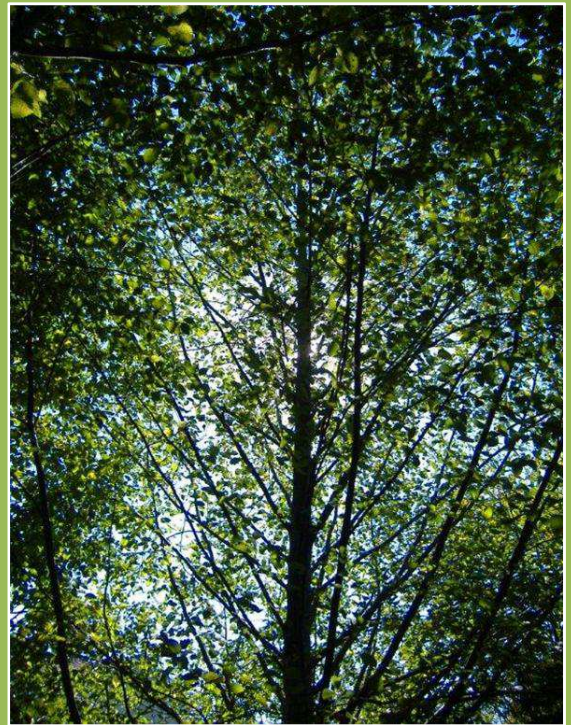


City of  
Covington

# Urban Forestry Strategic Plan

For Publicly-Managed Trees



April 2013

## **City of Covington**

### **Urban Forestry Vision**

*Covington is dedicated to protect and manage the urban forest in order to preserve and enhance its benefit to the environment and the livability of the community.*



*The nation behaves well if it treats its natural resources as assets which it must turn over to the next generation increased, and not impaired, in value.*

- Theodore Roosevelt

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# Table of Contents

- Executive Summary..... 1
  - Purpose ..... 1
  - Introduction ..... 1
  - Tree Canopy Cover..... 1
  - Vision Statement..... 2
  - Strategic Plan ..... 2
  - Summary Recommendations..... 2
- 1. Introduction/Background..... 4
- 2. Covington’s Urban Forest Assessment & Analysis..... 5
  - A. Current City Policy and Plan Review ..... 5
  - B. Current Tree Cover – i-Tree Assessment ..... 6
  - C. Urban Forest Criteria and Indicators Matrix..... 7
- 3. Public Process..... 8
- 4. Proposed Objectives & Strategies..... 9
  - A. Criteria and Strategies ..... 9
  - B. Key Objectives..... 10
    - Table 4.1 - COVINGTON’S KEY URBAN FOREST OBJECTIVES ..... 11
- 5. Recommendations ..... 14

## Appendices

- A. Urban Tree Benefits
- B. City of Covington, Washington, *i-Tree Canopy* Land Cover Assessment
- C. Combined Survey Results on Criteria and Indicators
  - C.1 – Vegetative Resource
  - C.2 – Resource Management
  - C.3 – Community Framework
  - Memo Summary of Survey Results – Terra Firma
- D. Covington’s Desired Level of Service with Strategies for each Criterion
  - D.1 – Vegetative Resource
  - D.2 – Resource Management
  - D.3 – Community Framework
- E. Resources

## Executive Summary

### Purpose

Covington is a rapidly growing new suburb and needs a logical direction for its urban forestry program. The city population has grown more than 40% during the 15 years since incorporation, and thousands of trees have been planted along new arterials, neighborhood streets and in parks. New trails and park facilities have been developed alongside existing trees. Conflicts with maturing trees and other maintenance issues require a reasonable and defensible strategic plan for responsible stewardship and management.

### Introduction

Like other progressive municipalities, Covington has a goal to better manage its urban forest, however, it's a small city with limited resources. Currently the city has thousands of trees that provide tremendous benefit and have high value, but no cohesive plan for managing these assets. With a grant from the Washington State Department of Natural Resources, in partnership with the USDA Forest Service, the City now has a clear direction for a more effective and cost-efficient management of public trees and urban forest. Terra Firma Consulting was contracted to work with City staff to develop a strategic plan that addresses how to manage and maintain public trees and lead the City to more specific action plans and budgets over time.

The development of a strategic plan was a collaborative process between the consultants and an assembly of City staff from the Planning, Parks and Public Works departments. The group was known as the "Tree Team" throughout the project. The main outcomes of the process were 1) a general assessment of the city's tree canopy cover; 2) a vision statement for urban forestry; and 3) key objectives and strategies for the Tree Team to build upon for a successful urban forestry program.

The recommendations in this plan are provided to guide the community over the next five years regarding planning, management and maintenance of trees on publicly-managed properties (street rights-of-way, stormwater facilities, developed parks, and open space parks). The plan will also help promote a more unified effort to manage the entire urban forest between the City and residents, business owners, utilities, and other tree stewards in the community.

### Tree Canopy Cover

Before one can define strategies for managing a resource, it is critical to understand the existing condition and extent of the resource itself. Terra Firma, in partnership with Plan-it Geo, provided a snapshot of the amount of urban tree cover in the city limits (private and public) as well as potential space for additional trees and other land cover, such as impervious surface. Using the i-Tree Canopy program, 600 random points were made throughout the city and designated as one of the three cover categories. Results utilizing 2012 high-resolution satellite imagery reveal that Covington's overall Urban Tree Cover stands at approximately 37%. The nationally recommended goal for average cover is at least 40%. This general cover assessment is useful in setting goals to maintain a highly functioning urban forest, especially during growth and development. The data

and software can be used by City staff to further refine public tree cover analysis as well as gauge the change in tree cover levels over time.

## Vision Statement

The City has several established documents and plans that have guided its programs and policies. The two plans that resonate well with an urban forest strategy are the Comprehensive Plan and the Parks, Recreation and Open Space Plan (2010). Upon review of the language in these plans around the environment and natural resources, the Tree Team proposes the Urban Forest Vision Statement as follows:

*Covington is dedicated to protect and manage the urban forest in order to preserve and enhance its benefit to the environment and the livability of the community.*



## Strategic Plan

Utilizing a model urban forest sustainability matrix, the consultants developed a survey on key criteria and objectives for an urban forestry program. Each Tree Team member weighed in on both current and desired levels for each criterion, and collectively, the group proposes six major objectives for the City's urban forest strategy:

1. A **comprehensive inventory of the tree resource** to direct its management.
2. A detailed understanding of the **condition and risk potential** of all publicly-managed trees in order to be more responsive.
3. All publicly-owned, highly managed trees are **maintained to maximize current and future benefits**.
4. A detailed understanding of ecological structure and function of all **publicly-owned natural areas to implement best management practices** appropriately.
5. Ensure all **city departments cooperate** with common goals and objectives for urban forest management.
6. The **urban forest is recognized by the public as vital** to the community's environmental, social and economic well-being.

## Summary Recommendations



The six key objectives identified by the Tree Team, and supported by the Parks & Recreation Commission and interested public, provide a solid basis for a reasonable and doable strategic plan and annual work plans that are appropriate for the City. Logically, the priority objective is to understand more about the public tree resource in order to better direct its management and maximize its benefits and function in the community. The recognition of good coordination with and within the City and other parties, including citizens and businesses, is also vital in achieving the urban forest vision.

The recommended urban forestry actions for the short-term are as follows:

1. Purchase a comprehensive tree inventory program and conduct an inventory of the public trees that includes condition and risk rating, where appropriate.
2. Generate a more accurate measurement of the public tree canopy cover by using the i-Tree software and initial database produced during this project. Establish a canopy goal for the City and commit to measure changes over time.
3. Develop an annual work plan for the maintenance of publicly-owned and managed trees based on the reports generated by the inventory program.
4. Recognize the interdepartmental Tree Team and enable them to develop work plans and budget requests, review policy, regulation and BMP's, and coordinate project-based urban forestry.
5. Strive to have more than one staff person (ideally one in each department – Parks, Public Works, Planning) acquire arborist certification to provide interdepartmental support, and provide necessary training to ensure qualified staff for the management of the urban forest.
6. Engage the community through neighborhood natural area planning (ex. Timberlane, Crofton Heights), annual work plan discussions, information on best management practices, and the general promotion of the benefits of the urban forest.
7. Update and adopt the Community Forestry Plan (2006) as the City's Best Management Practices for urban forestry.

Several actions will require staff time and resources to accomplish. Even with the coordinated Tree Team, some projects may require contracting with a qualified professional or specifying a designated staff person (part-time). The vision and key objectives all point toward an urban forestry program that will require dedicated staff resources over time.



## 1. Introduction/Background

There are many definitions for an *urban forest*, but it most commonly refers to all the trees and associated vegetation in a community. Often trees are planted as individuals in the suburban and urban environment, though many preserved natural areas in a city have remnant native forests. Vegetation in residential and commercial landscapes also contributes to the urban forest. Therefore, a healthy urban forest is best managed as an entire forest ecosystem.

The City of Covington understands that it needs to better manage its trees and urban forest. The City staff makes the connection that it's prudent to manage trees as *assets* because they provide many tangible benefits to the community. Some of the benefits from Covington's urban forest\* are:

- Reduces stormwater runoff and erosion
- Provides shade and cooling
- Improves air quality and mitigates wind effects
- Provides wildlife habitat
- Increases property values



\* For more information, see Appendix A.

