Council Meeting: 06/21/11
Agenda: Study Session
Item #: 3.a.

CITY OF KIRKLAND
Planning and Community Development Department
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MEMORANDUM

To: Kurt Triplett, City Manager

From: Deb Powers, Urban Forester
Paul Stewart, Deputy Director, Planning and Community Development
Eric Shields, Director, Planning and Community Development

Date: June 9, 2011

Subject: KIRKLAND URBAN TREE CANOPY ASSESSMENT REPORT

RECOMMENDATION:

Receive a presentation and report on the city-wide urban tree canopy assessment as consideration for staff to move forward with the Urban Forest Management Plan project. No specific action from the Council is requested at this time – however, the tree canopy assessment will serve as the basis for the next step which is the preparation of a citywide Urban Forest Management Plan.

REPORT SUMMARY

At the study session, city staff and the consultant, Ian Hanou, the project manager with AMEC Earth & Environment Inc. will present the findings from the Urban Tree Canopy Assessment.

Urban Tree Canopy or 'UTC' is assessed by the outline of tree foliage as seen from above in aerial imagery. Kirkland's Urban Tree Canopy Assessment Report (Attachment 1) includes mapping 2002 tree canopy within Kirkland's boundaries before annexation, then comparing canopy within the same boundary with current imagery. Comparing 2002 baseline canopy data to 2010 imagery helps verify trends in canopy gain or loss and allows detailed analysis by zoning classification and parcels.

In the pre-annexation area, Kirkland has 2,450 acres of tree canopy, which represents 36% of the overall area of the City. Despite development pressure within the region, Kirkland had a net gain of 4.4% tree canopy between 2002 and 2010. This compares favorably to other Puget Sound area cities, many of which had a loss of canopy during this same period.

The report provides existing canopy cover results within 6 generalized zoning categories and analyzes canopy coverage change by land use, parcel level, the public right-of-way (streets), and for each of Kirkland's 15 drainage basins. The results show canopy gain in most of the generalized zoning categories, with Kirkland's Industrial areas having the lowest tree cover of all zoning classes. The largest gains in canopy were within the Commercial, Multifamily Residential, and Public Right-of Way categories with 5.4%, 7.1%, and 6.9% canopy increases respectively.

In anticipation of the recent annexation that has now nearly doubled Kirkland's surface area, the study includes current canopy data in Finn Hill, North Juanita and Kingsgate. These data will provide a baseline for future canopy assessments. When including the recently annexed area, Kirkland's 2010 city-wide canopy cover was 40.7%. The study analyzes Kirkland's 'Possible UTC' and provides recommendations and strategies for use of the canopy data.

BACKGROUND DISCUSSION:

Introduction

At the study session, staff and the consultant will present the findings from the Tree Canopy Report. The City Council requested the canopy analysis when new tree regulations were adopted.

Adopted Goals and Policies

The City Council has adopted a goal statement on the Environment that states: "We are committed to the protection of the natural environment through an integrated natural management system." The goal is to "protect our natural environment for current residents and future generations." One of the performance measures noted in the Council goal is to monitor "tree coverage".

Kirkland is a city known for balancing growth and natural resource protection. Kirkland's Comprehensive Plan establishes the City's vision, its goals and policies and implements strategies for managing growth over decades. To promote significant environmental improvements both within the city and regionally, the Comprehensive Plan includes Policy NE-3.1 that states that the City should "*work toward increasing Kirkland's tree cover to 40 percent"* which is a standard recommended by American Forest's ecosystem analysis for the Puget Sound area. This policy also notes that the City should periodically assess the tree canopy.

The City's adopted 2003 Natural Resource Management Plan also contains a guiding principle regarding Tree Canopy Cover (III.C.1). It states that the "ecological and economic benefits of a significant tree canopy cover in an urban area are optimized at

an overall coverage of 40%." It goes on to note that the benefits are to storm water management and air quality.

The other essential policy document is the 20-year Forest Restoration Plan. This was prepared in partnership with the Cascade Land Conservancy and was adopted by the City Council in February, 2008. The Plan evaluated the forest conditions in the city's parks and open spaces through a "Tree-iage" model to determine the threat of invasive species coverage. One of the primary goals of this plan is to restore our natural areas by removing invasive plants and replanting native trees, shrubs and ground cover for the sustainability of the forest and its habitat.

History and Process

When the City's Comprehensive Plan was adopted in 1995, the City had not planned how to measure or monitor its tree canopy. In 2003, staff from the City's Information Technology-GIS (IT-GIS) department used simple mapping techniques to estimate the city's total canopy cover to draft the City's Natural Resource Management Plan.

The City Council adopted Chapter 95 of the Kirkland Zoning Code (KZC) in late 2005, establishing standards and procedures for tree management and required landscaping. The intent of Chapter 95 is to support the goals and objectives of the City's Comprehensive Plan and the City's Natural Resource Management Plan by maintaining and enhancing the City's tree canopy. The regulatory basis of Kirkland's tree ordinance is founded on the public benefits that trees and vegetation provide to the community. At that time, the Council also requested that a tree canopy assessment be undertaken in 2010.

As part of the ordinance adopting the Tree Regulations, it was noted that the City would undertake a two-year review of the regulations to see if any changes to the standards were needed. A status report was prepared in 2008 and the City did amend the regulations in 2009-10. With these amendments, the City Council approved minor modifications to the tree regulations recognizing that more comprehensive data were needed to consider any substantial changes to KZC 95.

Aside from supporting Kirkland's vision and goals, the benefits of completing a canopy assessment is that the data serve as performance measures that allow the City to:

- Provide the basis for the Urban Forestry Management Plan.
- Verify trends in canopy gain or loss on a several levels (e.g. at a neighborhood, watershed or zoning and land use scale).
- Have a baseline for future canopy monitoring.
- Calculate the cost-benefits of Kirkland's urban forest, i.e. quantify stormwater filtration and reduction of runoff, improve air quality, and address carbon

sequestration (with the use of i-Tree eco tools, UFORE-Hydro watershed model, CITYGreen or other software).

- Participate in uniform, accurate and comprehensive canopy data collection within the region.
- Determine whether or not additional changes to the tree regulations or city strategies, practices and programs will be needed. This project would need to be discussed following the Urban Forestry Management Plan.

As part of the Planning Department's 2010 Work Program, the City's Urban Forester developed a plan to implement a city-wide urban tree canopy (UTC) assessment. In early January 2010, an interdepartmental team was formed to identify the project purpose, scope, objectives, timeline, and funding sources. Funding in particular had been a previous obstacle for pursuing a comprehensive canopy study.

In late 2010, the City secured grant funding from the Washington Department of Natural Resources and the USDA Forest Service for its Urban Tree Canopy project. With additional funding from the City Forestry Account, a contractor (AMEC Earth & Environment, Inc.) was selected and the project proceeded with the collaborative efforts from an interdepartmental team involving IT-GIS, Public Works, Planning and Parks Department staff. A description of the project scope, objectives, timeline and contractor deliverables is outlined in the Scope of Work (Attachment 2).

Next Steps

Over the next several months the City will begin to work on the Urban Forestry Management Plan using the canopy assessment as the baseline. A second grant has been secured to fund this project.

The benefits, purpose and objectives of an Urban Forest Management Plan are outlined in the grant proposal (Attachment 3) as noted below:

> *Using current trends in business modeling and adaptive management strategies outline a strategic urban forest management plan that incorporates the City's values and vision with the following objectives:*
>
> 1. *Get an accurate depiction of how the City is currently managing its City-wide urban forest attributes by independent assessment.*
> 2. *Identify how to proactively manage the City's urban forest resources, reducing costs and liability while accommodating growth and maintaining or enhancing ecosystem viability & sustainability.*
> 3. *Develop a long-range strategic framework supported by incremental management plans, organizational approaches and annual operating plans.*

4. *Promote increased communication and accountability to decision-makers and the public regarding the City's forestry management activities*
5. *Provide technical information about urban forestry through appropriate education and outreach efforts*

ATTACHMENTS:

(1) - Kirkland Urban Tree Canopy Assessment Report
(2) - Scope of Work for 2010 Kirkland Urban Tree Canopy Assessment Project
(3) - Grant proposal for Kirkland Urban Forest Strategic Management Plan

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Attachment 1

city of kirkland washington

June 2011

URBAN TREE CANOPY ASSESSMENT REPORT

Prepared by:
AMEC Environment & Infrastructure, Inc.

ACKNOWLEDGEMENTS

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CONTENTS

EXECUTIVE SUMMARY 2
INTRODUCTION 4
MAJOR FINDINGS 6
DATA INPUTS, METHODOLOGY AND LAND COVER RESULTS 7
RECOMMENDATIONS 15
SUMMARY 16
ABOUT AMEC ENVIRONMENT & INFRASTRUCTURE, INC. 17
APPENDIX 18

LIST OF FIGURES

Figure 1. Land Cover Change Example 4
Figure 2. WorldView 2 Satellite Imagery 5
Figure 3. Example of 2002 to 2010 Tree Canopy Gain 5
Figure 4. Imagery used in Kirkland's UTC Assessment 7
Figure 5. Tree Canopy with Color-Infrared Imagery Example 7
Figure 6. 6-Class Land Cover Example 7
Figure 7. Land Cover Distribution Citywide 7
Figure 8. UTC Metrics for 2002, 2010 and Post-Annexation 8
Figure 9. Map of Canopy Change per Parcel 9
Figure 10. Map of Generalized Zoning 10
Figure 11. Zoning Distribution 10
Figure 12. Distribution of UTC by Zoning 10
Figure 13. Acres of 2002 and 2010 UTC by Zoning Class 11
Figure 14. Distribution of 6 Broad Zoning Types 12
Figure 15. Existing Percent UTC by Drainage Basins 13
Figure 16. Comparison of Tree Canopy to Neighboring Communities 16
Figure 17. Acres of UTC by Drainage Basin 20
Figures 18-19. Example of UTC at the Parcel-Level 21

LIST OF TABLES

Table 1. Land Cover Distribution Citywide 7
Table 2. UTC Metrics for 2002, 2010 and Post-Annexation 9
Table 3. 2002 – 2010 UTC by Zoning and Comparison to American Forest Goals 11
Table 4. 2010 UTC Results by Zoning including Annexation Area 12
Table 5. Possible UTC by Zoning Categories 14
Tables 6-9. UTC Results 14

Funding assistance for this assessment was provided by the USDA Forest Service and the Washington State Department of Natural Resources Urban and Community Forestry Program. The USDA is an equal opportunity provider and employer.

Executive Summary

The City of Kirkland is committed to preserve, protect and sustain its natural resources while meeting the demands of a growing suburban city. To achieve balanced growth, Kirkland's Comprehensive Plan established a citywide 40 percent tree cover goal as recommended by the American Forest's 1998 ecosystem analysis of the Puget Sound area. In support of the policies outlined in the Comprehensive Plan, the City implemented comprehensive tree regulations in 2006. This study measures Kirkland's urban tree canopy cover, analyzes canopy gains and losses, and explores the potential for tree canopy maintenance and enhancement.

Trees are a valuable natural resource for the City of Kirkland that provide multiple benefits including increased property value, pollutant removal, stormwater runoff reduction, carbon sequestration, energy savings, and other valuable ecosystem functions.

With a recent annexation nearly doubling Kirkland's area, it is vital to gauge canopy cover as a performance measure for a sustainable urban forest and a healthy environment. The data provided by this local level canopy analysis will enable Kirkland's leaders and citizens to continue with its legacy of stewardship.

Kirkland's Existing Urban Tree Canopy

Mapped from 1.5-foot 2010 satellite imagery with "leaf-on" conditions, Kirkland was found to have 2,450 acres (36.0%) of tree canopy, not including the recent annexation area. As a comparison, this rate coincides with the current canopy cover in Bellevue (36%), is higher than Renton (28.6%) and Shoreline (31%), and slightly less than Mercer Island (41%). When including the annexation area, Kirkland's current canopy cover is 40.7%.

