

# MEETING NOTES



## ISSUE DATE

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## MEETING DATE

July 26, 2018

## LOCATION

Cambridge Rindge and Latin School

## CLIENT

City of Cambridge

## PROJECT NAME/NUMBER

Urban Forest Master Plan  
2953

## RE

Task Force Meeting 3

## ATTENDEES

City of Cambridge  
City of Cambridge Task Force  
Reed Hilderbrand

### 1. Introduction

Reed Hilderbrand (RH) gave an overview of the agenda for the evening. Attendees were reminded to sign in on the provided sign in sheets. It was noted that there would be a public comment period at the end of the meeting. It was clarified that preliminary analysis is based on UVM Study from 2014 and is spatial and does not include other data like species.

### 2. Schedule

RH reviewed the project schedule and that the team is at the end of the Research Phase of the schedule. RH noted that three public meetings will be held, starting in the fall.

RH summarized the design team workshop that was held the previous week. The team members discussed the set of research questions that each are investigating, laying out the process going forward and took a tour around Cambridge. They looked at various conditions in the city, park and street trees, and areas that would be representative of larger areas of the city. They also visited the new street tree plantings that were part of the Sewer Separation project in West Cambridge.

Bartlett is conducting a representative tree health survey, which started last week.

The soil sample locations have been shifted to align with tree sample locations and soil analysis will start next month.

### 3. Initial Spatial Analysis

RH presented what the team has learned so far about the relationship between City's tree canopy cover and the urban heat islands, as well as the land use by breaking down by neighborhoods, according to LiDAR data and City GIS data. Summary of the presentation and task force comments follows:

#### *Urban Heat Island and Tree Canopy Cover*

RH noted the maps are based on 2014 LiDAR data and will be redone with 2018 LiDAR when it is available.

28.73% of land area of the City is covered by tree canopy. The canopy cover by neighborhoods range from 13% to 42%. The heat island data from 2070

CCVA report were overlaid with the canopy cover, to show the areas of the city with higher and lower temperatures.

For clarification, the heat island data uses measurements of ambient air temperature (six feet off the ground), not the temperature of the physical surface. Resolution of the data is 100 feet by 100 feet. [It is important to note that the maps in this presentation show ambient air temperature, while the heat island maps in the CCVA report use heat index temperature which accounts for relative humidity].

The variation of heat island and the relationship with canopy cover can be easily seen from the maps. It is noticeable that hot spots occur in areas with large block sizes and that the river edge and areas around water bodies are cooler.

Task Force (TF) comments:

Lechmere canal upper side has a good canopy and that's a nice place to hang out on a hot day. What is under the red hot spots- Cambridge Mall, large parcels with buildings and garages that take up most of the parcel. Mostly new construction.

Response: Because block size is so big, planting along the edge isn't going to be the solution for increasing canopy cover.

How do you measure ambient air at the building? Roofs will generate heat.

Response: It is measured 6' above the surface, whether it is ground or roof. Green roofs are not a part of this project, but it is important to think about. Different colors create different temperatures. A green roof would have a cooler signature than a white roof which has a cooler signature than a conventional black roof.

*Urban Heat Island and Canopy Cover by Neighborhoods:*

RH then walked through each neighborhood map which depicted canopy cover and heat island and invited the task force to comment on the maps.

Area 2/MIT:

Neighborhood has sports fields and pockets of hot spots along the edges of the neighborhood, which is usually commercial area.

TF: Does the canopy coverage include the water?

Response: It does not include the water.

Cambridgeport:

The neighborhood's hot spots are light industrial area and used to be filled

with auto body shops, so demand was not high for trees. These historical remnants are now being developed with biotech or new housing. It's an opportunity for new canopy.

TF: What about Mass Ave? There are trees on the avenue but is a large hot spot.

Response: Even if you have trees, they might be unhealthy, not creating shade. On Mass Ave, some of the commercial areas are continuous with no yards, thus creating hot spots. Adjacent streets to Mass Ave also don't have many trees.

TF: What is a healthy city's canopy coverage? What is a target canopy?

