City of Bainbridge Island

TREE RESOURCE CODE & POLICY RECOMMENDATIONS

December 2018

City of Bainbridge Island

Tree Resource Code and Policy Revision Recommendations

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Community specific,
resource specific planning

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1. EXECUTIVE SUMMARY

Trees in communities amplify human experience and wellbeing. Their provision of valuable economic and environmental benefits as natural resources is well documented.[1] Even so, urban and community tree canopy cover is decreasing across the nation. Urban tree cover in the U.S. dropped by 0.2 percent between 2000 and 2018 while impervious cover increased 2.8 percent.[2] This reduction of community tree canopy cover occurred concurrently while many tree protection ordinances, canopy cover goals and land conversion policies across the country attempted to arrest or reduce canopy decline. For cities and communities interested in reducing the decline of their community forests or increasing urban canopy cover, they must work to enact enforceable and comprehensible tree resource protection codes within their community.

Peninsula Urban Forestry LLC and Katy Bigelow, Arborist LLC (the "Consultants") were given authorization to review tree related parts of the Bainbridge Island Municipal Codes (16.18, 18.15 and the Landmark Tree Ordinance) and recommend changes based on current trends in tree protection ordinances, best-available-science, best-management-practices and reasonability with respect Bainbridge Island as a unique community governing its mosaic of community forest resources.

Through this review process and in preparation for policy development, the Consultants completed multiple metadata analyses and research subprojects. The City provided the Consultants with a vegetation classification of Bainbridge Island completed by University of Washington in 2017, using 2015 aerial natural imagery, near infrared imagery and lidar. This data was used to analyze current canopy composition relevant to zones and parcels throughout community, and to compare current canopy cover with the 2006 Community Forestry Management Plan canopy cover goals. We also completed comprehensive reviews of arboricultural and urban forestry literature, best-management-practices and adopted tree protection code in cities within Washington and across the nation.

Following our research above, we began reworking, revising, and amending the tree related code from a variety of Bainbridge Island Municipal Code chapters, including:

- 16.18 Forest stewardship
- 18.15 Landscaping, screening, and tree retention, protection and replacement.
- 16.32 Landmark Tree Ordinance
- 3.39 Tree Fund

Our policy recommendations include overhauling this current layout to create a single Tree Resource Protection subchapter which would include canopy cover and tree retention requirements for developed and developing areas, a landmark tree identification process and honed forest stewardship and land conversion processes.

[1] Nowak, D.J., Greenfield, E.J., 2018. U. S. urban forest statistics, values and projections. J. For. 116, 164–177.

[2] Nowak, David; Greenfield, Eric. November 2017. Declining urban and community tree cover in the United States. USDA Forest Service, Northern Research Station, Syracuse, NY; Urban Forestry & Urban Greening 32 (2018)32-55

Appendix A of this document outlines our recommended repeals, revisions and amendments to current code. Appendix B-D are comprehensive revisions of 16.18 and of portions of 18.15. Two new tree evaluation related forms were created and are located in Appendix F and G (the Dead and Emergency Tree Checklist, and the Tree Resource Functional Assessment). Appendix H is our literature review bibliography.

Bainbridge Island's historical context, its geographical location within the Puget Sound and its community makeup are strong reasons to adopt and enforce comprehensive tree protection policies. By aligning tree resource policies with other natural resource policies, the City can impact the rate of decline and actively work to increase tree canopy cover across the Island. Through our policy and code recommendations, tree resource protection and canopy increase are realistic and attainable goals.

1.1 ASSIGNMENT

For this project, the Consultants were initially tasked with reviewing Ordinance 2018-19 (Tree Board Review of BIMC 16.18 & BIMC 18.15), including Exhibit A, and Ordinance 2018-25 and subsequently Ordinance 2018-42 (Landmark Tree Ordinance).

As city policy and the codes they guide are inherently intertwined, reviewing code without reviewing policy would have resulted in a unactionable product. In addition to our code review policies, the Consultants reviewed current tree protection polices and development policies as they relate to trees. As such, we partially reviewed BIMC 18.15 (Landscaping, roadside buffers and tree retention), generally limited to its discussion within Ordinance 2018-19. Expanding further than Ordinance 2018-19 revised BIMC 18.15, the Consultants updated language in 18.15 to reflect current best-management-practices. The Consultants additionally reviewed BIMC 3.39 (Tree Fund). Our revision of all the above codes are provided as a single consolidated chapter, excluding BIMC 18.15.

1.2 BACKGROUND AND METHODOLOGY

On August 9, 2018, the City of Bainbridge Island (COBI) Planning Commission ("Planning Commission") forwarded to City Council the current draft of Ordinance 2018-19 including Chapter 16.18 as "Exhibit A." These documents contained recent and substantial changes to earlier drafts of Chapter 16.18 including integration of the "Landmark Tree Ordinance" provisions of June 26, 2018 subsequently recommended to be replaced by Ordinance 2018-19. There were also significant changes to Chapter 18 in this same Ordinance. The current adoption of Ordinance 2018-19 both repealed and replaced BIMC 16.18, implemented the 2018-25 Landmark Tree Ordinance as well as revised substantial tree related codes in BIMC 18.15.

A group of arboricultural and urban forest specialists including both locally consulting and working Board Certified Master Arborists, an environmental planner, a community forester and ecologist identified the revision process as a critical opportunity for COBI to use diligence by embarking on a City Council approved Consultant review of BIMC 16.18 and Ordinance 2018-19.

We believe the implementation of urban, community, and residential forest planning must be backed by a rigorous technical review like the diligence applied to forming code related to other natural resources such as Shorelines and other Critical Areas. Our goal was to offer a document with a high level of code operation (field

effectiveness) necessary to achieve real and functioning tree related ordinance goals desired by the City Council and the Island's community.

Our technical review used clear visioning, situational assessments, literature review, historical code review and best available science to inform a holistic single chapter of Tree Resource Code including updated aspects of BIMC 16.18, BIMC 18.15 & the 2018-25 Landmark Tree Ordinance, and to provide recommendations for further honing of BIMC 18.15 and other tree related codes.

Prior to the Consultants being hired, in 2016 through 2018 the Bainbridge Island Tree Committee reviewed municipal codes related to tree protection from cities in Washington State. The Consultants increased this review to include a national perspective of current tree protection codes. The Consultants believe a wide-ranging comprehensive review is required to identify alternatives and protocols for tree protection, preservation and retention. As such, two separate literature reviews were included in the scope of this project:

- Current nationwide municipal code related to tree protection.
- Tree protection literature found in published peer-reviewed publications, published manuals, books, and best management practices.

During the writing of this document, the Consultant team identified guiding principles for our methodology. These principles were focused through group discussions, review of historical public input related to code change decisions and meetings with City staff. These focused the Consultant's decision-making process and collaborations in order to arrive at synchronized recommendations.

Table 1: Consultant's Guiding Principles

1) Accessible, enforceable, and executable urban forest planning secures and amplifies the benefits received from a community forest.
2) Policies governing urban & community forest should act correspondingly with policies of other natural resources.
3) The function by which urban & community forests provide communities with tree resources is complex, as such, their quantification, valuation and interpretation must be thoroughly defined in policy.
4) Trees provide benefits in a non-linear fashion and in site-specific ways; each tree has their own level of functional capacity.
5) Clear, defined, and navigable policy language is critical for application and enforceability.

2. BENEFITS OF TREES AS RESOURCES

Trees improve the livability of cities for a myriad of reasons. The benefits of trees are well documented and were previously acknowledged in the 2006 City of Bainbridge Island's Community Forestry Management Plan (CFMP) as well as in many technical and socio-economic papers released world-wide since 2006.

However, the benefits that trees provide to a single community are variable depending on a variety of environmental, social and zoning factors. Furthermore, while trees provide many important benefits, not all trees provide the same benefits. It follows that not all land designations or zoning designations should intend to support or can support the same function or value from one tree resource to another. This understanding is pivotal in creating meaningful biological evaluations and executing natural resource planning paradigms.

Tree resource benefits within urban and community forests can be summarized into four broad and sometimes overlapping categories shown in Table 2, below. These groups won't be described at great length in this document but are used simply as a primer into tree resource benefits.

Table 2: Benefits of tree resources within a community forest.

• **Ecosystem services**
• **Human services**
• **Economic services**
• **Social services**

For example, some trees have historical context but support very limited ecosystem services, while other non-historically sensitive trees could potentially support a high level of ecosystem services. Equally, street trees in business districts increase user spending and economic vibrancy but lack any functional carbon sequestration benefits, and often in our region, don't provide any substantial stormwater attenuation. This resource variability is important to understand when writing efficient code that's purpose is managing such resources.

We've introduced a dynamic new concept into the recommended code revisions to better assist professionals and City staff to evaluate and manage tree resource variables:

1) Tree Resource Functional Assessment
    a) The TRFA is a tree resource classification tool to be used by Certified Arborists or Tree Risk Assessment Qualification (TRAQ) endorsed allied professionals to better assign the correct function of a tree or tree stand within its location.
    b) The TRFA allows us to measure Tree Benefit Capacity in both individual trees and tree stands.
        i) The Tree Benefit Capacity is the capacity for trees to procure benefits, whether those benefits are environmental, economic or social.
        ii) Calculating Tree Benefit Capacity acknowledges that trees do not procure benefits in a linear fashion and should enable professionals to better evaluate the function of individual trees and tree stands.

3. METADATA CANOPY ANALYSIS

The 2006 Bainbridge Island Community Forest Management Plan (CMFP) established a policy to "protect, restore and improve existing trees and vegetation" which acknowledges trees as valuable assets or resources to the community. Part of this policy is to, "Maintain or achieve optimum tree canopy cover level in all zones of the Island." The established canopy cover goals in the CMFP are seen in Table 3: 2006 CFMP Canopy Cover Goals per Zoning Designations. Table 4 shows the current Island zoning designations and definitions.

In order to track progress on the 2006 policy, we compared the canopy cover goals from 2006 with updated 2015 data. This process started by having an accurate assessment of the current canopy based on land classification by zoning. This assessment was performed by Jeffrey J. Richardson of the University of Washington in 2017 and provided to us by the City of Bainbridge Island. The Consultant's performed further geospatial analyses on this data utilizing COBI's zoning and parcel layers. This data resulted in an accurate comparison of canopy cover goals between the two years.

Data sources used in the analysis and methods to recreate the analysis are located in Appendix I: Metadata Canopy Methods. The results of this process are in Table 5. The zoning designation groups used in this analysis are based on the 2006 Bainbridge Island Community Forest Management Plan, with the exception of "Other" which includes zoning designations not found in the original plan and is set to 25% given that it is primarily industrial.

Table 3: 2006 CFMP Canopy Cover Goals per Zoning Designations

Zone	GIS Zoning Designation	Cover Goals
Low Density Residential	R-0.4	70%
	R-1	
	R-2	
High Density Residential	R-2.9	50%
	R-3.5	
	R-4.3	
	R-5	
	R-6	
	R-8	
	R-14	
Mixed Use Town Center/ High School Road	MAD	35%
	ERICK	
	GATE	
	HS - 1	
	HS - 2	
Winslow Core	FTD	35%
	CORE	
Neighborhood Service Centers	NC	35%
	NC – R-12	
Other	B/I	25%
	WDI	

Table 4: Current City of Bainbridge Island Zoning Designations and Definitions

District Type	Abbreviation	District Name
Residential	R-0.4	Residential 0.4 – One unit per 2.5 acres (100,000 sq. ft.)
	R-1	Residential 1 – One unit per acre (40,000 sq. ft.)
	R-2	Residential 2 – Two units per acre (20,000 sq. ft.)
	R-2.9	Residential 2.9 – Two and nine-tenths units per acre (15,000 sq. ft.)
	R-3.5	Residential 3.5 – Three and one-half units per acre (12,500 sq. ft.)
	R-4.3	Residential 4.3 – Four and three-tenths units per acre (10,000 sq. ft.)
	R-5	Residential 5 – Five units per acre (8,500 sq. ft.)
	R-6	Residential 6 – Six units per acre (7,260 sq. ft.)
	R-8	Residential 8 – Eight units per acre (5,400 sq. ft.)
	R-14	Residential 14 – 14 units per acre (3,100 sq. ft.)
Mixed Use Town Center	CC	Central Core Overlay
	MA	Madison Avenue Overlay
	EA	Ericksen Avenue Overlay
	Gate	Gateway Overlay
	Ferry	Ferry Terminal Overlay
Other	HS - 1	High School Road District I
	HS - 2	High School Road District II
	NC	Neighborhood Center
	NC – R-12	Neighborhood Center
	B/I	Business/Industrial
	WD-I	Water-Dependent Industrial
	FWHO	Fort Ward Historic Overlay District

3.1 CANOPY ANALYSIS RESULTS

The results of the canopy assessment generated from the Consultants are displayed below. Table 5 shows the zones grouped as they were in the CFMP, and Table 6 shows the zones independently according to current zoning districts. The findings show that overall, Bainbridge Island is not meeting canopy cover goals set in 2006. This is most true of High Density Residential, with a -16% difference between existing cover and cover goal and is closely followed by Neighborhood Service Centers with -15%.

The forested canopy layer created in this analysis could be used by regulators in the day to day management of development on Bainbridge Island. Additionally, the GIS layer could be incorporated into the Critical Area Maps on Bainbridge's website, allowing homeowners to identify their canopy current coverage and make decisions on their land. Being able to quickly view the approximate canopy cover at the parcel level can allow both regulators and property owners to make more informed decisions.

Table 5: City of Bainbridge Island canopy cover assessment as compared to canopy cover goals established in the 2006 Bainbridge Island Community Forest Management Plan

Zoning Designation Groups	2015 Canopy Cover	2006 Canopy Cover Goals	Difference	Min/Max Parcel Cover
Low Density Residential	65%	70%	-5%	0% / 100%
High Density Residential	34%	50%	-16%	0% / 88%
Neighborhood Service Centers	20%	35%	-15%	0% / 75%
Mixed Use Town Center/ High School Road	34%	35%	-1%	2% / 85%
Winslow Core	30%	35%	-5%	4% / 97%
All others (WDI, B/I)	40%	25%	15%	1% / 92%

Table 6: 2015 average canopy cover proportion of each zoning designation on Bainbridge Island

Zoning Designation	# of Parcels in Zone	2015 Canopy Cover
B/I	58	38%
CORE	182	31%
ERICK	74	36%
FTD	17	30%
GATE	13	52%
HS-1	27	30%
HS-2	6	15%
MAD	63	35%
NSC	51	22%
NSC-R-12	5	19%
R-0.4	2563	74%
R-1	2509	65%
R-14	80	11%
R-2	3904	56%
R-2.9	574	44%
R-3.5	489	42%
R-4.3	476	45%
R-5	9	56%
R-6	72	4%
R-8	119	37%
WDI	8	43%

Limitations

There exist some inaccuracies resulting from known error within the land classification, as well as potential errors in the parcel and zoning data. The land classification had a ~90% accuracy, which is normal given current technology. During analysis, very small "artifact" features within the final layer were created as a byproduct from the union of the zoning layer and parcel layer. These features can influence the analysis of the results by acting as an individual "parcel", which then contributes a proportion of forested canopy to the overall average for the zone. This can artificially increase or decrease the average forested proportion, especially in zones with very few parcels. To reduce this influence, the Consultant's removed any parcel under 100 square feet in area, thereby removing most of the artifact features. Approximately 500 features of 11806, or 0.04% of the dataset, were removed in this way.

4. LITERATURE REVIEW FINDINGS

Finding 1: Development is the leading cause of tree removal and tree canopy decline on Bainbridge Island. Conversely the number of trees removed by owners of single-family home properties due to tree decline, disease, death or homeowners' desires are relatively minimal. As of January 1, 2018, new development standards (ARPA) were adopted limiting the scope of development limits on single family home development and redeveloping lots.

When developing or redeveloping, the ARPA standards require property owners to sustain a majority of a property as undisturbed soils and vegetation. Nonetheless, there still remains a permanent net-loss of tree canopy cover and tree resources on the Island after development, most significantly noticed in high density development zones.

- Tree resource loss can be either temporary or permanent. Removal of declining, dead, and untreatably diseased trees or trees with low tree benefit capacity is a temporary loss. The limited functions provided by these trees will be regained in time, potentially without the added competition of new trees from reinstallation/mitigation.
- Permanent loss of tree resources occurs during land conversion. In this process, tree resources are removed and permanently lost form a site. Green infrastructure, to include street trees, low-impact-development, green roofs, etc. can attenuate the impact of this tree resource loss but fall short of replacing the function of large or mature trees growing on a specific site.
- Off-site mitigation and in-lieu fees, with the assistance of low-impact-development and green infrastructure, are the most widely accepted methods of recovering permanently lost tree resources due to development within a community.

Finding 2: Nearly all of our literature review including published articles and case studies of other municipalities noted the unequivocal importance of a single-point of contact for community members, landowners, planners and decision makers in matters of trees. A municipal arborist or community forester can communicate with the tree workers who evaluate and manage trees, increase enforceability of tree protection codes, can review or perform risk assessments in a timely fashion while avoiding risk for the City and can review development plans and tree protection plans to validate the removal or protection of trees.

- It is only through a combination of a City municipal arborist or community forester, an active tree board, open communication channels between city departments and effective and enforceable tree policies that trees can be properly managed and canopy coverage goals achieved.
- The 2006 Community Forest Management Plan also recommended hiring a municipal arborist staff member.

Finding 3: Many articles we reviewed found that large lot-size zoning leads to greater sprawl but can also lead to increased forest cover[3]. Conversely, high-density urban development's lead to reduced sprawl but very low levels of canopy cover over individual parcels. The resulting tree resource benefits of canopy preservation efforts in high density areas (green infrastructure, street trees, etc.) were minor in comparison to the effect of municipal land acquisition for forest conservation and forest rejuvenation/restoration. Large-scale, municipal forest acquisition, attenuation of many forested pocket parks, and other accessible green spaces which can sustain trees, can achieve reduction of lost tree resources in high density zoned areas more effectively than rigid and unachievable canopy coverage goals in these areas.

- In other cities tree resources have the opportunity to be conserved through off-site mitigation in nearby pocket-parks, in protected green space, designated open spaces or through funding a Tree Fund.
- When permanent tree resource loss occurs, a valuation of those resources should be invested into the tree bank. The tree bank can then be used to fund the Community Forestry Department, and acquire municipal land for reforestation, forest conservation, green space and park accessibility, and forest rejuvenation.
- The Consultant's 2015 metadata canopy analysis showed that High Density Residential areas fall 15% short of the policy goal in the 2006 Community Forest Management Plan.

Finding 4: Currently, nationwide community forest management trends are focusing on canopy cover measurements and less on tree diameter measurements in the valuation of trees. A benefit of valuating canopy cover instead of diameter is city canopy cover can be estimated to generally within 90% accuracy from remote sensing protocols.