This report provides existing canopy cover results within 6 zoning categories including the public right-of-way (streets), by public and private properties, and for each of Kirkland's 15 drainage basins.

Change in Urban Tree Canopy Change Since 2002

This study includes mapping 2002 tree canopy within Kirkland's boundaries before annexation, then comparing canopy within the same boundary with current imagery. The baseline year was selected for the best imagery available prior to the City's tree codes' effective date. Comparing baseline canopy data to 2010 imagery helps verify trends in canopy gain or loss and allows detailed analysis by zoning classification and parcels. Despite development pressure within the region, Kirkland gained 4.4% tree canopy between 2002 and 2010, compared to more substantial canopy loss of nearby cities.

UTC Goal Setting Process

This study is a comprehensive and scalable inventory of Kirkland's tree canopy: a top-down map of Kirkland's green infrastructure. As in any business model, stakeholders need an asset inventory in order to effectively manage the asset, set goals and monitor progress towards the goals.

Cities and communities set Urban Tree Canopy (UTC) goals as a planning tool to achieve greater environmental, human health and social standards. Adopting the City's tree regulations was a laudable first step towards reaching the recommended canopy goal for the region. However, even with canopy goals and tree protection policies in place, communities need to gauge their progress and determine how effective their tree protection has been over time. This study:

- Measures Kirkland's canopy in the pre-annexed area during a benchmark year prior to the adoption of the City's trees regulations
- Compares benchmark year canopy data to current canopy data within the same area
- Analyzes canopy statistics by land use, zoning, watershed, and parcel level detail to calculate canopy gain or loss in the pre-annexed areas
- Includes canopy data in the newly-annexed area for future canopy studies

Results showing specific gaps in canopy targets by zoning category were used by AMEC to assist in Kirkland's goal setting process.

Strategies and Recommendations

To meet and maintain Kirkland's UTC goals, it's important to use a diversity of strategies including education and outreach efforts, offering incentives to increase urban tree canopy, and supporting the City's goals and objectives with regulatory measures.

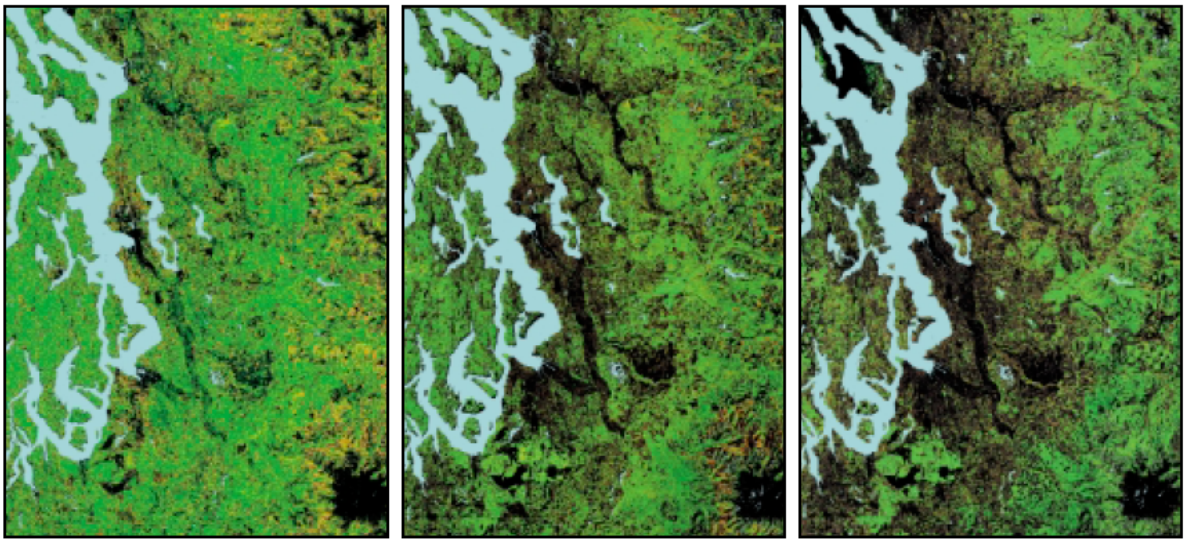
With 36 percent existing tree canopy cover in the previous city limits, the focus in Kirkland should be enhancing canopy in the areas identified in this study. When considering the current canopy data in the newly-annexed area, the City should protect and maintain the existing healthy urban forest by continued efforts outlined in the city's 20-Year Forest Restoration Plan and Chapter 95 of the Kirkland Zoning Code. In addition, an Urban Forest Management Plan could detail appropriate strategies to proactively manage the City's urban forest resources.

Kirkland volunteers maintaining a healthy urban forest

Introduction

In 1998, a study was performed by American Forests which highlighted alarming downward trends in forest cover at the regional scale (Figure 1).

Figure 1. Land cover change showing increased development (in black) in the Puget Sound region



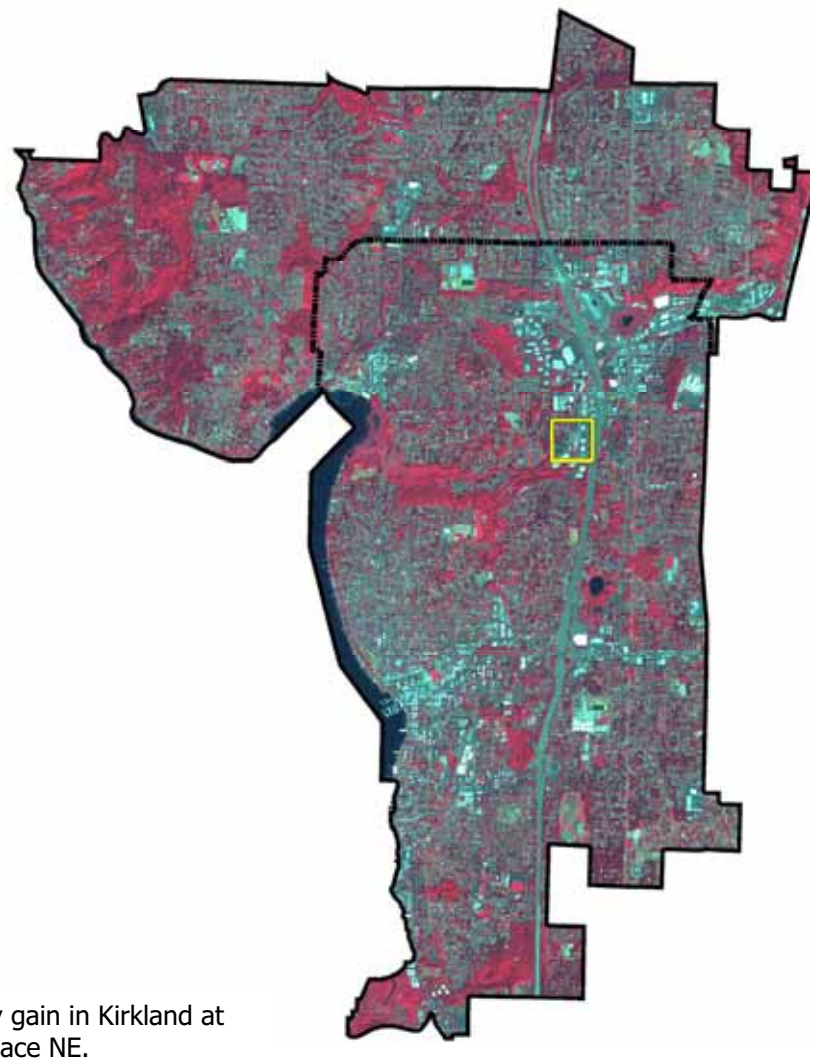
Landsat MSS 1972 *80 Meter Pixel Resolution* **Landsat TM 1986** *30 Meter Pixel Resolution* **Landsat TM 1996** *30 Meter Pixel Resolution*

When Kirkland's Comprehensive Plan was drafted, the City had not planned how to measure or monitor its tree canopy. When the City's tree regulations were adopted in 2006, the City Council requested that a tree canopy assessment be undertaken in 2010 to evaluate the effectiveness of the regulations.

With funding support from the U.S. Forest Service and the Washington Department of Natural Resources Urban & Community Forestry Program, AMEC Environment & Infrastructure, Inc. was contracted in March 2011 to assist the City in performing this analysis using Geographic Information Systems (GIS) and satellite imagery. The results of this report are meant to inform the public, City staff and decision-makers of Kirkland's canopy status, compare Kirkland's UTC metrics with other cities in the region, provide recommendations to maintain or enhance canopy towards the City's visions and goals, and increase awareness of urban forest benefits.

Geographic Information Systems (GIS) offer powerful tools for supporting decision-making through mapping, analysis and spatial visualization of data and information. Urban Tree Canopy (UTC) assessments are a cost-effective method to assess tree cover over time. UTC assessments, together with other software programs available through U.S. Forest Service and other organizations can be used to place a value on urban forests.

Figure 2. 1.5-foot resolution WorldView-2 satellite imagery (DigitalGlobe) shown in color-infrared where vegetation appears in shades of red. The yellow box references the location of the inset images in Figure 3 below.



The comparative study area covers the existing city limits prior to annexation. In addition, current data was compiled on the newly-annexed areas of Finn Hill, North Juanita and Kingsgate neighborhoods were included, an area which approximately totals 18 square miles. Figures 2 and 3 show the combined project area with color-infrared satellite imagery and an example of tree canopy gain from urbanized landscaping.

The land cover data, including impervious surfaces and 'Existing' and 'Possible' UTC GIS layers are the most comprehensive sets of data the City has compiled to date for potential stormwater, carbon and other environmental modeling.

Figure 3. Example of 2002 to 2010 tree canopy gain in Kirkland at the intersection of NE 112th Street and 117th Place NE.

Major Findings

Based on the analysis of satellite imagery, land cover, land use and a variety of other mapping data, the following represent the major findings from this study:

- *In Kirkland, 2,450 acres (36.0%) of tree canopy exists, not including the annexation area.*
- *In the pre-annexed area, a gap of 4.0% UTC was calculated from the City's Comprehensive Plan 40% UTC goal.*
- *In the pre-annexation area of Kirkland, planting approximately 5,600 additional large trees (50-foot crown spread at maturity) would attain the 40% UTC goal.*
- *Citywide, Kirkland had a net gain of 4.4% UTC from 2002-2010 from 31.6% to 36.0%. Recent tree canopy regulations appear to be very effective at increasing and maintaining tree canopy.*
- *Relative to 2002, this represents a 13.9% increase in canopy.*
- *The Holmes Point drainage basin has the highest UTC (63.3%) while the Houghton Slope A drainage basin has the lowest (27.1%).*
- *Industrial and Single Family Residential (LDR) zoning are below American Forest's recommendation of 25% and 50% canopy cover respectively.*
- *Park and Open Space zoning makes up just 9% of Kirkland, however 15% of the City's tree canopy is found in this zoning type, which has 66% tree canopy in 2010.*
- *By zoning type, the largest gains were found in Commercial, Multifamily Residential, and Public Rights-of-Way at 5.4%, 7.1% and 6.9% respectively.*
- *The only zoning type with marginal increase was Parks and Open Space.*
- *All six zoning types assessed saw an increase in canopy cover. Single Family Residential provided the greatest acres of gain (117) with Right of Way and Commercial next (77 and 65 acres respectively).*
- *Including the annexed neighborhoods of Finn Hill, Juanita and Kingsgate, the City of Kirkland has 4,637 acres of tree cover or 40.7% UTC.*
- *Kirkland's newly-annexed existing tree canopy is higher compared to UTC studies in Bellevue, Mercer Island, Renton, Seattle, Shoreline, and Tacoma*

