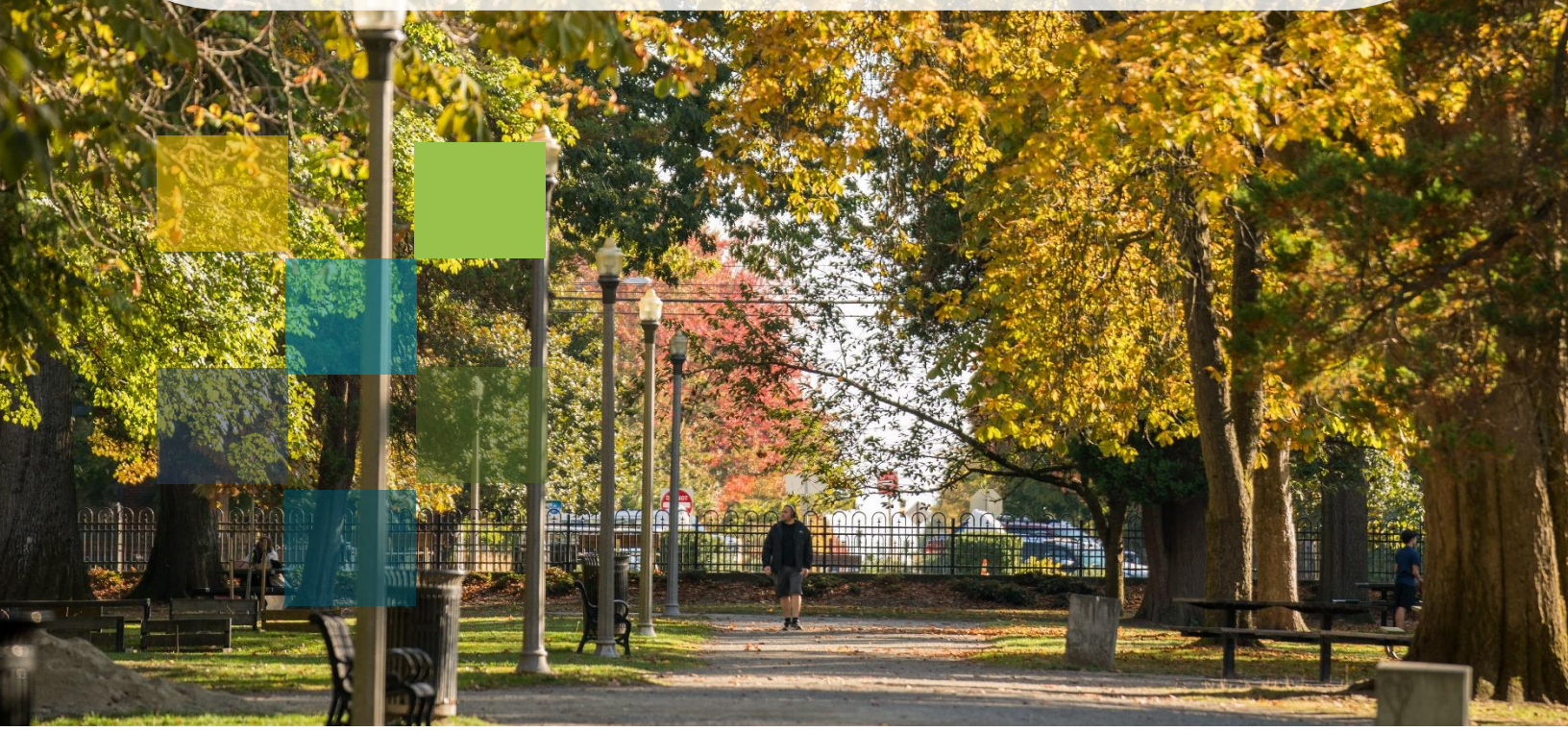
Element 3:

Urban Forest Benchmarks

Purpose

To understand the level of effort and capacity necessary to satisfy the City's adopted goals, to identify industry trends and best practices, and to ensure urban forest sustainability.



Element #3: Urban Forest Benchmarks

Purpose

To understand the level of effort and capacity necessary to satisfy the City's adopted goals, to identify industry trends and beset practices, and to ensure urban forest sustainability. Benchmarks help to gauge Tacoma's investment in community tree management compared to other communities facing similar issues in urban forest management.

Process

Below is an overview of the resources used to research the performance and standards of cities of similar sizes across Washington and the United States.

Summary of Benchmarking Resources

Arbor Day Foundation Tree City USA Database

To qualify as a Tree City USA community, four standards established by the Arbor Day Foundation and the National Association of State Foresters must be met. These standards were established to ensure that every qualifying community would have a viable tree management program and that no community would be excluded because of size. Communities must submit documentation for these standards each year for Tree City USA accreditation. These standards include:

1) An established tree board or department
2) A tree care ordinance
3) A community forestry program with an annual budget of at least $2 per capita
4) An Arbor Day observance and proclamation

This information submitted by communities is accessible for research and benchmarking purposes. The UF Team acquired this data for 2018 to analyze and compare urban and community forestry programs both regionally and nationwide. For more information about the Tree City USA program, visit www.arborday.org/programs.

Municipal Tree Care and Management in the United States: A 2014 Urban & Community Forestry Census of Tree Activities

This report, produced by Richard Hauer of University of Wisconsin – Stevens Point and with support from numerous partners and organizations (Hauer and Peterson, et al.), includes research and analysis of data from 667 communities throughout the United States to summarize the many approaches communities take to manage public trees. This report shows how communities are managing their trees on average, and how their municipal urban forestry operations are organized and funded.

2015 Inventory of Trees on City-Owned Facility Properties

In 2015 the City of Tacoma received a grant from the Washington Department of Natural Resources (WADNR) Urban and Community Forestry Program (UCF) and U.S. Forest Service (USFS) to inventory trees located on City-owned facility properties. The 69 sites inventoried included Fire Stations, Police Stations, Senior Centers, Parks, Libraries, Theaters, the Tacoma Dome, Municipal Buildings, Surface parking lots, and Power and Water Substations. The number of trees and maintenance recommendations were evaluated to assess the City's current maintenance responsibilities compared to similar jurisdictions.

