CITY of MADISON
URBAN FORESTRY TASK FORCE
FINAL REPORT
FOR DISCUSSION AND REVIEW
2019

URBAN FORESTRY TASK FORCE MEMBERS

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The reality of a developing urban community means tree loss from growth, infrastructure, invasive pests, diseases, and climate change. A tree canopy that is healthy for residents is 40% in an urban atmosphere; Madison is currently at 23%. To ensure the health and prosperity of our community, Madison must have thoughtful planning, active preservation, and increased planting of our urban forest.

Madison's developing urban forest can support the opportunity to thrive in every home.

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Madison Urban Forestry Task Force

Trees are a foundation for Madison's community and ecosystem health, sustainability and resilience. Our urban forest plays a vital role in stormwater management, protecting our drinking water, and reducing energy costs and human stress. With this mind, our urban forest must be managed holistically and urgently as a potentially fragile resource. We must look to its future with a focus on the hard science and policies that affect its growth, decline, and composition. Yet, there are also inexpressible qualities of our urban forest. Poets write elegies to trees, not stoplights and sidewalks. Our trees shelter our community.

This document presents findings and recommendations to preserve, enhance and expand Madison's urban forest. They have been prepared and are presented by the Madison Urban Forestry Task Force (UFTF) which was established by Common Council Resolution RES-17-00659 on August 1, 2017 to complete the following:

I. Review available research and best practices on promoting a vibrant, healthy and sustainable urban forest.

II. Review City policies, practices, programs, and operations that impact the urban forest (e.g. Zoning Code, Emerald Ash Borer Mitigation Plan).

III. Solicit input from local stakeholders with additional information on the issue as needed (e.g. WI DNR).

IV. Develop recommendations to the Mayor, Common Council, Committees or Commissions, and/or City agencies on the establishment of a Canopy Coverage Goal and action plan for the city covering both public and private trees.

V. Develop recommendations to the Mayor, Common Council, Committees or Commissions and/or City agencies to preserve and expand our urban forest resources through a well-planned and systematic approach to tree management.

VI. Develop recommendations to encourage private landowners to protect, preserve and promote a diverse and sustainable urban forest.

VII. Provide guidance for a long-term strategy to departments to promote the sustainability of a healthy urban forest.

The recommendations presented here address the Task Force's stated mission and thus provide a basis for subsequent progress on issues facing our urban forest. The UFTF is one step in an ongoing process.

The UFTF attempted to set a direction for a series of urban forest priorities and initiatives. It has concurrently considered both the complexities of enacting new policies and the existing expertise of staff that will initiate and strengthen the recommendations. The UFTF's work is the next step in the necessarily continuous urban forest management process. Urban forests are dynamic and our relationship to it must be long·term and evolutionary.

The Value of Trees

Madison residents value and care about the trees around their home and neighborhood. The value of trees is so multi-faceted it may be impossible to capture every way which they improve the quality of life in Madison. Trees are the backdrop of neighborhoods and one of the most basic tools for placemaking, as is often demonstrated in the classic tree-lined street. They shape our experience of a place and time, announcing the arrival of spring with a vibrant green, shading us from the intense summer sun and coloring the autumn horizon. Trees are critical habitat to urban wild life.

Trees have other direct benefits to residents as well. That trees cool homes in summer and make neighborhoods better places is common knowledge in Madison. Residents know by experience or intuition that trees on either private land or public property can increase property value, with some estimates as high as an additional $9,000 in sales value.

Beyond the inexpressible qualities of our urban forest, trees should be recognized as pieces of public infrastructure. The value of this infrastructure is measurable and fiscal benefits are quantifiable.

Stormwater: Trees reduce stormwater runoff by capturing and storing rainfall in their canopy and the soils supporting their roots.   Trees and their root systems are also effective at slowing run-off and reducing erosion. It is estimated that our current forest of street trees and parks intercepts 115 million gallons of rainfall in a year. Trees help mitigate the effects of stormwater.

Temperature and Energy: Trees lower air temperature by shading surfaces and transpiring water through leaves, reducing energy usage. The shading of buildings and streets in the summer by a healthy tree canopy lowers temperatures by 5-10 degrees, reducing the effects of a heat island in our downtown and densely paved areas. Without trees, summer heat islands created by surrounding buildings and pavement make walking or simply being outside uncomfortable if the heat is elevated (above 90 degrees). The reduction of energy use by the cooling effect of trees will help Madison achieve its goal of becoming carbon-neutral and save money on utility bills.

Removing Carbon Dioxide: Trees remove carbon dioxide from the atmosphere and in the process return oxygen. Urban forests clean the air by intercepting small particulate matter and absorbing harmful gases on their leaf surfaces. Our public urban forest removes an estimated 15,000 tons of carbon each year, equivalent to the output of 4,000 to 6,000 cars.

Madison's Urban Canopy

Within Madison's 80 square miles, the urban forest canopy covers 23% of land area. However, such generalized statistics overshadow the complexities on the ground. Trees are not evenly distributed; sometimes there are logical reasons for this, sometimes it's as a result of past decisions that did not place sufficient value on trees and their benefits.
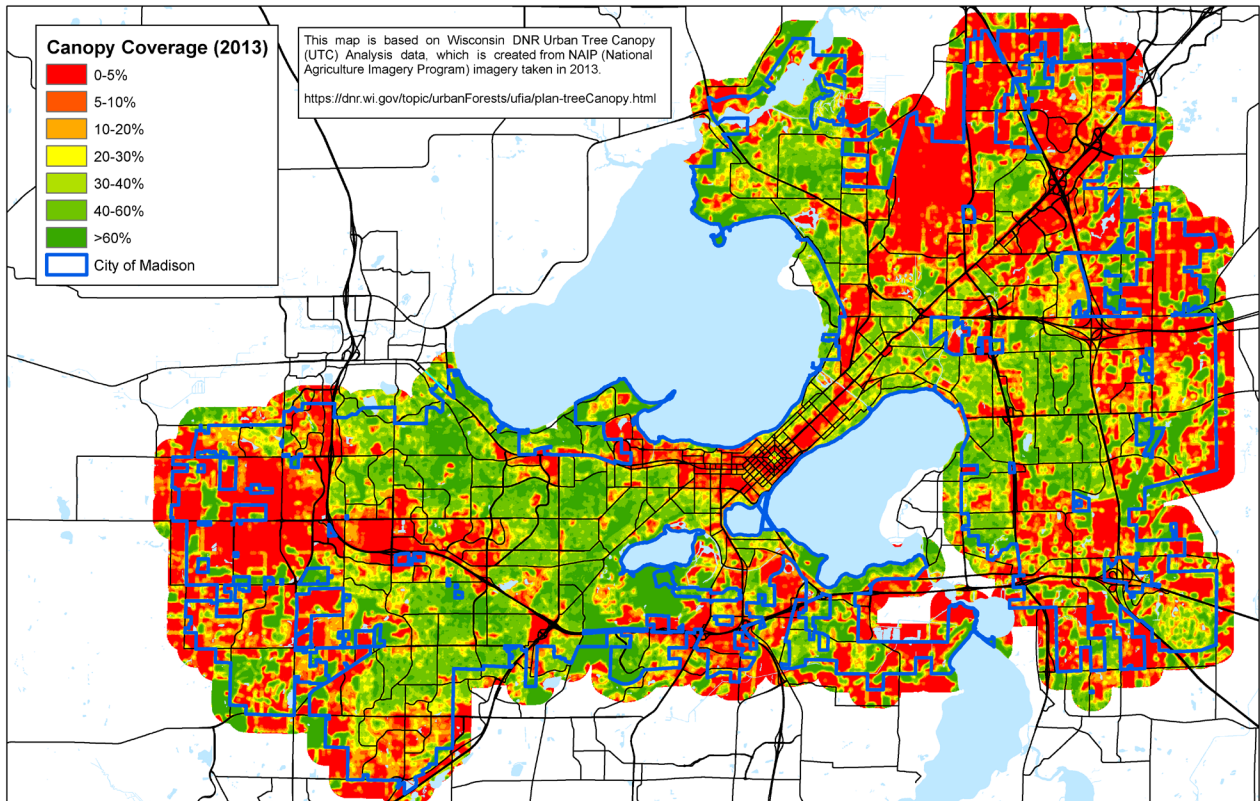
Urban Forest Canopy. The image above was produced using LIDAR data from 2013.

Our urban forest is comprised of trees in three major contexts:

- Private trees: trees owned and maintained on private property. Examples include the tree in front or back yards, in parking lots and other landscaped areas of associated with commercial buildings. 85% of the trees in Madison are on private property.

- Public trees: trees on public properties that are owned and cared for by the City. These are the trees found in parks, open spaces and on the grounds of City buildings such as police stations.

- Street Trees: trees located in public right of way, typically between the sidewalk and the curb. Although street trees comprise only a small percentage of the overall city forest, they are often the most visible, and as a result strongly define the character of a street, a neighborhood and the City as a whole. Madison has about 96,000 street trees, comprising

15% of the city's overall tree canopy. However, they have an outsized influence on many critical features of city-life such as moderating the climate, stormwater control and enhancing the appearance and character of our streets.

While each type of trees discussed above face unique challenges, all trees comprising our urban forest share common threats to their well-being, most notably the Emerald Ash Borer and climate change. Trees in urban environments have additional challenges including road salt applications and a competition for space that often results in cramped growing spaces. In order to preserve our urban forest and the benefits it brings to our city, it must be continually maintained and grown. Without this effort, the canopy will shrink with potentially disastrous results.

Composition of Urban Forest Species

The composition of urban forest species is always changing. However the types of species and relative distribution of species across Madison are typical of Midwestern urban areas and reflect decades long trends in taste and selection by public agencies and private property owners. New and historic threats, such as Emerald Ash Borer, Dutch elm disease, can dramatically alter the urban forest composition and visual character of the city.

A diverse forest is more resilient to various threats by incorporating species that responds better to future challenges. Over representation of individual species (e.g. maples, honey locusts, crab apples) creates long-term risks to the urban forest and can have devastating localized results. This is particularly visible now in neighborhoods where ash was extensively planted as street trees.

Current trends in species selection still tend toward minimal diversity, particularly with trees planted on private property. Private industry relies heavily on a relatively small selection of trees, a trend built on lack of market choice, professional familiarity and consumer taste. Nurseries are businesses and stock what sells; customers are generally content to buy what's in stock. The result is a market cycle does little to encourage a more diverse urban forest. To diversify publicly owned and manage trees, the City of Madison Forestry Division has adopted a policy of buying and planting no more than 10% of a genus for their total street tree program.
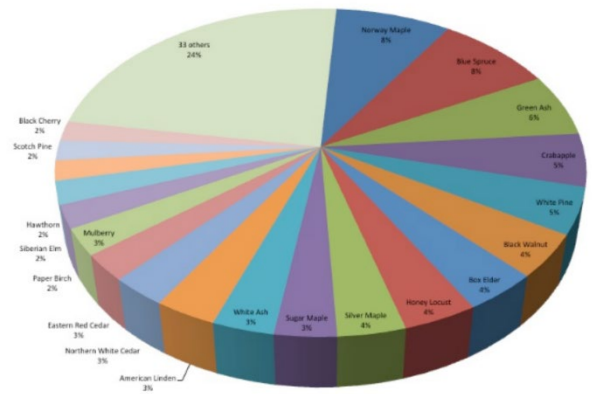
2010 Forest Composition. This diagram displays the results of a random species sampling of 200 plots in 2010. It includes both public and private properties.

Emerald Ash Borer

The single most influential force on the current composition of our urban forest is the proliferation of the Emerald Ash Borer (EAB). EAB was first found in Madison at Warner Park in 2013. An inter-departmental planning team was organized to establish the City's policies regarding ash tree treatment, removals and replacements, resulting in the Emerald Ash Borer Management Plan. In general, the EAB management plan called for treating ash trees over ten inches in diameter in good condition and removing ash trees in poor conditions, under power lines or that did not meet the 10" size criteria. The plan noted that 20,000 (22%) street trees were ash and a similar number were on City-owned properties, primarily parks.

By 2017, 10,724 ash trees were treated with TREE-äge, a tree-safe pesticide effective against EAB for three years. On-going reapplication cycles will be required to maintain effectiveness over time. Due to budget constraints only street trees were subject to treatment, although some trees in parks were treated with funds raised by neighborhood associations and other private sources.

By 2018, approximately 8,630 ash trees were preemptively removed, and 1,370 trees are planned for removal.

Replacement trees are scheduled to be planted within three planting seasons of the removal. By the end of 2017, 1,386 trees were planted to replace previously removed ash trees, accounting for roughly half of all street trees planted for the year (3,065).To accomplish the replacement goal and ensure effective species diversity, the forestry section plants a minimum of three species per block.

In 2019, as Madison enters the fifth year of EAB infestation, approximately 32% of all untreated ash trees will likely show significant decline.

The effects of the EAB are clearly evident across the city. These private trees were photographed on Madison's north side in 2016, near the point of discovery of EAB.