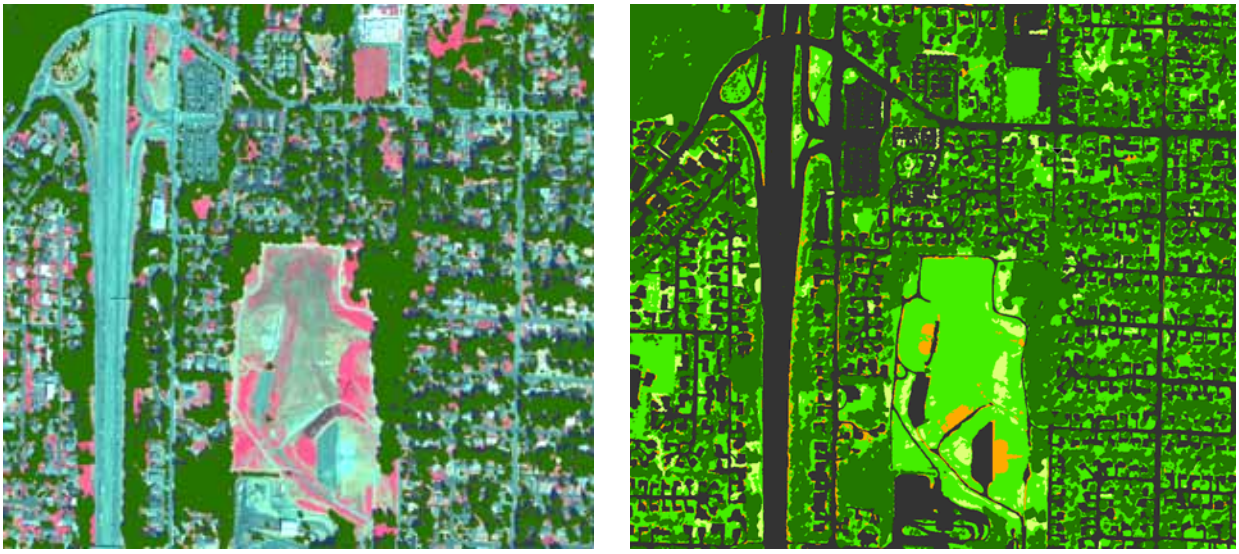
Data Inputs, Methodology and Land Cover Results

UTC assessments require geographic information systems (GIS), aerial or satellite imagery, and GIS data layers from the community. These inputs are used to map land cover data and summarize the area and percent of UTC for various boundaries. Additional information is provided in the Appendix.

Figure 4. Imagery used in Kirkland's UTC Assessment

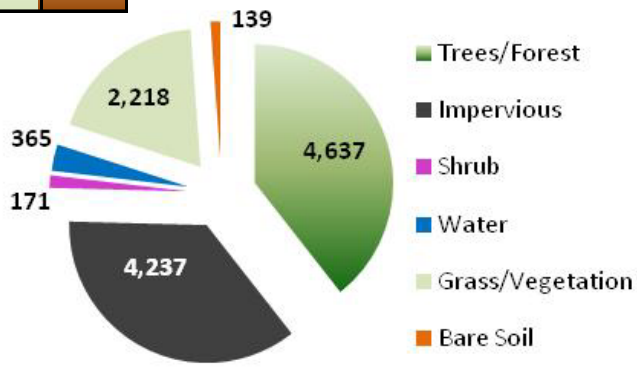
For this project, 2001 LiDAR (Figure 4, left panel), 2002 aerial natural color imagery (center panel), and 2010 multispectral satellite imagery (right panel) were used to map tree canopy (Figure 5 below). Five other land cover classes were mapped (Figure 6 below). Canopy cover percentage (%) is based on land area only.

Figures 5 & 6. Tree canopy shown in green areas (left). Other land cover classes (right)



	Total Acres	Trees %	Impervious %	Shrub %	Water %	Grass %	Soil %
City of Kirkland	11,768	39.4%	36.0%	1.5%	3.1%	18.8%	1.2%

Table 1 & Figure 7. Current city-wide land cover distribution in Kirkland including the recent annexation. Although a land cover classification, water is excluded when calculating UTC metrics.



Existing Urban Tree Canopy and Trends from 2002-2010

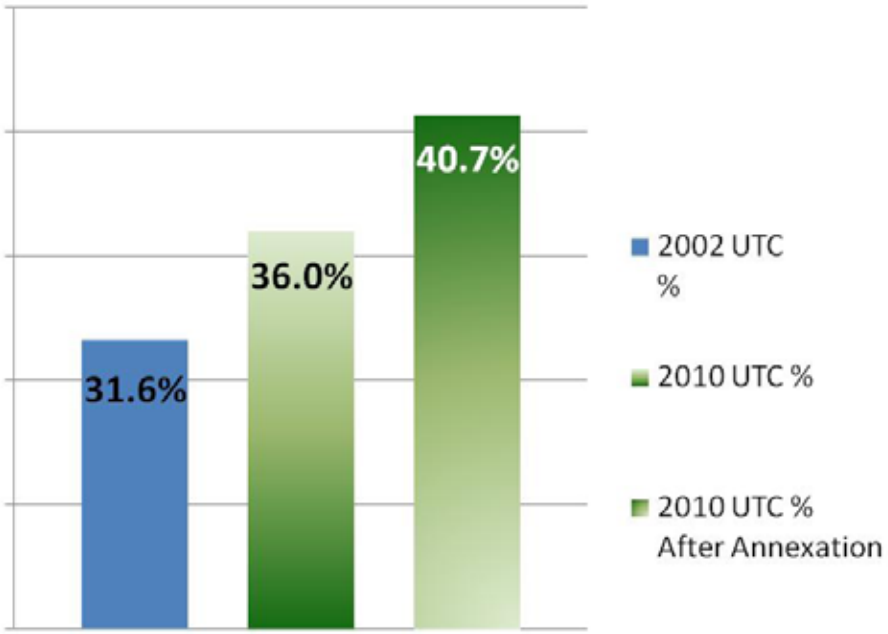
The primary scope of this project was to measure tree canopy cover in Kirkland prior to annexation to assess the effectiveness of the City's tree regulations. The study also allows the City to assess where they are in relation to the 40% UTC goal. Canopy change from 2002 to 2010 was calculated only for the pre-annexation area.

Prior to annexation, the City's land area covers approximately 6,806 acres, of which 2,450 acres (36.0%) was covered by trees based on 2010 imagery. Using 2002 imagery, the City's tree canopy was found to be 2,151 acres or 31.6%. This represents a net gain of 299 acres of tree canopy or 4.4%. When considering the change in canopy cover relative to the acres in 2002 and the acres in 2010, this is a 13.9% gain in tree canopy. The City's gap to achieving 40% UTC in the pre-annexed area is 4.0% or 272 acres.

The citywide (post-annexation) land area covered approximately 11,403 acres of which 4,637 are tree covered (40.7% UTC).

City of Kirkland	Total Land Acres	2002 UTC Acres	2002 UTC %	2010 UTC Acres	2010 UTC %	Change in UTC Acres	Relative Change in UTC (%)	Raw Change in UTC (%)
Pre-Annexation	6,806	2,151	31.6	2,450	36.0	299	13.9	4.4
Post-Annexation	11,403	--	--	4,637	40.7	--	--	--

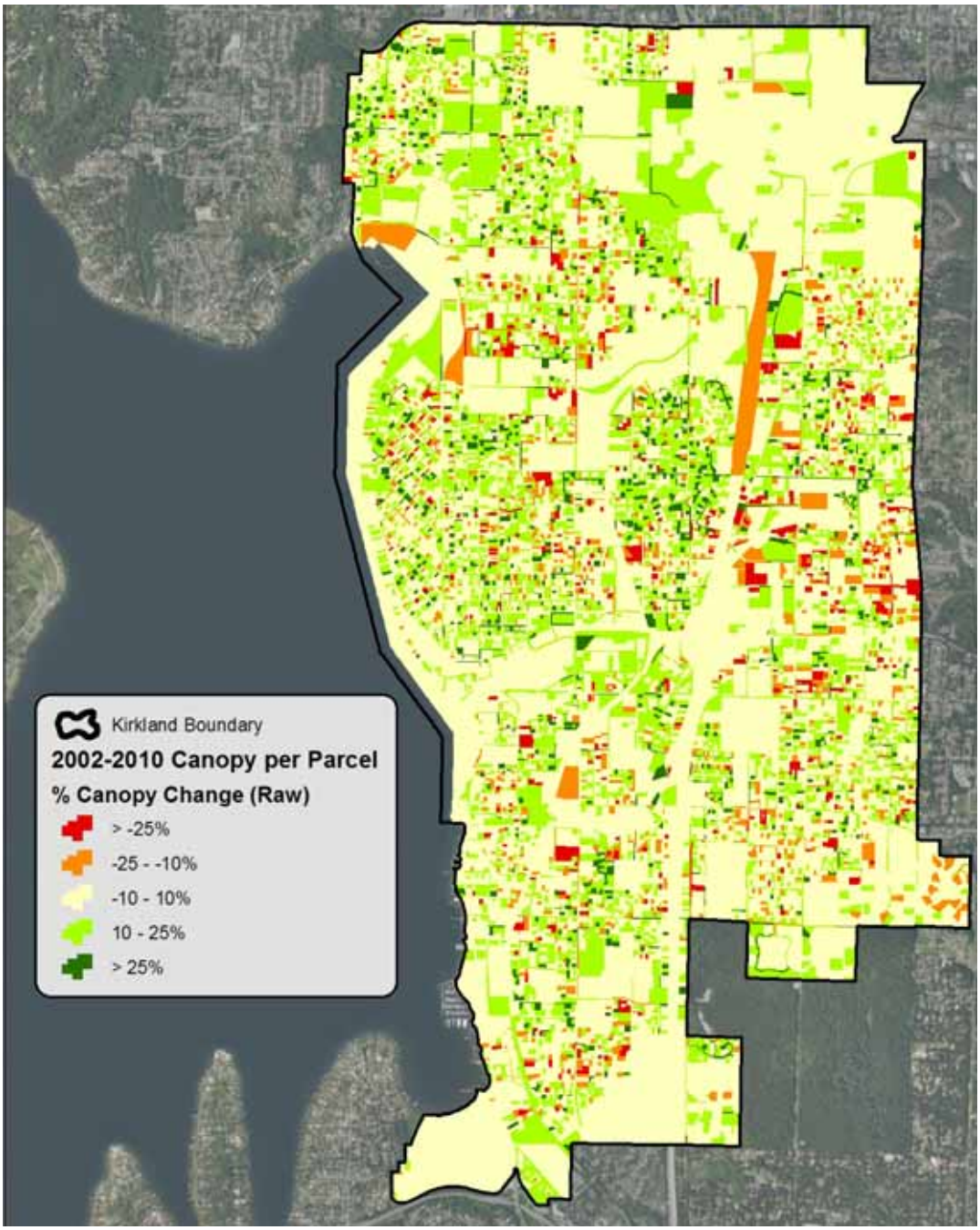
Table 2 (above) **& Figure 8** (below)**.** UTC metrics for 2002, 2010 and post-annexation.



Parcel Level

For improved planning and to assist with goal-setting, tree canopy cover was calculated for each parcel (property) boundary. The GIS and Excel databases delivered as part of this project include the area calculations, 2002 and 2010 tree canopy percentages and change of UTC ratios. By identifying these attributes on a parcel level, the information becomes another tool in which to study trends in the City's urban tree canopy. Figure 9 below shows individual parcels color-coded by the percent (%) of tree canopy change. Dark red indicates higher tree canopy loss; dark green indicates higher canopy gain.