Summary of Benchmarking Categories

Comparisons to Washington Communities

A. *Washington Urban and Community Forestry Budgets*
B. *Landmark and Heritage Tree Programs in Washington*
C. *General Tree Regulations for WA Jurisdictions*

Regional and Nationwide Comparisons

D. *Regional Tree Canopy Cover, Canopy Goals, and Public Tree Numbers*
E. *Regional and Nationwide Urban and Community Forestry Program Benchmarks*
   - *Municipal Code and Policy*
   - *Urban and Community Forestry Operations*
   - *Urban and Community Forestry Public Outreach*
F. *Current Urban Forest Management Activities in Tacoma*
   - *Tree Maintenance Demands on City Facility Grounds*
   - *City Tree Planting Archives*
   - *2018 Urban Forestry Expenditures by Partners*

Internal Benchmarking Research

G. *Tacoma Municipal Code and Policy Review*

Results

Understanding the urban forest policies, management approaches, budgets, and programs of comparable communities and nationwide averages provides comparative data to benchmark Tacoma's performance; present and future. While existing tree data describe the current condition, benchmarks offer guidance to bring Tacoma's urban forestry policies and practices into alignment with similar-sized cities in Washington and nationwide, enhancing urban forest management. A summary of research into policies and practices of these cities follows.

A. Washington Urban and Community Forestry Budgets

Budget data submitted by Washington cities to the Arbor Day Foundation's Tree City USA award was analyzed as part of the benchmarking research. Eleven municipalities were selected to benchmark across the City of Tacoma:

Table 3. 2018 Washington municipal urban forest per capita expenditures and maintenance responsibility

Rank	City	2018 Population	2018 U&CF Total Budget	2018 Per Capita	City Maintains ROW Trees?
1	Bellevue	139,014	$7,287,080	$52.42	No
2	Longview	36,740	$858,720	$23.37	Yes
3	Olympia	49,928	$914,740	$18.32	Yes
4	Kirkland	86,772	$1,568,690	$18.08	No, except CBD
5	Renton	99,692	$1,771,581	$17.77	No
6	Seattle	724,764	$10,168,821	$14.03	Select Areas
7	Redmond	60,712	$679,079	$11.19	No
8	Vancouver	171,393	$1,524,385	$8.89	Select Areas
9	Bellingham	85,388	$672,118	$7.87	Select Areas
10	Tacoma	207,280	$1,609,909	$7.77	No
11	Spokane	212,982	$894,620	$4.20	Select Areas

Using Arbor Day Foundation data, not all costs associated with all urban and community forestry (U&CF) expenditures for the year may be included in the numbers, though, it is likely the numbers are relatively precise with true municipal expenditures.

"Maintains ROW Trees" is referring to systemic management of developed right-of-way tree populations, not reactive management to avoid or mitigate risk. "CBD" indicates Central Business District, commonly known as a downtown area or similar retail district.

There are 32 cities in Washington with dedicated municipal arborist staff, and/or urban & community forest staff, out of a total of 281 total municipalities. Of the 281 municipalities, 95 are designated Tree City USA by the Arbor Day Foundation, including Tacoma. Tacoma has been a Tree City USA for 25 years, the States 12th longest designated Tree City USA.

Compared to other Washington cities, Tacoma ranks 10th in terms of municipal urban forest per capita expenditures ($7.77 per capita includes expenditures beyond the UF Program).

Table 4. Summary of Tree City USA communities and 2018 U&CF expenditures

City	Tree City USA	Years TCUSA as of 2019	Total Accounted U&CF Expenditures 2018	Population (2018)
Auburn	Yes	16	$181,419.40	82k
Bainbridge Island	Yes	14	$68,449.00	25k
Bellevue	Yes	28	$7,287,079.82	139k
Bellingham	Yes	23	$672,118.27	85k
Bothell	Yes	19	$119,763.19	47k
Bremerton	Yes	23	$85,904.67	41k
Ellensburg	Yes	36	$59,030.86	21k
Everett	Yes	26	$315,409.04	111k
Issaquah	Yes	26	$173,880.10	39k
Kent	Yes	17	$287,202.93	130k
Kirkland	Yes	17	$1,568,690.07	87k
Lacey	Yes	28	$260,964.73	51k
Lake Forest Park	Yes	16	$264,697.86	14k
Longview	Yes	35	$858,720.00	37k
Mercer Island	Yes	2	$621,757.38	26k
Olympia	Yes	26	$914,740.31	50k
Pasco	Yes	12	$148,218.00	75k
Pateros	Yes	6	$31,690.00	<1k
Redmond	Yes	20	$679,079.42	61k
Renton	Yes	11	$1,771,580.80	100k
Richland	Yes	21	$241,598.76	57k
SeaTac	Yes	10	$239,080.03	29k
Seattle	Yes	34	$10,168,821.00	725k
Shoreline	Yes	7	$278,515.27	57k
Snoqualmie	Yes	9	$410,637.30	14k
Spokane	Yes	16	$894,619.68	213k
Sumner	Yes	25	$87,938.06	10k
Tacoma	Yes	25	$1,609,909.35	207k
Vancouver	Yes	30	$1,524,385.13	171k
Walla Walla	Yes	25	$137,027.95	33k
Yakima	Yes	3	$263,600.00	94k

Provides representation of population ranges (0-10k, 10k-40k, 40k-80k, 80k-100k, 100k-140k, 140k-220k, >220k)
k = 1,000

B. Landmark and Heritage Tree Programs in Washington

Landmark and heritage tree programs are established in communities to protect trees that are significant in size, species, location, age, history, and/or culture. Such programs are often developed to protect and preserve trees in the public rights-of-way that provide significant benefit to the community's well-being, environment, economy, or other factors. Currently, Tacoma has no such program in place and this benchmarking research provides baseline data and approaches for consideration.

