

## City of Cambridge Committee on Public Planting

Meeting Minutes – January 11, 2023 - 5:30-7pm

Hybrid Meeting at DPW (147 Hampshire St) and via Zoom

### Attendance

CPP Members: Vinita Bhaskar, Maggie Booz, Cindy Carpenter, Sara Cohen\*, Paula Cortes, Chantal Eide, Sophia Emperador\*, Sandra Fairbank\*, Ahron Lerman, Ruth Loetterle\*

DPW/City of Cambridge: Abby Bentley\*, Kevin Beuttell, Andrew Putnam\*, Erik Thorkildsen (CDD), Kathy Watkins\*

Guests & members of the public: Kelly Dolan, Gretchen Friesinger\*, Deborah Gevalt, Elizabeth Gilmore, Heather Hoffman, Mark Levy, Melissa Ludtke, JN, Mike Nakagawa, Steven Nutter, Patrice Oliver, John Pitkin, Julie Ray, Eppa Riley, Raisa Sandstran, OR Simha, Charlie Teague, Resident of Westley Ave\*\*

(\* indicates attendees who attended in person)

Meeting notes submitted by: Ruth Loetterle

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### Agenda Items:

1. Review of Meeting Minutes: December
2. Urban Forest Master Plan Update and 2022 Canopy Report summary by Andrew Putnam
3. Updates from City Arborists
4. Updates from CDD
5. Other meeting items
  - a. Outreach efforts
    - Engagement plan - text - back-of-sidewalk trees
    - Arbor Day efforts
    - Tree Protection Ordinance - paper permits
    - Expanding our CPP network
  - b. CPP liaison for City-wide projects - sign-up!
    - Linear Park Redesign | Ruth
    - Memorial Drive | Sandra & Maggie
    - River Street/Carl Barron Plaza
    - Similar minded groups - ie. Green Cambridge (see spreadsheet)
6. Public comments

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### 1) Review of prior meeting minutes

Meeting minutes for December have been shared with the group and will be reviewed during the following meeting.

DPW Commissioner Kathy Watkins welcomed the attendees.

### 2) Urban Forest Master Plan Update and 2022 Canopy Report Summary by Andrew Putnam

- a. Urban Forest Master Plan Update: DPW has implemented numerous action items from the UFMP to reverse canopy loss including:
  - lowering of the caliper dimension for the designation of significant trees
  - increasing the requirements for obtaining a tree removal permit
  - increasing the tree plantings in Toomey and Triangle Park
  - planting two Miyawaki Forests with resident support and participation and proposing a goal of planting one /year going forward
  - redesigning streets/depaving to create more planting space (shared street design in the Port, Tubman Plaza and Cushing Plaza)

- working to achieve the goal of planting 1000 street trees/ year. One and possibly two interns will be charged with looking for spots throughout the City
- planting more diverse and resilient species through the practice of healing in of young trees at the golf course
- pruning young trees proactively – 1400 trees under 20’ will be pruned this year under a new contract with a local tree company
- managing urban soils through: the CUSI-2 analysis of each planting location prior to planting and the mapping of the City to identify difficult areas, the use of brine to pretreat roads, the use of larger tree pits, and the amendment of soils for new trees with compost tea, mycorrhizal inoculants and biochar
- revitalizing existing City programs

The next update in 2023 will report on the impact of last year’s drought. An update to the Healthy Forest Healthy City Report will be undertaken in 2025.

- b. 2022 Tree Canopy Assessment Summary: This study assessed the tree canopy of the City between 2009-2020. The report reassessed and harmonized the original LiDAR from 2009, 2014, 2018 and 2020. The methodology was revised to identify with higher accuracy the changes in tree canopy. The goal of achieving a minimum of 25% canopy for all City neighborhoods remains. The most improvement has been in the public ROW and in parks.

#### **CPP Comments:**

-CE: requested the number of trees removed each year. AP: this is being compiled and will be presented at a subsequent meeting. **KW:** a shared street project for Longfellow Road in the Port is currently in the community review process. It could be implemented as part of the River Street project.

-SE: inquired re the inclusion of the Miyawaki Forest trees in the annual counts and who is monitoring them. **AP:** the Miyawaki trees are not included in the annual counts. Monitoring is being done by Maya Dutta at Biodiversity for a Livable Climate, sensors, and a Lesley College professor. Monitoring of the forest at Greene-Rose Park has not been established.

-MB: inquired as to who is investigating options for new street design as recommended in the UFMP. **KW:** the CDD/Traffic, Parking and Transportation and DPW collaborate on major street projects. Kevin Beuttell hire as the City Landscape Architect is in response to the recommendation by the UFMP.

-MB: inquired about the lack of representation of Urban Forestry on the development of the City’s Urban Design Guideline. **ET:** goal setting is currently underway; UF will be invited

-SF: inquired as to whether citizens would be involved. **KW:** suggested to contact Suzannah Bigolin (CDD) on how we can be more involved with the Design Guidelines; she also asked Erik to have them involve Andrew in the process.

#### **Public Comments:**

-Inquiry regarding the huge changes to the 2009 data. **AP:** the data has not been changed, just its analysis, in order to match the more analysis which was applied to the latest data collected.

-Inquiry regarding the messaging from the DPW re tree removal. **AP:** the message from DPW is that the Tree Ordinance requirements must be met or mitigation is required

-Inquiry regarding the use of the wood from removed trees. **AP:** the stand of Black locust removed at Fresh Pond Reservation were used at Glacken Field and the Universal Playground on Field Street, some milling has yielded benches and chips are mixed with biochar and used for new plantings.

-Concern was expressed for the two huge trees and four small trees that will be heavily impacted if the proposed connection to Linear Park is made at Westley Ave as the tree roots run along the fence line. **KB:** no decisions have been made to open this connection or to remove these trees.

-Inquiry made into the implications on anticipated tree growth rate when trees are planted in the shade of new tall buildings, affecting sunlight and requiring additional use of ice melt. **AP:** the

growth rate may be impacted; species that can tolerate these growing conditions would be incorporated into the design try to plant appropriate tree species.

-Inquiry regarding whether the preservation and planting of trees can be supported through new zoning language (increasing setbacks and open space) and whether trees and green infrastructure are being considered in the development of the City's climate resilient zoning. The council's budget priorities recently presented did not include the planting of trees as a climate issue, only as an open space issue, and the hope is that the climate resilient zoning fully recognizes the value of green infrastructure, not just gray infrastructure. **KW**: the work of the Climate Resilient Task Force is proceeding. Flood mitigation and heat mitigation will factor into the development of a new Green Factor required for new developments.