Figure 9. Map of canopy change per parcel from 2002 to 2010



Results for Generalized Zoning Categories

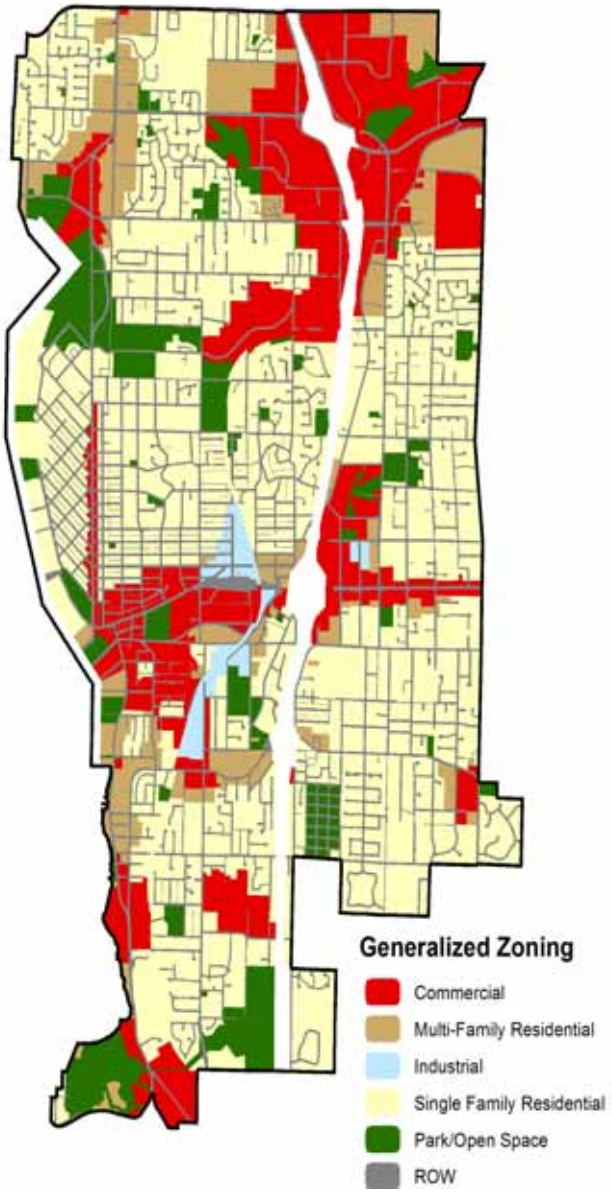
Kirkland's 144 different land use zoning districts were consolidated into six zoning categories. These Generalized Zoning Categories were then mapped to assess the existing, potential and change in tree canopy from 2002 to 2010. The map at right illustrates the distribution of these broad zoning types within the pre-annexed area of Kirkland.

The distribution of zoning and percent of 2010 UTC by zoning is shown in Figures 11 and 12 (below).

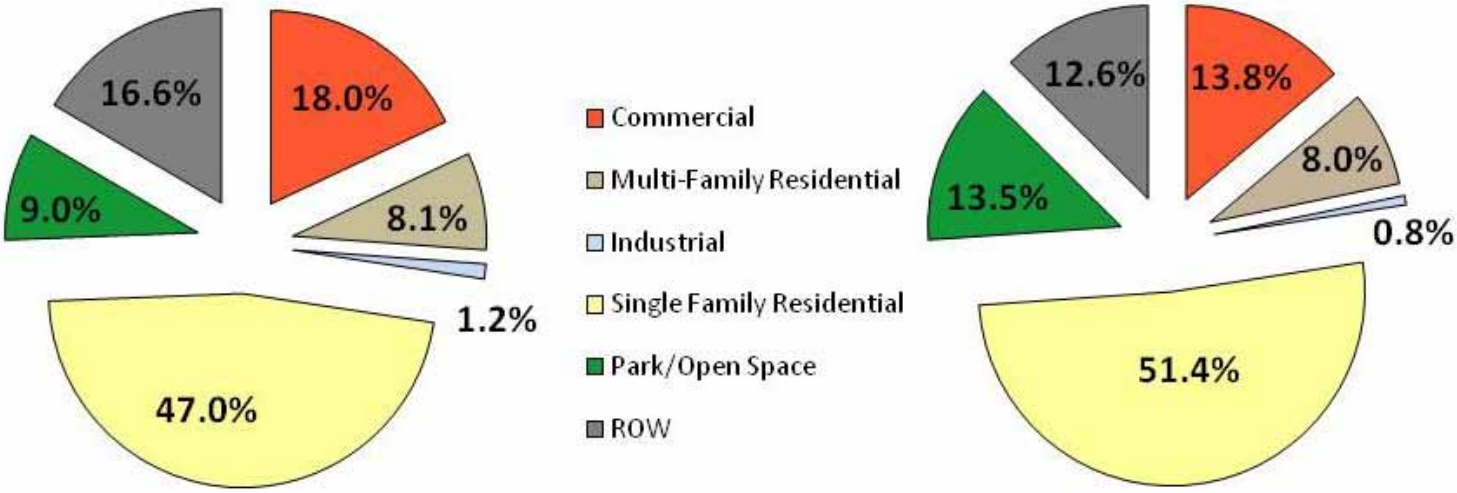
Did you know?

- *Prior to annexation, 55.1% of Kirkland was zoned Single or Multi-family Residential, yet this land use zone makes up 59.4% of the city's tree cover.*
- *While only 9% of Kirkland is zoned "Parks/Open Space," this represents 13.5% of the City's entire tree canopy.*

Figure 10. Generalized zoning map



Figures 11-12. Generalized zoning distribution (below left) and percentage of Kirkland's UTC by zoning category (below right)



Existing UTC and Canopy Change by Zoning Type Compared to American Forest Goals in the Pre-Annexation Area

Table 3. 2002-2010 UTC Zoning comparison to American Forest's recommended goals for land use in the Puget Sound

General Zoning Classification	% of Total Area	2002 UTC Acres	2002 UTC %	2010 UTC Acres	2010 UTC %	Distrib. Of 2010 UTC by Zoning	Change in UTC Acres	Relative Change in UTC*	Raw Change in UTC	UTC Goal	Delta (% Above or Below)
Commercial	18%	266	22.0%	331	27.5%	13.8%	65	24.5%	5.4%	20%	7.5%
Multi-Family Residential	8%	153	28.2%	192	35.3%	8.0%	38	25.0%	7.1%	35%	0.3%
Industrial	1%	16	18.8%	18	22.1%	0.8%	3	17.3%	3.2%	25%	-2.9%
Single Family Residential	47%	1,114	35.5%	1,232	39.2%	51.4%	117	10.5%	3.7%	50%	-10.8%
Park/Open Space	9%	318	52.7%	324	53.8%	13.5%	6	2.0%	1.0%	25%	28.8%
ROW	17%	225	20.3%	302	27.2%	12.6%	77	34.2%	6.9%	25%	2.2%
Total	**100%**	**2,092**	**31.3%**	**2,398**	**35.9%**	100.0%	**307**	**14.7%**	**4.6%**	**40%**	**-4.1%**

From a percentage standpoint, UTC in the right-of-way increased more than any other zoning type.

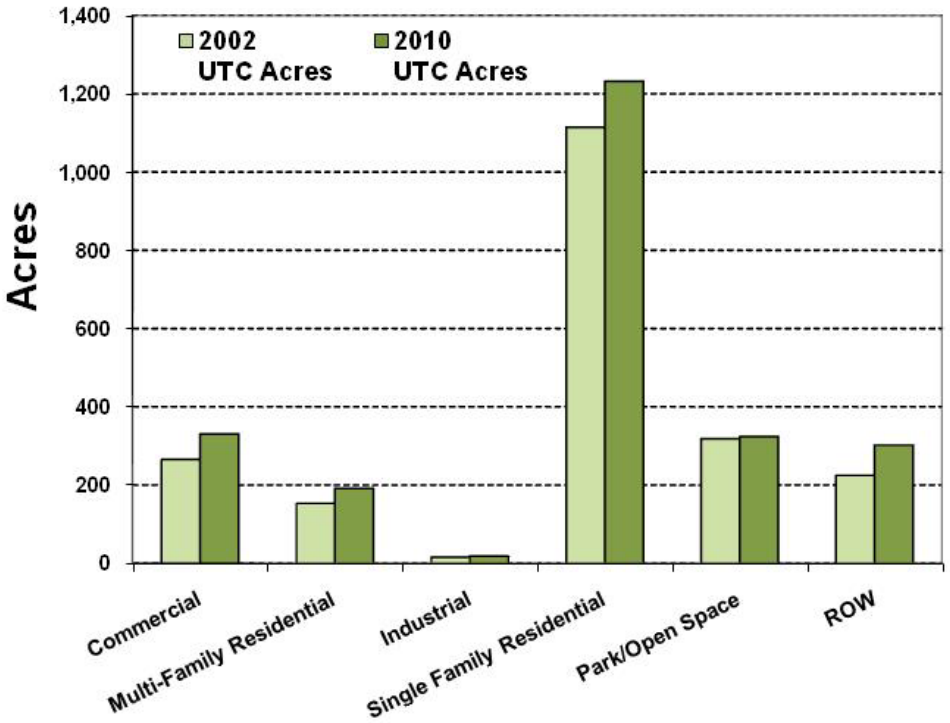
Single Family Residential properties gained the most UTC acres (117) but are 10.8% below American Forest's recommended goal.

At 27.5% UTC, commercial zoning is above American Forest's recommended goal for this zoning type.

54% of Kirkland's parks are tree-covered.

Kirkland's Industrial areas have the lowest tree cover (22%) of all zoning classes.

Figure 13. Comparison of 2002-2010 Tree Canopy Acres by Generalized Zoning Categories



Note: Total zoning area does not include water or land area in the Interstate-405 corridor

2010 Urban Tree Canopy (UTC) Results by Zoning Category including Finn Hill, North Juanita and Kingsgate

For future monitoring purposes, the analysis included UTC results taking into consideration Kirkland's new city boundary with the City's annexation June 1, 2011.

The annexation increased Kirkland's UTC from 36.0% to 40.7% due to a large presence of single family residential (SFR) and park/open space zoning (see Figure 14 at right) which had high canopy cover. The annexation increased Kirkland's SFR from 47% to 55%. As a result, 60% of all tree canopy is found on SFR properties (see Table 4 below).

Total acres and UTC percent do not incorporate the Interstate 405 corridor.

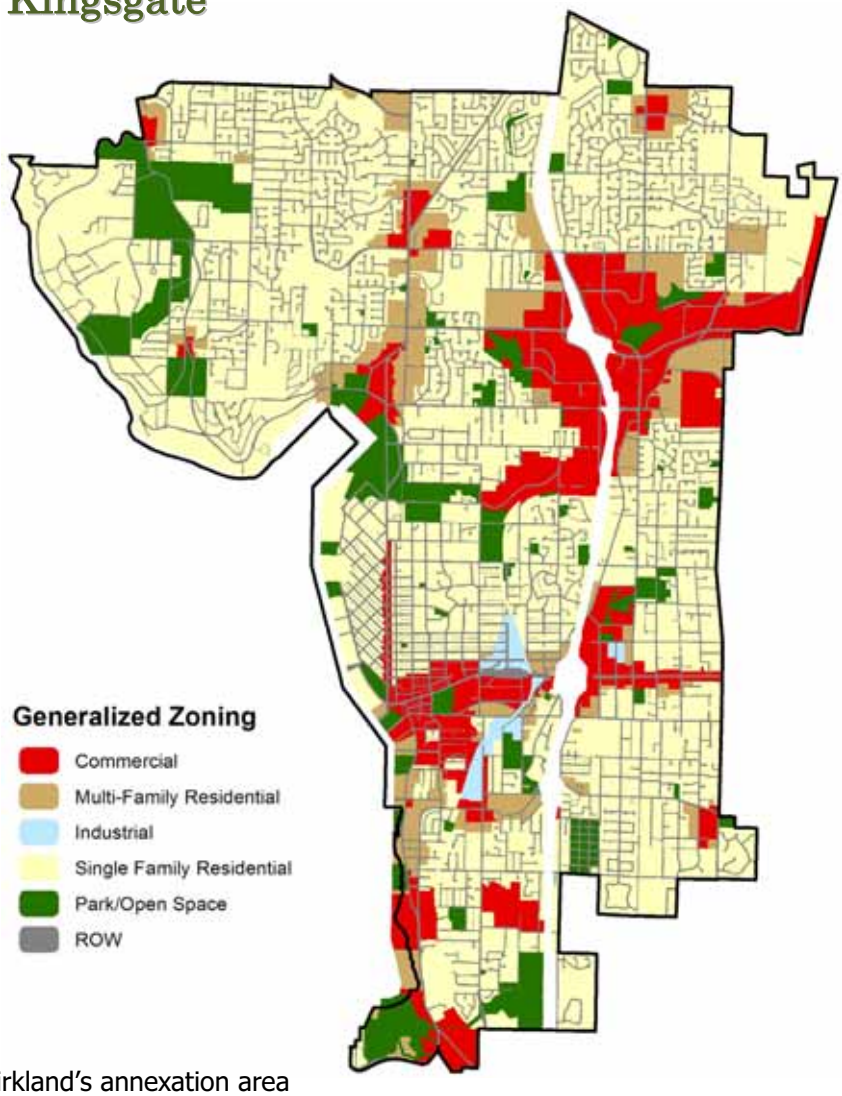


Figure 14. (above) Map illustrating the Generalized Zoning Categories in Kirkland including the annexed areas.