Furthermore, most primary benefits of trees in community can be proxied through both height and spread of canopy more accurately than through tree diameters. Evaluating a tree outside of its site-specific environmental and health contexts is unproductive and results in little useful information. Thus, to adequately value tree resources whether from individual trees or tree stands, tree health, tree survivability and preservability, species, size canopy coverage and other qualifiers are required to be known. The Consultants expanded on this concept by introducing a new resource evaluation method: The Tree Resource Functional Assessment.

- The Tree Resource Functional Assessment (TRFA) provides a vehicle for a qualified professional to assess the value of a stand of trees, or an individual tree. This is system of points relevant to current and future tree condition and includes ways to evaluate environmental, habitat and social benefits of an assessed tree resource. The numerical result of this assessment is then used to classify a tree or tree stand as Landmark, Exceptional, Typical, or Poor.
- This classification will drive mitigation to replace realized tree resource function.

[3] Robinson, D.T.; Brown, D.G. Evaluating the effects of land-use development policies on ex-urban forest cover: An integrated agent-based GIS approach. International Journal of Geographical Information Science. 23 (2009) 9:1211-1232.

5. TREE PROTECTION STRATEGIES BASED ON FINDINGS

Using our research as discussed above, this chapter discusses how Bainbridge Island tree resource protection and retention methodologies are functioning under its current codes and provides a basis for the revised and improved tree resource codes.

Majority of trees on private land

Urban foresters and municipal tree managers have long acknowledged that while the vast majority of community trees reside on private property, they sustain ecosystem services that are measurable and quantifiable public goods[4]. As such, regulation and protection of trees on private property is necessary. This is especially true as undeveloped private properties zoned for development, and developed properties zoned for redevelopment and infill, are where the city maintains most of its tree canopy cover. Tree protection ordinances require forethought, development, and commitment; the same as other municipal activities if tree policies are to be successful.

Development and zoning

Bainbridge Island's comprehensive plan prioritizes high-density development in urbanized designated centers. However, at the high-density zoning scales, tree retention and canopy cover goals are near-impossible to achieve once development is set in motion. Current development codes do not establish off property mitigation or in-lieu fees. Both of these mitigation alternatives can maintain or exceed canopy coverage goals within the same or nearby zoning areas though forest investment and municipal land acquisition.

Measuring and mitigating for lost tree function

Tree benefits are directly correlated to both tree health and tree size. As such, mitigation of removed trees should occur through reestablishment of lost tree functions. The Consultant's find that maintaining a single tree which has the capacity to replace the benefits of the removed trees is more effective than planting numerous trees. This stipulation requires performance standards of the property owner through tree establishment. If a single tree is planted for mitigation of a removed tree, that tree must be monitored annually, watered during summer, mulched and protected until it becomes established. If the tree perishes, it must be replaced. A municipal arborist could easily monitor and evaluate replacement trees for health and survivability.

If a tree is removed for any reason, that tree can be evaluated for function (using the Tree Resource Functional Assessment) and a tree can be selected for replacement which can regain that tree capacity. Using ratios for tree planting, like 3:1 replacement ratio, often exasperates biological competition and reduces likelihood of the replacement trees ever actually mitigating the function of the removed tree. Most often, lack of nutrient

[4] Mincey, Sarah K.; Schmitt-Harsh, Mikeala; Thurau, Richard. Zoning, land use, and urban tree canopy cover: The importance of scale. Urban Forestry & Urban Greening 12 (2013) 191-199.

availability and water are casual factors in tree decline. When removing these declining trees, replacing them 3 to 1 will not result in three healthy, functional trees.

When a development application requires the removal of trees, for any reason, those tree resources are potentially permanently lost through land conversion. Again, the Tree Resource Functional Assessment can be used to evaluate tree stand function and from that, classify the stand as it relates to those functions, i.e. landmark, exceptional, typical or poor. When development or other land action requires the removal of tree canopy, the tree stand classification and the canopy volume of the stand will result in a monetary valuation. This value can be invested back into the tree fund for zone wide canopy cover goals.

Minor and major tree permits

Canopy cover goals and permeance of tree resource losses are the qualifications for minor and major tree permits. When tree resources are removed from a property for any reason, the initial two concerns are:

(1) will this action decrease canopy coverage goals below the goals of the parcels zoning goals and

(2) is this tree resource loss temporary or permanent?

When a tree is removed from a moderate density, single-family residence, those lost functions can most likely be reestablished through proper tree re-installation and care through tree establishment. On the other hand, when mature trees are removed to create space for a development or new structure, particularly in high density zones the site's tree resource loss is permanent.

Equally, when a tree is removed from a property and the property remains above the goals of the Community Forest Management Plan, the action is within policy thresholds. When temporary tree resource loss occurs due to a hazardous tree, a sick tree, or just a tree planted in the wrong space, minor tree permits, appropriate mitigation and performance assurances will ensure a new tree is established and allowed to mature in order to accommodate the temporary tree resource loss.

When permanent tree resource loss occurs functional replacement on-site is limited. During high density infill and development, tree resource losses simply cannot be mitigated for onsite. When these scenarios occur a major tree permit will be required. Major tree permits will acknowledge lost tree function onsite and a formula will be used to address lost value. The valuation formula is a function of canopy measurements and the Tree Resource Functional Assessment. This way, mitigating a low functioning canopy will result in less valuation than mitigating a high functioning canopy. In addition to the lost tree canopy associated with the major tree permit, we recommend a bond be submitted to the tree fund whenever construction activities could potentially impact and be a causal factor in the decline of protected trees.

Replanting requires performance standards of the property owner through tree establishment. If a single tree is planted for mitigation of a removed tree, that tree must be monitored annually, watered during summer, mulched and protected until it becomes established. If the tree perishes, it must be replaced. A municipal or private arborist could easily monitor and evaluate replacement trees on developing sites for health and survivability.

Tree valuation

Bainbridge Island BIMC 18.15 currently stipulates the "current tree valuation system of the International Society of Arboriculture" be used to monetarily value trees. The Consultants strongly believe that a different approach to tree valuation should be taken.

The Council of Tree and Landscape Appraisers (CTLA), the council that develops the standard for plant appraisals, is not directed by the International Society of Arboriculture. Rather, seven different national organizations have representatives within the CTLA. Their methods of tree valuation set forth in the CTLA are complex and require an expert to correctly quantify; their usefulness resides within the courts, not within municipal code. Using the CTLA method of tree appraisals, the city could endure costly litigation defending the subjective results of the methodology.

Many cities are taking the advice of urban foresters and removing this stipulation from their code, in their place are municipal defined tree valuations. The City of Vancouver Washington and British Columba, City of Victoria, City of Portland, City of Ann Arbor, City of Santa Monica and the City of Bellingham are all using municipality defined cost methods which reside in their code to valuate trees.

In the context of Bainbridge Island, the Consultants recommend using Tree Resource Functional Assessment values to quantify and value lost tree resources. This method allows tree resources of higher functional value, i.e. landmark trees, to value much higher than poorly functional trees. Funds generated from projects who need to mitigate off-site will be reinvested into the Bainbridge tree fund and managed by the municipal arborist.

Forest stewardship plans

Small and large forest owners on the Island need a resource to execute forest-specific action. Forest soils, hydrology, aspect and grade, existing plant communities, spatially and compositionally, and other factors function into holistic forest management. Forest stewardship plans are an avenue for forest landowners to carry out specific recommendations and prescriptions on their forest land, while exhibiting a no-net-loss or net-gain of forest ecosystem function. The Consultants recommend all forest sizes be allowed to write forest stewardship plans for their property. The forest stewardship plans will act similar to an ARPA stewardship plan but will allow forest stewardship and modifications that accelerate tree resource functionality and resiliency.

Climate change in Washington

Within the next 100 years average annual temperatures in Washington are projected to rise at a rate of 0.1 to 0.6 °C. Precipitation forecasts are generally more uncertain, though, with winter projected to be wetter and summers drier[5]. Climate change is slowly reducing days of rainfall per year but not the total amount of

[5] Lawler J.J. and M. Mathias. 2007. Climate Change and the Future of Biodiversity in Washington. Report prepared for the Washington Biodiversity Council.

precipitation. This change is more quickly than ever forcing plants to adapt to warmer drier summers while at the same time, adapting them to wetter, rainy seasons.

These changes in our environment are already and will continue to affect tree and forest resilience, regeneration, diversity, spatial distribution and resilience to pests and diseases over time. Changes are expected in the length of growing season, plant and animal composition and distribution, water availability and duration and an increase in drought conditions during summer and fall. The single greatest forest management action to help sequester carbon is to manage stands for density, regeneration and resiliency to keep trees healthy and foster vigorous growth. Implementing tree resource codes and policy that focuses small and large-scale assessments as function based can ensure code stays relevant and effective through climate changes.

6. IDENTIFIED CODE CONCERNS – HISTORICAL TO PRESENT

The Consultants defined numerous concerns with both the historically adopted 16.18 code (Ordinance 2003-) and the recent Tree Board 16.18 Revision (Ordinance 2018-19). Below is a synthesis and rationale of the Consultant's concerns. As Ordinance 2018-19 only revised a portion of the 18.15 code, the Consultant's only focused on the revised portions of 18.15. The Consultant's did not study nor revise the entirety of tree and vegetation standards in 18.15 though some recommendations regarding this section are included in this report.

6.1 HISTORICAL 16.18 (ORDINANCE 2003-16 & 2015-03)

Practical Concerns

- No urban forest department or designated appointee within the City.
- Inconsistencies in the designation of the required professional as well as their title or association.
- Old usage of tree risk and tree hazard concepts.

Best Available Science Concerns

- Allowed the removal of six trees per year per parcel, independent of parcel size or parcel use (BIMC 16.18.030.B).
- Did not allow removal of trees on undeveloped land in accordance with forest health stewardship.

Language Concerns

- Used outdated and incorrect professional definitions.
- Used undefined scientific terminology

6.2 TREE AND LID COMMITTEE 16.18 REVISION (ORDINANCE 2018-19 EXHIBIT A)

Practical Concerns

- Tree related code found in many places throughout Municipal Code.
- No incentivization offered to retain large trees.
- No urban forest department or designated employee within the City.
- No definition of a certified "landscape professional" (BIMC 16.18.010.B).
- For properties one acre or less in size: A tree removal permit needed to remove four or more significant trees (previously, a permit was required to remove seven or more significant trees).
- Increasing the time period from 12 months to 36 months related to the removal of significant trees without a permit.

Best Available Science Concerns

- Off property tree protection during construction or redevelopment activities was undesignated.
- Mixed used town center (and newly added zoning areas) cannot sustain newly required tree buffers and tree units.
- References to ANSI A300 standards are limited.
- Mitigation requirement to replicate historic soil types is unclear.
- Requiring historical planting does not necessarily reflect or prepare Bainbridge Island for future climate shifts. (BIMC 16.18.090.A.3).

Language Concerns

- Difficult to read and interpret; especially for homeowners
- Uses undefined scientific terminology, (example: live crown ratio, BIMC 16.18.060.D).

6.3 LANDSCAPING, SCREENING, AND TREE RETENTION, PROTECTION AD REPLACEMENT 18.15 REVISION (ORDINANCE 2018-19 – EXCLUDING EXHIBIT A)

Practical Concerns

- Mentions list of city arborists, but no list exists to our knowledge (BIMC 18.15.010.C.4.b.viii).
- Planting requirements are unclear, especially as to who will decide which species are acceptable, native versus nonnative (BIMC 18.15.010.C.2.b).
- Maintenance assurance device for conformance with a required planting plan is not defined or explained, just deferred to be determined by the director (BIMC 18.15.010.H.4.b).
- Replanting plans with designated spacing regimes that are not site-specific are outlined in code (BIMC 18.15.010.C.2.b).
- The number of trees determined for a Full Screen does not account for tree species (BIMC 18.15.010.5.D.4.a).
- Monitoring and/or performance standards are not adequately addressed/checked, only that plants must be replaced in conformance with the planting plan (BIMC 18.15.010.H.4.a).

Best Available Science Concerns

- No metrics or follow-up inspection for re-planting.

Language Concerns

- Uses undefined scientific terminology.

6.4 LANDMARK TREE ORDINANCE 16.32 (ORDINANCE 2018-25 & 42)

Practical Concerns

- Methodology for identifying large trees for preservation is based on a single metric.
- The twenty-four species listed do not adequately represent the range of large tree species on Bainbridge Island.
- Permitting process is onerous for planning staff who are not qualified to double check an arborist's report.
- LTO does not significantly reduce the number of large trees in good condition being removed on Bainbridge.

Best Available Science Concerns

- Tree diameter is not an accurate proxy of tree function or values and is a random value for a "Landmark Tree".
- Trees that have been permitted to be removed to date have been poor condition or dead trees – most of which would not have needed a permit for removal prior to this ordinance.
- Reviewing staff not qualified with tree attributes are having to field "fact check" arborists reports.

Language Concerns

- Difficult to read and interpret; especially for homeowners.
- Uses undefined scientific terminology.
- "Landmark Tree" is defined as having several attributes the but process only requires a tree to be larger than a certain size.

7. SPECIFIC POLICY IMPROVEMENT RECOMMENDATIONS

This chapter outlines the Consultant's recommended policy and code improvements. Of these, the first three identified improvements were also identified as gaps in priorities and resources in the CFMP in 2006 but were never implemented.

Specific Recommendation 1 – Improve tree protection codes

Specific Recommendation 2 – Limit performance of tree activities to verified professionals

Specific Recommendation 3 – Create a Bainbridge Island Community Forestry Department

Specific Recommendation 4 – Implement the Tree Resource Functional Assessment (TRFA)

Specific Recommendation 5 – Modify Tree Resource Fund Code

Specific Recommendation 6 – Modify Landmark Tree Ordinance (LTO) language and designation methodology

Specific Recommendation 7 – Improve Actionable Policy Related to Tree Management

Table 7: Specific Recommendation 1 – Improve tree protection codes.

Recommendations 1) Consolidate tree resource protection codes found in 16.18, 18.15, LTO & 3.32 to reside inside of a single BIMC Chapter, excluding critical areas. 2) Remove after-the-fact tree removal permits. 3) Create a Dead and Emergency Tree Checklist easy to understand by homeowners, professionals and enforcement staff. 4) Launch webpage for the Community Forestry Department (CFD) for homeowners to easily find tree protection codes, tree removal and process information. 5) Provide a new hardcopy and online tree work process flow chart for homeowners and City Staff. 6) Public outreach to disseminate new code requirements.
Rationale 1) Need single source of information for the public, decision makers, contractors, landowners, arborists. 2) Dead and Emergency Tree Checklist will streamline processes for tree work as well as provide a way to document some tree removal that may previously have needed a permit (currently Landmark Trees). 3) After-the-fact permits are inefficient code techniques and have traditionally been used for emergency permitting often for trees that didn't need a permit in the first place.
Definitions 1) "Dead and Emergency Tree Checklist" used by tree workers to document large sized dead trees being removed due to being dead or in emergency situations.
Strategies 1) Develop webpage on COBI website (ex: Bainbridge.wa.gov/trees) as a single point source for all tree related codes, permitting information, flowcharts, etc. 2) Advertise this webpage to the public and to city staff.

Table 8: Specific Recommendation 2 – Limit performance of tree activities to verified professionals.

Recommendation

Trees and their parts should only be assessed, evaluated and reported on by verifiable professionals. All references to the identification, assessment, evaluation, management, and reporting of trees should be revised to reflect this. In some certain situations, only Certified Arborists should perform activities on or related to trees.

Rationale

1) Nearly every reference to published literature and other actively used code nationwide recommends and stipulates that Certified Arborist shall conduct all tree related tasks. We extend this paradigm to include tasks which can be completed by other allied professionals.
2) The revised language of the Critical Area Ordinance in 2018 stipulates only contractors and Certified Arborists can perform specific tasks. Similarity, only Certified Arborists are trained and educated to perform non-lethal activities on important trees.
3) Certified Arborists are trained, educated and experienced in the management of individual trees and systems of tree groups. Some are trained in Tree Risk Assessment.
4) Single source of education and certification results in increased median performance in evaluations and reporting. This provides a common baseline understanding of tree ecology, soil and site management, tree selection and placement, tree management and risk concepts.
5) Certified Foresters and Candidate Certified Foresters are educated, trained and experienced in timber product management, timber economics, and timber extraction principles, not the management of individual trees nor in Tree Risk Assessment. Equally, other allied professionals lack the significant education and training to evaluate trees and their features and components on individual scales.

Definitions

1) "TRFA" is a tree resource classification tool to be used by Certified Arborists or "Tree Risk Assessment Qualification" (TRAQ) endorsed allied professionals.
2) Certified and Candidate "Certified Foresters", "Certified Arborists", and "Registered Consulting Arborists" alike can enroll in the nationally defined TRAQ course and qualify themselves to evaluate trees and tree risk.
3) "Allied professionals" are Certified Foresters & Candidate Certified Foresters, Certified Professional Horticulturalist, Eco-Pros, Professional Wetland Scientists & Professional Wetland Scientists In-Training, Registered Consulting Arborist.
4) While a Certified Arborist without TRAQ can evaluate trees for TRFA, allied professionals will require TRAQ to evaluate trees for TRFA.
5) All professionals who evaluate trees for Risk shall have TRAQ.

Strategies

1) Tree inventories, tree protection plans, critical root zone measurements, tree valuations and other technical tree related tasks outlined in BIMC 18.15 should be conducted by Certified Arborists.
2) Create flowchart for professionals and planners to validate professional authority. The outline below is a simple outline of a flowchart to be used to verify professional's ability to manage trees on Bainbridge Island.
    a. Are you a licensed Contractor in the State of Washington?

i. You are permitted to remove trees, vegetation, and modify non-landmark trees, as allowed by code.

b. Are you a Certified Arborist?

i. You are permitted to evaluate trees using the Tree Resource Functional Assessment.

ii. If a licensed Contractor, or working with a licensed Contractor, you a permitted to modify landmark trees in addition to the above, as allowed by code.

c. Are you a Certified Arborist or allied professional with an active Tree Risk Assessment Qualification?

i. You are permitted to evaluate trees in any scenario, including evaluating trees for risk.

ii. You may not perform work on those trees unless you are a licensed Contractor or working with one.

d. Are you an allied professional without an active Tree Risk Assessment Qualification?

i. You are not permitted to evaluate trees using the Tree Resource Functional Assessment or to qualify tree risk.

3) Refer citizens to http://treesaregood.org for a list of locally working currently certified ISA Certified Arborists and TRAQ qualified professionals.

4) Require tree services, land clearing services and others performing tree services or land clearing work in the City acknowledge the City's tree protection requirements in order to conduct work within the City. This is similar to the current requirements for professionals working on trees in Critical Areas.

5) Establish and enforce a penalty for contractors or those individuals or companies performing tree removal and land clearing activities that do not sign the required form and operate within the City.