-Inquiry regarding the size of bare root trees and their growth rate in relation to larger B&B (ball and burlap) trees. **AP**: bare root trees are typically 1.75 to 2" caliper and outcompete the larger B&B trees within 3-5 years.

**Action items:**

- Report on numbers of trees removed by year - Andrew Putnam

### 3) Update from City Arborists

**CPP Comments:**

MB: Inquired about the back of sidewalk tree-planting program. **AP**: UF works with Green Cambridge who canvases locations to meet a goal of planting 300 trees on private property (greater than 20' from ROW) annually. DPW/UF provides the logistical support and the trees. DPW looking to simplify and better integrate the Green Cambridge program with the City's back of the sidewalk program. There is a need to get the word out and educate residents.

**Public Comments:**

Inquiry regarding the possibility of requiring permits for tree removal on private property to be posted thereby alerting neighbors clarifying the need for obtaining permits. **AP**: CPP can propose posting protocol and City can review.

**Items for further/future discussion:**

- CPP to develop a protocol for the posting of tree removal permits

### 4) Updates from CDD by Erik Thorkildsen

75 1<sup>st</sup> Street and Canal Park briefly presented due to the shortage of time

### 5) Other Meeting Items

a. Outreach efforts CPP sub-committee has developed a series of suggested several outreach efforts for 2023.

- Engagement plan - back-of-sidewalk trees: CPP would like to assist with the dissemination of information about this program through the use of existing green and neighborhood organizations in the City. We would prefer that the materials come from the City to ensure that the correct information is distributed. An approved strategy for this process is needed. **AP**: The Community Relations Manager for the DPW, Kristen Kelleher, would be the person with whom to develop this protocol.
- Arbor Day: CPP would like to assist with tabling at this and other similar events such as Fresh Pond Day. **AP**: David Lefcourt is in charge of Arbor Week, which includes several activities.
- Tree Protection Ordinance - paper permits: Requiring the posting of permits in a visible location and the sharing of the required mitigation would be helpful. Can the required mitigation efforts be followed through time?
- Expanding our CPP network: A google sheet of Cambridge organizations has been posted to the Google drive. CPP members are asked to add any missing organizations and identify any groups with which they are affiliated.

b. CPP liaison for City-wide projects - sign-up!

In an effort to have a more proactive and impactful role with City projects, the CPP will apply the model begun by Maggie and Sandra's involvement with Memorial Drive, where one or two members

follow the progress of projects. CPP members are asked to sign up for projects as they arise. The current list is as follows:

- Linear Park Redesign | Ruth: No updates
- Memorial Drive | Sandra & Maggie: Not all of the Memorial Drive Alliance's concerns have been heard. There is still concern regarding the siting of both bicycling and walking paths on the water side of the trees and the wall construction necessitated by that placement.
- River Street/Carl Barron Plaza
- Jefferson Park
- IQHQ
- Tree Protection Ordinance
- Similar minded groups - ie. Green Cambridge (see spreadsheet)

**Action items:**

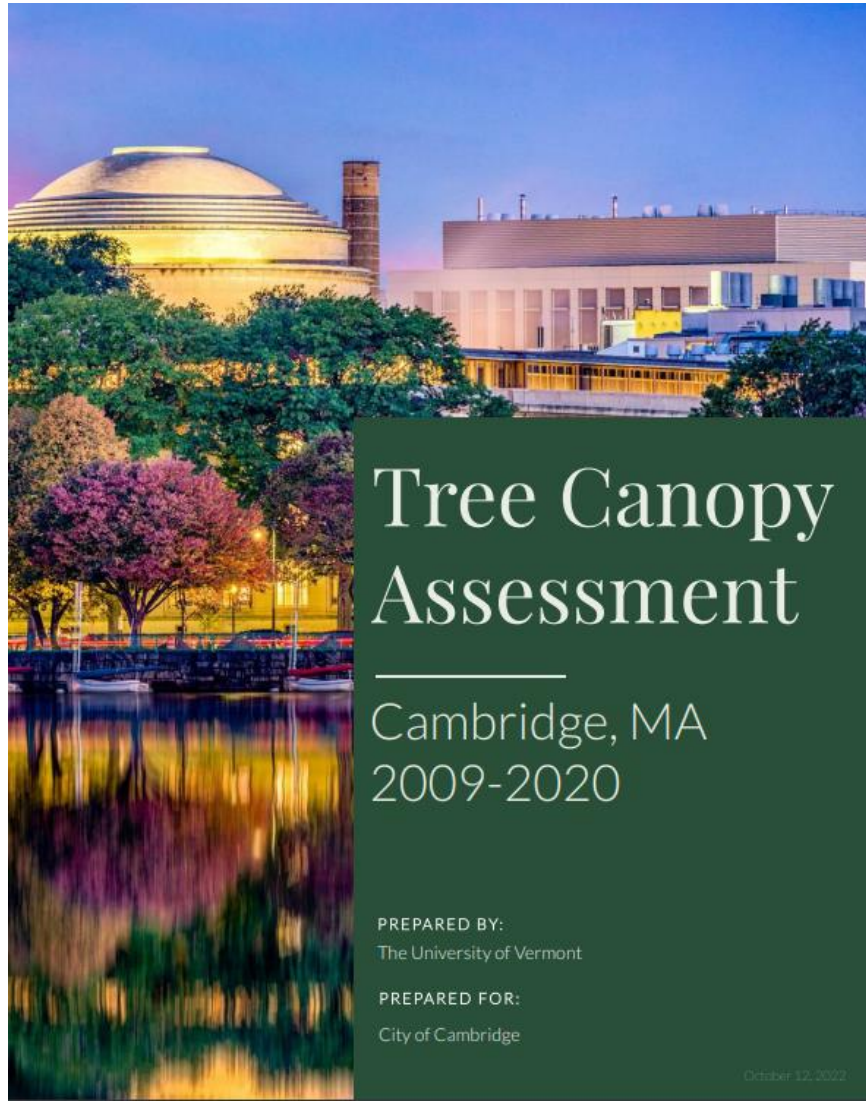
- Propose protocol for working with Kristen Kelleher to distribute DPW announcements regarding trees and planting.
- Contact David Lefcourt to determine CPP involvement with Arbor Day events and beyond

**Next meeting:** Our next meeting will be held on February 8, 2023 at 5:30pm and will be advertised to the public in advance.