Table 5. Summary of landmark and heritage tree programs in the State of Washington

Jurisdiction	Description of Qualifying Trees	Voluntary?	Designation Committee	Recorded on Title?
Auburn	N/A	N/A	N/A	N/A
Bainbridge Island (expired)	Select species and diameter depended. Approx. 25 species were selected and supplied a diameter criteria.	No	N/A	No
Bonney Lake	Size ≥ 36" Distinctive in Size/Age	Yes	N/A	No
DuPont	White Oak Preservation	N/A	N/A	N/A
Federal Way	N/A	N/A	N/A	N/A
Issaquah	Any trees ≥ 30" diameter Distinctive in Size/Age	No	N/A	No
Issaquah	Historic or Ecological Value	Yes	Park Board	No
Lacey	Historical value only	Yes	Planning Director decision	Yes
Lake Forest Park	Any tree ≥ 28" diameter	No	N/A	No
Lakewood	N/A	N/A	N/A	N/A
Lynwood	Size, Age, Usual Species, Historical Association	Yes	Park and Recreation Board	Yes
Mercer Island	Grove: mature, distinctive, historic. Tree: tree ≥ 36" diameter, unique/historic	Yes	City Arborist	Yes
Olympia	Historic, rare, unusual species or exceptional aesthetic quality	Yes	Planning Director decision	Yes
Port Orchard	Any trees ≥ 36" diameter	No	N/A	No
Puyallup	N/A	N/A	N/A	N/A
Redmond	Any healthy tree > 30" diameter	No	N/A	No
Seattle (SDOT)	Broad criteria: Specimen, Historic, Landmark, or Collection (groups of trees)	Yes	Volunteer committee	Voluntary
University Place	N/A	N/A	N/A	N/A
Woodinville	Tree(s) that are historic, rare/ unusual species or exceptional aesthetic quality	Yes	City Tree Board	No

C. General Tree Regulations for Washington Jurisdictions

The following summarizes research conducted by the UF Team to identify regulations regarding trees for jurisdictions within Washington. The information provides potential considerations for addition or revision of Tacoma Municipal Code, policies, standards, and practices.

Table 6. Summary of tree regulations for jurisdictions in the State of Washington

Jurisdiction	ROW Tree Protection	Tree Requirements for Existing Single-Family Residential (SFR) Lots?	Tree Fee-in-Lieu?
Bainbridge Island	Road buffering & setbacks	Only >7,000 square foot clearing, requires 35% native lot conservation	No
Bonney Lake	Street tree protection	Only on sub-dividable lots	New in 2019
King County	Street tree protection	No	No
Lacey	Street trees, road buffering & setbacks	For New SFRs: Lots < 7,500 ft^2 must have between 2-5 trees depending on lot size. Lots > 7,500 ft^2 must have 4 trees per 5,000 ft^2 lot size For Existing SFRs: 4 trees per 5,000 ft^2 lot size	No
Lake Forest Park	Parcel specific canopy goals, setbacks.	Canopy Coverage Goal: Lots > 15,000 ft^2: 58% Lots: 10,000-15,000 ft^2: 39% Lots < 10,000 ft^2: 28%	No
Lake Stevens	Road buffering & setbacks	New residences shall preserve or plant trees to achieve 2 or 3 trees per lot depending on zoning district.	Yes
Olympia	Street trees	30 Tree Units/acre or, 1 Tree Unit per 1500 ft^2 See Minimum Tree Units that vary by property size:	Yes
Pierce County	None	30% of significant trees on site shall be retained, preferably reflective of the diversity of species and age within the stand, up to the minimum tree density requirements. Minimum Tree Density Requirement: Urban Residential: 30 Tree Units/acre Rural Residential: 40 Tree Units/acre	No
Redmond	Street tree disfigurement	New Additions: A minimum of 35% of the existing healthy significant trees on the site must be retained. Maximum number of significant trees allowed to be removed per year is based on lot size. Up to 10,000 ft^2 – 2 significant trees 10,001 – 20,000 ft^2 – 4 significant trees 20,001 – 30,000 ft^2 – 6 significant trees 30,001 ft^2 or larger – 8 significant trees	Yes

Table 7. Summary of tree data for jurisdictions in the region

	Tacoma, WA	Seattle, WA	Shoreline, WA	Kirkland, WA	Lynnwood, WA	Mountlake Terrace, WA	Des Moines, IA	Salem, OR	
Existing Canopy Cover	19%	28%	37%	38.30%	N/A	N/A	29%	18.30%	23%
Canopy Cover Goals	30%	30%	40%	40%	N/A	N/A	N/A	23%	30%
City Acreage	39,948 ac	53,619 ac	7,500 ac	13,196 ac	5,049 ac	2,662 ac	52,864 ac	31,008 ac	27,980 ac
Population	207,280 pop.	724,764 pop.	55,431 pop.	86,772 pop.	37,242 pop.	20,922 pop.	214,778 pop.	424,982 pop.	374,748 pop.
Mean Population Income	$55,506	$86,822	$67,076	$104,319	$58,852	$69,727	$46,430	$56,163	$42,715
Mean Population Age	35.9	35.6	41.7	38.2	39.6	36.7	33.9	36.6	39.5
Urban Forest Emergency Mgmt. Plan?	No	Yes	No	Yes	No	No	No	No	No

E. Regional and Nationwide Urban and Community Forestry Program Benchmarks

In 2014 an analysis of Municipal Urban Forestry practices, management, budgets and benefits was conducted by the University of Wisconsin and Davey Resource Group. The following table provides a summary of nationwide averages, western region averages, and Tacoma's current standings. These values provide a general estimate of what may be feasible for Tacoma in terms of public trees per capita, canopy goals, future funding, staffing levels, and operations.