Shape of the Urban Forest Canopy

Madison's large overstory trees, including oaks, hackberries, elms and ashes, have thick shade-providing canopies or foliage coverings. Tree branches and leaves both absorb and deflect sunlight that pours downward, allowing limited sunlight through the foliage. Large trees help regulate both regional and global climate by reducing urban heat islands, cooling costs and air pollution. They also support a wide variety of animal life.

Small and medium-sized trees provide most of these benefits, however, they do so at a fraction of the scope of their larger counterparts. While yearly maintenance costs of a large tree are greater than for a small tree, the immediate and long-term benefits of a large tree are many multiples of the small tree.

Trees and Racial Equity and Social Justice

Although the estimated canopy coverage of the City of Madison was 23% prior to the arrival of EAB, it is not evenly distributed. Large commercial, employment uses, and schools appear to have the strongest correlation to lack of canopy coverage. The residential uses surrounding commercial areas, often more affordable rental units, face a greater share of impacts associated with lack of canopy. As a result, low income residents may not experience the benefits trees can provides including reduction of air pollution, moderation of temperatures, improved neighborhood character, and health benefits.

Trees are a public asset. As such, it is incumbent upon city to determine if they are distributed equitably on streets, parks and public spaces. Trees planted on private property benefit neighbors and the whole community and thus, the whole community should provide support for tree growth and maintenance wherever possible within reach.

Decision Making Landscape

Decisions affecting the management of urban trees is complex and dispersed. Policies, programs, and funding sources affecting trees are spread through multiple City of Madison departments, public utilities and institutions. Even within the City, multiple committees, boards, and commissions set and implement municipal policy impacting the overall health and viability of the tree canopy.

A brief overview of the primary agencies that shape our urban forest follows:

- **Forestry Section:** A section of the Parks Division that is being transferred to the Streets Division as part of the 2020 Operating Budget (this will take effect January 1, 2020). Forestry is responsible for the planting, maintenance, and removal of street trees and trees on many City-owned properties. It manages city-wide urban forestry health initiatives, such the addressing oak wilt. It reviews private development proposals and coordinates with

other City agencies on how development projects impact street trees. It also plays an enforcement role in private property violations.

- **Parks Division:** Parks plants, maintains, and removes trees within the park system and sets long-term policy goals through the five year Parks and Open Space Master Plan.

- **Planning Division:** Planning leads the review of private developments requiring discretionary approvals, such as conditional uses, rezoning and subdivision, in accordance with City zoning and subdivision ordinances. Planning also guides future growth for both existing and proposed neighborhoods through long range plans such as the citywide Comprehensive Plan and smaller supplemental plans.

- **Zoning:** Zoning reviews site plans of proposed development to ensure compliance with Madison's zoning ordinance, including any required landscaping. Zoning also ensures compliance with approved site plans through field inspections after development activities are complete.

- **Engineering Division:** Engineering is responsible for the design, construction, and maintenance of public infrastructure (such as road construction, road reconstruction sanitary, and storm water facilities,); reviews and designs ROW for private development proposals; and manages public lands designated as Greenways.

- **Traffic Engineering Division:** Traffic Engineering works closely with Engineering on the design of streets, traffic signals, signage, street lights and multi-use paths, all of which require a dimension buffers for trees.

- **Fire Department:** the Madison Fire Department reviews the placement of public and private trees adjacent to buildings to ensure emergency access and consistency with relevant fire safety codes.

- **Streets Division:** The Streets Division is responsible for the removal stumps for street trees and management of brush and waste.

- **Building Inspection:** Building Inspection enforces property maintenance ordinances in cases where private trees create safety hazards.

- **City Boards, Committees and Commissions:** The Common Council delegates certain decision-making authority and relies on advisory policy recommendations related to trees from several boards, commissions and committees, including but not limited to the Sustainable Madison Committee, Urban Design Commission, Board of Parks Commissioners, and Plan Commission.

- **Utilities:** Utilities including Madison Gas and Electric and Alliant Energy maintain tree clearance around primary electric lines through contracts with private arborists and coordination with the City Forestry. ATC maintains clearance for larger transmission lines on public and private properties with easements.

Urban Tree Program – City Funding

Funding for the City of Madison's Urban Tree Program includes a variety of sources to fund a complex operation to maintain and grow the city's urban tree canopy. The adopted City of Madison Capital Budget includes program funding for new tree plantings or replacement tree plantings as follows:
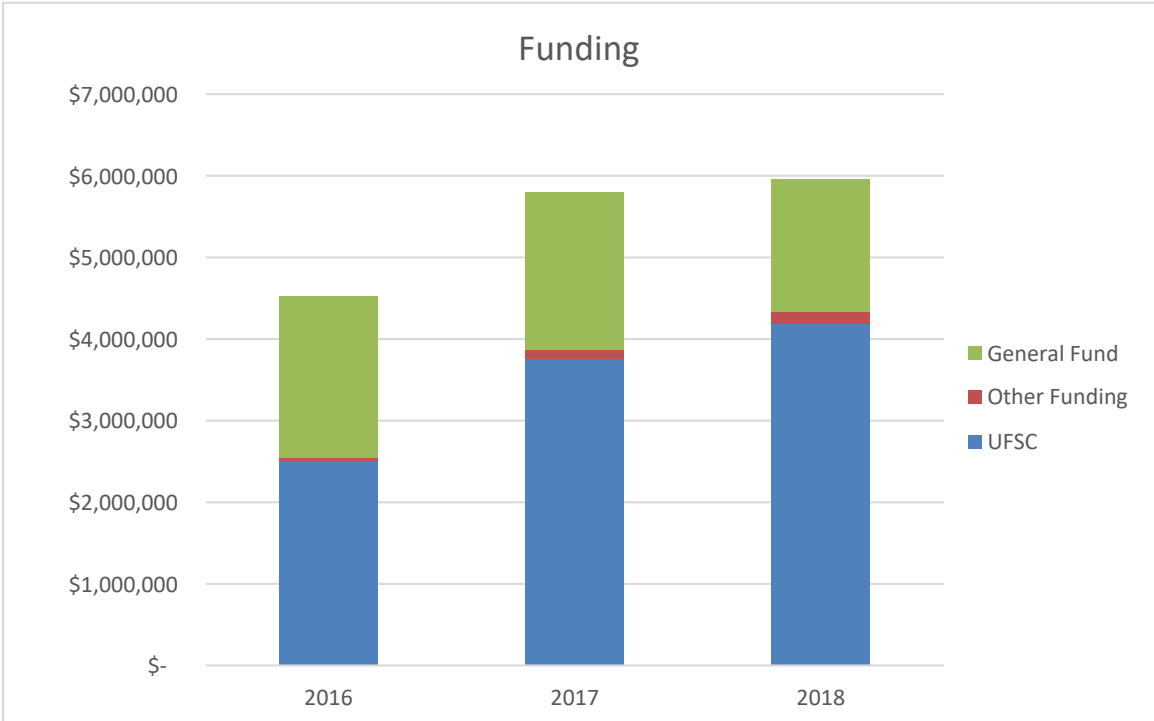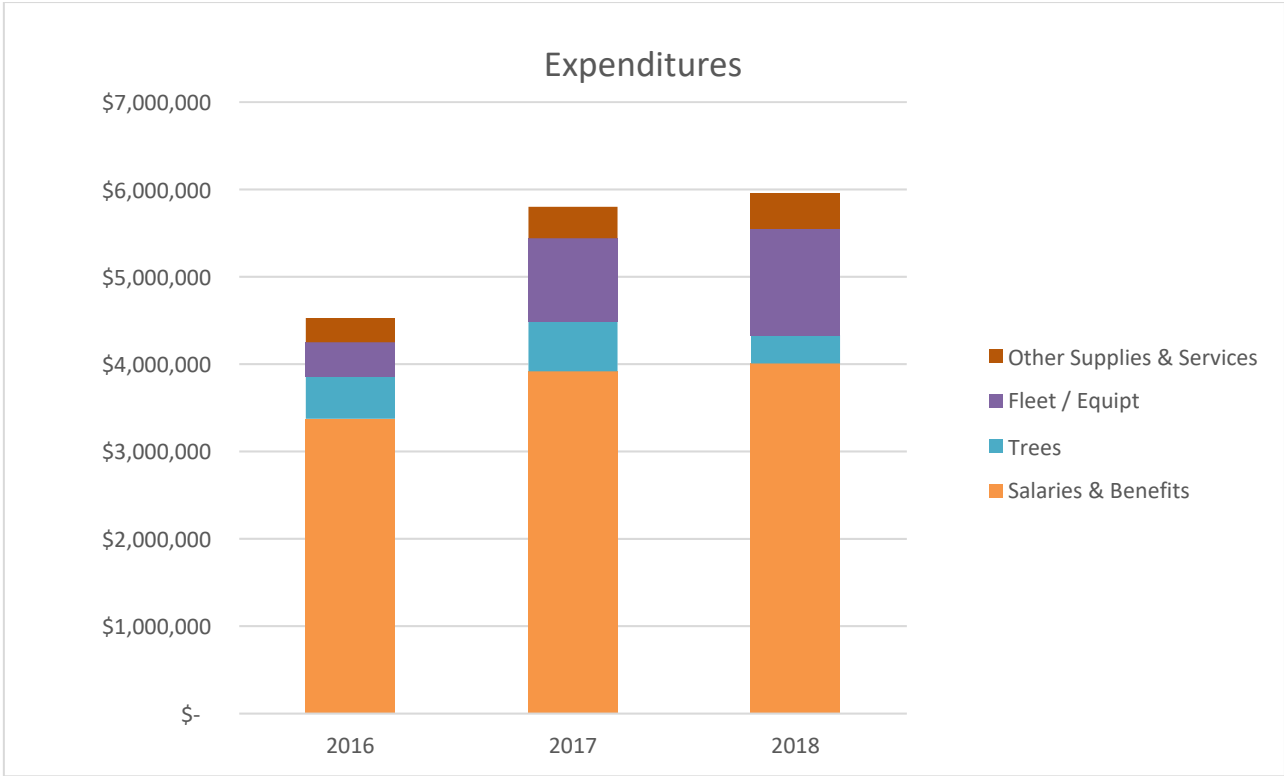
- Assessable Trees - provides funds for the planting of terrace trees along new streets, with the costs assessed directly to the property owners;

- Emerald Ash Borer Mitigation - funds the recommendations of the EAB Task Force to proactively remove and replace ash trees throughout the city (funded in Parks and Streets capital budgets);

- Street Tree Replacements - funds the replacement of street trees within the City in conjunction with EAB efforts; and

- Park Land Improvements – includes minor funding for park landscaping for tree planting in parks in conjunction with EAB efforts.

Through this capital program funding, the City has contracted to grow and/or purchased for planting nearly 16,000 trees since 2016. As part of the City's street tree program alone, a total of 8,630 street ash trees have been removed since the EAB plan was adopted; approximately 1,800 street ash trees remain to be removed in 2019-2020.

Approximately 11,000 ash trees are being treated on public property.

The adopted City of Madison Operating Budget includes funding from the General Fund and the Urban Forestry Special Charge to support the city's urban forest. This funding supports tree plantings, tree maintenance including pruning (young trees require more frequent pruning to establish healthy growth) and tree removals when necessary, including stump grubbing and restoration of the site as well as processing of the wood material.

The Urban Forestry Special Charge was created in 2015 to allow the City to recover its costs in performing the services associated with the City's urban tree program. The revenue target for the Urban Forestry Special Charge (UFSC) established as part of the city's operating budget process in 2019 is shown under the adopted Streets Division 2019 Operating Budget ($782,500 for stump grubbing activities), the adopted Parks Division 2019 Operating Budget ($3,610,320 for forestry services) and the costs associated with administering the Urban Forestry Special Charge (total revenue target in the 2019 Operating Budget of $4,415,840).

Expenditures

Legend: Other Supplies & Services, Fleet / Equipt, Trees, Salaries & Benefits

Funding

Legend: General Fund, Other Funding, UFSC

Private Trees

Arguably, the largest single constituency affecting the future of the urban forest canopy is the public itself. The majority of the urban forest exists on private residential and commercial properties, and accordingly decisions affecting those trees are made by thousands of individual property owners.

Landscape requirements in the zoning code have significant impacts on the quantity and location of trees on private property. Looking around Madison, some may question if the zoning code requires enough trees, particularly in parking lots. Many buildings and associated parking areas were approved when landscape requirements were minimal: up until 1984, the zoning code required parking areas be screened from view, but did not require any landscaping within them or specific tree requirements. As a result, many parking areas are legally non-conforming (commonly known as being grandfathered).

In 2013, the zoning code was completely rewritten, with significant updates to the landscape section. The new (current) code is far more prescriptive on location and quantity of required trees and other landscape features in parking areas and between the street and developed areas, generally requiring more trees in larger growing areas than previous codes. The 2013 zoning code update included triggers to bring existing sites up to current landscape standards, but this generally requires a significant redevelopment or addition. Minor renovations or changing tenants does not require installation of new landscaping.

The zoning code also specifies minimum building setbacks in all zoning districts. Certain districts, such as mixed use or downtown districts, require little or no setback to bring buildings closer to the street. While this has many benefits, it may prevent trees from being planted between the buildings and the street.