*NOTE: The foregoing represents our understanding of the discussions and decisions made during this meeting. The CPP requests permission to quote or reference these notes.*

Attachment: Urban Forest Master Plan Update and 2022 Canopy Report summary by Andrew Putnam

# 2020 Canopy Report & UFMP Action Plan Progress



# UVM's Tree Canopy Assessment

## TREE CANOPY BY THE NUMBERS

### Overall tree canopy change from 2009-2020

**427**  
Acres of Gain



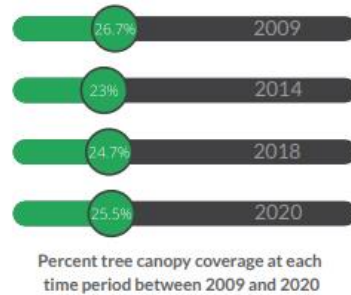
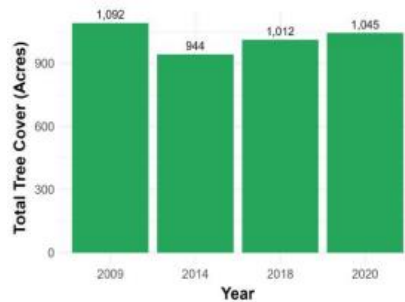
**474**  
Acres of Loss

**47**  
Acres net Loss



**-1.2%**  
Absolute Change

### Tree canopy by time period



2009-2014

**149**

acres of net loss in tree canopy coverage.

2014-2018

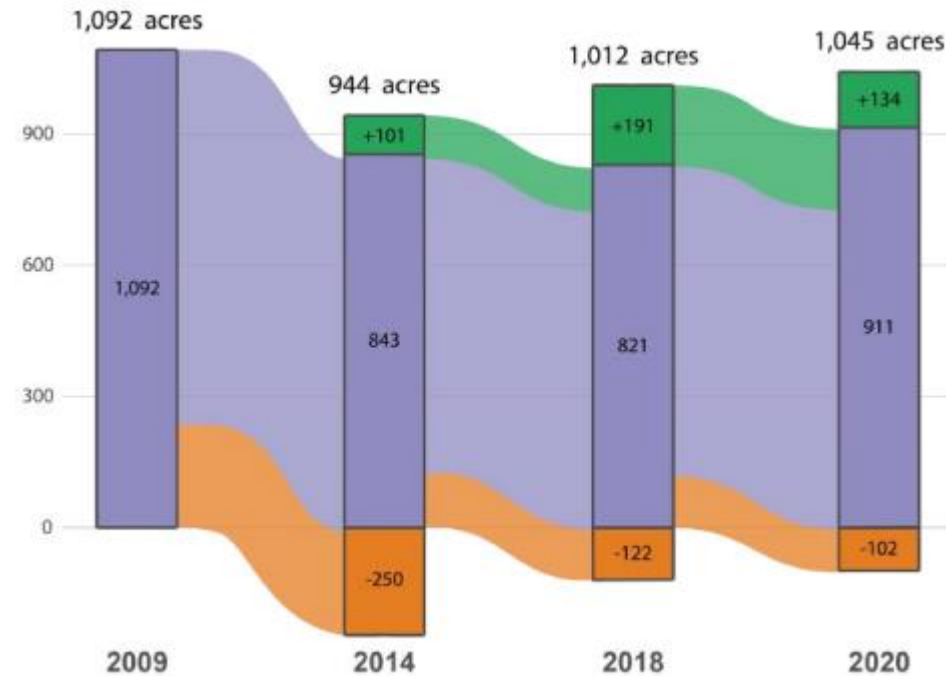
**69**

acres of net gain tree canopy coverage.

2018-2020

**33**

acres of net gain tree canopy coverage.





# UVM's Tree Canopy Assessment

## THE HARMONIZATION PROCESS

Tree canopy assessments were carried out for Cambridge for 2009, 2009-2014, and 2014-2018. This study sought to align these past assessments. This harmonization process was carried out to ensure the validity of the mapping classes across 2009, 2014, 2018, and 2020. Specifically, this assessment addressed the following issues:



**Resolution.** The tree canopy datasets were reprocessed to ensure a common pixel size, ensuring a consistent resolution across the four time periods.



**Alignment.** Detailed quality control procedures were carried out to ensure that errors in mapping from one time period did not carry over to the others.



**Methods.** Tree canopy change mapping was redone across all four time periods using the latest tree canopy mapping techniques developed in collaboration with the US Forest Service.



**Gain.** The new LiDAR in combination with advances in processing methodology enabled tree canopy gain to be mapped at a finer scale than prior assessments.



### Accuracy Improvements

Due to improved accuracy achieved through the harmonization process, tree canopy numbers in this assessment may differ from previous analyses. Original tree canopy outputs for 2009 and 2014 were much coarser in resolution and required smoothing prior to harmonization.

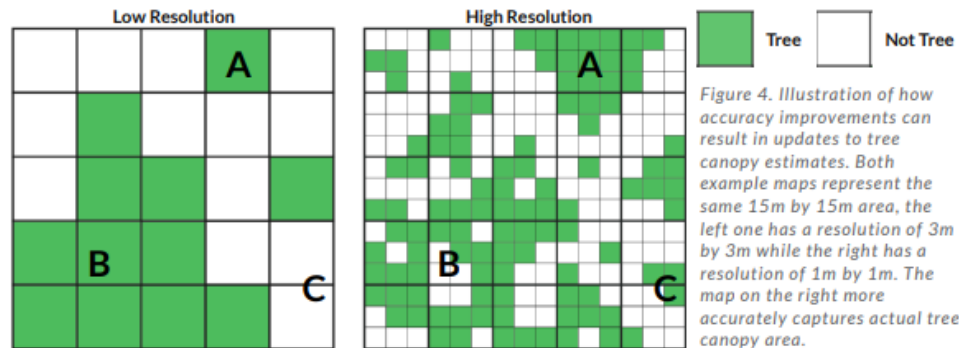


Figure 4. Illustration of how accuracy improvements can result in updates to tree canopy estimates. Both example maps represent the same 15m by 15m area, the left one has a resolution of 3m by 3m while the right has a resolution of 1m by 1m. The map on the right more accurately captures actual tree canopy area.

New techniques better capture:

- A** Edge Growth. Better detection of edge growth may add tree cover that was not previously mapped.
- B** Forest Gaps. Previous assessments may include overestimates of tree cover where tree canopy gaps were not detected.
- C** Small Patches. Tree patches that were previously too small for detection can now be mapped.