Table 4. 2010 UTC Results by Zoning including Kirkland's annexation area

General Zoning Classification	Total Acres	% of Total Area	2010 UTC Acres	2010 UTC %	Distrib. Of 2010 UTC by Zoning
Commercial	1,387	12%	364	26.3%	8.0%
Multi-Family Residential	794	7%	282	35.5%	6.2%
Industrial	83	1%	18	22.1%	0.4%
Single Family Residential	6,185	55%	2,740	44.3%	60.1%
Park/Open Space	1,007	9%	664	66.0%	14.6%
ROW	1,837	16%	494	26.9%	10.8%
Total	**11,293**	**100%**	**4,563**	**40.4%**	**100.0%**

Results by Drainage Basins for Existing UTC

Kirkland's Drainage Basins were assessed for current tree canopy cover, including the newly annexed areas. Urban Tree Canopy (UTC) measured at this scale is extremely useful information for watershed- and neighborhood-level planning. Kirkland's drainage basins or watersheds were delineated for the percent of 2010 existing UTC. Canopy cover in the northeastern annexed area is very high with Holmes Point Basin at 63.3% UTC and Denny Creek Basin at 55.9% UTC.

Evidence supports the link between higher UTC in watersheds to decreased contaminants from urban runoff into Lake Washington. Higher percentages of tree cover and other vegetation within watersheds correlates directly to quality creek, stream and lake habitat, reduced runoff and improved surface water quality.

A full table of results by drainage basin is included in the Appendix.

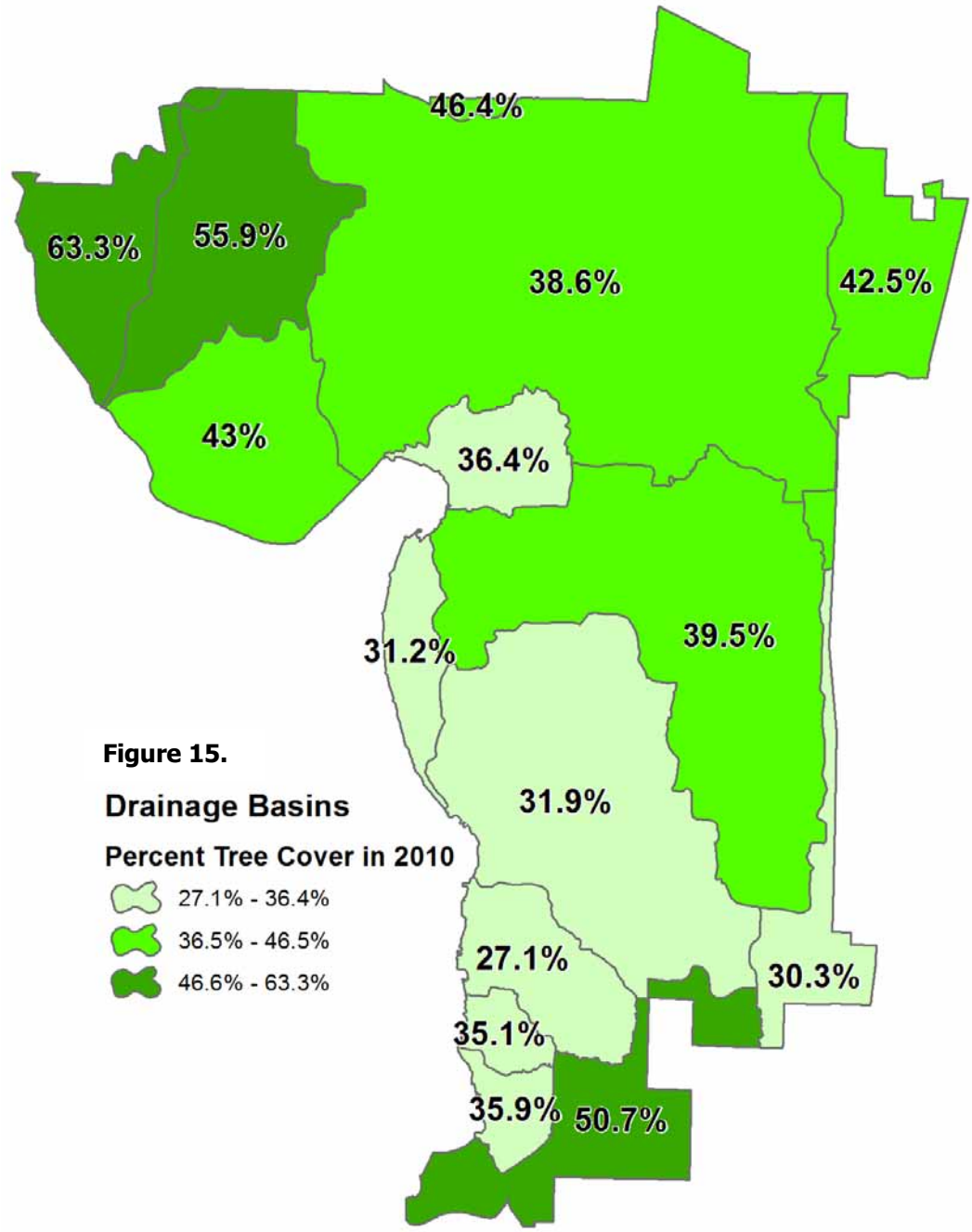


Figure 15.

Assessing Kirkland's Possible UTC

Goal setting involves a number of stakeholders and accurate data from which to base decisions on. Using Kirkland's 2010 land cover data and supporting GIS layers, this study involved an analysis of Kirkland's "Possible UTC". Possible UTC is defined in two categories: Possible UTC Vegetation and Possible UTC Impervious.

Existing UTC

All vegetated areas not covered by trees, forest or shrub, typically lawn and open space areas are Possible UTC Vegetation. After removing buildings and roads, the remaining impervious areas, which are typically parking lots, driveways, patios and other paved surfaces define the Possible UTC Impervious areas. Both areas represent US Forest Service protocols for where it is biophysically feasible to establish tree canopy. Possible UTC is liberal by including all of these areas but conservative where tree canopy can overhang other areas.

Possible UTC Vegetation

With 1,491 acres of Possible UTC Vegetation and 703 acres of Possible UTC Impervious (Table 5 below), more opportunities exist for potentially increasing canopy in Single Family Residential zoning than any other zoning category.

Recommendations are provided below using the results of this analysis for targeting specific tree planting and policy opportunities.

Possible UTC Impervious

General Zoning Classification	Total Acres	2010 UTC %	Possible UTC Vegetation Acres	Possible UTC Vegetation %	Possbile UTC Impervious Acres	Possible UTC Impervious %	Total Poss. Acres	Total Poss. %	UTC Goal	Delta (Above or Below)
Commercial	1,387	26.3%	140	10.1%	455	32.8%	595	42.9%	20%	6.3%
Multi-Family Residential	794	35.5%	113	14.2%	143	18.0%	256	32.2%	35%	0.5%
Industrial	83	22.1%	8	9.6%	32	38.4%	40	48.0%	25%	-2.9%
Single Family Residential	6,185	44.3%	1,491	24.1%	603	9.8%	2,094	33.9%	50%	-5.7%
Park / Open Space	1,007	66.0%	188	18.7%	31	3.1%	219	21.7%	25%	41.0%
ROW	1,837	26.9%	194	10.6%	201	10.9%	395	21.5%	25%	1.9%
Total	**11,293**	**40.4%**	**2,134**	**18.9%**	**1,465**	**13.0%**	**3,599**	**31.9%**	**40%**	**0.4%**

Table 5. Possible UTC by Zoning Categories including difference between Existing and UTC Goals

Recommendations

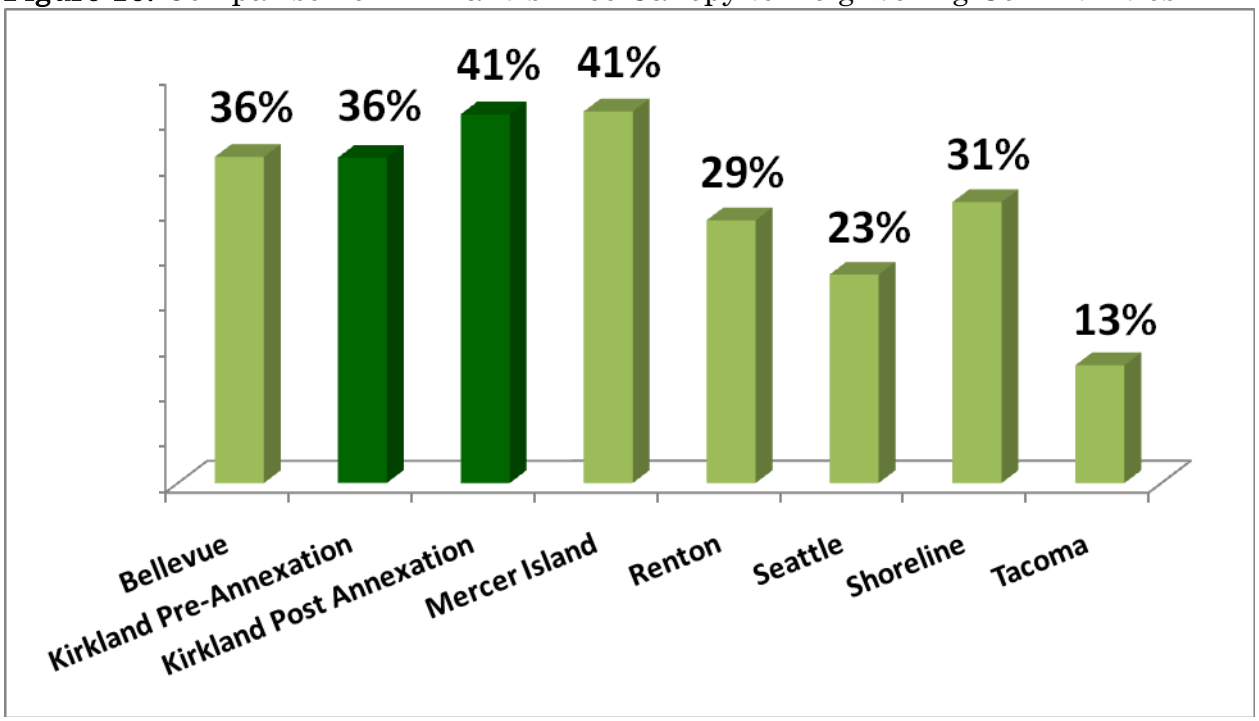
Strategies and management recommendations for meeting tree canopy goals:

- Enhance canopy in the pre-annexed areas to meet the 40% canopy goal
- Prevent further loss by preserving and maintaining canopy within the newly-annexed City limits. Identify and target tree planting to areas that are at highest risk for potential canopy loss UTC that remains at risk from development based on city-wide zoning
- Outline a strategic urban forest management plan to get an accurate depiction of how the City is currently managing its city-wide urban forest attributes to prioritize efforts and establish best management practices
- Increase awareness of UTC information by education/outreach efforts
- Identify stakeholders for tree protection, maintenance, and planting efforts
- Establish a long-term plan for continued UTC monitoring at regular intervals
- Sustain a healthy canopy succession by new tree planting efforts and retention tactics (development standards, heritage tree program, forest restoration programs etc.)
- Offer incentives such as public and private tree planting programs, "tree registration" to contribute to the UTC goal, stormwater credit or rebates for tree planting, reduced utility bill or development permit fees for tree retention, etc.
- Work with private landowners to increase open space areas by creating Native Growth Protection Easements
- Continue support and stewardship of public open space areas per the Green Kirkland Partnership's 20-Year Forest Restoration Plan
- Utilize canopy data for city-wide stormwater modeling, LID feature impacts, Green Building code implementation, and regional sustainable sites initiatives
- Generate an ecosystem services analysis by utilizing software to calculate the environmental cost benefit analysis of a healthy urban forest, ie: quantify stormwater filtration and reduction of runoff, improved air quality, and carbon sequestration
- Explore all potential partnerships: corporate sponsors, volunteer opportunities, non-profit organizations, neighborhood associations, etc.
- Further analyze the effectiveness of tree protection policies, code, and ordinances in a comparative study with adjacent municipalities to correlate trends in canopy gain or loss
- Use UTC metrics from parcel level and street tree inventory data to prioritize sites and implement tree planting on public and private property to increase canopy city-wide

Summary

The Kirkland City Council adopted a goal statement on the environment that states: "We are committed to the protection of the natural environment through an integrated natural management system." The goal is to "protect our natural environment for current residents and future generations". This commitment, supported by City policies and programs, appears to be a key factor in the city's upward trend in tree cover. Ordinances requiring landscaping on multi-family/commercial sites, frontage improvement requirements such as street trees with development, tree removal limitations, tree removal replacement requirements and minimum tree density credits for single family development exceed adjacent municipality's tree protection requirements, where canopy loss has been a recent trend. Below is a comparison of existing tree canopy in Kirkland to other neighboring communities.

Figure 16. Comparison of Kirkland's Tree Canopy to Neighboring Communities



The City should consider the results of this report while making any changes to its policies regarding the protection of its forestry resources. Recommendations have been provided to assist in this process. Continuing in this positive direction, the City should continue to engage, educate and increase public awareness on the benefits of healthy, working urban forests.

About AMEC Environment & Infrastructure, Inc.

AMEC Environment & Infrastructure (AMEC) is a leading full-service environmental engineering firm in North America, providing environmental and geotechnical engineering and scientific consulting services. AMEC is a focused supplier of high-value consultancy, engineering, and project management services to the world's environmental, energy, power and process industries. We are one of the world's leading environmental and engineering consulting organizations. AMEC"s Puget Sound offices in Bothell, Lynnwood, Seattle, and Tacoma employ 116 full-time professional, technical, and support personnel who provide geotechnical engineering, environmental consulting, natural resources and planning, and related services. Our full service capabilities cover a wide range of disciplines, including environmental engineering and science, geotechnical engineering, water resources, materials testing and engineering, surveying, information management (GIS, remote sensing, database/application development) and program/project management.

The team involved in this project has collectively developed and completed urban tree canopy (UTC) assessment projects with more than thirty (30) cities and counties. Clients range from municipal foresters, non-profits, universities and state urban forestry coordinators. AMEC's project manager has presented this topic at well over a dozen state and national conferences, workshops and webinars.

In addition to UTC assessments, we have extensive experience in and knowledge of ecosystem services analysis. Examples of these services include air quality improvements through pollutant removal and urban heat island mitigation, energy benefits from savings due to reduced heating and cool costs, stormwater and water quality mitigation by improved infiltration, interception and erosion control, and carbon storage and sequestration. We have experts in air quality modeling and monitoring related to non-attainment and State Implementation Plans and are a recognized leader in green infrastructure modeling, design, and policy development, currently leading GI programs for the City of Indianapolis and Nashville, Tennessee. Our team has conducted more than a dozen projects that involved training on, collecting field data for, and applying tools such as CITYgreen from American Forests and the U.S. Forest Service Community Tree Guides and i-Tree site of tools (Eco, Streets, Hydro, Vue, Canopy and Design). Experience with custom stormwater models includes the Western Washington Hydrology Model (WWHM) and the EPA's Stormwater Management Model (SWMM) Low Impact Development (LID) module.

Appendix

The appendix of this report provides additional details on the methods used in the assessment including software/technology f the data deliverables. Generally speaking, the appendix follows the order in which the steps of the project were taken. It should be used as a reference in future urban tree canopy or land cover mapping projects for monitoring purposes and consistency.

Land Cover Classification Methodology

The land cover classification task of a UTC project requires good technical capabilities and attention to detail given that all metrics in which to make improved decisions from stem from this data. AMEC's classification process used Feature Analyst software version 5.0 and a technique known as object-based image classification (OBIA). This technology is particularly useful for classifying high-resolution multispectral aerial, LiDAR and satellite imagery. For the 2002 tree canopy mapping, film-based natural color aerial imagery was used along with 2001 Light Detection and Ranging (LiDAR) data. For 2010, 1.5-foot resolution WorldView-2 satellite imagery was used. Both imagery datasets were collected during summer with "leaf-on" conditions. Only tree canopy data was mapped from the 2002 timeframe while the 2010 analysis included trees/forest, shrub, open space/grass, impervious surfaces, water, and bare soil / dry vegetation.

Kirkland provided AMEC with their existing GIS layers for buildings and streets which were incorporated into the land cover classification. Both files were used "as-is" (some features were out of date). Shrub was a separate class based on analysis of shadows and texture in vegetation. Note that "grass" includes all open space, lawn area and low-lying herbaceous cover this is not shrub or forest and that "soil" includes barren/exposed soil and dry vegetation. Land cover data was used for all other aspects of the study including Existing and Possible UTC.

AMEC performed a manual, visual review and editing process on the automated land cover classification at approximately 1":2,000" scale with particular emphasis on tree canopy accuracy and consistency between 2002 and 2010. The specification was to achieve 95% overall accuracy for tree canopy and 90% for other land cover classes. Minimum mapping units for each were as follows: trees/forest (~75-sq.ft., shrub (~2,500-sq.ft.), grass/meadow (~100-sq.ft.), impervious surfaces (200-sq.ft.), bare soil (~2,500-sq.ft.), and water (~2,500-sq.ft.). These accuracy levels were met after AMEC's quality control/quality assurance (QA/QC) step and by comparing to other datasets where detailed accuracy assessments were performed and yielded 96-97% accuracy.

Note: LiDAR data is flown with a specialized airborne sensor where a series of mirrors record vertical elevation values. Whiter objects (pixels) in Figure 4, left panel, on page 7 have a higher elevation value than darker areas. LiDAR and color-infrared imagery (right) are helpful in automated classification of trees and forests.

Complete Tables of UTC Metrics

Complete tables of the results from this study are provided below. Some results were provided in the main body of the report where appropriate. Due the large number of records that cannot be shown in a table, parcel-level results of Existing UTC were provided in GIS format.

Table 6. Citywide results pre- and post-annexation for 2002, 2010 and Possible UTC

City of Kirkland	Total Land Acres	2002 UTC Acres	2002 UTC %	2010 UTC Acres	2010 UTC %	Change in UTC Acres	Relative Change in UTC (%)	Raw Change in UTC (%)	Poss. UTC Veg Acres	Poss. UTC Veg %	Poss. UTC Imp. Acres	Poss. UTC Imp %	Total Poss. UTC Acres	Total Poss. UTC %
Pre-Annexation	6,806	2,151	31.6	2,450	36.0	299	13.9	4.4	--	--	--	--		
Post-Annexation	11,403	--	--	4,637	40.7	--	--	--	2,193	19.2%	1,515	13.3%	3,708	32.5%

Table 7. UTC Results by Zoning type (Pre-Annexation)

General Zoning Classification	% of Total Area	2002 UTC Acres	2002 UTC %	2010 UTC Acres	2010 UTC %	Distrib. Of 2010 UTC by Zoning	Change in UTC Acres	Relative Change in UTC*	Raw Change in UTC	UTC Goal	Delta (% Above or Below)
Commercial	18%	266	22.0%	331	27.5%	13.8%	65	24.5%	5.4%	20%	7.5%
Multi-Family Residential	8%	153	28.2%	192	35.3%	8.0%	38	25.0%	7.1%	35%	0.3%
Industrial	1%	16	18.8%	18	22.1%	0.8%	3	17.3%	3.2%	25%	-2.9%
Single Family Residential	47%	1,114	35.5%	1,232	39.2%	51.4%	117	10.5%	3.7%	50%	-10.8%
Park/Open Space	9%	318	52.7%	324	53.8%	13.5%	6	2.0%	1.0%	25%	28.8%
ROW	17%	225	20.3%	302	27.2%	12.6%	77	34.2%	6.9%	25%	2.2%
Total	**100%**	**2,092**	**31.3%**	**2,398**	**35.9%**	100.0%	**307**	**14.7%**	**4.6%**	**40%**	**-4.1%**

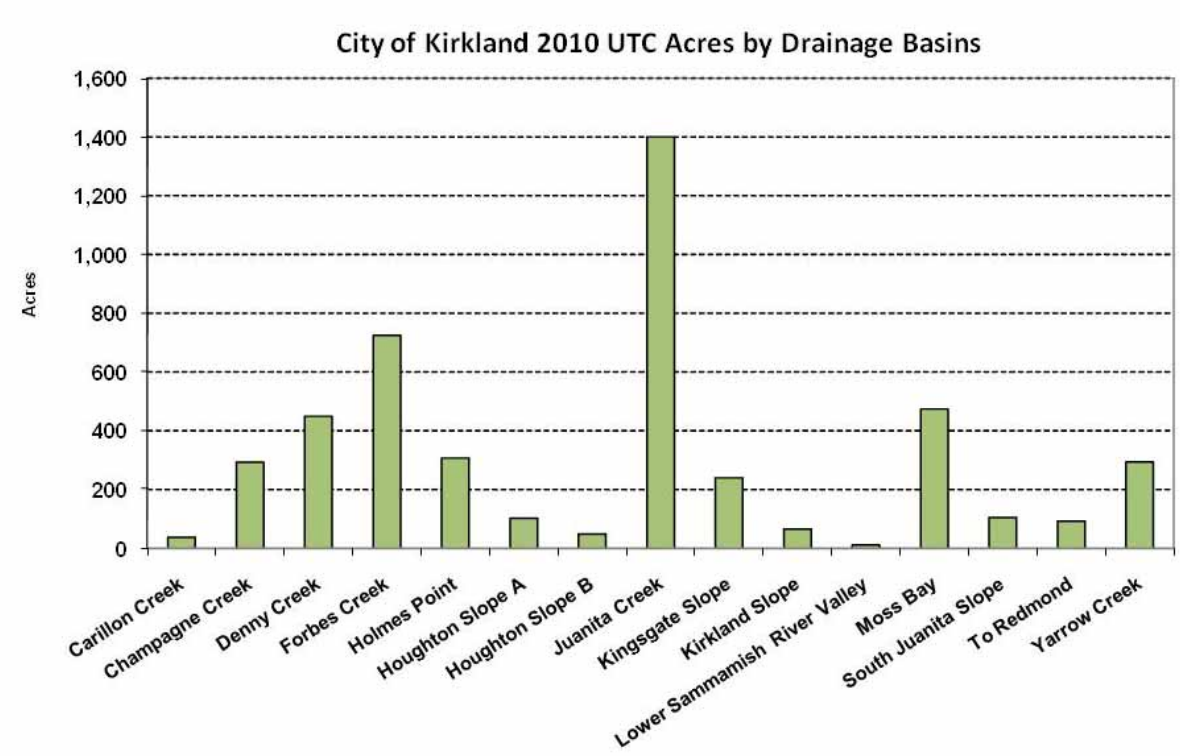
Table 8. Citywide UTC Results by Zoning type (Post-Annexation)