Single family and two family homes are specifically exempted from landscape requirements in the code for a variety of reasons. However, this means there isn't a tree requirement for nearly 30% of the City's land area (excluding right of way). While most single family homes have one or more trees planted by current or pervious owners, these properties may be easiest and most cost effective way to add tree canopy to Madison's neighborhoods.

Tree on Public Properties

For the purpose of trees, Madison has three types of City-owned property: buildings/facilities, parks and stormwater management areas. Like all other properties, City buildings and facilities must be in compliance with landscape standards in the zoning code, and planted trees on the ground now generally reflect the standards in place at the last approval. Additionally, all public buildings must receive an additional approval by the Urban Design Commission, which may require trees or landscaping beyond what is required in the zoning code.

The Parks Division manages the City's 5,600 acres of parks. A place of active and passive recreation for the City and all of its residents, it may be hard to imagine a park without trees. However, as a result of the many types of recreation parks must accommodate, parks cannot be just trees. Athletic fields, sledding hills, community gardens plots, play grounds and splash pads all appropriately exist in

Madison's parks and limit tree planting. Still, there may be opportunities to add trees in appropriate locations in parks.

While trees may play a role in stormwater management, often they can create issues on City properties dedicated to stormwater management. Trees are generally incompatible with ponds and other areas designed to store large volumes of water, though some may be planted around the edge. Greenways are wide corridors which are typically dry but can contain moving water during rain events. Historically, the City's greenways have been planted with prairie grasses and are often accompanied by a bike and pedestrian paths. Trees planted in greenways in the past has led to significant issues with erosion: shade from trees inhibits the growth of grasses, leading to bare soil and soil loss during rains.

Street Trees - A Contest for Space

Most people walking down a street see a relatively simple arrangement of elements: a building on private property, the sidewalk, the grassy terrace, followed by the curb and remaining street elements. What is not visible is that each foot of space in the public right of way, above and below ground, have been negotiated, planned and apportioned to accommodate a variety of needs. Historically, these competing interests led to the design of the street, including underground elements. Once the street (and often surrounding new development) was constructed, Forestry was then tasked with determining where street trees could be planted. Forestry generally will not plant trees in the terrace if the width is below four feet, and eight feet is preferred for larger canopy trees.

During street reconstructions, this contest for space is clearly visible. Reasonable desires to better accommodate transit, include bike lanes and on-street parking, in addition to drive lanes and sidewalk all take up a very finite amount of space, often as small as 60 feet across. The terrace width was often the dimension that shrank as other needs grew, leaving less space and soil volume for trees to grow. Where terraces already are too small to support tree growth, it can be very difficult to increase this width as it often requires removal of on-street parking lanes or bike facilities, both of which may have vocal supporters in the design process. The process surrounding the Winnebago Street reconstruction is a perfect example of these competing interests.

Above Ground Restrictions

The placement and allocation of street trees is not as straightforward as terrace width and minimum tree spacing. Some of the dimensional restrictions established by varying City agencies impact street tree placement as a result of the following **above the ground features**:

- Trees should be six feet from driveways (Traffic Engineering).

- Trees should be at least 25 feet from a street light (Traffic Engineering).

- Trees should be at least six feet from a fire hydrant (Water Utility).

- Trees should be at least 10 feet from a traffic sign (Traffic Engineering).

- Trees should generally be at least 20 feet from a corner to protect "line of sight" (Traffic Engineering).

- Height, shape, and location of trees generally should allow the placement of aerial ladders on buildings taller than 30 feet (Fire Department).

- Trees should be at least 10 feet from utility poles, and the canopy should not be within five feet of overhead electric wires (Utility Companies).

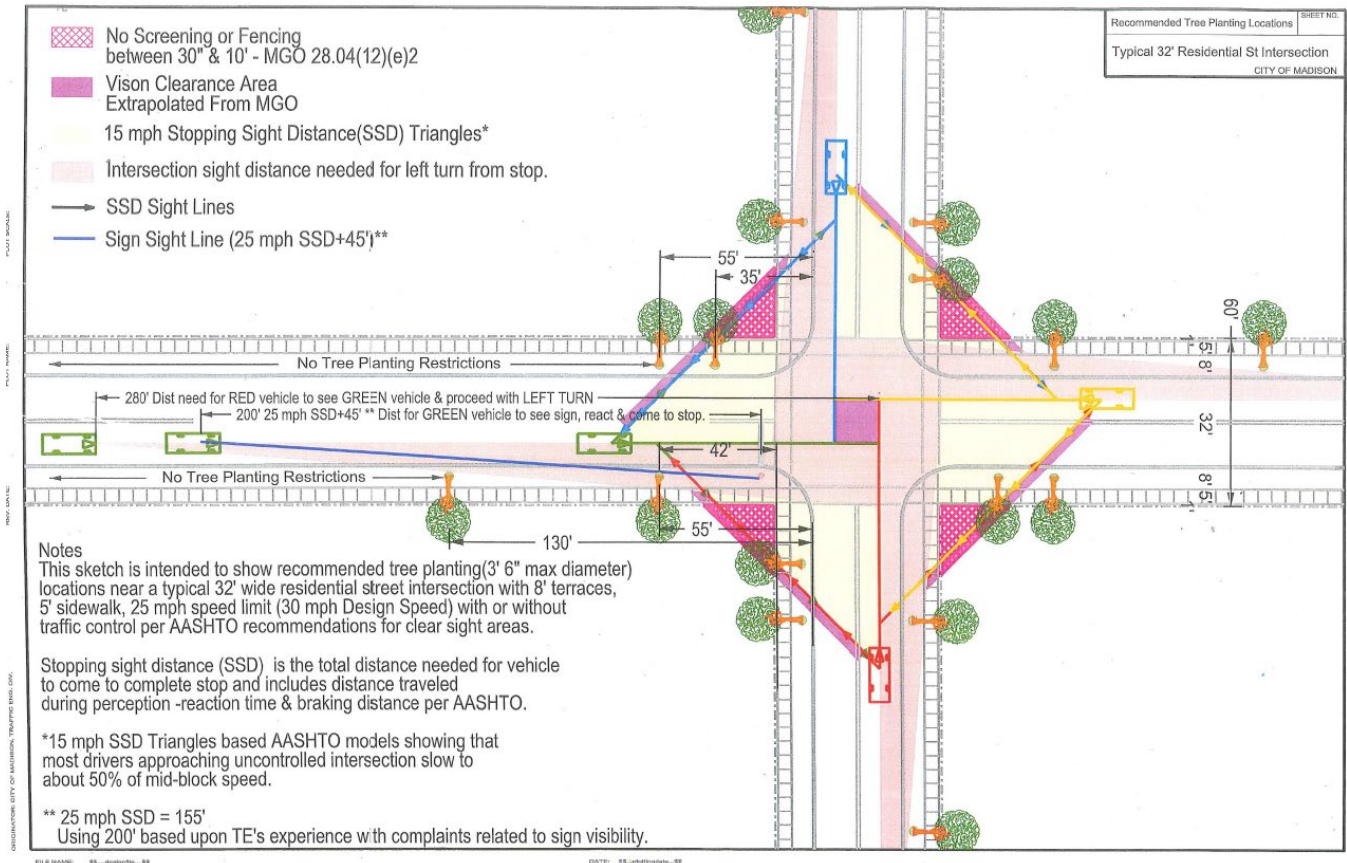Current guidelines for Forestry also impact tree spacing.

Diagram of vision triangle.

Underground Restrictions:

Underground infrastructure presents numerous restrictions to street tree planting. In addition to the utility poles, street lights and signage above the ground, the placement of the electrical service, gas and water mains, sewers and all required laterals must be considered as part of the process of siting trees. The diagram below is a cut-away of the underground view of a typical street.

Together, the above and below ground restrictions often result in fewer trees planted, smaller species and less optimum growing environments.
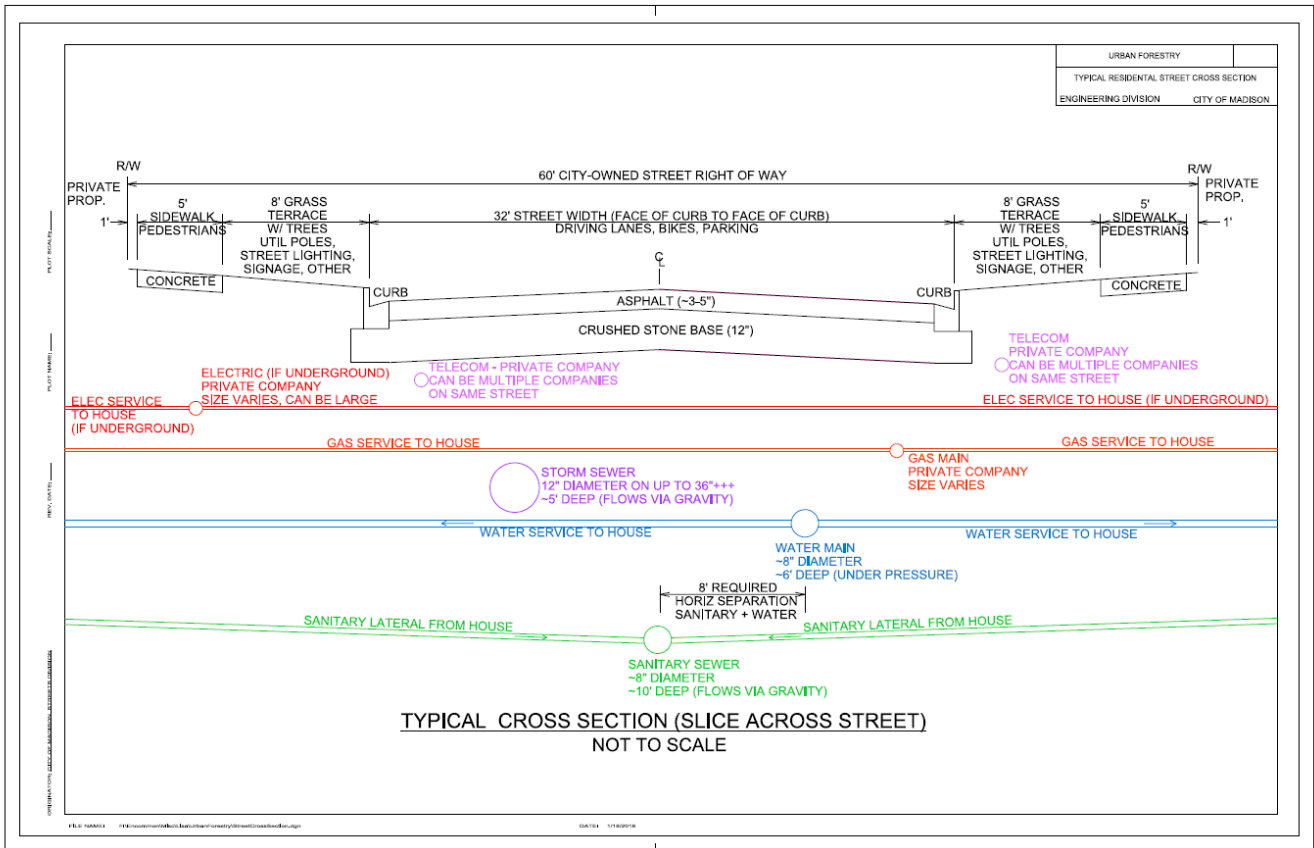
Underground schematic. These are competing factors for trees.

Development Impacts on Existing Street Trees

Once streets are planted and established, different challenges emerge. Much of Madison's growth is occurring through redevelopment of properties on existing streets, often with existing mature street trees. Since most redevelopment is occurring in central areas with better transit access, higher densities are generally encouraged and proposed buildings often occupy more of their sites. Physically constructing these redevelopments can be challenging, as they are surrounded by streets and other buildings leaving little available space for staging areas for construction materials.

Often the staging area is permitted to extend over the sidewalk and into the street, as there are few reasonable alternatives. This can result in removal of trees to accommodate cranes or other equipment and as a result of potential damage sustained by trees during the construction process. If a

street tree is removed, developers are responsible for costs associated with replanting a new tree, approximately $250. Few people would argue that replanting an 8-10' young tree is an even exchange for removal of a mature tree, yet it is allowed by City policy and relatively common with redevelopments. Redevelopments and associated construction are allowed to remove street trees; however, increasing costs associated with removal of this infrastructure may encourage developers to investigate other staging options.

Goals and Recommendations

Most street trees exist in an urban environment that ranges from non-optimal to hostile. In more densely built areas, trees are often shadowed for much of the day by buildings; when not shaded, they are subject to higher-than-normal temperatures that can be magnified by reflections off primarily glass buildings. The often insufficient soil volume and impervious pavement can lead to drought in the summer, and poorly drained tree pits can drown trees. Overuse of road salt by residents, businesses and contractors and dog urine can change the chemistry of the soil, further threatening already challenged trees. Trees along power lines are routinely and significantly pruned, and major limbs can be lost. Underground, their roots are stunted or stymied by a multitude of infrastructures and periodically threatened by road reconstruction and sidewalk repair.