Table 8. Hauer and Peterson, et al. 2014 - urban forest benchmark analysis

COMPARE BUDGETS & PROGRAMS	Average Across U.S.	Average Western Region	Average Population Group 100k - 250k	Tacoma
General				
Number of public trees	55,332	34,939	73,723	46,685
Public trees per capita	0.55	0.38	0.51	0.23
Canopy goals	44%	n/a	n/a	30%
Funding				
Total municipal budget, excluding school budget	$200,316,126	$205,786,179	$331,018,081	$2,700,114,363 (2-year)
Average annual tree care and program budget	$801,595	$675,314	$1,368,607	$1,609,909 (includes partners)
Average budget per public tree	$37.5	$33.72	$44.85	$34.48
Average budget per street tree	$42.59	$38.77	$64.35	$45.99
Average annual budget per capita	$8.76	$7.75	$9.05	$7.77 (includes partners)
Tree care and management program budget percent of total municipal operating budget	0.50%	0.40%	0.50%	0.07%
Program Management				
State License or Credential on staff	23%	n/a	31%	Yes
ISA Certified Arborist on staff	61%	n/a	92%	Yes
ISA Advanced Credential on staff	11%	n/a	26%	Yes
ISA Municipal Specialist on staff	15%	n/a	27%	Yes
How many cities have a public electric utility?	17%	n/a	n/a	Yes
Emergency management plan related to trees/UF?	55%	n/a	74%	No

(Table 8 continued)

COMPARE BUDGETS & PROGRAMS	Average Across U.S.	Average Western Region	Average Population Group 100k - 250k	Tacoma
Parks, Open & Green Space				
Acres park land	1010	637	1284	2,960 Metro Tacoma Parks, 496 City of Tacoma
Municipal Code and Policy				
Tree protection ordinances	89%	n/a	98%	Yes
Active enforcement of code?	64%	N/A	N/A	Yes
Tree Operations & Maintenance				
Systematic tree care vs Relative Management	55.00%	n/a	48.00%	Current: Relative
Number of trees planted annually	629	356	634	150
Number of trees pruned annually	2108	2813	3897	<100
Number of trees removed annually	467	226	593	<100
Number of trees treated for pests annually	265	245	339	N/A
Rotational pruning goals?	5 year	n/a	5 year	5 year
Tree Benefits				
Total value of publicly owned trees	$68,665,110	$74,841,722	$98,460,117	$935,038 (i-Tree*, 2019)
Community and Stakeholders				
Tree City USA	73%	n/a	96%	Yes
Have volunteers taking part in tree activities	65%	n/a	75%	Yes
Have volunteers involved in tree planting	85%	n/a	n/a	Yes

*A study in 2019 was conducted using the i-Tree suite of tools (www.itreetools.org) with City tree inventory data.

Tacoma has an estimated 46,685 public trees and a goal of 30% tree canopy cover. In contrast to other cities, the percent of tree care and management program budget compared to the total operating budget is well below average (0.07% compared to 0.40% western community average).

Hauer & Peterson, et al. *2014 Municipal Tree Care and Management in the U.S.*

Cities comparable in size to Tacoma (100,000 to 249,999 people) spent $9.05 per capita on urban forestry.

Between 2011 through 2015, the City of Tacoma spent an average of $1.31 per capita on the urban forestry program. If Metro Parks expenditures are included, urban forest expenditures in Tacoma total $1.96 per capita, approximately 1/5 of the national average for cities the size of Tacoma.

Hauer & Peterson, et al. *2014 Municipal Tree Care and Management in the U.S.*

Urban and Community Forestry Program Budget Summary

In communities throughout the United States, funding for urban forestry primarily comes from the General Fund, making up 71.2% of the national average for funding. From 2011 to 2015, 61% of Tacoma's urban forestry funding came from the Surface Water Utility fee and 35% from Metro Parks Tacoma.

According to the 2014 report from Hauer, R., Peterson, W. et al., cities spend half of their urban forestry budget on tree pruning and tree removal. About 14% of municipal budgets go towards tree planting. 8% of the budget is used for supervision and 6.6% is used for administrative work. Most of the remaining 23% is used for various operating expenditures.

Between 2011 and 2015, the City of Tacoma spent an average 26% of the urban forestry budget on pruning and removals, 55% on planting, 5% on staffing and 14% on various operating expenditures. The exceptionally low tree maintenance budget (for pruning and removals), compared to national averages, prevents the City of Tacoma from having a systematic tree care program involving regularly scheduled tree maintenance.

In the 2014 report, 63% of communities have systematic tree care on a continual basis, with an average pruning cycle for each municipally-managed tree of 6.6 years. Systematic tree care is directly related to a significant reduction in tree failures affecting public health and safety.

F. Current Urban Forest Management in Tacoma

Tree Maintenance Demands on City Facility Grounds

The inventory of trees on City facility property assessed 1,950 trees on 69 sites and included a technical report for the inventory. Not all properties owned by the City were completed nor were any portions of right-of-way that the City is responsible to maintain (such as medians). An inventory and assessment on the 52 remaining City-owned facilities and the portions of the ROW the City is responsible to maintain is still required.

To develop strategies for the care of City-owned trees, existing conditions were reviewed and summarized in planning Element #4, High-Level and In-Depth Data Analysis. To establish tree maintenance baselines and benchmarks, the trees on City-managed facilities were closely analyzed in this planning element (#3, Urban Forest Benchmarks).

The City is exploring options to complete tree inventories on City-owned properties and facilities. A City-staffed arborist crew could address tree maintenance needs, starting with high priority/highest risk tasks and progressing tree maintenance as funding follows. The current inventory results recommend maintenance for the majority of the trees inventoried (1,045) and about 3% require removal (68 trees).

