

**If a tree falls in the urban forest:
How Seattle’s tree retention code fails to protect canopy coverage in the city**

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I. Introduction

Many Seattle residents, particularly those who have grown up in the area, have noticed the vast population increase over the past decade.¹ The often-discussed effects of a rising population include decreased housing affordability, greater population density, and increased traffic congestion, among others. While there are both benefits and drawbacks of population increase, one impact that is rarely addressed is the effect that population growth has on the tree coverage in the city. Seattle has a well-known reputation for its abundant greenery but the tree coverage in the city has been dropping due to the construction boom related to the city's rapid population growth.² This change has largely fallen under the city's radar. According to national tree conservation group American Forests, 40 percent of Seattle was shaded by trees in 1970.³ The same measurement in 2016 found tree canopy at just 28 percent.⁴ Based on the drastic increase in construction over the five years since, it is likely that this number has declined even further.

Advocates have been pushing for a new tree retention ordinance since the Seattle City Counsel approved the last ordinance in 2008.⁵ The 2008 ordinance was meant to be a temporary solution to the decrease in canopy coverage in the city,⁶ but unfortunately has not been updated or replaced since then. The ordinance has some features that protect certain types of trees, such as those given "exceptional" status,⁷ but it has many loopholes that developers can exploit to

¹ Gene Balk, *Seattle ended decade with faster growth than suburbs, reversing a 100-year trend*, SEATTLE TIMES (December 7, 2021), <https://www.seattletimes.com/seattle-news/data/seattle-ended-decade-with-faster-growth-than-suburbs-reversing-a-100-year-trend/>

² Jenny Cunningham, *How COVID-19 hurt Seattle's plan to strengthen its tree law*, CROSSCUT (July 9, 2020) <https://crosscut.com/2020/07/how-covid-19-hurt-seattles-plan-strengthen-its-tree-laws>.

³ *Id.*

⁴ Adiel Kaplan, *Seattle's Tree Canopy Studies*, INVESTIGATE WEST (June 27, 2017), <https://www.invw.org/2017/06/27/seattles-tree-canopy-studies/>.

⁵ Cunningham, *supra* note 2.

⁶ *Id.*

⁷ Department of Planning & Development: Director's Rule 16-2008 (Interpretation of SMC 25.11).

avoid these restrictions.⁸ Exceptions to designations can be granted when a tree is deemed a “hazard,” or if a developer is unable to achieve maximum lot coverage on a particular parcel.⁹

Most concerning, however, is the lack of an enforcement provision in the 2008 ordinance. While there are rules developers or property owners must abide by, permitting is largely not required for tree removal in Seattle, and the city operates under a complaint-based system.¹⁰ This system conceals how much canopy coverage is lost on a yearly basis and also limits redress for violations to a fine after the tree has already been cut down. A permit-based system would remove these obstacles and allow the city to preserve the current canopy coverage while also increasing canopy coverage in deforested areas. Seattle needs to substantially adjust the tree retention laws in the city to accommodate its rapid urban growth while also protecting its natural resources and preserving the health of its citizens.

This paper will focus on the benefits that a healthy urban forest brings to the surrounding community, centering on mature tree preservation in furtherance of this goal. The best way to ensure retention is more stringent laws that decrease the likelihood of tree removal, coupled with more severe punishments for violations. Changing regulations alone will not solve the problem of urban deforestation; therefore, the city must create an urban forestry department with the power to both advise on and enforce regulations

II. Positive Effects of Trees

Before delving into how to retain tree coverage in Seattle, it is important to establish why the city should do so in the first place. The most easily recognized feature is the aesthetic value

⁸ *Seattle's Tree Protection Ordinance*, DON'T CLEAR CUT SEATTLE, <https://www.dontclearcutseattle.org/seattle-tree-protection-ordinance/>.

⁹ *Hazard Trees*, SEATTLE DEPARTMENT OF CONSTRUCTIONS & INSPECTIONS, (March 27, 2020) Tip 331B.

¹⁰ *Id.*

that trees provide in urban settings, but this only scratches the surface of the benefits a healthy urban forest brings to the surrounding community. These include not only financial benefits, but also positive environmental impacts such as pollution control, increased air quality and water quality, personal health benefits, and even a racial justice component when it comes to increasing canopy coverage in low coverage areas. Each of these elements will be addressed in turn.

A. Personal Health

Likely the most overlooked benefit of a healthy urban forest is the effect it has on the physical and mental health of the surrounding community.¹¹ Physical health benefits are better understood and measurable through metrics like air quality, but mental health benefits are equally important. These two effects work in tandem to produce better health outcomes, mentally and physically, for those with increased exposure to green spaces and a healthy urban forest.¹² Some of the mental health benefits include longer life, better birth outcomes, lower stress levels, lower risk of heart disease, lower risk of diabetes, and symptoms of ADHD.¹³ The proximity to trees is associated with a “ridiculously broad range of health benefits,”¹⁴ with one researcher noting that he “wish[es] we had pills that were this good for health.”¹⁵ It is unclear how much exposure to trees suffice to attain these benefits. It could be a variety of factors such as the amount of time spent near the trees, the type or size of the tree, or the difference between physical and visual exposure. Whatever the reason, the data indicates a causal relationship between exposure and positive health benefits.¹⁶

¹¹ WEEKEND ADDITION SATURDAY, *Trees Could Be A Mental, Physical And Climate Change Antidote*, (September 18, 2021), <https://www.npr.org/2021/09/18/1038533100/trees-could-be-a-mental-physical-and-climate-change-antidote>.

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

While few research studies and little data are available to definitively show these positive health benefits, a few studies have shown positive correlation between urban green spaces, areas with abundant plant life such as arboretums or vegetated parks, and increases in mental and physical health.¹⁷ One study examined the relationship between urban green spaces and anxiety and mood disorders among residents.¹⁸ The study showed that the presence of green space in urban environments may decrease anxiety and mood disorders.¹⁹ Specifically, higher proportions of, and closer proximity to, surrounding green space are associated with lower levels of anxiety and mood disorder treatment.²⁰ Both the distance to useable green space and increased proportion of green space were associated with decreased anxiety and mood disorder treatment counts in the urban environment.²¹ While these studies do not dispositively show mental health outcomes are the sole result of urban green spaces, they do show a link between the two and indicate that increasing quantities of green space could result in benefits to the population as well as potential reductions of pressure on healthcare facilities.²² A more tangible outcome from this study showed that a 1% increase in canopy cover leads to a 4% increase in mental health.²³

Aside from mental benefits, many physical benefits result from increased exposure to green spaces.²⁴ Much of this discussion will center around air quality, discussed later in the article, but increased physical exposure to urban flora can provide positive health outcomes for those with increased exposure.²⁵ For example, a U.K. study found that interacting with and

¹⁷ *Id.*

¹⁸ Nutsford, Pearson & Kingham, *An ecological study investigating the association between access to urban green space and mental health*, <https://www.sciencedirect.com/science/article/pii/S0033350613002862#bib6>.