Every tree also has a monetary value. For example, if one is damaged by a car crash, there is a landscape value that is considered in its replacement cost. Trees, like other assets, also have maintenance costs, such as pruning young trees for structural integrity or for clearance on roadways and trails. Trees also have public safety liabilities that must be accounted for, for instance, when they get structurally unsafe or die and fall into the road or onto a park trail or sports field. A proactive removal and replacement program of high risk trees is responsible stewardship of the urban forest.

### Strategic Planning Process

With a grant from the USDA Forest Service administered by the Washington State Department of Natural Resources Urban and Community Forestry Program, Covington contracted with Terra Firma Consulting to help City staff develop a strategic plan for the management of public trees. Beginning in June of 2012, Terra Firma consultants met with the newly formed Covington "Tree Team" in order to develop the proposed strategic plan. This "Tree Team" consists of:

Glenn Akramoff, Public Works Director  
Bill Fealy, Maintenance Worker (Arborist)  
Richard Hart, Community Development Director  
Salina Lyons, Principal Planner  
Nelson Ogren, Development Review Engineer  
Ben Parrish, Engineering Technician II  
Scott Thomas, Parks and Recreation Director



The initial steps included a review and discussion of the current city policies and plans that related to trees and urban forestry; a basic Urban Tree Cover assessment; and a survey of the Tree Team to identify staff's key objectives and desired levels of service for an urban forestry program.

With the key objectives and levels of service identified, the Tree Team and consultant conducted a public meeting with the Parks & Recreation Commission in November 2012 for additional input. A Preliminary Plan was then prepared for review in January 2013 to finalize for estimated adoption by City Council in April 2013.

## 2. Covington's Urban Forest Assessment & Analysis

### A. Current City Policy and Plan Review

Upon review of existing City plans and documents, several important items relating to urban forestry called out in the Parks, Recreation and Open Space (PROS) Plan (2010) were incorporated into the Comprehensive Plan and excerpted below:

#### Parks and Recreation Element (2010)

PRG 4.0 – Protect and manage the City's environmentally-sensitive land, remnant open spaces and natural and cultural resources to highlight their uniqueness and local history.

*4.3 – Develop management plans for the City's larger natural areas and greenspaces and facilitate community-based volunteer restoration.*

*4.8 – Revise and adopt the Covington Community Forestry Plan to articulate a long-term strategy for tree protection, urban forestry management and public education and outreach.*

*4.9 – Consider creating community-based volunteer and stewardship opportunities as a way to inform and engage residents about urban forestry issues, such as tree planting, tree care and management and the benefits of urban trees.*

*4.10 – Analyze the City's existing tree canopy cover, establish canopy cover goals and promote urban forestry programs in order to maintain healthy atmospheric conditions [and other benefits].*

*4.11 – Establish a Heritage Tree program.*

*4.12 – Comply with Evergreen Communities Act and achieve status.*

*4.13 – Maintain Tree City USA.*

*4.14 – Promote the installation and management of street trees as an extension of urban habitat and providing green infrastructure benefits.*

#### Environmental Element (2003)

EVP 7.5.1 – Foster recognition of the significant role played by natural features and systems in determining the overall environmental quality and livability of the community.

*1.1 – Protect and enhance environmentally sensitive areas via the adoption of City regulations and programs that encourage well-designed land use patterns...in order to preserve natural features such as large wetlands, streams, steep slopes and wooded areas.*



EVP 7.5.9 – Minimize the loss of vegetation as new development occurs. Continue to recognize the value of trees and other vegetation in increasing the livability of the City.

*9.1 – Promote and support a systematic approach to enhancing the City through carefully-planned plantings and ongoing maintenance of street trees, public landscaping and public greenbelts.*

*9.4 – Utilize regulations, incentives and non-regulatory means to preserve, replace or enhance native vegetation that contributes to the City’s scenic beauty [and other benefits].*



A “Community Forestry Plan” was assembled in 2006. The document provides a compilation of good tree management practices and public information regarding tree care. While it has not been adopted, it can be updated to complement urban forest strategies implemented in the near future.

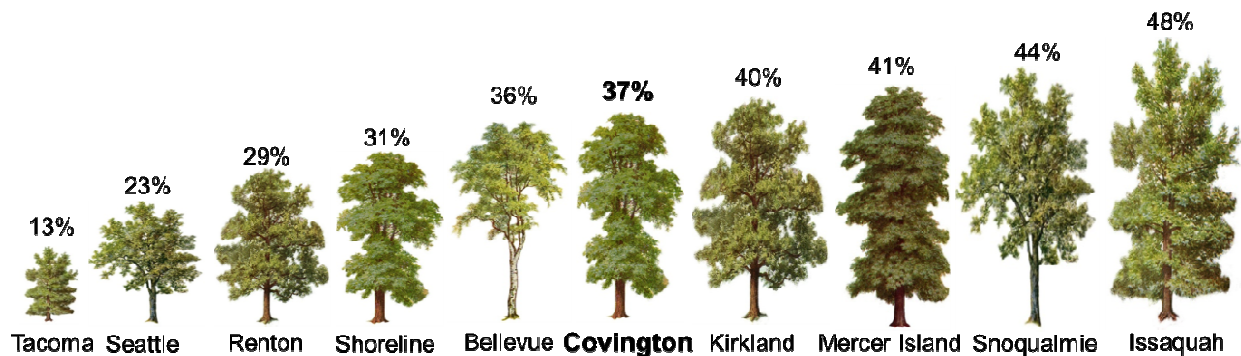
These references of urban forestry in significant documents provide a solid basis for supporting the recommended strategies and any funding requests for a City urban forestry program.

## **B. Current Tree Cover – i-Tree Assessment**

Since Covington has no comprehensive data on its existing public tree resource, Terra Firma contracted with Plan-it Geo to conduct a snapshot assessment of the current tree cover in the city limits. Utilizing free software called i-Tree Canopy, an initial measurement of the canopy cover was made to start the conversation. The quick assessment also offers a good comparison metric with other communities and to the City’s goals toward a sustainable urban forest as a valuable asset.

The i-Tree Canopy software was used to assess Covington’s tree canopy cover based on 2012 aerial imagery. Land cover type was assessed at 600 randomly distributed points across the City to determine percent cover for (1) Canopy, (2) Plantable spaces, and (3) all other land cover types (Table 1). Points were then overlaid with land ownership to assess these three cover types by public vs. private property. Points were determined to be “Forest” if they were located on any part of a tree. Points were determined to be “Plantable vegetation” if they fell on grass or other non-tree vegetation, and not within agricultural or recreational fields. Points were determined to be “Other land cover” if they fell on all other locations (including impervious surface and agricultural or recreational fields). After the i-Tree Canopy analysis was completed, sample points were extracted and brought into a Geographic Information System (GIS) and separated by ownership type. The assessment report is Appendix B.

Results indicate that Covington’s overall canopy cover is approximately 37% (4% standard error). As shown below, this percentage is robust and comparable to other progressive communities in the area.



For Covington, grass and open areas comprises 28% and all other land cover 35%. Private ownership represents 81% of Covington’s total area and is comprised of 38% canopy, 30% grass and open areas, and 32% other land cover. Public ownership represents 19% of Covington’s total area with 30% canopy, 21% grass and open areas, and 50% other land cover.

Table 1. Land Cover Assessment for Covington using i-Tree Canopy

Land Cover Class	Private				Public				Citywide			
	3,088 acres (4.8 sq. miles), 80.6%				742 acres (1.2 sq. miles), 19.4%				3,830 acres (6 sq. miles)			
	No. of Points	Percent of Points	Standard Error	95% CI*	No. of Points	Percent of Points	Standard Error	95% CI*	No. of Points	Percent of Points	Standard Error	95% CI*
Canopy	187	38%	0.022	4.314	33	29%	0.043	8.443	220	37%	0.020	3.856
Plantable	146	30%	0.021	4.063	24	21%	0.039	7.599	170	28%	0.018	3.606
Other	155	32%	0.021	4.131	55	49%	0.047	9.259	210	35%	0.019	3.817
<b>Sum</b>	<b>488</b>	<b>100%</b>	<b>0.064</b>		<b>112</b>	<b>100%</b>	<b>0.129</b>		<b>600</b>	<b>100%</b>	<b>0.058</b>	

\* CI = Confidence interval = Percent plus or minus to determine the actual coverage per class.

Note: The standard error (SE) for public lands is fairly high given the relatively small number of sampling points falling on public properties (112 out of 600).

For a more complete picture of the public portion of the City’s canopy cover, the City can utilize the free i-Tree Canopy software and the files provided to the City. Additional points can be added to reduce the standard error relatively quickly.

### C. Urban Forest Criteria and Indicators Matrix

To understand the current perspectives and attitudes regarding urban forestry among City staff, the consultants offered a survey to the Tree Team. The matrix for the survey was originally adopted from Clark and Matheny (G. Cross, and V. Wake. 1997) as part of a model of urban forest sustainability, as it provides a comprehensive look at all aspects of an urban forestry program.

The survey was divided into three sections: 1) Vegetative Resource, 2) Resource Management, and 3) Community Framework. In each section there is a matrix of urban forest criteria and different levels of performance for each criterion. Key objectives were also shown for each criterion. The Covington Tree Team members independently indicated the current (C) and desired (D) level for

each criterion (Low, Moderate, Good, or Optimal). They also selected the important key objectives for Covington to pursue.

Appendix C summarizes the responses regarding the criteria, indicators and objectives for the City's urban forestry program. A memo from Terra Firma explaining the initial observations is also included. In summary, the Team recognized that all criteria in the three sections of urban forestry management were important and the desired level for each criterion was at least Moderate, with mostly Good selected.