Table 9. 2015 tree maintenance needs and responsibility for 69 inventoried City Facilities

	City Facility					
Activity	Public Assembly Facility	Tacoma Public Utilities	Public Works Grounds	Tacoma Public Library	Blank	**Total**
Prune	129	126	371	113	268	**1,007**
Remove	4	4	8	4	48	**68**
Remove Stake	0	0	0	0	19	**19**
No Action	32	174	193	50	396	**845**
Total	**165**	**304**	**572**	**167**	**731**	**1,939**

For detailed information regarding the specific maintenance needs by City facility, see Appendix C.

City Tree Management Archives

In addition to efficient tree maintenance, this Plan's strategies address tree planting. By evaluating past planting efforts, specifically by the Environmental Services Department, and cross-examined with available and proposed budgets, realistic and achievable tree planting targets can be developed. The following provides a summary of past tree planting activities. This list identifies trees planted in public rights-of-way and excludes tree installations completed by development and redevelopment.

Table 10. 5-year urban forest management activities for all City partners (2013-2017)

	2013		2014		2015		2016		2017	
	$	*Total Trees*	*$*	*Total Trees*	*$*	*Total Trees*	*$*	*Total Trees*	*$*	*Total Trees*
Trees Planted	$247,217	1,842	$144,731	1,313	$42,230	1,163	$173,558	1,672	$199,725	731
Trees Maintained	$112,159	3,000	$51,801	3,526	$144,315	3,526	$220,447	--	$229,831	--
Trees Removed	$61,955	314	$15,990	192	$28,310	52	$4,587	29	$10,462	28
Management	$414,425	--	$390,301	--	$613,255	--	$242,118	--	$244,400	--
Utility Line Clearance	$391,168	--	$670,423	--	$659,746	--	$684,570	--	$862,134	--
Capital Improvement	$931,468*	--	--	--	--	--	--	--	--	--
Sub-Totals	$2,158,392		$1,273,246		$1,487,856		$1,325,280		$1,546,579	
Volunteers' Value (TCUSA)	$48,670	4,700	$42,430	1,588	$45,937	2,077	$30,526	1,404	$26,225	--
Total	**$2,207,062**		**$1,315,676**		**$1,533,793**		**$1,355,806**		**$1,572,804**	
City popul.	202,010		203,446		205,159		207,948		211,277	
City per capita spend	**$10.93**		**$6.47**		**$7.48**		**$6.52**		**$7.44**	

*Construction of City tree nursery

5-YEAR URBAN FOREST ACTIVITY TOTAL

6,721 trees planted
10,052 trees maintained
615 trees removed (view 2018 on next page)

AMOUNTS INCLUDE CITY PARTNERS (OEPS, TPU, METRO PARKS, PW)

2018 Urban Forestry Expenditures by Partners

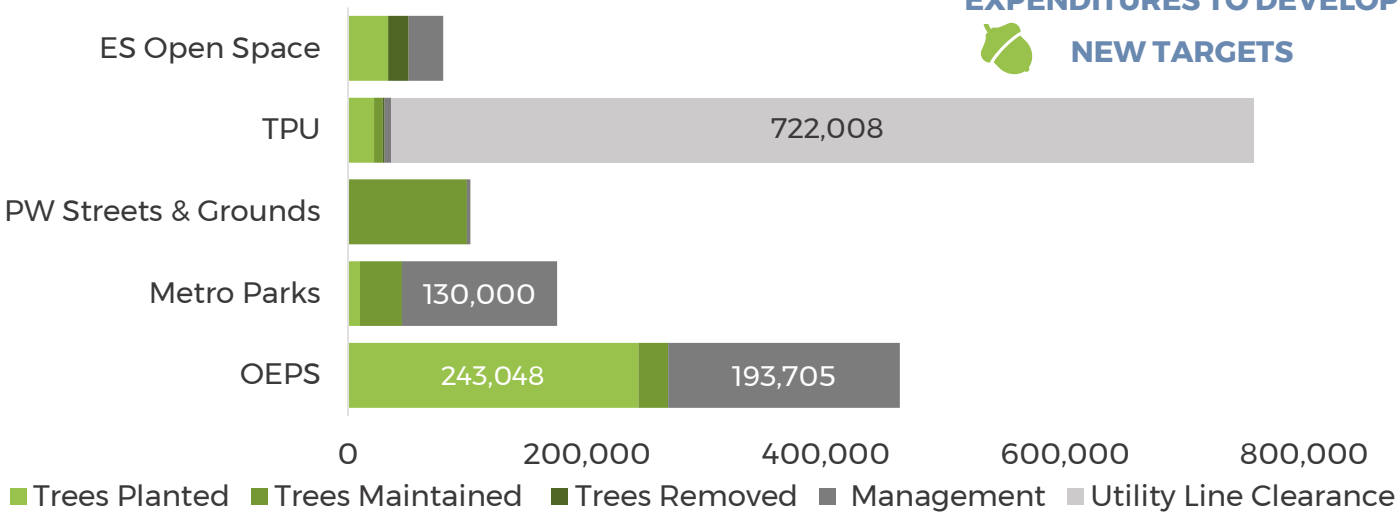
Table 11. Summary of expenditures by Tacoma partners and by management activity for 2018

	OEPS ($)	Units	Metro Parks ($)	Units	PW Streets & Grounds ($)	Units	TPU ($)	Units	ES Open Space ($)	Units	Total Spend	Total Units
Trees Planted	243,048	1,086	10,000	168	0	0	21,900	146	33,630	1,235	**$308,577**	2,635
Trees Maintained	25,048	39	35,000		99,388	2,300	7,040		0	0	**$166,476**	2,339
Trees Removed		0	30		138	1	1,700	20	17,000	11	**$18,868**	32
Mgmt.	193,705		130,000		3,000		5,589		29,095	NA	**$361,389**	NA
Utility Line Clearance							722,008			NA	**$722,008**	NA
Sub-Totals	461,801	NA	175,030	NA	102,526	NA	758,237	NA	79,725	NA	**$1,577,319**	NA
Volunteers											**$22,591**	
# of volunteers	275		30	**Total #**	**305**						**$1,599,910**	
# of hours	825		90	**Total hrs.**	**915**							
City per capita (2018 population: 213,418) spend (reported for TC USA)											$7.50	