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

²³ Ali Lakehart, Arborist Presenter, Cascadia Now presentation for Client Science on Tap (November 15, 2021).

²⁴ Nutsford, Pearson & Kingham, *An ecological study investigating the association between access to urban green space and mental health*, <https://www.sciencedirect.com/science/article/pii/S0033350613002862#bib6>.

²⁵ *Id.*

working in the garden for two hours a week was enough to report better health than compared to those who lacked the same exposure.²⁶ The study noted that whether the subjects were exercising or sitting still was irrelevant, but the exposure to nature is what drove the results.²⁷ Additionally, there is evidence to suggest that this same exposure can stimulate the exposed individual's immune system, leading to better overall health.²⁸ These health benefits are recognized by cultures around the world, including in Japan and Korea, where "forest bathing" is used as an exposure therapy of sorts to increase the overall health of individuals.²⁹ By increasing the health of individual members of the community, urban forests provide benefits to the entire population of a given urban setting.

B. Environmental Impacts

The environmental impacts of tree loss are a major issue concerning not only the city of Seattle, but also the rest of the world as it relates to the continuing health of ecosystems. As the global average temperature continues to rise in the coming decades,³⁰ strategies to mitigate the effects of temperature fluctuations will become paramount to ensuring the health and safety of residents, especially during the summer months. In the Pacific Northwest, summers have largely coincided with increased wildfires and rising temperatures.³¹ The negative health effects from the smoke are obvious dangers, but a less considered factor is the problematic increase in

²⁶ WEEKEND ADDITION SATURDAY, *Trees Could Be A Mental, Physical And Climate Change Antidote*, (September 18, 2021), <https://www.npr.org/2021/09/18/1038533100/trees-could-be-a-mental-physical-and-climate-change-antidote>.

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*

³⁰ Rebecca Lindsey and Luann Dahlman, *Climate Change: Global Temperature*, CLIMATE.GOV (August 12, 2021) <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature> (Rate of warming per decade is 0.32° F since 1981 with 10 of the warmest years on record occurring since 2005).

³¹ Hannah Hickey, *Study Synthesizes What Climate Change Means for Northwest Wildfires*, UW NEWS (April 1, 2020) <https://www.washington.edu/news/2020/04/01/study-synthesizes-what-climate-change-means-for-northwest-wildfires/>.

temperature on those living in urban areas. Urban tree retention will play a large part in determining the effect of climate change to those residing in these areas, primarily through temperature and pollution control.³²

1. Temperature Control

Large trees provide a check on temperature fluctuations through two processes: evapotranspiration and shading.

Evapotranspiration is the combination of evaporation and transpiration that results in more moderate temperature fluctuation in the immediate area.³³ Transpiration is the process that trees and vegetation use to absorb water through their roots and emit it through their leaves.³⁴ Evaporation is the conversion of water from liquid to a gas.³⁵ Combined, these processes create what is known as evapotranspiration, which cools the air by using heat from the air to evaporate water.³⁶ A basic principle of this process is the more water that runs through this process, the more cooling effects exist.³⁷ Therefore, the more mature the tree, the more water that cycles through the system and the better prepared a given area is to deal with a drastic temperature increase.³⁸ This effect is not a modest one; rain or groundwater evaporating from trees can lower air temperatures by up to 9 degrees Fahrenheit.³⁹ While the precise degree shift will vary based on the size and species of the tree, the greater the canopy coverage through the combination of age, species and number of trees, the more temperature regulating effects the vegetation will

³² U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>.

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

³⁷ *See Id.*

³⁸ *See Id.*

³⁹ Alejandra Borunda, *A Shady Divide*, NAT'L GEOGRAPHIC, July 2021, at 78.

have on the surrounding microclimate.⁴⁰ Mature trees not only help cool the air during a drastic heat increase, but also provide more shade protection against temperature increases.

Shading is a relatively straightforward process in which leaves and branches reduce the amount of solar radiation that reaches buildings and pavement below the vegetation.⁴¹ Shading objects from solar rays can lower their surface temperature by up to forty five degrees Fahrenheit on a hot day.⁴² Depending on the canopy coverage and species of tree, this can vary from between ten and thirty percent of the sun's energy reaching the area below the tree in the summer, to between ten and eighty percent in the winter.⁴³ This drastic difference in the winter is largely due to coverage varying between deciduous and coniferous trees, evidencing the need for a diversity of species to maintain a healthy and balanced ecosystem.⁴⁴

The combination of evapotranspiration and shading can lead to some drastically different temperature outcomes and in some instances have caused the following reductions: peak air temperatures in tree groves that are 9°F cooler than over open terrain; suburban areas with mature trees that are 4-6°F cooler than new suburbs without trees; and temperatures over grass sports fields that are 2-4°F cooler than over bordering areas.⁴⁵ With more plants and less pavement, urban settings are more able to withstand the negative effects of climate change and

⁴⁰ See Robert Brown et. al., *Designing Urban Parks that Ameliorate the Effects of Climate Change*, LANDSCAPE AND URBAN PLANNING,

<https://www.sciencedirect.com/science/article/abs/pii/S0169204615000377?via%3Dihub>, at 129.

⁴¹ U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>, at 2.

⁴² Alejandra Borunda, *A Shady Divide*, NAT'L GEOGRAPHIC, July 2021, at 78.

⁴³ U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>, at 6.

⁴⁴ Alejandra Borunda, *A Shady Divide*, NAT'L GEOGRAPHIC, July 2021, at 78.