Table 9: Specific Recommendation 3 - Create the Bainbridge Island Community Forestry Department

Recommendation Fund, form and staff the Bainbridge Island Community Forestry Department.
Rationale 1) This recommendation is called out in Bainbridge Island's 2006 Community Forest Management Plan as Policy Number 4. 2) There is currently no single staff member at the City actively tracking or following up on permit submissions, development projects, replanting, landmark tree submissions, etc. 3) Arboricultural professionals are unable to communicate with the City on sophisticated tree related issues or in a reasonable time frame. 4) A municipal arborist or urban forester position creates a single point of contact city-wide for tree related issues. 5) Expert and more consistent interpretation of tree codes, tree science and tree resource management at multiple scales of management functions better with an arborist on staff. 6) Municipal arborists or city foresters can conduct Level 1 and Level 2 tree risk qualifications for City, including trees in rights-of-way, road edges and private property risk evaluations and verify other arborist reports.
Definitions 1) An "urban forester" or "municipal arborist" position should head the Bainbridge Island Community Forestry department. We foresee a single full-time employee initially required to fulfill this recommendation.
Strategies 1) Create a stand-alone department or nesting the arborists position within Department of Community Development. 2) Job description for this position should include but not be limited to: reviewing tree removal permits, reviewing tree related issues on developing properties, identifying active trends in city tree canopy cover and report to Department of Community Development on goals outlined in the Community Forest Management Plan, manage the recommended Tree Fund grants to improve the Islands urban forest and tree resources.

Table 10: Specific Recommendation 4 – Implement the Tree Resource Functional Assessment (TRFA)

Recommendation Tree resources should be quantified by their functionality not merely by their species and diameter. All references to tree units, tree classifications, tree removal allowances or other tree quantifications should instead be evaluated and calculated via the Tree Resource Functional Assessment.
Rationale 1) Currently 16.18 employs a standard tree diameter function to arrive at a tree unit number. This singular function does not take into consideration functional limitations & capacity of tree species, site-specific considerations and health of trees among other attributes. 2) Diameter of a tree and species of a tree is not a qualitative or quantitative measure of that trees community importance (value) or its environmental function. 3) A better method is needed to understand long-term tree function and benefits.
Definitions 1) The TRFA is a classification tool to be used by Certified Arborists or Tree Risk Assessment Qualification (TRAQ) endorsed allied professionals.
Strategies 1) The TRFA will be used to discourage replacing large, mature trees which provide numerous benefits, with small, inconspicuous trees providing few benefits. When site conditions don't allow this, a value-added mechanism through the tree Fund to compensate for lost tree capacity as defined by the TRFA.

Table 11: Specific Recommendation 5 – Modify Bainbridge Island Tree Fund Code

Recommendation

Bainbridge Island Municipal Code outlines the formation of a Tree Fund but should be refined, enhanced, and its breadth should be increased to reflect in-lieu fees, mitigation fees and management by the community forestry department.

Rationale

1) Landowners in all zones sometimes need off-site options to mitigate necessary healthy tree removal in property developing situations.
2) On-site mitigation of tree resource benefits is functionally impossible in high density land-use types.
3) Provides long term funding to start and enhancing urban forest maintenance and planting programs.
4) The fund offers options for mitigation fee-in-lieu option.
5) The fund prioritizes money for restoration activities to improve functionality, similar to the goals of Shoreline Master Program (SMP) restoration plans.

Definitions

1) Those development activities that result in tree resource losses and that cannot be mitigated for on site will pay into the "Tree Resource Fund".

Strategies.

1) The City should enact a fund holding specific to tree resource mitigation administered through its Administrative Code. This fund will be labeled the Tree Resource Fund and will receive in-lieu fees from on or off-site mitigation of lost tree resources.
2) The fund can be used to assist in municipal land acquisition to offset canopy loss in areas of high-development
3) This fund will be solely managed by the City Urban Forester or City Arborist for projects related to urban and community forest management.
4) The fund can help provide grants to Bainbridge Island Parks District to enhance forests and parks.
5) The fund can aid landowner assistance programs (direct or indirect grants) for
    a. Street tree enhancement, planting and maintenance, landowner tree pruning and maintenance education, ecosystem functionality enhancement, wildfire resilience
6) Municipal land acquisition, forest conservation
    a. Use TRFA to develop a Citywide Forest Valuation & Prioritization Assessment. Document will be used to assess and prioritize forest conservation through municipal acquirement or horizontal funding to Conservation Districts/non-profits.
    b. Use fees to promote horizontal funding to non-profits working to increase community forestry health & resiliency.
    c. Landowner assistance programs (direct or indirect grants)
    d. Use TRFA to develop wildfire community action plan in order to replace a similar outdated plan developed in 2010.

Table 12: Specific Recommendation 6 – Modify Landmark Tree Ordinance (LTO) language and designation methodology

Recommendation Adopt the Tree Resource Functional Assessment (TRFA) to identify trees of "landmark" status.
Rationale 1) Current Landmark Tree Ordinance uses single function metered rates (tree diameter) to designate a "Landmark Tree". 2) Considerations such as site-specific attributes, tree health, tree safety and numerous other important qualifiers can better qualify a tree that can or should be retained, preserved or protected. 3) The biggest trees of every species are not always the most important or best trees to preserve on every job site or within every zoning designation. 4) As proved during its adoption the LTO did not reduce the amount of larger sized good condition trees being removed Island wide. 5) LTO has increased the work load on Planning Commission staff through necessitating their time to fact check arborists reports. 6) The perceived loss of large trees Island wide is not the result of homeowners removing large, good condition trees.
Definitions 1) "Landmark tree" means any tree identified as a landmark through accumulation of points in Tree Resource Functional Assessment. 2) "Exceptional tree" means any tree identified as exceptional through accumulation of points in Tree Resource Functional Assessment. 3) The measurement instrument to determine a Landmark Tree is the TRFA.
Strategies 1) Repeal the currently adopted Landmark Tree Ordinance. 2) Enact the TRFA to encourage to qualify healthy, high functioning, large sized tree retention and to help maintain tree canopy coverage island wide.

Table 11: Specific Recommendation 7 – Improve Actionable Policy Related to Tree Management

Recommendation Outdated and unused policy within the City should be revisited and updated with the assistance of an urban forester or consulting arboricultural professional. Equally, gaps in tree management policy should be addressed in part, by an urban forester or consulting arboricultural professionals.
Rationale 1) In all policy creation which relates to trees, a qualified urban forester or consulting arborist should be consulted with on subjects related to tree science and management. Other planning, design and resource professions do not have the qualifications necessary to make informed decisions on tree concerns. 2) A purpose of the Bainbridge Tree Fund is to purchase, enhance and conserve forests, street trees, pocket parks that can sustain trees, and other green infrastructure. This procurement should be prioritized through a priority matrix identifying ecological, economic and social function, as well as preservability and thread of development. 3) The national FireWise® program is incredibly broad and does not incorporate all best available science. Its specifications and ramifications for using it to administer Bainbridge Island's wildfire action plan program is unwise and does not mesh with the goals of the recommended code revisions. 4) Community and resource specific planning is needed to facilitate an actionable community fire resiliency program.
Strategies. 1) Identify forest lands of unique ecological, social and economic value that have the potential to be preserved as city green infrastructure. 2) Revisit and revise the City of Bainbridge Island Open Space Plan of 2008 to qualify for current applicability. 3) When redeveloping the Shoreline Master Plan and Critical Area Ordinances, consult with a qualified urban forester or consulting arborist. 4) Write a climate resiliency policy which, at least in part, specifically discusses green infrastructure, trees and forests. 5) Update Bainbridge Island Community Wildfire Action Plan, through collaboration with Bainbridge Island Fire Department. 6) Revise Bainbridge Island Street Design Manual to allow for large, functional street trees.

8. OTHER CODE AND POLICY RECOMMENDATIONS

After the new version of the tree code has been adopted, we recommend the following tasks are undertaken to ensure better and ongoing community and staff tree resource code which ultimately improves code function and compliance. Many of these tasks fall under the job description of and can be completed by a municipal arborist.

Short term tasks

- Provide outreach to Parks, COBI city staff, Islandwood, Bloedel Reserve and Wing Point Golf Course (large private land owners) about the new tree code.
- Continue community outreach about new tree code updates.
- Provide outreach to tree workers regarding the new tree code updates.
- Provide COBI staff orientation about new tree code.
- Create one tree code related page on the City of Bainbridge Island's website offering permitting forms and submission information, permitting flow chart, tree related code links, zoning links, a see-click-fix button for reporting infractions and a way to reach the city's arborist.

Long term tasks

- Completely revise and compile BIMC 18.15 into a single-source of tree code located within the Environmental Chapter, 16. BIMC 18.15 should be integrated into BIMC 16.18.
- Develop a technical manual for professionals to improve accuracy and further standardize results on the Tree Resource Functional Assessment.
- Integrate new definitions and code language into Critical Areas and Shorelines codes to improve language uniformity resulting in better enforceability.
- Periodic policy and canopy coverage reviews (also recommended in the CFMP) to address changing or emerging circumstances and needs.
- Embed ANSI and ISA standards into all tree related codes.

Other general tree code related improvements recommendations

- Improve codes regulating tree protection during construction.
    - Add requirements for a Tree Inventory, Tree Protection Plan, and Follow-up Care and Monitoring for trees with critical root zones within development envelopes (can fall back on Annex A in the ANSI A300 Part 5, and the Conservation Suitability Worksheet included in ISA Managing Trees During Construction).
    - Include off site trees during the pre-development Tree Inventory to include both general notes about probable effects to trees on adjacent lots, as well as specific notes to inventory trees on adjacent lots whose Critical Root Zone (CRZ) falls within the limits of construction impacts.
    - Embed the ANSI A300 standards AND ISA BMPs for tree preservation during construction, Soil Management and Tree Risk Assessment into construction related codes.
    - Include a "Conservation Suitability Worksheet" prepared by an ISA Certified Arborist for trees that will be affected by the limits of construction area.
    - Task the City Arborist or require a certified arborist to monitor trees in larger construction sites at appropriate intervals during all phases of site work and construction to ensure compliance with Tree Protection Plan.

9. CLOSING

The Consultants believe the revised code has the potential to positively influence Island-wide forests through implementing methods to maintain and improve Island-wide canopy coverage and individual trees with meaningful tree function loss mitigation alternatives. The Consultants believe that our recommendations have potential longevity that can positively influence the way trees are treated into the future.

Work for this project was performed and this report prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. No warranty, expressed or implied, is made. Katy Bigelow, Katy Bigelow, Arborist LLC, John Bornsworth, nor Peninsula Urban Forestry, LLC or their staff, has any current or prospective interest in the plants or properties discussed. Acceptance of this report acknowledges receipt and agreement with Peninsula Urban Forestry's attached Assumptions & Limiting Conditions.

10. GENERAL ASSUMPTIONS & LIMITATIONS

1. Any legal description provided to Consultant is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. Consultant assumes no responsibly for verification of ownership or locations of property lines, or for results of any actions or recommendations based on inaccurate information. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes or other governmental regulations, unless explicitly stated otherwise.
2. Consultant assumes no responsibilities for legal matters in character. Consultant assumes all property appraised or evaluated is free and clear and is under responsible ownership and competent management.
3. Any evaluation or assessment carried out was restricted to the property and the plants or landscapes within the Scope of Assignment. No assessment of any other plants or landscapes has been undertaken by Consultant. The conclusions of this report do not apply to any zones, landscapes, trees, plants, or any other property not explicitly covered in the Scope of Assignment.
4. The total monetary amount of all claims or causes of action the Client may have as against Consultant, including but not limited to claims for negligence, negligent misrepresentation, and breach of contract, shall be strictly limited to solely the total amount of fees paid by the Client to Consultant pursuant to the Agreement for Services as dated for which this Assignment was carried out. Further, under no circumstance may any claims be initiated or commenced by the Client against Consultant. or any of its directors, officers, employees, contractors, agents, or Assessors, in contract or in tort, more than 12 months after the date of this Assignment.
5. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others
6. Consultant shall not be required to testify or attend court due to any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in a Consulting Arborist Agreement.
7. Unless otherwise required by law, possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the parties to whom it is addressed, without the prior expressed written or verbal consent of the Consultant.
8. Neither all or any part of the contents of this report, nor copy thereof, shall be conveyed to anyone, including the client, to the public through advertising, public relations, news, sales or other media, without prior expressed written consent of Consultant. Particularly as to value conclusions, identify of Consultant., or any reference to any professional society or to any initialed designation conferred upon Consultant as stated in its qualifications.
9. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
10. All photographs included in this report were taken by Consultant during the documented site visit, unless otherwise noted.
11. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other Consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
12. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.
13. This report is based on the condition of the trees, landscape, or plants at the time of inspection.
14. Loss or alteration of any part of this report invalidates the entire report. This report is only valid if reproduced from a digital file.

11. APPENDIX A: PREPARED TREE CODE REVISIONS

Appendix A includes the Consultant's consolidated tree code revisions. We recommend the Council adopt all the following repeals, revisions and adoptions.

Table 13: Code Repeals, Revisions and Amendments

1. Fully repeal of Exhibit A from Ordinance 2018-19.
2. Repeal amendments to 18.15.010.C and 18.15.010.G from Ordinance 2018-19.
3. Adopt Appendix B as the new 16.18: Tree Protection and Forest Stewardship.
4. Amend section 18.15.010.C with Appendix C.
5. Amend section 18.15.010.G with Appendix D.
6. Amend section 18.15.010.H with Appendix E.
7. Amend section 18.15.010 I with Appendix F.
8. Full repeal of 3.39 Tree Bank.

12. APPENDIX B: BIMC CHAPTER 16.18 – TREE REMOVAL AND FOREST STEWARDSHIP

12.1 PURPOSE AND INTENT

Accessible, enforceable and executable tree resource planning secures and amplifies the benefits received from a community forest. The City Council finds that tree resources on Bainbridge Island including private and public trees, native forests, street trees, historic and landmark trees and other trees of local importance enhance the character, livability and social resiliency of the Island.

This revision consolidates and integrates tree resources codes from 16.18 – Tree Removal, Forest Stewardship and Vegetation Maintenance and from 16.32 - Landmark Tree Ordinance.

It is the intent of this chapter to protect the character, livability and social resiliency of the Island's tree resources by:

1. Promoting the public health, safety, and general welfare of Bainbridge Island citizens without preventing the reasonable use of private property.
2. Preserving and enhancing the functions of Bainbridge Island's tree and forest systems physical and aesthetic characters and ability to provide economic benefits for the sake of present and future generations.
3. Implementing and integrating the purposes of the State Growth Management Act relating to conservation of natural resources, pursuant to RCW 36.70A.
4. Implementing the goals and policies in the current Comprehensive Plan, the Community Forest Management Plan (2006), the Bainbridge Island Open Space Study (October 2008), and the Bainbridge Island Community Wildfire Protection Plan (2010), or subsequent updated versions of any of the documents.
5. Implementing long-range function-based goals of maintaining the Island's forest canopy cover to allow adaptability to a changing climate.
6. Allowing provisions for solar access, agriculture and gardens.
7. Allowing removal of dead trees and tree removal in emergency circumstances.
8. Using best-available-science to maintain healthy trees and appropriately manage unhealthy trees.
9. Preventing unnecessary tree removal, injury to or disfigurement of trees, and maintaining designated canopy cover goals across the City.

12.2 DEFINITIONS

For the purposes of this chapter the following definitions shall apply:

1.	"ANSI" means the American National Standards Institute - a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.
2.	"Applicant" means a person, corporation or organization that files an application for a development permit with the City and that is either the owner of the land on which that proposed activity would be located, a contract vendee, a lessee of the land, the person who would actually control and direct the proposed activity or the authorized agent of such a person.
3.	"Best available science" (BAS) means scientifically valid information derived in accordance with WAC 365-195-905, now or as amended hereafter, that is used to develop and implement critical areas policies or regulations.
4.	"Best management practices" (BMPs) means published best management practices from the International Society of Arboriculture, the Tree Care Association of America, American Society of Consulting Arborists, the American National Standards Institute, other professional associations related to natural resource management including arboriculture and horticulture state and local public organizations like the Kitsap Conservation District and the City of Bainbridge Island.
5.	"Board Certified Master Arborist" (BCMA) means an individual recognized by the ISA as a current Board-Certified Master Arborist®. These individuals have passed the Certified Arborist exam and a secondary, extensive scenario-based exam which is the capstone of the arboricultural professional. BCMA's must abide by a Code of Ethics, which ensures quality of work.
6.	"Certified Arborist" means an individual recognized by the ISA as a current Certified Arborist. These individuals must have at least three years' experience and education in the arboricultural professional and must pass a significant test covering many tenants of tree management.
7.	"Certified Forester" means a professional certified through the Society of American Foresters as a Candidate Certified Forester or a Certified Forester. Such professionals have displayed they have a combination of education and experience of timber harvest, forest economics and natural resources of forest systems.
8.	"Clearing" means the destruction of trees and/or vegetation by manual, mechanical, or chemical methods.
9.	"Cohort" means a group of trees sufficiently uniform in composition, structure, age and size class distribution, spatial arrangement, and condition to distinguish it from adjacent groups of trees. There can be multiple cohorts within tree stands.
10.	"Critical Areas" means aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and wetlands.
11.	"Critical Root Zone" (CRZ) The International Society of Arboriculture (ISA) defines CRZ as an area equal to a 1-foot radius from the base of the tree's trunk for each 1 inch of the tree's

	diameter at 4.5 feet above grade (referred to as diameter at breast height). Certified Arborist's should adapt a tree's CRZ given site specific, environmental and biological conditions during a tree assessment.
12.	"Designated Centers" means those areas of the Island referred to as Winslow, Lynwood Center, Island Center, Rolling Bay, Day Road and Sportsman Triangle and shown on Figure LU-3 in the City's 2017 Comprehensive Plan.
13.	"Development area" means the area of land disturbing activity on a site.
14.	"Development" means any action that would require land use review or other approval from the city or other local, state or federal jurisdictions. Development includes but is not limited to: land division; construction, reconstruction, structural alteration, relocation, or enlargement of any structure; clearing or grading; and changes to surface or ground waters.
15.	"Director" means the director of the City's Planning and Community Development Department or his/her designee.
16.	"Drip line" means the area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.
17.	"Existing development" means a development that was lawfully constructed, approved or established prior to the effective date of the ordinance codified in this chapter.
18.	"Functions" means the beneficial roles served by tree resources including, but not limited to, water and air quality improvements, economic acceleration, stormwater attenuation, food provisions, habitat foraging production, erosion control, aesthetic value protection, and recreation. These roles are not listed in order of priority.
19.	"Hazard tree" means a tree identified as posing a hazard to a target by a Tree Risk Assessment Qualified professional. All such trees require a target and a time-frame of failure.
20.	"Hedge" means a line of closely-spaced trees and/or shrubs intentionally planted and/or maintained along a property boundary or landscape border for privacy, screening, safety, or similar function, which typically requires ongoing pruning or shearing to maintain its intended function and/or reasonable use of nearby developed areas.
21.	"Impact of land use" means the relative measure of the intensity of land use used to determine that uses influences on a natural system categorized as follows: 21.1 High impact land use includes commercial development, industrial development, institutional development, residential (more than one unit per acre) development, new agriculture (high-intensity such as dairies, nurseries, greenhouses, raising and harvesting crops requiring annual tilling, raising and maintaining animals), and high-intensity recreation such as golf courses and ballfields. 21.2 Moderate impact land use includes residential development (1 unit/acre or less), new agriculture (moderate-intensity such as orchard and hay fields), paved trails, and building of logging roads. 21.3 Low impact land use includes low-intensity open space such as passive recreation, natural resources preservation, and unpaved trails.
22.	"International Society of Arboriculture (ISA)" is an international non-profit professional organization. The ISA is the international leader of tree related science and management and