General Zoning Classification	Total Acres	% of Total Area	2010 UTC Acres	2010 UTC %	Distrib. Of 2010 UTC by Zoning	Poss. UTC Veg Acres	Poss. UTC Veg %	Poss. UTC Imp. Acres	Poss. UTC Imp %	Total Poss. Acres	Total Poss. %	UTC Goal	Delta (% Above or Below)
Commercial	1,387	12%	364	26.3%	8.0%	140	10.1%	455	32.8%	595	42.9%	20%	6.3%
Multi-Family Residential	794	7%	282	35.5%	6.2%	113	14.2%	143	18.0%	256	32.2%	35%	0.5%
Industrial	83	1%	18	22.1%	0.4%	8	9.6%	32	38.4%	40	48.0%	25%	-2.9%
Single Family Residential	6,185	55%	2,740	44.3%	60.1%	1,491	24.1%	603	9.8%	2,094	33.9%	50%	-5.7%
Park/Open Space	1,007	9%	664	66.0%	14.6%	188	18.7%	31	3.1%	219	21.7%	25%	41.0%
ROW	1,837	16%	494	26.9%	10.8%	194	10.6%	201	10.9%	395	21.5%	25%	1.9%
Total	**11,293**	**100%**	**4,563**	**40.4%**	**100.0%**	**2,134**	**18.9%**	**1,465**	**13.0%**	**3,599**	**31.9%**	**40%**	**0.4%**

Table 9. UTC Results by Drainage Basin

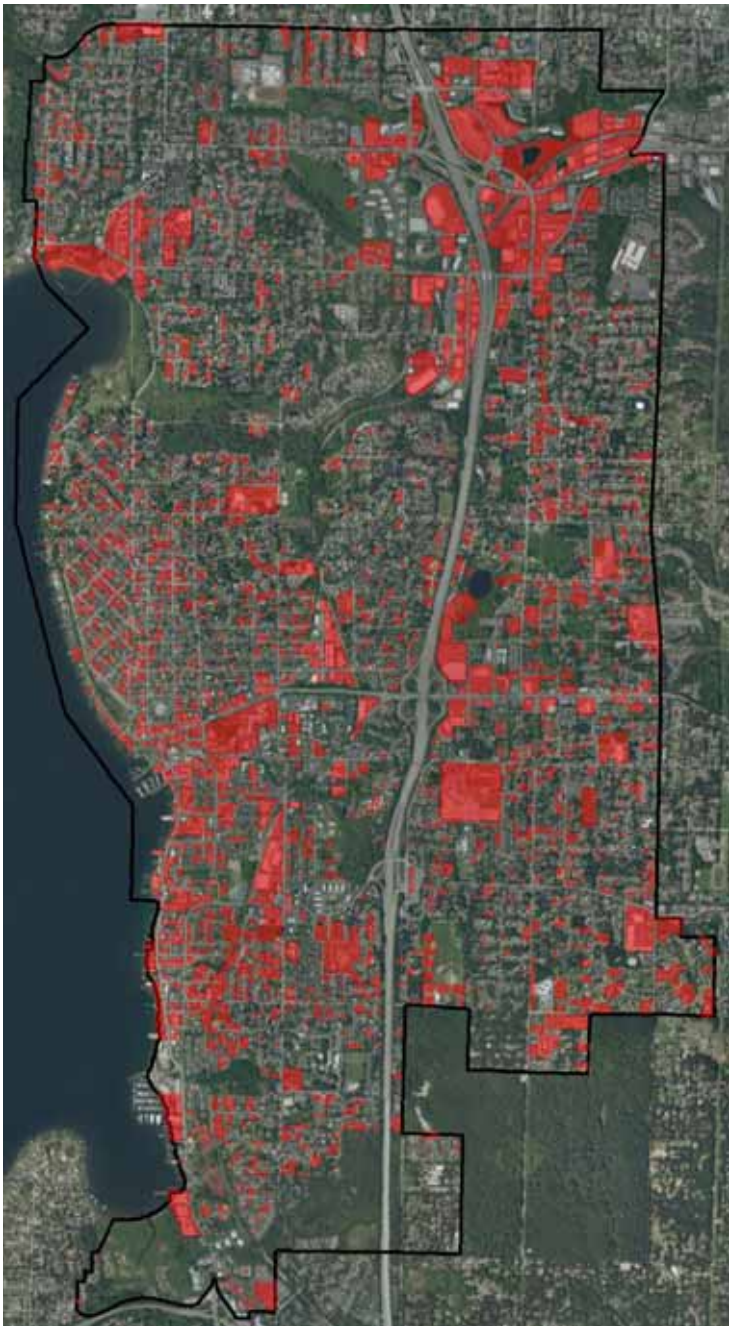
City of Kirkland Drainage Basins	Total Acres	2010 UTC Acres	2010 UTC %
Carillon Creek	106	37	35.1%
Champagne Creek	680	293	43.0%
Denny Creek	804	449	55.9%
Forbes Creek	1,837	725	39.5%
Holmes Point	485	307	63.3%
Houghton Slope A	377	102	27.1%
Houghton Slope B	134	48	35.9%
Juanita Creek	3,631	1,400	38.6%
Kingsgate Slope	563	240	42.5%
Kirkland Slope	211	66	31.2%
Lower Sammamish River Valley	24	11	46.5%
Moss Bay	1,487	474	31.9%
South Juanita Slope	287	105	36.4%
To Redmond	303	92	30.3%
Yarrow Creek	579	294	50.7%
Total	**11,508**	4,642	**40.3%**

Figure 17. Acres of UTC by Drainage Basin



Additional Examples of Kirkland's 2010 UTC by Parcel Data

Figures 18 & 19. Example of UTC Analysis at the Parcel-Level. Parcels with less than 20% urban tree canopy are shown in red (below left). Parcels with more than 20% canopy loss or more than .1 acre of canopy loss are shown in yellow (below right).



ATTACHMENT 2

CITY OF KIRKLAND

2010 URBAN TREE CANOPY ASSESSMENT PROJECT

SCOPE OF WORK

CITY OF KIRKLAND
2011 URBAN TREE CANOPY ASSESSMENT
SCOPE OF WORK

PURPOSE

To utilize the professional services of AMEC Earth & Environmental, Inc (AMEC) for assisting the City of Kirkland (the City) with an urban tree canopy assessment. The final report will benchmark, compare and evaluate trends in City-wide canopy cover to gauge the effectiveness of Kirkland's tree protection regulations.

GENERAL PROJECT DESCRIPTION

This project encompasses land cover mapping and analysis using remote sensing and geographic information system (GIS) technologies and/or aerial photography to determine the current acres and percentages of land cover types, including tree canopy cover. The project will analyze the data by land use, zoning classifications, drainage basins, and other classifications provided by the City. The assessment shall include analysis comparing a benchmark year to current UTC coverage within the non-annexed area. Findings and recommendations will be presented in a written report and results presented to Kirkland City Council.

AREA OF STUDY The current canopy assessment shall cover the entire existing city limits and include the newly-annexed area of Finn Hill, North Juanita and Kingsgate, an area approximately 18 square miles, including public and private land.

The area of study for canopy cover comparison between 2002 and the current (2010) is limited to the Kirkland city limits prior to annexation, an area approximately 11 square miles, including public and private land.

PROJECT ROLES & RESPONSIBILITIES

The following roles and responsibilities apply in this project:

1. CITY: The city will designate a Project Manager who will be the primary contact on all project communications. The City PM will coordinate all project tasks, data transfers to the Consultant, review of deliverables, approval of monthly invoices, and communication between the city and the Consultant. The City PM will involve other city staff including sponsoring department, purchasing manager, and GIS staff to ensure that the Consultant receives data, feedback, and decisions in a timely fashion.

2. CONSULTANT: The Consultant will designate a Project Manager who will be the primary contact on all project communications. The Consultant PM will manage all internal or external resources necessary to keep the project progressing in accordance with the city's final deadline. Each month, the Consultant PM will provide the city with a brief progress report and invoice.

PROJECT COORDINATION – comprised of the following tasks:

I. Kickoff Meeting

This task will consist of a conference call including both City and Consultant project managers, with other key staff attending as appropriate. The purpose of this meeting is to review and confirm details of both the technical and administrative parts of the project:

- Client/Consultant expectations
- Project communications
- Scope of work as contracted
- Deliverable review/acceptance
- Schedule
- Budget and invoicing
- Vendor resource commitment

The city does not anticipate the need for a formal work plan, but will instead document the kickoff meeting as a baseline for initiating the project.

Deliverable(s): *Consultant/City – telephone conference call*
Consultant– meeting summary

II. Acquire/Prepare Imagery

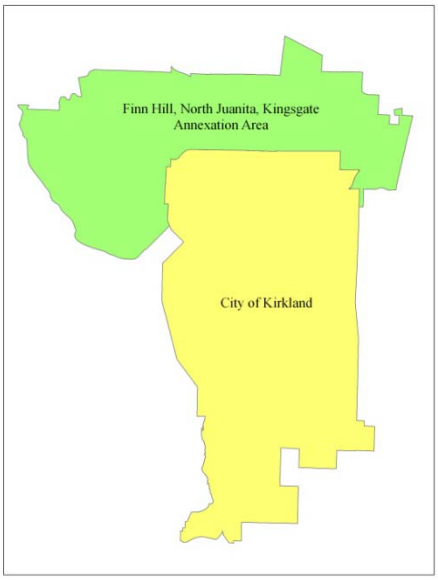
The Consultant team will review, evaluate, and purchase appropriate multi-spectral imagery for use in this project. Prior to actual purchase of the imagery, the Consultant PM will briefly discuss the choices with the City PM and provide the City with documentation of the imagery's technical specifications, cost, and limitations of usage (if any). City of Kirkland staff will provide the Consultant team with all available GIS data for the project area including April 2009 .25-foot resolution color orthophotography, parcels and other cadastral boundary features, digital elevation data, survey control, and thematic layers. The Consultant will obtain suitable imagery and proceed with the tasks in III (below), providing the City PM with periodic progress updates. The Consultant team will then proceed with orthorectification and other activities to prepare the imagery for the next task using a DEM (if available) and aerial images provided by the City.

Deliverable(s): *Consultant/City– telephone conference call to clarify information needed for project*
Consultant - imagery and documentation
City – GIS/imagery data, deliverable reviews
Other - as identified in the kickoff meeting contingent upon approval and funding by City or as shown in subsequent sections of this Scope.

III. Land Cover Mapping

1. Map the following 2010 land cover classification on public and private lands:
   a. Trees/Forest
   b. Shrubs
   c. Turf/Meadow
   d. Bare earth
   e. Impervious (buildings, streets, driveways and parking lots)
   f. Water
2. Map the tree cover classification using historical data as applicable within the current City of Kirkland city limits (see Fig 1 below), not including the annexation area. Provide information and data for canopy change over time comparisons and trend analysis summaries.