⁴⁵ U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>, at 3.

prevent the formation of “urban heat islands,” a phenomenon that occurs in urban areas with low tree cover.⁴⁶

The “urban heat island effect” occurs where dark surfaces with lack of tree cover such as asphalt absorb and reflect heat, increasing the surrounding temperature.⁴⁷ The less tree cover there is in a given area, the greater the heat increase, especially during a heatwave. The risk of extreme temperatures is especially problematic in the Pacific Northwest in the summer months, as only a third of Seattle residents own an air conditioner.⁴⁸ In 2021, Washington recorded 138 heat-related deaths between June 26th and August 31st, 70 of which occurred during the record heat wave from June 26th-29th.⁴⁹ This represents a sharp increase from the previous year, in which there were only seven total deaths during the same two-month period.⁵⁰ This increase occurred primarily in urban areas, with 54 of those deaths⁵¹ occurring in either King or Pierce County, the two most populated counties in the state.⁵² The temperature difference between urban heat islands and areas with more full canopy coverage can be drastic, and sometimes carry lethal consequences. One study found that there was a 23.3-degree difference in temperature between locations in King County,⁵³ and a 20-degree difference between two locations in Seattle

⁴⁶ *Id.*

⁴⁷ Bellemy Pailthorp and Lilly Ana Fowler, *For local communities, combating climate change starts with more plants, less pavement*, (September 1, 2021), <https://www.knkn.org/2021-09-01/for-local-communities-combatting-climate-change-starts-with-more-plants-less-pavement>.

⁴⁸ Gene Balk, *Seattle is least air-conditioned metro area in the U.S. So how do locals keep cool?*, Seattle Times, July 23, 2018, <https://www.seattletimes.com/seattle-news/data/seattle-is-least-air-conditioned-metro-area-in-the-u-s-census-data-show-so-how-do-locals-keep-cool/>.

⁴⁹ *Heat Wave 2021*, WASHINGTON STATE DEPARTMENT OF HEALTH, https://www.doh.wa.gov/Emergencies/BePreparedBeSafe/SevereWeatherandNaturalDisasters/HotWeatherSafety/HeatWave2021#dnn_ctr35592_dnnTITLE_titleLabel.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Washington Counties by Population*, WASHINGTON DEMOGRAPHICS BY CUBIT, https://www.washington-demographics.com/counties_by_population.

⁵³ *Results of heat mapping project show inequitable impact of hotter summers, will inform actions by King County and City of Seattle*, KING COUNTY.GOV, <https://kingcounty.gov/elected/executive/constantine/news/release/2021/June/23-heat-mapping-results.aspx>

due to canopy coverage and vegetation.⁵⁴ The differences underscore the importance of mature tree cover; the more mature trees, the more the temperature is mitigated. Mature trees take decades to grow, so simply replacing trees with those that will eventually reach the right canopy coverage might arrive too late to make an effective impact. Further, the methodology the city uses to replace existing canopy coverage will often never fully replace the removed tree, even at maturity.⁵⁵ In many instances, the species of replacement tree is inadequate to replace the felled one, or the location makes it impossible to replace the size and impact of the previous tree.⁵⁶ This canopy coverage can be lifesaving in many instances and must be emphasized as an important environmental measure.

2. Air Quality

Another important environmental factor supporting tree retention is the pollution control trees offer through increases in air and water quality. As more people move into cities and urban areas increase in population density, urban air quality has become an increasingly urgent priority. While Seattle has largely avoided the smoggy fate of cities like Los Angeles, Seattle has experienced temporary air quality issues such as smoke from wildfires in recent summers.⁵⁷ One factor that has kept smog at bay and softened the effects of temporary air quality issues is tree coverage in the city.⁵⁸ Trees act as a filtration system that removes pollutants from the air and stores carbon, thereby preventing negative impacts on the surrounding environment.⁵⁹

⁵⁴ Ali Lakehart, Arborist Presenter, Cascadia Now presentation for Client Science on Tap (November 15, 2021).

⁵⁵ Figure 1.

⁵⁶ Picture and diagram of tree replacement on a recent townhouse build in Seattle.

⁵⁷ Knute Berger, *The Pacific Northwest has a long history of devastating wildfires, but today's megafires are something entirely new*, (October 13, 2021), INLANDER, <https://www.inlander.com/spokane/the-pacific-northwest-has-a-long-history-of-devastating-wildfires-but-todays-megafires-are-something-entirely-new/Content?oid=22556489>.

⁵⁸ Lakehart *supra* note 54.

⁵⁹ *Id.*

One mechanism of air filtration that trees provide is carbon storage and sequestration.⁶⁰ Through this process, trees intake surrounding carbon dioxide and store it within the structure of the tree. This is the antithesis of generating energy by burning fossil fuels, which releases carbon dioxide into the atmosphere.⁶¹ Carbon storage and sequestration negates the effects of greenhouse gas emissions and is currently the most effective method to combat the negative impacts of fossil fuel use.⁶² The net rate of carbon sequestered by urban trees in the continental United States in 2005 is estimated to have been around 24 million tons per year, while current total carbon storage in urban trees in the continental United States is approximately 700 million tons of carbon.⁶³ Urban trees account for an important change not only in the local environment, but also more broad positive environmental impacts. Tree retention is the key to this environmental benefit because if trees are removed, the filtration stops and is sometimes negated if the carbon is reintroduced in the atmosphere through use as firewood.

A second mechanism of filtration is the process of “dry disposition,” which removes pollutants from the air to improve air quality as well as remove and prevent greenhouse gas emissions.⁶⁴ In a very similar process to carbon removal and sequestration, trees intake various pollutants from the air and store them in their internal structure.⁶⁵ A 2006 study estimated total annual air pollutant removal by urban trees in the United States at 784,000 tons, with a value of \$3.8 billion.⁶⁶ In addition to removing pollutants from the air, the temperature regulation

⁶⁰ U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>.

⁶¹ UCAR CENTER FOR SCIENCE EDUCATION, Biogeochemical Cycles, <https://scied.ucar.edu/learning-zone/earth-system/biogeochemical-cycles>.

⁶² U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft.* <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>

⁶³ *Id.* at 6.

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ *Id.*

provided by tree cover can also reduce the need for air conditioning, further decreasing the amount of greenhouse gases in the air.

Tree shade also helps to prevent air pollutants through a process called evaporative emissions.⁶⁷ A common source of this pollution is the gas tanks of parked vehicles, which emit volatile organic compounds (VOCs) as the car temperature rises.⁶⁸ VOCs are organic compounds that fall under the larger classifications of greenhouse gases, some of which are precursors to ground level ozone.⁶⁹ According to one study, tree shade can reduce the emissions of VOCs by 2 percent per day if the tree canopy over parking lots is increased by 42 percent.⁷⁰

3. Water and Soil Quality

Urban trees also benefit the environment by filtering water that accumulates from rainfall. Large trees with wide canopy coverage and complex root systems help prevent adverse effects to surrounding water quality, especially during periods of heavy rainfall.⁷¹ Stormwater runoff can drastically change based on the amount of tree coverage in the area.⁷² This runoff is especially important in Seattle, given the combination of elevation fluctuations and proximity to large bodies of water.⁷³ The fewer trees the city has, the less restrictive the flow will be into Puget Sound and the more negative impacts to the water quality will occur.⁷⁴ The city is aware of this issue as evidenced by programs such as Rainwise.⁷⁵ This program gives grants to private property owners to install rain gardens using plants to slow the runoff from inclines in certain

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ Dave Moehring, Interview, (January 9, 2022).