	the organization who certifies arborists, tree risk qualified professionals and other industry certifications.
23.	"Invasive/exotic species" means plants and animals that are not native to the Puget Sound lowlands and are recognized by resource professionals or biologists to be highly competitive with native vegetation and animals. Invasive/exotic plant species include those listed on the noxious weed list developed by the Washington State Noxious Critical Areas Ordinance (2005-03) as modified by Ordinance 2007-05 & 2008-13 – Weed Board. Invasive/exotic animal species include any species, such as rats, bullfrogs, zebra mussels and green crabs, considered by resource professionals to be damaging to the native animal populations.
24.	"Land Use Permit" means any of the following: Planned Unit Developments (Chapter 18.120 BIMC); Conditional Use Permits (Chapter 18.108 BIMC); and/or Site Plan Review (Chapter 18.105 BIMC).
25.	"Mitigation", a. Substitute: To replace a tree function or tree value, or canopy coverage, away from the site on which a tree has been removed, destroyed or degraded by a regulated activity. b. On-site: To replace a tree function or tree value, or canopy coverage, adjacent to the site on which a tree has been removed, destroyed or degraded by a regulated activity.
26.	"Native or equivalent vegetation" means species which are indigenous to the Puget Sound lowlands ecoregion; or a species that is equivalent in providing the same site-specific functional arrays as would the native species. Functional arrays may include forage, water quality improvements, hiding habitat, or other physical or biologic roles in the ecosystem that individually or as whole correspond to those of the native species. As with natives, the role of an alternative species may vary depending on the site and its surrounding ecosystem. Invasive/exotic species shall not be considered equivalent species.
27.	"Open space" means undeveloped areas of varied size. Open space often contains distinctive geologic, botanic, zoologic, historic, scenic or other critical area, or natural resource land features.
28.	"Reasonable use exception (RUE)" is a means of relief that is available for a property that is encumbered to such an extent by tree resources, critical areas and/or water quality buffers that application of this chapter would deny all reasonable use of the subject property, as further defined by the decision criteria of BIMC 16.20.080.G & BIMC 16.18.XXX, and reasonable use of a property cannot be achieved through any other means.
29.	"Redevelopment" means, on a site that is already substantially developed (i.e., has 35 percent or more of existing impervious surface coverage), the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; construction, installation or expansion of a building or other structure; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities.
30.	"Registered Consulting Arborist (RCA)" means a natural resource professional who has fulfilled the requirements for the RCA registration designated by the American Society of Consulting Arborist. RCA's have demonstrated higher skills in a broad range of technical areas related to trees and tree care, providing objective, independent opinions, with training for higher communication, presentation and/or report writing skills.

31.	“Remnant tree” means any tree which was part of the vegetated landscape prior to development or impact. This includes native, juvenile and mature trees of all cohorts and all species.
32.	“Retrenchment and rejuvenation pruning” means crown reduction in late-mature and senescent trees to anticipate or keep pace with decline in the crown.
33.	“Site” means the entire lot, series of lots, or parcels on which a development is located or proposed to be located, including all contiguous undeveloped lots or parcels under common ownership.
34.	“Snag” see “Wildlife tree”.
35.	“Topping” means the practice of reducing a tree’s size by cutting live branches and leaders to stubs at internodes without regard to long-term health or structural integrity of a tree.
36.	“Tree activity” and “tree action” means any action on or around trees and their associated vegetation. This includes all trees within the code’s jurisdiction, included but not limited to remnant forest trees in forest settings, individual remnant trees and installed landscape trees.
37.	“Tree advisory group” means a group ordained by the City Council through ordinance, or an ad-hoc committee, or a public non-governmental committee associated with making tree decisions for the City.
38.	“Tree benefit capacity” means the functional capacity for mature trees to provide benefits to communities and the environment through their entire life span. The benefit capacity of large, long-lived trees is exceptionally higher than the benefit capacity of small, short-lived trees.
39.	“Tree disfigurement” means a variety of outdated, improper or inaccurately executed pruning techniques. Some types of tree disfigurement include topping, lion tailing, flush cutting, wind sailing, and stubbing.
40.	“Tree Resource Functional Assessment” (TRFA) means an assessment and evaluation of tree resources provided through individual trees or through tree stands. The TRFA is a means of valuating functional capacity of tree resources.
41.	“Tree resource professional” means ISA-Certified Arborist, Certified Forester, Certified Professional Horticulturalist, other allied professional with the Tree Risk Assessment Qualified qualification, or another natural resource professional as determined by the director.
42.	“Tree resource” means all tree-like woody plants on Bainbridge Island.
43.	“Tree Risk Assessment Qualified” (TRAQ) means an individual who has successfully completed the ISA TRAQ training course and assessment and holds a valid ISA TRAQ credential. TRAQ individuals can be Certified Arborist, Registered Consulting Arborists, Certified Foresters, Candidate Certified Foresters, Certified Professional Horticulturalists and Eco-Pros.
44.	“Tree risk” means risk posed when conflicts develop between trees and societal functions and from structural tree failures.
45.	“Tree stand” means a contiguous or geographically defined, non-contiguous group of trees within a certain area. Depending on context, a tree stand be within a single parcel, or within many parcels.

46.	"Tree" means a woody perennial plant with a single or multiple trunks, which typically develop a mature size of over several inches diameter, and ten (10) or more feet in height. 46.1 "Landmark tree" means any tree identified as a landmark through accumulation of points in Tree Resource Functional Assessment. 46.2 "Exceptional tree" means any tree identified as exceptional through accumulation of points in Tree Resource Functional Assessment. 46.3 "Typical tree" means any tree identified as typical through accumulation of points in Tree Resource Functional Assessment. 46.4 "Poor tree" means any tree identified as poor through accumulation of points in Tree Resource Functional Assessment. 46.5 "Dead tree" in the context of this document, means any tree identified as dead through the Dead and Emergency Tree Checklist. 46.6 "Significant tree" outside the Mixed-Use Town Center and High School Road zoning districts means a: (1) a live evergreen tree 10 inches in diameter or greater, measured 54 inches above existing soil grade; or (2) a live deciduous tree 12 inches in diameter or greater, measured at 54 inches above existing soil grade; within the Mixed-Use Town Center and High School Road zoning districts, a significant tree means (3) any live tree 8 inches in diameter or greater, measured at 54 inches above existing soil grade. 46.7 "Insignificant tree" means trees measuring less than 3 inches in diameter growing within a landscaped property, right-of-way, or other non-forested landscape. Forested landscapes do not include insignificant trees unless as determined through site-specific Forest Stewardship Plan.
47.	"Trees of local importance" means trees or stands of trees which have developed exceptional cultural, social, historical or aesthetic values for a variety of reasons, including but not limited to age, historical status or event, history of establishment, exemplary representation of a species, rarity of the specimen, amplification of social, human health or economic benefits.
48.	"Urban natural open space" means an open space that (a) a priority species either resides within, or resides adjacent to and uses the open space for breeding and/or regular feeding; and/or (b) functions as a corridor connecting other priority habitats, especially those that would otherwise be isolated; and/or (c) is an isolated remnant of natural habitat larger than 10 acres and is surrounded by urban development. "
49.	"Vegetation" means shrubs, ground cover, vines and other low-growing plants, EXCLUDING trees.
50.	"Wildlife tree" means a tree or group of trees that are identified to provide present and future wildlife habitat. A wildlife tree is any standing dead or live tree with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife. Downed trees are not wildlife trees, but rather downed woody debris.

12.3 TREE CANOPY COVER GOALS

(The Consultants recommend storing Tree Canopy Cover Goals in the administrative manual to allow for ease in updating goals depending on updated community forest guidelines, technical manuals, remote sensing canopy assessments and a changing climate. We recommend the Tree Canopy Cover goals in high-density residential, especially R-8 and R-14, be readdressed.)

Island wide tree canopy cover goals for lot sizes and land use types are set forth in Table 14.

a) Tree canopy cover is measured by the percentage of canopy cover provided by (a) existing trees or (b) the projected mature canopy coverage to be provided by trees planted to meet requirements in section 16.18 and/or 18.15, as determined by a ISA-Certified Arborist.
b) A parcel's canopy cover shall include both deciduous and evergreen trees that are above 15 foot in height.
c) This measurement can be approximated using the area measure tool on recent aerial imagery, which can be found on Bainbridge Island's GIS Map App, Google Earth, or another similar source.
d) If canopy coverage is reduced below the goal on any single parcel a minor or major tree permit is required.

Table 14: Tree Canopy Cover Goals

District Type	Abbreviation	Name – Description	Canopy Cover Goals
Low Density Residential	R-0.4	Residential 0.4 – One unit per 2.5 acres (100,000 sq. ft.)	70%
	R-1	Residential 1 – One unit per acre (40,000 sq. ft.)	
	R-2	Residential 2 – Two units per acre (20,000 sq. ft.)	
Moderate Density Residential	R-2.9	Residential 2.9 – Two and nine-tenths units per acre (15,000 sq. ft.)	50%
	R-3.5	Residential 3.5 – Three and one-half units per acre (12,500 sq. ft.)	
High Density Residential	R-5	Residential 5 – Five units per acre (8,500 sq. ft.)	35%
	R-6	Residential 6 – Six units per acre (7,260 sq. ft.)	
	R-8	Residential 8 – Eight units per acre (5,400 sq. ft.)	
	R-14	Residential 14 – 14 units per acre (3,100 sq. ft.)	
Mixed Use Town Center & High School Road District 1 & 2	CC, MA, EA, Gate, Ferry	Central Core Overlay Madison Avenue Overlay Ericksen Avenue Overlay Gateway Overlay Ferry Terminal Overlay High School Road Districts I and II	35%
Other	NC, B/I, WD-I, FWHO	Neighborhood Center Business/Industrial Water-Dependent Industrial	25%

12.4 APPLICABILITY

1) This chapter shall apply to all trees and vegetation within jurisdiction of the City, including,
   a) Trees and vegetation on private property, including private landscapes and gardens,
   b) Trees and vegetation on City of Bainbridge Island property, including all street trees, trees within right-of-way, and trees managed by city departments,
   c) Trees and vegetation on property owned or managed by other institutional, governmental or non-profit organizations including the Bainbridge Island Parks District and the Utility company Right of Ways and properties,
   d) Trees and vegetation within dedicated open space which support conditions of development permits and other land use actions.

   and excluding,
   e) Environmentally critical areas and their buffers pursuant to BIMC 16.20,
   f) Shorelines from original-high-water-mark to 200 feet landward, as regulated by the Shoreline Master Program,
   g) Aquifer recharge protection areas (ARPAs),
   h) Individual parcels within subdivisions, short plats, or other development actions, less than 10,000 square feet that have met canopy cover goals and other supporting conditions through dedicated open space.

2) All development, uses, actions and activities performed near trees or their roots within jurisdiction of the City shall meet the requirements of this section. This includes, but is not limited to, development and redevelopment near trees with the potential of entering their critical root zone, tree removal, tree pruning, tree planting, and any other source of action which may conflict with or damage trees.

3) In the event of a conflict between the requirements of this chapter and any other requirement of the Bainbridge Island Municipal Code, the more restrictive requirement shall apply. Additional permits may be required if the activities are regulated by other chapters.
   i) Where this section conflicts with neighborhood Codes, Covenants, and Regulations, or other development regulation managing trees, the more restrictive requirement shall apply.

12.5 EXEMPTIONS

The following activities are exempt from the requirements of this chapter:

a) **Emergency activities.** Emergency activities are considered those necessarily to prevent an unanticipated and immediate threat to public health, safety or welfare or an immediate risk of danger to property which requires action within a time frame too short to allow compliance with this chapter. Although exempt from permitting, emergency tree activities are required to be documented using the Dead and Emergency Tree Checklist (16.18.XXX). The Checklist and an electronic photograph of the tree requiring emergency action must be delivered to trees@bainbridge.wa.gov.

   Within 30 days, the City's arborist, Director or their designee shall determine if the action taken was within the scope of the emergency actions allowed in this subsection. If the City's arborist, Director or their designee determines that the action taken, or any part of the action taken, was beyond the scope of an allowed emergency action enforcement provisions of BIMC 16.18.XXX shall apply.

b) **General landscaping.** General landscaping, gardens, and low growing vegetation and their maintenance are not regulated in this chapter. Normal and routine yard and garden activities include, but are not limited to, cutting and mowing lawns, weeding, removal of noxious and invasive species, harvesting and replanting of garden plants and crops, incidental vegetable gardening, pruning and planting of noninvasive ornamental vegetation intended to maintain the general condition and extent of such areas; provided, that such activities do not reduce overall normal function of a landscape.

c) **Forest practices.** Class I, II and III forest practices regulated pursuant to Chapter 76.09 RCW.

d) **Agricultural management** of existing farmed areas through an existing farm management and/or forest stewardship plan.

e) **Forest stewardship activities** outlined in an approved forest stewardship plan as described in this chapter.

f) **Wildfire plans.** Properties with adopted wildfire prevention plans, as defined in the most current edition of the City's Wildfire Prevention Plan or equivalent document.

g) **Activities within the improved right-of-way.** Replacement, modification, installation, or construction of utility facilities, lines, pipes, mains, equipment, or appurtenances, when such facilities are located within the improved portion of the public right-of-way or easement of a private street, except those non-emergency activities that might affect significant trees in the vicinity.

12.6 ACTIVITIES NOT REQUIRING CITY REVIEW OR APPROVAL

1) The following activities do not require city review, pre-approval or permitting:

a) **Routine maintenance.** Routine maintenance of trees and hedges including planting, limited pruning, limited removal of invasive tree species, management of tree debris and pruning or removal of insignificant trees, provided that:
   i) Pruning operations must conform to the current publication of ANSI A300 (Part 1) Tree, Shrub and Other Woody Plant Management – Standard Practices (Pruning), and the accompanying ISA's Pruning Best Management Practices;
   ii) Pruning of living tree branches less than approximately four inches in diameter.
   iii) Pruning of living tree branches greater than approximately four inches in diameter to remove high-risk branches or other structurally poor crown components, provided that such work is prescribed by a Tree Risk Qualified Professional and is performed, monitored or reviewed by a Certified Arborist.
   iv) Pruning of dead, untreatably diseased or damaged branches, provided the structural integrity and long-term health and typical structure of the tree is preserved despite their removal.
   v) Other maintenance pruning of trees and hedges provided the structural integrity and long-term health of the trees are preserved.
   vi) Pruning operations should limit percent of canopy removal;
      (1) Pruning operations conducted with an ISA-Certified Arborist on site that remove less than 20 percent of living material within any three-year period;
      (2) Pruning operations conducted without an ISA-Certified Arborist on site that remove less than 10 percent of living material within any three-year period;

b) **Dead trees.** To qualify for this tree activity, all trees must fulfill the following requirements:
   i) Tree owner, contractor or other professional shall identify and record tree on the "Dead and Emergency Tree Checklist".
   ii) A clear and identifiable electronic photo of the tree along with the "Dead and Emergency Tree Checklist" must be emailed to trees@bainbridgewa.gov or another email designated by the Director.
   iii) Removing more than 3 dead trees per year requires a minor tree permit.
   iv) Removal of 3 or less dead trees per year does not require mitigation.

c) **Rights-of-ways and utilities.** Normal and routine maintenance or repair of existing utility structures within a right-of-way or existing utility corridor or easements, including the cutting, removal and/or mowing of vegetation, including:
   i) Removal of high-risk trees as determined by a Tree Risk Assessment Qualified professional.
   ii) Maintenance pruning of hedges provided the structural integrity and long-term health of the vegetation is preserved.
   iii) The control of trees and vegetation on road and utility rights-of-way (see BIMC Chapter 12.04).

d) **Healthy, live tree removal allowance.** Removal of some healthy, significant trees is allowed without a permit, given the tree is not required to meet provisions of a land-use application, or provisions in any other chapter including but not limited to, 16.20 (Shoreline Master Program), 18.15 (Landscaping, Screening and Tree Retention), 17.12 (Subdivision Design Standards) or other applicable provision of BIMC.

i) Trees must be on a developed property with an active use.

ii) Tree must not be designated as a "Landmark" tree as rated by the Individual Tree Assessment Form of the Tree Resource Functional Assessment.

iii) Healthy, living tree removal allowances for lot sizes and districts are set forth in Table 15: Healthy Tree Removal Allowances in Developed Properties.

Table 15: Healthy Tree Removal Allowances in Developed Properties

District Type	Abbreviation	Name	Tree Removal Allowance
Low Density Residential	R-0.4	Residential 0.4 – One unit per 2.5 acres (100,000 sq. ft.)	5 significant trees in 12-month period
	R-1	Residential 1 – One unit per acre (40,000 sq. ft.)	
	R-2	Residential 2 – Two units per acre (20,000 sq. ft.)	
Moderate Density Residential	R-2.9	Residential 2.9 – Two and nine-tenths units per acre (15,000 sq. ft.)	3 significant trees in 12-month period
	R-3.5	Residential 3.5 – Three and one-half units per acre (12,500 sq. ft.)	
High Density Residential	R-5	Residential 5 – Five units per acre (8,500 sq. ft.)	No tree removal allowance without minor tree permit.
	R-6	Residential 6 – Six units per acre (7,260 sq. ft.)	
	R-8	Residential 8 – Eight units per acre (5,400 sq. ft.)	
	R-14	Residential 14 – 14 units per acre (3,100 sq. ft.)	
Mixed Use Town Center	CC, MA, EA, Gate, Ferry	Central Core Overlay Madison Avenue Overlay Ericksen Avenue Overlay Gateway Overlay Ferry Terminal Overlay	No tree removal allowance without minor tree permit.
Other	HSR, NC, B/I, WD-I, FWHO	High School Road Districts I and II Neighborhood Center Business/Industrial Water-Dependent Industrial Fort Ward Historic Overlay District	No tree removal allowance without minor tree permit.