After a group discussion of the individual responses, the Team proposed the following key objectives:

- Have a comprehensive inventory of the public trees to direct its management.
- Have a detailed understanding of the condition and risk potential of all the publicly-managed trees in order to be more responsive.
- Maintain all publicly-owned, highly managed trees to maximize current and future benefits.
- Have a detailed understanding of ecological structure and function of all publicly-owned natural areas to implement best management practices appropriately.
- Ensure all city departments cooperate with common goals and objectives for urban forest management.
- The public recognizes the urban forest as vital to the community's environmental, social and economic well-being.

### 3. Public Process

On November 7, 2012, the Parks & Recreation Commission hosted an open house to receive feedback on the key objectives and levels of service. The event was prior to their scheduled meeting and included 1) an explanation of why it's important to manage the urban forest; 2) poster boards with the six primary objectives; 3) a poster board with Covington urban forest photos; and 4) an open roundtable discussion about the city's urban forest, its issues, concerns and benefits.

While the attendance was low, the City staff felt the conversation was very helpful. Attendees included a representative from a Homeowners Association, an environmentalist, and a business representative who shared opinions from their perspectives, as summarized below:

- The growth of trees in the public rights-of-way and in parking lots can block signage.
- Balancing canopy cover with business needs (sign visibility, more parking, low cost of landscape maintenance) is a challenge.
- The selection of street trees must be appropriate for the site conditions and space available.
- The City should evaluate regulations regarding tree removal on private property. Permit fees and requirements are a barrier to private tree management, especially to the HOA's.
- Concern for the lack of follow-up with new plantings – staking was left on too long (in Wood Creek).
- Need management strategies for conifer root disease in open spaces.



Staff responded that new tree standards (installation and care) and a new species list were developed after the January 2012 storm. They also plan to incorporate a street tree maintenance bond as a component of bonding for development.

Participants, including commission members, were asked to indicate their top three objectives with stickers on the poster board. The votes were as follows:

- Objective #1 – Tree Inventory (4 votes)
- Objective #2 – Assessment of Tree Condition and Hazard (6 votes)
- Objective #3 – Management to Maximize Benefits (8 votes)
- Objective #4 – Ecosystem Benefits of Natural Areas (5 votes)
- Objective #5 – Interdepartmental Coordination (0 votes)
- Objective #6 – Community Involvement (4 votes)

With the comments and voting, the City staff felt they were on target with the proposed key objectives and priorities. Even with no votes for objective 5, staff interpreted that as something that is understood and in effect. It is important to note that while the strategic plan is focused on public tree management, concerns about private trees were received and forwarded to the Community Development Department, as it is responsible for responding to questions regarding trees on private property. The City adopted the Tree Preservation Ordinance in 2008 (CMC 18.45), which outlines how private trees are managed through development applications and criteria for removal of trees on private property.

Additional opportunities for public input on the plan include the review and comment on the Preliminary Plan by the Parks & Recreation Commission and Planning Commission and through the presentation of the Proposed Plan to City Council in April 2013 for adoption.

## 4. Proposed Objectives & Strategies

### A. Criteria and Strategies

In an effort to address each criterion on the urban forest sustainability matrix, the tables in Appendix D show each objective, Covington’s desired level, and suggested strategies by the consultant for the City’s urban forestry program:

- Table D.1 is **Vegetation Resource** and pertains to urban forest metrics.
- Table D.2 is **Resource Management** and refers to staffing, policy, and management planning.
- Table D.3 is **Community Framework** and deals with citizen and business involvement and community engagement around the urban forest.

This will provide a good basis to refine and update any urban forestry plans as priorities change and tasks are completed over time.

## B. Key Objectives

When analyzing the urban forest criteria and the objectives, a logical combining of strategies to apply toward Covington’s six key objectives was done. For instance, much of the vegetation resource criteria and objectives, including risk management, can be accomplished with a comprehensive inventory. The inventory would meet two key objectives for resource management as well. Table 4.4 is the result of streamlining recommended strategies and actions to meet the key objectives.



Covington’s key objectives are broad yet comprehensive and lend to a balanced urban forestry program. While the key objective “the public recognizing the value of the urban forest” is important, it is an indirect objective to meeting the plan’s primary goal of better managing **public** trees. Public engagement and participation is critical to advancing any natural resource program. Therefore, strategies are provided to have the City work toward a holistic plan and program that affect both the private and public components of the urban forest.

The following is a table of Covington’s identified key objectives with some strategies and tasks, recommended timeline, and budget implications.

**Table 4.1 - COVINGTON'S KEY URBAN FOREST OBJECTIVES**

OBJECTIVE	DESIRED LEVEL	STRATEGIES/TASKS	TIMELINE/BUDGET
<p><b>1. Tree Resource</b> A comprehensive inventory of the tree resource to direct its management. (M1)</p>	<ul style="list-style-type: none"> <li>Complete inventory of publicly-owned trees and sample-based inventory of privately-owned trees included in city-wide GIS; includes age and species distribution</li> </ul>	<ul style="list-style-type: none"> <li>RFP for an inventory program and collection of first inventory</li> <li>In-house program provides the largest flexibility in use</li> <li>Consider using current database (record of new trees when planted)</li> <li>Train in-house or volunteers for maintenance of inventory</li> </ul>	<ul style="list-style-type: none"> <li>\$\$ - \$15-20K for software and inventory (by college students?)</li> <li>Short-term – high priority</li> <li>WADNR grant (probably will need City match)</li> </ul>
<p><b>2. Assessment of Tree Condition and Hazard</b> Detailed understanding of the condition and risk potential of all publicly-managed trees in order to be more responsive. (V5)</p>	<ul style="list-style-type: none"> <li>Complete inventory includes failure risk rating as a basis for a more proactive risk management. <i>[Publicly-owned trees are managed with safety as a high priority- M8]</i></li> <li>Inventory includes tree condition to guide tree establishment/renewal and management decisions for tree health and optimal condition to ensure maximum longevity. (M6)</li> </ul>	<ul style="list-style-type: none"> <li>Risk assessment must be done by a qualified professional (Tree Risk Assessment training)</li> <li>Must be part of the inventory program to generate priority reports, etc.</li> <li>Condition rating is collected as part of complete inventory</li> </ul>	<ul style="list-style-type: none"> <li>\$ - contract professional (risk can be assessed on only larger trees in fair to poor condition; defects)</li> <li>Short-term; in tandem or proceeding general inventory</li> <li>Included in objective 1; training may be needed to identify defects, rate condition</li> </ul>

Timeline - short = 1-2 yrs, mid = 2-3 yrs, long-term = 3-5 yrs; Budget - \$= <\$5k, \$\$= <\$15k, \$\$\$=\$20k or more

#### 4.1 - COVINGTON'S KEY URBAN FOREST OBJECTIVES, cont'd

OBJECTIVE	DESIRED LEVEL	STRATEGIES/TASKS	TIMELINE/BUDGET
<p><b>3. Maximize Benefits</b> All publicly-owned, highly-managed trees are maintained to maximize current and future benefits. (M7)</p>	<ul style="list-style-type: none"> <li>The trees are systematically maintained; young, establishing trees are assessed for structural pruning.</li> <li>Based on inventory data; establish a defensible program and a reasonable cycle (5-7 years considered optimal)</li> </ul>	<ul style="list-style-type: none"> <li>Annual data review from inventory to prioritize work</li> <li>Develop an annual work plan with a proposed budget</li> <li>Adopt BMP's (update Community Forestry Plan, 2006)</li> <li>Develop a policy toward the desired maintenance cycle and reasonable timeline to achieve</li> </ul>	<ul style="list-style-type: none"> <li>\$ - dedicated staff time</li> <li>Post inventory collection to prioritize workload – short-term (2 years)</li> <li>Part of annual work plan</li> </ul>
<p><b>4. Ecosystem Function of Natural Areas</b> Detailed understanding of the ecological structure and function of all publicly-owned natural areas. (V6)</p>	<ul style="list-style-type: none"> <li>The ecological structure and function of all publicly-owned natural area are documented through an <u>Urban Tree Canopy Analysis</u> and included in the city GIS; <i>mapped urban tree cover using satellite imagery</i></li> </ul>	<ul style="list-style-type: none"> <li>i-Tree Eco software on entire public natural area inventory for ecological structure (see references)</li> <li>May need interim steps – Ex. natural area plans with appropriate BMP's recommended</li> </ul>	<ul style="list-style-type: none"> <li>\$ - staff time (software is free) or contract services</li> <li>Mid to long-term (3-5 years)</li> <li>Update 'Community Forestry Plan' (2006) as urban forest BMP's and have policy to apply to natural areas</li> </ul>
<p><b>5. City Team</b> Ensure all city departments cooperate with common goals and objectives. (C1)</p>	<ul style="list-style-type: none"> <li>Interdepartmental urban forest team acknowledged [formed] to implement city policy and common goals on [at least] a project-specific basis</li> </ul>	<ul style="list-style-type: none"> <li>Tree Team develops work plan, budget; reviews policy, regulation; coordinates project-based urban forestry following strategic plan</li> <li>Team meets on a regular basis – quarterly</li> <li>Team reports to PRC/Tree Board and other boards, as needed</li> </ul>	<ul style="list-style-type: none"> <li>\$ - dedicated staff time from departments; short-term (immediate)</li> <li>\$\$ - program manager (P/T or contract) for Team Lead; mid to long-term (3-5 years)</li> <li>\$ - At least one certified arborist in each department - Parks, Public Works, Planning; short to mid-term (2-3 years)</li> </ul>