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *RainwWise – Private property owners can be part of the stormwater solution*, King County.gov, <https://kingcounty.gov/services/environment/wastewater/cso/rainwise.aspx>.

sections of the city. Lack of tree retention will run counter to this program and only make matters worse for our local water quality. Puget Sound already has water quality issues from the increased population in the area,⁷⁶ so any increase in stormwater runoff will only contribute to the existing problem.

Seattle's drastic fluctuations in elevation are also a concern for slope stability, especially during periods of heavy rainfall.⁷⁷ The city of Seattle identifies 8.4% of the city's surface as slide prone, with slides more likely to occur when the soil is saturated.⁷⁸ Trees can help mitigate not only the amount of water sitting in the soil, but also the stability of the soil and slope itself through root reinforcement.⁷⁹ In one study conducted in British Columbia, the root network accounted for 71% of the sheer strength of the soil,⁸⁰ and the ground can bear 70% greater weight loads before soil rupture in soils with a root network than in soils without roots. Because most slides occur within a few days of heavy rainfall or rapid snowmelt,⁸¹ the presence of trees will relieve the added landslide risk by lessening the saturation in and adding to the strength of the soil.

C. Financial Impacts

Tree retention does not come without a price, but the benefits largely outweigh the costs. A study of urban forestry programs in five U.S. cities showed a range in degree of expenditure: annual costs ranged from almost \$15 per tree in the Desert Southwest region to \$65 per tree in

⁷⁶ Ashley Braun, *Urine trouble: High nitrogen levels in Puget Sound cause ecological worry*, CROSSCUT (October 20, 2021), <https://crosscut.com/environment/2021/10/urine-trouble-high-nitrogen-levels-puget-sound-cause-ecological-worry>.

⁷⁷ Rainwise *supra* note 74.

⁷⁸ City of Seattle CEMP-SHIVA, Seattle Office of Emergency Management, <https://www.seattle.gov/emergency-management/hazards/landslides>, at 5-26.

⁷⁹ Robert Ziemer, *The Role of Vegetation in the Stability of Forested Slopes*, UNITED STATES DEPARTMENT OF AGRICULTURE, at 298.

⁸⁰ *Id.* at 299.

⁸¹ City of Seattle CEMP-SHIVA, Seattle Office of Emergency Management, <https://www.seattle.gov/emergency-management/hazards/landslides>, at 5-26.

Berkeley, California.⁸² The greatest maintenance cost is often pruning, accounting for roughly 25-40% of the total annual costs, followed by administration and inspection, ranging from 8-35% of annual costs, while tree planting only accounted for 2-15% of annual costs.⁸³ On a per-tree basis, the cities accrued benefits ranging from about \$1.50–\$3.00 for every dollar invested.⁸⁴ These cities spent roughly \$15–\$65 annually per tree, with net annual benefits ranging from approximately \$30–\$90 per tree.⁸⁵ Financial benefits include decreased demand for air conditioning as well as reduced pavement maintenance, as tree shading slows the deterioration of street pavement.⁸⁶ Joint studies by the Lawrence Berkeley National Laboratory (LBNL) and the Sacramento Municipal Utility District (SMUD) placed varying numbers of trees around houses to shade windows, and then measured the buildings’ energy use.⁸⁷ The cooling energy savings ranged between 7 and 47 percent and were greatest when trees were planted to the west and southwest of buildings.⁸⁸ A United States Department of Agriculture (USDA) Forest Service study investigated the energy savings resulting from SMUD’s residential tree planting program. This study included over 250 program participants in Sacramento, California, and estimated the effect of new shade trees planted around houses. An average of three new trees were planted within 10 feet of each house.⁸⁹ Annual cooling energy savings were 1 percent per tree, and annual heating energy use decreased by almost 2 percent per tree.⁹⁰ The trees provided net wintertime benefits because the positive effect of wind shielding outweighed the negative effect

⁸² U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation. Draft*. <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ *Id.*

of added shade.⁹¹ Another LBNL study simulated the effects of trees on homes in various communities throughout the United States.⁹² Assuming one tree was planted to the west and another to the south of a house, the model predicted that a 20-percent tree canopy over the house would result in annual cooling savings of 8 to 18 percent and annual heating savings of 2 to 8 percent.⁹³

Finally, the presence of trees, especially exceptional trees as defined by the Seattle Municipal code based on the size and species of the tree, can increase the value of houses. Studies have found general increases of about 3 to 10 percent in residential property values associated with the presence of trees and vegetation on a property.⁹⁴ While retention does include some upfront costs, the long-term benefits and make the initial investment well worth it.

D. Racial Justice

An often overlooked, aspect of tree retention and canopy coverage is the racial justice component. Tree coverage, or lack thereof, can be almost directly linked to the socioeconomic status of a given city's residents. For example, historically redlined areas in Tacoma have about 15% less tree cover than areas that were not redlined. This is not unique to the Northwest, as comparative studies have been conducted in hotter areas that better illustrate the disparity in vegetation. A study in Los Angeles found that formerly redlined Los Angeles neighborhoods had less canopy coverage and are on average 7.6 degrees hotter than the richest ones.⁹⁵ In some of the city's poorest neighborhoods, such as Huntington Park, trees shade well under 10 percent of

⁹¹ Simpson, J.R. and E.G. McPherson, *Simulation of Tree Shade Impacts on Residential Energy Use for Space Conditioning in Sacramento*. UNITED STATES DEPARTMENT OF AGRICULTURE, <https://www.fs.usda.gov/treearch/pubs/60565>.

⁹² *Id.*

⁹³ U.S. ENVIRONMENTAL PROTECTION AGENCY, *Reducing urban heat islands: Chapter 2: Trees and Vegetation*. Draft. <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>.

⁹⁴ *Id.*

⁹⁵ Alejandra Borunda, *A Shady Divide*, NAT'L GEOGRAPHIC, July 2021, at 70.

the area, while in better-off places, such as Los Feliz, the canopy coverage can hit nearly 40 percent.⁹⁶ Much of the disparity is due to lack of public investment in formerly racially “redlined” areas.⁹⁷ While the introduction of additional trees might marginally increase the surrounding property values, the risk of increasing the property value to an amount that would price out current residents is low, and the benefits to the community far outweigh the risks. The direct correlation between areas with historically disenfranchised populations and areas with low canopy coverage is yet another compelling rationale to begin substantively addressing the issues of the tree retention laws.