Any one of the above-mentioned environmental conditions in and of itself could be sufficient to limit growth or kill a tree. However, often the most challenging condition on street terraces is insufficient space and soil volume required for healthy and sustainable tree growth. Compacted rock and soils required for sidewalks and streets can result in cramped root environments, smaller canopy and a shorter life span.

The following recommendations, organized into four categories, are focused on addressing some of the major factors that adversely affect tree planting and favorable growing conditions:

- Land Use Planning and Design
- Outreach and Education
- Canopy Coverage and Growth
- Forestry Operations and Public Lands

Planning & Design

Trees and the impact on their health are affected throughout the planning, design, and construction phases of public infrastructure projects and private developments. Multiple departments and municipal committees also administer the policies, standards, and processes that influence decisions regarding tree preservation, removal and planting. These dynamics can lead to contradictory policies and ill-timed decisions affecting the fate of the urban canopy. However, for trees to thrive, they must be comprehensively integrated in to the City of Madison's infrastructure and building practices.

Goals

1. The decision·making process regarding land use planning and design should engaged in earlier and more comprehensive consideration of the tree canopy. Issues affecting trees and tree health should be integrated as early as possible into the land use decision·making process. This decision-making process should account for tree benefits and value in both qualitative and quantitative terms.

2. The quality of the physical environment in which trees are planted is elemental to their future long-term health. City policies and standards should insure improved growing conditions for large trees, including maximizing soil volumes for tree rooting zones and removing overhead impediments.

3. The values of trees multiply as they mature. Accordingly, those existing values should be formally considered, and often preserved, when assessing design decisions.

4. Individual projects and the city as a whole will benefit in proportion to which the canopy can be grown. Policies and practices should seek to maximize species diversity, canopy coverage, and landscape aesthetics.
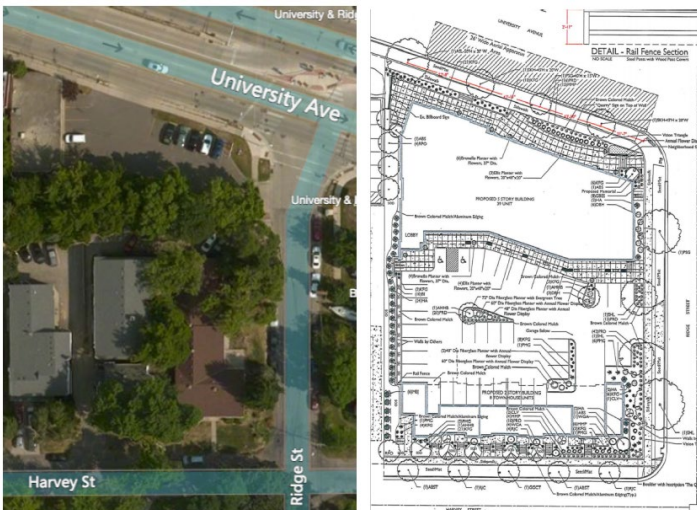
These images illustrate a mixed-use redevelopment project where the site was cleared of all trees (including several in the right of way). Although a new terrace and trees were included in the initial site plan approvals, it was later determined that underground infrastructure would limit their implementation. Better planning for retaining trees and accounting for the value of existing canopy are critical decision points in the planning process.

Trees in densely developed areas suffer multiple space and material constraints. However, these are precisely the areas where thriving trees can provide the most value. The development scale and tight relationship to the street in this recent project, precludes the possibility of street tree and represents a loss of potential for the urban forest canopy.

Zoning & Site Plan Review Recommendations

1. Private development proposals subject to city review should create and provide a **Tree Management Plan**. The Tree Management Plan should include, but not be limited to:

    a. An **inventory** that identifies the locations and species of trees larger than 5" DBH for both private trees and possibly affected public trees within the adjacent public right-of-ways.

    b. A **statement** describing the impacts of the development on the all tree resources that includes a description (size, species) of trees to be preserved and removed.

    c. A **construction plan** illustrating how practices may affect existing trees and details physical tree preservation measures such critical root zones protection, locations for materials storage, site access, and prescribe tree measures such as pruning.

2. Include Forestry in the final approval process for any development in regards to the public right-of-way. Any street tree preservation plan shall be considered as part of the evaluation for approval at the Board of Public Works (BPW). If a tree needs to be removed that was not otherwise indicated on the plan to be removed, the plan will need to be re-submitted to the BPW and the developer will need to be present to describe the change in the plan.

3. Mature trees lost during construction reduce the public benefit of Madison's urban forest canopy. A required replacement of mature with new trees is not an equal exchange. Even when new trees are planted, it can be several decades until they can provide the value of mature trees. In such cases where existing canopy value is lost or diminished, the city should develop a more equitable metric than "one mature tree for one sapling" when seeking measures to **remediate losses** even if those measures are outside of the project bounds.

4. The City should increase costs associated with public tree removal related to house moves and private development projects, such as $500 to $1,000 per inch of diameter at breast height. This would create a financial incentive for developers to avoid public street tree removal while

providing Forestry funds that could be used for improve growing environments to speed future tree growth.

5. Public trees that are removed should be replaced in enhanced growing conditions, at the cost of the developer, in consultation with the City Forester. Forestry should partner with Traffic Engineering and Engineering on redevelopment projects for dedication needs to enhance the terrace and sidewalk.

6. **Building set back** allowances have been reduced in urban areas to increase density. These policies have likewise reduced areas for potential tree plantings in critical areas. The city should consider the loss of potential trees due to this zoning condition as a detriment to the public value of the city streets. The city should develop zoning policies that encourage, not prevent, the provision of street trees or trees on privately developed properties.

7. In the zoning code, amending landscape applicability standards should be considered to bring more legal nonconforming site plans up to current landscape standards.

8. Incentives should be established for private developments that exceed landscape requirements.

9. The City Forester should recommend an adequate soil volume to be included within landscape zoning requirements for parking lot trees and general landscape plans.

Neighborhood Planning & Long-Term Planning Recommendations

This concept plan illustrates the type of spatial planning completed within the City's neighborhood planning process. The resulting neighborhood development plans are intended to provide a framework for the growth and development of the City's peripheral urban expansion areas where development is expected to occur in the foreseeable future.

1. Neighborhood-scaled canopy coverage assessments should be developed and conducted in order to set goals and strategies for canopy growth within those areas.

2. Planning documents, such as Neighborhood Development Plans and Neighborhood Plans, should include an existing tree canopy inventory and identify areas for tree preservation. As appropriate, it is recommended that existing plans be amended to address these issues.

3. Neighborhood development plans should consider developing connected greenspaces, environmental corridors, etc. Whenever possible, efforts should be taken to link existing forested lands.

Subdivision Recommendations

1. Planning Division should investigate how new single-family lots, which are exempt from landscape standards in the zoning ordinance, can have a tree planting requirement. Strategies may include, but not be limited to, incentives for developers and/or homeowners to plant and maintain trees, the use of neighborhoods covenants to require trees, or direct planting programs focused on private properties. It is further recommended that the city provide guidance on best practices regarding the location of trees of lots and species selection to encourage diversity and large trees.

    a. City Planning should investigate a tree preservation policy for the subdivision process.

These pre- and post- development photos illustrate the potential for new subdivisions to grow the canopy. Through the provision of trees on public and private property, development on the city's periphery represents new opportunities to expand the urban forest.

Street Design Recommendations

1. Add to Madison General Ordinances: "In new developments, terraces shall have the following optimal minimum widths:

    a. Local streets – 10'

    b. Collector streets – 10'

    c. Arterial streets – 12'

2. During the public planning and design phases of street re·construction projects, **alternative design scenarios,** such as **engineered soil volume construction methods and terrace support systems**, should be investigated for street reconstruction projects in order to provide a more optimal environment, in consultation with the City Forester. Public works design specifications should be updated to allow for such innovative methods and standardized details. These methods should be further identified with educational signage to raise awareness of the methods.

3. Explore requiring zones free of laterals (e.g., water, sanitary) and parallel utilities for redevelopments at the beginning of the process in order preserve open and contiguous areas used to maximized soil volumes for tree plantings.

4. The Undergrounding of Overhead Utility Lines policy criteria should be amended to account for the impact of overhead utility lines on city terrace trees. The criteria should include but may not be limited to: ability to underground, terrace width, availability of space for private trees adjacent to the right-of way, ability to improve canopy coverage, availability of cost-share funding source (e.g., TIF), potential for place-making, etc.

5. Appropriate annual funds for full or partial underground projects as a separate budget line item.

6. Amend MGO 16.23.8(g) to clarify that existing trees should not be removed for the purposes of solar panel installation. Planting trees, planting location, and species would only be in effect if the building plan includes using solar.

7. Existing policies impacting street trees, such as Complete Streets, Rural to Urban Roads, Madison in Motion, and Comprehensive plan, should be reviewed in order to ensure consistency in tree policy.

Outreach & Education

An engaged and empowered citizenry is crucial to the future preservation, growth, and sustainability of the local urban forest canopy. Because the urban forest is a public resource, its future relies on broad public commitment and support. Strategies designed to increase knowledge about our trees and to involve people in stewardship activities diverse can increase the social and environmental value of our urban trees.

Goals

- Outreach strategies should be designed and implemented by a coalition of interested groups and managed in a comprehensive program.

- Outreach strategies should be tailored to diverse groups such as developers, homeowners, apartment owners and dwellers, neighborhoods with low canopy levels and environmental

groups to increase support and understanding about our urban forest and convey technical knowledge.

Recommendations

1. Create a position for a Forestry outreach and education specialist, who would combine education/communication and an arborist background. This position would help develop an Urban Forest Outreach Initiative that would provide public education; coordinate events; and create a program similar to Tree Tender, Tree Keeper, or Adopt-a-Highway, in conjunction with the City Forester. The Initiative would partner with interested groups and individuals to maintain and grow the urban forest.

2. Create a grant program that includes the City providing trees to be planted on private property.

3. Multi·year programs intended to plant trees in areas not covered by the city's operations such as private homes, schools, and multi·family housing should be designed and supported. Such a program is key to planting more trees and providing direct outreach in the city.

4. Among other activities, the outreach program should organize volunteer tree planting and tree maintenance programs should be developed for private property and city parks in order to include citizens in a program of tree stewardship.

Canopy Coverage

Researchers estimate that average tree canopy cover in urban areas across the U.S. is approximately 27%. Because of the well-established relationships between higher tree populations and improved human and environmental health, canopy coverage goals have been set in cities in order to measure and spur canopy growth. For example, Pittsburgh has to sought to increase its canopy coverage from 42% to 60%, Baltimore from 28% to 40% by 2040 and Charlotte from 32% to 50% by 2050. The American Forests had recommended achieving a 40% optimal canopy coverage for a healthy urban area.

However, the practicality and effects of broadly stated goals can be misleading since existing canopies and canopy growth is not evenly distributed. As noted previously, there are substantial differences in tree canopy by area. For example, downtown Madison and the UW-Madison campus areas have only 8-13% of canopy. Areas on the far east (District 17) have only 17% canopy and far west (District 9) have 16% canopy. Other areas of the city have canopy levels of 40% and higher.

Given these differences, a general citywide goal may not address the deficiencies at the neighborhood level where the absence of trees is most acutely experienced.

Tree Priority Scale from Low (Green) to High (Purple)

These maps were produced with I-Tree Landscape, and web- based modeling program to assess tree planting priorities according to census districts. The top map illustrates areas for tree planting based on existing canopy coverage and population.

Goals

- Canopy growth strategies should be directed at the neighborhood level in order to account for variations in land uses and development densities and patterns.

- Canopy growth and strategies should address the substantial disparities in specific neighborhoods and communities.

- Canopy strategies should be associated with actionable programs and results.

- Canopy growth should be pursued in coordination with canopy preservation.

Recommendations

1. The City of Madison should achieve an optimal tree canopy coverage goal of 40% overall, consistent with the American Forests Association current recommendations. Currently, Madison tree canopy coverage is estimated at 23%.

2. The City Forester and Sustainable Madison Committee should create a Tree Preservation Ordinance in order to preserve, expand, and protect canopy coverage overall in Madison.

3. The city should institute a range of policies and program designed to increase canopy coverage at the neighborhood level. In conjunction with neighborhood groups, staff should develop strategies for increasing tree population. Canopy trends should be evaluated with particular attention paid to rates of coverage in neighborhoods of higher poverty and greater concentrations of persons of color.

4. Public plantings along streets, in parks, and within greenways should be prioritized according to a need·based neighborhood analysis. The city should consider subsidies for street or private trees in neighborhoods or census districts with household incomes below the area mean and neighborhoods that have not historically had street trees.

5. The city should support multi·year programs to support tree planting for private homes in neighborhood with low canopy coverage, apartment/rental housing, schools, and other areas not currently covered with existing municipal plantings.

Forestry Operations & Public Lands

The City Madison maintains hundreds of thousands of trees along streets, in parks, and along greenways. Accounting for approximately 20% of the total urban forest, public trees are essential to the health of our landscape. Their vitality sets a tone and direction of the whole urban forest eco·system.

Goals

- The constraints for planting on public land may be fewer compared to private lands. The city should make use of this opportunity by increasing municipal planting rates.

- The management of public lands and trees is complex and labor intensive. Management practices should integrate and invest in technologies in order to increase efficiency and leverage investments.

