URBAN TREE CANOPY

ASSESSMENT

MERCER ISLAND,
WASHINGTON
SEPTEMBER | 2018

King Conservation District

plan-it GEO

CITY OF MERCER ISLAND · WASHINGTON

AN ASSESSMENT OF
URBAN TREE CANOPY

MERCER ISLAND, WASHINGTON

> **Someone is sitting in the shade today because someone planted a tree a long time ago.**
> **-Warren Buffet**

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1,921
ACRES OF TREE CANOPY

EXECUTIVE SUMMARY

PURPOSE OF THIS ANALYSIS

The City of Mercer Island is located within King County, Washington, in the Seattle metropolitan area (Figure 1). Situated within Lake Washington, it is an island of approximately 6.3 square miles or 4,045 acres, of which 4,027 are land acres. Mercer Island has placed a high priority on ensuring the long-term health of its urban forest resource, and this assessment demonstrates their continued commitment to protecting, maintaining, and expanding the city's tree canopy. The primary goal of this assessment was to provide an updated baseline and benchmark of the City's tree canopy and interpret the results across a range of geographic boundaries. Canopy change since 2007 was also assessed to determine the extent and location of growth or decline in Mercer Island's urban forest to better inform future management actions.

URBAN TREE CANOPY IN MERCER ISLAND

Results of this study indicated that in 2017, the city of Mercer Island contained 48 percent urban tree canopy (or 1,921 of the city's 4,045 total acres); 24 percent non-canopy vegetation (976 acres); 1 percent soil/dry vegetation (30 acres); 27 percent impervious surfaces (1,099 acres); and less than 1 percent water (18 acres). In further subdividing the impervious areas, 6 percent (246 acres) were roads, 11 percent (431 acres) were buildings, 2 percent (64 acres) were parking lots, 3 percent (110 acres) were driveways, less than 1 percent (9 acres) were sidewalks, and 6 percent (239 acres) were "other impervious" areas such as trails, medians, etc. Of the city's 52 percent of land area not presently occupied by tree canopy, 28 percent (1,121 acres) was suitable for future tree plantings, and 24 percent (916 acres) was unsuitable due to its current land use or other restraint. In further dividing the city's urban tree canopy, 41 percent was deciduous, 59 percent was evergreen, and 25 percent was overhanging impervious surfaces. A change analysis was also performed and determined that the city's canopy has expanded by as much as 8 percent, up from 40 percent when it was last assessed in 2010 based on 2007 imagery.

ASSESSMENT BOUNDARIES

This study assessed urban tree canopy (UTC) and possible planting areas (PPA) at multiple geographic scales in order to provide actionable information to a diverse range of audiences. By identifying what resources and opportunities exist at these scales, the City can be more proactive in their approach to protect and expand their urban tree canopy.

Metrics were generated at the following geographic boundaries: the citywide boundary; county land use classes (7); U.S. census block groups (16); city stormwater drainage basins (87); parks and open spaces (66);

Figure 1. | Mercer Island occupies approximately 6.3 square miles in King County, Washington. It is a true island, fully engulfed by Lake Washington, and located approximately 7 miles east of Seattle.

right-of-way areas (2); as well as the following sensitive ecological areas (1 each): shorelines, streams, potential slide areas, and steep slopes.

Canopy change since 2007 was also assessed for all geographic boundaries. Additionally, the city's urban tree canopy was subdivided into deciduous and evergreen classes and delineated as overhanging impervious surfaces or not.

RECOMMENDATIONS

The results of this analysis can be used to develop a continued strategy to protect and expand Mercer Island's urban forest. The UTC, PPA, and change metrics should be used as a guide to determine where the city has succeeded in protecting and expanding its urban forest resource, while also targeting the best areas to concentrate future efforts based on needs, benefits, and available planting space.

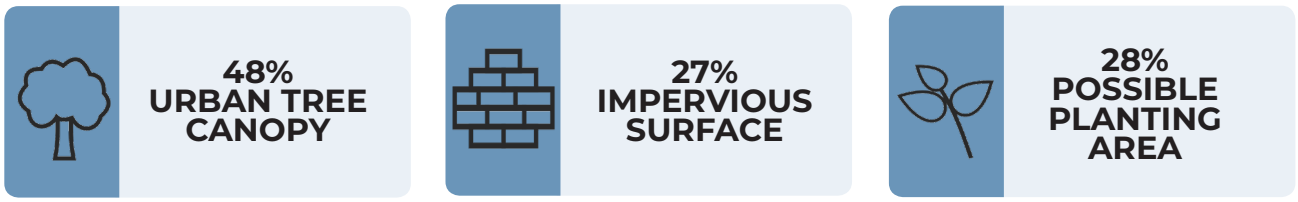


Figure 2. | Based on an analysis of 2017 high-resolution imagery, Mercer Island contains 48% tree canopy, 28% areas that could support canopy in the future, and 27% total impervious areas.

PROJECT METHODOLOGY

This section describes the methods through which land cover, urban tree canopy, and possible planting areas were mapped. These datasets provide the foundation for the metrics reported at the selected target geographies, as well as the change in canopy over time.

DATA SOURCES

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 Mercer Island were also incorporated into the analysis, such as the 2017 impervious surfaces layer and the 2007 urban tree canopy layer which provided the basis of the change analysis.

MAPPING LAND COVER

An initial land cover dataset was to be created prior to mapping tree canopy and assessing change. The land cover data set is the most fundamental component of an urban tree canopy assessment. An object-based image analysis (OBIA) software program called Feature Analyst was used to classify features through an iterative approach. In this process, objects' spectral signatures across four bands (blue, green, red, and near-infrared), textures, pattern relationships, and object height were considered. This remote sensing process used the NAIP imagery and LiDAR to derive five initial land cover classes. These classes are shown in Figure 3. After manual classification improvement and quality control were performed on the remote sensing products, additional data layers from the city (such as buildings, roads, and other impervious surfaces from 2017) were utilized to capture finer feature detail and further categorize the land cover dataset.

Figure 3. | Five (5) distinct land cover classes were identified in the 2017 tree canopy assessment: urban tree canopy, non-canopy vegetation, bare soil and dry vegetation, impervious (paved) surfaces, and water.

CLASSIFYING URBAN TREE CANOPY

Following the remote sensing classification and final QA/QC of the tree canopy data layer, this output was used as a mask to extract generalized tree species composition using a Normalized Difference Vegetation Index (NDVI), LiDAR height information, supervised training, and an iterative machine learning approach. Leaf-off aerial photography from Google Earth was used to obtain training and verification samples of deciduous and evergreen trees. Generalized tree species composition mapping was performed at a scale to classify larger groves of trees but not individual trees. There were no accuracy standards required or assessed for this classification. Using impervious surface data provided by the city (buildings, roads, parking lots, etc.), the amount of deciduous and evergreen tree canopy overhanging impervious surfaces was also quantified to assist with hydrologic modeling.

IDENTIFYING POSSIBLE PLANTING AREAS AND UNSUITABLE AREAS FOR PLANTING

In addition to quantifying Mercer Island's existing tree canopy cover, another metric of interest in this assessment was the area where tree canopy could be expanded. To assess this, all land area in Mercer Island that was not existing tree canopy coverage was classified as either possible planting area (PPA) or unsuitable for planting. Possible planting areas were derived from the non-canopy vegetation and impervious classes. Unsuitable areas, or areas where it was not feasible to plant trees due to biophysical or land use restraints (e.g. airport runways, recreation fields, etc.), were manually delineated and overlaid with the existing land cover data set (Figure 4). The final results were reported as PPA Vegetation, PPA Impervious, Total PPA and Unsuitable Vegetation, Unsuitable Impervious, Unsuitable Soil, and Total Unsuitable.

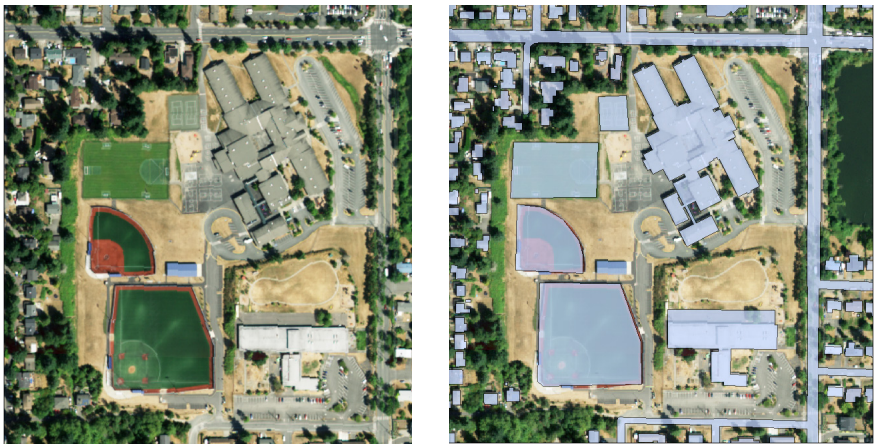


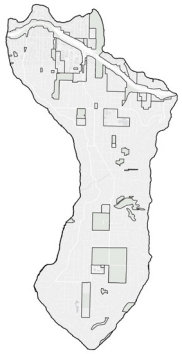
Figure 4. | Vegetated areas where it would be biophysically feasible for tree plantings but undesirable based on their current usage (left) were delineated in the data as "Unsuitable" (right). These areas included recreational sports fields and other open space.

DEFINING ASSESSMENT LEVELS

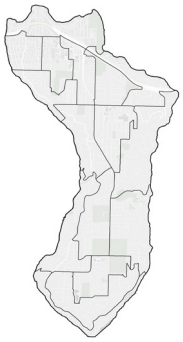
In order to best inform the City Council and all of Mercer Island's various stakeholders, urban tree canopy and other associated metrics were tabulated across a variety of geographic boundaries (Figure 5). These boundaries include the city boundary, storm water basins, land use classes, census block groups, parks and open space, rights-of-way, shorelines, streams, potential slide areas, and steep-sloped areas.

- The City of Mercer Island's citywide boundary is the one (1) main area of interest over which all metrics are summarized.
- Sixteen (16) census block groups were assessed. Census block groups (CBGs) are used by the U.S. Census Bureau to assure statistical consistency when tracking populations across the United States and can be valuable indicators of environmental justice as they are directly linked with demographic and socioeconomic data.
- Seven (7) King County land use classes were analyzed to assess differences in tree canopy across different human uses of land.
- Eighty-seven (87) stormwater basins make up the city of Mercer Island. Since trees play an important role in regulating storm water runoff and preventing flooding, the basins were analyzed to explore differences in tree canopy across the city's drainage areas.
- Sixty-six (66) parks and open spaces were assessed to determine how tree canopy is distributed in the city's green spaces.
- Right-of-way (ROW) was also assessed at two (2) ownership classes: city-owned and Washington State Department of Transportation-owned. ROW refers specifically to the areas that are publicly maintained, such as streets, sidewalks, and medians, and is helpful for quantifying the city's street trees.
- Trees also provide innumerable environmental benefits such as preventing erosion, offering a habitat for wildlife species, and improving air and water quality. Four (4) additional geographies were assessed to determine how tree canopy is distributed in the city's sensitive ecological areas: shorelines, streams, potential slide areas, and areas with steep slopes.

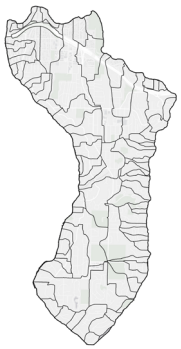
City of Mercer Island



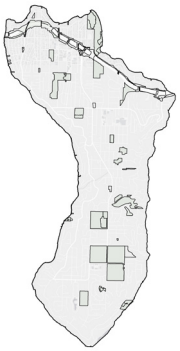
King County Land Use



U.S. Census Block Groups



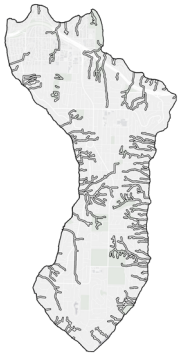
Stormwater Basins



Parks and Open Spaces

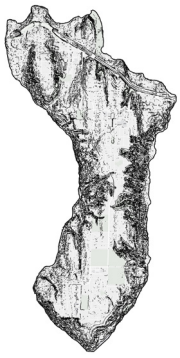
Right-of-Way Areas

Shorelines (200’ Buffer)



Streams (50’ Buffer)

Potential Landslide Areas



Steep Slopes (>40º)

Figure 5. | Ten distinct geographic boundaries were explored in this analysis: the full city boundary, storm basins, county land use classes, census block groups, parks and open spaces, right-of-way areas, shorelines, streams, potential slide areas, and steep slopes.

STATE OF THE CANOPY AND KEY FINDINGS

This section presents the key findings of this study including the land cover base map, canopy analysis, and change analysis results which were analyzed across various geographic assessment boundaries. These results, or metrics, help inform a strategic approach to identifying existing canopy to preserve and future planting areas. Land cover percentages are based on the total area of interest while urban tree canopy, possible planting area, and unsuitable percentages are based on land area. Water bodies are excluded from land area because they are typically unsuitable for planting new trees without significant modification.

CITYWIDE LAND COVER

In 2017, tree canopy constituted 48 percent of Mercer Island's land cover; non-canopy vegetation was 24 percent; soil/dry vegetation was 1 percent; impervious was 27 percent; and water was less than 1 percent. These generalized land cover results are presented below in Table 1.

The impervious land cover class was then subdivided into more specific classifications. Approximately 11 percent was buildings, 6 percent was roads, 2 percent was parking lots, less than 1 percent was sidewalks, 3 percent was driveways, and 6 percent was "other impervious" (all other paved surfaces not included in the previous classes). Parking lots and sidewalks may offer opportunities for new tree plantings and additional canopy cover, but the data for these opportunistic impervious land classifications would require further analyses to determine their planting suitability. The detailed land cover results, including impervious classifications, are presented in Figure 6.

Table 1. | Generalized land cover classification results

City Boundary	City Boundary	Tree Canopy	Impervious Surfaces	Non-Canopy Vegetation	Soil & Dry Vegetation	Water
Acres	4,045	1,921	1,099	976	30	18
% of Total	100%	48%	27%	24%	1%	<1%

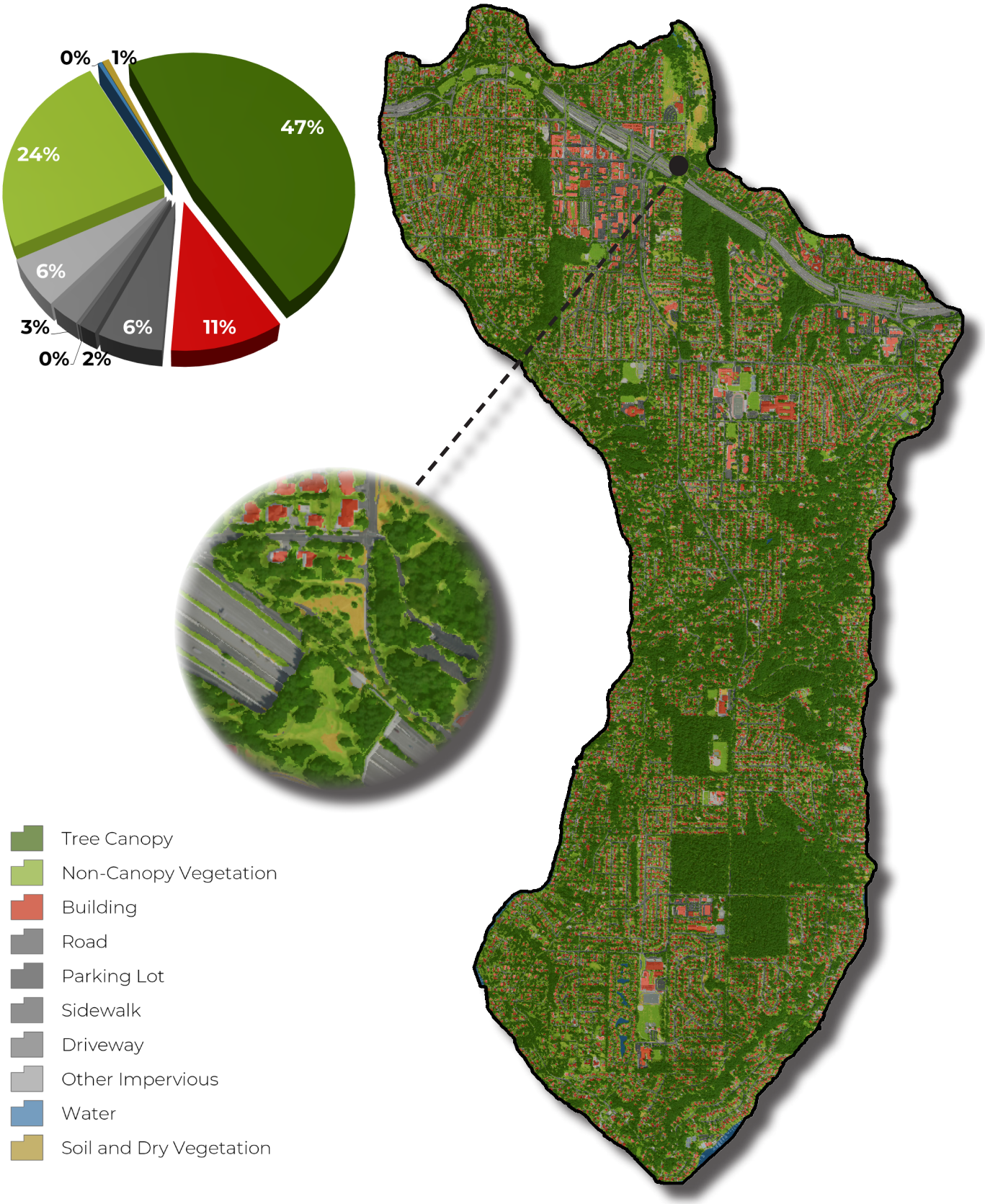


Figure 6. | Detailed land cover classes for Mercer Island, Washington based on 2017 NAIP imagery and 2016 PSLC LiDAR data. (Percentages based on land acres.)