Timeline - short = 1-2 yrs, mid = 2-3 yrs, long-term = 3-5 yrs; Budget - \$= <\$5k, \$\$= <\$15k, \$\$\$=\$20k or more



#### 4.1 - COVINGTON'S KEY URBAN FOREST OBJECTIVES, cont'd

OBJECTIVE	DESIRED LEVEL	STRATEGIES/TASKS	TIMELINE/BUDGET
<p><b>6. Community Engagement</b> The urban forest is recognized by the public as vital to the community's environmental, social and economic well-being (C6)</p>	<ul style="list-style-type: none"> <li>• Neighborhood action – at the neighborhood level, citizens understand and cooperate in urban forest management [<i>city-wide coverage and interaction</i>]</li> <li>• Citizen-city-business interaction – all constituencies in the community interact for the benefit of the urban forest [<i>informal and general cooperation</i>]</li> <li>• The green industry operates with high professional standards and commits to city-wide goals and objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Start with Timberlane, Crofton Heights, Crystal View to develop and implement natural area plans</li> <li>• Generate, distribute public outreach materials to promote the urban forest and proper management</li> <li>• Engage Middle Green 'group' and Green River College for curricula and volunteer resources; forest stewardship program (Master Gardener model – Woodway project)</li> <li>• Establish a City tree worker license (LFP model)</li> <li>• Partner with local nurseries and/or electric utility for vouchers</li> </ul>	<ul style="list-style-type: none"> <li>• \$ - dedicated, qualified staff to assist in plans; short to mid-term</li> <li>• \$ - research, collect and reproduce or post on city website; short-term</li> <li>• New community park development – opportunity? Mid to long-term</li> <li>• \$ - After adopted BMP's and policies; mid to long-term</li> <li>• Begin discussions with approved tree lists; short to mid-term</li> </ul>

Timeline - short = 1-2 yrs, mid = 2-3 yrs, long-term = 3-5 yrs; Budget - \$= <\$5k, \$\$= <\$15k, \$\$\$=\$20k or more

## 5. Recommendations

The six key objectives identified by the Tree Team and supported by the Parks & Recreation Commission, Planning Commission, and interested public, provide a solid basis for a reasonable and doable strategic plan and annual work plans that are appropriate for the City. Logically, the priority objective is to understand more about the public tree resource in order to better direct its management and maximize its benefits and function in the community. The recognition of good coordination within the City and with other parties, including citizens and businesses, is also vital in achieving the urban forest vision.

The recommended urban forest strategies for the short-term are as follows:

1. Purchase a comprehensive tree inventory program and conduct an inventory of the public trees that includes condition and risk rating, where appropriate.
2. Generate a more accurate measurement of the public tree canopy cover by using the i-Tree software and initial database produced during this project. Establish a canopy goal for the City and commit to measure changes over time.
3. Develop an annual work plan for the maintenance of publicly-owned, highly-managed trees based on the reports generated by the inventory program.
4. Recognize the interdepartmental Tree Team and enable them to develop work plans and budget requests, review policy, regulation and BMP's, and coordinate project-based urban forestry.
5. Strive to have more than one staff person (ideally one in each department – Parks, Public Works, Planning) acquire arborist certification to provide interdepartmental support, and provide necessary training to ensure qualified staff for the management of the urban forest.
6. Engage the community through neighborhood natural area planning (ex. Timberlane, Crofton Heights), annual work plan discussions, information on best management practices, and the general promotion of the benefits of the urban forest.
7. Update and adopt the Community Forestry Plan (2006) as the City's Best Management Practices for urban forestry.

Several actions will require staff time and resources to accomplish. Even with the coordinated Tree Team, some projects may require contracting with a qualified professional or specifying a designated staff person (part-time). The vision and key objectives all point toward an urban forestry program that will require dedicated staff resources over time.

# APPENDIX A

## ***Urban Tree Benefits***

The benefits of urban trees, sometimes called “ecosystem services”, include environmental, economic, and social values. These are direct or indirect benefits provided by urban forests and individual trees that are often dismissed or underrepresented when valuing infrastructure because they don’t readily have an associated dollar value. Types of tree benefits are listed and briefly described below. While none alone are a “silver bullet”, when combined, trees and the collective urban forest are an impressive part of the solution for sustainability during urban planning and community development.

### **Environmental “Services” of Urban Trees:**

- 🌳 Air Quality – trees absorb, trap, offset and hold air pollutants such as particulate matter, ozone, sulfur dioxide, carbon monoxide, and CO<sub>2</sub>.
- 🌳 Greenhouse Gases (GHGs) and Carbon – trees store and sequester carbon through photosynthesis as well as offset carbon emissions at the plant due to energy conservation.
- 🌳 Water Quality and Stormwater Runoff Mitigation – trees infiltrate, evapo-transpire, and intercept stormwater while also increasing soil permeability and ground water recharge.
- 🌳 Erosion control – tree roots hold soil together along stream banks and steep slopes, stabilizing soils and reducing sedimentation issues in water bodies.
- 🌳 Urban heat island effect – trees cool the air directly through shade and indirectly through transpiration, reducing day and nighttime temperatures in cities.
- 🌳 Increased wildlife habitat – Trees create local ecosystems that provide habitat and food for birds and animals, increasing biodiversity in urban areas.

### **Economic “Services” of Urban Trees:**

- 🌳 Property value – numerous studies across the country show that residential homes with healthy trees add property value (up to 15%).
- 🌳 Energy conservation – trees lower energy demand through summer shade and winter wind block, additionally offsetting carbon emissions at the power plant.
- 🌳 Retail and Economic Development – trees attract businesses, tourists, and increase shopping.
- 🌳 Stormwater facilities – trees and forests reduce the need for or size of costly gray infrastructure.
- 🌳 Pavement – tree shade increases pavement life through temperature regulation (40-60% in some studies).

### **Social “Services” of Urban Trees:**

- 🌳 Public health – trees help reduce asthma rates and other respiratory illnesses.
- 🌳 Safe walking environments – trees reduce traffic speeds and soften harsh urban landscapes.
- 🌳 Crime and domestic violence – urban forests help build stronger communities. Places with nature and trees provide settings in which relationships grow stronger and violence is reduced.
- 🌳 Connection to nature – trees increase our connection to nature.
- 🌳 Noise pollution – Trees reduce noise pollution by acting as a buffer and absorbing up to 50% of urban noise (U.S. Department of Energy study).

From: Benefits of Trees and Urban Forests: A Research List

[http://www.actrees.org/files/Research/benefits\\_of\\_trees.pdf](http://www.actrees.org/files/Research/benefits_of_trees.pdf), Published August 2011

# APPENDIX B

## City of Covington, Washington, *i-Tree Canopy* Land Cover Assessment

### Introduction

Urban forests provide many services essential for maintaining healthy and livable urban communities. Urban Tree Canopy (UTC) assessments provide an important all around measure of community forest health and sustainability. Traditionally, UTC assessments are completed using high-resolution aerial imagery and sophisticated remote sensing classification methods. The main limitation to these assessments is the expertise and cost required to accurately measure the extent of a community's urban forest.

The U.S. Forest Service has partnered with several institutions and agencies to create the *i-Tree* suite of tools targeted at measuring the benefits urban communities receive from trees ([www.itreetools.org](http://www.itreetools.org)). One of the latest tools introduced to the suite is *i-Tree Canopy* designed to allow anyone with internet access in the continental United States and access to a study area boundary ESRI shapefile to conduct their own UTC assessment.

The screenshot shows the *i-Tree Canopy* web interface. At the top, there is a navigation menu with buttons for Home, About, Applications, Utilities, Resources, Support, and News. Below the navigation is a search bar and a login/register section. The main content area is divided into two panels. The left panel shows a satellite map of Covington, WA, with city limits outlined in red and 10 sampling points marked with yellow crosses. The right panel displays the *i-Tree Canopy* results, including a bar chart showing Percent Cover (±SE) for UTC, PPA, and OLC. Below the chart is a table with 10 rows of data, each representing a sampling point with its ID, Cover Class, Latitude, and Longitude.