Recommendations

1. Write a biennial urban forest report. This would accomplish the same goals as a Forestry Master Plan (e.g., assessing the current state of the urban forest, reviewing the UFTF recommendations, and evaluating the success of those goals).

2. Update and upgrade the process of inventorying street trees to include up-to-date information.

3. Inventory trees on all City-owned properties including parks and greenways, in order to maintain and add new trees. The inventory would be used to mitigate and respond to threats to the urban forest as well as prioritize growth of the forest.

4. Forestry should work cooperatively with other City agencies to identify opportunities to enhance green space (e.g., pocket parks) in areas with low canopy cover, like downtown.

5. Create a canopy tree planting program for city-owned bike path corridors and other city-owned transportation corridors that are currently rented for parking.

6. Dedicate additional resources to Forestry for more frequent pruning and maintenance of new and existing street trees. The current approximately 21-year **pruning cycle** of street trees should be evaluated in order identify methods and resources needed to shorten the cycle.

7. The Park Commission should prepare a policy of and develop methods for **canopy growth within parks with the goal of planting 2,000 more trees above the replacement rate each year for the next five years**, taking into account existing park policies (park master planning and land management, etc.), park values (sight lines, viewsheds, no-mow prairie areas, etc.) and other park uses (active recreation as well as passive recreation opportunities) to create a diverse and balanced park system as identified in the Park and Open Space Plan.

8. The City Forester and Engineering Division should work cooperatively to develop standards for tree plantings in greenways and other stormwater management areas and identify strategies to minimize erosion from shaded exposed soil that can result with trees and moving stormwater while maintaining the inherent functions of the greenways.

9. Revise urban design district ordinances MGO 33.24 (8-15) to remove list of allowable trees species and grant this authority to the City Forester.

10. Develop a Tree Technical Manual to create new standards and review existing standards for improvement, to increase tree canopy. This would include a detailed guide as to the currently used and recommended spacing requirements. The rationale for spacing standards and opportunities for reduction in spacing should be documented. For example, the Technical Manual should review the relationships between trees and street lights, review the need for vision corner restrictions, and review fire department requirements (whether policy, code, etc.).

11. Forestry should obtain the appropriate software licenses and permissions to coordinate more extensively with other agencies involved in Public Works projects and permits.

12. When planting on arterial and collector streets, City Forester should consult with Engineering Division to identify long-term plans for street design (e.g., bike lanes).

13. Property owners should not have the ability to veto a planting site identified by the Forestry section as an appropriate site.

14. An assessment of the **street tree inventory** should prioritized in order to assess current and future needs. The assessment should include, but not be limited, to opportunities for public

access to data, mobile applications for fieldwork orders and data editing, and strategies for a comprehensive update.

15. The Common Council should develop an urban forest board with regular meetings or revise the responsibilities of the existing Habitat Stewardship Subcommittee to include this work, in order to advise on the recommendations made by the Urban Forestry Task Force and to address future urban forestry needs.

Emerald Ash Borer Response

Efforts related to preserving the urban canopy against the Emerald Ash Borer will not end once all impacted trees are either treated or removed and replanted. More than 20,000 new replacement trees will need regular pruning, watering, and other maintenance and will require more trained staff. The longer-term effect of the ash borer on private properties is unknown, however it is estimated that 30,000 trees will die as a result of the pest during its most active phase. These are important operational and policy issues that should be addressed before they become urgent. We recommend:

1. Additional staff will be needed to care for (prune, water, etc.) 20,000 new trees. These trees require more frequent pruning and care than older, mature trees.

2. It will be necessary to gear up enforcement of regulations pertaining to dead trees.

3. The city pursue strategies to encourage tree planting to replace ash tree losses on private property.

	2017
Preemptive ash park/golf tree removals	1,310
Replanting	348
Adopt- a – Tree Program	254*

These statistics from the 2018 Emerald Ash Borer Planupdate indicate the potential for tree planting on public land in order to keep up with the pace of ash tree removal.

Appendix A: Urban Forestry Task Force Subcommittee Recommendations

On September 20, 2019, the Urban Forestry Task Force moved to form a subcommittee for the purpose of: 1) prioritizing the recommendations for initial enactment; 2) establishing an approximate 3 year plan for all recommendations; and 3) estimating necessary resources with staff assistance.

The results of the subcommittee's work are included in this appendix. The recommendations are rated in three separate categories ('ease of implementation', 'impact', and 'estimated cost to city') with each being assigned a score between 1 and 5. A score of 1 in 'ease of implementation' means that a recommendation is *easy* to implement, while a score of 5 means it is *difficult* to implement. A score of 1 in 'impact' means that a recommendation has a *high* impact, while a score of 5 means it has a *low* impact. A score of 1 in 'estimated cost to city' means that a recommendation has a *low* cost, while a score of 5 means it has a *high* cost. The table has been sorted in ascending order, firstly by 'year', secondly by 'impact', and thirdly by 'estimated cost to city'.

Urban Forestry Task Force Sub-Committee

	Recommendation	Ease of implementation	Impact	Estimated Cost to city	Stakeholders	Year	City Agencies	Actual cost to City	
Forestry Operations & Public Lands	12. When planting on arterial and collector streets, City Forester should consult with Engineering Division to identify long-term plans for street design (e.g., bike lanes).	1	1	1	Residents	2020	Streets, Engineering		
Forestry Operations & Public Lands	13. Property owners should not have the ability to veto a planting site identified by the Forestry section as an appropriate site.	2	1	1	Property owners	2020	Streets		
Neighborhood & Long-Term Planning	3. Neighborhood development plans should consider developing connected greenspaces, environmental corridors, etc. Whenever possible, efforts should be taken to link existing forested lands.	2	1	1	Developers	2020	Planning		
Street Design	1. Add to Madison General Ordinances: "In new developments, terraces shall have the following optimal minimum widths: a. Local streets – 10' b. Collector streets – 10' c. Arterial streets – 12'	2	1	1	Developers	2020	Engineering, Traffic, Planning		
Emerald Ash Borer Response	3. The city pursue strategies to encourage tree planting to replace ash tree losses on private property.	2	1	2	Property owners	2020	Planning, Streets		Might be a 2021 budget item
Forestry Operations & Public Lands	7. The Park Commission should prepare a policy of and develop methods for canopy growth within parks by planting **2,000 more trees above the replacement rate each year for the next five years** and how it could interact with other park uses (e.g., no mow areas). An assessment for park properties should be completed in order to identify preliminary tree locations, set consistent design goals, and project both priority areas and rates for tree planting. In addition, a tree preservation plan or criteria should be developed for Parks.	3	1	2	Residents	2020	Parks		Might be a 2021 budget item
Outreach and Education	2. Create a grant program that includes the City providing trees to be planted on private property.	3	1	3	Property owners	2020	Finance, Streets		Might be a 2021 budget item
Zoning & Site Plan Review	9. The City Forester should recommend an adequate soil volume to be included within landscape zoning requirements for parking lot trees and general landscape plans.	3	2	2	Developers, Contractors	2020	Streets, Planning		
Neighborhood & Long-Term Planning	2. Planning documents, such as Neighborhood Development Plans and Neighborhood Plans, should include an existing tree canopy inventory and identify areas for tree preservation. As appropriate, it is recommended that existing plans be amended to address these issues.	2	2	3	Residents, Property owners, Developers	2020	Planning		
Forestry Operations & Public Lands	9. Revise urban design district ordinances MGO 33.24 (8-15) to remove list of allowable trees species and grant this authority to the City Forester.	1	3	1	Developers	2020	Streets, Planning, Attorney		

Urban Forestry Task Force Sub-Committee

	Recommendation	Ease of implementation	Impact	Estimated Cost to city	Stakeholders	Year	City Agencies	Actual cost to City	
Forestry Operations & Public Lands	15. The Common Council should develop an urban forest board with regular meetings or revise the responsibilities of the existing Habitat Stewardship Subcommittee to include this work, in order to advise on the recommendations made by the Urban Forestry Task Force and to address future urban forestry needs.	2	3	1	Residents	2020	Streets, Engineering, Planning, Parks		
Zoning & Site Plan Review	2. Include Forestry in the final approval process for any development in regards to the public right-of-way. Any street tree preservation plan shall be considered as part of the evaluation for approval at the Board of Public Works (BPW). If a tree needs to be removed that was not otherwise indicated on the plan to be removed, the plan will need to be re-submitted to the BPW and the developer will need to be present to describe the change in the plan.	2	3	1	Developers	2020	Planning, Streets, Engineering		
Forestry Operations & Public Lands	8. The City Forester and Engineering Division should work cooperatively to develop standards for tree plantings in greenways and other stormwater management areas and identify strategies to minimize erosion from shaded exposed soil that can result with trees and moving stormwater while maintaining the inherent functions of the greenways.	2	3	2	Residents	2020	Streets, Engineering		
Street Design	2. During the public planning and design phases of street re-construction projects, alternative design scenarios, such as engineered soil volume construction methods and terrace support systems, should be investigated for street reconstruction projects in order to provide a more optimal environment, in consultation with the City Forester. Public works **design specifications should be updated to allow for such innovative methods and standardized details**. These methods should be further identified with educational signage to raise awareness of the methods.	2	3	4		2020	Engineering, Streets		
Forestry Operations & Public Lands	1. Write a **biennial urban forest report**. This would accomplish the same goals as a Forestry Master Plan (e.g., assessing the current state of the urban forest, reviewing the UFTF recommendations, and evaluating the success of those goals).	2	1	2	Residents	2021	Streets		
Street Design	4. The Undergrounding of Overhead Utility Lines policy criteria should be amended to account for the impact of overhead utility lines on city terrace trees. The criteria should include but may not be limited to: ability to underground, terrace width, availability of space for private trees adjacent to the right-of way, ability to improve canopy coverage, availability of cost-share funding source (e.g., TIF), potential for place-making, etc.	3	1	2	Residents, Property owners, Utility companies	2021	Engineering, Streets		
Zoning & Site Plan Review	3. Mature trees lost during construction reduce the public benefit of Madison's urban forest canopy. A required replacement of mature with new trees is not an equal exchange. Even when new trees are planted, it can be several decades until they can provide the value of mature trees. In such cases where existing canopy value is lost or diminished, the city should **develop a more equitable metric** than "one mature tree for one sapling" when seeking measures to **remediate losses** even if those measures are outside of the project bounds.	2	1	2	Developers, Contractors	2021	Streets, Engineering		
Zoning & Site Plan Review	5. Public trees that are removed should be replaced in enhanced growing conditions, at the cost of the developer, in consultation with the City Forester. Forestry should partner with Traffic Engineering and Engineering on redevelopment projects for dedication needs to enhance the terrace and sidewalk.	4	1	2	Developers, Contractors	2021	Streets, Traffic, Engineering		
Outreach and Education	1. Create a position for a Forestry outreach and education specialist, who would combine education/communication and an arborist background. This position would help develop an Urban Forest Outreach Initiative that would provide public education; coordinate events; and create a program similar to Tree Tender, Tree Keeper, or Adopt-a-Highway, in conjunction with the City Forester. The Initiative would partner with interested groups and individuals to maintain and grow the urban forest.	2	1	3	Residents	2021	Streets, HR		

Urban Forestry Task Force Sub-Committee

	Recommendation	Ease of implementation	Impact	Estimated Cost to city	Stakeholders	Year	City Agencies	Actual cost to City	
Outreach and Education	4. Among other activities, the outreach program should organize volunteer tree planting and tree maintenance programs should be developed for private property and city parks in order to include citizens in a program of tree stewardship.	2	1	3	Urban Tree Alliance, Property owners	2021	Streets, Parks		
Zoning & Site Plan Review	7. In the zoning code, amending landscape applicability standards should be considered to bring more legal nonconforming site plans up to current landscape standards.	3	1	3	Commercial property owners	2021	Planning		
Outreach and Education	3. Multi-year programs intended to plant trees in areas not covered by the city's operations such as private homes, schools, and multi-family housing should be designed and supported. Such a program is key to planting more trees and providing direct outreach in the city.	4	1	4	Urban Tree Alliance, Property owners	2021	Finance, Streets		Possible 2022 budget item
Neighborhood & Long-Term Planning	1. Neighborhood-scaled canopy coverage assessments should be developed and conducted in order to set goals and strategies for canopy growth within those areas.	5	1	5	Residents, Property owners	2021	Streets, Planning		
Zoning & Site Plan Review	4. The City should increase costs associated with public tree removal related to house moves and private development projects, such as $500 to $1,000 per inch of diameter at breast height. This would create a financial incentive for developers to avoid public street tree removal while providing Forestry funds that could be used for improve growing environments to speed future tree growth.	3	2	1	Developers, Contractors	2021	Streets, Attorney		
Forestry Operations & Public Lands	11. Forestry should obtain the appropriate software licenses and permissions to coordinate more extensively with other agencies involved in Public Works projects and permits.	3	2	2	Utility companies	2021	Streets, Engineering, IT		
Canopy Coverage	3. The city should institute a range of policies and program designed to increase canopy coverage at the neighborhood level. In conjunction with neighborhood groups, staff should develop strategies for increasing tree population. Canopy trends should be evaluated with particular attention paid to rates of coverage in neighborhoods of higher poverty and greater concentrations of persons of color.	4	2	3	Neighborhood associations, Property owners, Low-income renters	2021	Planning, Streets		Possible 2022 budget item
Canopy Coverage	4. Public plantings along streets, in parks, and within greenways should be prioritized according to a need-based neighborhood analysis. The city should consider subsidies for street or private trees in neighborhoods or census districts with household incomes below the area mean and neighborhoods that have not historically had street trees.	5	2	3	Residents	2021	Parks, Engineering, Streets, Planning		Possible 2022 budget item
Forestry Operations & Public Lands	10. Develop a **Tree Technical Manual** to create new standards and review existing standards for improvement, to increase tree canopy. This would include a detailed guide as to the currently used and recommended spacing requirements. The rationale for spacing standards and opportunities for reduction in spacing should be documented. For example, the Technical Manual should review the relationships between trees and street lights, review the need for vision corner restrictions, and review fire department requirements (whether policy, code, etc.)	4	2	3	Residents, Developers, Contractors	2021	All		
Canopy Coverage	5. The city should support multi-year programs to support tree planting for private homes in neighborhood with low canopy coverage, apartment/rental housing, schools, and other areas not currently covered with existing municipal plantings.	2	2	4	Property owners, Residents, Urban Tree Alliance	2021	Streets, Finance		Possible 2022 budget item