CITYWIDE URBAN TREE CANOPY

This urban tree canopy assessment utilized the land cover map as a foundation to determine Possible Planting Areas throughout the City. Additional layers and information regarding land considered unsuitable for planting were also incorporated into the analysis. Note that the results of this study are based on land area as opposed to total area (note the difference between Total Acres and Land Acres in Table 2).

Table 2. | Urban tree canopy assessment results, by acres and percent. (Percentages based on land acres.)

City of Mercer Island	Acres	%
Total Area	4,045	100%
Land Area	4,027	100%
Urban Tree Canopy	1,921	48%
Possible Planting Area - Vegetation	938	23%
Possible Planting Area - Impervious	183	5%
Total Possible Planting Area	1,121	28%
Unsuitable Vegetation	38	1%
Unsuitable Impervious	916	23%
Unsuitable Soil	30	1%
Total Unsuitable Areas	946	23%

Results of this study indicate that within the city of Mercer Island, 1,921 acres are covered with urban tree canopy, making up 48 percent of the city's 4,027 land acres; 1,121 acres are covered with other vegetation or impervious surfaces where it would be possible to plant trees (PPA), making up 28 percent of the city; and the other 946 acres were considered unsuitable for tree planting, making up 23 percent of the city. The unsuitable areas include recreational sports fields, buildings, roads, and areas of bare soil and dry vegetation. Bare soil and dry vegetation are considered unsuitable as these areas would require modification through irrigation or other methods to support healthy trees.

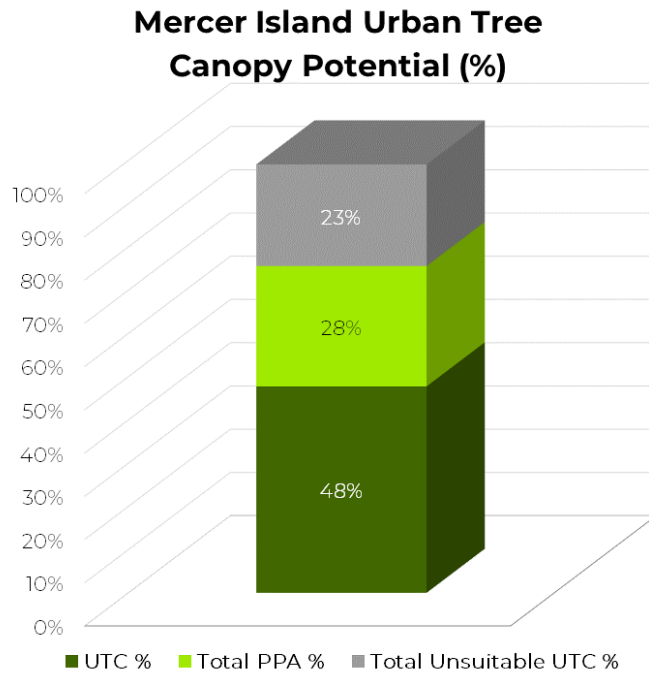


Figure 7. | Urban tree canopy, potential planting area, and area unsuitable for UTC in the City of Mercer Island.

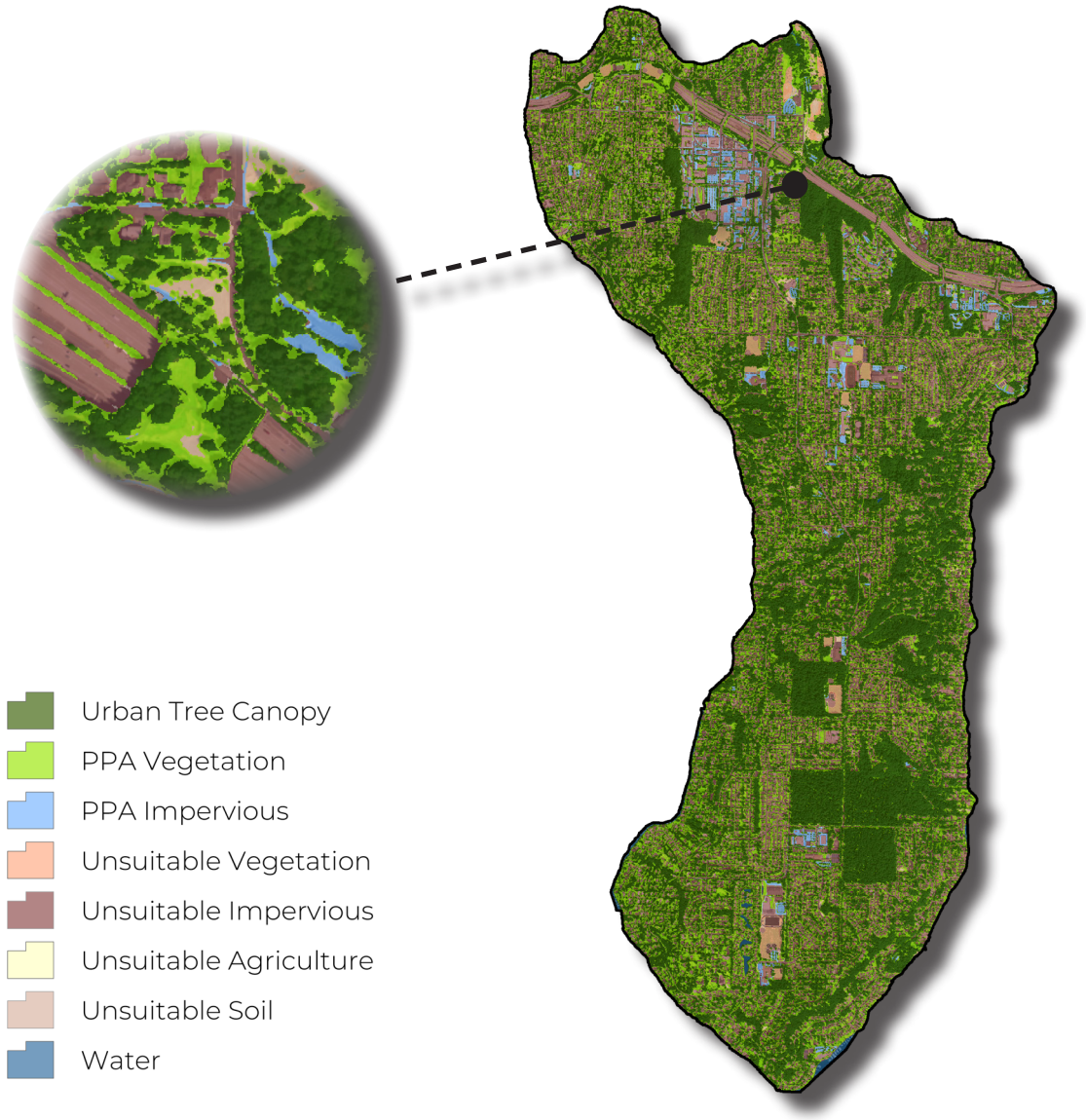


Figure 8. | Urban tree canopy, possible planting area, and area unsuitable for UTC in the city of Mercer Island.

The city's 1,926 acres of urban tree canopy were further divided into several subcategories based on whether the trees were deciduous (broad-leafed) or evergreen, and whether their canopy had an impervious understory or pervious understory. Tree canopy overhanging an impervious surface can provide many benefits through ecosystem services such as localized cooling provided by shading of impervious surfaces and increased stormwater absorption. Results indicated that Mercer Island's UTC was predominantly evergreen, with 59 percent evergreen canopy and 41 percent deciduous canopy. In Mercer Island, 25 percent of all tree canopy had an impervious understory.

Table 3. | Detailed urban tree canopy classifications.

City of Mercer Island	Acres	%
Deciduous Urban Tree Canopy	794	41%
Evergreen Urban Tree Canopy	1,132	59%
Tree Canopy with Impervious Understory	484	25%

URBAN TREE CANOPY BY LAND USE

Urban tree canopy metrics and possible planting areas were assessed for Mercer Island's 7 different land use categories (Table 4) found within the King County comprehensive plan land use data layer. Results indicated that the highest canopy coverage was observed in the park/trail/open space category, with 67 percent UTC, while the lowest was the central business district at 19 percent. Another trend showed that the greatest proportion of UTC by land use class came from the single-family residential category which had 47 percent canopy cover and comprised 76 percent of the City's overall UTC due to its large land area.

In terms of potential planting areas, the city's small Office/Business Park area had the highest PPA at 36 percent, while the parks category had the lowest at only 12 percent (likely due to its high existing canopy cover). Again, the single-family residential class contributed the greatest to the city's total PPA, making up 85 percent of the total citywide. This indicates that if the city is interested in expanding its overall UTC in the future, outreach and incentives to private homeowners are recommended.

Table 4. | Urban tree canopy assessment results by land use. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within each and use (dist.).

Land Use	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
Central Business District	78	2%	15	19%	1%	27	35%	2%
General Commercial	14	0%	4	27%	0%	5	34%	0%
Multi-Family Residential	112	3%	44	39%	2%	31	28%	3%
Office/Business Park	15	0%	5	34%	0%	5	36%	0%
Park/Trail/Open Space	536	13%	358	67%	19%	63	12%	6%
Public Use/Institutional	129	3%	31	24%	2%	36	28%	3%
Single-Family Residential	3,141	78%	1,463	47%	76%	954	30%	85%
Totals	**4,025**	**100%**	**1,920**	**48%**	**100%**	**1,121**	**28%**	**100%**



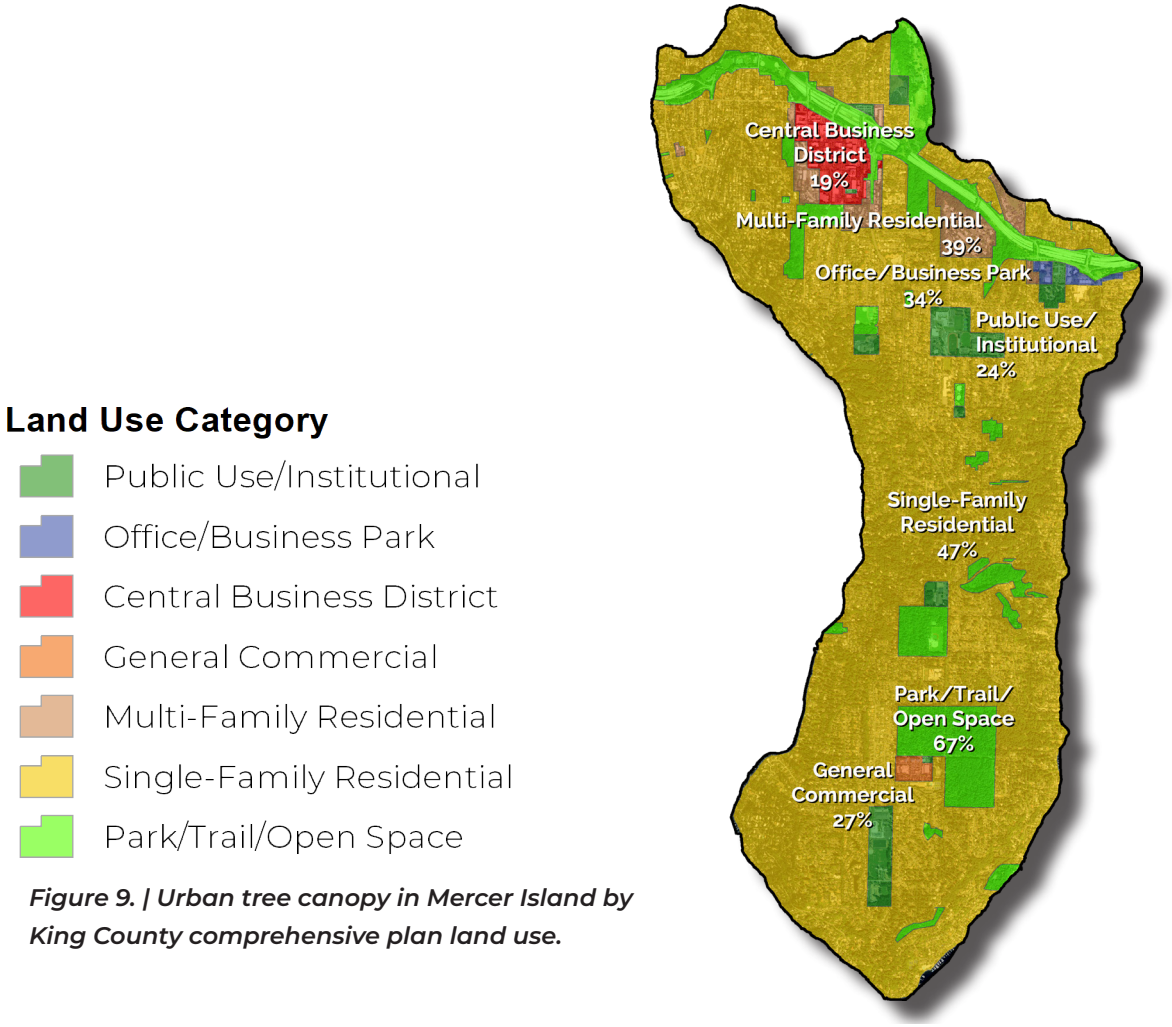


Figure 9. | Urban tree canopy in Mercer Island by King County comprehensive plan land use.

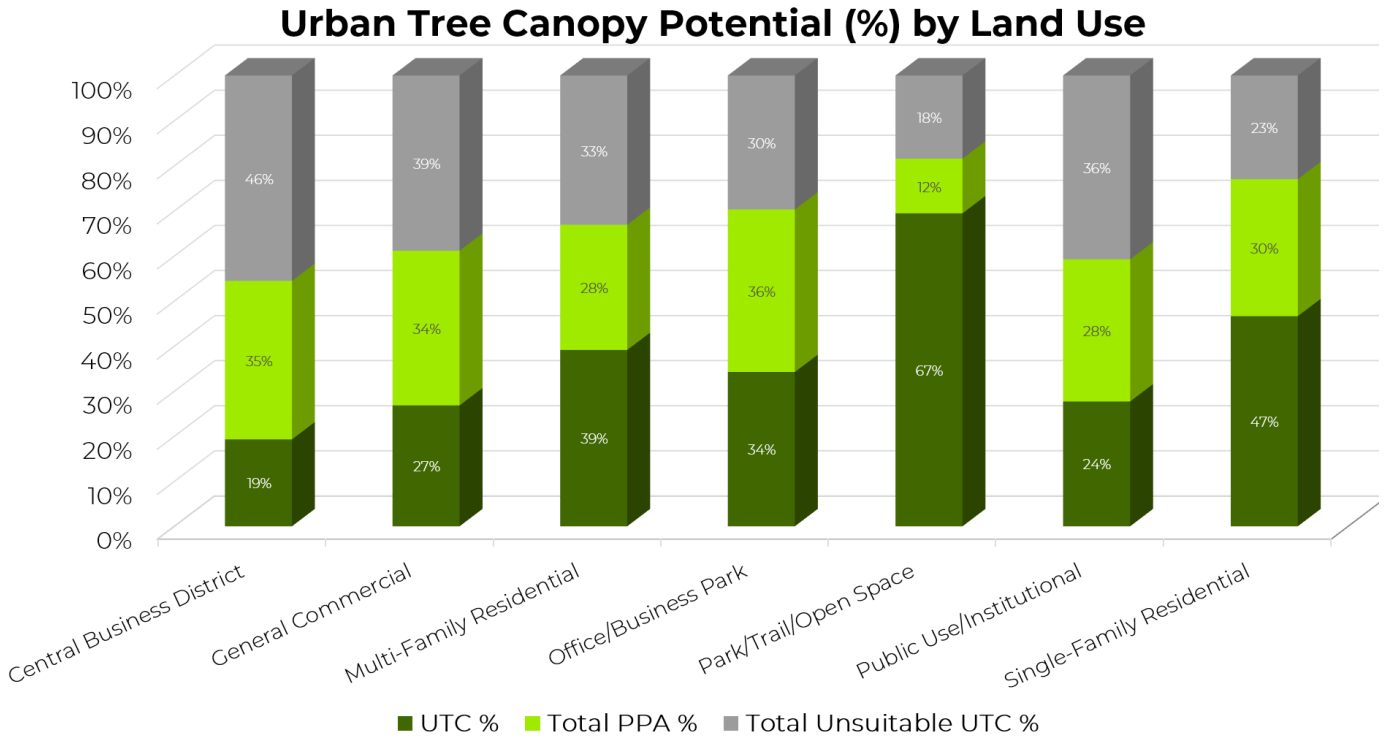


Figure 10. | Urban tree canopy, potential planting area, and area unsuitable for UTC by land use.