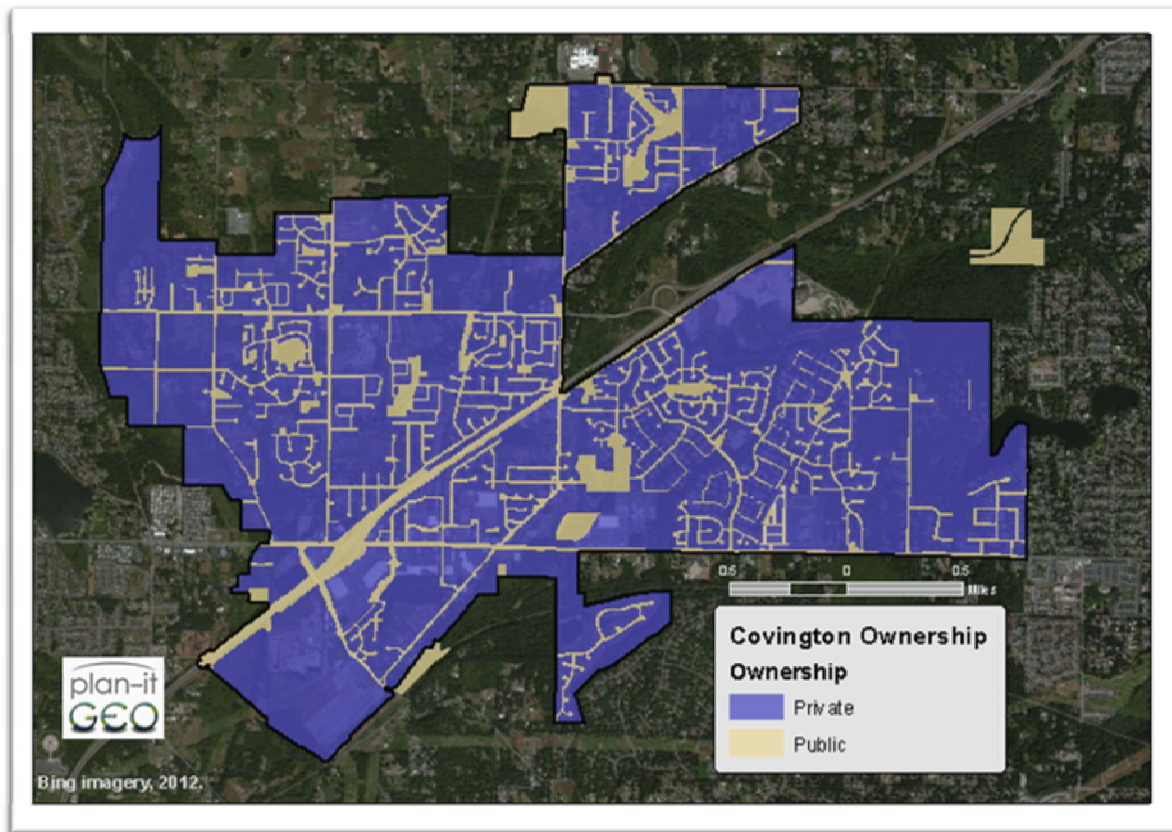
Id	Cover Class	Latitude	Longitude
1	OtherLC	47.35969	-122.106
2	Plantable	47.35935	-122.106
3	OtherLC	47.37614	-122.124
4	Canopy	47.36348	-122.132
5	OtherLC	47.36817	-122.097
6	Plantable	47.37877	-122.101
7	OtherLC	47.36178	-122.000
8	Canopy	47.36519	122.105
9	OtherLC	47.34103	-122.121
10	Plantable	47.37652	-122.124

The *i-Tree Canopy* interface with Covington city limits (red), select land cover sampling points (yellow) and land cover data (table right).

## Urban Tree Canopy Assessment Methods

I-Tree Canopy was used to conduct a UTC assessment for the City of Covington, WA using 2012 aerial photography. Land cover was assessed at 600 randomly distributed points across the City to determine percent cover for (1) Forest, (2) Plantable vegetation, and (3) Other land cover (Table 1). Points were determined to be “Forest” if they were located on any part of a tree. Points were determined to be “Plantable vegetation” if they fell on grass or other non-tree vegetation, and not within agricultural or recreational fields. Points were determined to be “Other land cover” if they fell on all other locations (including agricultural or recreational fields). After the i-Tree Canopy analysis was completed, sample points were extracted and brought into a Geographic Information System (GIS) and separated by ownership type.

Ownership within Covington was created in a GIS using data provided by the City. Public ownership was determined using two data layers: (1) Parcels were defined as public if they were identical to the public parcels layer provided by the city. All other parcels were then defined as private ownership. (2) A Rights of Way (ROW) feature class was created by mapping the inverse of the comprehensive parcels dataset (symmetrical difference between the parcels and city boundary). The ROW and Parcels features were then merged to create a city-wide ownership feature class. Spatial join was then used to assign an ownership class to each land cover sampling point.



Ownership classes used to assess land cover across Covington’s city limits.

Percent of each class relates directly to the percent of points falling on each land cover type during the assessment. Standard Error (SE) reports the probability of each land cover class's estimated percent being the actual percent cover across Covington. Confidence Intervals (CI), calculated using the SE and an acceptable margin of error, provide a plus and minus margin within which we are confident the actual percentage is. For Covington, we used a 95% CI to derive the plus/minus percent. This can be interpreted as saying if we conducted the same point-based land cover assessment 100 times, 95 of those times the city-wide canopy percent would be between 40.5% and 32.81% (see Table 1). Splitting the points between ownership classes reduces the number of available points used to estimate percent cover, which also increases the SE and CI.

## Results

Results using 2012 high-resolution satellite imagery reveal that Covington's overall UTC stands at around 37% (plus or minus 3.8%). Plantable vegetation comprises around 28% and other land cover 35%. Private ownership represents 80.6% of Covington's total area and is comprised of 38% forest canopy, 30% plantable vegetation, and 32% other land cover. Public ownership represents 19% of Covington's total area with 30% forest canopy, 21% plantable vegetation, and 50% other land cover. Note that the SE and CI values for public lands is fairly high given the relatively small number of sampling points falling on public properties.

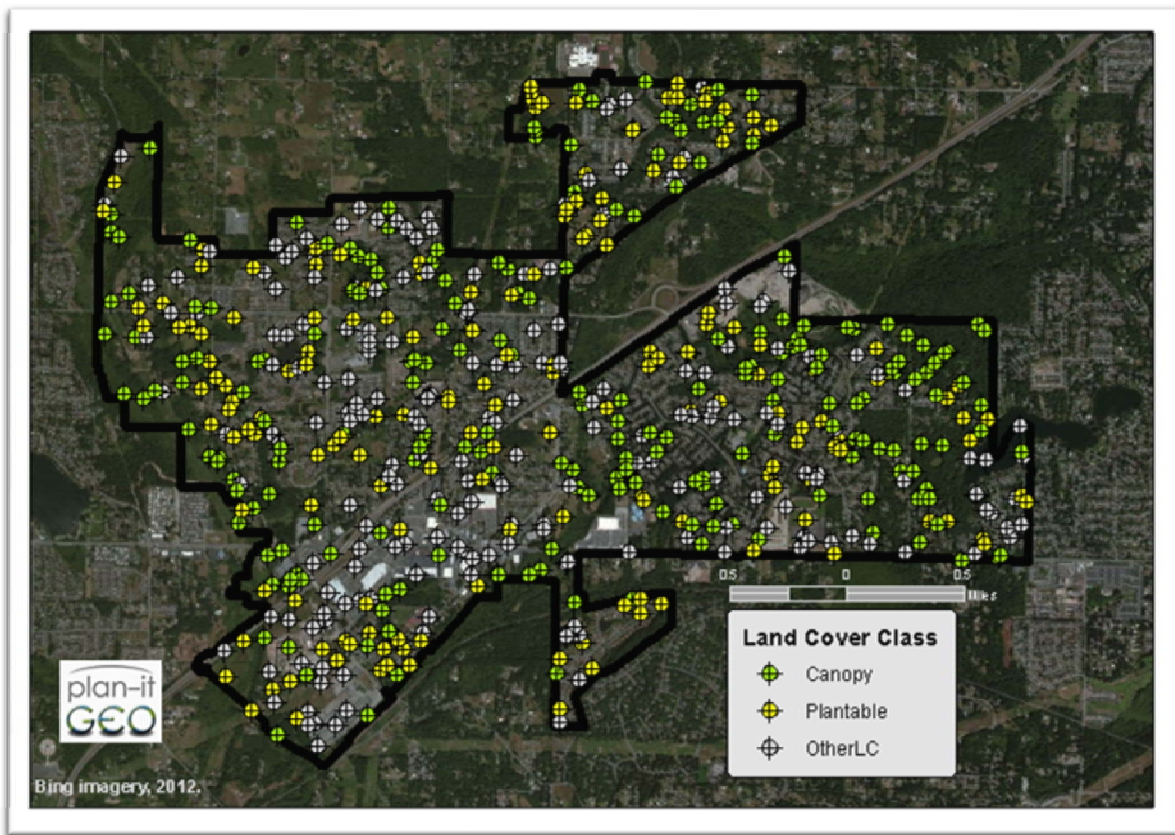
Table 1. Land cover assessment for Covington using i-Tree Canopy.

Land Cover Class	Private 3,088 Acres (4.8 sq. miles), 80.6%				Public 742 Acres (1.2 sq. miles), 19.4%				City-Wide 3,830 Acres (6 sq. miles)			
	Number of Points	Percent of Points	Standard Error	95% CI*	Number of Points	Percent of Points	Standard Error	95% CI*	Number of Points	Percent of Points	Standard Error	95% CI*
Canopy	187	38.32%	0.022	4.314	33	29.46%	0.043	8.443	220	36.67%	0.020	3.856
Plantable	146	29.92%	0.021	4.063	24	21.43%	0.039	7.599	170	28.33%	0.018	3.606
Other LC	155	31.76%	0.021	4.131	55	49.11%	0.047	9.259	210	35.00%	0.019	3.817
SUM	488	100.00%	0.064		112	100.00%	0.129		600	100.00%	0.058	

\* CI = Confidence interval = Percent plus or minus to determine the actual coverage per class.