Response: We don't think we are ready to set numbers. We need to understand the context first and need to be realistic. We are giving the context now and will get to our mission statement.

**The Port:**

22% canopy cover. Hot spots are along the edges.

**Wellington Harrington:**

19% canopy cover. Hot spots are along arterials.

**Mid-Cambridge:**

Canopy cover is 29% with Harvard yard. Campus spaces have more canopy.

TF: Harvard Museum of Natural History area is very green.

**Riverside:**

Canopy cover is 27%. River edge is cooler.

**Agassiz:**

Canopy cover is 33%. Left edge is Mass Ave. Green area is Academy of Arts and Sciences.

**Neighborhood Nine:**

Canopy cover is 33%. Density and continuity of canopy with Danehy Park.

Pattern of trees in Danehy delineate the sports fields.

**West Cambridge:**

West Cambridge has a good amount of canopy, 42%, but it still has red spots, so it is not only about number but the distribution.

**North Cambridge:**

Canopy cover is 26%. The neighborhood has large open areas and Alewife corridor, which will see big changes.

Cambridge Highlands:

28% of canopy cover, but this number is misleading as almost all of which is at Fresh Pond.

Strawberry Hill:

37% of canopy coverage, not many hot spots because of Fresh Pond.

### *Land use and Tree Canopy Cover*

The next set of maps and diagrams relate canopy to land use type in three different neighborhoods of Cambridge (East Cambridge with low canopy, Mid Cambridge with medium canopy, and West Cambridge with high canopy). The legend shows the proportion of canopy by land use. For instance, in Mid-Cambridge residential yards have most of the canopy, but because of land use percentage the overall pattern is a rather even distribution of canopy. With these maps we're looking to identify opportunities and challenges/limitations for more trees by land use. Owner occupied vs renter occupied will also be evaluated at a later time.

TF: Would like to see heat island over land use to see where more trees could be planted.

TF: We cannot have impact on heat island in commercial areas like Binney St because of big footprint of buildings but can do so on residential. What can we do with street trees?

TF: Pedestrian comfort is important. What can and cannot be done?

Response: There will be different strategies based on land use types. There can be processes to encourage developers to plant more trees. We are just showing heat island map right now because it's the data we have available, but it's important to keep in mind it's not our only goal.

### *Tree Canopy Cover Change*

The figure shows the UVM report's percent change of canopy cover over five years (2009-2014) by census block.

TF: What are the gains in tree canopy cover?

Public Comment: Green part may be Daneyh Park where existing canopy became bigger- maturation of existing trees.

Public Comment: Even though trees were planted, there is loss corresponding to sewer separation.

John Bolduc: West Cambridge- some aging out of trees. Irene and Sandy happened between 2009-2014, storm damage have affected some trees.

RH: The Earthwatch Institute report, "Scientific Analysis of Current Trends in Growth and Survival of Cambridge's Street Trees and Management Recommendations" is specific about species mortality but not about causes.

TF: No mention about people and income levels who live in these neighborhoods.

Response: Vulnerable populations is something we are looking into as mentioned in our first presentation. There are differences between owner or renter occupied, and will run analysis when we have the data.

#### **4. Project Goals**

The mission statement was part of the RH proposal. We are interested in what this means at the practical scale, what our goals are and how we can set practical targets.

Some cities have set planting goals, such as million trees. Is this a good metric? We are conscious of setting targets that don't mean anything. It matters which species you select, how long they survive, and where you put them. Achieving a canopy cover percent may be more useful than specifying a number of trees to be planted, but we're still looking at what that percent should be.

TF: Our own city council looked into 1000 trees a year.

Response: It is easy to set number targets but it is hard to achieve them. 40% coverage was a goal set by American Forests in 1997 but they no longer recommend this target and instead say the goal should be contextualized to the culture and climate of the city.

The real question is what we are trying to achieve and how we get there. Envision may help us narrow our goals to make more targeted decisions. Equity, stormwater, transportation and connectivity are some of the things that help us focus our goal.

In the CCPR Report, "cool corridors" is a strategy about to design the

spaces people move through. Imperviousness, soil volume, planting strategy, green infrastructure- these should feed into decision making.