URBAN TREE CANOPY BY CENSUS BLOCK GROUP

Urban tree canopy and possible planting areas were assessed at the census block group level. This unit of analysis can be particularly valuable for assessing the equitable distribution of tree canopy throughout the city as the block groups are linked to all demographic and socioeconomic U.S. census data. Results indicated that urban tree canopy varies substantially throughout the city, with the lowest census block group containing 30 percent cover and the highest containing more than twice that. PPA also varied across the block groups with some containing only 21 percent PPA and others as much as 37 percent PPA. For the complete results by census block group, refer to Table 5.

Table 5. | Urban tree canopy assessment results by census block group. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within each census block group (dist.).

Census Block Groups	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
53-033-024601-1	379	9%	229	60%	12%	85	23%	8%
53-033-024602-2	337	8%	172	51%	9%	103	30%	9%
53-033-024602-3	153	4%	73	48%	4%	52	34%	5%
53-033-024601-2	298	7%	177	59%	9%	63	21%	6%
53-033-024300-4	168	4%	76	45%	4%	47	28%	4%
53-033-024300-2	171	4%	51	30%	3%	54	32%	5%
53-033-024300-1	323	8%	117	36%	6%	106	33%	9%
53-033-024300-5	163	4%	54	33%	3%	60	37%	5%
53-033-024300-3	189	5%	81	43%	4%	65	34%	6%
53-033-024400-1	222	6%	85	38%	4%	56	25%	5%
53-033-024400-2	187	5%	105	56%	5%	40	21%	4%
53-033-024500-1	423	11%	233	55%	12%	103	24%	9%
53-033-024500-3	264	7%	146	55%	8%	68	26%	6%
53-033-024500-2	248	6%	84	34%	4%	74	30%	7%
53-033-024602-1	210	5%	96	46%	5%	54	26%	5%
53-033-024601-3	291	7%	144	50%	8%	91	31%	8%
Totals	**4,027**	**100%**	**1,921**	**48%**	**100%**	**1,121**	**28%**	**100%**

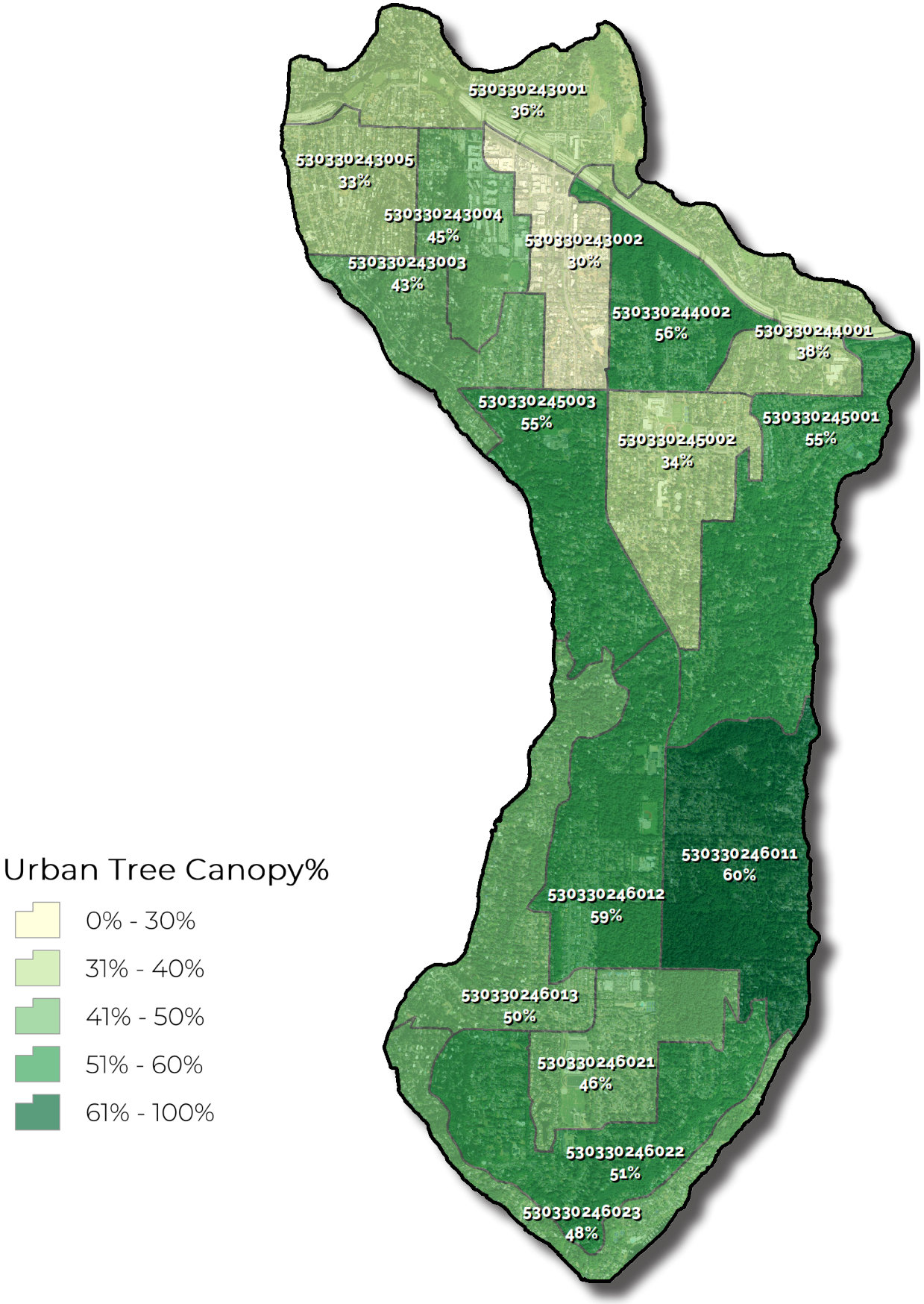


Figure 11. | Urban tree canopy in Mercer Island by U.S. census block groups.

URBAN TREE CANOPY BY STORMWATER BASIN

Urban tree canopy metrics and possible planting areas were assessed for the 87 stormwater drainage basins found within Mercer Island. UTC varied substantially across the drainage basins, with the lowest having just 26 percent UTC and the highest having greater than 80 percent. However, most of the basins' canopy coverages were similar to the City's overall average of 48 percent with 27 basins having 35-45 percent UTC and another 25 having 45-55 percent. From a spatial perspective, it is evident that the drainage basins near the center of the city have the highest UTC, while those on the northern and southern ends have less coverage. The lowest UTC can be found in the northwest corner of town. Refer to Table A3 in the Appendix for the full results by stormwater basin.

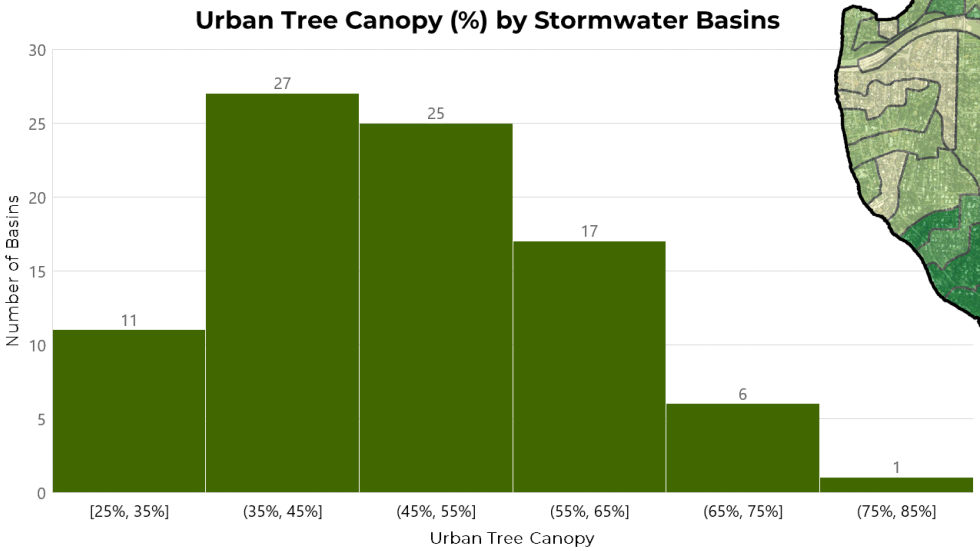


Figure 12. | Urban tree canopy in Mercer Island by stormwater basin.

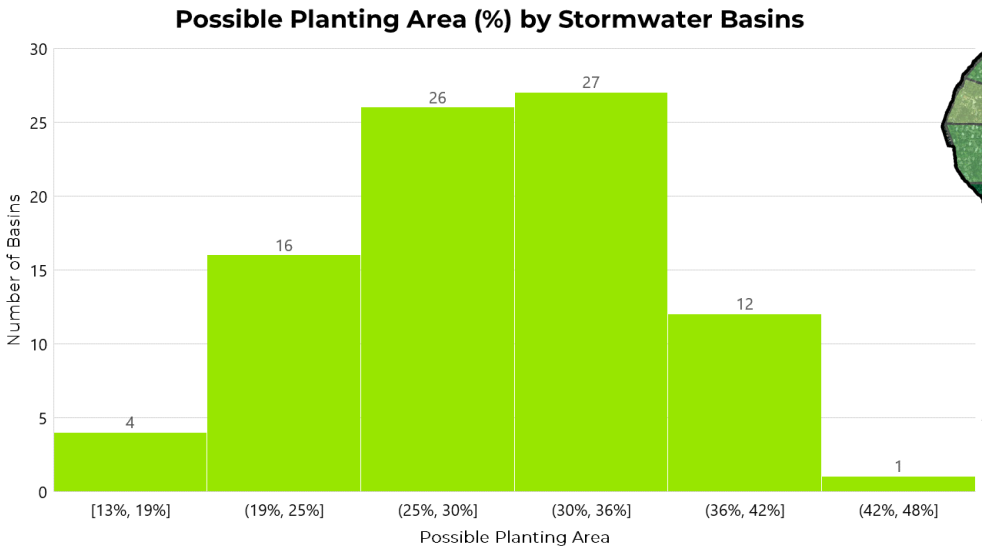


Figure 13. | Possible planting area in Mercer Island by stormwater basin.

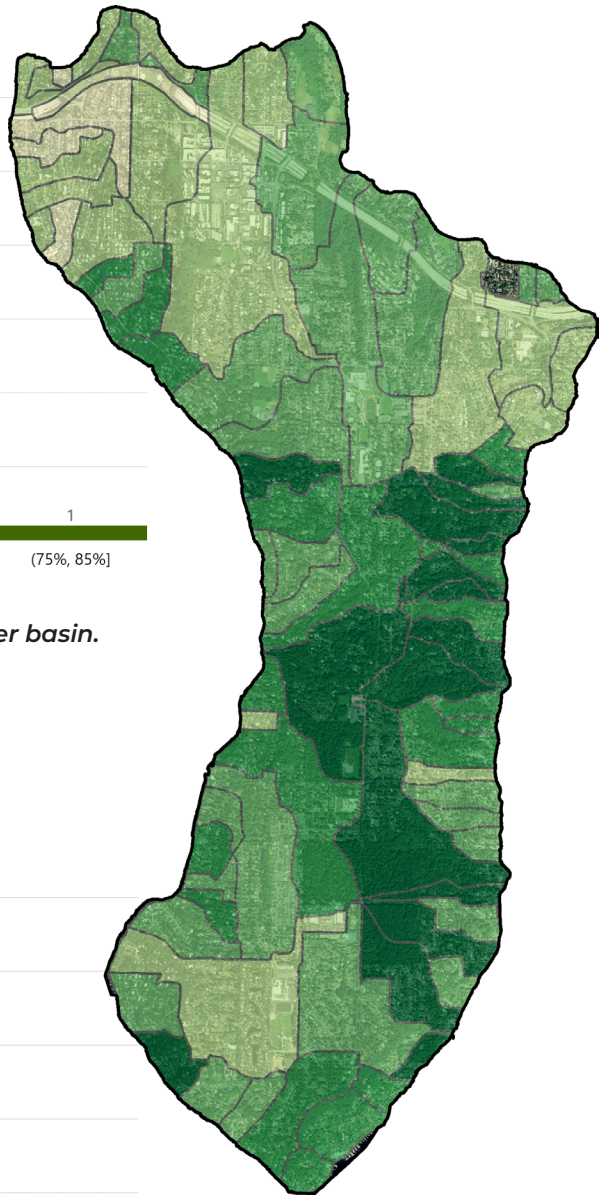


Figure 14. | Urban tree canopy in Mercer Island by stormwater basin.

URBAN TREE CANOPY BY PARKS AND OPEN SPACES

UTC and PPA were assessed for the city's designated parks (40) and open space areas (26). Overall, the combined UTC of these areas was significantly higher than the citywide average at 75 percent compared to 48 percent citywide.

When the results were separated for parks and open spaces, the differences were large. UTC in the parks category was 40 percent, while open space areas had 97 percent. Several areas such as Upper Luther Burbank, North Mercerdale Hillside, Clise, Island Crest, and the Hollerbach, Engstrom, and SE 53rd Open Space areas had almost full canopy coverage at 99 percent UTC or higher. Others had a UTC percent much lower than the citywide average such as the South Mercer Playfields at 16 percent.

The combined PPA in parks and open space areas was much lower than the city's average at 11 percent compared to 28 percent for the whole city. Of this available planting space, almost all of it was located within parks as opposed to open spaces. When the results were sub-divided, parks had a PPA of 25 percent whereas open spaces had 3 percent.

Table 6. | Urban tree canopy in Mercer Island by parks and open spaces (aggregated). UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within parks and open spaces (dist.). Refer to Table A5 in the Appendix for the full results by parks and open spaces.

