

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Presenting the Results of the 2018 Citywide Tree Canopy Assessment
DEPARTMENT:	Parks, Recreation and Cultural Services (PRCS)
PRESENTED BY:	Eric Friedli, PRCS Director
ACTION:	<input type="checkbox"/> Ordinance <input type="checkbox"/> Resolution <input type="checkbox"/> Motion <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Public Hearing

PROBLEM/ISSUE STATEMENT:

The City Council adopted the Urban Forest Strategic Plan (UFSP) in 2014. Priority 1 of the USFP is to “Achieve [a] climate appropriate degree of tree cover, community-wide.” In 2011, the average tree canopy cover for Shoreline was 30.6%. The UFSP states that this “is an acceptable amount of canopy to realize ecosystem benefits.”

One of the implementation strategies included in the UFSP is to complete an urban tree canopy assessment every 6 to 10 years. The last tree canopy assessment was completed seven years ago in 2011 and was based on 2009 data. Earlier this year the City hired a consultant to complete an urban tree canopy assessment based on 2017 data. Attachment A is Shoreline’s 2018 Urban Tree Canopy Assessment.

The purpose of this assessment is to review the City’s progress towards achievement of Priority 1 - “maintaining [a] climate-appropriate degree of tree cover, community-wide”. In 2017, the average tree canopy cover for Shoreline was 37%.

RESOURCE/FINANCIAL IMPACT:

The tree canopy assessment cost \$21,000 in professional services.

RECOMMENDATION

No action is necessary. This is a discussion item only.

Approved By: City Manager City Attorney

BACKGROUND

The City Council adopted the Urban Forest Strategic Plan (UFSP) in 2014. Priority 1 of the USFP is to “Achieve [a] climate appropriate degree of tree cover, community-wide.” In 2011, the average tree canopy cover for Shoreline was 30.6%. The UFSP states that “is an acceptable amount of canopy to realize ecosystem benefits.”

The 2014 Urban Forest Strategic Plan and 2011 Urban Tree Canopy Assessment can be accessed in the Reference Information section of the Parks, Recreation & Cultural Services/Tree Board website: www.shorelinewa.gov/parkboard

One of the implementation strategies included in the UFSP is to complete an urban tree canopy assessment every 6-10 years. The last tree canopy assessment was completed seven years ago in 2011 and was based on 2009 data. Earlier this year the City hired a consultant to complete an urban tree canopy assessment based on 2017 data.

This analysis is a follow-up to Shoreline’s first urban tree canopy assessment, which the City Council commissioned as a part of their City Sustainability Strategy nearly a decade ago. That study, completed in March 2011, sought to establish a baseline of the city’s tree canopy that the City could, in turn, utilize to shape policy decisions regarding Shoreline’s urban forest.

The primary goal of this assessment was to compare tree canopy change over an 8-year time period, to provide an update to the baseline, and to offer insights as to how, where, and why Shoreline’s urban tree canopy has been changing since it was originally assessed in 2011 using source data representing conditions in 2009.

DISCUSSION

Results of this study indicate that there has been movement from impervious surface to tree canopy in the city of Shoreline since 2009 (Table 1). The Urban Tree Canopy (UTC) increased by 474 acres (21%) between 2009 and 2017.

Table 1: Land coverage 2009 and 2017

Land coverage	2009		2017		% change 2009-2017
	Acres	%	Acres	%	
Urban Tree Canopy (UTC)	2270	31%	2744	37%	21%
Shrub, grass, water, other	1715	23%	1632	22%	-5%
Impervious Surface	3427	46%	3041	41%	-11%

In 2017 approximately 1,009 acres of land (14% of total) is not presently occupied by tree canopy but is assessed to be suitable for future tree plantings. These areas provide opportunity to further expand the tree canopy in Shoreline.

This assessment utilized 2017 high-resolution (1-meter) multispectral imagery from the U.S. Department of Agriculture’s National Agriculture Imagery Program (NAIP) and 2016 LiDAR data from King County, Washington to derive the land cover data set. The NAIP imagery is used to classify all types of land cover, whereas the LiDAR is most useful for distinguishing tree canopy from other types of vegetation. Additional GIS layers provided by the City of Shoreline were also incorporated into the analysis.

Urban Tree Canopy (UTC) by Land Use

UTC metrics and possible planting areas were assessed for 14 different land use categories (Table 2). Land use category calculations do not include roads and water bodies. The highest canopy coverage was seen in the private open space and public open space classes, with 50 percent and 66 percent, respectively. However, these land use classes only occupy a small percentage of Shoreline’s total land area, and, therefore, did not contribute greatly to the city’s total canopy cover, constituting just 7 and 9 percent.