Figure 1 – City Project Area



Deliverable(s): *Consultant – provide City with tree canopy GIS layers for review and approval in ArcMap v. 10 file geodatabase land cover classifications. Provide quality control/assurance to achieve 95% accuracy.*
City – deliverable reviews

IV. Urban Tree Canopy Assessment

Using the accepted land cover data from Task III (above), Consultant will utilize City GIS data to calculate the quantity and percent of tree canopy of the following boundary areas (modifications may be made by the City):

1. Public property – to include Parks and Open Space areas
2. Right-of-way streets
3. Individual parcels

4. Drainage basins
5. Land use/zoning classifications. Zoning classifications to be used are broad categories as follows:
    a. Single Family residential
    b. Multifamily
    c. Commercial
    d. Industrial

Deliverable(s): *<u>Consultant</u> – to provide in kickoff meeting summary the final agreed upon zone classification structure if different than above and any other pertinent information in Task IV. Final format for canopy boundary areas shall be in ArcMap v. 10 file geodatabase thematic extracts*
<u>City</u> – help create broad zoning types, deliverable reviews

V. <u>Final Report</u>

Consultant to provide up to two draft review reports and one final report from the analysis and assessment of data collected in the required City format. The report will be concise and readable to the untrained citizen. Use of graphics, tables, charts, insets and bulleted lists of items and other techniques that provide the message without extensive use of paragraphs and long sentences is preferred. A large font size shall be utilized. The report shall be as long as necessary but fewer pages and an uncluttered appearance are preferred. The report shall include:

1. Cover page with title and cover photography including City logo, Contractor identification and date of report. Title shall be "City of Kirkland 2010 Urban Tree Canopy Assessment"
2. Acknowledgements (to be provided by City), Table of Contents, and Executive Summary. May identify project funding source.
3. Body of Report to include an introduction, methodology and other clarifying descriptions for the untrained reader to understand as necessary. Body of report shall include:
    a. Trends in canopy gain or loss within the current city limits by the above land use classifications and land cover
    b. Urban Tree Canopy cover goal (use UTC Calculator and compare trends with city-wide goal of 40% and American Forests UTC goals by land use types.
    c. Comparisons of tree canopy in Kirkland to similar communities. Additional discussion comparing Kirkland with Renton, Mercer Island and Bellevue utilizing their recent canopy studies.
    d. Recommend further uses of the 2010 data including possible next steps and strategies for meeting canopy goals and

identify appropriate tools or software programs for quantifying UTC cost/benefits.

4. Summary - shall include a recommendation for implementing cyclical updates to the analysis.
5. Appendix (if applicable) – containing supporting data, factsheets, documents and other information that enhance the report.

Deliverable(s): *Consultant – to provide electronic deliverables and any other project information agreed upon at kickoff meeting, ie: UTC Calculator, including a 1-hour web-based City staff training.*
City – deliverable reviews

VI. City Council Presentation

The Consultant will coordinate a date for City staff given at least 4 weeks' notice where the City will be responsible for cost ramifications should the Council date change thereafter, and the Consultant to present findings at a City Council study session. This presentation will be a high-level overview of the project. This will be an opportunity for both City staff and the Consultant to discuss the uses of this project's data for subsequent urban forest management plans and other public policy issues with the Council.

Deliverable(s): *Consultant - PowerPoint presentation*
City – deliverable reviews

PROPOSED TIMELINE

Task	Date
Contract Signed	March 14
Kickoff Meeting	March 17
Acquire/Prepare Imagery	March 25
Land Cover Mapping	April 22
Urban Tree Canopy Assessment	April 29
Final Report	May 20
City Council Study Session Presentation	June 7 or 21
Final invoicing due for all deliverables	Noon, June 27
Project Completion/Final Report to Funding Source	June 30, 2011

CITY OF KIRKLAND
Planning and Community Development Department
123 Fifth Avenue, Kirkland, WA 98033 425.587-3225
www.kirklandwa.gov

In 2009, Kirkland's voters approved an annexation measure, nearly doubling the city's area and significantly increasing its population when it goes into effect in June 2011. While Kirkland has made significant improvements in our urban forestry policies over the past several years, we have not prepared a comprehensive urban forest management plan. As an example, all of the goals outlined within the City's *2001 Tree Management Review* have been attained since it was written ten years ago, and most of the urban forestry-related goals outlined in the City's Natural Resource Management Plan have been achieved to date. Given the City's growth and potential for development, the City of Kirkland needs to update its forestry management plan to strategically manage Kirkland's urban forest, a community asset which contributes to the health, safety and pleasant environment for its residents, businesses and visitors.

Unlike the previously-mentioned documents, an Urban Forest Strategic Management Plan specifically outlines how the City wants to measure, monitor, and manage its urban forest. Distinctly different from a goal-setting type of management plan, it will establish priorities in context to short and long-term goals, spelling out how to get there from here. It will also assist the City in identifying urban forest management priorities with performance measures, enabling staff to perform more efficiently and cost-effectively, which is critical for any sustainable management plan.

BENEFITS: Updating the City's obsolete forestry management plan is a key benefit of the project. In addition, a significant benefit of the project will be achieved by having an independent consultant conduct a gap analysis, essentially auditing the City's urban forest management practices and programs. This analysis will provide insight into increasing the City's internal efficiencies, evaluating the organizational framework, reducing redundancies, identifying cost savings, and providing greater protection from liability. The final document itself will identify potential financial assistance from outside agencies. The process of creating a City-wide strategic plan will undoubtedly promote better communication and collaboration between departments and with the public.

Other benefits of the project will include linking the City's forestry-related goals from the Comprehensive Plan, Natural Resource Management Plan, Green Kirkland Partnership's 20-Year Reforestation Plan, Climate Action Plan, Stormwater Regulations, tree retention regulations, Shoreline Master Program, and Green Building Program into a cohesive, practical 'How-to Manual'. The City

stands to gain from an external perspective what procedures, programs and incentives that we can develop to meet the City's urban forestry goals and vision, such as tree-planting programs, stormwater rebates, or implementing ecosystem service modeling (e.g. incorporating carbon sequestration and stormwater remediation build-out scenarios into the City's GIS system). By integrating the City's canopy and tree inventory data with a management strategy, the Plan will also guide potential policy decisions regarding potential amendments to the City's tree regulations and future programs to increasing the City's tree cover to 40 percent as called for in the adopted Comprehensive Plan.

A final benefit of this project, if funded by the 2011 Community and Forestry Assistance Grant, is that a completion date requires the adherence to a project timeline. This is an important efficiency measure considering the multiple internal departments involved in such a project.

PURPOSE: The purpose of the City-wide Urban Forest Strategic Management Plan project is to provide a guide for decision-makers, City staff and the public to sustainably manage Kirkland's urban forest, a community asset which contributes to the health, safety and pleasant environment for its residents, businesses and visitors.

The project will incorporate Kirkland's values and vision, as outlined in the Kirkland Comprehensive Plan and City Council goals:

Vision FG-7, as a: *responsibility to create a sustainable community that balances urban growth with resource protection…that meets the needs of the present without sacrificing the ability of future generations and other species to meet their own needs…*

Policy NE-1.2: *selecting the most effective management tool for a desired outcome, allocating staff and financial resources for greatest results.*

City Council Goals as: *[The city is] committed to the protection of the natural environment through an integrated natural resource management system,* and *to protect our natural environment for current residents and future generations.*

OBJECTIVES - Using current trends in business models and adaptive management strategies, outline a strategic urban forest management plan that incorporates the City's values and vision. The project will assess both internal and external factors to formulate a strategy, clearly define how to implement the strategy, evaluate progress, and make adjustments as necessary to stay on track. The project objectives are detailed as follows:

1. Get an accurate depiction of how the City is currently managing its City-wide urban forest attributes by independent assessment

2. By establishing criteria and indicators (reference Clark et al, 1997), establish forestry priorities using community involvement with a business analysis model
3. Identify how to proactively manage the City's urban forest resources, reducing costs and liability, while combining the needs of a growing community with ecosystem viability & sustainability
4. Develop long-range (minimum 20-year) strategic framework supported by incremental (5-year) management plans, with annual operating plan.
5. Promote increased communication and accountability to decision-makers and the public regarding forestry management activities
6. Provide technical information about urban forestry through appropriate education and outreach efforts

SCOPE OF WORK/ACTIVITIES:

1. Establish Project Team & Identify Stakeholders – promote project to stakeholders and appropriate City department leaders, interested groups and affected agencies *[City Manager, Public Works, Planning Dept, Parks Dept, Parks Board, Cascade Land Conservancy, Eastside Audubon, businesses, property owners, Kirkland Alliance of Neighborhoods, etc.]*
2. Develop Purpose, Objectives, Scope of Work and project timeline
3. Consider relevance of existing UF Management Plans - review case studies *[Lake Forest Park, Seattle, Walla Walla, Vancouver WA, Oakville OT]*
4. Identify funding *[2011 Community Forestry Assistance grant]*
5. Narrow scope of project (if necessary)
6. Draft/release Request for Proposals
7. Select vendors/contractors from proposals
8. Support contractor activities: develop project framework, establish methodology, provide pertinent documentation, set up interviews, conduct public survey, organize input, etc.
9. Maintenance component – Establish a sustainable method to periodically monitor and re-evaluate criteria & indicators and define continuation of project
10. Develop education & outreach component endorsing the UF Strategic Management Plan, including a strategy for distributing urban forest-related information internally and to citizens. This includes updating forms, handouts and other literature, the City website, etc. *[use examples, including Seattle, WFPA, Lake Forest Park, Vancouver WA, etc]*
11. Incorporate document into City's policy framework through review by the City Council and other appointed commissions.

TIMETABLE OF PROJECT:

In late 2010, the City of Kirkland's Urban Forester met with staff from various departments, namely the Parks Department, Public Works and Planning and Community Development to discuss the potential benefits of an UF Management

Plan. From this meeting, an interdepartmental team was formed to establish the relevance, purpose, objectives, and scope of the project including potential funding and the project timeline (Activities #1-3). Depending on funding, the Team plans to complete Activities #5-11, the bulk of the project, in early spring 2012. If funded by the 2011 Community Forestry Assistance grant, the completion date for the project will be no later than mid-May 2012 to comply with the grant rules for reimbursement.

2010	**2011**					**2012**
Oct-Dec	**Jan**	**Mar**	**April-May**	**by July 15th**	**Aug 2011-March 2012**	**May**
Draft grant application Assemble materials	Submit grant appl by 1/27	Funding verified by 3/1	Narrow project scope, draft & release RFP	Select vendor	Support contractor activities Conduct interviews/survey Draft Plan City council adoption **Oct 2011**-grant mid-report due?	Project completion by 5/31/12

PARTICIPANTS:

Kirkland's UF Strategic Management Plan Project Team:

- Deb Powers, Urban Forester, Project Lead
- Paul Stewart, Deputy Director, Planning and Community Development
- Jennifer Schroder, Director, Parks Department
- Ray Steiger, Interim Director, Public Works
- Jenny Gaus, Senior Stormwater Utility Engineer, Public Works
- Bobbi Wallace, Surface & Wastewater Manager, Public Works
- John Hopfauf, Street Maintenance Manager, Public Works
- Mark Padgett, Grounds Leadperson, Public Works

Selected contractor(s)

Stakeholders:

- Cascade Land Conservancy
- Kirkland Parks Board

ADMINISTRATION: The City's Urban Forester is the project lead and will oversee the majority of administrative tasks, including drafting the grant application, providing all necessary documentation for grant processing, inter-departmental coordination, drafting Requests for Proposals and overseeing the

contractor's work. Draft documents will be finalized and selection of contractors shall be overseen by the Project Team. Technical assistance for the outreach and education component will be coordinated between the project lead and the City's Multimedia Department. Paul Stewart will facilitate the incorporation of the final document into City structure.

FACILITIES AND EQUIPMENT: The project will occur entirely within the City limits, utilizing the meeting facilities at City Hall. Meeting arrangements will be made by the Project Lead or other Planning Department official. Other equipment utilized by the project may include equipment for conference calls and presentations, which will be scheduled by the Project Lead and supported by the City's Information Technology Department if necessary. No other special equipment needs are required for the project. All City Council presentations will occur at Kirkland City Hall, 123 5th Avenue, Kirkland, Washington.

DELIVERABLES: Upon award of a contract, the selected vendor will develop a project framework, including a methodology for obtaining staff input, conducting public surveys, and organizing input. Deliverables include preliminary drafts and the final Urban Forest Management Plan document, and a powerpoint presentation created expressly for document adoption by City Council. Deliverables for the educational outreach component of the project include an outline strategy for communicating how the Urban Forest Strategic Management Plan information will be incorporated into all forestry-related communications, forms, handouts, and the City's website, etc.

ATTACHMENTS:

Budget worksheet
Letter of Commitment from Kirkland City Manager
Letter of Commitment from Department Directors
Letter of Support from Cascade Land Conservancy
Letter of Support from Kirkland Parks Board