Parks & Open Spaces	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
Parks	172	38%	69	40%	20%	43	25%	82%
Open Spaces	286	62%	277	97%	80%	9	3%	18%
Totals	**459**	**100%**	**345**	**75%**	**100%**	**52**	**11%**	**100%**

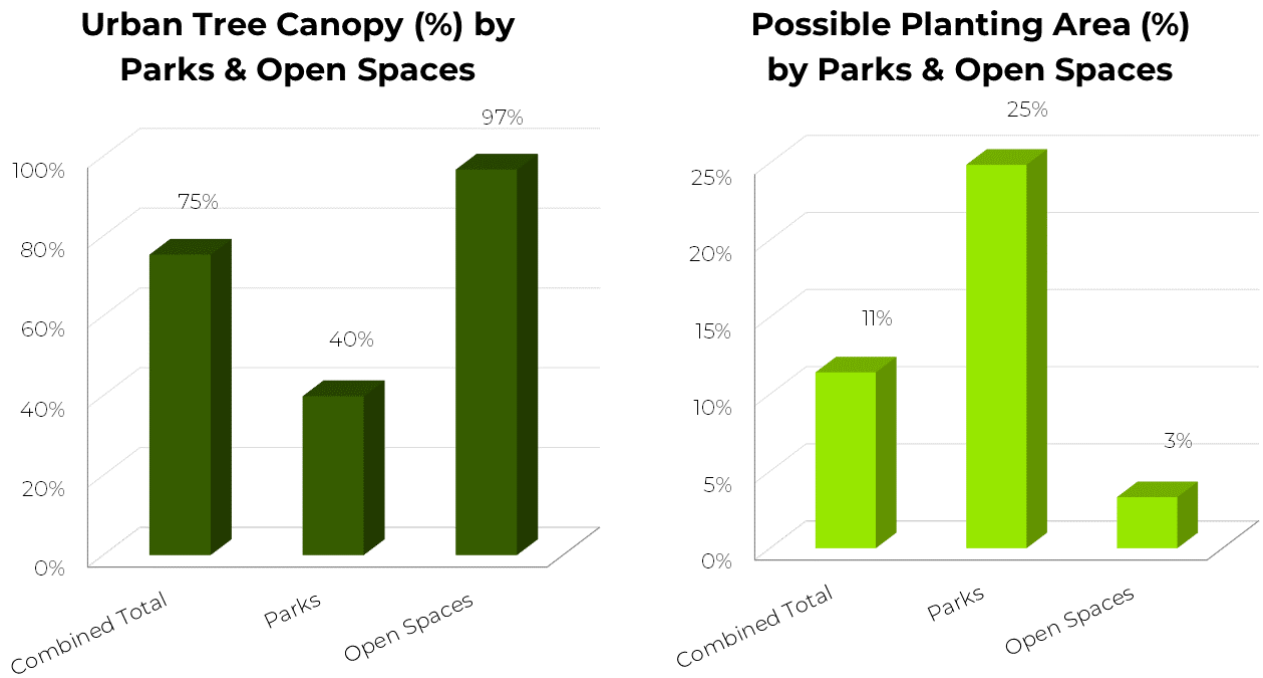


Figure 15. | Urban tree canopy and potential planting area in Mercer Island by parks and open spaces.

URBAN TREE CANOPY BY RIGHTS-OF-WAY

Right-of-way is comprised of publicly maintained areas such as streets, sidewalks, and medians. Because ROW is owned and managed by the city or state, possible planting areas located within them are often easy targets for increasing tree canopy cover. Two (2) different categories were explored: the ROW maintained by the City of Mercer Island and that maintained by the Washington State Department of Transportation (WSDOT). City-owned ROW had 42% UTC and 25% PPA while state-owned ROW had 35% UTC and 18% PPA. Much of the ROW is impervious road surface so increased tree canopy in these areas would help to mitigate stormwater runoff and improve local air quality.

Table 7. | Urban tree canopy in Mercer Island by rights-of-way. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within the ROW (dist.).

Right-of-Way	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
ROW	581	79%	242	42%	81%	146	25%	83%
WSDOT	159	21%	56	35%	19%	29	18%	17%
Totals	**740**	**100%**	**298**	**40%**	**100%**	**176**	**24%**	**100%**

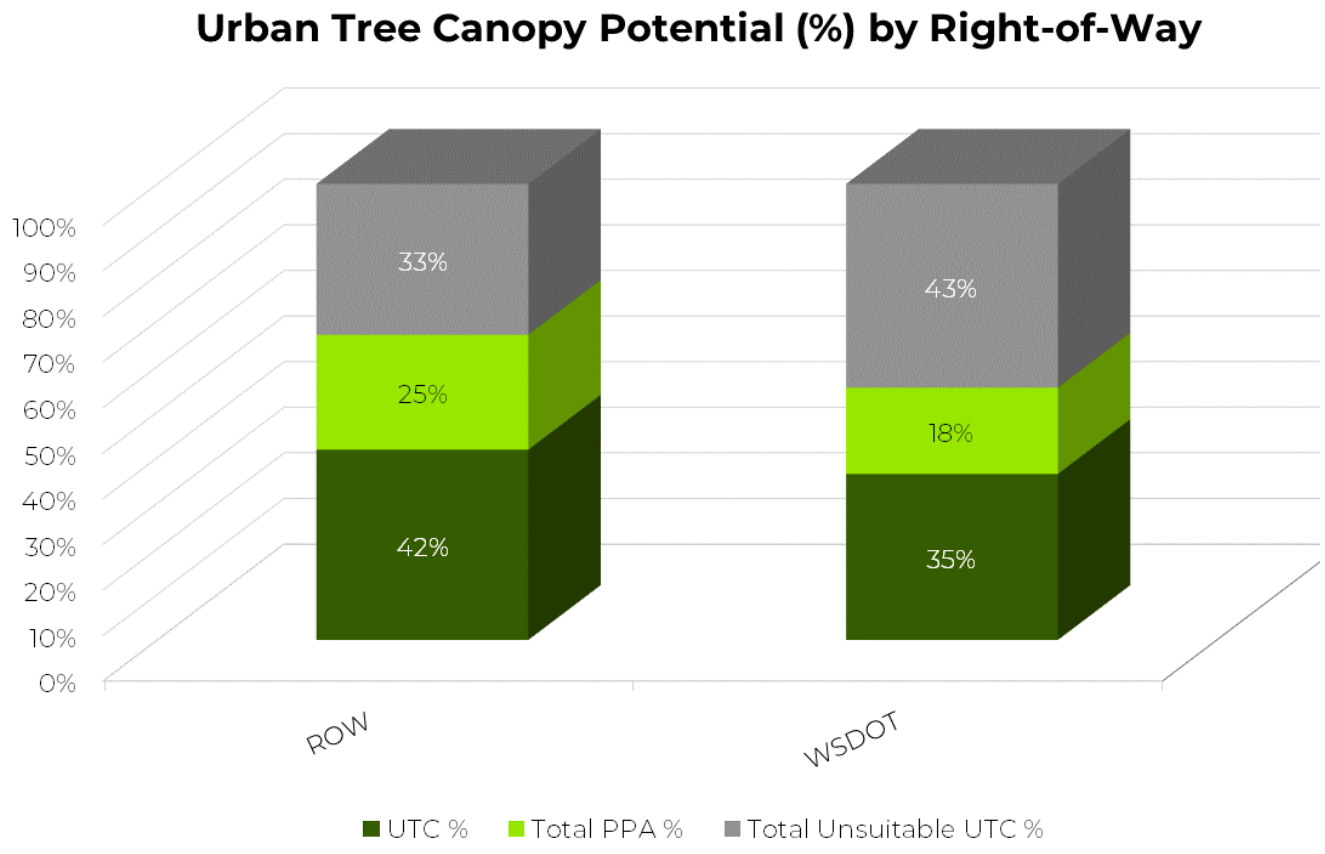


Figure 16. | Urban tree canopy, possible planting area, and unsuitable area in Mercer Island by rights-of-way.

URBAN TREE CANOPY BY SENSITIVE ECOLOGICAL AREAS

In addition to the geographies described above, several types of sensitive ecological areas were also assessed. Increased tree canopy in these areas would be particularly beneficial for providing air and/or water purification, wildlife habitat improvement, stormwater runoff control, and erosion prevention. The areas include the city's coastal zones, or a 200-foot buffer around the **shorelines**; the city's riparian areas, or a 100-foot buffer around the **streams**; the city's designated potential **landslide areas**; and areas with a **steep slope** of 40% or greater.

Refer to Table 8 for the full UTC results by sensitive ecological areas.

Shorelines

Mercer Island is surrounded by Lake Washington. Its shoreline serves as an important interface between the land and water. Trees can help filter pollutants that otherwise may drain into the lake during storm events. A 200-foot buffer inland from the city's shorelines was created, and UTC and PPA were assessed within the area. Results indicated that the UTC was lower than the citywide average at 37 percent, but PPA was higher at 38 percent. Much of the land in these areas is privately owned and in the single-family residential land use class. Public education and outreach campaigns may help to increase awareness of the benefits that trees provide and encourage new tree plantings by homeowners.

Streams

Trees are valuable for protecting the riparian environment by providing wildlife habitat, enhancing water quality, regulating stormwater runoff, and preventing erosion and transport of sediments. UTC and PPA were assessed within a 50-foot buffer on either side of all streams. Results indicated that the UTC was higher than the citywide average, at 67 percent, and PPA was slightly lower at 21 percent.

Table 8. | Urban tree canopy in Mercer Island by sensitive ecological areas. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within each sensitive ecological area (dist.). Note that totals are not included as each area is distinct from the others.

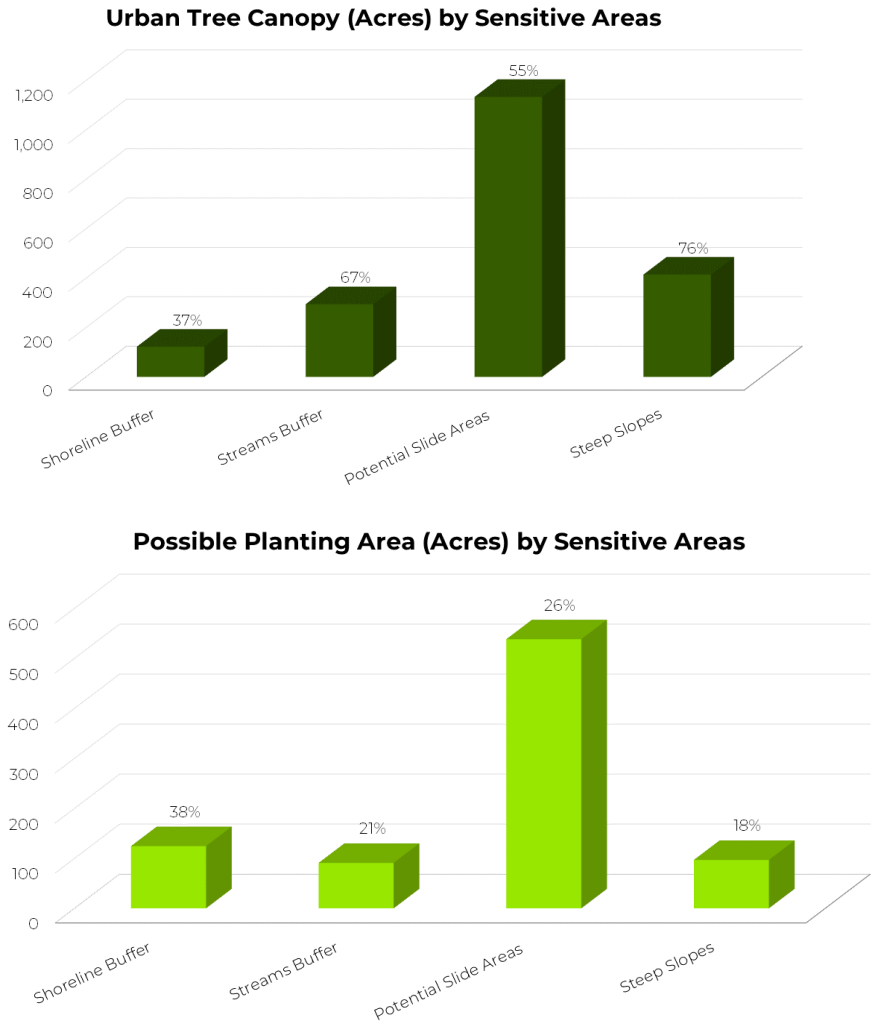
Sensitive Ecological Area	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
Shorelines	331	8%	122	37%	6%	124	38%	11%
Streams	439	11%	294	67%	15%	91	21%	8%
Slide Areas	2,046	51%	1,133	55%	59%	538	26%	48%
Steep Slopes	547	14%	414	76%	22%	97	18%	9%

Potential Slide Areas

The roots of trees penetrate deep into the soil helping to stabilize the land. Because of this, trees are especially valuable in landslide-prone areas. UTC and PPA were assessed throughout the city's designated potential slide areas and the results showed that UTC exceeded the citywide average at 55 percent while PPA was close to the average at 26 percent. More than half of Mercer Island's total urban tree canopy (59 percent) was found within these areas. Since these areas are likely to be unsuitable for future urban development due to the associated landslide risks, they represent an excellent place for the city to expand its citywide canopy coverage. Over 80% of the potential slide areas are found within single-family residential areas.

Steep Slopes

The city's steepest, most slide-prone areas were also assessed. These areas had a slope of 40 percent or greater and comprised 14 percent of the city's land area. Within that region, UTC was 76 percent, while PPA was 18 percent.



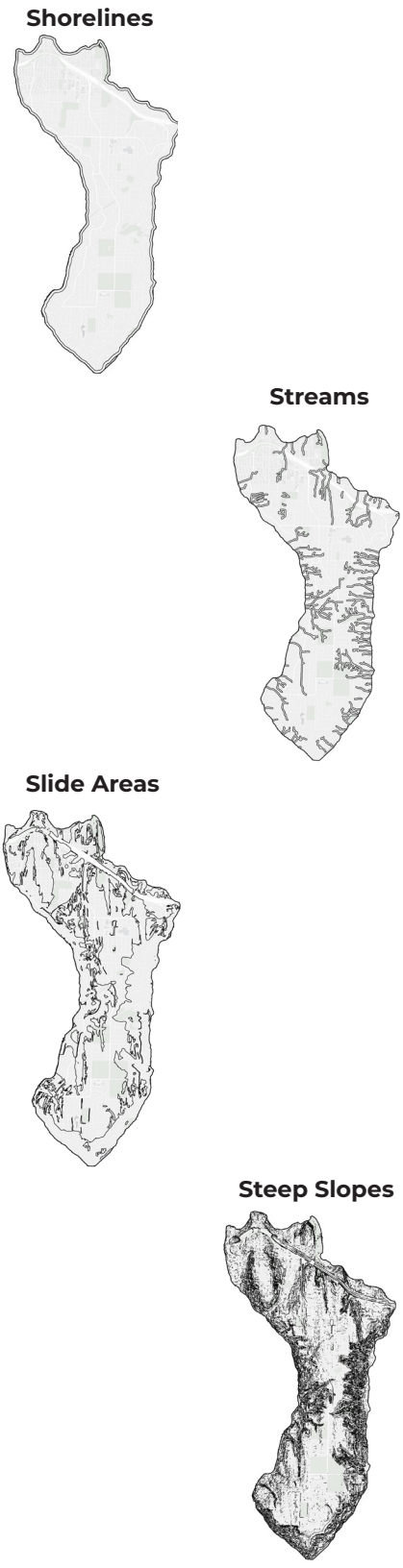


Figure 17. | Urban tree canopy (top) and possible planting area in Mercer Island by sensitive ecological areas.

URBAN TREE CANOPY CHANGE ANALYSIS

In addition to assessing Mercer Island's urban tree canopy using current 2017 imagery, this study also quantified changes in urban tree canopy since it was last assessed by AMEC Earth & Environmental using 2007 imagery. Although the exact methods used to map land cover varied between the 2017 and 2007 studies, the resulting land cover data are comparable. Both studies used high-resolution aerial imagery as their primary source. The spatial resolution of the imagery in 2007 was 2-feet while this study used 1-meter NAIP imagery. To ensure an even comparison, the 2007 land cover data were reanalyzed using the current boundaries of the city, land use, census block groups, etc. Changes since that time were assessed at all of the geographic assessment scales.

Figure 18. | Urban tree canopy in 2007 (yellow) compared to 2017 (green) in Town Center.

CITYWIDE URBAN TREE CANOPY CHANGE

Mercer Island saw an increase in its canopy over the 10-year study period from 2007-2017. Throughout the city, the average canopy cover leapt from 40 percent in 2007 to 48 percent in 2017. Tree canopy increased by 315 acres, yielding an 8 percent raw or 20 percent relative increase since 2007.

Table 9. | Urban tree canopy change for the City of Mercer Island.

Mercer Island	Land Area		UTC 2007		UTC 2017		UTC Change	
	Total Acres	*Land Acres*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
City Boundary	4,045	4,027	1,606	40%	1,921	48%	315	8%

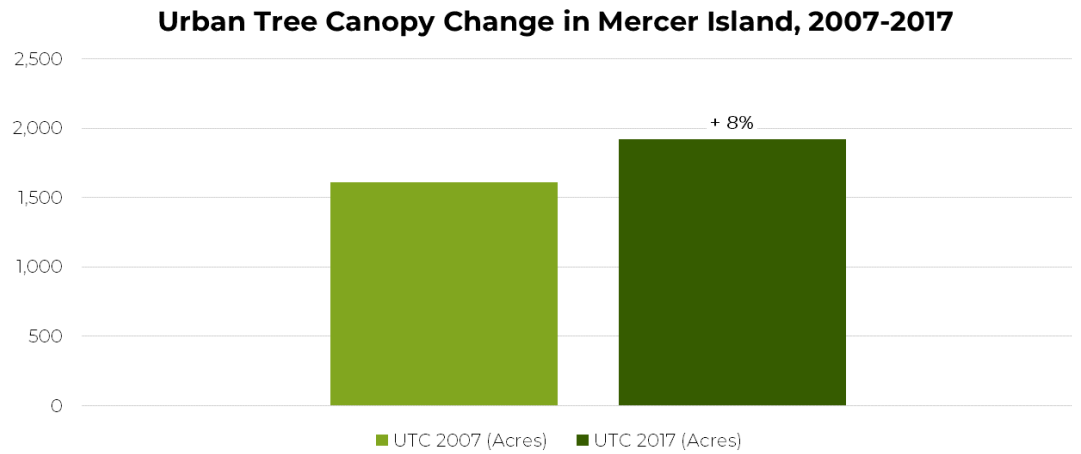


Figure 19. | Urban tree canopy change for the City of Mercer Island.