Low-density residential areas (i.e. single-family homes) contributed the greatest proportion of the city’s urban tree canopy, with 43 percent canopy cover making up 63 percent of the city’s total. Likewise, low-density residential areas promised the greatest opportunities for canopy expansion with 616 acres available for planting making up 67 percent of the city’s total Potential Planting Area (PPA).

The classes with the largest amounts of impervious land cover also had some of the smallest amounts of current canopy cover and PPA. The two mixed-use classes and the Town Center District had 81, 72, and 80 percent impervious land cover, respectively, with 12, 17, and 10 percent tree canopy, and just 5, 7, and 5 percent PPA.

Table 2. Urban tree canopy assessment results by land use classification.

Land Use	Land Acres	UTC Acres/% of Land	Distribution of Total UTC	PPA Acres/% of Land	Distribution of Total PPA	Total Unsuitable
Institution/Campus	224	90 (40%)	4%	21 (10%)	2%	112 (50%)
Low Density Residential	3,607	1554 (43%)	63%	616 (17%)	67%	1437 (40%)
Medium Density Residential	69	27 (39%)	1%	10 (14%)	1%	33 (48%)
High Density Residential	146	44 (30%)	2%	15 (11%)	2%	86 (59%)
Mixed Use 1	237	29 (12%)	1%	12 (5%)	1%	196 (83%)
Mixed Use 2	118	20 (17%)	1%	9 (7%)	1%	89 (75%)
Planned Area 3	16	2 (15%)	0%	2 (11%)	0%	12 (74%)
Public Facility	507	115 (23%)	5%	46 (9%)	5%	346 (68%)
Private Open Space	321	160 (50%)	7%	55 (17%)	6%	106 (33%)
Public Open Space	349	230 (66%)	9%	37 (11%)	4%	83 (24%)

Land Use	Land Acres	UTC Acres/% of Land	Distribution of Total UTC	PPA Acres/% of Land	Distribution of Total PPA	Total Unsuitable
Station Area 1	200	63 (32%)	3%	30 (15%)	3%	107 (53%)
Station Area 2	139	48 (35%)	2%	25 (18%)	3%	66 (47%)
Station Area 3	157	62 (39%)	3%	29 (18%)	3%	66 (42%)
Town Center District	105	11 (10%)	0%	5 (5%)	1%	89 (85%)
Totals*	6,195	2,455 (40%)	100%	913 (15%)	100%	2,828 (46%)

*Excludes roads, water bodies

Urban Tree Canopy (UTC) Change 2009-2017

While tree canopy has increased substantially over the last eight years, these increases have not been distributed evenly throughout the City. Table 3 indicates UTC change since 2009 by land use type. Figure 1 shows UTC change since 2009 by census block group.