# UVM's Tree Canopy Assessment



## Neighborhoods

In Cambridge, neighborhoods are areas that most residents can easily relate to, especially the neighborhoods in which they live, work or visit most often. The city's official neighborhood geographic boundaries are a useful way to summarize tree canopy and draw comparisons between neighborhoods.

In 2020, West Cambridge had the highest existing tree canopy overall (36.4%) as well as the largest area of existing tree canopy (about 256 acres). Though the Strawberry Hill neighborhood's tree canopy cover was small in area (48 acres), it had the second highest tree canopy percent (35%). East Cambridge had the lowest percent tree canopy (11.4%) followed by MIT/Area 2 (14.7%). All of Cambridge's neighborhoods saw net gains in tree canopy between 2018 and 2020. North Cambridge had the largest gains, both in terms of area (12 acres) and in terms of relative percent change (9.4%). Mid-Cambridge still saw increases in tree canopy but saw the smallest gains with a 0.69 increase

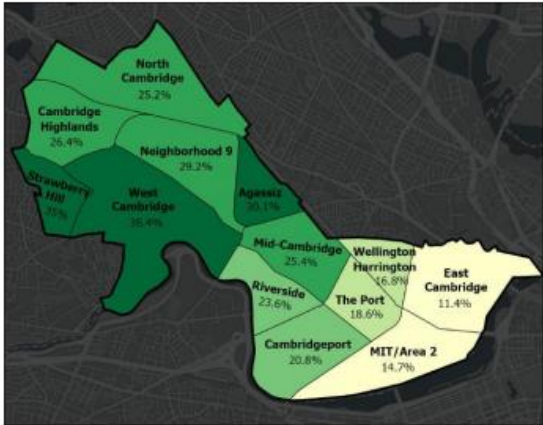


Figure 14: Existing tree canopy percentage for 2020 summarized by neighborhood.

in tree canopy acres, representing a relative percent increase of 0.9%. Strawberry Hill had similar growth in area to Mid-Cambridge with an increase of 0.7 acres, but because Strawberry Hill had a lower tree canopy area in 2018, it represented a larger magnitude of change, a relative percent increase of 1.4%.

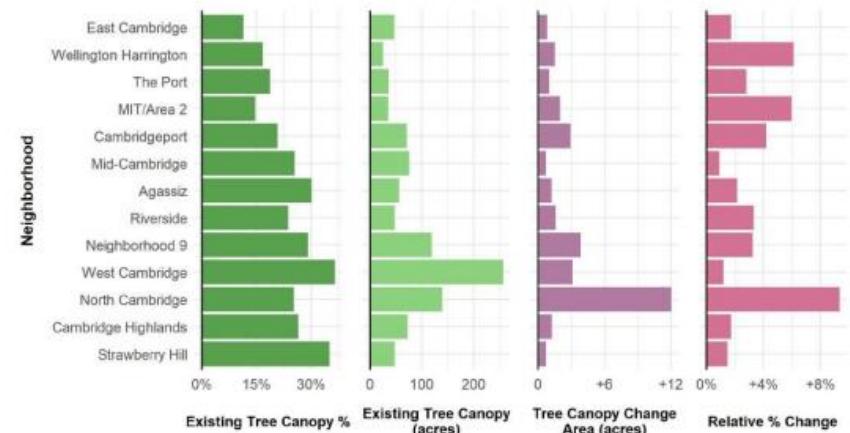
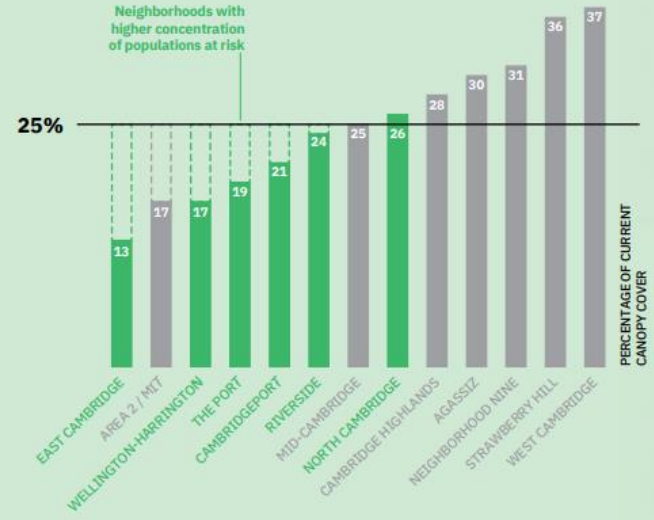


Figure 15: Tree canopy and 2018-2020 change metrics by neighborhood.

## GOAL

Increase canopy cover where it is currently lacking, particularly in areas with high concentrations of minorities, the elderly, non-English speakers, and those with low incomes

→ 25% minimum canopy cover for every neighborhood



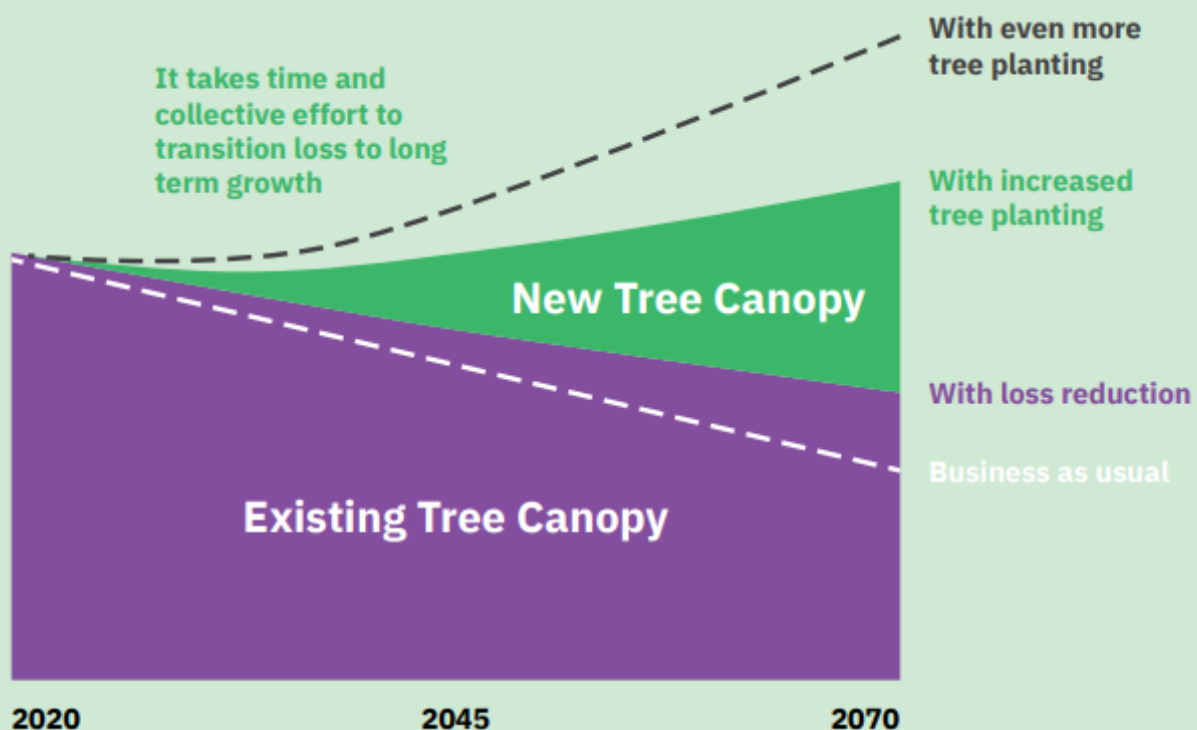
City of Cambridge Healthy Forest → Healthy City