OEPS = Office of Environmental Policy and Sustainability, PW = Public Works Department, ES = Environmental Services Department, Mgmt = Management, NA = Not Applicable or Not Available, hrs = hours, TC USA = Arbor Day Foundation's Tree City USA Program

USE CURRENT ACTIVITIES AND EXPENDITURES TO DEVELOP NEW TARGETS

Figure 4. 2018 urban forestry expenditures by partner



The table and figure above describe the operations relating to urban forest management in Tacoma in 2018. A total of 2,635 trees were planted across all partners and a total of 2,339 trees were maintained in addition to 32 trees removed. A total of $1,577,319 was spent on urban forest management and adding volunteer numbers and hours equates to $1,599,910, or $7.50 per capita. This summary of expenditures was prepared by the City as one of four requirements for Tree City USA accreditation by the Arbor Day Foundation.

In addition to the tree planting table on the previous page, this benchmark summary of urban forest management activities provides the baseline for strategies, targets for improvement, and the measurements which are provided in this Plan.

G. Tacoma Municipal Code and Policy Review

A component of the Urban Forest Management Plan project included an analysis and revision to urban and community forestry policy and Tacoma Municipal Code (TMC) where necessary. The following information is summarized from the urban and community forest policy review. A more thorough analysis is provided as an Appendix (B) along with recommendations for revision. This review assessed the effectiveness of existing tree-related policy and municipal code within Tacoma and introduce new (to Tacoma) concepts standardized in the industry for urban and community forestry policy.

Based on the review of existing code and the benchmarking research completed, proposed recommendations for TMC were prepared and presented to City Council's Infrastructure, Planning, and Sustainability (IPS) Committee in August 2019. These recommendations will be finalized for development of the Plan's strategies.

The following provides seven key findings relating to urban forest policy and potential changes to Tacoma Municipal Code.

Key Findings – Opportunities for Alignment with One Tacoma Comprehensive Plan

An analysis of One Tacoma was prepared with a focus on the urban forest to identify current policies and where improvement was necessary to meet the guidelines of One Tacoma. Nine urban forest principles were identified that directly associate with these policies. These nine elements, listed below, will facilitate the policies through direct, actionable policy items defined in the Urban Forest Management Plan Phase 2 document. The tables below provide a brief primer on how the urban forest elements correlate with One Tacoma, and how the two complement each other.

Table 12: Main urban forest elements associated with One Tacoma

One Tacoma Themes	
1) Resource Management a) Resilience and risk management b) Street trees c) Viewsheds	6) Long-term Funding 7) Climate Resiliency
2) Planning the Urban Forest 3) Education, Outreach, Collaboration 4) Equity and Accessibility	8) Municipal Code and Policy a) Preserving trees during development b) Landmark tree policy c) Single Title/consolidation
5) Canopy Growth–30/30	9) Environmental a) Net-loss b) Watershed-scale planning

ALIGNING EFFORTS WITH OTHER PLANS IS RESOURCEFUL AND EFFECTIVE IN ACCOMPLISHING SHARED GOALS AND OBJECTIVES

Table 13: Urban forestry companion to One Tacoma policies

1) Resource Management		
1.a) Resilience and risk management - Forest structure, composition and species diversity. - Risk management and avoidance. - Resource inventories and prioritization.	**1.b) Street trees** - Supportive places, improved livability. - Street design and engineering to support trees. - Street tree maintenance.	**1.c) Viewsheds** - Identification / management of preserved viewsheds. - Long-term ecological and geological net-loss reduction.
2) Planning the Urban Forest	**3) Education, Outreach, Collaboration**	**4) Equity and Accessibility**
- Inventories and assessments, levels of service.	- Targeted messages to various sectors.	- Equal levels of service and opportunities across Tacoma.
5) Canopy Growth – 30/30	**6) Long-term Funding**	**7) Climate Resiliency**
Maximize accessible planting areas and retain existing canopy to facilitate meeting a Citywide canopy cover goal of 30% by 2030.	- Diversified budget portfolio. - Encourage urban forest contribution from beneficiaries of tree benefits: stormwater, public health, energy distribution.	Risk Mitigation: identify and prioritize vulnerability to heatwave mitigation, urban heat island effect, and other climate-related emergencies.
8) Municipal Code and Policy		
8.a) Preserving trees during development Reduced canopy loss through preservation of trees during development action.	**8.b) Landmark tree policy** Voluntary preservation and catalogue of historic, cultural, memorial, and ecological significant trees.	**6.c) Single Title/consolidation** Clear access to Tacoma policies related to urban forestry.
9) Environmental		
7.a) Net-loss - No net loss of tree canopy. - Reduce tree canopy degradation within environmentally critical areas. - Reduce canopy fragmentation.	**7.b) Watershed-scale planning** - Plan and mitigate tree canopy connectivity on a watershed scale. - Track canopy and habitat connectivity across watersheds.	

Key Findings – Current Organization of Urban Forest Policy

It is important to promote and facilitate an inclusive and collaborative approach to urban forest planning that mitigates the barriers associated with interconnected and diverse public planning goals.

Currently, references to urban forest management components such as procedures, protocols, authority, and enforcement are dispersed inconsistently throughout Tacoma Municipal Code. Within the TMC, there exists no clearinghouse for these urban forestry components.

Elimination and/or prevention of organizational silos, workflow inconsistencies, permit ineffectiveness, and departmental disassociation are integral to the Plan's shot- and long-term strategies. Strategies to advance tree planting and tree preservation to meet Tacoma's 30% tree canopy by 2030 goal—and supported by recommended changes to the TMC—will be developed based on the evaluations of existing conditions and operations of public agencies and departments across the municipal organization conducted for Phase 1 and summarized in this report.