12.7 ACTIVITIES REQUIRING CITY REVIEW AND PRE-APPROVAL

1) **Minor Tree Permits.** The following activities require an applicant to submit a minor tree permit application and obtain a decision prior to action. A minor tree permit shall be granted (a) given the on-site mitigation standards in 16.18.XXX Mitigation, are met; and (b) that the replacement trees provide canopy coverage when mature are equal to or greater than the tree(s) removed. Substitute mitigation methods (16.18.XXX.(x) Substitute Mitigation) are not available using a minor tree permit.
   a) **Tree Removals in Mixed Use Town Center and High-Density Areas.** For developed and undeveloped properties located within the Mixed-Use Town Center, High School Road and High Density Residential (R-5, R-6 & R-8, R-14) zoning districts, a Minor Tree Permit is required for removing any live significant tree. The applicant shall submit a minor tree permit with required documents to the City's designated municipal arborist. The applicant must demonstrate that the requested removal meets both (1) and (2) and either (3) or (4) of the following criteria:
      i) The tree is not conserved, preserved, or planted to meet conditions on a land-use permit.
      ii) The removal does not reduce the parcel's total canopy cover below the prescribed canopy cover goals in Table 14: Tree Canopy Cover Goals.
      iii) The tree is determined through a written tree risk assessment report to be a high-risk or imminent-risk as rated by a Tree Risk Assessment Qualified professional
      iv) The removal is necessary to maintain utilities, provide access, or fulfill terms of an easement or covenant recorded prior to the adoption of this section.

   b) **Tree Removals in Moderate and Low Density Residential.** For developed properties located within the Moderate and Low Density Residential (R-0.4, R-1, R-2, R-2.9, R-3.5) zoning districts, a Minor Tree Permit is required for removing more significant trees than allowed as shown in Table 15: Healthy Tree Removal Allowances in Developed Properties. The applicant shall submit a minor tree permit with required documents to the City's designated municipal arborist. The applicant must demonstrate that the requested removal meets both (1) and (2) and either (3) or (4) of the following criteria:
      i) The tree is not conserved, preserved, or planted to meet conditions on a land-use permit.
      ii) The removal does not reduce the parcel's total canopy cover below the prescribed canopy cover goals in Table 14: Tree Canopy Cover Goals.
      iii) The tree is determined through a written tree risk assessment report to be a high-risk or imminent-risk as rated by a Tree Risk Assessment Qualified professional
      iv) The removal is necessary to maintain utilities, provide access, or fulfill terms of an easement or covenant recorded prior to the adoption of this section.

   c) **Pruning limitations.** For all properties, a minor tree permit is required for pruning of any tree resource over the stipulated pruning limitations in 16.18.XXX (Routine Maintenance). The applicant must demonstrate the request meets of the following criteria:
      i) Pruning specifications must be submitted to the City's designated municipal arborist for authorization along with a minor tree permit.

(1) If work will be conducted by a non-ISA-Certified Arborist, a written prescription is required. The tree professional carrying out the prescription must understand and abide by the pruning prescription of the ISA-Certified Arborist. Submit tree-specific tree pruning prescription, as outlined within 16.18.XXX Tree Resources Reports.
(2) If tree pruning prescription work will be conducted by the prescribing ISA-Certified Arborist, a written or verbal prescription to the City's designated municipal arborist is required.

2) **Major Tree Permits.** The following activities require an applicant to submit a major tree permit application and obtain a decision prior to action. A major tree permit shall be granted if it can be demonstrated through an application submission and mitigation report that on-site or substitute mitigation methods identified in 16.18.XXX Mitigation are sufficient to allow for restoration of tree resources.
   a) **Below canopy cover goals.** At any time, when the removal of trees would reduce a parcel below the canopy cover goals stipulated in Table 14: Tree Canopy Cover Goals, a major tree permit is required. Reducing a parcels' tree canopy cover below the stipulated canopy cover goals may be permitted if the applicant can show how the loss will not affect tree resource loss on the site, or how the applicant can mitigate for lost tree resources using 16.18.XXXX Mitigation.

      <u>The following is required upon major tree permit submission:</u>

      i) A completed Tree Resource Functional Assessment on the applicable tree resource(s) applicant is seeking to remove, this may be fulfilled by either a:
         (1) Tree Stand Assessment Form (or)
         (2) Individual Tree Assessment Form
      ii) An arborist report and/or mitigation plan from a tree resource professional identifying how the property owner will mitigate for tree resources losses per 16.18.XXX Mitigation.

   b) **Landmark tree removal.** The removal of living trees designated a Landmark tree through the Individual Tree Rating form of the Tree Resource Functional Assessment requires a major tree permit. The removal of any landmark designated tree requires a tree risk assessment letter from a qualified professional submitted with the major tree permit.

      <u>The following is required upon major tree permit submission:</u>

      i) A completed Tree Resource Functional Assessment on the applicable tree resource(s) applicant is seeking to remove, this may be fulfilled by either a:
         (1) Tree Stand Assessment Form (or)
         (2) Individual Tree Assessment Form
      ii) Tree risk assessment letter from a qualified professional,
      iii) A mitigation report from a tree resource professional identifying how the applicant will mitigate for tree resources losses per 16.18.XXX Mitigation.

3) **Forest stewardship plans.** Forest and tree resource activities are permitted, given they (a) demonstrably result in a no-net-loss of tree resources and (b) are prescribed by a tree resource professional through the submission and approval of a forest stewardship plan, in accordance with 16.18.XXX Tree Resource Reports.
   a) The contents of a forest stewardship plan are outlined in 16.18.XXX Tree Resource Reports.
   b) If through the applicant's forest stewardship plan, a no-net loss of forest function and the parcel canopy cover will not be reduced below their stated goals in Table 14: Tree Canopy Cover Goals.
   c) Forest stewardship plans shall include at minimum:
      i) Natural resource inventory
      ii) Forest prescription and timeline
      iii) Statement on how the proposed forest prescriptions will affect the natural resource functions.
      iv) Completed Tree Resource Functional Assessment.
   d) Forest stewardship plans should be written to manage tree resources for a 10-year time-frame.

12.8 REVIEW PROCEDURES

1) **Applications for tree permits.** Unless otherwise provided for in this chapter, applications for minor or major tree work permits shall be reviewed and approved, approved with conditions or denied pursuant to the administrative review procedures in BIMC 2.16.030 unless a reasonable use exception is requested. Minor and major tree permit applications shall be reviewed based on the proposal's ability to comply with all the criteria of this chapter, and other relevant chapters in BIMC.
   a. The proposal is consistent with the general purposes of this chapter and the public interest;
   b. The proposal is consistent with other applicable regulations and standards.
   c. The proposal outlines tree resource mitigation per the requirements of 16.18.XXX Mitigation.

2) Except as provided for by this chapter, any applicable activity or action that cannot adequately mitigate its impacts to tree resources through on-site mitigation or substitute mitigation, given the provisions in BIMC 16.18.XXXX Mitigation, shall be denied.

3) **Application Required.** Any action or activity nearby trees or their critical root zones, unless an exempt activity pursuant to BIMC 16.18.XXX Exemptions, requires submittal of the City's Master Land Use application, with either minor or major tree permit checked, to the Department of Planning and Community Development in accordance with the requirements outlined in the City's administrative manual for land use permits. The applicant shall not be granted any approval or permission to perform action or activity as identified in 16.18.XXX Applicability, prior to fulfilling the requirements of this chapter.

4) Support information required. All required supporting information for tree permit applications shall include necessary forms and reports identified in 16.18.XXX Activities Requiring a Tree Permit.

12.9 MITIGATION & PERFORMANCE STANDARDS

1) **Purpose.** The purpose of tree resource mitigation is to maintain the function of the community forest throughout the city while maintaining canopy coverage goals within zone districts.

2) **Requirements.** When any action or activity removes, destroys or disfigures a living tree resource not exempt or allowed through this section, mitigation is necessary. The following minimum mitigation and performance standards shall be met when mitigation is required. All mitigation should attempt to fully regain lost tree benefit capacity through some manner, as described in below.
   a) Both minor and major tree permits require mitigation as identified below.

3) **Mitigation Methods.**
   a) **On-site mitigation.** Where on-site mitigation of lost tree resources is feasible, this shall be the preferred method.
      i) **Requirements.**
         (1) A completed Tree Resource Functional Assessment of the tree resource and Mitigation plan shall be submitted with a tree permit. Approved mitigation plan shall seek to compensate for lost resources as determined through the Tree Resource Functional Assessment and outlined in a replanting plan.
      ii) **Performance Standards.**
         (1) All replacement trees shall be native or equivalent trees. Replacement trees shall attempt to regain the majority of lost tree size and tree function of removed trees.
         (2) The Mitigation plan shall include a five (5) year monitoring plan for replacement trees.
            (a) Five annual inspections of replacement trees shall be conducted by an ISA-Certified Arborist or Tree Risk Assessment Qualified professional.
            (b) If trees installed to meet the requirements of this section are dead, in decline, or are untreatably diseased, they must be replaced according to the monitoring plan.
            (c) Installed trees must be irrigated during the summer with 8-12 gallons of water per inch of tree diameter per week, or otherwise recommended by an ISA-Certified Arborist.
            (d) Installed trees shall be mulched with wood chip or mulch, according to published ISA Best Management Practices.
            (e) Tree shall be structurally pruned at least once in the five years of monitoring, according to published ISA Best Management Practices.
            (f) After the five successful annual inspections, applicant must submit annual reports the City municipal arborist or director's designee and replanted trees shall be considered established.
         (3) If trees installed to meet the requirements of this section require replacement, the city municipal arborist or director's designee may require a performance surety from the applicant, valued at 200% the methods of 16.18.XXX.(3).(c) Tree Diameter Valuation. If tree mortality continues, this surety shall be invested into the Bainbridge Island Tree Fund.
      iii) **Alternatives.** Substitute mitigation can be used instead of on-site mitigation given the following circumstances:

(1) Development or land-use application where an ARPA has been designated and properly conserved, and where additional mitigation or conservation of tree resources would conflict with permitted land-use applications.
(2) As verified and documented by a resource professionals, the specific parcel is unequipped to sustain additional tree resources in their mature stage, or equally, the installation of new trees will subtract from the limited natural resources on site and potentially over-compete with other established trees, with the potential to cause or perpetuate tree disease or decline.
(a) A report from a resource professional documenting this is necessary and shall be submitted with a tree permit. This report shall be evaluated for accuracy by the city municipal arborist, resource professionals from city staff or a third party at the cost of the applicant.

b) **Subsitute mitigation** shall be used when on-site mitigation is determined to be insufficient to replace lost tree resources or on-site mitigation is unlikely to restore lost tree resource functionality and investment into the Bainbridge Island Tree Fund is required. This determination shall be made by the City municipal arborist or director's designee, or another Certified Arborist representing the land owner.
i) **Requirements.**
(1) A completed Tree Resource Functional Assessment and Mitigation plan shall be submitted with a major tree permit. Approved mitigation plan shall describe valuation methods used according to 16.18.XXX.(4) Valuation Methods.
(2) Applicant shall demonstrate how substitute mitigation is the most sustainable and long-term method of mitigating for tree resource loss.
(3) Applicant shall invest into the Bainbridge Island Tree Fund a dollar amount equal to the valuation method result noted in 16.18.XXX.(4) Valuation Methods.

4) **Valuation Methods.**
a) **Tree diameter valuation** shall be used when BIMC, outside of 16.18, refers to any tree valuation methodology. Tree diameter valuation shall be used instead of the prior tree valuation methodologies.
i) Tree diameter valuation shall be calculated from the Tree Resource Functional Assessment rating and tree DBH in inches, as noted in Table 16: Tree Diameter Valuation Costs, below.

Table 16: Tree Diameter Valuation Costs

TRFA Rating	Value per inch of DBH
Landmark	$250 per inch of DBH
Exceptional	$125 per inch of DBH
Typical	$100 per inch of DBH
Poor	$75 per inch of DBH

b) **Functionality valuations** shall be used for all other tree valuation purposes.

5) **Table 17: Tree Functionality Valuation Costs**

TRFA Rating	Value per Square Foot of Canopy Volume
Landmark	$1.80 per square foot
Exceptional	$0.90 per square foot
Typical	$0.70 per square foot
Poor	$0.50 per square foot

12.10 BAINBRIDGE ISLAND TREE FUND

1) **Established** A special revenue fund to be designated as the "tree fund" is established to receive special revenues supporting the City's tree program, including efforts to maintain or increase the tree canopy on Bainbridge Island, encouraging a street tree program, or similar efforts, and to provide segregated accounting and control for expenditure of monies (Ord. 2015-05 § 1, 2015). There is hereby established a City of Bainbridge Island Tree Bank that shall receive payments made by property owners in lieu of planting additional tree canopy cover as approved by the City arborist or municipal forester, in addition to forfeited bonds and forfeited escrow funds.

2) **Accounting** within the tree fund shall segregate revenues and expenditures so that funds shall be used to support the City's tree-related activities (Ord. 2015-05 § 1, 2015). Funds in the tree fund shall be administered by the head of the City Director, head of the community forestry department, or his/her designee.

3) **Definitions** as established in BIMC Titles 16, 17 and 18 shall apply here (Ord. 2015-05 § 1, 2015). Where is it impractical or impossible to fully meet tree canopy requirements for a site, the portion of the canopy that cannot be accommodated on the site may be satisfied by payment into the tree fund that shall be made prior to issuance of a minor or major tree permit. The amount of payment shall be calculated using the Tree Resource Functional Assessment (TRFA) and its applicable rates as defined in the administrative manual.

4) **Functions and Disbursements**
   a) The Bainbridge Island tree fund is intended to accept funds from sources that include, but are not limited to, private donations, public allocations and the proceeds from the payment of tree-related code enforcement actions (Ord. 2015-05 § 1, 2015). The tree fund monies shall be available for use by the City for establishment, maintenance, and expansion of tree canopy cover on public property and through programs on private property.

b) The Bainbridge Island Tree Fund is intended to support conservation and as such, expenditure of tree fund monies shall be permitted for various activities related to conservation including, but not limited to:
   i. Support the City's Community Forestry Department and City's municipal arborist functions.
   ii. Support the city's tree program (Ord. 2015-05 § 1, 2015);
   iii. Provide direct financial and technical assistance to qualified projects (Ord. 2015-05 § 1, 2015);
   iv. Provide financial assistance to public and private nonprofit organizations supporting activities consistent with city policy (Ord. 2015-05 § 1, 2015);
   v. Fund approved, eligible operating expenditures related to the provision of assistance covered by this chapter (Ord. 2015-05 § 1, 2015).;
   vi. Purchase, planting and care through establishment of trees;
   vii. Maintenance of trees during establishment period;
   viii. Funding tree and forest care programs.

5) **Reporting.** A separate written report on the financial status of the city of Bainbridge Island tree fund shall be available upon request at the conclusion of each financial year (Ord. 2015-05 § 1, 2015).

12.11 TREE RESOURCE REPORTS

1) **Arborist reports** must meet the following requirements.
   a) Arborist reports submitted must be written by a current ISA-Certified Arborist. The city may request additional information or technical review from qualified ISA-Certified Arborist at the applicant's expense to ensure best-management-practices and best-available-science are being applied.
   b) An arborist report must include the following site plan and site-specific narrative report:
      i) Site plan can be hand-drawn, or rendered to a 10-foot approximation and shall include:
         (1) Location of all significant trees.
         (2) Areas of proposed actions.
         (3) Limits of construction and existing and proposed grade changes, if applicable.
         (4) Location and species of tree(s) proposed for removal and replanting, if applicable.
         (5) Location of trees and Critical Root Zones of all trees within the limits of construction and area of grade changes, if applicable.
      ii) Narrative report shall include:
         (1) General site and parcel characteristics, including zoning and land use.
         (2) Resource inventory classifying tree and vegetation characteristics.
         (3) Simple narrative describing the proposed action and describing measures taken to avoid, minimize and reduce adverse impacts to identified trees.
         (4) Completed Tree Resource Function Assessment
         (5) Assessment of any potential damage to tree(s) whose critical root zone is within the limits of construction and area of grade changes, if applicable.
         (6) Description of tree(s) and vegetation proposed for removal and replanting, if required, including size, species and condition.

(7) Description of mitigation and tree protection measures for trees and vegetation to be retained through construction.
(8) Planting plan including location, species and size of trees and vegetation to be replanted, if required.
(9) Description of performance standards and monitoring actions (e.g., plant survival count, percent canopy coverage estimate) sufficient to document success of any required mitigation action.

2) **Arborist pruning specifications** must meet all general requirements in the current revision of the ISA's Best Management Practices Pruning, and must also meet the following requirements:
   a) Report must be verbally addressed or written by a current ISA-Certified Arborist. The city may request additional information or technical review from qualified ISA-Certified Arborist at the applicant's expense to ensure best-management-practices and best-available-science are being applied.
      i) If work will be conducted by the prescribing ISA-Certified Arborist, a verbal prescription is sufficient.
      ii) If work will be conducted by a non-ISA-Certified Arborist, a written prescription is required.
   b) Pruning prescription must contain:
      i) Size, species and health of trees, if necessary, to distinguish trees, include a brief site plan of trees to be pruned.
      ii) Include statement that all work shall be performed in accordance with the ANSI A300 pruning standard and ANSI Z133.1 safety standard.
      iii) Provide clearly defined pruning objectives.
      iv) Specify the pruning methods to be performed to meet objectives.
      v) State the size and specifications of the minimum and/or maximum branch size to modify.
      vi) Specify the maximum amount to living tissue that can be removed.

3) **Tree risk assessment (TRA) reports** must meet the following requirements.
   a) Report must be written by a current Tree Risk Assessment Qualified professional. The city may request additional information or technical review from qualified tree resource professionals or other agencies at the applicant's expense to ensure a tree's high- or imminent-risk.
   b) A TRA must include the following site plan and tree-specific narrative report:
      i) Site plan can be hand-drawn, or rendered to a general approximation and shall include:
         (1) Location of all significant trees addressed in the report.
         (2) Locations of existing buildings and targets.
         (3) Limits of construction and existing and proposed grade changes, if applicable.
         (4) Location and species of tree(s) proposed for removal and replanting, if applicable.
      ii) Narrative report shall include all general requirements from the most current version of ANSI A300 (Part 9): Tree Risk Assessment a. Tree Failure.
         (1) Date of inspection.
         (2) Identification of assessor and qualifications.
         (3) Tree parts assessed and not assessed.
         (4) Limits of tree-specific risk assessment.
         (5) A description of findings and methodology.

(6) Level of tree risk assessment used to rate tree risk.
(7) Targets associated with tree risk.
(8) Time frame for rated risk.
(9) Risk mitigation options and residual risk associated with mitigation options.