# Continued Implementation of the UFMP Action Steps:

Building canopy is a slow and steady race, but we are seeing substantive progress. The investments in tree plantings and maintenance combined with tree preservation initiatives are reversing the loss of tree canopy. The city is committed to building on this work and continuing to implement the recommendations of the Plan.

It will take time to reverse the trend from loss to gain. It is important to both **curb loss of existing trees** and to **plant new trees** to create the next generation of canopy.



## CITY COUNCIL

### Update the Tree Protection Ordinance.

Enhance and expand the Tree Protection Ordinance by redefining "Significant Trees" to include more trees, creating an "Exceptional Tree" category to protect the largest and oldest trees, increasing mitigation requirements to reduce the rate of removal, requiring replacement tree planting be included as a mitigation option and including mitigation for tree removals to all private property, where the largest proportion of trees are in Cambridge. Emphasize tree preservation on construction sites and mitigation for injuring roots or canopy that may cause decline or mortality of existing trees during construction.

### Amend zoning code to encourage preserving and planting trees.

Implement recommendations of the Resilient Zoning Task Force including a "Cool Factor" that creates a weighted scoring system to encourage keeping existing trees, planting of new trees, and a reduction in impervious surfaces in the city. Changes to Article 19 should also be considered that prioritize the value of urban trees in urban design.

### Expand the ways the Tree Fund can be used.

Take action to allow for flexibility in how the existing City Tree Fund is dispersed. Explicitly allow for funding of outreach and education programs and for planting trees outside of City property.

### Establish a Tree Trust.

Establish a Tree Trust where funds can be gathered and then distributed to support planting on private property. Clarify that funds may be received outside of those required by mitigation as required in the Tree Protection Ordinance. Establish a Board of Trustees to oversee the administration of the fund.

## DEPARTMENT OF PUBLIC WORKS

### Plant in parks.

Maximize canopy by planting all available areas within parks in neighborhoods that have below average canopy cover. For parks with active recreational programs, plant a thick buffer. (Potential Sites: Cambridge Common, Dana Park, Danehy Park, Flagstaff Park, Fort Washington Park, Front Park, Greene Rose Heritage Park, Joan Lorentz Park, Longfellow Park, Mary Conlan Park, New Riverside Neighborhood Park, Riverside Press Park, Sennott Park.)

### Redesign streets and sidewalks to make room for more trees.

When rebuilding streets and sidewalks, implement innovative design alternatives that accommodate space for trees with adequate soil volume. Include the priorities of UFMP when revising the City's 5 Year Sidewalk and Street Reconstruction Plan and 10 year Sewer and Drain Infrastructure Plan. UFMP priority neighborhoods include: East Cambridge, The Port, Wellington-Harrington.

### Plant 1,000 street trees each year.

Focus planting in priority areas and along priority streets (Massachusetts Avenue, Cambridge Street, River Street, Beacon Street, Main Street, etc). Follow best practices for soils and planting details. Water and provide appropriate establishment support.

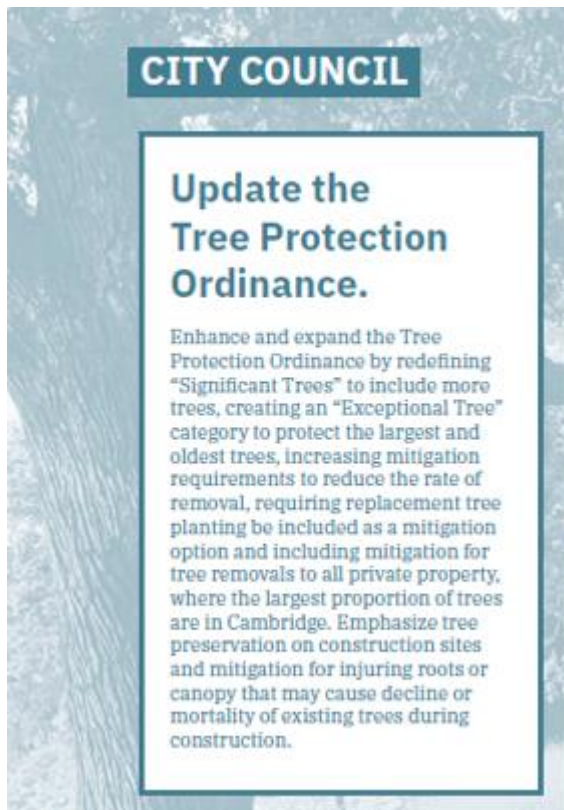
### Plant diverse and resilient species.

Plant well-adapted species with a high climate resiliency score (Refer to Appendix N). Track species planted city-wide to meet the overall diversity targets (no more than 10% of any one species, 20% per genus, 30% per family).