URBAN TREE CANOPY CHANGE BY LAND USE

Assessing changes by land use showed that tree canopy had doubled in the central business district and general commercial areas. The general commercial class had the greatest growth, nearly doubling its canopy since 2007 to achieve a 13 percent increase and bringing its canopy cover up from approximately 14 to 28 percent. The central business district showed an increase of tree canopy from 7 acres to 15 or 9 percent canopy cover to 19 percent. However, these areas only represent 2 percent of the city's land area. Single-family residential areas represent about 75 percent of Mercer Island. Within these areas, there was an increase of 202 acres of tree canopy or 6% increase canopy cover.

Table 10. | Urban tree canopy change in Mercer Island by King County land uses.

Land Use	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
Central Business District	78	2%	7	9%	15	19%	8	10%
General Commercial	14	0%	2	14%	4	27%	2	13%
Multi-Family Residential	112	3%	34	31%	44	39%	10	9%
Office/Business Park	15	0%	4	25%	5	34%	1	10%
Park/Trail/Open Space	536	13%	325	61%	358	67%	33	6%
Public Use/Institutional	129	3%	27	21%	31	24%	5	4%
Single-Family Residential	3141	78%	1,261	40%	1463	47%	202	6%
Totals	**4,025**	**100%**	**1,659**	**41%**	**1,920**	**48%**	**261**	**6%**

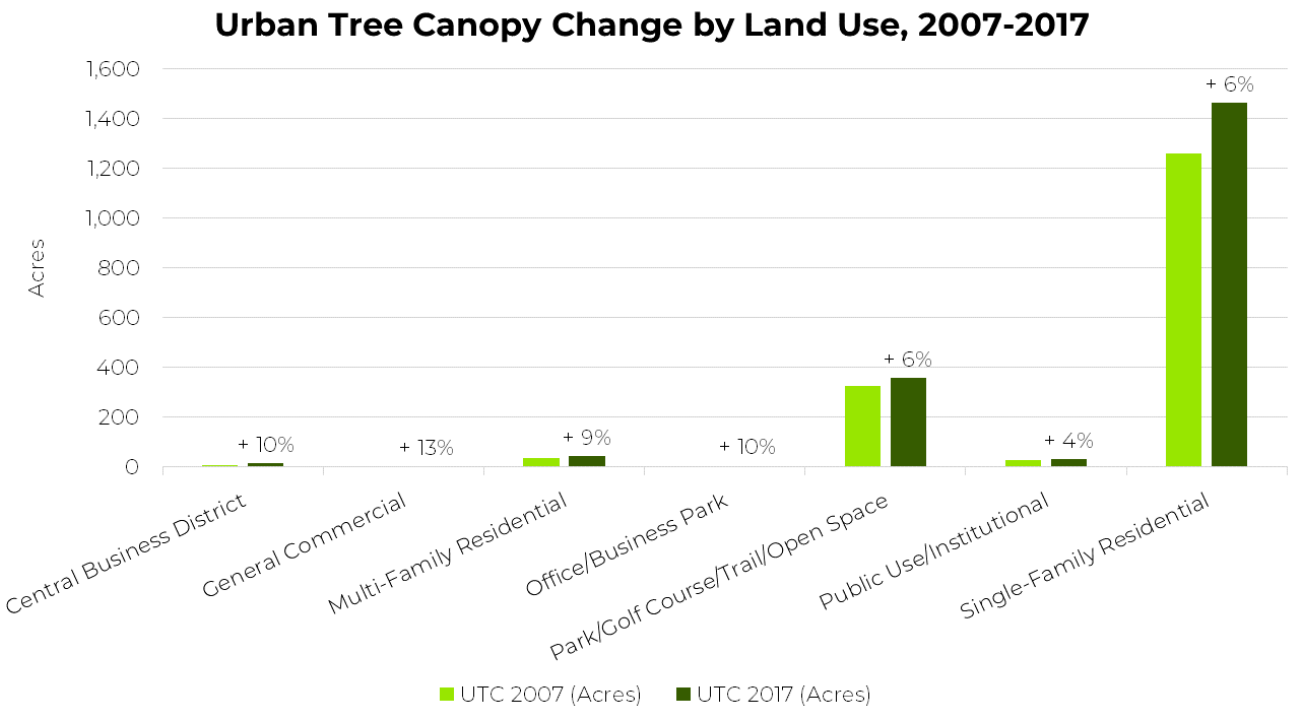


Figure 20. | Urban tree canopy change in Mercer Island by county land uses.

URBAN TREE CANOPY CHANGE BY CENSUS BLOCK GROUPS

Mercer Island's census block groups did not show a drastic variation in urban tree canopy growth. The block groups with the smallest increases had a 5 percent gain, whereas those with the highest had 9-10 percent. The majority of the census block groups' UTC increase was similar to the citywide average of 7-8 percent, and no census block groups had a decrease in canopy.

Table 11. | Urban tree canopy change in Mercer Island by census block groups.

Census Block Groups	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
53-033-024601-1	379	9%	211	56%	229	60%	18	5%
53-033-024602-2	337	8%	150	44%	172	51%	22	7%
53-033-024602-3	153	4%	59	39%	73	48%	14	9%
53-033-024601-2	298	7%	163	55%	177	59%	14	5%
53-033-024300-4	168	4%	65	39%	76	45%	11	6%
53-033-024300-2	171	4%	34	20%	51	30%	17	10%
53-033-024300-1	323	8%	90	28%	117	36%	27	8%
53-033-024300-5	163	4%	43	26%	54	33%	11	7%
53-033-024300-3	189	5%	68	36%	81	43%	14	7%
53-033-024400-1	222	6%	68	31%	85	38%	16	7%
53-033-024400-2	187	5%	94	50%	105	56%	11	6%
53-033-024500-1	423	11%	210	50%	233	55%	23	6%
53-033-024500-3	264	7%	124	47%	146	55%	22	8%
53-033-024500-2	248	6%	72	29%	84	34%	13	5%
53-033-024602-1	210	5%	86	41%	96	46%	10	5%
53-033-024601-3	291	7%	124	42%	144	50%	21	7%
Totals	**4,027**	**100%**	**1,659**	**41%**	**1,921**	**48%**	**262**	**7%**

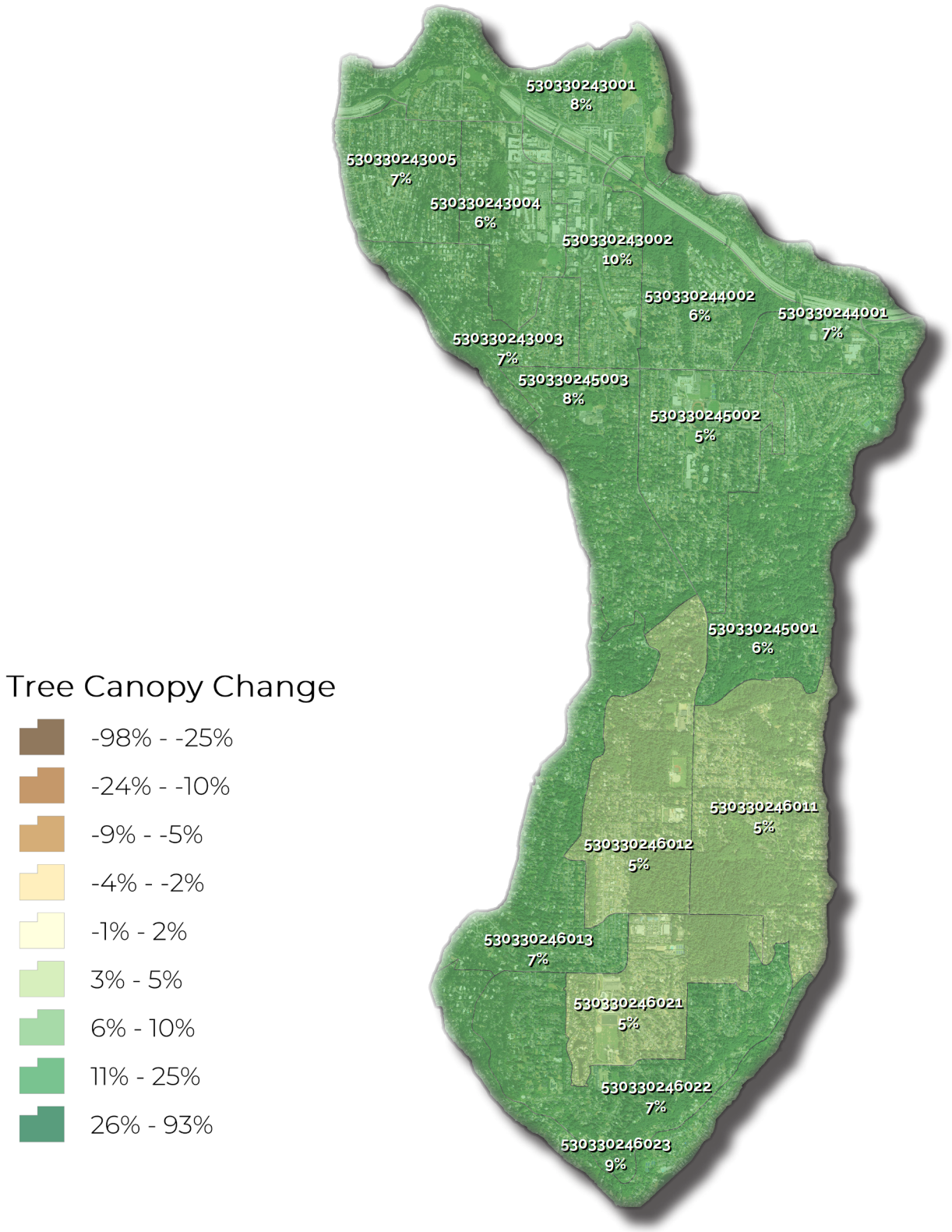


Figure 21. | Urban tree canopy change in Mercer Island by census block groups.

URBAN TREE CANOPY CHANGE BY STORMWATER BASIN

Change within the individual 86 stormwater drainage basins varied significantly. Some showed an increase of up to 18 percent while others saw little to no change. Only one basin showed a decrease in canopy coverage, while most showed similar increases in UTC as the citywide average. Refer to Table A4 in the Appendix for the full change analysis results by stormwater basin.

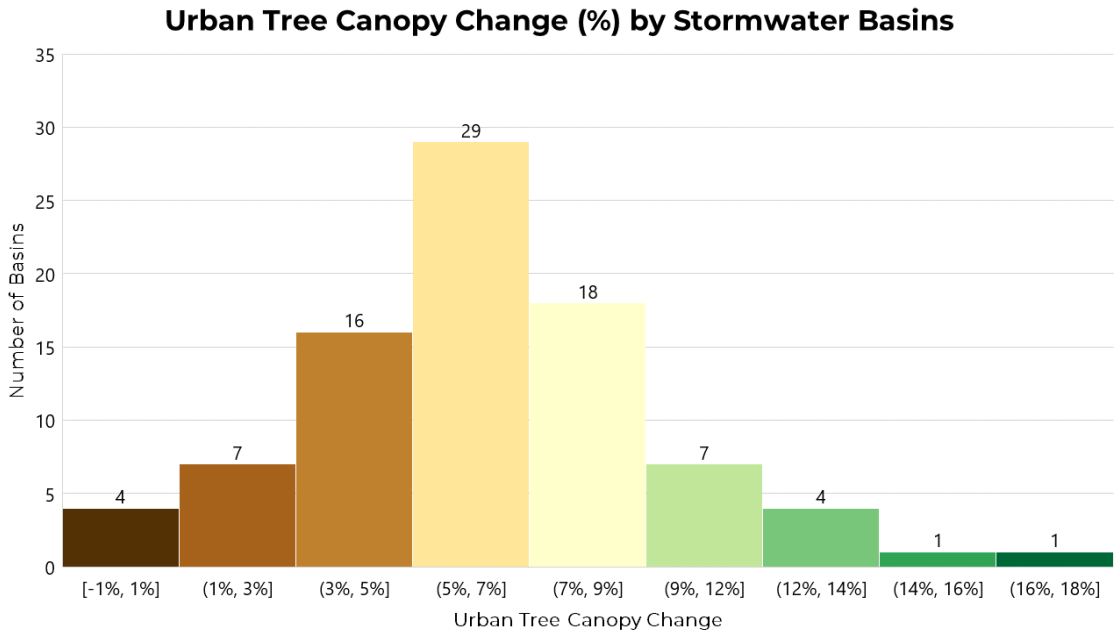


Figure 22. | Urban tree canopy change in Mercer Island by stormwater basins.

URBAN TREE CANOPY CHANGE BY PARKS & OPEN SPACES

Mercer Island's parks and open spaces had a canopy cover well above the citywide average in 2007 and consequently showed a smaller increase than the rest of the city in 2017. The average UTC in this category was 69 percent in 2007 and 75 percent in 2017, yielding a 6 percent increase (compared to the citywide average of 8 percent). In sub-dividing the results, parks had an increase of 8 percent and open spaces had an increase of 5 percent.

Increases in canopy were not uniformly distributed throughout the City's various parks and open spaces. While several areas had increases of 20-40 percent (such as the SE 20th and SE 70th Street Landings) and one area more than tripled its canopy from 17 to 70 percent (Groveland Beach Park), many areas had no change in UTC and 10 had losses of canopy.

Table 12. | Urban tree canopy change in Mercer Island by parks and open spaces (aggregated). Refer to Table A6 in the Appendix for the full change analysis results by parks and open spaces.

Parks & Open Spaces	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
Parks	172	38%	54	32%	69	40%	14	8%
Open Spaces	286	62%	264	92%	277	97%	13	5%
Totals	**459**	**100%**	**318**	**69%**	**345**	**75%**	**28**	**6%**

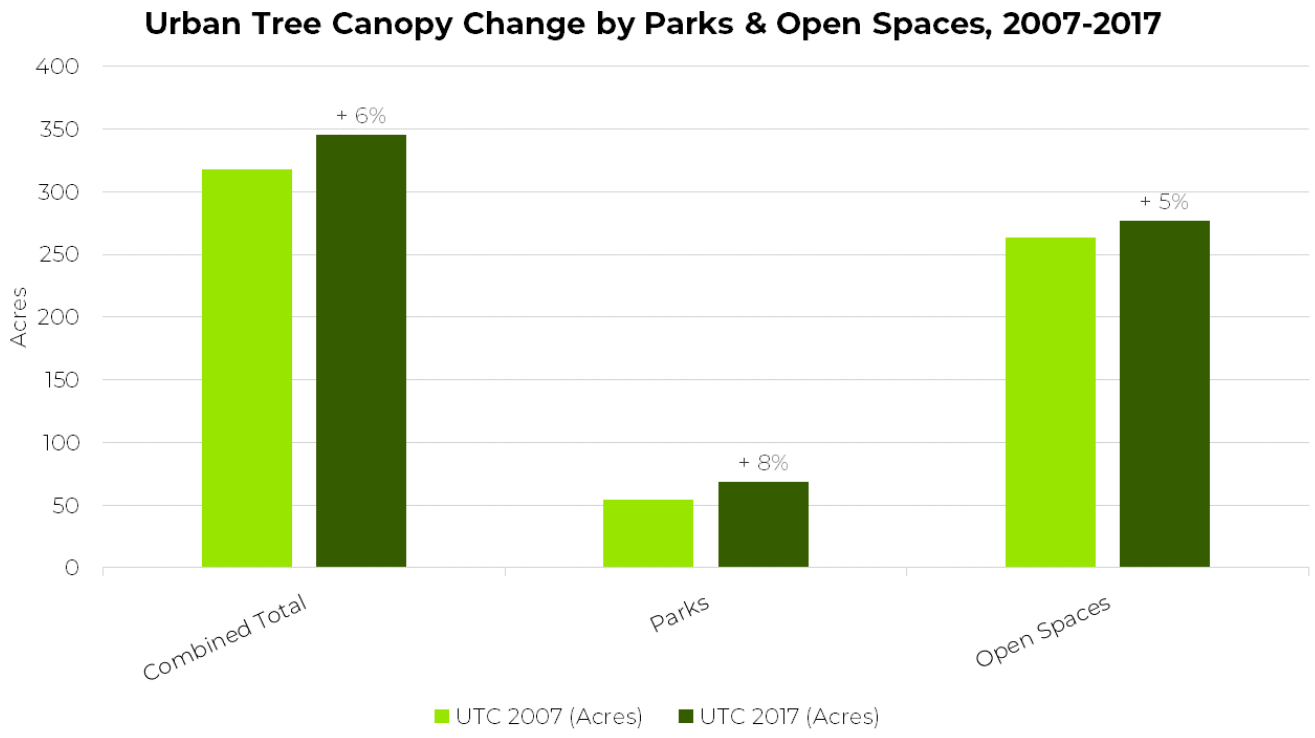


Figure 23. | Urban tree canopy change in Mercer Island by parks and open spaces (aggregated).