Currently, tree-related code in Tacoma is generally accessed through an action occurring rather than the resource itself. Tree related code in Tacoma is activated through commercial and industrial development and through environmentally sensitive (Critical Areas) code.

Key Findings – Considerations for Plan Strategies Relating to Tacoma Municipal Code

Development of this Plan's strategies will consider the following topics:

1) Urban Forestry Policy alignment with One Tacoma.
2) Location of urban forest policy for urban forest related topics that are not urban forest standards triggered through development/disturbance actions.
3) Current interdepartmental processes, permits, and workflows relating to urban forestry.
4) Opportunities for regulation, incentives, and stewardship.
5) Existing or absent definitions of roles and responsibilities of an existing committee / commission overseeing urban forestry such as the Sustainable Tacoma Commission.
6) Opportunities for expanding appropriate tree preservation.

Key Findings – Common Themes in Landmark Tree Ordinances

Correlation between tree growth and tree benefits is exponential. Landmark tree policies acknowledge the scientific consensus that large trees provide substantially more social, public health and environmental benefits than small trees. Mature large trees deliver a greater annual net benefit than mature small trees. The presence and stature of large trees has a measurable human health impact—relieving stress, decreasing respiratory illness, and inspiring awe in the community.

As part of the benchmarking research, existing landmark / heritage / historic tree programs across the State of Washington were reviewed and summarized. Information from this research will be applied to the strategies and recommendations in this Plan.

COMMON THEMES IN LANDMARK TREE ORDINANCES ACROSS WASHINGTON AND THE NATION

1) Potential Landmark trees can be voluntarily or non-voluntarily designated.
    a) Voluntary designation by the property owner is generally coupled with title recording on the property mandating the preservation of the tree while the tree remains healthy.
    b) Non-voluntary/mandatory – designation applies to trees that meet a certain criteria, most often a combination of size and species, that immediately protects a tree from removal or mal-pruning while the tree remains healthy.
2) Designation committees for voluntary designation of landmark trees can be a public urban forester, municipal arborist, City Council or committee, or tree board.
3) Documentation and inventorying of voluntary landmark trees is often facilitated through a landmark tree database and tree management software.

a) This list is often in conjunction with a community's historical society—similar to Tacoma's Landmarks Preservation Commission. These organizations often host historical tours that include landmark trees.

4) Qualifying criteria for landmark trees normally contain subjective and/or objective requirements for historical, cultural, ecological significance, or other important qualifying attributes.
5) Variances and relief of landmark tree protection are often provided through the following:
    a) High-risk rating through qualified Tree Risk Assessor and/or conspicuously dead trees.
    b) Spatial conflict of actively permitted development/redevelopment are exempt.
    c) Utility work as necessary to retain utility connectivity are exempt.
    d) Other large public land-owning organizations can be exempt if they have their own plan for urban forest management or similar document that is supported by the municipal government.

POTENTIAL OUTCOMES OF LANDMARK TREE PROTECTION AND INVENTORY FOR TACOMA

1) Complements and implements Design and Development goals of One Tacoma into Urban Forestry Policy (DD-5.11, DD-13.5 and DD-13.6).
2) Conservation of culturally or historically relevant City landmarks that have importance to the community.
3) Ecological inventory of large, important trees and economic quantification of their provided ecosystem services.
4) Species diversity improvement; often landmark trees will be trees of special ecological significance and rare species presence, resulting in a higher species richness across the City.
5) Preservation of trees would support the City's goal for 30% canopy cover by 2030.

Key Findings – Importance of Protecting and Managing Trees in the Right-of-Way

The "right-of-way" (ROW) is defined as (typically) an easement provided to the City over the land of the abutting property owner, which establishes an accessory right for public benefit or transportation, such as for roadways, sidewalks, or utilities. According to TMC 8.30.020,

"The public right-of-way includes the area of land, the right to possession of which is secured by the City for right-of-way purposes and includes the traveled portion of the public streets and alleys, as well as the border area, which includes, but is not limited to, any sidewalks, planting strips, traffic circles, or medians."

The City of Tacoma requires abutting property owners to maintain adjoining rights-of-way. This includes streets and alleys extending from the owner's property lines out to the curbs or edges of pavement (includes sidewalks and planting strips) if improved, or if unimproved (unpaved), out to the centerlines of the road. There are several places in the Tacoma Municipal Code where these obligations are stated: Chapters 9.17, 9.18, 8.30, 8.31, and 12.09.

Street trees, curbs, sidewalks, and utilities play vital roles in Tacoma's public realm, helping to make the City more livable and sustain the quality of life. It is not uncommon for conflicts to arise between trees and infrastructure, particularly in locations where they were installed some time ago. These conflicts can compromise pedestrian access to the sidewalk and/or tree health.

Common Outcomes of Right-of-Way Tree Protection and Management

Based on the benchmarking research, the following outcomes from ROW tree protection and management for various cities were identified:

1) Maintained and enhanced urban forest accessibility to support equity and social justice.
2) Reasonable and justifiable tree preservation that considers all variables and impacts. Right-of-way tree protection does not imply all trees are absolutely preserved. Trees are inventoried and evaluated to determine their fate in an infrastructure conflict situation.
3) Protection of trees during construction and infrastructure repair / replacement / installation prevents devastating damage to trees which could otherwise cause tree decline, need for removal, and potential public hazard.
4) Reduced tree risk, increased tree longevity, tree canopy retention, reduced tree maintenance costs, proper tree care, improved public health, reduced infrastructure conflicts, and equitable access to the urban forest.
5) A decision matrix with various mitigation strategies or amendments to address the tree and infrastructure conflict by considering existing conditions among other variables. An example of this approach is the Seattle Trees & Sidewalks Operations Plan. A similar plan will be developed for Phase 3 of the Urban Forest Management Plan project.