### Update recommended species list.

Update the recommended street tree species list on the City's website to include more diverse species and reduce dependence on overplanted species. Add a searchable database of recommendations for private property trees based on size, location, type, and habit. (Refer to page 42)





## Update Tree Protection Ordinance

The greatest rate of canopy loss in the City is happening on residential properties, so actions that curb the loss of trees on private property are critical. In 2019 and 2021, the **City Council updated the Tree Protection Ordinance** to cover the removal of Significant Trees, defined as 6 inches in diameter, and Exceptional Trees, defined as 30" in diameter, on private property. Permits are required to remove a Significant Tree or Exceptional Tree on private property and mitigation is required to help offset canopy loss. The mitigation can be replanting, payment into the Tree Fund or a combination of both. This allows residents to offset the cost associated with removing a significant tree by planting replacement trees. The goal is to curb removals and when removals do proceed, to encourage replanting of trees.

## Plant in parks.

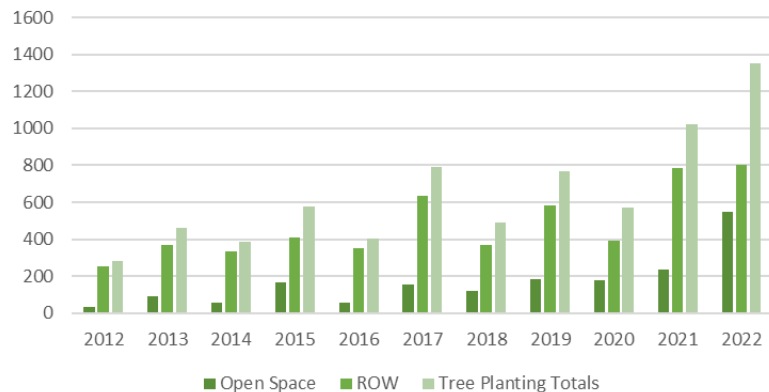
Maximize canopy by planting all available areas within parks in neighborhoods that have below average canopy cover. For parks with active recreational programs, plant a thick buffer. (Potential Sites: Cambridge Common, Dana Park, Danehy Park, Flagstaff Park, Fort Washington Park, Front Park, Greene Rose Heritage Park, Joan Lorentz Park, Longfellow Park, Mary Conlan Park, New Riverside Neighborhood Park, Riverside Press Park, Sennott Park.)

- Toomey Park** in East Cambridge is new 2.2-acre park that includes 162 new park trees and 19 street trees

- Triangle Park** in Kendall Square is a new park that is currently under construction and will be open to the public in 2023. Denser tree plantings and a focus on replicating forest conditions enabled the planting of 392 trees in the park. This **design approach was a direct result of the Urban Forestry Master Plan.**

- The City's second **Miyawaki Forest**, with PB7 funding was planted on November 5, 2022, in **Green-Rose Park** in the Port. A Miyawaki Forest is a dense, multilayered forest comprised of native flora. The planting replicates the forests native to the Northeast. The Miyawaki method produces high growth and survival rates by improving soil biology before planting. This forest will serve as a habitat for native animals and birds. Public Works in partnership with Biodiversity for a Livable Climate worked with over 60 volunteers to install the plants in one day. There are 40 native species and 900 plants in the 1,400 sq ft area.

Public Works Tree Planting



## Redesign streets and sidewalks to make room for more trees.

When rebuilding streets and sidewalks, implement innovative design alternatives that accommodate space for trees with adequate soil volume. Include the priorities of UFMP when revising the City's 5 Year Sidewalk and Street Reconstruction Plan and 10 year Sewer and Drain Infrastructure Plan. UFMP priority neighborhoods include: East Cambridge, The Port, Wellington-Harrington.

There are many competing interests / uses for our public right-of-way and creating spaces for more trees can be challenging. But space for trees is a key consideration in all capital projects. Some great recent examples include:

Large capital project in **the Port** that will include reconstructing many streets and sidewalks. Many of which are very narrow and make it challenging to plant trees and provide accessible sidewalks. Through the community design process, **shared streets** are being considered. Shared streets create a slow speed environment where people walking, biking and driving can share the road. This can provide more space for people walking, trees and other plantings.





## Redesign streets and sidewalks to make room for more trees.

When rebuilding streets and sidewalks, implement innovative design alternatives that accommodate space for trees with adequate soil volume. Include the priorities of UFMP when revising the City's 5 Year Sidewalk and Street Reconstruction Plan and 10 year Sewer and Drain Infrastructure Plan. UFMP priority neighborhoods include: East Cambridge, The Port, Wellington-Harrington.

**Tubman Square** at River and Pleasant Street is being reconstructed beginning in 2023. The park area will be expanded by closing a short section of Kinnaird St. This will create **more usable open space for people and allow more tree plantings**. In order to implement the new design and provide more usable space for people, 4 trees will be transplanted from Tubman Square to Riverside Press Park, 3 trees will be removed and 15 new trees will be planted. The priorities established in the Urban Forestry Master Plan were critical in supporting this plan which will provide more open space for people, more plantings and trees, and less paving.

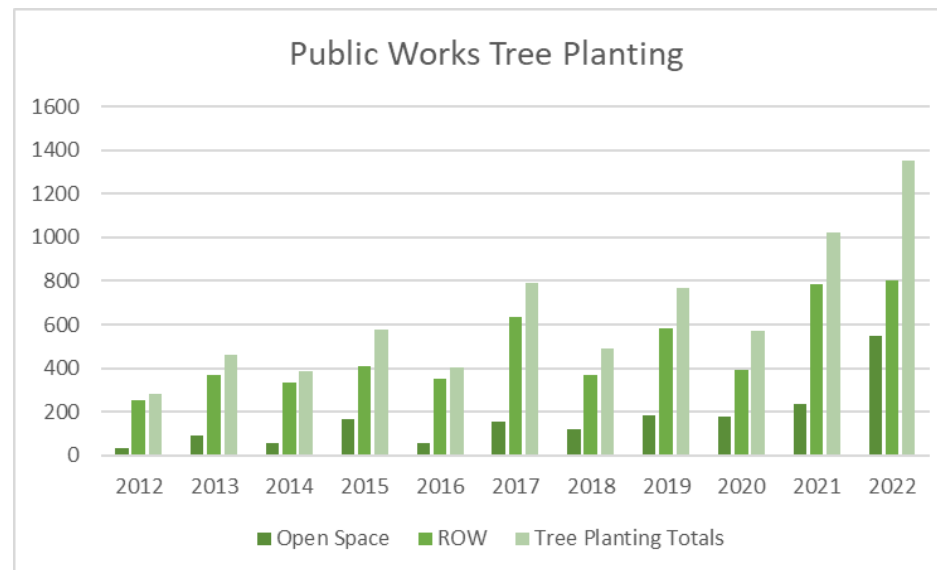
**Cushing Plaza** - starting construction tomorrow! Current conditions include large brick plaza and existing trees have limited soil volume. Existing trees are being transplanted to Danehy, where they will have improved conditions. 3,750 sq ft of plaza being depaved with enhanced soils and 20 new trees are being planted.