URBAN TREE CANOPY CHANGE BY CHANGE BY RIGHTS-OF-WAY

Mercer Island's UTC change from 2007-2017 by City and Washington State right-of-way averaged a 10% increase. WSDOT increased by 8 percent and the city-owned ROW increased by 11 percent. Street trees are highly valuable resources in the urban environment due to their stormwater, air quality, and aesthetic benefits. Continuing to expand canopy coverage in these areas will be greatly beneficial to the City.

Table 13. | Urban tree canopy change in Mercer Island by City and State rights-of-way.

Right-Of-Way	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
ROW	581	79%	179	31%	242	42%	64	11%
WSDOT	159	21%	43	27%	56	35%	13	8%
Totals	**740**	**100%**	**222**	**30%**	**298**	**40%**	**76**	**10%**

URBAN TREE CANOPY CHANGE BY SENSITIVE ECOLOGICAL AREAS

Changes in Mercer Island's UTC since 2007 were assessed within four ecologically sensitive areas: a 200-foot buffer inland from the Lake Washington shoreline, a 50-foot buffer on either side of any streams, the City's designated potential landslide areas, and the areas with steep slopes greater than 40%. UTC increased in each of these areas.

Shorelines

UTC change along the City's shoreline was close to the citywide average, increasing by 8 percent from 29-37 percent over the 10-year period.

Streams

UTC coverage within the City's riparian stream corridors was greater than the citywide average in 2007 and remained greater in 2017. UTC along streams increased by 6 percent over the study period from 61-67 percent.

Potential Slide Areas

UTC in the City's potential landslide areas had the greatest change of any of the ecologically sensitive regions and increased by 13 percent from 43-55 percent.

Steep Slopes

The City's steepest-sloped regions had the smallest increase over the 10-year timespan but the highest percentage of canopy cover of any of the sensitive areas in both 2007 and 2017 and increased 5 percent from 71-76 percent.

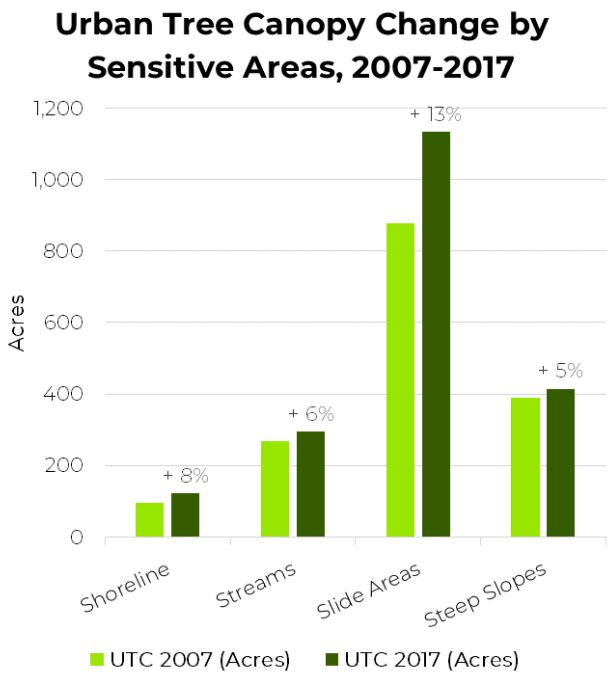


Figure 24. | Urban tree canopy change in Mercer Island by sensitive ecological areas.

Table 14. | Urban tree canopy change in Mercer Island by sensitive ecological areas.

Sensitive Area	Land Area		UTC 2007		UTC 2017		UTC 2007 - 2017	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
Shoreline Buffer	331	8%	96	29%	122	37%	26	8%
Streams Buffer	439	11%	268	61%	294	67%	26	6%
Potential Slide Areas	2,046	51%	877	43%	1,133	55%	256	13%
Steep Slopes	547	14%	389	71%	414	76%	25	5%

RECOMMENDATIONS

The City of Mercer Island has started the process of preserving, protecting, and maintaining their urban forest resource by assessing their canopy in 2007 and again in 2017. As the City changes, staff will be able to use these recommendations to ensure that their urban forest policies and management practices prioritize its maintenance, health, and growth. Now, the City must put these results to work to preserve and promote its tree canopy.

Urban tree canopy in Mercer Island's potential landslide areas increased by 13% from 2007-2017.

The results of this assessment can and should be used to encourage investment in forest monitoring, maintenance, and management; to prepare supportive information for local budget requests/grant applications; and to develop targeted presentations for city leaders, planners, engineers, resource managers, and the public on the functional benefits of trees in addressing environmental issues. The land cover data should be disseminated to diverse partners for urban forestry and other applications while the data is current and most useful for decision-making and implementation planning. The information from this study can help establish canopy cover goals for the short- and long-term.

Additionally, the City and its various stakeholders can utilize the results of the UTC, PPA, and change analyses to identify the best locations to focus future tree planting and canopy expansion efforts. While the City has a high overall canopy coverage, breaking up the results by several different geographic boundaries demonstrated that canopy change was not evenly distributed throughout the City's area. For example, some parts of Mercer Island have increased their canopy by more than 60 percent relative to their previous amounts while others experienced gains as small as 1 percent. Some areas have even lost canopy. Using the canopy change data, the City can determine possible causes of tree canopy gains and losses from 2007 to 2017, both citywide and by each studied geography, to identify strategies that address these losses and gains.

The greatest opportunities for planting trees are found in the Single-Family Residential land use areas. If 25% of vegetated plantable space in these areas was converted to tree canopy (an additional 209 acres), citywide coverage would increase to nearly 53%. Mercer Island should conduct outreach and education workshops to inform the public of the benefits of trees and proper tree planting and maintenance to encourage increased canopy in these areas. The City should also identify planting opportunities within Census Block Group #53-033-024300-5 which has the second lowest existing tree canopy percentage (33%) but the highest PPA vegetation percentage (32%).

RIGHTS-OF-WAY IN MERCER ISLAND ARE PRIME AREAS FOR INCREASING URBAN TREE CANOPY

Of Mercer Island's land use classes, the public use/institution category saw the smallest increase (4%) over the ten-year period. New tree plantings can be prioritized in these areas. The City can also use the results for sensitive areas to protect its critical environmental regions. The data can be used to identify opportunities along streams, especially where impervious surfaces along streams could be reduced or covered by canopy. PPA should be overlaid with the Potential Slide Areas and Steep Slopes to identify areas where trees could be planted to reduce the potential for erosion.

These results can be used as a guide to determine which areas would receive the greatest benefits from the investment of valuable time and resources into Mercer Island's urban forest. In addition to the examples above, the City can use the provided Canopy Planner tool to explore a wide range of targeted, in-depth planting scenarios based on several prioritization criteria. Canopy Planner allows stakeholders to visualize existing land cover and create custom weighted priority planting maps.

A nation-wide analysis conducted by USFS researchers stated that under ideal conditions, forested states such as Washington could achieve a canopy cover of 40-60%. With its current canopy, Mercer Island has already met that goal and is poised to continue its upward trend even further. Mercer Island's urban forest provides the City with a wealth of environmental, social, and even economic benefits which relate back to greater community interest in citywide initiatives and priorities. These updated results can be used to interpret where these gains have been felt most significantly and where there is still work to be done in accordance with the city's broader goals and vision for its future.

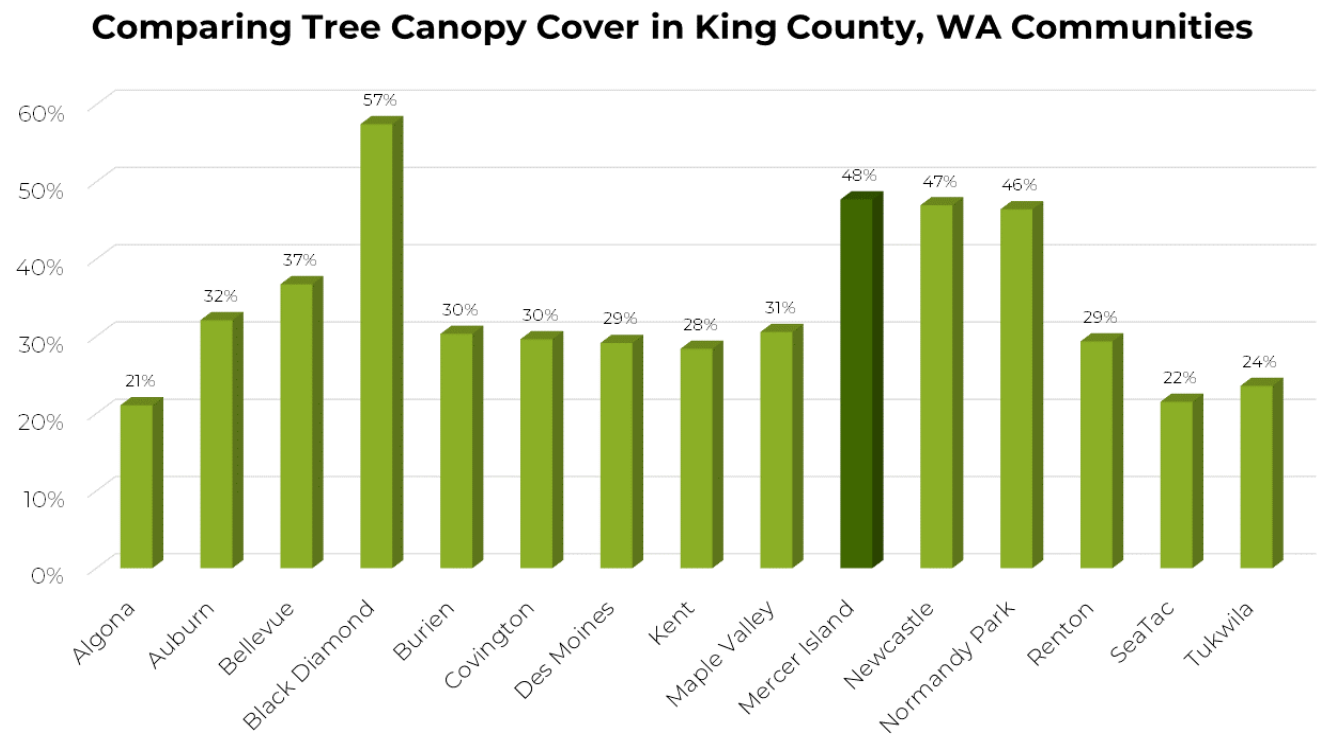


Figure 25. | A comparison of tree canopy in all 15 cities mapped in the 2017 South King County UTC Assessment.

APPENDIX

ACCURACY ASSESSMENT

Classification accuracy serves two main purposes. Firstly, accuracy assessments provide information to technicians producing the classification about where processes need to be improved and where they are effective. Secondly, measures of accuracy provide information about how to use the classification and how well land cover classes are expected to estimate actual land cover on the ground. Even with high resolution imagery, very small differences in classification methodology and image quality can have a large impact on overall map area estimations.

The classification accuracy error matrix illustrated in Table A1 contain confidence intervals that report the high and low values that could be expected for any comparison between the classification data and what actual, on the ground land cover was in 2017. This accuracy assessment was completed using high resolution aerial imagery, with computer and manual verification. No field verification was completed.

THE INTERNAL ACCURACY ASSESSMENT WAS COMPLETED IN THESE STEPS

1. One hundred (100) sample points, or approximately 15 points per square mile area in Mercer Island (6.3 sq. miles), were randomly distributed across the study area and assigned a random numeric value.
2. Each sample point was then referenced using the NAIP aerial photo and assigned one of five generalized land cover classes ("Ref_ID") mentioned above by a technician.
3. In the event that the reference value could not be discerned from the imagery, the point was dropped from the accuracy analysis. In this case, no points were dropped.
4. An automated script was then used to assign values from the classification raster to each point ("Eval_ID"). The classification supervisor provides unbiased feedback to quality control technicians regarding the types of corrections required. Misclassified points (where reference ID does not equal evaluation ID) and corresponding land cover are inspected for necessary corrections to the land cover.[1]

Accuracy is re-evaluated (repeat steps 3 & 4) until an acceptable classification accuracy is achieved.

SAMPLE ERROR MATRIX INTERPRETATION

Statistical relationships between the reference pixels (representing the true conditions on the ground) and the intersecting classified pixels are used to understand how closely the entire classified map represents Mercer Island's landscape. The error matrices shown in Tables A1 represent the intersection of reference pixels manually identified by a human observer (columns) and classification category of pixels in the classified image (rows). The gray boxes along the diagonals of the matrix represent agreement between the two-pixel maps. Off-diagonal values represent

1 Note that by correcting locations associated with accuracy points, bias is introduced to the error matrix results. This means that matrix results based on a new set of randomly collected accuracy points may result in significantly different accuracy values.

the number of pixels manually referenced to the column class that were classified as another category in the classification image. Overall accuracy is computed by dividing the total number of correct pixels by the total number of pixels reported in the matrix (44 + 26 + 22 + 0 + 1 = 93 / 100 = 93 percent), and the matrix can be used to calculate per class accuracy percent's. For example, 44 points were manually identified in the reference map as Tree Canopy, and 44 of those pixels were classified as Tree Canopy in the classification map. This relationship is called the "Producer's Accuracy" and is calculated by dividing the agreement pixel total (diagonal) by the reference pixel total (column total). Therefore, the Producer's Accuracy for Tree Canopy is calculated as: (44/44 = 1.00), meaning that we can expect that 100 percent, or all of the 2017 tree canopy in the Mercer Island, WA study area, was classified as Tree Canopy in the 2017 classification map.

Conversely, the "User's Accuracy" is calculated by dividing the total number of agreement pixels by the total number of classified pixels in the row category. For example, 44 classification pixels intersecting reference pixels were classified as Tree Canopy, but 5 pixels were identified as Vegetation in the reference map. Therefore, the User's Accuracy for Tree Canopy is calculated as: (44/49 = 0.90), meaning that ~90 percent of the pixels classified as Tree Canopy in the classification were actual tree canopy. It is important to recognize the Producer's and User's accuracy percent values are based on a sample of the true ground cover, represented by the reference pixels at each sample point. Interpretation of the sample error matrix results indicates this land cover, and more importantly, tree canopy, were accurately mapped in Mercer Island in 2017. The largest sources of classification confusion exist between tree canopy and vegetation.

Table A1. | Error matrix for land cover classifications in Mercer Island, WA (2017).

Classification Data	Reference Data: Tree Canopy	Vegetation	Impervious	Soil / Dry Veg.	Water	Total Reference Pixels
Tree Canopy	44	5	0	0	0	49
Vegetation	0	26	0	0	0	26
Impervious	0	1	22	0	0	23
Soil / Dry Veg.	0	1	0	0	0	1
Water	0	0	0	0	1	1
Total	44	33	22	0	1	100

Overall Accuracy = 93%

Producer's Accuracy	
Tree Canopy	100%
Veg. / Open Space	79%
Impervious	100%
Bare Ground / Soil	0%
Water	100%

User's Accuracy	
Tree Canopy	90%
Veg. / Open Space	100%
Impervious	96%
Bare Ground / Soil	0%
Water	100%

ACCURACY ASSESSMENT RESULTS

Interpretation of the sample error matrix offers some important insights when evaluating Mercer Island's urban tree canopy coverage and how land cover reported by the derived rasters and the human eye. The high accuracy of the 2017 data indicates that Mercer Island's current tree canopy can be safely assumed to match the figures stated in this report (approximately 48 percent). However, the accuracy of the results of the previous 2007 study were not assessed, indicating that the change results presented in this report should be interpreted with caution as it is possible that the 2007 metrics against which the current metrics were compared may have been slightly under- or over-reported.