4) **Forest stewardship plans (FSP)** must meet the following requirements.
   a) Forest stewardship plans may be completed by the property owner. The city may request additional information or technical review from qualified tree resource professionals or other agencies at the applicant's expense to ensure no reduction in net canopy.
   b) Forest stewardship plans should be written to manage tree resources for a 10-year time-frame.
   c) An FSP must include the following site plan and site-specific narrative report:
      i) Site plan can be hand-drawn, or rendered to a 10-foot approximation and shall include:
         (1) Location and dimensions of proposed development within ARPA
         (2) Limits of construction and existing and proposed grade changes
         (3) Location and species of tree(s) proposed for removal and replanting, if applicable.
      ii) Narrative report shall include:
         (1) Resource inventory classifying tree and vegetation characteristics.
            (a) Include forest structure, forest composition, varying tree cohorts, species and canopy dominance.
            (b) Include an inventory of invasive and exotic plants within the parcel.
            (c) Include a list of forest diseases and pests within the forest, and other forest health concerns.
            (d) Current canopy cover estimation.
            (e) Completed Tree Resource Function Assessment.
            (f) Forest prescriptions or treatments and timeline.
            (g) Statement on how the proposed forest prescriptions will affect the natural resource functions.

5) **Mitigation plans** must meet the following requirements.
   a) Mitigation plans must be completed by a tree resource professional. The city may request additional information or technical review from qualified tree resource professionals or other agencies at the applicant's expense to ensure no net loss in canopy goals.
   b) A mitigation plan should outline how a permit applicant wishes to mitigate for lost tree resources as described in 16.18.XXX Mitigation.
   c) At a minimum, mitigation plans should contain a site plan and narrative report identifying how tree resources are being affected and how the applicant wishes to mitigate for those affected resources:
      i) Site plan can be hand-drawn, or rendered to a 10-foot approximation and shall include:
         (1) Location of all significant trees.
         (2) Areas of proposed actions.
         (3) Locations of impacted tree resources.
         (4) Locations of restoration, if applicable.
      ii) A narrative report must contain the following information:

(1) General site and parcel characteristics, including zoning and land use.
(2) Resource inventory classifying tree and vegetation characteristics.
(3) Completed Tree Resource Functional Assessment.
(4) Simple narrative describing the proposed action and describing measures taken to avoid, minimize and reduce adverse impacts to identified trees.
(5) Mitigation planned to be used to offset impacts (as necessary dependent on mitigation used):
    (a) Planting plan including location, species and size of trees and vegetation to be replanted, and planting specifications, if required.
    (b) Monitoring and contingency plan identifying how trees will be monitored through establishment and how long trees will be monitored. Include specifications on irrigation, mulching, plant healthcare and other relevant tree management information.
        (i) Description of performance standards and monitoring actions (e.g., plant survival count, percent canopy coverage estimate) sufficient to document success or failure of any required mitigation.
        (ii) A contingency plan if performance standards a are not reached.
(6) Monetary valuation of individual tree or tree stand per standards in 16.18.XXX Mitigation.

12.12 VARIANCE PROCEDURE

1) A property owner or their agent may apply for a variance to applicable requirements in this chapter by demonstrating greater functionality, safety, or ecosystem values can be obtained through the use of different standards, practices or procedures. Such applications must be made in writing and submitted to the Director or their designee, who may require review of the application by City Municipal Arborist or other qualified consultants, at the cost of the applicant.
2) Such variance applications will be granted, granted with conditions, or denied within 90 days of the date the application is received by the City.

12.13 RESONABLE USE EXCEPTIONS

1) **Applicability and Intent.** The purpose of the reasonable use exception (RUE) process is to allow reasonable use of property and explore alternatives to development that would be permitted in accordance with the underlying zoning designation and standards. An applicant may request a RUE pursuant to this section when a Major Tree Permit pursuant to BIMC Chapter 16.18.XXX demonstrates that:
    a) The subject property is encumbered to such an extent by the requirements of this chapter that application of this chapter would deny all reasonable use of the subject property;
    b) Reasonable use of the subject property cannot be achieved through tree resource mitigation, (BIMC 16.18.XXX) or a forest stewardship plan (BIMC 16.18.XXX);

2) **Review Alternatives.** During the preapplication process, the city Community Forestry Department or other designee may:
    a) Determine whether the property qualifies for inclusion in any program that would eliminate the need for a RUE including, but not limited to, transfer or purchase of development rights, mitigation

banking, and open space acquisition or other conservation mechanism. If the property qualifies for inclusion in one or more of such programs, the director shall notify the applicant in writing of such qualification and of the applicable rules and regulations and shall send an application form for inclusion in such program(s). If the property is included in one or more of such programs, a RUE application is not required; or

b) Determine to offer to purchase the development rights rather than grant a RUE, and the applicant, at his/her sole discretion, may agree to sell said development rights rather than pursue a RUE.

3) **RUE Request and Review Process.** An application for a Tree Resource RUE shall include the city's Major Tree Permit application; a Certified Arborist or other resource professional report, including mitigation plan, if necessary; and any other relevant information and reports that are necessary, as determined by the Community Forestry Department, or director, to process and prepare the recommendation on the application, such as permit applications to other agencies, special studies, and environmental documents prepared pursuant to the State Environmental Policy Act, Chapter 43.21C RCW (SEPA documents).

4) **Reasonable Use Review Criteria.** Criteria for review and approval of reasonable use exceptions are as follows:
   a) The application of this chapter would deny all reasonable use of the property;
   b) There is no reasonable alternative to the proposal with less impact to tree resources;
   c) The proposal minimizes the impact on tree resources in accordance with mitigation sequencing (BIMC 16.20.030);
   d) The proposed impact to the tree resources is the minimum necessary to allow reasonable use of the property;
   e) The inability of the applicant to derive reasonable use of the property is not the result of actions by the applicant, or of the applicant's predecessor, that occurred after February 20, 1992;
   f) The proposed total lot coverage does not exceed 1,200 square feet for residential development;
   g) The proposal does not pose an unreasonable threat to the public health, safety, or welfare on or off the property;
   h) The proposal protects the tree resource functions and values consistent with the best available science and results in no net loss of critical area functions and values;
   i) The proposal addresses cumulative impacts of the action; and
   j) The proposal is consistent with other applicable regulations and standards.

5) **Payments in-lieu.** All REU applications approved by the director or designee shall follow compensatory mitigation standards outlined 16.18.XXX. All REU applications are required to pay normal tree resource mitigation fees. Payments will be added to the Bainbridge Island Tree Fund and used as outlined in 16.18.XXXX (Bainbridge Island Tree Fund).

6) **Burden of Proof.** The burden of proof shall be on the applicant to bring forth evidence in support of the application and to provide sufficient information on which any decision has to be made on the application. The standard for the burden of proof shall be clear and convincing evidence.

12.14 ADMINISTRATION

(To be completed by the City Attorney and Department of Community Development.)

1) Interpretation
2) Procedures
3) Suspension
4) Other Laws & Regulations
5) Conflict
6) Severability

12.15 COMPLIANCE AND ENFORCEMENT

1) **It is a violation of this chapter** for any person to fail to comply with a requirement of this chapter. It is further a violation of this chapter for any person to:
    a. Initiate or maintain, or cause to be initiated or maintained, the use, construction, placement, alteration, or demolition of any structure, land, property, or tree within the city without first obtaining permits or authorizations required by this chapter, or in a manner that violates the terms or conditions of such permits or authorizations;
    b. Misrepresent any material fact in any application, plans or other information submitted to obtain permits or authorizations under this chapter; or
    c. Remove or deface any sign, notice, complaint, or order required by or posted in accordance with this chapter.

2) **When a tree has been altered, impacted, damaged or disturbed** in violation of this chapter, all ongoing activity shall stop. If through proper arboricultural restorative pruning practices as determined by the city's municipal arborist or another ISA-Certified Arborist, the altered, impacted or damaged tree can be restored, it should be. Th cost for such restorative pruning shall be at the cost of the violator, and the cost is to be shared between the party requesting services and the party performing services. The city shall have the authority to issue a stop work order to cease all ongoing development work, and order restoration, rehabilitation, or replacement measures at the owner's or other responsible party's expense to compensate for violation of provisions of this chapter.

3) **Mitigation plan required.** All development and/or tree activity work shall remain stopped until an appropriate mitigation plan is submitted and approved by the director. Such a plan shall be prepared by a qualified professional using the best available science and shall describe how the actions proposed meet the minimum requirements 16.18.XXX (Mitigation). The director shall, at the violator's expense, seek expert advice in determining the adequacy of the plan. Inadequate plans shall be returned to the applicant or violator for revision and resubmittal.

4) **Minimum performance standard for tree mitigation.**
    a. Where a significant tree has been altered, impacted, damaged or disturbed but is not removed, the following minimum performance standards shall be met for the restoration of the tree; provided, that if the violator can demonstrate that greater tree resource function or values can be obtained through the application of different standards, these standards may be modified:
        i. The functional values of the tree shall be restored, including ecosystem benefits, economic benefits, human and social benefits;
        ii. Information demonstrating compliance with canopy cover goals in BIMC 16.18.XXXX shall be submitted to the director or community forest department.
        iii. All pruning plans and prescriptions shall include a detailed estimate of the cost for implementation of the mitigation plan.

    b. Where a significant tree has been removed or otherwise killed, the following minimum performance standards shall be met to mitigate for lost tree resources; provided, that if the violator can demonstrate that greater tree resource function or values can be obtained through the application of different standards, these standards may be modified:
        i. The violator shall pay an amount equal to 200% the resulting value of the trees as calculated in 16.18.XXX Mitigation. This sum shall be paid to the Bainbridge Island Tree Fund, additionally, on-site mitigation must include the following:
        ii. Information demonstrating compliance with canopy cover goals in BIMC 16.18.XXXX shall be submitted to the director or community forest department.

5) **Site investigations.** The director or authorized designee is authorized to make site inspections and take such actions as are necessary to enforce this chapter. The director or authorized designee shall present proper credentials and make a reasonable effort to contact any property owner before entering onto private property.

6) **Penalties.** Any development or activity carried out contrary to the provisions of this chapter shall constitute a public nuisance and may be enjoined as provided by the statutes of the State of Washington. Enforcement of this chapter and the imposition of penalties for violations of this chapter shall be as provided for in Chapter 1.26 BIMC; provided, that in addition to the civil penalties provided for in BIMC 1.26.090, an additional penalty shall be imposed on any person, party, firm, corporation, property owner, or other legal entity who fails to complete a required mitigation plan, who conducts any alteration, impact, damage or disturbance of a tree resource violation of this chapter, or who is otherwise in violation of this chapter, including a violation of BIMC 16.20.090.E.

    For such violations, the additional penalty shall be in the amount equal to 200% of the cost of restoration as approved under a mitigation plan pursuant to 16.18.XXX Mitigation for a minor violation and a minimum of $2,500 for a major violation. The director or head of the community forest department shall determine whether the disturbance is a minor or major violation. Any person, party, firm, corporation, or other legal entity who knowingly and willfully refuses to complete a required

restoration pursuant to 16.18.XXX Mitigation above shall be guilty of a misdemeanor punishable by not more than 30 days in jail and/or not more than a $1,000 fine.

For landmark tree violations resulting in the removal, destruction, or lethal damage to a landmark tree, as defined in this chapter, in addition to the civil penalties imposed under BIMC 1.26.090, an additional civil penalty will be imposed on person, corporation, or other legal entity. This additional civil penalty will be in the amount of $25,000 for each landmark tree removed. The City Attorney will take appropriate action to collect this additional civil penalty.

13. APPENDIX C: BIMC CHAPTER 18.15.C TREE RETENTION, PROTECTION AND REPLACEMENT

C. **General Regulations** Tree Retention, Protection and Replacement.

Where Table 18.15.010-1 indicates that development must comply with the requirements of this subsection C, all development shall comply with the following requirements. These requirements are intended to supplement any regulations in Chapters 16.12 (Shoreline Master Program) and 16.20 (Critical Areas) BIMC, which remain the primary source of regulation for environmentally sensitive areas in Bainbridge Island. In the event of any inconsistency between the requirements of this subsection C and the requirements of Chapters 16.12 and 16.20 BIMC, the requirements of Chapters 16.12 and 16.20 BIMC shall apply.

Definitions from 16.18 shall be incorporated into this section. When a conflict arises, the definition from this chapter shall apply.

1) **Retention.**

   a) **Intent.** The intent of these regulations is to preserve the forested character of the Island by preserving existing vegetation, trees and tree stands, and incentivizing tree protection and replacement in certain districts through a tree unit system, thereby mitigating the development impacts of increased stormwater runoff, impervious surface, and loss of carbon dioxide absorption capacity. This shall be accomplished in a manner consistent with the comprehensive plan and the requirements of Washington law and to discourage the removal of significant tree(s) and tree stands.

   b) **Perimeter Tree Retention Requirements.** Trees and tree stands located in the perimeter areas required to be landscaped pursuant to subsections D and E of this section shall be retained and protected as described in subsection C.4 of this section, unless an applicant can demonstrate during the land use permit review process that the existing trees and vegetation will be compromised after the development is complete, and would likely become hazardous as described in subsection C.1.c of this section. If the applicant can demonstrate that hazard, then new trees and vegetation may be planted pursuant to the planting standards of subsection D.4 of this section. Perimeter landscape widths may be averaged to save significant trees but shall not be reduced to less than the allowed minimum perimeter dimension.

   c) **Exceptions.** Significant trees and tree stands may be removed if it is determined by a Tree Risk Assessment Qualified professional, and whose services are paid for by the applicant, that the tree is:

      i) A high-risk or imminent-risk with less than a two-year risk time frame and evaluated through a Level 2 or Level 3 risk assessment.

      ii) Tree evaluation must contain all potential mitigation options, and their residual risks, including, but not limited to, wildlife tree conversion, cabling/bracing and pruning.

iii) A tree risk assessment report as identified in 16.18.XXX Tree Resource Reports shall be submitted to the city prior to approval.

d) **Protection of Tree Stands.** Notwithstanding a determination under subsection C.1.c of this section, if trees have been removed from a closed, forested location, a buffer of smaller trees shall be retained or planted on the fringe of the closed, forested area. The buffer of smaller trees shall be adequate to protect the health of the remaining mature trees in the closed, forested area, as determined and specified by a Certified Arborist, and whose services are paid for by the applicant.

2) **Replacement.**

a) **Intent.** The intent of these regulations is to discourage the unauthorized removal of established tree(s), significant tree(s), tree stands and reduce overall canopy loss in the community; and to establish a replacement or fine if such activity occurs.

b) All replanting plans must be prepared by a Landscape Architect licensed by the State of Washington or a Certified Arborist. All replanting plans which involve the installation of trees must be reviewed by a Certified Arborist for species form and tolerance, placement and soil requirements and installation requirements.

c) **Requirements for Unauthorized Removal.** If trees required to be retained pursuant to subsection C.1 of this section are not retained or if protection measures described in subsection C.4 of this section are not fully implemented, they shall be replaced by at least the required tree units and be monitored by a Certified Arborist for a duration of 5 years, or less if a Certified Arborist has determined they are healthy and established. If the replacement trees are dead, dying, untreatably diseased, or declining, they must be replaced.

(1) The trees removed shall be replaced with trees of the same foliage, evergreen or deciduous. Native shrubs and ground cover shall also be replaced when replacing tree stands due to unauthorized removal. Shrubs shall be one-gallon size planted four feet on center spacing; ground cover shall be one-gallon size planted three feet on center spacing. The shrubs and ground cover shall be planted within the limits of the previous tree stand canopy.

(2) A Replacement Tree Monitoring and Contingency Plan written by a Certified Arborist or other natural resource professional is required, and must be received and approved by the city, prior to restoration. A Certified Arborist or other natural resource professional may modify the planting strategies above, if site specific qualities would affect tree survival or long-term tree health.

d) **Requirements for Permitted Removal.** A property owner may request removal of trees required to be retained pursuant to this chapter by applying for a major tree permit (Chapter 16.18 BIMC).

(1) The major tree permit application shall include a replanting plan written by a Certified Arborist or Landscape Architect consulting with a Certified Arborist. In designing the replanting plan, the professional must consider what ecological, landscape and social functions the tree(s) to be removed are serving on the property (e.g., water quality improvement, wildlife habitat, noise

attenuation, parking lot, street tree, perimeter screening), and what tree species and location(s) for replanting replaces that lost tree function. New planting areas may need to be created to achieve this goal.

3) **Enforcement and Penalties.** Failure to retain, replace or transplant trees will be enforced as follows; provided, that any fine shall be no less than three times the value of the lost tree canopy, as determined by the 16.18.XXX Mitigation.

If unauthorized tree(s) or vegetation removal occurs within the public right-of-way, all permits in force on the subject property shall be suspended and no new permits issued until the tree(s) or vegetation has been replaced or all penalties have been satisfied. The director is authorized to make site inspections and take such actions as are necessary to enforce this title in accordance with Chapters 1.16, 1.24, and 1.26 BIMC.

Tree plan review processes and tree removal inspections must be reviewed by a Certified Arborist. The director may require an evaluation by a qualified engineer, landscape architect, soils engineer, testing lab, or other specialist at any time during the tree plan review process or tree removal inspection as necessary to ensure compliance with the provisions of this chapter and/or the terms of the clearing permit. Applicant shall be responsible for any associated costs.

a) **Notice of Infraction.** It is unlawful for any person to:

i) Initiate or maintain, or cause to be initiated or maintained, the use, construction, placement, removal, alteration, or demolition of any structure, land, tree, vegetation or property within the city contrary to the provisions of this chapter.

ii) Misrepresent any material fact in any application, plans or other information submitted to obtain permits or authorizations under this title or not following the conditions of an approval.

iii) Remove or deface any sign, notice, complaint, or order required by or posted in accordance with this chapter.

iv) Fail to submit or implement a planting plan as required by this section.

b) **Stop Work Orders.** The city shall have the authority to issue a stop work order to cease all development work, and order restoration, rehabilitation, or replacement measures, including applicable sureties, at the owner's or other responsible party's expense to compensate for the use, construction, placement, removal, alteration, or demolition of any structure, land, vegetation or property within the city contrary to the provisions of this chapter.

c) **Additional Remedies.** In addition to any other remedy provided by this chapter or under the BIMC, the city may initiate injunction or abatement proceedings or any other appropriate action in courts against any person who violates or fails to comply with any provision of this chapter to prevent, enjoin, abate, and/or terminate violations of this title and/or to restore a condition which existed prior to the violation. In any such proceeding, the person violating and/or failing to comply with any provisions of

this chapter shall be liable for the costs and reasonable attorneys' fees incurred by the city in bringing, maintaining and/or prosecuting such action.

d) **Notice of Infraction.** Except as provided in subsection C.3.f of this section, conduct made unlawful by the city under this chapter shall constitute a civil infraction and is subject to enforcement and fines as provided in BIMC 1.26.035, and additionally, is subject to fines as provided in Table 18.15.010-2. A civil infraction under this section shall be processed in the manner set forth in Chapter 1.26 BIMC.

e) **Civil Penalty.**

i) In addition to any civil infraction fine, criminal penalty, and/or other available sanction or remedial procedure, any person engaging in conduct made unlawful by this chapter shall be subject to a cumulative civil penalty in the amount of $1,000 per day for each violation from the date set for compliance until the date of compliance. Any such civil penalty shall be collected in accordance with BIMC 1.26.090.

ii) A person who fails to comply with the requirements of this chapter or the terms of a permit issued hereunder, who undertakes an activity regulated by this chapter without obtaining a permit, or fails to comply with a cease and desist or stop work order issued under this chapter shall be subject to a civil penalty as set forth in Table 18.15.010-2. Each unlawfully removed or damaged tree shall constitute a separate violation.

iii) Any person who aids or abets in the violation shall be considered to have committed a violation for purposes of the civil penalty.

iv) In addition to the penalties addressed under subsection C.3.e.ii of this section, failure to retain, replace or transplant trees will be enforced as provided in this code; provided, that any financial penalty assessed will be the greater of the amount indicated in Table 18.15.010-2 or three times the value of the trees according to 16.18.XXX Mitigation. The director may elect not to seek penalties if he or she determines that the circumstances do not warrant imposition of civil penalties in addition to restoration.