## Traditional UTC vs. i-Tree Canopy Analysis

I-Tree canopy results provide a great first estimate of tree cover but have limited utility when compared with traditional UTC assessments (see Table 2 for a summary comparison). This method quickly provides a fairly accurate measure of land cover if the number of land cover classes are few and each represents a large proportion of the sampled landscape. From the land manager's perspective, there are several drawbacks to the point based assessment. First, land cover classes that represent a small proportion of the overall landscape (for example soil, water, or wetlands) can be difficult to estimate and impossible to estimate accurately without sampling a very large number of points. Secondly, point based estimates do not provide much spatial information regarding the distribution of land cover classes. For example, determining the canopy percent by Covington neighborhood would require the collection of many points for each land cover class in each neighborhood.



i-Tree Canopy land cover assessment results within a GIS.

The main advantages of traditional UTC assessments are: (1) Land cover is mapped for 100% of the study area. (2) Remote sensing and GIS methods can incorporate many data sources that the City is likely to already possess. (3) Results can be used to segment results for an unlimited number of management boundaries. Land cover classifiers are effective at mapping different land cover types regardless of their size (given the land cover type is larger than a single assessment pixel). Existing data (for example, land use, ownership, or parking lots) can be used to create additional land cover classes that are useful for determining tree planting opportunities. With 100% land cover coverage, results can be segmented in a GIS by using existing data sources (for example, neighborhoods, management areas, or rights of way).

### **How Would a Tree Canopy Assessment Move Covington Toward its Proposed Urban Forest Objectives?**

Understanding the value of Covington’s urban forest resources will require many steps along the assessment process. Canopy cover assessments provide a snapshot of the City’s canopy extent from above. Individual tree inventories provide a framework for assigning per area forest values, but they require a significant investment of time and resources to manage properly. Both provide valuable information for maintaining a comprehensive inventory of the tree resource to direct its management, and understanding of risk potential and ecological structure. The UTC has become so important for managing urban forests today because they provide good information that can be collected rapidly and at multiple points of time to assess the success of urban forest management goals.

Table 2. Comparison of i-Tree Canopy and traditional Urban Tree Canopy mapping

Criteria	i-Tree Canopy	Traditional UTC
<i>Level of Effort</i>	Low (~1-day)	High (3-6 months)
<i>\$ - Cost - \$</i>	Low or free	Medium to High
<i>Method (generalized)</i>	Statistical sampling of Google maps imagery	Remote Sensing/GIS, comprehensive analysis
<i>GIS Software Needed</i>	No	Yes
<i>GIS Products Produced</i>	No	Yes
<i>Spatially Specific?</i>	No	Yes
<i>Use for Change Analysis</i>	Yes, with limitations	Yes
<i>Assessment Boundaries</i>	Limited; typically citywide only	Yes, numerous
<i>Use Results to Assess Ecosystem Services</i>	Not currently without additional effort / assumptions	Somewhat. Exs: CITYgreen, i-Tree Vue
<b><i>Overall / Summary</i></b>	<b>Low cost, easy snapshot, no or fewer visual products</b>	<b>Target strategic areas, partners, needs, etc.</b>



## APPENDIX C

# Terra Firma Consulting

*Sound • Sustainable • Strategic*

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Elizabeth G. Walker  
P.O. Box 1745 ~ Duvall, WA 98019  
ewtreelady@gmail.com

DATE: August 27, 2012

TO: Covington Urban Forest Strategic Plan Team

RE: Urban Forest Criteria & Indicators Matrix – responses/comments

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Attached is a version of the matrix with an effort to combine the responses regarding the criteria, indicators and objectives for the City's urban forestry program.

To explain the notation and meaning of the different highlighting, the size of the "C" (current) or "D" (desired) indicates the number who indicated that level. The darker the blue, the more respondents for that selection. An asterisk on the right means that one person indicated as an objective; if highlighted, more than one person indicated as a key objective (the darker the color, the more respondents). I also have edits that are underlined or in italics to better reflect input.

As you can see, there were similar responses regarding many of the criteria. While there are quite a few different thoughts about where the City is regarding its current performance level, the more critical piece to this exercise is the desired level. It would be very helpful if we could get one more response from you all in order to get agreement on a unified desired indicator and the key objectives for the strategic plan. As you review the results, I would suggest that:

- If you do agree to a key objective, that the desired level is at least "Good".
- If you do not select an objective (with "\*\*"), then the desired level should not be higher than "Good".
- If the group is still split between two levels (most of them are between "Good" and "Optimal"), we can consider the lower level as a more short-term objective and the higher level as long-term.

Please read the comments I offer below regarding each criterion:

### A. Resource Management –

1. Tree Inventory: group split between Good and Optimal. It appears that the difference between the two is whether it's connected to the GIS or not. Considered a key objective.
2. Canopy Cover Assessment: group split between Good and Optimal. Not considered a key objective. If not considered a key objective, should go with Good.
3. City-wide management plan: All but PW indicated Good but with no private tree management. Only one indicated as key objective.
4. Municipality-wide funding: more indicated good; only one indicated as key objective.
5. City staffing: All but one indicated Good for desired; only one indicated as key objective.

## APPENDIX C

6. Tree establishment/planning: most indicated Good; only one indicated as key objective.
7. Maintenance of publicly-owned trees: most indicated “optimal” and many indicate as key objective.
8. Tree Risk Management: desired is split between Moderate and Good with one indicating a key objective.
9. Tree Protection Policy: All who indicated chose Good as current and desired; only one indicated as key objective.
10. Publicly-owned natural area management: group split between Good and Optimal

### B. Vegetative Resource –

1. Relative Canopy Cover: group split between Moderate and Good; only one selected as key objective.
2. Age distribution: group split between Moderate and Good; only one selected as key objective.
3. Species suitability: group split between Moderate and Good; only one selected as key objective.
4. Species distribution: group split between Moderate and Good; not indicated as key objective
5. Condition of publicly-managed trees: group split between Good and Optimal; most indicate as key objective.
6. Publicly-owned natural areas: Most indicated Optimal and key objective.
7. Native vegetation: Most indicated Good; only one indicated key objective.

### C. Community Framework –

1. Public agency cooperation: group split between Good and Optimal; most indicated as key objective.
2. Involvement of large institutional land holders: most indicated Good; not a key objective.
3. Green industry cooperation: most indicated Good; not a key objective.
4. Neighborhood action: some split between Good and Optimal; only one indicated as key objective.
5. Citizen-City-Business interaction: most indicated Good; only one indicated as key objective.
6. General awareness of trees as community resource: some split between Good and Optimal (more); indicated as key objective.
7. Regional cooperation: split across the board for desired level; not a key objective.

Instructions: Each participant (or department, like Community Development) indicate in this letter your selection of desired level for each criterion and indicate if it is now considered an objective to include in the strategic plan. Please return your input back to me via email by Wednesday, September 5<sup>th</sup>. I will then prepare the final matrix for discussion on September 13<sup>th</sup>, including any continued differences in desired levels and key objectives to include in the strategic plan after this exercise.

As always, if you have any questions, please contact me. Thank you!

**Vegetative Resource Criteria and Indicators**

C = Current Level; D = Desired Level

PR= Parks; PW = Public Works; CD = Community Development Team; ET = Engineering; CA = City Arborist

Criteria	Performance Indicator Spectrum				Key Objective
	Low	Moderate	Good	Optimal	
<b>1. Relative Canopy Cover</b>	The existing canopy cover equals 0-25% of the potential.	The existing canopy cover equals 25-50% of the potential. <i>Desired by CD, CA</i>	The existing canopy cover equals 50-75% of the potential. <i>Desired by PW, ET, PR</i>	The existing canopy cover equals 75-100% of the potential.	* Achieve climate-appropriate degree of tree cover, community-wide
<b>2. Age distribution of trees in the community</b>	Any Relative DBH (RDBH) class (0-25% RDBH, 26-50% RDBH, etc.) represents more than 75% of the tree population.	Any RDBH class represents between 50% and 75% of the tree population. <i>Desired by CD, CA</i>	No RDBH class represents more than 50% of the tree population. <i>Desired by ET, PR</i>	25% of the tree population is in each of four RDBH classes.	* Provide for uneven-aged distribution city-wide as well as at the neighborhood/HOA level.
<b>3. Species suitability</b>	Less than 50% of trees are of species considered suitable for the area.	50% to 75% of trees are of species considered suitable for the area. <i>Desired by PW</i>	More than 75% of trees are of species considered suitable for the area. <i>Desired by CD, CA, PR, ET</i>	All trees are of species considered suitable for the area.	* Establish a tree population suitable for the urban environment and adapted to the regional environment.
<b>4. Species distribution</b>	Fewer than 5 species dominate the entire tree population city-wide.	No species represents more than 20% of the entire tree population city-wide. <i>Desired by PW, PR, CD, CA</i>	No species represents more than 10% of the entire tree population city-wide. <i>Desired by ET</i>	No species represents more than 10% of the entire tree population at the neighbourhood level.	Establish a genetically diverse tree population city-wide as well as at the neighborhood level.
<b>5. Condition of Publicly-managed Trees (including ROW trees)</b>	No tree maintenance or risk assessment. Request based/reactive system. The condition of the urban forest is unknown	Sample-based inventory indicating tree condition and risk level is in place.	Complete tree inventory which includes detailed tree condition ratings.	Complete tree inventory which includes detailed tree condition and risk ratings.	* Detailed understanding of the condition and risk potential of all publicly-managed trees