Table 3: Change in UTC by Land Use Type

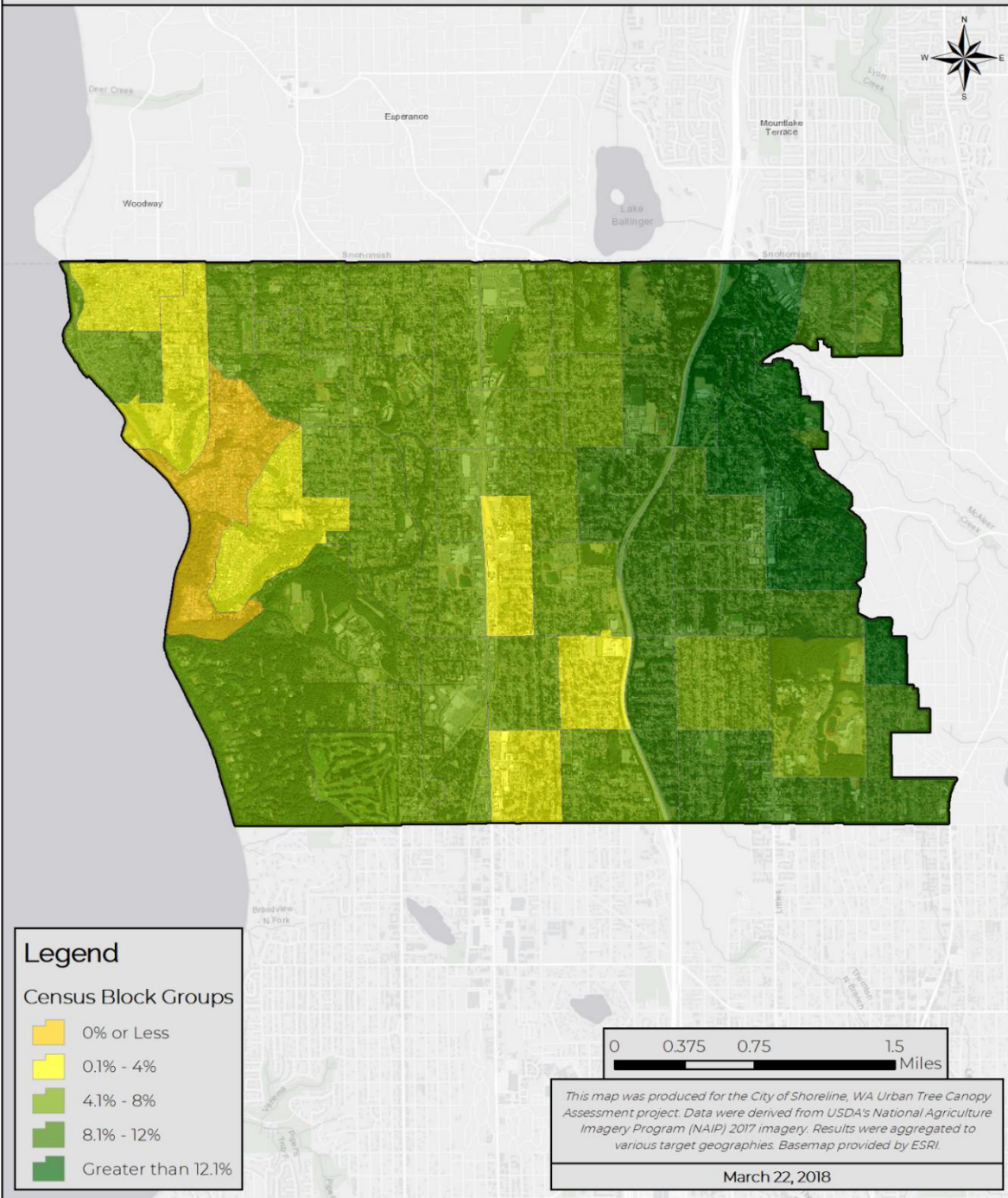
Land Use	Land Acres	UTC (2017)	UTC Change (Since 2009)
Institution/Campus	224	90 (40%)	+17 (+8%)
Low Density Residential	3607	1554 (43%)	+230 (+6%)
Medium Density Residential	69	27 (39%)	+6 (+8%)
High Density Residential	146	44 (30%)	+10 (+7%)
Mixed Use 1	237	29 (12%)	+8 (+3%)
Mixed Use 2	118	20 (17%)	+6 (+5%)
Planned Area 3	16	2 (15%)	+1 (+6%)
Public Facility	507	115 (23%)	+23 (+5%)
Private Open Space	321	160 (50%)	+15 (+5%)
Public Open Space	349	230 (66%)	+13 (+4%)
Station Area 1	200	63 (32%)	+19 (+9)
Station Area 2	139	48 (35%)	+13 (+9%)
Station Area 3	157	62 (39%)	+15 (+10%)
Town Center District	105	11 (10%)	+3 (+3%)
Totals*	6,195	2,455 (40%)	+381 (+6%)

*Excludes roads, water bodies

Figure 1: Change in UTC by Census Block Group

City of Shoreline, WA Urban Tree Canopy Assessment

Urban Tree Canopy Percent by
Census Block Groups - Percent Change 2010 to 2017



The results can also be used to identify the best strategies for replacing lost tree canopy, engaging the community with greening events, and ensuring a vibrant future Shoreline. A healthy urban forest benefits practically every sector in Shoreline, so it must be taken into account when envisioning the city's broader goals and planning.

While our tree canopy is currently meeting the UFSP targets, that does not preclude the need to plant more trees in order to maintain the long-term health of the urban forest. There are many reasons why planting new trees continues to be important. There will continue to be a loss of trees due to new development, particularly related to the light rail line that will be constructed through Shoreline over the next six years. Trees that die or need to be removed for safety or other reasons need to be replaced. It is important to plan ahead for replacing aging trees that will eventually die and be removed. Trees need to be planted in locations that would benefit from their shade and wildlife value. Planting new trees is important to strive for age and species diversity in our urban forest, as this is the only way to support long-term health of the City's urban forest.

Staff will use the information from the tree canopy assessment to better target tree planting projects in the future.

RESOURCE/FINANCIAL IMPACT

The tree canopy assessment cost \$21,000 in professional services.

RECOMMENDATION

No action is necessary. This is a discussion item only.

ATTACHMENTS

Attachment A – Shoreline's Urban Tree Canopy Assessment - 2018