## Plant 1,000 street trees each year.

Focus planting in priority areas and along priority streets (Massachusetts Avenue, Cambridge Street, River Street, Beacon Street, Main Street, etc). Follow best practices for soils and planting details. Water and provide appropriate establishment support.

Fiscal Year	ROW Goal	Open Space Goal	Total Goal	Planting Season	Actual Number of Planted	Total By FY
FY22	725	275	1000	F21	804	1156
				S22	352	
FY23	725	275	1000	F22	823	
				S23	TBD	
FY24	775	325	1100	F23	TBD	
				S24		
FY25	925	325	1250	F25	TBD	
				S26		
FY26	1000	250	1250	F26	TBD	
				S27		
FY27	1000	250	1250	F27	TBD	
				S28		



## Tree Species List

### Shade Tree (no wires present)

Species (Common Name)	Height (feet)
Acer rubrum and cultivars (Red maple)	40-70
Aesculus hippocastanum (Horsechestnut)	50-75
Betula nigra (River birch)	50-70
Carya ovata (Shagbark hickory)	70-90
Carpinus betulus (European hornbeam)	40-60
Celtis occidentalis (Hackberry)	60
Cercidiphyllum japonicum (Katsuratree)	50
Cladrastis kentukea (American yellowwood)	30-50
Corylus colurna (Turkish hazelnut)	40-50
Ginkgo biloba (Ginkgo, male cultivars)	40-80
Gleditsia triacanthos (Honeylocust)	45-50
Gymnocladus dioica (Kentucky coffeetree)	75
Koelreuteria paniculata (Golden raintree)	30-40
Liquidambar styraciflua (Sweetgum)	65
Liriodendron tulipifera (Tuliptree)	70-90
Metasequoia glyptostroboides (Dawn redwood)	75
Nyssa sylvatica (Black tupelo)	30-50
Parrotia persica (Persian Parrotia)	20-40
Platanus x acerifolia (London planetree)	80
Populus tremuloides (Quaking aspen)	40-50
Quercus bicolor (Swamp white oak)	45
Quercus imbricaria (Shingle oak)	40-60
Quercus macrocarpa (Bur oak)	70-80
Quercus palustris (Pin oak)	75
Quercus rubra (Red oak)	75
Quercus velutina (Black oak)	50-60
Styphnolobium japonica (Japanese pagoda tree)	50
Tilia americana (American linden)	60-80
Tilia cordata (Littleleaf linden)	45-60
Tilia tomentosa (Silver linden)	30-40
Ulmus americana (American elm)	50-70
Ulmus sp (Elm cultivars)	40-60
Zelkova serrata (Zelkova)	50-70

### Ornamental Tree (overhead wires present)

Species (Common Name)	Height (feet)
Acer campestre (Hedge maple)	25-30
Acer griseum (Paperbark maple)	30
Amelanchier sp. (Serviceberry)	20-30
American hornbeam (Carpinus caroliniana)	20-30
Cercis canadensis (Eastern redbud)	20-30
Cornus kousa (Kousa dogwood)	20-30
Maackia amurensis (Amur maackia)	20-30
Maclura pomifera 'White Shield' (White Shield Osage Orange, male cultivar)	20-35
Magnolia virginiana (Sweetbay magnolia)	15-20
Malus sp. (Crabapple)	15-25
Ostrya virginiana (American hophornbeam)	25-40
Prunus 'Accolade' (Accolade cherry)	20
Prunus sargentii (Sargent cherry)	25-40
Prunus serrulata 'Kwanzan' (Kwanzan cherry)	25
Prunus serrulata 'Snowgoose' (Snowgoose cherry)	20
Prunus subhirtella 'Autumnalis' (Autumn cherry)	25-40
Prunus x incam 'Okame' (Okame cherry)	15-25
Prunus x yedoensis 'Akebono' (Akebono cherry)	25
Syringa reticulata (Japanese tree lilac)	20-30

### Plant diverse and resilient species.

Plant well-adapted species with a high climate resiliency score (Refer to Appendix N). Track species planted city-wide to meet the overall diversity targets (no more than 10% of any one species, 20% per genus, 30% per family).

### Update recommended species list.

Update the recommended street tree species list on the City's website to include more diverse species and reduce dependence on overplanted species. Add a searchable database of recommendations for private property trees based on size, location, type, and habit. (Refer to page 154 in the UFMP Technical Report)



## DEPARTMENT OF PUBLIC WORKS

### Track progress annually and conduct a tree census every five years.

Publish annual reports to document initiatives, garner support, and track progress toward goals (Precedent: Annual Net Zero Action Plan progress report). Every five years, undertake a detailed city-wide tree census and evaluate progress and adjust strategies.

Specifically: Survey neighborhood associations, business associations, and other groups that may be able to estimate the tree numbers planted each year on private property. Review tree removal permit applications yearly to evaluate the potential effectiveness and impact of the Ordinance. Conduct LIDAR studies every 5 years to evaluate overall canopy cover change. Engage an expert advisory committee to advise the City on current science on climate and horticultural practices, as well as, reviews annual progress on efforts to reduce rate of canopy loss.

### Expand data collection to enhance tree health.

Expand the use of Cartegraph to include additional data on each tree, including soil design, soils management practices, paving condition, pruning schedule, etc., to allow the City to target maintenance efforts most efficiently and to assess the effectiveness of pilot projects and experimental treatments.

### Increase tree assessments to improve resiliency.

Conduct a windshield assessment for all City trees once a year and after large storms. Increase pruning frequency so every City tree in the City is assessed and cared for on a more frequent basis. As part of the pruning work, or as a separate assessment, monitor trees for potential pests and diseases.

### Manage urban soils to grow healthier trees.

Implement recommendations from a Soils Management Plan, which the City is currently undertaking. The plan will provide targeted recommendations to enhance the health and performance of urban soils based on specific planting conditions and situations within the city.

### Prune proactively.

Undertake structural pruning for young shade and ornamental trees. Identify trees planted within the last 4 to 8 years. Contract to prune for form and structure to reduce potential future damage during ice and wind storms. Pruning now can reduce risks and costs later in a tree's life.