**6. Publicly-owned natural areas (e.g. woodlands, sensitive areas, etc.)**

<p>No information about publicly-owned natural areas.</p>		<p>Publicly-owned natural areas identified in a “natural areas survey” or similar document [PROS plan].</p>	<p>C</p>	<p>The level and type of public use in publicly-owned natural areas is documented</p>	<p>C</p>	<p>The ecological structure and function of all publicly-owned natural areas are documented through an Urban Tree Canopy Analysis and included in the city wide GIS</p>	<p>D</p>	<p>*</p>	<p>Detailed understanding of the ecological structure and function of all publicly-owned natural areas.</p>
<p>No program of integration</p>		<p>Voluntary use of native species on publicly and privately-owned lands; invasive species are recognized.</p>	<p>C</p>	<p>The use of native species is encouraged on a project-appropriate basis in actively managed areas; invasive species are recognized and discouraged; some planned eradication.</p>	<p>C/ D</p>	<p>The use of native species is required on a project-appropriate basis in all public and private managed areas; invasive species are aggressively eradicated.</p>	<p>D</p>	<p>*</p>	<p>Preservation and enhancement of local natural biodiversity</p>

**7. Native vegetation**

Resource Management Criteria and Indicators

C = Current Level; D = Desired Level

PR= Parks; PW = Public Works; CD = Community Development Team; ET = Engineering; CA = City Arborist

Criteria	Performance Indicator Spectrum						*	Key Objective		
	Low		Moderate		Good		Optimal			
<b>1. Tree Inventory</b>	No inventory	C	Complete or sample-based inventory of publicly-owned trees	C	Complete inventory of publicly-owned trees AND sample-based inventory of privately-owned trees. <i>Desired by PW, CD, CA</i>	D	Complete inventory of publicly-owned trees AND sample-based inventory of privately-owned trees included in city-wide GIS <i>Desired by ET, PR</i>	D	*	Comprehensive inventory of the tree resource to direct its management. This includes: age distribution, species mix, tree condition, risk assessment.
<b>2. Canopy Cover Assessment</b>	No inventory	C	Visual assessment		Sampling of tree cover using aerial photographs or satellite imagery; I-Tree; <i>Desired by ET, CD, CA</i>	C	Mapped urban tree cover using aerial photographs or satellite imagery included in city-wide GIS; <i>Desired by PW, PR</i>			High resolution assessments of the existing and potential canopy cover for the entire community.
<b>3. City-wide management plan</b>	No plan	C	Existing plan limited in scope and implementation	C	Comprehensive plan for publicly-owned, intensively- and extensively-managed forest resources accepted and implemented	D	Strategic multi-tiered plan for public and private intensively- and extensively-managed forest resources accepted and implemented with adaptive management mechanisms. <i>Desired by PW; others indicated NO private tree management</i>	D	*	Develop and implement a comprehensive urban forest management plan for private and public property.
<b>4. Municipality-wide funding</b>	Funding for only emergency reactive management	C	Funding for some proactive management to improve the public portion of urban forest.	D	Funding to provide for a measurable increase in urban forest benefits.	D	Adequate private and public funding to sustain maximum urban forest benefits.		*	Develop and maintain adequate funding to implement a city-wide urban forest management plan

5. City staffing	No staff.	C Limited trained or certified staff.	C Certified arborists and professional foresters on staff with regular professional development.	D	Multi-disciplinary team within an urban forestry program. <b>Desired by PW</b>	D	*	Employ and train adequate staff to implement city-wide urban forestry plan
6. Tree establishment, planning and implementation	Tree establishment is ad hoc (no plan or budget)	C Limited tree establishment occurs on an annual basis with minimal budget.	C Tree establishment is directed by needs derived from a tree inventory or strategy	D	Tree establishment is directed by needs derived from a tree inventory and is sufficient to meet canopy cover objectives (see Canopy Cover criterion in Table 1)	D	*	Urban Forest renewal is ensured through a comprehensive tree establishment program driven by canopy cover, species diversity, and species distribution objectives
7. Maintenance of publicly-owned, intensively managed trees (not open space)	No maintenance of publicly-owned trees	C Publicly-owned trees are maintained on a request/reactive basis. No systematic (block) pruning.	C All publicly-owned trees are systematically maintained on a cycle longer than five years.	D	All mature publicly-owned trees are maintained on a 5-year cycle. All immature trees are structurally pruned.	D	*	All publicly-owned, intensively managed trees are maintained to maximize current and future benefits. Tree health and condition ensure maximum longevity.
8. Tree Risk Management	No tree risk assessment/remediation program. [Request based/reactive system?] The condition of the urban forest is unknown	C Sample-based tree inventory which includes general tree risk information; Request based/reactive risk abatement program system. <b>Desired by PR, CD, CA</b>	D Complete tree inventory which includes detailed tree failure risk ratings; risk abatement program is in effect eliminating hazards within a maximum of one month from confirmation of hazard potential. <b>Desired by ET, PW</b>	D	Complete tree inventory which includes detailed tree failure risk ratings; risk abatement program is in effect eliminating hazards within a maximum of one week from confirmation of hazard potential.		*	<i>All publicly-owned trees are managed with safety as a high priority.</i>

**9. Tree Protection Policy Development and Enforcement**

<p>No tree protection policy</p>		<p>Policies in place to protect public trees.</p>		<p>Policies in place to protect public and private trees <u>[with enforcement desired]</u>.</p>	<p>C/ D</p>	<p>Integrated municipal wide policies that ensure the protection of trees on public and private land are consistently enforced and supported by significant deterrents</p>		<p>*</p>	<p>The benefits derived from large-stature/mature trees are ensured by the enforcement of municipal wide policies.</p>
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**10. Publicly-owned natural areas management planning and implementation**

<p>No stewardship plans or implementation in effect.</p>	<p>C</p>	<p>Reactionary stewardship in effect to facilitate public use (e.g. hazard abatement, trail maintenance, etc.)</p>	<p>C</p>	<p>Stewardship plan in effect for each publicly-owned natural area to facilitate public use (e.g. hazard abatement, trail maintenance, etc.) <b><i>Desired by ET, CD, CA</i></b></p>	<p>D</p>	<p>Stewardship plan in effect for each publicly-owned natural area focused on sustaining the ecological structure and function of the feature. <b><i>Desired by PW, PR</i></b></p>	<p>D</p>	<p>*</p>	<p>The ecological structure and function of allpublicly-owned natural areas are protected and, where appropriate, enhanced.</p>
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**Community Framework Criteria and Indicators**

C = Current Level; D = Desired Level

PR= Parks; PW = Public Works; CD = Community Development Team; ET = Engineering; CA = City Arborist

Criteria	Performance Indicator Spectrum						*	Key Objective	
	Low		Moderate		Good		Optimal		
<b>1. Public agency cooperation (inter-departmental and with utilities)</b>	No communication or conflicting goals among departments and or agencies.		Common goals but no coordination or cooperation among departments and/or agencies.		Informal teams among departments and or agencies are functioning and implementing common goals on a project-specific basis. <i>Desired by PR, ET</i>		C Municipal policy implemented by formal interdepartmental/ interagency working teams on ALL municipal projects. <i>Desired by PW, CD, CA</i>	*	Ensure all city department cooperate with common goals and objectives
<b>2. Involvement of large institutional land holders (ex. hospitals, campuses, utility corridors)</b>	No awareness of issues	C	Educational materials and advice available to landholders.	C	Clear goals for tree resource by landholders. Incentives for preservation of private trees.		D Landholders develop comprehensive tree management plans (including funding).		Large private landholders embrace city-wide goals and objectives through specific resource management plans.
<b>3. Green industry cooperation</b>	No cooperation among segments of the green industry (nurseries, tree care companies, etc.) No adherence to industry standards.	C	General cooperation among nurseries, tree care companies, etc.	C	Specific cooperative arrangements such as purchase certificates for “right tree in the right place”		D Shared vision and goals including the use of professional standards.		The green industry operates with high professional standards and commits to city-wide goals and objectives.
<b>4. Neighborhood action</b>	No action		Neighborhood associations/HOA's exist but are minimally engaged or a limited number are engaged.	C	City-wide coverage and interaction.		D All neighborhoods/HOA's organized and cooperating.	D *	At the neighborhood level, citizens understand and cooperate in urban forest management.



**5. Citizen-municipality-business interaction**

Conflicting goals among constituencies		No interaction among constituencies.	C	Informal and/or general cooperation.	C/ D	Formal interaction e.g. Tree board with staff coordination.		*	All constituencies in the community interact for the benefit of the urban forest.
Trees not seen as an asset, a drain on budgets.		Trees seen as important to the community.		Trees acknowledged as providing environmental, social and economic services.	D	Urban forest recognized as vital to the communities environmental, social and economic well-being.	D	*	The general public understanding the role of the urban forest.
Communities independent.	C	Communities share similar policy vehicles.	D	Regional planning is in effect	D	Regional planning, coordination and /or management plans	D		Provide for cooperation and interaction among neighboring communities and regional groups.