I-TREE HYDRO STORMWATER ANALYSIS

i-Tree Hydro is a tool designed to simulate the impacts that tree canopy cover, impervious surfaces, and other land cover types have on the hydrological cycle. Users of the tool can make use of existing input datasets provided by i-Tree or they can incorporate their own data for hourly weather, streamflow, and elevation (either a digital elevation model (DEM) or one of Hydro's pre-formatted topographic index files). One or many different land cover scenarios can be defined in order to estimate the impact on stormwater runoff. Reports detailing these impacts can be exported. Additional parameters can be configured such as soil texture and conductivity. However, these variables are recommended for more advanced users. The default regional values that are provided should be sufficient for the average user.

For the purposes of this study, a simplified version of the model was used utilizing only pre-existing data already available in i-Tree Hydro. A topographic index was chosen to represent the area of interest (see Appendix 2, page 47 of the i-Tree Hydro User's Manual for more information on topographic indexes). Baseline land cover conditions created by this tree canopy assessment were incorporated. To create an alternate land cover scenario, all existing tree canopy was removed and converted to herbaceous or impervious land cover to show a drastic case where all canopy cover in Mercer Island was removed. The results, provided in total stormwater runoff over a specified period of time, can help natural resource managers and urban planners engage in meaningful discussions to better describe the impacts of land cover changes in their cities. The results in Table A2, below, are presented as raw numbers (cubic feet) and a percent change (%) from the base case scenario. At the time of publication, Plan-It Geo is engaged in a comprehensive analysis of the i-Tree Hydro tool's applications in western Washington. This project will provide much more detailed modeling scenarios and offer guidance on best practices. This project is anticipated to be completed in 2019.

Table A2. | Stormwater runoff values using the existing land cover and an alternate scenario where all tree canopy was removed. (Continued on next page.)

Land Cover	Base (%)	Alternate (%)	Change (%)
Tree Canopy	47.5%	0.0%	-47.5%
Pervious Under Tree Canopy	36.7%	0.0%	-36.7%
Impervious Under Tree Canopy	10.8%	0.0%	-10.8%
Herbaceous	24.1%	60.8%	36.7%
Water	0.5%	0.5%	0.0%
Impervious	27.2%	38.0%	10.8%
Soil	0.8%	0.8%	0.0%

Streamflow Predictions	Base (m^3)	Alternate (m^3)	Change (%)
Total Flow	2,454.9	2,539.7	3.0%
Base Flow	453.8	466.7	3.0%
Pervious Runoff	1,185.2	1,230.0	4.0%
Impervious Runoff	815.9	842.9	3.0%

GLOSSARY/KEY TERMS

Land Acres: Total land area, in acres, of the assessment boundary (excludes water).

Non-Canopy Vegetation: Areas of grass and open space where tree canopy does not exist.

Possible Planting Area - Vegetation: Areas of grass and open space where tree canopy does not exist, and it is biophysically possible to plant trees.

Possible Planting Area - Impervious: Paved areas void of tree canopy, excluding buildings and roads, where it is biophysically possible to establish tree canopy. Examples include parking lots and sidewalks.

Possible Planting Area - Total: The combination of PPA Vegetation area and PPA Impervious area.

Shrub: Low-lying vegetation that was classified based on interpretation of shadows and texture in vegetation. Shrubs produce little to no shadow and appeared smooth in texture compared to tree canopy.

Soil/Dry Vegetation: Areas of bare soil and/or dried, dead vegetation.

Total Acres: Total area, in acres, of the assessment boundary.

Unsuitable Impervious: Areas of impervious surfaces that are not suitable for tree planting. These include buildings and roads.

Unsuitable Planting Area: Areas where it is not feasible to plant trees. Airports, ball fields, etc. were manually defined as unsuitable planting areas.

Unsuitable Soil: Areas of soil/dry vegetation considered unsuitable for tree planting. Irrigation and other modifiers may be required to keep a tree alive in these areas.

Unsuitable Vegetation: Areas of non-canopy vegetation that are not suitable for tree planting due to their land use.

Urban Tree Canopy (UTC): The "layer of leaves, branches and stems that cover the ground" (Raciti et al., 2006) when viewed from above; the metric used to quantify the extent, function, and value of Mercer Island's urban forest. Tree canopy was generally taller than 10-15 feet tall.

Water: Areas of open, surface water not including swimming pools.

FULL URBAN TREE CANOPY & CHANGE ANALYSIS RESULTS

URBAN TREE CANOPY BY STORMWATER BASINS

Table A3. | Urban tree canopy in Mercer Island by stormwater basins. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within each basin (dist.).

Stormwater Basins	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
1	72	2%	23	32%	1%	18	25%	2%
2a	8	0%	3	41%	0%	3	31%	0%
2b	8	0%	4	47%	0%	2	28%	0%
3b	137	3%	53	38%	3%	37	27%	3%
4	109	3%	48	44%	3%	26	24%	2%
5	58	1%	24	42%	1%	14	25%	1%
6	181	5%	74	41%	4%	47	26%	4%
7	113	3%	47	42%	2%	30	26%	3%
8	51	1%	20	40%	1%	15	30%	1%
9	45	1%	17	38%	1%	14	31%	1%
10	264	7%	100	38%	5%	75	28%	7%
11	10	0%	5	48%	0%	3	31%	0%
11	94	2%	37	40%	2%	32	34%	3%
12a	14	0%	6	44%	0%	5	38%	0%
12b	14	0%	5	36%	0%	6	39%	1%
12c	20	0%	7	35%	0%	9	45%	1%
13a	4	0%	1	26%	0%	2	48%	0%
13b	7	0%	3	39%	0%	2	35%	0%
13c	19	0%	7	38%	0%	6	32%	1%
14	56	1%	16	29%	1%	22	39%	2%
15	21	1%	6	30%	0%	8	37%	1%
16	32	1%	10	33%	1%	12	37%	1%
17	28	1%	9	34%	0%	11	40%	1%
18a	9	0%	3	37%	0%	3	33%	0%
18b	17	0%	4	25%	0%	7	42%	1%
18c	48	1%	17	36%	1%	18	38%	2%
19a	13	0%	7	53%	0%	4	30%	0%
19b	26	1%	11	44%	1%	9	34%	1%

URBAN TREE CANOPY BY STORMWATER BASINS (CONTINUED)

Stormwater Basins	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
19c	32	1%	16	51%	1%	11	33%	1%
20	30	1%	16	54%	1%	10	33%	1%
21	98	2%	40	41%	2%	29	30%	3%
22	87	2%	42	49%	2%	25	29%	2%
23	35	1%	22	64%	1%	8	23%	1%
24	11	0%	5	45%	0%	4	33%	0%
24a	50	1%	27	55%	1%	12	25%	1%
25a	31	1%	15	49%	1%	10	31%	1%
25b	31	1%	15	49%	1%	10	32%	1%
26	101	3%	52	52%	3%	26	26%	2%
27a	153	4%	99	65%	5%	29	19%	3%
27b	19	0%	10	52%	1%	6	31%	1%
28a	8	0%	3	35%	0%	3	36%	0%
28b	140	3%	81	58%	4%	33	23%	3%
29	117	3%	50	43%	3%	36	31%	3%
30a	18	0%	9	49%	0%	6	32%	1%
30b	21	1%	11	51%	1%	6	30%	1%
31a	13	0%	6	47%	0%	4	35%	0%
31b	17	0%	9	53%	0%	5	30%	0%
31c	44	1%	18	41%	1%	17	39%	2%
32a	39	1%	19	48%	1%	15	38%	1%
32b	181	5%	69	38%	4%	61	34%	6%
33a	27	1%	17	60%	1%	9	31%	1%
33b	30	1%	13	42%	1%	11	37%	1%
34	24	1%	11	46%	1%	8	33%	1%
35	71	2%	38	53%	2%	21	29%	2%
36	19	0%	11	57%	1%	5	28%	0%
37a	13	0%	8	66%	0%	3	21%	0%
37b	17	0%	9	51%	0%	5	30%	0%
37c	44	1%	22	51%	1%	13	30%	1%
38	132	3%	59	45%	3%	38	29%	3%

URBAN TREE CANOPY BY STORMWATER BASINS (CONTINUED)

Stormwater Basins	Land Area		Urban Tree Canopy			Possible Planting Area		
	Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
39a	63	2%	39	63%	2%	12	20%	1%
39b	20	0%	10	49%	1%	6	29%	1%
40a	26	1%	12	48%	1%	8	30%	1%
40b	49	1%	32	65%	2%	10	20%	1%
41	19	0%	14	73%	1%	3	18%	0%
42	154	4%	107	69%	6%	26	17%	2%
43a	17	0%	8	47%	0%	5	31%	0%
43b	16	0%	7	47%	0%	5	31%	0%
44b	26	1%	11	42%	1%	9	32%	1%
44c	16	0%	6	38%	0%	6	34%	0%
45a	15	0%	9	60%	0%	4	24%	0%
45b	49	1%	28	57%	1%	12	24%	1%
45d	9	0%	5	57%	0%	3	29%	0%
46a	59	1%	47	80%	2%	8	13%	1%
47	38	1%	24	62%	1%	8	22%	1%
48	29	1%	16	57%	1%	8	26%	1%
49a	11	0%	8	73%	0%	2	20%	0%
49b	26	1%	17	65%	1%	6	22%	1%
49c	15	0%	9	58%	0%	4	25%	0%
50a	10	0%	7	65%	0%	2	21%	0%
50b	60	1%	40	67%	2%	12	20%	1%
50c	19	0%	12	63%	1%	4	22%	0%
51a	19	0%	13	68%	1%	4	22%	0%
51b	8	0%	4	49%	0%	2	32%	0%
52	19	0%	10	55%	1%	5	27%	0%
53	33	1%	11	35%	1%	11	33%	1%
54	26	1%	8	32%	0%	8	33%	1%
i90	30	1%	9	28%	0%	7	23%	1%
Totals	**4,011**	**100%**	**1,915**	**48%**	**100%**	**1,117**	**28%**	**100%**

URBAN TREE CANOPY CHANGE BY STORMWATER BASINS

Table A4. | Urban tree canopy change in Mercer Island by stormwater basins. UTC results include acres and percent of area covered by UTC (%) in 2007 and 2017, and acres and percent change from 2007-2017.

Stormwater Basins	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
1	72	2%	18	25%	23	32%	4	6%
2a	8	0%	3	37%	3	41%	0	5%
2b	8	0%	3	38%	4	47%	1	9%
3b	137	3%	42	31%	53	38%	11	8%
4	109	3%	40	37%	48	44%	8	7%
5	58	1%	19	33%	24	42%	5	8%
6	181	5%	66	36%	74	41%	8	4%
7	113	3%	39	34%	47	42%	8	7%
8	51	1%	17	34%	20	40%	3	6%
9	45	1%	12	27%	17	38%	5	11%
10	264	7%	76	29%	100	38%	24	9%
11	10	0%	3	30%	5	48%	2	18%
11	94	2%	31	33%	37	40%	6	6%
12a	14	0%	5	34%	6	44%	1	10%
12b	14	0%	4	31%	5	36%	1	6%
12c	20	0%	6	29%	7	35%	1	6%
13a	4	0%	1	19%	1	26%	0	7%
13b	7	0%	2	25%	3	39%	1	15%
13c	19	0%	6	29%	7	38%	2	9%
14	56	1%	12	21%	16	29%	4	8%
15	21	1%	5	23%	6	30%	2	7%
16	32	1%	9	28%	10	33%	1	5%
17	28	1%	7	27%	9	34%	2	7%
18a	9	0%	3	32%	3	37%	0	5%
18b	17	0%	4	25%	4	25%	0	0%
18c	48	1%	15	31%	17	36%	2	5%
19a	13	0%	6	43%	7	53%	1	10%
19b	26	1%	9	35%	11	44%	2	9%
19c	32	1%	14	43%	16	51%	3	8%
20	30	1%	14	47%	16	54%	2	6%

URBAN TREE CANOPY CHANGE BY STORMWATER BASINS (CONTINUED)

Stormwater Basins	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
21	98	2%	33	34%	40	41%	7	7%
22	87	2%	35	41%	42	49%	7	8%
23	35	1%	20	57%	22	64%	2	7%
24	11	0%	4	33%	5	45%	1	12%
24a	50	1%	23	46%	27	55%	4	9%
25a	31	1%	12	39%	15	49%	3	10%
25b	31	1%	14	43%	15	49%	2	6%
26	101	3%	47	46%	52	52%	6	6%
27a	153	4%	92	60%	99	65%	7	5%
27b	19	0%	8	40%	10	52%	2	12%
28a	8	0%	2	26%	3	35%	1	8%
28b	140	3%	74	53%	81	58%	7	5%
29	117	3%	42	36%	50	43%	8	7%
30a	18	0%	7	37%	9	49%	2	12%
30b	21	1%	10	46%	11	51%	1	5%
31a	13	0%	5	41%	6	47%	1	6%
31b	17	0%	9	52%	9	53%	0	1%
31c	44	1%	17	38%	18	41%	1	3%
32a	39	1%	16	41%	19	48%	3	7%
32b	181	5%	58	32%	69	38%	11	6%
33a	27	1%	14	50%	17	60%	3	10%
33b	30	1%	11	35%	13	42%	2	7%
34	24	1%	9	38%	11	46%	2	8%
35	71	2%	32	46%	38	53%	5	8%
36	19	0%	9	49%	11	57%	2	8%
37a	13	0%	7	54%	8	66%	2	12%
37b	17	0%	7	42%	9	51%	2	9%
37c	44	1%	19	43%	22	51%	3	8%
38	132	3%	50	38%	59	45%	9	7%
39a	63	2%	37	59%	39	63%	2	4%

URBAN TREE CANOPY CHANGE BY STORMWATER BASINS (CONTINUED)

Stormwater Basins	Land Area		UTC 2007		UTC 2017		UTC Change	
	Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
39b	20	0%	9	45%	10	49%	1	3%
40a	26	1%	11	42%	12	48%	2	6%
40b	49	1%	30	62%	32	65%	1	3%
41	19	0%	14	71%	14	73%	0	2%
42	154	4%	98	64%	107	69%	8	5%
43a	17	0%	7	42%	8	47%	1	5%
43b	16	0%	7	47%	7	47%	-0	-0%
44b	26	1%	10	39%	11	42%	1	3%
44c	16	0%	6	36%	6	38%	0	2%
45a	15	0%	8	57%	9	60%	0	3%
45b	49	1%	25	52%	28	57%	2	5%
45d	9	0%	5	53%	5	57%	0	5%
46a	59	1%	45	76%	47	80%	3	5%
47	38	1%	22	58%	24	62%	2	4%
48	29	1%	15	53%	16	57%	1	4%
49a	11	0%	8	68%	8	73%	1	5%
49b	26	1%	15	59%	17	65%	1	6%
49c	15	0%	8	51%	9	58%	1	7%
50a	10	0%	6	55%	7	65%	1	10%
50b	60	1%	36	60%	40	67%	4	7%
50c	19	0%	11	56%	12	63%	1	6%
51a	19	0%	12	65%	13	68%	1	3%
51b	8	0%	3	44%	4	49%	0	5%
52	19	0%	9	47%	10	55%	2	8%
53	33	1%	9	29%	11	35%	2	6%
54	26	1%	8	33%	8	32%	-0	-1%
i90	30	1%	7	22%	9	28%	2	6%
Totals	**4,011**	**100%**	**1,656**	**41%**	**1,915**	**48%**	**259**	**6%**

URBAN TREE CANOPY BY PARKS AND OPEN SPACES

Table A5. | Urban tree canopy in Mercer Island by parks and open spaces. UTC and PPA results include acres, percent of area covered by UTC or PPA (%), and distribution of the city's total UTC or PPA within each park (dist.).