The positive physical, environmental, financial, and social benefits that a healthy urban forest brings to the city are numerous, but many are lessened or even negated by lack of regulation. One of the consequences of a lack of regulation is that once the trees are gone, they are very hard to replace.⁹⁸ The Los Angeles inquiry into canopy coverage in the city led to a positive change, with the city stating a goal to plant 90,000 trees by the end of 2021.⁹⁹ However, the canopy coverage necessary to mirror the same benefits seen in more affluent areas of the city will not be realized for many years, if it can be attained at all due to adverse growing conditions. To avoid delaying the benefits of full canopy coverage, existing trees must be more effectively protected by the city.

III. Current Tree Retention Laws

⁹⁶ *Id.*

⁹⁷ *Id.* at 76.

⁹⁸ *Id.*

⁹⁹ *Id.* at 82

Seattle’s tree protection laws largely operate based on a tree protection ordinance passed in 2008 and codified in Chapter 25 of the Seattle Municipal Code.¹⁰⁰ While the Seattle City Council has promulgated resolutions to update the ordinance, no official changes have been made. The City of Seattle recently disseminated an Urban Forest Management Plan (the Plan) which lays out forestry goals for Seattle over the next 5 years.¹⁰¹ The Plan includes creating greater access to tree cover through planting initiatives and other programs in “environmental equity priority communities,” which are areas with historically disenfranchised groups with less prevalent tree cover.¹⁰² Another goal of the Plan is to update Seattle’s tree protection regulations to close loopholes that allow subversion of retention regulations. The Plan notes that the majority of trees are on private property, with 67% of residential land in Seattle home to 72% of the city’s canopy coverage.¹⁰³ Unfortunately, the language in the Plan is not codified in laws that developers and arborists must follow when working in the Seattle. Formal changes with more stringent regulations coupled with strict enforcement will be needed if Seattle is to preserve its existing canopy coverage. Retaining older trees noted as “exceptional trees” in the code, is especially important to preserve the benefits that larger trees bring to the city.

A. Exceptional Trees

The main function of the current code is to protect exceptional trees. An "exceptional tree" means a tree or group of trees that because of unique historical, ecological, or aesthetic value constitutes an important community resource, and is determined as such according to standards and procedures promulgated by the Department of Planning and Development.¹⁰⁴ This

¹⁰⁰ Tree Protection, Chapter 25.11, Seattle Municipal Code.

¹⁰¹ 2020 Urban Forest Management Plan (Executive Summary).

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ Department of Planning & Development, *Supra* note 7.

provision protects trees that are a certain size, depending on the type of tree. Tree size is measured by diameter at breast height (DBH) which means the diameter of a tree trunk measured at 4.5 feet above ground level.¹⁰⁵ Each species of tree has a DBH standard that indicates if it is an exceptional tree.¹⁰⁶

The Seattle Municipal Code limits the number, size, and type of trees that may be removed from a given property.¹⁰⁷ A Tree & Vegetation Removal Permit is required when removing exceptional trees, or more than three trees that measure 6-inches or greater in diameter in a one-year period.¹⁰⁸ Removing an exceptional tree or more than three trees in a one-year period generally occurs either through “hazard tree” designations or because a developer is not able to achieve maximum lot coverage because of the presence of the tree or trees.¹⁰⁹

1. Hazard Trees

To qualify for removal, a protected tree must meet the following three criteria set by the Seattle Department of Development and Inspections (SDCI): the tree has structural defects or other conditions that make it likely to fall or break; there is a permanent structure or an area of moderate-to-high use by people that would be impacted if the tree failed; and the danger cannot be mitigated by pruning the tree or moving the structure or activity.¹¹⁰ The assessment must be completed by a licensed professional who holds a current Tree Risk Assessment Qualification (TRAQ) and has a minimum of three years of experience in tree evaluation.¹¹¹ The full program of obtaining the qualification consists of a two-day course followed by a half day of

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Tree Protection Code*, SEATTLE DEPARTMENT OF CONSTRUCTIONS & INSPECTIONS, [http://www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/tree-protection-code](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/tree-protection-code).

¹⁰⁸ *Id.*

¹⁰⁹ *See id.*

¹¹⁰ Hazard Trees, *supra* note 9.

¹¹¹ International Society of Arboriculture, <https://www.isa-arbor.com/Credentials/ISA-Tree-Risk-Assessment-Qualification>.

assessments.¹¹² While becoming a certified arborist with a TRAQ does require some effort, it is not a stringent requirement but grants an individual the ability to allow the removal of essentially any tree in the city. In practice, the hazard tree designation overrules the Municipal Code, rendering the rest of the tree protection code essentially meaningless. Hazard trees do exist and at times removal under the exception is justified, but these permits are generally granted by overworked and unsophisticated city planners that almost always agree with the determination of the arborist submitting the removal application. The regulations place a great deal of faith in certified arborists because Seattle has a complaint-based system, making it more difficult to ensure the validity of a hazard tree designation.

2. Maximum Lot Coverage

Single-family zones allow for structural lot coverage of up to 35% but there are many ways around this such as rezoning, and exceptions granted by the Seattle. City guidelines provide that “[e]xceptional trees must be retained unless doing so would prevent the development from achieving the maximum allowed lot coverage.”¹¹³ The tree protection area may be determined by an arborist based on the condition and location of the tree; however, it is generally considered to be the dripline (a horizontal area equal to the maximum extent of all branches and leaves) minus any allowed encroachment. If the development potential cannot be reached, or if avoiding development in the tree protection area would result in a portion of the house being less than 15 feet in width, then construction in the protected area is permitted or the tree may be removed.¹¹⁴ Lot coverage applies for both developed and undeveloped land, but the standards are similar for both project types.

¹¹² *Id.*

¹¹³ *Hazard Trees*, SEATTLE DEPARTMENT OF CONSTRUCTIONS & INSPECTIONS, (March 27, 2020) Tip 331B, at 3.

¹¹⁴ *Id.*

On undeveloped land, a developer may not remove trees six inches in diameter or greater unless they are found to be hazardous or unless the developer proposes to remove a tree as part of a development.¹¹⁵ On developed land, tree removal is limited in all single-family, low-rise, midrise, and commercial zones. No more than three non-exceptional trees six inches in diameter or greater may be removed on a lot in any one-year period, unless trees are found to be hazardous, or where tree removal is proposed as part of a development. These protection exceptions function to make it that much easier for those seeking to remove trees to negate provisions in the protection code.