Exception to director's discretion statement above: Any tree identified on a development project's required landscaping plan as retained and given a monetary value per subsection G.3.a.iii of this section that is removed or dies during the surety period due to improper protection during construction, shall be subject to an automatic fine of three times the tree's stated value according to 16.18.XXX Mitigation. All of the project's active permits shall also be suspended until the fine is paid and all restoration work completed.

f) **Repeat Offenders.** Any person who again violates this chapter within 12 months after having been found by the Bainbridge Island municipal court to be in violation of this chapter commits a misdemeanor and any person who is convicted of that misdemeanor shall be punished as provided in BIMC 1.24.010.A.

Table 18.15.010-2: Penalties

Types of Violations	Allowable Fines per Violation
1. Removal of tree(s) approved to be removed, but prior to final tree retention and planting plan approval or issuance of a city tree removal permit	$100.00 per tree
2. Removal or damage of tree(s) that are or would be shown to be retained on an approved tree retention and planting plan or any other violation of approved tree protection plan	$1,000 per tree
3. Removal of tree(s) without applying for or obtaining a required city land use permit	$1,000 per tree
4. Removal of tree(s) without applying for or obtaining a required city clearing permit	$1,000 per tree
The financial penalty will be the amount indicated in this table or three times the value of the trees, as determined by 16.18 Tree Valuations Methods, whichever is greater, pursuant to subsection C.3.e.iv of this section.	

4) **Protection During Construction and Development.**

a) **Intent.** The intent of these regulations is to provide the best protection for existing vegetation, trees and tree stands, including protection for trees on adjacent properties, protection of LID BMPs during construction and development activities, and preservation of the ecological, landscaping and social functions of the area's trees, vegetation and soils.

b) **Requirements.**

i) No cutting of trees shall be allowed on a site until the tree retention and planting plans have been approved by the director and a clearing, grading or building permit issued.

ii) In order to preserve future ecological function, the applicant shall identify areas of prohibited disturbance, corresponding to the critical root zone, as identified by a Certified Arborist, of the existing vegetation, trees and/or tree canopy of tree stands to be retained, buffers, areas of existing vegetation to be maintained, future LID BMPs, and future planting areas larger than 400 square feet (i.e., landscape islands in parking lots). The prohibited disturbance areas shall be reviewed and approved by the director as part of the land use permit review process.

iii) A temporary five-foot-high chain link fence with tubular steel poles or "T" posts shall delineate the area of prohibited disturbance defined in subsection C.4.b.ii of this section, unless the director has approved the use of a four-foot-high plastic net fence as an alternative. The fence shall be erected and inspected by city staff before clearing, grading and/or construction permits are issued and shall remain in place until construction has been completed and shall at all times have affixed to it a sign indicating the protected area.

iv) No impervious surfaces, fill, excavation, vehicle operations, compaction, removal of native soil or storage of construction materials shall be permitted within the area defined by the required construction fencing. If avoiding construction and compaction in future planting areas is

unavoidable, the landscape plan for the project shall include methods for aerating and/or augmenting compacted soil to prepare for new planting, pursuant to subsection H.2 of this section.

v) A rock well shall be constructed if the grade level around the tree is to be raised more than one foot. The inside diameter of the well shall be equal to the diameter of the critical root zone, as identified by a Certified Arborist, of the tree or tree canopy of tree stands.

vi) Grade levels beyond one foot must be consulted on and be recommended by a Certified Arborist.

vii) Alternative protection methods may be used if recommended by a Certified Arborist and determined by the director to provide equal or greater tree protection.

viii) Wherever this subsection C.4 allows or requires the involvement of a Certified Arborist, that individual shall be selected through the International Society of Arboriculture directory, or American Society of Consulting Arborists directory, and his or her services shall be paid for by the applicant.

ix) Protect LID BMPs during construction and development activities in accordance with Chapter 15.20 BIMC.

5) **Modification of Requirements.** If the significant tree and tree stand retention requirements of this section create an unnecessary hardship, the applicant may request a modification. The director may administratively (1) approve a modification of, or (2) approve compensatory mitigation, as defined in 16.18.XXX Mitigation, of the significant tree and tree stand requirements of this section, if the director finds that the following standards have been met:

a) The modification is necessary because of special circumstances relating to the location of existing significant trees and tree stands that prevent compliance with this section; and

b) The special circumstances of the subject property make the strict enforcement of the provisions of this section an unnecessary hardship to the property owner; and

c) The special circumstances of the subject property are not the result of the actions of the applicant; and

d) The approving of the modification will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and land use district in which the subject property is located; and

e) The modification is consistent with the purpose and intent of this chapter; and

f) The site design incorporates the retention of other natural vegetation in consolidated locations that promotes the natural vegetated character of the site.

14. APPENDIX D: BIMC CHAPTER 18.15.G – TOTAL SITE TREE UNIT REQUIREMENTS

G. Total Site Tree Unit Requirements.

1) **Intent.** The overall purpose of this section is to preserve the landscape character of the community through development standards by encouraging the retention of existing vegetation, significant trees and tree canopy cover by incorporating them into site design. The intent of this subsection G is to ensure that, to the degree practicable, (a) each development approval in the MUTC, HSR I and II, R-5, R-8, R-14, and NC zone districts, and (b) each development approval for nonresidential development property in the R-5, R-4.3, R-3.5, R-2.9, R-2, R-1, and R-0.4 zone districts, and (c) new and existing single-family residential development in the R-2.9, R-3.5, and R-4.3 zone districts leaves the development parcel with at least a specified minimum amount of tree canopy coverage, measured by provisions in 16.18.XXX Canopy Cover Goals. ~~that reflects the degree of tree coverage prior to development or redevelopment and that discourages avoidable site disturbances that would require tree removal.~~

2) **Applicability.** The regulations of this subsection G apply to development applications involving (a) any modification to a parcel located in the MUTC, HSR I and II, R-5, R-8, R-14, or NC districts, (b) a permitted nonresidential development in the R-5, R-4.3, R-3.5, R-2.9, R-2, R-1, and R-0.4 zone districts, and (c) new and existing single-family residential development in the R-2.9, R-3.5, and R-4.3 zones. Canopy which extends over property lines meets canopy cover goal requirements of Subsection 16.18.XXX Canopy Cover Goals.. These provisions shall not apply to projects involving only interior renovations of existing buildings.

   Definitions from 16.18 shall be incorporated into this section. When a conflict arises, the definition from this chapter shall apply.

3) **Site Specific Evaluation of Total Impact on Tree Coverage**.
   a) In order to show how the canopy cover requirements of subsection 16.18.XXX Canopy Cover Goals is being met, the applicant shall submit the following information as part of the landscaping plan information for a land use permit application:

      i) For new and existing single-family residential development in the R-2.9, R-3.5 and R-4.3 zone districts.
         (1) A Certified Arborist or Tree Risk Assessment Qualified professional shall conduct a tree inventory to include location, species identification, DBH and contributing canopy for each tree to be impacted;
         (2) Calculate and document the Tree Resource Functional Assessment (TRFA) rating (16.18.XXX) for each tree or tree stand to be impacted, including canopy volumes;

      ii) For all others
         (1) Survey all existing established trees and/or their canopies (whether fragmented or contiguous) to be retained as part of the proposed development.

(2) A Certified Arborist or Tree Risk Assessment Qualified professional shall conduct a tree inventory to include location, species identification, DBH and contributing canopy for each tree to be impacted;
(3) Calculate and document the TRFA rating (16.18.XXX) for each tree or tree stand to be impacted, including canopy volumes;
(4) The applicant shall submit valuation of all trees to be retained, compiled by a Certified Arborist, using the Tree Diameter Valuation method in 16.18.XXX Mitigation.

b) In determining which trees will be retained on a property to meet the canopy cover requirements pursuant to 16.18.XXX Canopy Cover Goals, an applicant shall retain an ISA-Certified Arborist to evaluate and make recommendations on health and the preservability of retained trees, and recommendations for tree removals. Trees with very low preservability due project impacts shall be removed or plans should be modified. The Certified Arborist shall attempt to retain trees whose critical root zones are least impacted, greater than 15 inches, trees in tree stands, and trees adjacent to tree stands on adjacent properties.

c) A major tree permit pursuant to Chapter 16.18 BIMC is required to request removal of any tree that is contributing to a property meeting the canopy cover goals requirements of section 16.18.XXX Canopy Cover Goals. Mitigation per 16.18.XXX Mitigation is required to offset tree resources removed from site.

4) **Requirements.**
a) A development application covered by subsection G.2 of this section shall only be approved if it complies with the requirements of subsections C (Tree Retention, Protection, and Replacement), D (Perimeter Buffering and Screening), E (Street Frontage Landscaping), and F (Parking Lot Landscaping) of this section, and also complies with all requirements of this section.

i) In the MUTC central core and ferry terminal overlay districts, the development parcel, following the proposed development or redevelopment, shall at minimum:
(1) Meet the canopy cover goals identified in 16.18.XXX Tree Canopy Goals, or through a landscaping plan reviewed by an ISA-Certified Arborist and approved by the city, show how replacement trees will meet canopy cover goals when mature.

ii) In the MUTC Ericksen Avenue, Madison Avenue, and gateway overlay districts, and each site in the R-8, R-14, HSR I and II, and NC districts, and for permitted nonresidential development in the R-5, R-4.3, R-3.5, R-2.9, R-2, R-1, and R-0.4 zone districts, the development parcel, following the proposed development or redevelopment, shall at minimum:
(1) Meet the canopy cover goals identified in 16.18.XXX Tree Canopy Goals, or through a landscaping plan reviewed by an ISA-Certified Arborist and approved by the City, show how replacement trees will meet canopy cover goals when mature.

iii) As an alternative to subsections G.4.a.i and ii of this section, and at the applicant's option and expense, and upon approval by the submission and approval of a major tree permit, applicant may

use the mitigation methods outlined in 16.18.XXX Mitigation to restore lost tree resources through substitute mitigation methods (16.18.XXX).

b) Existing and new trees in roadside, perimeter, and shoreline buffers and/or critical areas and their buffers do not count towards the tree canopy requirements of this section.

c) To reestablish tree canopy on site, the on-site mitigation requirements and performance standards found in 16.18.XXX Mitigation are required.

d) If, after complying with subsections C, D, E, and F of this section, additional trees need to be planted to meet the minimum TRFA requirements in subsection G.4 of this section:
   i) In the MUTC central core and ferry terminal overlay districts, those trees may be planted either at ground level or above ground level (such as a patio, terrace, or rooftop); and
   ii) In the MUTC Ericksen Avenue, Madison Avenue, and gateway overlay districts, R-8, R-14, HSR I and II, NC districts, as well as for nonresidential developments within residential districts, those trees shall be planted at ground level.
   iii) All replanting must include five years of monitoring, or until tree establishment, as determined by an ISA-Certified Arborist.

15. APPENDIX E: TREE REMOVAL FLOWCHART – TEMPLATE

This basic template can be used to develop a tree removal information sheet or flowchart.

1. Is the tree visibly and completely dead? (This does not include diseased or damaged trees.)
   a. You, an ISA-Certified Arborist or contractor may complete and submit "Dead and Lesser Tree Checklist" and provide it to the City.
   b. The submission is required to include a clear and identifiable electronic photo of the dead tree.
   c. The photo must be emailed to trees@bainbridgewa.gov.
   d. You will not receive confirmation from the City.
   e. You may remove the dead tree.

2. Is the tree assumed to be a risk?
   a. Contact a Tree Risk Assessment Qualified professional to assess your tree's risk and provide guidance.

3. Is the tree within 200 feet from the shoreline, near a wetland, stream, steep slope, or their buffers, or located in an open area or other protected area?
   a. Yes – Review 16.20, SMP or development documents.
   b. No – Go to (4).

4. Is the property developed or undeveloped?
   a. Developed – Go to (5)
   b. Undeveloped – Go to (6)

5. Is the developed property within the MUTC, Highschool, or High Density Residential -OR- Moderate Density Residential -OR- or Low Density Residential?
   a. MUTC/HS/HDR – MUTC/HS/HDR – If the tree or tree part is rated as a high or imminent risk by a Tree Risk Assessment Qualified individual, you are permitted to remove the tree or tree part.
   b. MDR – You are permitted to remove 3 healthy trees per 12 months.
   c. LDR – You are permitted to remove 5 healthy trees per 12 months.

6. Is the undeveloped property within the MUTC, Highschool, or High Density Residential -OR- Moderate Density Residential -OR- or Low Density Residential?
   a. MUTC/HS/HDR – If the tree or tree part is rated as a high or imminent risk by a Tree Risk Assessment Qualified individual, you are permitted to remove the tree or tree part.
   b. MDR – You must submit a permit to remove trees.
   c. LDR – You must submit a permit to remove trees.

16. APPENDIX F: DEAD AND EMERGENGY TREE CHECKLIST

This form is used for three purposes:

1) To alleviate property owners from having to procure Tree Risk Assessment Qualified professional to identify a visibly dead tree that otherwise would need a permit,
2) To track and characterize emergency tree actions when they occur,

This document is a template for the City to rework into their own forms, not to be used as-is. We recommend the final version reside in the Bainbridge Island Administrative Manual for easy updating. We recommend a printable PDF format of the file be accessible for contractors to print and carry with them in their work vehicles. Additionally, an online form that could be submitted via a questionnaire with a photo submission can help streamline submission processes.

To classify a tree as dead using this form, the tree must be visibly and verifiably identified as dead. If the tree requires further diagnosis, it cannot be easily and positively confirmed as dead or all the questions are unable to be completed, a tree-risk report is required and must be submitted to the City in a minor tree permit.

Step 1: Dead and Emergency Tree Checklist.

Landowner Name/Address or Parcel Tax #:
Certified Arborist # (if applicable):
Tree Risk Assessment Qualified (if applicable): Yes/No
Tree Species
Tree Diameter
Tree Height
How far away is the tree standing from the home or other structures?
If the distance to the structure measures further than the tree height x 1.25, the tree is not within striking distance of the structure. To remove the tree, submit a Minor Tree Permit as described in 16.18.XXX.
In summer, does the tree have less than 25% normal leaves or needles?
If there are more than 25% leaves or needles in the summer-time the tree is not dead. Submit a Minor Tree Permit as described in 16.18.XXX.
Can the tree be converted into a wildlife snag? Yes/No
If the tree is within or on the edge of a forested setting and 40 feet or more from a structure, the tree must be converted into a wildlife snag.
Submit a minor tree permit if this would cause undue burden on the property.
Is the tree posing a clear and present threat to human health or property?
Remove the tree as an emergency activity.

Step 2: Email the following to trees@bainbridgew.gov.

1) Electronic photo of the tree and nearby structure
2) Completed Dead and Emergency Tree Checklist

Step 3: Signature. (City of Bainbridge Island must complete this clause.)
I, _____, affirm the above information is accurate.

17. APPENDIX G: TREE RESOURCE FUNTIONAL ASSESSMENT

CITY OF BAINBRIDGE ISLAND
TREE RESOURCE FUNCTIONAL ASSESSMENT

Date of Visit:	Assessed by:	Certified Arborist #:	TRAQ?: Yes/No
Assessor Contact Information:			
Project Address		Parcel Number:	
Property Owner	Property Owner Contact Information:		

Each form has several functional categories. After reaching the end of each category, total your points and mark if that category is a high, moderate or low. Once you've rated the individual categories, identify the overall rating using the matrix below.

Tree Stands Rating Form:
Landmark Stand = All four categories are high ratings.
Exceptional Stand = Any combination of three high and one moderate of two high and two moderate ratings.
Typical Stand = Any combination of three moderate ratings.
Poor Stand = Three or more low ratings.

Individual Tree Rating Form:
Landmark Tree = All three categories are high ratings.
Exceptional Tree = Any combination of two high and one moderate or one high and two moderate ratings.
Typical Tree = Any combination of three moderates or two moderates and a low rating.
Poor Tree = Two or more low ratings.

Assessor must use Tree Stand Rating Form (Page 2) within:

- Moderate Density Residential (R-0.4, R-1, R-2)
- Low-Density Residential (R-2.9, R-3.5, R-4.3)
- All other districts
- Or whenever assessing over 5,000 square feet of canopy.
- (If multiple cohorts exist over a large stand of trees wherein said cohorts may total stand functionality, multiple Tree Stand Rating Forms may be used. Stratify each individual forest unit on Site Plan.)

Assessor must use the Individual Tree Rating Form (Page 5) within:

- Mixed Use Town Center
- High School Road Districts 1 & 2
- High-Density Residential areas (R-14, R-8, R-6, R-5)

Tree Stand Rating Form

L1.0	Landscape components. (9 possible points)	Point score
L1.1	*What is an approximate total canopy cover for the tree stand?* This is an approximate total canopy cover measurement that includes all trees over 20 feet in height, including native forests, landscape trees and green infrastructure trees. This may include fragmented and contiguous tree canopies. This measurement can be approximated using the area measure tool on recent aerial imagery, which can be found on Bainbridge Island's GIS Map App, Google Earth, or other similar source.	**Approximate canopy cover:** **_____ ft^2**
L1.2	*What is an approximate live crown ratio of the tree stand's dominant species?* This is an average measurement of live crown height (LCH). Looking at the dominant tree species, measure the first living branch height for as many trees (within the stand) as required for a representative sample, and average those together for an approximate LCH. Next, measure the height of an equal number of trees from the dominant tree species, and average these together. Subtract these two averages to determine an approximate live crown height.	**Approximate LCH:** **_____ft**
L1.3	*What is an approximate canopy volume for the tree stand?* Multiply the approximate square foot of canopy by the approximate live crown ratio. This will result in a canopy volume used to quantify the stand.	**Approximate Canopy Volume:** **_____ft^3**
L1.4	*Determine what's around the assessed tree stand?* Draw a polygon around the canopy that extends approximately 500 feet from the edge of the canopy. Use Bainbridge Island's Online Mapping tool to measure and make estimates within this area.	**N/A**
L1.5	*What is the estimated tree canopy cover nearby the tree stand?* Total canopy cover within 500 feet <5% **5 points** Total canopy cover within 500 feet 6-25% **4 points** Total canopy cover within 500 feet 26-50% **3 points** Total canopy cover within 500 feet 51-75% **2 points** Total canopy cover within 500 feet 75-100% **1 points** This is a total canopy cover measurement that includes all trees over 20 feet in height, including native forests, landscape trees and green infrastructure trees. This may include fragmented and contiguous tree canopies.	