Parks and Open Spaces	Type	Land Area		Urban Tree Canopy			Possible Planting Area		
		Acres	Dist.	Acres	%	Dist.	Acres	%	Dist.
72ND AVE SE LANDING	PARK	0.21	0%	0.14	67%	0%	0.07	33%	0%
74TH AVE SE LANDING	PARK	0.06	0%	0.04	67%	0%	0.02	33%	0%
77TH AVE SE LANDING	PARK	0.29	0%	0.22	76%	0%	0.06	21%	0%
AUBREY DAVIS PARK	PARK	82.18	18%	39.19	48%	11%	24	29%	46%
BICENTENNIAL PARK	PARK	0.16	0%	0.1	63%	0%	0.05	31%	0%
CALKINS LANDING	PARK	0.45	0%	0.13	29%	0%	0.13	29%	0%
CAYHILL OPEN SPACE	OPEN SPACE	1.07	0%	0.99	93%	0%	0.08	7%	0%
CLARKE BEACH PARK	PARK	0.8	0%	0.24	30%	0%	0.14	18%	0%
CLARKE BEACH PARK	OPEN SPACE	6.94	2%	6.27	90%	2%	0.67	10%	1%
CLARKE BEACH PARK	PARK	1.19	0%	0.79	66%	0%	0.4	34%	1%
CLISE PARK	OPEN SPACE	1.65	0%	1.64	99%	0%	0.02	1%	0%
DEANES CHILDRENS PARK	PARK	3.93	1%	3.75	95%	1%	0.17	4%	0%
ELLIS POND	OPEN SPACE	3.94	1%	3.86	98%	1%	0.07	2%	0%
ENGSTROM OPEN SPACE	OPEN SPACE	8.53	2%	8.48	99%	2%	0.05	1%	0%
FIRST HILL PARK	PARK	0.68	0%	0.63	93%	0%	0.05	7%	0%
FOREST LANDING	PARK	0.04	0%	0	0%	0%	0.03	75%	0%
FRANKLIN LANDING	PARK	0.02	0%	0.01	50%	0%	0.01	50%	0%
FRUITLAND LANDING	PARK	0.14	0%	0.07	50%	0%	0.02	14%	0%
GALLAGHER HILL OPEN SPACE	OPEN SPACE	11.44	2%	11.25	98%	3%	0.19	2%	0%
GARFIELD LANDING	PARK	0.44	0%	0.39	89%	0%	0.05	11%	0%
GROVELAND BEACH PARK	OPEN SPACE	1.84	0%	1.71	93%	0%	0.13	7%	0%
GROVELAND BEACH PARK	PARK	0.46	0%	0.32	70%	0%	0.08	17%	0%
GROVELAND BEACH PARK	PARK	0.2	0%	0.07	35%	0%	0.13	65%	0%
GROVELAND BEACH PARK	PARK	0.49	0%	0.21	43%	0%	0.26	53%	0%
HOLLERBACH OPEN SPACE	OPEN SPACE	5.22	1%	5.22	100%	2%	0	0%	0%
HOMESTEAD PARK	PARK	7.81	2%	1.71	22%	0%	1.1	14%	2%
HOMESTEAD PARK	OPEN SPACE	3.24	1%	3.12	96%	1%	0.11	3%	0%
ISLAND CREST PARK	OPEN SPACE	27.46	6%	27.13	99%	8%	0.3	1%	1%
ISLAND CREST PARK	PARK	7.59	2%	1.36	18%	0%	0.64	8%	1%
LINCOLN LANDING	PARK	0.23	0%	0.19	83%	0%	0.04	17%	0%
LUTHER BURBANK PARK	PARK	34.67	8%	10.57	30%	3%	10.61	31%	20%
LUTHER BURBANK PARK	OPEN SPACE	12.05	3%	8.57	71%	2%	3.38	28%	6%
LUTHER BURBANK PARK	OPEN SPACE	4.27	1%	3.99	93%	1%	0.28	7%	1%
LUTHER BURBANK PARK	OPEN SPACE	2.58	1%	2.24	87%	1%	0.34	13%	1%

URBAN TREE CANOPY BY PARKS AND OPEN SPACES (CONTINUED)

Parks and Open Spaces	Type	Land Area		Urban Tree Canopy			Possible Planting Area		
		Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
MERCERDALE HILLSIDE	**OPEN SPACE**	24.79	5%	24.34	98%	7%	0.43	2%	1%
MERCERDALE PARK	**PARK**	5.73	1%	1.36	24%	0%	0.66	12%	1%
MILLER LANDING	**PARK**	0.24	0%	0.18	75%	0%	0.05	21%	0%
NORTH MERCERDALE HILLSIDE PARK	**OPEN SPACE**	6.19	1%	6.17	100%	2%	0.03	0%	0%
PARKWOOD RIDGE OPEN SPACE	**OPEN SPACE**	3.8	1%	3.8	100%	1%	0	0%	0%
PIONEER PARK	**OPEN SPACE**	113.62	25%	111.36	98%	32%	2.24	2%	4%
PROCTOR LANDING	**PARK**	0.4	0%	0.25	63%	0%	0.12	30%	0%
ROANOKE LANDING	**PARK**	0.14	0%	0	0%	0%	0.09	64%	0%
ROANOKE PARK	**PARK**	0.99	0%	0.56	57%	0%	0.35	35%	1%
ROTARY PARK	**PARK**	3.75	1%	1.83	49%	1%	0.7	19%	1%
SALEM WOODS OPEN SPACE	**OPEN SPACE**	0.32	0%	0.31	97%	0%	0.02	6%	0%
SE 20TH ST LANDING	**PARK**	0.13	0%	0.12	92%	0%	0.01	8%	0%
SE 36TH ST LANDING	**PARK**	0.08	0%	0.04	50%	0%	0.04	50%	0%
SE 40TH ST LANDING	**PARK**	0.05	0%	0.03	60%	0%	0.02	40%	0%
SE 45TH ST LANDING	**PARK**	0.12	0%	0.11	92%	0%	0.01	8%	0%
SE 47TH ST OPEN SPACE	**OPEN SPACE**	1.29	0%	1.2	93%	0%	0.09	7%	0%
SE 50TH PL OPEN SPACE	**OPEN SPACE**	1.79	0%	1.79	100%	1%	0	0%	0%
SE 53RD OPEN SPACE	**OPEN SPACE**	19.96	4%	19.14	96%	6%	0.81	4%	2%
SE 53RD OPEN SPACE	**OPEN SPACE**	0.45	0%	0.45	100%	0%	0	0%	0%
SE 53RD OPEN SPACE	**OPEN SPACE**	3.58	1%	3.58	100%	1%	0	0%	0%
SE 56TH ST LANDING	**PARK**	0.31	0%	0.3	97%	0%	0.01	3%	0%
SE 72ND ST LANDING	**PARK**	0.12	0%	0.07	58%	0%	0.01	8%	0%
SEASHORE LANDING	**PARK**	0.04	0%	0.03	75%	0%	0.01	25%	0%
SECRET PARK	**PARK**	0.18	0%	0.12	67%	0%	0.06	33%	0%
SECRET PARK	**OPEN SPACE**	0.6	0%	0.58	97%	0%	0.02	3%	0%
SLATER PARK	**PARK**	0.59	0%	0.38	64%	0%	0.2	34%	0%
SOUTH MERCER PLAYFIELDS	**PARK**	16.14	4%	2.63	16%	1%	1.96	12%	4%
SOUTH POINT LANDING	**PARK**	0.06	0%	0.02	33%	0%	0.03	50%	0%
UPPER LUTHER BURBANK PARK	**OPEN SPACE**	18.04	4%	17.86	99%	5%	0.18	1%	0%
WILDWOOD PARK	**PARK**	1.05	0%	0.38	36%	0%	0.43	41%	1%
WILDWOOD PARK	**OPEN SPACE**	1.78	0%	1.73	97%	1%	0.05	3%	0%
Totals	**PARKS**	**172**	**38%**	**69**	**40%**	**20%**	**43**	**25%**	**82%**
	OPEN SPACES	**286**	**62%**	**277**	**97%**	**80%**	**9**	**3%**	**18%**
	COMBINED	**459**	**100%**	**345**	**75%**	**100%**	**52**	**11%**	**100%**

URBAN TREE CANOPY CHANGE BY PARKS AND OPEN SPACES

Table A6. | Urban tree canopy change in Mercer Island by parks and open spaces. UTC results include acres and percent of area covered by UTC (%) in 2007 and 2017, and acres and percent change from 2007-2017.

Parks & Open Spaces	Type	Land Area		UTC 2007		UTC 2017		UTC Change	
		Acres	*Dist.*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
72ND AVE SE LANDING	**PARK**	0.21	0%	0.14	65%	0.14	67%	0.00	1%
74TH AVE SE LANDING	**PARK**	0.06	0%	0.04	60%	0.04	67%	0.00	6%
77TH AVE SE LANDING	**PARK**	0.29	0%	0.15	52%	0.22	76%	0.07	23%
AUBREY DAVIS PARK	**PARK**	82.18	18%	30.15	37%	39.19	48%	9.04	11%
BICENTENNIAL PARK	**PARK**	0.16	0%	0.11	68%	0.1	63%	-0.01	-6%
CALKINS LANDING	**PARK**	0.45	0%	0.25	56%	0.13	29%	-0.12	-27%
CAYHILL OPEN SPACE	**OPEN SPACE**	1.07	0%	1.02	96%	0.99	93%	-0.03	-3%
CLARKE BEACH PARK	**PARK**	0.8	0%	0.19	24%	0.24	30%	0.05	6%
CLARKE BEACH PARK	**OPEN SPACE**	6.94	2%	5.82	84%	6.27	90%	0.45	6%
CLARKE BEACH PARK	**PARK**	1.19	0%	0.66	56%	0.79	66%	0.13	11%
CLISE PARK	**OPEN SPACE**	1.65	0%	1.60	97%	1.64	99%	0.04	3%
DEANES CHILDRENS PARK	**PARK**	3.93	1%	3.43	87%	3.75	95%	0.32	8%
ELLIS POND	**OPEN SPACE**	3.94	1%	3.56	90%	3.86	98%	0.30	8%
ENGSTROM OPEN SPACE	**OPEN SPACE**	8.53	2%	8.13	95%	8.48	99%	0.35	4%
FIRST HILL PARK	**PARK**	0.68	0%	0.47	69%	0.63	93%	0.16	23%
FOREST LANDING	**PARK**	0.04	0%	0.03	67%	0	0%	-0.03	-67%
FRANKLIN LANDING	**PARK**	0.02	0%	0.01	61%	0.01	50%	-0.00	-11%
FRUITLAND LANDING	**PARK**	0.14	0%	0.03	19%	0.07	50%	0.04	31%
GALLAGHER HILL OPEN SPACE	**OPEN SPACE**	11.44	2%	10.71	94%	11.25	98%	0.54	5%
GARFIELD LANDING	**PARK**	0.44	0%	0.38	87%	0.39	89%	0.01	1%
GROVELAND BEACH PARK	**OPEN SPACE**	1.84	0%	1.63	89%	1.71	93%	0.08	4%
GROVELAND BEACH PARK	**PARK**	0.46	0%	0.08	17%	0.32	70%	0.24	53%
GROVELAND BEACH PARK	**PARK**	0.2	0%	0.05	26%	0.07	35%	0.02	9%
GROVELAND BEACH PARK	**PARK**	0.49	0%	0.15	30%	0.21	43%	0.06	13%
HOLLERBACH OPEN SPACE	**OPEN SPACE**	5.22	1%	4.86	93%	5.22	100%	0.36	7%
HOMESTEAD PARK	**PARK**	7.81	2%	1.20	15%	1.71	22%	0.51	6%
HOMESTEAD PARK	**OPEN SPACE**	3.24	1%	3.16	98%	3.12	96%	-0.04	-1%
ISLAND CREST PARK	**OPEN SPACE**	27.46	6%	25.58	93%	27.13	99%	1.55	6%
ISLAND CREST PARK	**PARK**	7.59	2%	1.12	15%	1.36	18%	0.24	3%
LINCOLN LANDING	**PARK**	0.23	0%	0.12	53%	0.19	83%	0.07	29%
LUTHER BURBANK PARK	**PARK**	34.67	8%	8.81	25%	10.57	30%	1.76	5%
LUTHER BURBANK PARK	**OPEN SPACE**	12.05	3%	7.72	64%	8.57	71%	0.85	7%
LUTHER BURBANK PARK	**OPEN SPACE**	4.27	1%	3.49	82%	3.99	93%	0.50	12%
LUTHER BURBANK PARK	**OPEN SPACE**	2.58	1%	1.65	64%	2.24	87%	0.59	23%

URBAN TREE CANOPY CHANGE BY PARKS AND OPEN SPACES (CONTINUED)

Parks and Open Spaces	Type	Land Area		Urban Tree Canopy			Possible Planting Area		
		Acres	*Dist.*	*Acres*	*%*	*Dist.*	*Acres*	*%*	*Dist.*
MERCERDALE HILLSIDE	**OPEN SPACE**	24.79	5%	23.13	93%	24.34	98%	1.21	5%
MERCERDALE PARK	**PARK**	5.73	1%	0.82	14%	1.36	24%	0.54	9%
MILLER LANDING	**PARK**	0.24	0%	0.12	50%	0.18	75%	0.06	25%
NORTH MERCERDALE HILLSIDE PARK	**OPEN SPACE**	6.19	1%	5.76	93%	6.17	100%	0.41	7%
PARKWOOD RIDGE OPEN SPACE	**OPEN SPACE**	3.8	1%	3.64	96%	3.8	100%	0.16	4%
PIONEER PARK	**OPEN SPACE**	113.62	25%	107.96	95%	111.36	98%	3.40	3%
PROCTOR LANDING	**PARK**	0.4	0%	0.20	50%	0.25	63%	0.05	12%
ROANOKE LANDING	**PARK**	0.14	0%	0.06	40%	0	0%	-0.06	-40%
ROANOKE PARK	**PARK**	0.99	0%	0.55	55%	0.56	57%	0.01	1%
ROTARY PARK	**PARK**	3.75	1%	1.53	41%	1.83	49%	0.30	8%
SALEM WOODS OPEN SPACE	**OPEN SPACE**	0.32	0%	0.27	83%	0.31	97%	0.04	14%
SE 20TH ST LANDING	**PARK**	0.13	0%	0.07	51%	0.12	92%	0.05	41%
SE 36TH ST LANDING	**PARK**	0.08	0%	0.05	66%	0.04	50%	-0.01	-16%
SE 40TH ST LANDING	**PARK**	0.05	0%	0.03	56%	0.03	60%	0.00	4%
SE 45TH ST LANDING	**PARK**	0.12	0%	0.08	68%	0.11	92%	0.03	24%
SE 47TH ST OPEN SPACE	**OPEN SPACE**	1.29	0%	1.18	91%	1.2	93%	0.02	2%
SE 50TH PL OPEN SPACE	**OPEN SPACE**	1.79	0%	1.63	91%	1.79	100%	0.16	9%
SE 53RD OPEN SPACE	**OPEN SPACE**	19.96	4%	18.13	91%	19.14	96%	1.01	5%
SE 53RD OPEN SPACE	**OPEN SPACE**	0.45	0%	0.43	96%	0.45	100%	0.02	4%
SE 53RD OPEN SPACE	**OPEN SPACE**	3.58	1%	3.47	97%	3.58	100%	0.11	3%
SE 56TH ST LANDING	**PARK**	0.31	0%	0.22	72%	0.3	97%	0.08	24%
SE 72ND ST LANDING	**PARK**	0.12	0%	0.03	23%	0.07	58%	0.04	35%
SEASHORE LANDING	**PARK**	0.04	0%	0.03	81%	0.03	75%	-0.00	-6%
SECRET PARK	**PARK**	0.18	0%	0.11	58%	0.12	67%	0.01	8%
SECRET PARK	**OPEN SPACE**	0.6	0%	0.52	86%	0.58	97%	0.06	11%
SLATER PARK	**PARK**	0.59	0%	0.27	45%	0.38	64%	0.11	19%
SOUTH MERCER PLAYFIELDS	**PARK**	16.14	4%	2.26	14%	2.63	16%	0.37	2%
SOUTH POINT LANDING	**PARK**	0.06	0%	0.04	61%	0.02	33%	-0.02	-28%
UPPER LUTHER BURBANK PARK	**OPEN SPACE**	18.04	4%	16.93	94%	17.86	99%	0.93	5%
WILDWOOD PARK	**PARK**	1.05	0%	0.14	14%	0.38	36%	0.24	23%
WILDWOOD PARK	**OPEN SPACE**	1.78	0%	1.61	91%	1.73	97%	0.12	7%
Totals	**Parks**	**172**	**38%**	**54**	**31%**	**69**	**40%**	**14**	**8%**
	Open Spaces	**286**	**62%**	**264**	**92%**	**277**	**97%**	**13**	**5%**
	Combined	**459**	**100%**	**318**	**69%**	**345**	**75%**	**28**	**6%**

SEPTEMBER | 2018

URBAN TREE CANOPY

ASSESSMENT

MERCER ISLAND, WASHINGTON

King Conservation District

plan-it GEO

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