B. Tree Replacement

Seattle's Municipal Code requires a certain amount of tree coverage for new construction projects, as well as a documented process for replacing trees that were removed per one of the exceptions listed above.¹¹⁶ Trees sufficient to meet the following requirements shall be provided when single-family dwelling units are constructed: for lots over 3,000 square feet, at least 2 caliper inches of tree per 1,000 square feet of lot area; on lots that are 3,000 square feet or smaller, at least 3 caliper inches of tree.¹¹⁷ A caliper inch is measured using a special ruler that measures the width of the tree.¹¹⁸

While this may sound like an effective way to maintain the same amount of coverage that previously existed, two trees that equal the caliper inches of a larger tree will not necessarily provide the same benefits. The Code states that “the minimum number of caliper inches of tree required may be met by preserving existing trees, planting new trees, or by a combination of

¹¹⁵ *Id.*, at 2.

¹¹⁶ Seattle Municipal Code, 23.44.020.

¹¹⁷ *Id.*

¹¹⁸ *Id.*

preservation and planting.”¹¹⁹ The Code provides greater leeway and flexibility for tree removal and replacement. While this does ensure easier access for development, it also opens larger loopholes to negate the existing tree retention laws in the city. Further, the way in which the Code treats trees and their replacements does not properly distinguish between a given type of tree and its replacement. For example, a few small deciduous trees would be indistinguishable in the code from a large coniferous tree that provides all the environmental and economic benefits to a given area.

Seattle’s Code ensures certain exceptional trees will be replaced with the types of trees that will fully replace their benefits, but this type of regulation has two issues: timing and exceptions. The Code states that “in all zones, each exceptional tree, and tree greater than 24” DBH/DSH [Diameter at Standard Height], removed in association with development must be replaced with a tree that will provide the same canopy coverage at maturity unless it qualifies as a hazardous tree.”¹²⁰

The first issue is the use of the language “coverage at maturity.” This means that while the coverage will eventually equal the replaced tree, this process could take decades. For example, if a mature Douglas fir is replaced with a sapling, it will not reach the same size for forty years. No protection is afforded to trees that have been designated as hazard trees, making it easy to sidestep regulations using a certified arborist with the proper accreditation with little oversight in the process.

Another problematic loophole for tree replacements are exceptions created for the construction of Detached Accessory Dwelling Units (DADUs). These exceptions were originally created to increase housing affordability and allow current residents to afford to continue to live

¹¹⁹ Seattle Municipal Code, 23.44.020.

¹²⁰ *Hazard Trees*, SEATTLE DEPARTMENT OF CONSTRUCTIONS & INSPECTIONS, (March 27, 2020) Tip 331B, at 3.

in their current home,¹²¹ but have been perverted by many developers to be used as an avenue to increase the size and scope while reducing the regulations on a given project.¹²² If a DADU is present or built on the property, the tree replacement requirements change to require only 2 caliper inches of tree for the entire lot.¹²³ This allows a developer to remove and not fully replace the caliper inches of current tree and canopy coverage by simply building a DADU, a tactic already implemented to effectively subdivide a lot by completing a project and reclassifying it as a condominium. No city ordinance currently governs this process, making the combination of the DADU exception and condominium creation¹²⁴ a particularly insidious combination that expands lot coverage and reduces canopy coverage.

While Seattle's tree retention code does have some positive features that promote the growth and preservation of a healthy urban forest, the number of loopholes and lack of enforcement generally lead to many of the more important provisions in the code being ignored.¹²⁵ There are currently proposed changes to the Code, but they are a long way from being approved and codified. These changes include reducing the number of allowed removals from three to two and extending protections for significant trees to undeveloped lots.¹²⁶ However, the hazard tree exception remains, rendering these changes largely meaningless. Further, the changes include giving the SDCI the final authority over the exemptions.¹²⁷ This creates the same issue in oversight that currently exists. For a more comprehensive policy that ensures the preservation of a healthy urban forest through more stringent oversight, Seattle will need to change the permitting process that allows for the circumvention of tree retention laws.

¹²¹ Executive Order 2019-04.

¹²² *See id.*

¹²³ Seattle Municipal Code 23.44.020 (A)(2).

¹²⁴ RCW 64.34.

¹²⁵ *See supra* Current Tree Retention Laws.

¹²⁶ UFC Proposed Changes (6/14/19).

¹²⁷ *Id.*

IV. Model Tree Retention Laws

Several cities in the Northwest have beneficial provisions in their tree codes that policy makers in Seattle should emulate. Lawmakers in Portland updated the city's tree retention laws, which restrict the ability of developers to remove existing trees at will and allows the city to track the canopy cover using a comprehensive permitting system.¹²⁸ Federal way and Portland share many similarities such as vegetation, climate and population growth with Seattle, making them excellent candidates to compare the differing approaches to tree retention and the impact that has had on each area.

A. Portland Tree Retention Laws

The most substantial difference between the tree retention policy in Seattle and Portland is that Portland has a City Forester. The City Forester grants far more control to the city to preserve the existing urban forest and acts as a more stringent deterrent to potential removal of canopy coverage. Unlike Seattle's enforcement process, which primarily operates through a building permitting process, Portland's process largely centers around the determination of the City Forester. While some determinations are made by the Director of the Bureau of Development Services, the major projects, ones that generally concern larger projects and trees, are subject to review by the City Forester. The City Forester is responsible for administering the tree permit program, reviewing development permits, processing violations, managing the urban forest program, and preserving and enhancing the urban forest.¹²⁹ Urban forestry review is assigned to the City Forester when a project is valued at \$25K or greater and any time a Street,

¹²⁸ City of Portland City Code, <https://www.portland.gov/code/11/10>.

¹²⁹ *Id.*

City, or Heritage tree may be impacted or removed by the development.¹³⁰ This largely encompasses the most high-risk projects as they relate to tree retention because a majority of trees are lost when developers tear down and build a new building on a given lot. The policy grants the city control over all street or city trees as well as any trees on private property designated as a “heritage tree”. Heritage trees are trees that are of special importance to the city because of their age, size, type, historical association, or horticultural value.¹³¹ This designation is different than exceptional trees and requires a separate permitting process. The application of Portland’s policy to all projects valued over \$25,000 ensures that the permitting process does not overly burden landscapers and arborists during smaller projects, while granting the City Forester greater discretion and regulatory authority over new housing developments.