L1.6	*What is the estimated existing impervious surface cover nearby the tree stand?* Count percentage of all ground occupied by roads, roofs, parking lots, asphalt and gravel driveways and other structures that impede soil infiltration within 500 feet, within or outside of the current parcel. Square footage of lawn is counted as 0.5 impervious cover. Impervious surfaces within 500 feet is <5% **0 points** Impervious surfaces within 500 feet is 6-25% **1 points** Impervious surfaces within 500 feet is 26-50% **2 points** Impervious surfaces within 500 feet is 50-75% **3 points** Impervious surfaces within 500 feet is >75+% **4 points**	
	Total landscape parameter points	**_____**
	7-9 points = High | 4-7 points = Moderate | <4 points = Poor	**_____**
C2.0	**Composition & structure. (21 possible points)**	**Point score**
C2.1	*How many tree species are represented in the stand?* For this question, use all tree sizes, including tree regeneration. One tree species **1 point** Two to three tree species **2 points** Four or more tree species **3 points**	
C2.2	*Approximately how many total plant species, including trees, are represented in the stand?* Do not include invasive plants in this total. All plant species represented in this abundance rating must total over 5 square feet of cover. There is no need for a list of species, only distinguish different plant species. <5 species **0 point** 5-12 species **1 point** 13-19 species **2 points** >19 species **3 points**	
C2.3	*What is the approximate diameter size of the dominant species on site?* <12“ DBH **0 point** 12-20” DBH **2 point** 21-28” DBH **3 point** >28” **4 points** + 4 point any one tree over 38” is on site. **+3 points**	

C2.4	*What is the approximate average trees per acre on the site?* Calculate trees per acre by the average distance between dominant trees. Determine the average space between dominant trees to calculate trees per acre (TPA). <50 TPA (30ft spacing between trees) **4 points** 51-150 TPA (30ft to 15ft spacing between trees) **2 points** 151-300 TPA (15ft to 10ft spacing between trees) **0 points** 300-500 TPA (10ft to 6ft spacing between trees) **-2 points** 500+ TPA (<6ft spacing between trees) **-4 points**	
C2.5	*What is the approximate percentage of evergreen trees on site?* No conifers on site **0 points** Conifers < 25% composition **1 point** Conifers 25-50% composition **2 points** Conifers 50-75% composition **3 points** Conifers >75% composition **4 points** +2 points if conifer regeneration is identified **+2 points**	
C2.6	*Is there an abundance of noxious or invasive weeds?* Noxious and invasive plants are found on Washington Invasive Species Council and Kitsap County Noxious Weed Board. All noxious and plants of concern should be included in this rating. 0 species present **0 points** 1 species present **-1 point** 2 species present **-2 points** 3-4 species present **-3 points** 5+ species present **-4 points**	
C2.7	*What disease, pests or stressors are affecting the tree stand?* Include occurrences of beetle expression, fungal fruiting bodies, drought stress, advanced chlorosis, root rot, etc. No aggravating conditions. **+3 points** 1-2 expressions of pest, pathogen, or disease **0 points** 3-4 expressions of pest, pathogen, or disease **-3 points** 4+ expressions of pest, pathogen, or disease **-5 points**	
	Total forest composition and structure points **15-21 points = High | 8-14 points = Moderate | <0-7 points = Poor**	**____**

H3.0	Habitat components. (20 possible points)	Point score
H3.1	*Species and stand age interspersion.* Decide from the diagrams below whether interspersion between forest cohorts is none, low, moderate or high. None (Drawing) **0 point** Low (Drawing) **1 point** Moderate (Drawing) **2 points** High (Drawing) **3 points** + 2 points if wildlife corridor, habitat conservation easement, or other protected land within or adjacent to forest. **+2 points**	
H3.2	*Are environmentally critical or shoreline habitats within the forest?* No environmentally critical areas, shoreline or buffers is present **0 points** One or more environmentally critical areas, shoreline or buffers is present **1 point** +3 if environmentally critical areas, shoreline or buffers >51% of parcel **3 points**	
H3.3	*Habitat features within the parcel:* Select all that apply. If no occurrences, zero points are accumulated. Standing snags >4 and <12 inches DBH **+1 point** Standing snags >12 inches DBH **+2 points** Downed woody debris >4 inches diameter and 6 feet long. **+1 point** Active raptor perches (stag-horned trees) **+2 points** Active cavities, nests or dens **+2 points**	
H3.4	*Occurrence of known Washington Department of Fish & Wildlife Priority Habitat and Species?* 0 occurrence **0 points** 1 occurrence **1 points** 2 occurrence **3 points** 3+ occurrence **4 points** WA DFW priority habitats and species can be found at https://wdfw.wa.gov/mapping/phs/	
	Total habitat component points **14 or greater points = High | 8-13 points = Moderate | <8 points = Poor**	_____ _____
S4.0	**Social components. (6 possible points)**	**Point score**
S4.1	*Does this stand of trees contain trees of local importance?* +3 points if yes **+3 points** Trees of local importance are trees or stands of trees which have developed exceptional cultural, social, historical or aesthetic values for a variety of reasons, including but not limited to, age, historical status or event, history of establishment, exemplary representation of a species, rarity of the specimen, amplification of social, human health or economic benefits.	

S4.2	*What is the majority land use within 500 feet of the tree stand? (From L1.2)?* High impact land use includes commercial development, industrial development, institutional development, residential (more than one unit per acre) development, new agriculture (high-intensity such as dairies, nurseries, greenhouses, raising and harvesting crops requiring annual tilling, raising and maintaining animals), and high-intensity recreation such as golf courses and ballfields. **3 points** Moderate impact land use includes residential development (1 unit/acre or less), new agriculture (moderate-intensity such as orchard and hay fields), paved trails, and building of logging roads. **2 points** Low impact land use includes low-intensity open space such as passive recreation, natural resources preservation, and unpaved trails. **1 point**	
	Total social component points **5 or greater points = High | 3-4 points = Moderate | 1-2 points = Poor**	_____ _____

Individual Tree Rating Form

T1.0	Tree health and structure. (18 possible points)	Point score
	What is the crown volume of the assessed tree? Measure the height of the uppermost living branch (ULB) and height of first living branch (FLB) to calculate live crown height (LCH). ULB – FLB = LCH. Measure canopy spread by approximating canopy length along a north-to-south line and an east-to-west line and multiplying these values together. Calculate the crown volume by multiplying the canopy spread and the live crown height together. Finally, approximate missing canopy and subtract that percentage from the measured canopy volume to arrive at an actual canopy volume. For example, a tree with 25% missing canopy and a 500 foot^3 measured volume canopy is reduced to 375 foot^3 of actual canopy volume. 500 foot^3 x 75% = 325 foot^3 total canopy volume.	**Actual Canopy Volume:** **_____ft$_2$**
T1.1	*What is diameter of the assessed tree?* <8" DBH — **0 points** 9-12" DBH — **1 point** 12-16" DBH — **2 points** 17-24" DBH — **3 points** 25-32" DBH — **4 points** 33-38" DBH — **6 points** 38+ DBH — **8 points**	
T1.2	*What disease, pests or stressors are affecting the tree?* Include occurrences of beetle expression, fungal fruiting bodies, drought stress, advanced chlorosis, root rot, etc. No aggravating conditions — **+2 points** 1-2 expressions of pest, pathogen, or disease — **0 points** 3-4 expressions of pest, pathogen, or disease — **-2 points** 4+ expressions of pest, pathogen, or disease — **-4 points**	
T1.3	*What is the tree's normal POTENTIAL life span given its current location and placement?* This question aims to capture the trees potential life span given its current environmental conditions and placement. Short life span — **1 points** Moderate life span — **2 points** Long life span — **4 points** Review Dirr's Manual of Woody Plants, Washington Native Plant Society, Sunset Western Garden manual, or United States Forest Service Silvics Manual.	

T1.4	*Is the tree's crown healthy, highly representative of its species or particularly aesthetic?* Exceptional quality crown **+4 points** Normal given its age and environment **0 points** Poor quality crown **-4 points**	
	Total tree structure & health points **10 or greater points = High | 5-9 points = Moderate | <5 points = Poor**	**_____** **_____**
H2.0	**Habitat components. (9 possible points)**	**Point score**
H2.1	*Does the tree support foraging and pollination?* Select all that apply. Tree produces fruits, nuts or cones specifically use by foraging wildlife? **+1 points** Do these fruits, nuts or cones persist through the winter? **+1 points** Tree has atypical flowering period **+1 points** (Tree flowers outside of spring & summer.)	
H2.2	*What habitat features does the tree have currently?* Select all that apply. Cavities **+1 points** Nests **+1 points** Perching branches specifically used by wildlife **+1 points**	
H2.3	*Does this tree provide eagle, shorebird perching habitat and are trees with similar habitat function within 500 feet?* No **0 points** Yes, no similar trees within 500 feet **2 points** Yes, similar trees within 500 feet **1 points**	
	Total habitat component points **6 or greater points = High | 2-5 points = Moderate | 0-2 points = Poor**	

S3.0	Social components. (3 possible points)	Point score
S3.1	*Does this tree have exceptional aesthetic value, or does it contribute exceptionally to a landscape?* + 1 points if yes **+1 points**	
S3.2	*Is this a tree of local importance?* +1 points if yes **+2 points** Trees of local importance are trees or stands of trees which have developed exceptional cultural, social, historical or aesthetic values for a variety of reasons, including but not limited to, age, historical status or event, history of establishment, exemplary representation of a species, rarity of the specimen, amplification of social, human health or economic benefits.	
S3.4	*If the tree is over 30 inches in diameter, are there similar trees of the same size nearby?* Make tree size estimations on visible tree canopy nearby. Use a radius of 500 feet from the assessed tree. Yes, it's likely trees (2+) 30-inch DBH trees are growing within 500 feet **0 points** No, it's unlikely trees (2+) 30-inch DBH are growing within 500 feet. **1 points**	
	Total social component points **3 points = High | 2 points = Moderate | 0-1 points = Poor**	

18. APPENDIX H: SCIENTIFIC JOURNAL ARTICLES LITERATURE REVIEW

Mincey, Sarah K.; Schmitt-Harsh, Mikeala; Thurau, Richard. Zoning, land use, and urban tree canopy cover: The importance of scale. Urban Forestry & Urban Greening 12 (2013) 191-199.

- While most urban trees reside on private property, their canopies sustain ecosystems services that are considered public goods.
- Residential high-density zones are different than other types of zones but share more similarities to commercial zones in their canopy metrics.
- Fine-scale variation in land-use policies matters correlate to canopy cover policies.
- Use of zone-specific impervious cover regulations for the maintenance of canopy cover goals.
- Adapting canopy cover goals at a fine scale for policy effectiveness.

Hill, Elizabeth; Dorfman, Jeffrey H.; Kramer, Elizabeth. 2010. Evaluating the impact of government land use policies on tree canopy coverage. Land Use Policy. 27 (2010) 407-414.

- Tree canopy can be preserved in an economically and environmentally sound way with effective tree ordinance clauses, zoning ordinances, and enacting quality smart growth projects.
- However, it was determined that only having a tree ordinance, designating a management person in charge of tree programs, the existence of a tree board, and multiple communication channels were ineffective ways to increase canopy coverage.
- It is within effective policies that tree canopy cover can be preserved.

Zhu., Pengyu; Zhang, Yaoqi. Demand for urban forests in United States cities. Landscape and Urban Planning. 84 (2008) 29-300.

- Planning codes often reference zoning codes with site requirements.
- Cross references in code result in the public and private forests being highly integrated and they often impact each other.

Landry, Shawn; Pu, Ruiliang. The impact of land development regulation on residential tree cover: An empirical evaluation using high-resolution IKONOS imagery. Landscape and Urban Planning 94 (2010) 94 -104.

- An empirical evaluation of land development and tree cover elucidated that after the adoption of tree protection standards, greater tree cover existed on parcels with homes built after the adoption even with increased building coverage.

Galenieks, Andrejs. Importance of urban street tree policies: A comparison of neighboring Southern California cities. Urban Forestry & Urban Greening 22 (2017) 105-110.

- Urban forestry requires forethought, development, and commitment, the same as other municipal activities if policies are to be successful.
- Collection of data prior to planned tree planting, care and removal should be included in policies.
- A city must be proactive in its policy strategies toward tree planting and maintenance.

Hauer, Richard J.; Vogt, Jessica M.; Fischer, Burnell C. The costs of maintaining and not maintaining the urban forest: a review of the urban forestry and arboriculture literature. Arboriculture and Urban Forestry. 41 (2015) 6, 293-323.

- Urban trees supply their maximum benefit during their mature phase.

Kim, Jinki; Zhou, Xiaolu. Landscape structure, zoning ordinance, and topography in hillside residential neighborhoods: A case study of Morgantown, WV. Landscape and Urban Planning 108 (2012) 28-38.

- Zoning requirements like high density housing with smaller minimum lot size and lot frontage result in more vegetation abundance but also result in increased fragmentation than the larger lots sizes and frontage.

Sung, Chan Yong. Evaluating the efficacy of a local tree protection policy using LiDAR remote sensing data. Landscape and Urban Planning 104 (2012) 19– 25.

- Tree removal permit regulation conserved trees on private lands.
- This study also examined mean canopy height and percent canopy cover. Mean canopy height was determined to be an important factor, especially in terms of assessing existing mature trees. This is not able to be determined using percent canopy cover alone.
- This study recommends the use of LiDAR to monitor urban forests.

Guo, Tingdong; Morgenroth, Justin; Conway, Tenley. Redeveloping the urban forest: The effect of redevelopment and property-scale variables on tree removal and retention. Urban Forestry & Urban Greening 35 (2018) 192-201.

- At the property scale, redevelopment on residential properties influenced tree removal rates.
- Therefore, even on properties where development is not new, tree protection should be a consideration.

Payton, Seth; Lindsey, Greg; Wilson, Jeff; Ottensmann, John R.; Man, Joyce. Valuing the benefits of the urban forest: a spatial hedonic approach. Journal of Environmental Planning and Management 51 (2008) 6:717-736.

- Housing prices are influenced by the urban forest.
- Greener vegetation around a property has a significant positive effect on housing prices and this effect continues at the neighborhood level.
- It is therefore in the interest of the community-at-large to maintain its urban forest.

Robinson, D.T.; Brown, D.G. Evaluating the effects of land-use development policies on ex-urban forest cover: An integrated agent-based GIS approach. International Journal of Geographical Information Science. 23 (2009) 9:1211-1232.

- Large lot-size zoning leads to greater sprawl but can also lead to increased forest cover.

- However, this effect is small in comparison to the effect of municipal land acquisition for forest conservation, which is influenced by location strategy more than independent zoning policies or the quantity of area acquired for forest conservation or a combination of the two.

Song, Xiao Ping; Tan, Puay Yok; Edwards, Peter; Richards, Daniel. The economics benefits of urban forest stewardship: A systematic review. Urban Forestry & Urban Greening. 29 (2018) 162-170.

- The importance of urban governance cannot be disregarded as policy and governance continue to gain support for urban tree growth.

Tsegaye, Seneshaw; Singleton, Thomas L.; Koeser, Ander K.; Lamb, David S.; Landry, Shawn M.; Lu, Shen; Barber, Joshua B.; Hilbert, Deborah R.; Hamilton, Keir O.; Northrop, Robert J.; Ghebremichael, Kebreab. Transitioning from gray to green (G2G)- A green infrastructure planning tool for the urban forest. Urban Forestry & Urban Greening. 2018: Article in Press.

- Green infrastructure like urban forests and utilization of natural drainage pathways along with best management practices can reduce runoff and increase stormwater infiltration.
- Thereby, stormwater is retained in areas that support vegetation in the urban environment. This vegetation then assists in buffering future runoff events while supplying the community with numerous societal, environmental, and economic benefits.

Guidelines for Developing and Evaluation Tree Ordinances[6]

- For a tree ordinance to be effective, it must at least have basic performance standards, flexibility, enforcement, a comprehensive management strategy and community support.
- A tree ordinance should be clear about the specific standards and practices that are permissible and those that are not.
- Performance standards should not be vague as this leads to an unenforceable ordinance.
- Flexibility in tree ordinances allows for site-specific factors to come into play. Cities with a community arborist or forester or communities requiring permits with a report written by a qualified consultant can assess these site-specific factors. An appeal process may also be used, however is more likely to be abused and used to override decisions of a City's or other competent specialist.
- Enforcement means that ordinances are enacted in practice. However, when no one is charged with the duty specifically, the job of enforcing tree ordinances is often overlooked.
- "The lack of integration between urban forest management and tree ordinances is probably the most prevalent and serious problem with tree ordinances overall."
- Many communities copy ordinances from each other when there is no cookie-cutter solution for a community.
- While an ordinance may be technically correct, it must have public support to be successful.

[6] Swiecki, T.J., and Bernhardt, E.A. 2001. Guidelines for Developing and Evaluating Tree Ordinances. Page 9. (Online PDF)

19. APPENDIX I: METADATA CANOPY METHODS

Data Sources

All data used in this project was projected into the NAD 1983 2011 StatePlane Washington North FIPS 4601 Ft US_1 coordinate system before being used in geospatial analyses.

- Bainbridge Island Land Classification
  - BI_LandCover_2015
  - Data provided by City of Bainbridge that was part of the White Paper "Monitoring Ecological Functions with Remote Sensing at Bainbridge Island: Draft Final Report"
    - Prepared for: WA Department of Fish and Wildlife and Washington Department of Ecology
    - Prepared by: Jeffrey J Richardson, University of Washington
    - Prepared as part of the project: Monitoring Ecological Function with Remote Sensing at Bainbridge Island
- Bainbridge Island Parcels
  - Parcels_November_2018
  - Sourced from Gretchen Brown, City of Bainbridge Island GIS Specialist
- Bainbridge Island Zoning
  - Offical_zoning_polygons_nov18_2016 layer
  - Sourced from hosted layer by cobiuser1 on ArcGIS Portal