Urban Forestry Task Force Sub-Committee

	Recommendation	Ease of implementation	Impact	Estimated Cost to city	Stakeholders	Year	City Agencies	Actual cost to City	
Street Design	6. Amend MGO 16.23.8(g) to clarify that existing trees should not be removed for the purposes of solar panel installation. Planting trees, planting location, and species would only be in effect if the building plan includes using solar.	3	3	1	Property owners, Residents	2021	Attorney, Engineering, Streets		
Street Design	3. Explore requiring zones free of laterals (e.g., water, sanitary) and parallel utilities for redevelopments at the beginning of the process in order preserve open and contiguous areas used to maximized soil volumes for tree plantings.	5	3	4	Developers	2021	Engineering, Streets		
Emerald Ash Borer Response	1. Additional staff will be needed to care for (prune, water, etc.) 20,000 new trees. These trees require more frequent pruning and care than older, mature trees.	1	1	4	Residents	2022	Streets, Finance, HR		
Forestry Operations & Public Lands	6. Dedicate additional resources to Forestry for more frequent pruning and maintenance of new and existing street trees. The current approximately 21-year **pruning cycle** of street trees should be evaluated in order identify methods and resources needed to shorten the cycle.	2	1	4	Residents	2022	Streets, Finance		
Forestry Operations & Public Lands	2. Update and upgrade the process of inventorying street trees to include up-to-date information.	5	1	5	Residents	2022	Streets		
Forestry Operations & Public Lands	14. An assessment of the **street tree inventory** should prioritized in order to assess current and future needs. The assessment should include, but not be limited, to opportunities for public access to data, mobile applications for fieldwork orders and data editing, and strategies for a comprehensive update.	5	1	5	Residents	2022	Streets, IT		
Street Design	5. Appropriate annual funds for full or partial underground projects as a separate budget line item.	3	1	5	Utility companies	2022	Finance		
Forestry Operations & Public Lands	4. Forestry should work cooperatively with other City agencies to identify opportunities to enhance green space (e.g., pocket parks) in areas with low canopy cover, like downtown.	3	2	2	Residents	2022	All		
Forestry Operations & Public Lands	5. Create a canopy tree planting program for city-owned bike path corridors and other city-owned transportation corridors that are currently rented for parking.	3	2	3	Residents	2022	Streets, Engineering, Traffic, Parks		

Zoning & Site Plan Review	1. Private development proposals subject to city review should create and provide a **Tree Management Plan**. The Tree Management Plan should include, but not be limited to:
	  a. An inventory that identifies the locations and species of trees larger than 5" DBH for both private trees and possibly affected public trees within the adjacent public right-of- ways.
	  b. A statement describing the impacts of the development on the all tree resources that includes a description (size, species) of trees to be preserved and removed.
	  c. A construction plan illustrating how practices may affect existing trees and details physical tree preservation measures such critical root zones protection, locations for materials storage, site access, and prescribe tree measures such as pruning.
		2	5	1	Developers	2022	Planning		

Urban Forestry Task Force Sub-Committee

	Recommendation	Ease of implementation	Impact	Estimated Cost to city	Stakeholders	Year	City Agencies	Actual cost to City	
Zoning & Site Plan Review	6. **Building set back** allowances have been reduced in urban areas to increase density. These policies have likewise reduced areas for potential tree plantings in critical areas. The city should consider the loss of potential trees due to this zoning condition as a detriment to the public value of the city streets. The city should develop zoning policies that encourage, not prevent, the provision of street trees or trees on privately developed properties.	5	2	2	Developers	2023	Planning		
Canopy Coverage	2. The City Forester and Sustainable Madison Committee should create a **Tree Preservation Ordinance** in order to preserve, expand, and protect canopy coverage overall in Madison.	5	2	3	Developers, Property owners, Contractors	2023	Attorney, Planning, Streets, Engineering		
Forestry Operations & Public Lands	3. Inventory trees on all City-owned properties including parks and greenways, in order to maintain and add new trees. The inventory would be used to mitigate and respond to threats to the urban forest as well as prioritize growth of the forest.	5	2	5	Residents	2023	All		
Subdivision	1. Planning Division should investigate how new single-family lots, which are exempt from landscape standards in the zoning ordinance, can have a tree planting requirement. Strategies may include, but not be limited to, incentives for developers and/or homeowners to plant and maintain trees, the use of neighborhoods covenants to require trees, or direct planting programs focused on private properties. It is further recommended that the city provide guidance on best practices regarding the location of trees of lots and species selection to encourage diversity and large trees.	5	2	5	Developers, Property owners	2023	Planning		
Street Design	7. Existing policies impacting street trees, such as Complete Streets, Rural to Urban Roads, Madison in Motion, and Comprehensive plan, should be reviewed in order to ensure consistency in tree policy.	2	3	2	Residents, Developers	2023	Planning, Engineering, Streets		
Zoning & Site Plan Review	8. Incentives should be established for private developments that exceed landscape requirements.	3	3	3	Developers	2023	Planning		
Emerald Ash Borer Response	2. It will be necessary to gear up enforcement of regulations pertaining to dead trees.	3	3	2	Property owners	9999	Planning, Streets		
Canopy Coverage	1. The City of Madison should achieve an optimal tree canopy coverage goal of 40% overall, consistent with the American Forests Association current recommendations. Currently, Madison tree canopy coverage is estimated at 23%.	5	1	5	Residents, Property owners, Developers		Streets, Planning, Parks, Engineering		

Appendix B: Urban Forestry Task Force Presenters

Phil Gaebler, City of Madison Engineering

Matt Tucker, City of Madison Building Inspection

Brad Hofmann, City of Madison Forestry

Brian Smith, City of Madison Traffic Engineering

David Benforado, Madison Gas & Electric

Martin Jacobi, Madison Gas & Electric

Dan Buckler, Wisconsin Department of Natural Resources

Carissa Wegner, City of Madison Engineering

Maddy Dumas, City of Madison Engineering

Kate Kane, City of Madison Parks

Kyle Bunnow, City of Madison Building Inspection

Bill Sullivan, City of Madison Fire Department

John Sapp, City of Madison Engineering

Mark Winter, City of Madison Traffic Engineering

Katy Thostenson, Wisconsin Department of Natural Resources

Bret Shaw, University of Wisconsin – Madison and UW-Extension

Appendix C: Public Comments

5/9/19 Email

-----Original Message-----

From: noreply@cityofmadison.com <noreply@cityofmadison.com> On
Behalf Of Webadmin Sent: Thursday, May 09, 2019 11:00 AM

███████████████████████████

Subject: [Web Feedback] Public Input Meeting - Urban Forestry Task Force

Page Title: Public Input Meeting - Urban
Forestry Task Force Breadcrumbs: City of
Madison » Parks » Calendar
Page URL: parks/calendar/public-input-meeting-urban-
forestry-task-force Was this page helpful to you? Yes
Why or why not? what I need to know to attend or submit comments

This feedback was submitted from:

http://www.cityofmadison.com/parks/calendar/public-input-meeting-urban-forestry-task-force

5/13/19 Email

-----Original Message-----
From: Ronnie Hess <rlhess@wisc.edu>
Sent: Sunday, May 12, 2019 4:16 PM

███████████████████████

Subject: Urban Forestry Task Force Draft Report Comments

Sorry but I may not be able to attend the meeting.
I would very much like to argue for the planting of more fruit trees. Please do not be discouraged
from this out of concerns surrounding debris. I think you will find neighborhoods, possibly through
existing neighborhood associations, very willing to ensure cleanliness at the sites. We need more
rather than fewer food sources.

Thanks for your work,

(Ms.) Ronnie Hess

"The more stars in your itinerary, the less likely you are to find the real life of another country." Ruth
Reichl

5/14/19 Email

From: erichschmidtke@yahoo.com
Sent: Tuesday, May 14, 2019 1:34 PM

▮▮▮▮

Subject: Urban Forestry Task Force Report - Comment

Hello,

Reading the Task Force's report, the comment I would have is that because most of the City's trees are privately owned, there should be a strong push to increase trees in yards. Maybe offer people a property tax credit of $1/per yard tree, or some other financial incentive to get them to fill their yards with trees.

Thanks,

Erich

5/15/19 Voicemail

First, trees are calming, good for mental health, and good for the environment. They cool homes and are very beautiful. She really hopes that we can have canopy trees all over in Madison.

5/15/19 Email

From: Dawn O'Kroley
Sent: Wednesday, May 15, 2019 11:36 AM

▮▮▮▮▮▮

Subject: Urban Forestry Task Force Draft Report

Hi and thanks to you all for this important work. I'm looking at this from the perspective as to how this report can support a department/commission's review of development. Considering the urgency and importance of this work, include goals that can be referenced by committees through the adoption of this report. Site Plan/UDC/Plan Commission review could then reference the Urban Forestry Task Force Report in addition to Comp Plan, UDC District standards, neighborhood plans, etc.

- Revise the cover page reference of a healthy tree canopy at 40% to a canopy that exceeds 40%.

- Each recommendation section should state or reference the goal of a minimum 40% tree canopy coverage. In areas with an established pattern, public and private parcels should contribute to the established pattern where exceeding 40% coverage (i.e. no reduction).

    Many goals and requirements influence development and this goal should clearly be stated

while individual developments are reviewed against other requirements, including setback. On page 22 the risk of not setting a goal is maintaining the same development patterns. Every part of the city should equitably have the same goal. Large institutional campus may need to be calculated differently to reflect their contribution to greenspace and the tree canopy, but the intent of this language could be misinterpreted.

- Some thoughts on specific tree placement beyond % requirement. Requirements need to also prevent the continued loss of mid-block (back yard) tree canopy to the pattern of multiple combined parcel redevelopment. City Row on Johnson Street is one example of a development review process that integrated density and affordable housing with trees both along the street (in addition to the terrace street trees) and in the center of the block (back yard).

  2008 BUILD East Washington Avenue Capitol Gateway Corridor Plan Design Guideline 6 implemented trees in the setbacks in addition to the terrace street trees. I also recall UDC discussion regarding the need for street trees at the E Wilson Street development pictured on page 17 of the report.

  Pedestrian scale street lighting needs to become the city standard, which is still effective below a mature tree canopy. Utilities need to be located underground.

  If we're getting specific, this report could also reinforce not using stone mulch.

- To build momentum in support of this study, consider including a historical reference. Below is from 1911, Madison: a model city by John Nolen:

Goal 10: "To remove from the public streets all wires, poles and other obstructions."

Goal 11: "To pass a shade tree ordinance providing for the systematic public planting and maintenance of street trees."

From Chapter 4: "Better looking streets is another urgent need of Madison. Except around Capitol Square, I believe there are no wires underground. Elsewhere, on State Street, on the main business streets, in the principal residence sections, surrounding the parks, nearly everywhere, unsightly poles and wires appear in profusion. Some way should be found to remove gradually practically every pole and overhead wire from the streets of Madison. It is folly to reply that it is impossible when a small city like La Crosse accomplished it unaided a decade ago.