**6. General awareness of trees as a community resource**

**7. Regional cooperation**

**Table D.1 – VEGETATION RESOURCE**

**APPENDIX D.1**

<b>Criteria</b>	<b>Objective</b>	<b>Current Condition</b>	<b>Desired Level</b>	<b>Strategies/Tasks</b>
1. Relative Canopy Cover	Achieve climate-appropriate amount of tree cover, community-wide	The canopy cover is estimated at 37% of the city-wide land cover according to I-Tree results (2012); [57% of total potential , forest canopy and plantable vegetation; see report]	Canopy cover equals 50-75% of the potential	<ul style="list-style-type: none"> <li>• I-Tree software and data is sufficient to measure change in cover over time (every 5 years)</li> <li>• Set policy to ensure sufficient cover through development and change in land use</li> </ul>
2. Age Distribution	Provide for an uneven – aged distribution city-wide and at the neighborhood level	Unknown	No relative diameter class represents more than 50% of the tree population	<ul style="list-style-type: none"> <li>• Comprehensive tree inventory with size data (DBH)</li> </ul>
3. Species Suitability	Establish a tree population suitable for the urban growing conditions and adapted to the regional environment	Perceived around half of the trees are of species suitable for the area	More than 75% of tree species are suitable for the growing conditions and regional environment	<ul style="list-style-type: none"> <li>• Comprehensive tree inventory with species data</li> <li>• Update recommended tree list to latest trends in regional climate</li> </ul>
4. Species Distribution	Establish a genetically diverse tree population city-wide and at the neighborhood level	Perceived no species representing more than 10-20% of the entire tree population city-wide	No species represents more than 10% of the highly managed tree population city-wide	<ul style="list-style-type: none"> <li>• Tree inventory and mapping of species</li> <li>• Planting designs are to include a diverse palette of species</li> </ul>

**Table D.1 – VEGETATION RESOURCE**

**APPENDIX D.1**

<b>Criteria</b>	<b>Objective</b>	<b>Current Condition</b>	<b>Desired Level</b>	<b>Strategies/Tasks</b>
5. Condition of Publicly-managed Trees (including ROW)	Detailed understanding of the condition and risk potential of all publicly managed trees	No tree maintenance or risk management; request-based/reactive system. Condition of the urban forest is unknown	Complete tree inventory which includes detailed tree condition and risk ratings	<ul style="list-style-type: none"> <li>• Risk management approach to prioritize work plan and budget</li> <li>• Review species and size trends with condition ratings to refine planting and maintenance decisions.</li> </ul>
6. Publicly-owned Natural Areas (e.g. woodlands, sensitive areas)	Detailed understanding of the ecological structure and function of all publicly-owned natural areas	The level and type of public use in publicly-owned natural areas is documented	The ecological structure and function of all publicly owned natural areas are documented through an Urban Tree Canopy Analysis and included in the city-wide GIS	<ul style="list-style-type: none"> <li>• RFP for Urban Tree Canopy Analysis to determine cost</li> <li>• Apply for a grant for Analysis if high priority</li> </ul>
7. Native Vegetation	Preservation and enhancement of local natural biodiversity	The use of native species is encouraged on a project-appropriate basis in actively managed areas; invasive species are recognized and discouraged; some planned eradication	Same as Current	<ul style="list-style-type: none"> <li>• Engage the public in invasive removal and native plantings through volunteer efforts</li> </ul>

**Table D.2 – RESOURCE MANAGEMENT**

**APPENDIX D.2**

Criteria	Objective	Current Condition	Desired Level	Strategies/Tasks
1. City Staffing	Employ and train adequate staff to implement a city-wide urban forestry plan [ <i>certified arborists and program manager with professional development</i> ]	Limited trained or certified staff	Certified arborists and professional foresters on staff with regular professional development.	<ul style="list-style-type: none"> <li>• Consider in-house UF manager (existing staff) with invested professional development [both technical and program management]</li> <li>• (Short-term) Contract consultation services for specific projects</li> <li>• At least one certified arborist for each discipline (PW, Parks, Planning)</li> <li>• Provide for cooperation and interaction among neighboring communities and regional groups [share resources with Black Diamond, Maple Valley?]</li> </ul>
2. City-wide Management Plan	Develop and implement a comprehensive urban forest management plan for publicly-owned trees	No Plan	A comprehensive plan for publicly-owned, actively managed forest resources accepted and implemented	<ul style="list-style-type: none"> <li>• Consider a 1-5 year strategic/work plan (outcome from this plan)</li> <li>• Update the Community Forestry Plan with BMP's</li> </ul>

**Table D.2 – RESOURCE MANAGEMENT**

<p>3. Urban Forestry Funding</p>	<p>Develop and maintain adequate funding to implement a city-wide urban forest management plan</p>	<p>Funding for only emergency reactive management</p>	<p>Funding for proactive management to improve the public portion of the urban forest striving for a measurable increase in urban forest benefits</p>	<ul style="list-style-type: none"> <li>• WADNR and other grants for one-time projects (inventory, management plan)</li> <li>• Consider stormwater utility to subsidize with contributions from the 3 P's for ongoing funding</li> </ul>
<p>4. Tree Protection Policy</p>	<p>Benefits derived from large, mature trees are ensured by the enforcement of municipal-wide policies</p>	<p>Policies in place to protect public and private tree with enforcement</p>	<p>Same as current</p>	<ul style="list-style-type: none"> <li>• Periodically update policy if not adequate urban forest protection (inventory, mapping data)</li> </ul>
<p>5. Publicly-owned natural areas management [planning and implementation]</p>	<p>The ecological structure and function of all publicly-owned natural areas are protected and where appropriate, enhanced</p>	<p>Reactionary stewardship in effect to facilitate public use (e.g. hazard abatement, trail maintenance, etc.)</p>	<p>Stewardship/Management plan in effect for ALL natural areas and strives toward sustaining ecological benefit</p>	<ul style="list-style-type: none"> <li>• Part of city-wide plan and policies</li> <li>• Engagement of HOA's with the management of their natural areas</li> </ul>

**Table D.3 – COMMUNITY FRAMEWORK**

**APPENDIX D.3**

Criteria	Objective	Current Condition	Desired Level	Strategies/Tasks
1. Public Agency Cooperation (inter-departmental and with utilities)	Ensure all city departments cooperate with common goals and objectives.	Informal teams among the departments and or agencies are functioning and implementing common goals on a project-specific basis.	Municipal policy with established interdepartmental/ interagency working teams on ALL municipal projects.	<ul style="list-style-type: none"> <li>• Tree Team meets on a regular basis - quarterly</li> <li>• Tree Team develops work plan, budget; reviews policy, regulation; coordinates project-based urban forestry following strategic plan</li> <li>• Tree Team reports to Parks Commission/Tree Board and other boards, as needed</li> </ul>
2. Involvement of large institutional land holders (hospitals, campuses, utility corridors)	Large private landholders embrace city-wide goals and objectives through specific resource management plans	No proactive education or awareness of City goals/objectives.	Clear goals for tree resource by landholders. Incentives for preservation of private trees.	<ul style="list-style-type: none"> <li>• Engage with new strategic plan and annually present work plan</li> </ul>
3. Green Industry Cooperation	The green industry operates with high professional standards and commits to city-wide goals and objectives.	No cooperation among green industry (nurseries, tree care companies, etc.) No consistent adherence to industry standards.	Specific cooperative arrangements, such as purchase certificates for “right tree in the right place”	<ul style="list-style-type: none"> <li>• Adopt City BMPs for tree care in the community; city license for tree work?</li> <li>• Provide City tree list to nurseries and encourage partnership</li> </ul>

**Table D.3 – COMMUNITY FRAMEWORK**

**APPENDIX D.3**

<b>Criteria</b>	<b>Objective</b>	<b>Current Condition</b>	<b>Desired Level</b>	<b>Strategies/Tasks</b>
4. Neighborhood Action	At the neighborhood level, citizens understand the benefits derived from large, healthy trees - and cooperate in urban forest management	Neighborhood Associations/HOA's exist but are minimally engaged or a limited number are engaged.	City-wide engagement and interaction	<ul style="list-style-type: none"> <li>• Work with select HOA's for a model neighborhood urban forestry plan; incentive to streamline permits for tree activity</li> </ul>
5. Citizen-municipality-business interaction	All constituencies in the community interact for the benefit of the urban forest.	Informal and general cooperation	Interaction with City Tree Board and Tree Team for better policies, compliance and cooperation	<ul style="list-style-type: none"> <li>• Work with Chamber, HOA's and others to refine tree protection policy and increase appreciation</li> </ul>
6. General awareness of trees as a community resource	The general public understanding the role and value of the urban forest.	Unknown	Urban forest recognized as vital to the communities environmental, social and economic well-being.	<ul style="list-style-type: none"> <li>• Work with schools, incorporating urban forestry into curriculum; Urban Forest Stewardship program (Master Gardener model)</li> <li>• Develop/distribute public info brochures; provide incentives to stewards</li> </ul>
7. Regional cooperation	Provide for cooperation and interaction among neighboring communities and regional groups.	Communities in area are independent re: urban forestry	Regional planning, coordination and/or management plans; shared resources	<ul style="list-style-type: none"> <li>• Approach neighboring communities to share resources (Black Diamond, Maple Valley)</li> </ul>

**APPENDIX D.3**

# APPENDIX E

## Resources

Alliance for Community Trees (ACT). **Benefits of Trees and Urban Forests: A Research List.** [http://www.actrees.org/files/Research/benefits\\_of\\_trees.pdf](http://www.actrees.org/files/Research/benefits_of_trees.pdf), Published August 2011.

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City of Renton. 2009 Urban and Community Forestry Development Plan. <http://rentonwa.gov/uploadedFiles/Living/CS/PARKS/FINAL%20Renton%20UCFDP%200Aug2009SMALLER.pdf>

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WA Department of Ecology. **Western Washington Hydrology Model** [http://www.ecy.wa.gov/programs/wq/stormwater/wwhmtraining/wwhm/wwhm\\_v3/index.html](http://www.ecy.wa.gov/programs/wq/stormwater/wwhmtraining/wwhm/wwhm_v3/index.html)