Potential Plan Strategies to Support Right-of-Way Tree Protection and Management

The final strategies recommended in this Plan will consider their impact to the protection and management of trees in the public rights-of-way. To develop these strategies, the following topics will be evaluated:

1) Existing permitting and alert system for City personnel who review and evaluate a situation(s) where trees may be impacted.
2) Current and potential inventory and assessment cycles for trees in the right-of-way to identify potential risks, trees in decline, pests and disease threats, monitoring needs, and treatment needs.
3) Current and potential procedures and considerations for tree species selection for new plantings in the rights-of-way.
4) Current and recommended implementation of tree planting best practices such as appropriate soil volume, irrigation needs, proper planting depth, quality tree nursery stock, and young tree care (e.g. scaffold branches, lowest permanent branch, central leader).

Key Findings –Tree Planting Goals and Policies across Washington

Communities in Washington with tree canopy cover goals were evaluated to determine existing policy and approaches in effect to support these initiatives. As stated in this report, Tacoma has established a canopy goal of 30% Citywide by 2030. Findings from this research will be applied to the strategies in this Plan.

Tacoma's 30% Citywide canopy goal is achievable with well-planned tree canopy growth. Planting trees without equitable access of benefits, adequate spatial capacities and poor genetic selection are common challenges that result in an unhealthy urban forest and misspent budgets. Solving these discrepancies requires careful consideration of urban design and engineering and tree-resource management, translated through the lenses of social equity and environmental justice. This may require tailored strategies, new policies and increased resourcing for these areas. The existing policies/procedures will not provide more equitable access to the urban forest resources. Proven tree planting policy goals and

municipal code are equity driven, prioritized by asset generation, contain measurable performance standards, are adaptive and provide feedback.

Citywide datasets were analyzed for tree canopy distribution, to reveal neighborhoods with missing or inequitable tree canopy and areas historically low in tree canopy. These analyses are described in Element #4: High-Level and In-Depth Data Analysis, page 32.

1) Canopy cover distribution
2) Availability and distribution of possible planting areas
3) Tacoma's Equity Index
4) Urban heat island index
5) Urban forest characteristics, structure, and maintenance needs

Common Themes of Community Tree Planting Goals

1) Consistent application, regulation, and stewardship across land uses, stakeholders, and time.
2) Long-term commitment to equitable tree canopy growth at all levels of city government.
3) Best management practices in tree planting and care are clearly defined and readily available. Internal procedures are adopted to ensure trees are not only planted properly, but also establish well into healthy, structurally sound trees.
4) Tree planting and mitigation designs and selection used environmental and physical criteria.
5) Street engineering and urban design promote maximum tree health and benefits within this environment.

Potential Outcomes of Citywide Tree Planting Goals

A variety of outcomes may be expected from well-planned tree management goals, depending on the strategies adopted by the City to implement those goals.

1) Complement and support comprehensive plan strategies relating to urban forestry (e.g. EN-4.29 of One Tacoma).
2) Project designs, development, and tree preservation are based on or supported by tree canopy goals, including site-specific and environmentally accurate tree species selection.
3) Alignment of permitting and trigger processes for re/development actions where supplemental tree installation is a viable co-design to reduce missed opportunities for collaborative tree planting and green urban design.
4) Increased urban forest biodiversity and ecological resiliency through planned natural resource management techniques while adapting genetic diversity to climate change.
5) Accelerated growth of urban forest benefits. Large trees with contiguous tree canopy provide more environmental and ecological benefits than small trees and fragmented canopies.
6) Reduced conflict with City infrastructure. Planning for urban trees from the inception of project design alleviates common future conflicts with utilities, sidewalks and other street infrastructure. Currently, this is captured in Title 12 "Utilities" in the TMC.

Key Findings – Antiquated or Inconsistent Language in Tacoma Municipal Code

The first tree protection ordinance in Tacoma, and Washington State, was adopted in 1927 as "9.18 Trees and Shrubs – Trimming and Removal". This called for the protection of Tacoma's street trees growing in the right-of-way (see 9.18.030). Since then, a number of related ordinances have been added through a long history of Tacoma ordinances. Some of this municipal code is heavily antiquated and its applicability has eroded with time.

For consistent implementation and enforcement of urban forest policy, the following concerns were identified within Tacoma Municipal Code:

1) Existing inaccuracies and discrepancies.
2) Antiquated municipal code and language relating to trees.
3) Inconsistencies/conflicts between existing code and policies.
4) Isolated, separated, or conflicting descriptions of authority to approve urban forestry related actions (e.g. City Manager, Director of Public Works, City Engineer, Committee).
5) References to permits and processes that no longer exist.
6) Inconsistencies with industry best management practices and American National Standards Institute (ANSI) Standards.
7) Conflicts between critical areas and right-of-way codes.

An example of a concern identified in the TMC is outdated reference information: of the 110 tree-related references, 37 contain outdated and inaccurate information regarding currently accepted, best available science of arboriculture and urban forestry.

Revised Municipal Code will be provided as a separate document but as part of the Urban Forest Management Plan project. A summary of this document will be provided as an appendix to this Plan.

Conclusion

Municipal Benchmarks and Code Review

Urban forests are integral to the fabric of city life. The planning, management, growth, preservation, and long-term funding of Tacoma's urban forest are critical for public health, safety and well-being. These urban forestry actions result in amplified health, safety and welfare of Tacoma's citizens. City growth and redevelopment impacts and influences the urban forest and the urban forest complements urban design.

One Tacoma is a fundamental piece of the 2019 Plan. The Plan focuses through the lens of One Tacoma to amplify and complement the vision set forth in the Comprehensive Plan. The 2019 Plan will implement actions to meet these City policies while focused on Tacomans' values and responsibility towards a greener city. Actions are based on attainable municipal forest measurements as summarized in this section.

The Plan will consider ROW tree protection and management to implement practices and procedures that maintain the qualify of life for all Tacoman's while supporting ongoing initiatives such as the 30% tree canopy goal and American Disabilities Act (ADA) compliance.