The removal of the poles from the streets would prepare the way for a better method of planting and maintaining street trees. At present the trees in the streets of Madison are not under public control and every attempt to place them there has been defeated in the city council. Seldom does one see even a single well-located, well-developed street tree and never a row of good trees a block long. Madison - and it is true of Wisconsin generally - holds tenaciously to individual rights and is less willing than cities

in other parts of the country to place the care of the street trees in the hands of a properly constituted public body. It seems unnecessary to state so obvious a thing as the value of good trees in city streets, nor the impossibility of getting good street trees under individual control. In the notes at the back of this report is printed a proposed street tree ordinance, modeled after those of the more progressive cities in other parts of the country where trees are looked upon as a civic asset.[4]"

Thank you,

Dawn O'Kroley

646 E Gorham Street

Madison, WI 53703

5/15/19 Verbal Feedback at Listening Session

- When a development occurs and the developer is given extra points for preserving a larger tree, is there a time period for how long the tree has to remain? When is it assessed for preservation?
- Going in a good direction, appreciated presentation – for the Isthmus and some of the new developments, the Fire Department has some concerns about big trees near buildings. Was that a factor in the group's decisions?
- Does this mean that, if they put in sprinkler systems, more street trees can be planted?
- Peter Wolf – Incredible piece of work, especially the first part talking about importance of trees. Beautifully written, wonderfully convincing. Second part, there were good ideas for policy. Right tree in the right place. What he's missing is one way to look at ash borer thing is as a catastrophe. There is no emergency here. There are ways that the whole city can treat this as an emergency. There's a real caring in the city about trees; there are good possibilities. Other possible ways to look at things – putting canopy trees where they should be. Everywhere on the street. Don't fit the tree to fit the wires. There should be large canopy trees on every street. Marquette neighborhood used to have elms lining the whole street. Makes so much sense to have the street trees be large trees. Mayor has agreed to work with Peter on this. His evaluation is on the tall tree side. Jenifer St varies. For aesthetics, make both sides the same. Slow down on putting small trees; let them have a try to look at other solutions.
- Faith Fitzpatrick – report has a lot in it on planting new trees. However, there's a gap in protecting mature canopy trees in the City, and how those canopies are linked, creating green belts. Greenways provide a longitudinal and cross-city links. Madison is one of the few cities that doesn't have a green belt focus, like Chicago and Milwaukee. Even as the city expands, keep the corridors. Is there a place for the protection of the woods in this plan? Gems of woods exist. So many benefits to keeping those intact, from both the tree side of things and the stormwater side. Working with greenways and clear communication between

the two agencies is really important.

- Working with Marquette neighborhood off and on since 2009 – we began working on the Jenifer St reconstruction project. Lots of gains have been made in protecting trees. Has there been a change in policy? Wanted to address the graphic showing undergrounding, Silva cells, planting – it's far more complex. He

  recommended not using the graphic; it's inappropriate. There is far greater density, greater usage in some of the areas, and that makes shade trees even more important. Usage, tax base, proximity to important public spaces should be addressed.
- All new subdivisions since 1971, 1973 have been having undergrounded high voltage wires. That's a different kind of formula, so that should be stated to avoid urban versus subdivision. Older, downtown areas do not have alleyways. Go down E Johnson St, and you can see street reconstruction has removed trees all along one side. It's complex, and it should be reflected in these recommendations.
- Bike path corridors – does the City own the land along the bike path? Does Forestry plan for these?
- Did anyone ever think of using conservation easements to plan trees?
- Is purchasing conservation easements being explored? These would be public-private partnership.
- It is expensive to underground. During a street reconstruction, and everything is torn up, it seems like then it should be possible.
- She thought that several recommendations might require an ordinance change. Is there any way that some of the development-oriented recommendations could be spearheaded by alders?
- Lance Green – In 2016, people were coming to Sustainable Madison and saying that there are serious problems with the street trees. Then, the Task Force was formed. From his perspective, they did well. He really appreciates the neighborhood plan component. Having greenways in the neighborhood, putting it together, amending it – this is really important. Subdivisions, the new terrace requirements are excellent, plus undergrounding. Tree preservation ordinance, not sure what would be in that; the Sustainability Committee would be happy to work with Forestry on that. Equity concerns and targeting low-income neighborhoods is so important as well. Having a biennial Forestry report is very important to keep abreast on a regular basis, to track progress, actual measures. Creating a Forestry Board is really good. Public awareness is great – people know about EAB but nothing else. Developing existing areas, upping the requirements for trees, working with Fire Department are all really good ideas. In the 2012, the Sustainability Plan was adopted, which included undergrounding. It costs money. Cost will be shared by the City, as part of property tax. If we make decisions to plant ornamental trees, this might be a place that could be undergrounded. Stop planting ornamental trees in those areas. When we do road reconstructions, it comes down to money. Up the money. Undergrounding downtown.

Urban heat islands need to be planted. Planting trees where they'll absorb the storm water, divert the stormwater to water the trees. Work on flooding, urban heat, forestry all at the same time.

- Great recommendations. A lot of these recommendations will do a lot to increase canopy, but when we get to the Isthmus, there was nothing that would enhance her space. What are the kinds of things we can do that might break the mold of what we always do? We need to get canopy trees where people are. Very specific ideas about re-thinking how far apart a tree is planted. Soil volume issue. Wants us to think about what that might look like. Friend moved into subdivision; every single place on his lot had a utility conflict. Explicit guidance in terms of planning for divisions to allow opportunities for planting on private properties.
- Why isn't there a canopy tree in the bottom picture? That looks like a great opportunity. Sight triangles need to be questioned. Why is sight so critical at controlled intersections?
- Player is community utility. More and more, they're being concerned about putting more carbon and always concerned about costs. Tree trimming – creating "Y" trees – has costs over time. Look for additional help with the funding from the utility companies. Savings of maintenance over 30 years – long-term thinking. Not in the report.
- MG&E – damage to wires that take repairs, storms are much less with undergrounding.
- Cost for undergrounding – how much again? Wholesale versus retail. Have to be specific. Got some costs from MG&E – around $385,000 to do four blocks. Undergrounding just the high voltage lines was just $192,000.
- Lot of other things on poles other than electric. One challenge of undergrounding – in an older neighborhood, transformers have to go somewhere. That seems like the worst in the world that you can look at, but it is the reality.

- People are given an option to pay for service wires to be placed underground. You can eliminate the high voltage wires, but you won't eliminate all the other infrastructure. There could still be limitations to planting.

- Inconsistent about what you can and can't plant around poles. Inconsistency about poles in general – two wires for the same things at different point. It would be helpful to have that information available. Need more information about planting.
- MG&E has diagrams and brochures about where to plant.
- The message has changed. For more than 100 years, we had wires and trees, and it was ok. Why it is no longer? We want everything to be perfect, but that doesn't mesh with a liveable, walkable environment. In consolidated urban areas, there needs to be flexibility.
- Similar questions being asked across the country. Insurance coverage had become a major factor in why small trees are planted under wires. Cost of people living in areas without shade.
- Spring Harbor neighborhood – University Ave corridor, large buildings coming. Not much set-back. It's like fighting against the machine. Disconnect with the Planning Department – they're going forward with the plans. Building haven't been built because construction

workers are hard to get. It's disheartening to know that trees won't be planted.

- Is there any resource to better link communication with Planning?

5/16/19 Email

From: Laurie S
Sent: Wednesday, May 15, 2019 8:39 PM

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Subject: Urban Forestry Task Force Draft Report Comments

Thanks for all the work that you all put into this draft report. I appreciate the detailed observations and could not find any of your conclusions or proposals that I disagreed with. I want to share some experiences on the block we've lived on for the past 27 years.

Sometime In the past 10 years, a developer put up 2 houses on the other side of the alley in back of our house. The houses fit into the neighborhood very nicely. And he left some green space between the buildings. When he was presenting his plan to the neighborhood he had inventoried all the trees on the property and said which ones would be eliminated and which ones would be kept. The neighborhood overwhelmingly supported the project, largely because he had figured the trees into the overall plan. Unfortunately, on the first day of work on the site, the bulldozers came in a cleared EVERYTHING, even a very large spruce tree that was supposedly going to be saved. He planted 2 trees (in replacement?)--neither is more than 15 feet after 10years. Developers need to be held accountable and be made to pay a higher price for removing mature trees so they are more motivated to save them.

I also think the utility companies need to be held accountable. These companies keep increasing their requirements for pruning and distance between their lines and trees, but what do they do to increase the number of trees? When the quality of living is decreased by limiting the height of trees, couldn't the companies responsible bear the cost of burying lines to enable more tree planting?

I also think some of your proposals need to be made into city statutes. You probably are aware of a law that exists in Portland, Oregon. This law requires that requires you to get a city permit if you cut down a tree on your property. And then you must plant a new one that also has to meet city approval. Perhaps Mayor Satya will have some other ideas via her experience on the mayor's council.

There are two property owners on our block who have requested that no street trees be planted to replace trees that have taken down in the past 20 years. That should not happen. Those trees should have been replaced. Again, it seems that this could be addressed with city laws.

And one last item--when our street and sewers were redone approximately 12 years ago, the city used gravel and a very thin layer of topsoil as they finished. The grass wouldn't even grow!! After several neighbors complained, the city came back out and took out some of the gravel and added more top

soil. But as you point out, soil conditions conducive to thriving tree populations need to be put into the overall plan.

I have one question--I assume your wanting to reduce the number of years in the tree pruning cycle is so the trees won't be as decimated when they get their pruning. But that isn't very clear in the report.

Thanks again for putting together this report.

Laurie Swimm

5/29/19 Email
From: Faith Fitzpatrick <fafitzpa@gmail.com>
Sent: Wednesday, May 29, 2019 10:55 PM
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Subject: Urban Forestry Task Force

Hello please see below my comments for consideration from the review of the City of Madison Urban Forestry Task Force, Draft Report dated May 6, 2019. Apologies for the length and maybe some typos. Thank you for holding the listening session on 5/15/19. It was very helpful. The draft report is well written and organized, especially the recommendations.

1.Existing mature canopy forests in public green spaces (100 year old ++) -- these need to be included in the overview (p.12-13) and in the recommendations for special consideration of protection. The focus of the report is on mainly terraces along roadways or grassed areas which is great but care and protection of existing full canopy woods needs inclusion. Of special concern are woods with full canopy coverage and thick healthy soils that were preserved through European settlement, clearing for agriculture, and urban development. Their uniqueness and connectivity along drainage networks makes them especially unique gems of special preservation need. One example is the woods near Nautilus Park on the west side that were just cleared. These woods provided many hydrologic and habitat benefits that were not fully characterized or counted for stormwater BMP benefit, including an intact downstream channel after the August 2018 flood. Stormwater management's narrow view of vegetation along drainage corridors is sorely in need of updating. The statement on the top of p. 13 "Trees planted in greenways in the past has led to significant issues with erosion: shade from trees inhibits the growth of grasses, leading to bare soil and soil loss during rains". This statement, which fits for a narrow portion of small streams in the Driftless Area that had riparian prairie corridors (actually they were likely strips of wetlands), is getting wrongly over-applied to all riparian settings and is in direct opposition to all the many decades of work that were done for keeping riparian forest cover,ie buffers along stream corridors for both hydrologic and water quality benefits.The removal of a full canopy tree structure can be viewed as a violation of the Hippocratic Oath -- Primum non

nocere. Endit -- "mature woods" as a category needs to be included in TMDL tool to get proper credit for TSS and TP.

Recommended publications to include (in general the report needs citations):

Berland, et al., 2017, The role of trees in urban stormwater management: Landsc Urban Plan. 2017 June ; 162: 167–177. doi:10.1016/j.landurbplan.2017.02.017.

Cappiella, K., et a., 2016, Recommendations of the expert panel to define BMP effectiveness for urban tree canopy expansion, Center for Watershed

protection: https://www.chesapeakebay.net/documents/Urban Tree Canopy EP Report WQGIT approved final.pdf.

Center for Watershed Protection and U.S. Forest Service, 2017, Making Urban trees count:A Project to Demonstrate the Role of Urban Trees in Achieving Regulatory Compliance for Clean Water

Gerken Golay, M., J. Thompson, and R. Kolka. 2016. Carbon, nitrogen and phosphorus storage across a growing season by the herbaceous layer in urban and preserved temperate hardwood forests. Applied Vegetation Science, 19: 689-699.

Wu, J., T.W. Stewart, J.R. Thompson, R.K. Kolka, and K.J. Franz. 2015. Watershed features and stream water quality: Gaining insight through path analysis in a Midwest urban landscape, U.S.A. Landscape and Urban Planning, 143: 219-229.

Wu, J.Y., J.R. Thompson, R.K. Kolka, K.J. Franz, and T.W. Stewart. 2013. Using the Storm Water Management Model to predict urban headwater stream hydrological responses to climate and land cover change. Hydrology and Earth System Sciences, 17: 4743- 4752.

Gerken Golay, M., R. Manatt, C. Mabry, J. Thompson, and R. Kolka. 2013. Targeted restoration of herbaceous woodland plants: survival, growth, and reproductive success of local and non-local propagules. Ecological Restoration, 31: 378-387.

Gerken Golay, M.E., J.R. Thompson, C.M. Mabry, and R.K. Kolka. 2013. An investigation of water nutrient levels associated with forest vegetation in highly altered landscapes. Journal of Soil and Water Conservation, 68: 361-371.

Curtis, Vegetation of Wisconsin Chapter 8 Southern Lowland Forests

2) Include plans for green corridors -- connected mature forests that weave from greenspace, park, private, and rail. Chicago, Milwaukee, Minneapolis and surrounding communities have these yet we don't in Madison. This document would be a good place to give them recognition and include in a plan. A west side mature canopy forest/green corridor existed (before Nautilus woods was removed) that connected the sw side of Madison habitats to the lakeshore habitats.