The third-party approval of the City Forester is a key provision that prevents decisions regarding tree removal from resting in the hands of the developing party. While Seattle laws require city approval for designating hazard trees, the designations are made by arborists who may not be motivated to preserve the trees. Additionally, hazard tree designations are reviewed by the Seattle Department of Construction and Inspections. Unlike Portland, Seattle processes these applications through the SDCI, a department that does not have specific knowledge of the health or safety of urban forests. Portland’s system ensures that review is completed by professionals that have a sophisticated knowledge of urban forests from beginning to end. This prevents deferral to professional arborists that in many cases have financial incentive to designate certain trees as hazardous because they would gain employment in removing that tree if the designation is successful.

¹³⁰ City of Portland City Code, Overview of Urban Forestry Development Review, <https://www.portland.gov/trees/trees-development/tree-plan-requirements-development-permits/overview-urban-forestry>.

¹³¹ Portland City Code, 11.20.030 The Urban Forestry Appeals Board.

Portland's system is not without controversy, as there are financial avenues around compliance with urban forestry provisions. One such avenue gives developers the ability to pay a fee instead of replacing trees that were removed during the construction project. The money is put into a fund that the city uses to plant and preserve more trees in the rest of the city, but this does not address the issue of the missing tree in the immediate environment. While it is not a perfect model, Portland's permit-based system allows for more regulation and accountability.

B. Federal Way Tree Retention Laws

Federal Way uses a system of Tree Unit Credits to ensure that replacement trees fully replace the trees cut down during development. Although Federal Way's tree retention policy is similar to Seattle's, Federal Way's process for removal is more stringent because it requires either written approval by the city or permit applications. Certified arborists are still required for exemptions to removal provisions, but Federal Way's policy requires the use of Tree Unit Credits.

Each property in a single-family residential area in Federal Way has a minimum tree density requirement of 25 tree units per acre.¹³² The city uses a table that classifies the existing category of tree to determine the replacement value of that species based on its current size.¹³³ Classifications are based on a point system that requires replacement with enough trees that match the points allotted to the removed tree. Because the original tree will be valued higher than a replacement tree, the point system favors retention over replacement, incentivizing developers to retain trees than replace the once they are removed. The point system creates a scenario in which developments are easier to complete by leaving existing trees rather than removing and

¹³² *Tree and Vegetation Retention Requirements: For Developed Single Family Parcels*, Department of Community Development, City of Federal Way.

¹³³ Federal Way Municipal Code, Chapter 19.120: Clearing, Grading, and Tree and Vegetation Retention, <https://www.codepublishing.com/WA/FederalWay/html/FederalWay19/FederalWay19120.html#19.120.130>.

replacing them. This is how an effective tree retention policy should operate if it is to preserve the growth already present in the city.

In addition to the size of the tree, Federal Way's Code also specifies what type of tree should replace those that are removed. The Code is explicit in how groves are to be replaced, stating that "[w]here tree replacement is required in order to achieve minimum tree units per acre, the replacement trees shall consist of a mix of evergreen and deciduous trees, suitable to specific site conditions."¹³⁴ Federal Way maintains a non-exhaustive list of replacement tree species to aid in replacement to ensure the biodiversity and local environment are affected as little as possible. Further, the Code stipulates the size of the replacements, asserting that "[r]eplacement trees shall be evergreen trees a minimum of six feet in height and deciduous trees with a minimum two inches caliper."¹³⁵ The specificity of both the size and species of the tree allows for more intentional tree replacement, if needed.

This aspect of Federal Way's retention code highlights another glaring issue in Seattle's Code, which only loosely states the size of trees using caliper inches and does not distinguish between different tree types that offer varied benefits to the surrounding environment. Many developments are allowed to simply replace conifer trees with deciduous trees, as long as the stem of each matches the tree which is being replaced. Federal Way does an excellent job maintaining a consistent urban forest environment, even when trees are replaced.

The Federal Way and Portland tree retention laws offer provisions that would be helpful in creating a new law for Seattle to model new laws around. While they are not perfect, they suggest possible additions that could make a more comprehensive tree retention policy. Each

¹³⁴ *Id.* at 19.120.150)(1).

¹³⁵ *Id.* at (19.120.150)(3).

system provides a more intentional approach to both tree retention, and if necessary, tree replacement. The Federal Way policy addresses replacement with the specificity required to maintain a healthy urban forest, while Portland provides a sophisticated department to ensure compliance. The combination of these two elements would go a long way in addressing some of the issues currently facing Seattle.

C. Retention Proposals

Seattle has stated that it has comprehensive goals to overhaul the tree retention laws, but there have been few changes implemented. The following is the Urban Forestry Commission's stated goal for a new urban forestry plan, but it is from 2017, and has had few changes since its promulgation:

The City of Seattle set the bold goal of achieving 30% tree canopy cover by 2037 to increase the environmental, social, and economic benefits trees bring to Seattle residents. The Seattle Urban Forest Stewardship Plan (UFSP), adopted in 2013, is a comprehensive strategy for increasing Seattle's tree canopy cover to meet the 30% target. The UFSP lays out goals and a broad range of actions to be implemented over time to preserve, maintain, and plant trees as well as restore the public forested areas remaining in the city.¹³⁶

The Seattle City Council has disseminated some goals with no substantive policy to back them up, such as the Mandatory Housing Affordability (MHA) legislation, which was passed on March 18, 2019. Part of the MHA legislation was Resolution 31870, which called for additional measures to promote livability and equitable development.¹³⁷ Resolution 31870 recognized the benefits that urban forests bring to the city and discussed advancing the Urban Forest Stewardship plan.¹³⁸ The Resolution noted that

¹³⁶ Urban Forestry Commission, CITY OF SEATTLE, <https://www.seattle.gov/urbanforestrycommission>.

¹³⁷ Seattle City Council Legislative Summary Resolution 31870, <https://friends.urbanforests.org/2019/04/13/seattle-city-council-mha-resolution-section-on-trees/>.