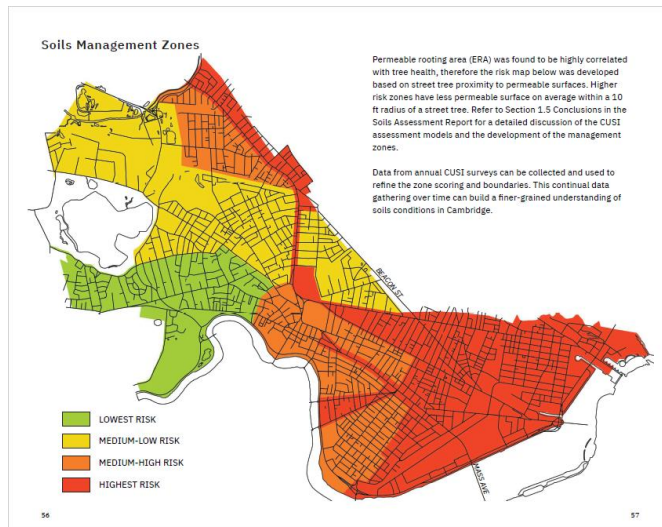




## Manage urban soils to grow healthier trees.

Implement recommendations from a Soils Management Plan, which the City is currently undertaking. The plan will provide targeted recommendations to enhance the health and performance of urban soils based on specific planting conditions and situations within the city.

- Based on an on-site assessment of existing soil conditions at each planting location, the best management practices described in the Soils Management Field Guide are implemented before planting.
- In the future, CUSI-2 findings at each planting location will be entered into our asset management system at the time of remediation. Further refining the Soil Management Zones dataset to better understand soil condition trends throughout Cambridge.
- Our winter operations have also been modified to reduce the overall usage of salt. One exciting change to our program is the use of brine to pretreat roads in advance of snowstorms. Brine is a liquid combination of salt and water that is sprayed on roadways to prevent ice and snow from adhering. It can be applied in advance of a snowstorm and uses less salt than traditional salting operations.





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- Soil management - Using CUSI-2 analysis each planting location is remediated at the time of planting to improve available water, microorganisms, and nutrients in the soil.
- Compost tea - Forestry continues to ramp up our compost tea program. This fall, 15,000 gallons of compost tea was added to the soil of newly planted trees. Every tank of compost tea contains mycorrhizal fungi inoculant at the time of application. Mycorrhizal fungi are essential for root systems and greatly increases tree's ability to absorb water and nutrients.
- Biochar - This is a subsurface soil amendment used to increase organic surface area for beneficial microorganisms to thrive and improve growing conditions for trees. Forestry amends each planting location with at least 30 lbs. of activated Biochar.
- Bigger tree pits - Rooting area and pervious surfaces surrounding trees is the most important site factor in ensuring the survivability of trees. The City has updated the standard size of tree pits.

## DEPARTMENT OF PUBLIC WORKS

### Require City Arborist inspection prior to occupancy.

For special permit projects, the City Arborist should confirm that tree plantings conform to project planting plans and details before granting a final Certificate of Occupancy.

### Promote existing City programs.

Promote existing programs that encourage tree planting and stewardship such as the Back of Sidewalk program, Adopt a Tree, and Junior Forester. Communicate opportunities directly to stakeholders and through community organizations, neighborhood associations, events, and cultural events.

### Educate local businesses about the dangers of pest outbreaks.

Pests that have devastated some of our most prevalent trees have been introduced in industrial packaging materials. Send fliers to business about the importance of confirming materials meet international standards (ISPM 15) for imported wood packaging.

### Engage all stakeholders.

Implement recommendations from the Outreach and Engagement Plan, which the City is currently undertaking. Broaden the community of people interested in improving the urban forest. And undertake efforts to engage people in concerted action, including preserving and planting trees.

## COMMUNITY DEVELOPMENT

### Add landscape architects to City staff to advocate for trees.

Add more landscape architects to City staff and encourage representation of holistic landscape and urban forestry issues on official boards like Planning and Zoning.

### Develop a public realm design manual.

Develop a public realm design manual that supports tree plantings while balancing the need to provide amenities, connections, and green infrastructure necessary to maintain and enhance the city's livability. The manual will document goals for the beauty, functionality, safety, and environmental performance of the City's public realm.

### Amend zoning code to encourage preserving and planting trees.

Implement recommendations of the Resilient Zoning Task Force including a "Cool Factor" that creates a weighted scoring system to encourage keeping existing trees, planting of new trees, and a reduction in impervious surfaces in the city. Changes to Article 19 should also be considered that prioritize the value of urban trees in urban design.

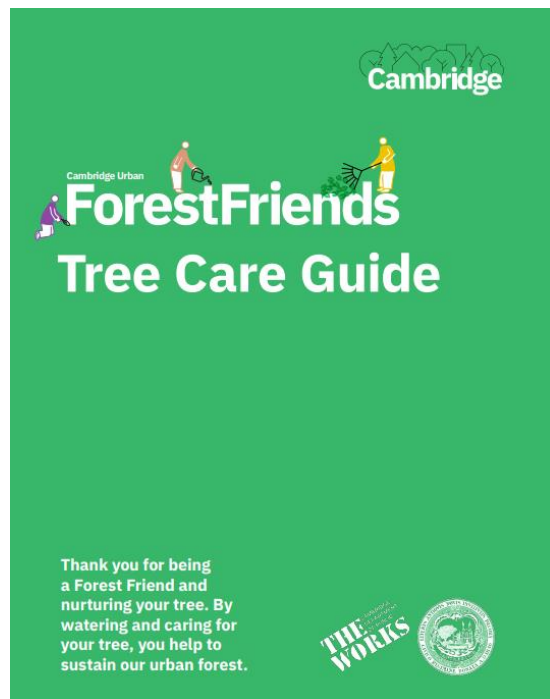
### Ensure new trees are cared for after construction projects.

Identify and implement a regulatory mechanism to ensure owners care for and establish new trees that are planted as part of a project review and approval process.

### Encourage new public parks and open space.

Encourage the development of new parks and publicly accessible open spaces that provide canopy cover as part of large redevelopment projects, especially in underserved neighborhoods including East Cambridge, The Port, Wellington-Harrington, Area2/MIT, and Cambridgeport.





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# 2020 Canopy Report & UFMP Action Plan Progress



The UFMP is a data driven plan that is leading the efforts of the Forestry Division

City is committed to continuing to build on the programs to curb loss and grow canopy

Next canopy update scheduled for 2023 data

2025 - Comprehensive update on state of the urban forest, including Healthy Forest - Healthy City Report