3) Special consideration for vintage trees along lakeshores -- 150+ year old oaks and other riparian original trees are getting removed at a rapid rate along the Spring Harbor Neighborhood lakeshore for redevelopment. They need special consideration in zoning. Given our ample lakeshore, this setting should get special mention in this document. There are very few wooded shorelines left with natural shoreline material. Much loss has happened over the last 10 years and more is happening now.

4) University Avenue Whitney to Allen redevelopment -- urban planning is pushing new building designs ubiquitously close to the street without consideration of the need for plantings of large terrace trees. This section of University Ave needs special consideration in planning because of the contaminated drinking water supply well, local springs, harbor and lakeshore. Much of the street is in a 2- to 10-yr time of travel to the well. This area could benefit much from full size trees along the terrace without power lines as well as the center median. Instead small ornamental trees were planted. Also of consideration is evergreens which would have the most benefit for spring thaw and snowmelt. They are not included in possible trees because of street "pollution", yet private single family residences on University Avenue have mature white pines. Again the "list" is too narrow for special situations, especially where the quantity and quality of stormwater is at a critical stage. The plans are approved but construction not started. This is a forever decision for such a critical zone in direct conflict with the draft report's recommendations. Is there anything that can be done?

5) Linkage to neighborhood planning documents -- Thank you for including this in the list of recommendations that "Planning documents, such as Neighborhood Development Plans and Neighborhood Plans, should include an existing tree canopy inventory and identify areas for tree preservation. As appropriate it is recommended that existing plans be amended to address this issue" (p. 19). I am proposing that Spring Harbor Neighborhood Association Board evaluates this recommendation and takes action on it to have our plan amended.

6) Street design recommendation -- The recommendations reflect the great deal of thorough research that was done for street terraces and it is greatly appreciated. Of special note is a 12 ft recommendation for arterial streets.

7) Canopy coverage (p. 22) -- this would be a good place to not just talk about the percent of cover but it is equally important to take advantage of locations where connectivity or setting give it even more of a benefit for water quality, stormwater saving, and terrestrial to riparian habitats.

8) Forestry operations and public lands recommendations (p. 24) -- goals and recommendations are great but could be made stronger by including a plan to get mature woods in the toolbox for stormwater credit. Instead of looking at forest management as hard on existing maintenance budgets it would be better to compare the difference for maintaining a mature forest over the amount of mowing and heavy machinery usage to keep spaces in grass. The parks conservationist needs to be included in discussions with city forestry and engineering to get the best combination of ecosystem benefits and human quality of life.

9) Emerald ash borer response (p. 25) -- need more consideration of mature ash trees in greenspaces for treatment options. There may be special areas that give more cost benefit if trees are treated and maintain a mature canopy.

Respectfully,

Faith Fitzpatrick

5/30/19 Email
---------- Forwarded message ---------
From: **JOHN A HARRINGTON**
<jaharrin@wisc.edu> Date: Thu, May
30, 2019 at 10:00 AM
Subject: comments on task force report

████████████████████████

Thank you for the opportunity to comment on the Urban Forestry Task Force Draft Report on Madison's urban forest. The report covers the importance of the urban forest and has, what I consider, some very appropriate recommendations that the City should attempt to implement. I do have some comments though, that emphasize stressing to a higher level the importance of the urban forest, large canopy trees over smaller "ornamental" trees and a very major need to prioritize tree placement equally with utility and sidewalk placement as a very important part of the urban infrastructure, particularly as this City looks to be more sustainable and "green."

I would encourage the following points to be given greater emphasis in the report.

1. Emphasize the importance of large canopy trees as a priority infrastructure piece on par with the siting of walks, building setbacks, street lamps and utilities.

Each of the above are essential, yet trees should not be put on the back burner until these other pieces are sited. For example, we would not build a street today without light standards, but we often will do so without trees as no place has been left for them to grow (terraces too narrow, buildings sited too close to street, distance from light standards to be maintained, bike racks, etc). The lighting provides safety, visibility and an aesthetic, all highly valuable. The benefits of trees are equally as important and numerous. Research from the National Forest Service and the University of Georgia show that *large* canopy trees 1) increase retail traffic over streets that have no trees and or are planted to smaller ornamental trees, 2) enhance residential values, benefit mental health, reduce morning and evening glare and may contribute to reduced traffic speed, when trees are spaced and arranged appropriately; 3) sequester carbon and trap particulates, 4) mitigate stormwater, 5) mitigate the urban heat island effect; 6) provide wildlife habitat including that for pollinators and song birds; 8) provide directional cues; 9) enhance and define the street edge; and 10) enhance aesthetics.   To acquire these benefits requires creative thinking in where we place street trees and how we place streets in relation to buildings. One note on stormwater: Trees capture considerable rainfall along their trunks and branches as well as leaves. In the *average* precipitation event, less than half of the rainfall may reach the ground under a full canopied tree and that which does is slowed considerably. Tree roots are excellent at capturing rainfall as well. The crux is soil compaction. In forested areas that have not been grazed

minimal runoff or erosion occurs in an average rainfall event. The trick is to develop solutions that prevent soil compaction under trees.

2.   Emphasize the importance of larger canopy trees over that of ornamental. Multiple studies demonstrate that each of the above benefits increase exponentially with tree size. The dollar value of these benefits are significant and need to be included when determining the costs of burying or relocating overhead power lines that exist in terraces. USDA Forest Service studies suggest that a 77 cm diameter tree removes approximately 70 times more air pollution annually than trees with diameters of 8 cm or less.

3.   City zoning needs to reflect the city vision for trees and the environment that is required for trees to grow. For the city to grow large canopy trees along streets a minimum building to tree distance is 15' plus additional footage from the tree to the street. As buildings increase over 4 stories this distance also needs to increase, particularly on west and east street edges East Washington is an excellent example where the draft master plan vision was originally for double rows of canopy trees along the street edge. Due to the zoning setback this prohibited such use in many locations and resulted in single rows of trees or the use of narrow columnar trees, which although provide an aesthetic, provide few of the other amenities discussed above. Where buildings with 7 stories occur and with the top 3 stories stepped back further, canopy trees need a minimum 22' away from the building face along east- and west-facing edges and a 16' distance from south-facing edges. As building height increases, these distances need to increase as well. These distances may not always be practical in older areas that are being revitalized, but the point is that as buildings increase in height, distance from street to building must increase as well, if we wish to have canopy trees as part of our environment.

4.   Emphasize the below ground needs of large canopy trees. A 16" diameter tree requires 1000 cubic feet of soil to grow in. Considering that tree roots typically feed within the top 18" of the soil and seldom extend below 3', a soil bed needs to have an outer dimension that is greater than 10' x 30'. To obtain that in a city business district means attention to the soil situation under pavements that will allow for oxygen to reach roots and for soils to drain. This may require porous surfaces or soil replacement, but in some cases could require the use of structural soils or silva cells or the equivalent. The cost for these is not inexpensive but should be similar to the cost for a lamp post and its installation.

5.   Recognize in actions that the urban forest and the City goals for it are as, or more, dependent on trees occurring on private lands as they are on public lands. Recommendation #6 on page 23 is important to increase canopy cover but should go further with the goal of increasing tree diversity. Although diversity goals for the urban forest on public lands appear to be meeting city goals, it is less clear that this is occurring on private lands where the majority of the urban forest exists. City programs that assist private land owners in understanding the need to plant greater diversity in their neighborhoods and direct them to resources for selecting trees may prove beneficial. Programs that encourage landscape architects and nurseries to encourage diversity in neighborhoods are also

important. Recommendation 3 on page 24 is to inventory trees on all city-owned properties, I encourage the City to institute a program for a similar inventory on private lands, with landowner permission, is as important. The goals for the urban forest will not be accomplished unless the City acknowledges that the trees on private lands are a major part of accomplishing diversity, storm water benefits, UHI benefits, wildlife habitat, carbon sequestration, etc. Without knowing what the urban forest is on the majority of land in the city, planning for the future urban forest is at a tremendous disadvantage.

6.   Strong incentives are required to protect larger canopy trees from removal. Ordinances that include a charge for removal of trees are often based on each inch increase in DBH. A major problem with such ordinances has been that the fines are insufficient, to the extent it becomes cheaper for a developer to remove a tree and pay the penalty, than to strategize how to work around a tree. UDC and Planning commissions were able to stop several large bur oaks from removal during the the project review for Grand Commons. The developer came back with plans to save and protect these trees, but if the two commissions hadn't caught these, due to citizens bringing it these commissions' attention, they would have been removed. Unfortunately, larger trees along Bedford Street, were removed and trees along Doty Street had all limbs cut off from there south side for a development that was allowed to occur close to the street edges due to the zoning setback. The trees were in the way and they would be replanted is the typical response given by a developer. Given the time it takes for tree to grow to resupply the benefits that are lost, zoning needs to rethink how easy it is for a developer not to have to plan for existing trees that occur on a lot.

7.   The idea that only buildings can provide a street edge has led to set backs that result in major sections of streets bare of trees and not one that citizens, in general, appear to embrace. But are buildings the only way to create a street edge? Large evenly spaced trees created edges throughout history along roads, alleys, and promenades. Large canopy trees lining streets work with architecture to reinforce strong edges that also appeal to citizens moving along sidewalks and cars on the streets. We moved away from this patterns as terraces were narrowed to allow for increased street widths and a planning mantra that buildings need to built to the street to create an edge arose. But is this true? The reliance on buildings only to create a street edge is not a sustainable vision. Buildings, alone, do not mitigate stormwater, reduce UHI, or enhance walkability.

8.   The recommendations for requiring an existing tree plan for all proposed developments is important, but it would be beneficial if this were to extend to adjacent properties in order to ensure diversity throughout the neighborhood. A developer can provide a landscape plan that includes species diversity for the site under review, but if all other properties have the same species composition then the neighborhood is not really diverse.

9.   Last, one additional recommendation could go a long way to mitigate stormwater runoff and enhance aesthetics of large surface lots, that is developing a grant, similar to the City's facade grants, that would help landowners to redevelop older surface lots and bring them into conformance.

As the city evaluates the need to be sustainable, to address storm,water and UHI, considerations beyond engineering solutions need to be part of the strategy. Too long the City has stated the desire for a strong urban forest but has instituted obstacles for creating one, in part because trees have been a low priority in the development process. They need to be considered major infrastructure and not to be located in the only remaining sites left that can support them after all other infrastructure is in place. Our planning process as where to place trees should not be targeted to the only remaining spaces left after all other infrastructure is in place. That is self-defeating.

We have made it too easy to take out large trees that are perceived to be in the way of development. The thought that trees are replaceable, that they can be replanted is a fallacy in terms of benefits we seek. Small trees, beyond a small aesthetic, do not provide the benefits of a 20-30 year old tree. If we are constantly removing trees as we develop we will never obtain the benefits that a street or property with large canopy trees makes possible.

Sincerely,

John Harrington

Department of Planning and Landscape Architecture Rm 25C Agricultural Hall
Email: jaharrin@wisc.edu Phone: 608-263-4587

5/30/19 Email
From: Gary Tipler <garytip8778@gmail.com>
Sent: Thursday, May 30, 2019 11:40 AM

Subject: Urban Forestry Task Force Comment

Dear members of the Task Force, Parks Commission and Alders,

I attended the public meeting only a couple weeks ago. I'm sorry that it appears that there is still much confusion about the reasons and costs for "partial undergrounding of the high-voltage line" and undergrounding wires. The first one accomplishes the planting of full canopy shade trees. The second one accomplishes that, but is more attractive. Time is essential. We can't be held back by the call for undergrounding to be translated into the aesthetic approach online, justified by higher expense estimates. We need the effects of large trees sooner than later.

From the public meeting it appears that the evaluation of whether to use partial undergrounding of the high-voltage line was weighed against the value of planting trees in places where their are no wires (subdivisions built since 1973(?) and elsewhere.

This evaluation is flawed.

The graphic that reflects that evaluation was shown. It compared costs of full undergrounding.

There should be a cost to value comparison with density and tax base as factors... not only cash costs.

Other values that must be considered include:
  the high density;
  highly active locations -- for pedestrians, bicyclists and automobiles;
  the higher preponderance of concrete in some urban locations (heat
  islands); and the higher value of lands (taxation).

  Each canopy tree in the suburbs may serve one person, but in a high density area may serve a multitude of people.

  Thank you for your consideration.

Appendix D: Annotated Bibliography

Bergquist, L. (2018, August 8) Gypsy moths plummet in eastern Wisconsin, prompting DNR to suspend spray program. Milwaukee Journal Sentinel. Retrieved from https://www.jsonline.com/story/news/2018/08/08/gypsy-moth-numbers-drop-prompting-dnr-suspend-spray-program/927378002/

>   Brought to 8/9/18 Urban Forestry Task Force Meeting, available under file 51042. Describes Wisconsin's current and historical response to gypsy moth treatment. 4 pages.

Capanella, T.J. (2003). Republic of Shade: New England and the American Elm. Yale University Press. New Haven, CT: 141 – 146.

>   Presented at 5/17/18 Urban Forestry Task Force Meeting; available under file 51287.Describes the impacts of modernization – wider streets, electricity, different road materials – on street trees. 5 pages.

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