Our goals should be talking about individual trees, people and forest as a system. Within "People," a forest that contributes to the well-being of the people. Within trees, a healthy forest whose trees live longer and thrive during predicted changing climate conditions. Within forest, a forest that supports a resilient, connected ecosystem.

### *Decision Support Framework*

RH talked through the draft project goals in the decision support framework.

The goals in the framework are not listed in ranked order and it is a draft document.

### People:

- Reducing urban heat island effects
- Enhancing citywide stormwater management
- Increasing equity in distribution of canopy cover
- Air quality: How to measure air quality, pollutants in the air or abstract to leaf surface area?
- Creating aesthetically pleasing streetscapes: How to measure aesthetically pleasing streets?
- Enhancing pedestrian outdoor thermal comfort
- Increasing carbon sequestration

### Trees:

- Improving soils health: How to evaluate health?
- Improving tree health: A baseline that can be assessed over time
- Improving street tree lifespan: Street tree is limited

### Forest:

- Enhancing habitat, connectivity
- Diversifying forest composition
- Planning for disaster response (noreaster, drought)

### *Discussion*

TF: Under people for stormwater, include water quality and thermal pollution?

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Wind buffering, some trees buffer wind?

TF: Suggestions for measuring air quality, such as moss. Nitrogen analysis on leaf for air pollution. Is it possible to set target for air quality?

Response: Maybe leaf area defined through species.

TF: Social Aspects of trees; canopy connectivity- trees are social. Are there ways to increase proximity of trees with each other? They share soil and water. Soil connectivity is the key here. Grove plantings, clumping trees. For example, on Mass Ave, clumping six trees would protect each other and can supply shade and can be watered easily.

TF: Bird observations: Bird populations might be a criteria to measure habitat connectivity. Getting in touch with birders in Cambridge for bird surveys. It's hard to find a baseline for new species. Mass Audubon's mission is all about climate change and would be a great partner.

TF: Public health information: Respiratory illnesses tied to the air quality. Maybe look into ambulance calls during heat waves

TF: Measuring human stress levels on different streets, in public spaces, as a measure of aesthetically pleasing streetscapes.

TF: Upland Road -anecdotal- small planting areas can make huge differences.

TF: Tree health: what additional supports can be made to increase tree lifespan? Rethinking how we are planting along denser, busier streets. Is there a way to assess how we are doing now? How can we give the agencies responsible more tools- how can we use data to buttress that effort? Maintenance issues: Mass Ave trees take a beating - very difficult to get a tree to grow in that environment - DPW/City needs more resources. Design and planning issue - put trees more likely to thrive.  
Response: We aren't in a place for making recommendation right now but hope to set the stage.

TF: Can we quantify economic value of ecosystem services?

Response: We have a cost estimator on the team, and we will assess the costs of planting and maintenance programs against the value of benefits to the City, including ecosystem services that can be reliably quantified.

TF: What about unnatural causes of tree death such as damage from trucks which impacts tree mortality?

Response: We need to talk about all the reasons why tree die. There are many different factors for reasons of mortality. In some neighborhoods they are aging, in others it might be drought etc.

TF: Property value is not necessarily a good metric for aesthetics. Keep an eye on social equity with property value.

Response: We need to find metrics to respond to the overall experiential quality of trees.

TF: Street Design: Not only planting trees but we need to improve conditions. Restrictive sidewalk widths will limit street planting. How can the urban form change? If mature trees die, they would not be replanted because sidewalks are too narrow to accommodate ADA and trees. Some changes in parking requirement and traffic patterns? Some ideas: asymmetrical streets, front yard trees.

TF: Goals under people, there should be something for engagement and awareness because we are looking for partners. Must be a way to measure engagement. Measuring programs like BOS program.

TF: “What can we do for trees?” We are not doing enough as residents and as a city. Add “residents that contribute to the forest well-being” to People Goals. More of awareness in Cambridge of the value of trees.

TF: Salt as a subcomponent of soils

TF: What is the Shannon Index?