¹³⁸ *Id.*

[p]otential measures may include, but are not limited to, the following:

- A. Retaining protections for exceptional trees and expanding the definition of exceptional trees.
- B. Creating a permitting process for the removal of significant trees, defined as trees 6 inches in diameter at breast height or larger.
- C. Adding replacement requirements for significant tree removal.
- D. Simplifying tree planting and replacement requirements.
- E. Maintaining tree removal limits in single-family zones.
- F. Exploring the feasibility of establishing a in-lieu fee option for tree planting.
- G. Tracking tree removal and replacement throughout Seattle.
- H. Providing adequate funding to administer and enforce tree regulations.
- I. Requiring that all tree service providers operating in Seattle meet the minimum certification and training requirements and register with the city.¹³⁹

Unfortunately, there has not been any substantive action behind this messaging. There is sound evidence the city has been aware of tree retention issues for years now, and simply has not addressed many glaring issues such as the exceptional tree loophole. In 2017, the Seattle Department of Construction and Inspections instigated an internal study to determine the effectiveness of tree regulations in Seattle. The internal study revealed that

current regulations and enforcement practices were not supporting tree protection. Unrelated to development, exceptional trees and groves were removed, with most removals occurring in Environmentally Critical Areas, particularly landslide-prone areas. New development has contributed to the loss of trees, despite tree planting requirements in single-family zones.¹⁴⁰

The memo went on to say that “[c]onifers and large trees are being removed while new trees tend to be smaller and/or deciduous. Additionally, individuals appeared to be using the broad definition of hazard trees to circumvent regulations, allowing them to remove trees and avoid replacement requirements.”¹⁴¹ The lack of action has been frustrating for many residents who

¹³⁹ *Id.*

¹⁴⁰ Seattle City Council Central Staff Memo, Draft Updates to Seattle’s Tree Regulations, <https://www.documentcloud.org/documents/6940402-Central-Staff-Memo-051618.html#document/p2/a566804>, at 2.

¹⁴¹ *Id.*

find themselves facing a sheer wall of a new development where an exceptional tree used to be,¹⁴² especially when coupled with the knowledge that the city is aware of the problem and continues to not take affirmative steps to ameliorate the issue.

While there are many issues with Seattle’s current tree retention policy, solutions must also be balanced with the need for increased density and affordability as the city continues to grow. Tree retention for a high quality of life is important but it is not without drawbacks. Population density and housing affordability are important issues that must be addressed in drafting any new provisions.

V. Issues

Seattle currently has more than four million trees with a replacement value of around \$5 billion dollars, representing a substantial city resource that is not currently being properly monitored or cared for.¹⁴³ Seattle’s lack of a comprehensive permit system is problematic and any substantive changes to policy will be ineffective if there is no enforcement. Seattle is aware of this issue, stating that “the City of Seattle counts on the public to report illegal tree removal.”¹⁴⁴ The stated policy of the city is for those that “observe what [they] think is a violation of Seattle’s tree code on private property, [and] report it to the Code Compliance Division of the Department of Construction and Inspections,”¹⁴⁵ either online or over the phone, during limited hours four days a week. The city notes that the police department will generally not respond to code violations but encourages citizens to send information to the code compliance division regardless of if the trees have already been removed.

¹⁴² Cunningham *supra* note 2.

¹⁴³ 2020 Urban Forest Management Plan (Executive Summary).

¹⁴⁴ Trees for Seattle, CITY OF SEATTLE, <https://www.seattle.gov/trees/regulations/illegal-cutting>

¹⁴⁵ *Id.*

There are a number of things wrong with this process. First, it requires everyone to be aware of the provisions in the Seattle tree code because when removals occur, they are completed with large construction equipment with uniformed professionals. The vast majority of residents will not question such an operation because the assumption is the company is there legally doing their job. Questioning the operation requires a nuanced understanding of designating exceptional trees, lot coverage, caliper inch measurements, and diameter at breast height (DBH) among other things, and most laypeople will lack the knowledge necessary for citizenry enforcement. Second, this system means the laws function exclusively as a monetary punishment after the fact; there is no method to prevent the cutting of the tree in the first place. Seattle does not have a system that logs exceptional trees, so when they are removed, the purported goal of retaining the tree is an afterthought to the practical effect of the regulation, which is simply a monetary penalty, if anything at all. Enforcement and policy considerations are sorely lacking in the current system and a more cohesive system that balances a healthy urban forest with healthy urban development would go a long way towards solving this issue.

VI. Solutions

Enforcement and policy considerations are sorely lacking in the current system, but a more cohesive system that balances a healthy urban forest with healthy urban development would go a long way towards solving this issue. The creation of a dedicated urban forestry department—staffed with professional arborists who do not have a stake in the removal of individual trees—would ameliorate many of the current issues in both enforcement and long-term strategic planning, crafting a more unified city-wide vision and set of policies for tree retention.

First, this department could shift the city from after-the-fact monetary punishments to proactive tree management. This would contribute to a more collaborative approach to tree retention in collaboration with, rather than in opposition to, developers. One aspect of the current tree retention problem in Seattle is an increasing the demand for housing. Policies regarding tree retention should seek the middle ground between preservation of vegetation and expansion of housing that promotes both urban development and urban forestry. The two aims need not be at odds with one another. In fact, in many cases, developers would be able to maintain profitability while maintaining existing trees with only minor changes to proposed builds. One study of a proposed build revealed 5 options for a build that would save two trees on the property, that would be hard to replace or potentially impossible to replace given the square footage of the build.¹⁴⁶ The plan was subsequently changed to accommodate the existing trees, and the units were built and sold while preserving the existing canopy coverage. A dedicated urban forestry department could help facilitate this more collaborative approach as part of a long-term tree retention plan.

Second, a new urban forestry department in Seattle, like the existing department in Portland, could begin to meaningfully enforce the provisions already codified in the Seattle code. The current SDCI lacks the expertise and resources to adequately enforce the existing regulations. A city arborist with detailed expertise into the care of trees would help determine when codes are broken and proactively save trees, rather than waiting for complaints to be issued after the fact. The increased threat of enforcement and punishment would also help deter developers and landowners from removing trees.

¹⁴⁶ Twist Design Inc, *Feasibility Study*, (January 23, 2018).

The creation of an urban forestry department or designation of an official city arborist would go far towards crafting a more integrated approach to tree retention and management that would balance each interest, ensuring a healthy ecological and housing environment for the city of Seattle.

Author's Note

The Seattle City Council passed a new tree ordinance on May 23, 2023. Some of the notable changes include the reclassification of trees into 4 separate tiers. The reclassification protects trees as small as 12" DBH, half of the previous requirement under the ordinance. If a tree cannot be replaced on the property, the developer must pay a fee into the central fund, which could be used to replant trees in neighborhoods with less canopy coverage. However, the ordinance did not address lot coverage or hazard tree exemptions and failed to create an enforcement mechanism to implement the necessary changes advocated for in this paper. It also fails to address the problem of tree replacement by failing to provide clear standards, noting that a replacement tree at maturity should be "roughly proportional to the canopy cover of the original tree." The new ordinance shifts a great deal of the onus for tree protection onto the arborists performing tree services. Hazard tree determinations continue to be made by certified arborists and these actions continue to be overseen by the SDCI. Crucially, the ordinance did not create a city arborist with the power to oversee and enforce either the existing or new provisions. Until this occurs, any regulations will likely continue to be plagued by the existing issues in the system.

Figure 1

BEFORE



AFTER