Response: In order to evaluate diversity, look at ratio of species and number of species. We should figure out a number for an urban context – Shannon Index used for forestry. Management tool and we have to figure out how to use it.

D Lefcourt: have used a metric that says there should be no more than 10% of genus. Currently, Honey locust and Maples are more than 10%.

Response: What percentage of the canopy under risk? We need to start to adjust for future planting, catastrophic events

TF: Break out Public ROW street trees from other trees



TF: Concerns about using 2014 data

Response: Once we have the full data, we will run the models. AES gathered and is processing the 2018 LiDAR, Bartlett and T are also gathering data. These numbers from 2014 will change. In August we will have the current conditions.

TF: How detailed is the Bartlett survey?

Response: Their categories of assessment are genus, species, DBH, condition class, age class, native-invasive species to Massachusetts, pests/diseases, location info, size of planting bed/tree pit, material of the surface, private/public/commercial.

Question to the TF: Is there a hierarchy to the goals- how would you prioritize the values and goals?

TF: Some of the goals seem unnecessary, like air quality. It is a residual effect of having trees. It's worth measuring but not at the top of the list.

TF: Loved the phrase "Cool corridors". Cool corridors have multiple benefits and they are very desirable as goal or strategy.

TF: Neighborhood differentiation in character: The framework is too general, neighborhoods have different characters and goals and strategies need to be prioritized by neighborhood. How do you take these metrics and apply them to the neighborhoods? The goals of neighborhoods may require certain things to increase or decrease. In an urban environment, you might want to have pedestrian connectivity, pleasant streets, active programming etc. How does this get overlaid on that matrix?

TF: Neighborhoods are often divided by major corridor, transportation corridors.

TF: Education about private trees. How can we influence/protect private trees (majority of trees)?

Response: Recommendations, some of these will be about soils, about policy and about education. We don't know yet what the most effective place is to spend money on.

## **5. Public Comment Period:**

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Speaker 1: She believes naming trees create connection and allows residents to also report issues. She's lived here for 25 years. She has seen a job posting for Superintendent of Urban Forestry on City website- is it part of this effort? We should have a relation, an interactive thing with trees. Trees should not be anonymous. Cambridge citizens should be able to have call in number to phone a problem. A Pin Oak in East Cambridge was devastated by EverSource, which was an old, enormous and beautiful tree - need to consider policies below ground and advocate for trees.

Speaker 2: Importance of equity, habitat and joy of trees. Would like to see equity moved over to Macro definition to "well being in equitable fashion". Seeing many things quantified on the list but not everything can be quantified, would like to see inclusion of joy and pleasure. Birds and critters of all kind and tree habitat should be an important component. Additional suggestion for metrics- When does it makes sense to cut down existing trees? Maintenance schedule for existing city trees?

Speaker 3: Expand Adopt-a-tree program. A tree was removed from Gore St. in East Cambridge, and it was a traumatic experience for the neighborhood. People wrote letters and put flowers on the stump. East Cambridge has a spiritual relationship to trees, especially on Gore St. He doesn't see development on the list- not the same if replacing large trees with small ones. Developers need to take into count value of trees. He has a handout for a Adopt-a-Tree Partners Program Incentive program and Catherine will put it up on the website. The handout proposes to make Adopt-a-Tree program more attractive by providing public recognition such as tree tags, certificate of adoption, business window sticker, listing on City website, and media kit. Maybe developers would like to adopt a whole street of trees.

Speaker 4: Runoff/carbon sequestration/beauty/cool corridors. She remarks this has been a great discussion. City manager has responded to council order asking for more frequent LiDAR studies. They are willing to do more frequent LiDAR studies because also benefits for other things. Her four top rankings for value of trees are: stormwater, carbon, cool corridors and beauty/aesthetic factors.

Speaker 5: SeeClickFix doesn't have entry for trees in distress. Many trees being cut down in the past year. He doesn't see anything about why trees being proactively cut down in our study. He thinks there is a big hole in the

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data. Barcelona has big program on green corridors. See ClickFix used to report tree issues- should have option to help out a tree.