PROGRESS UPDATE

INITIAL SPATIAL ANALYSIS

PROJECT GOALS

DISCUSSION AND QUESTIONS

PUBLIC COMMENTS
PROGRESS UPDATE

INITIAL SPATIAL ANALYSIS

PROJECT GOALS

DISCUSSION AND QUESTIONS

PUBLIC COMMENTS
RESEARCH
Preliminary team summit — July 2018
RESEARCH

Preliminary team summit — July 2018
SURVEY OF CURRENT CANOPY

200 random 1 acre plots equal a 5% representative sample

The categories of assessment:
- Genus
- Species
- DBH
- Condition Class
- Age Class
- Native - Invasive to Massachusetts
- Pests / Diseases
- Location Information
- Size of Planting Bed/Tree Pit
- Material
- Private / Public / Commercial

TREE HEALTH CONDITIONS

- Good: 28.6%
- Fair: 7.4%
- Poor: 2.0%
- Dead: 0.8%
- No Information: 61.2%

31,800 tree data points total

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
SOIL SURVEY
A representative sample to assess city soils

TREE HEALTH CONDITIONS
- Good 28.6%
- Fair 7.4%
- Poor 2.0%
- Dead 0.8%
- No Information 61.2%
31,800 tree data points total

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
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TREE CANOPY COVER
Preliminary spatial analysis

CAMBRIDGE CANOPY COVERAGE
25.57% OF TOTAL CITY AREA
28.73% OF CITY LAND AREA

Source: UVM 2014 Canopy Layer
TREE CANOPY COVER
Preliminary spatial analysis

Source: UVM 2014 Canopy Layer
URBAN HEAT ISLAND
Predicted heat impacts 2070

ESTIMATED AMBIENT AIR TEMPERATURE OF A 100 °F DAY

- 86.6 - 87.5
- 87.5 - 90
- 90 - 92.5
- 92.5 - 95
- 95 - 97.5
- 97.5 - 100
- 100 - 102.5
- 102.5 - 105
- 105 - 107.5
- 107.5 - 110
- 110 - 112.5

Source: CCVA
2070 Urban Heat Island
URBAN HEAT ISLAND AND CANOPY COVER
Predicted heat impacts 2070

ESTIMATED AMBIENT AIR TEMPERATURE OF A 100 °F DAY
- 86.6 - 87.5
- 87.5 - 90
- 90 - 92.5
- 92.5 - 95
- 95 - 97.5
- 97.5 - 100
- 100 - 102.5
- 102.5 - 105
- 105 - 107.5
- 107.5 - 110
- 110 - 112.5

Source: CCVA
2070 Urban Heat Island
CANOPY COVER
East Cambridge — 13% Coverage
CANOPY COVER
Area 2 / MIT — 18% Coverage
CANOPY COVER
Cambridgeport — 22% Coverage
CANOPY COVER
The Port — 22% Coverage
CANOPY COVER
Wellington-Harrington — 19% Coverage
CANOPY COVER
Mid-Cambridge — 29% Coverage
CANOPY COVER
Riverside — 27% Coverage
CANOPY COVER
Agassiz — 33% Coverage
CANOPY COVER
Neighborhood Nine — 33% Coverage
CANOPY COVER
West Cambridge — 42% Coverage
CANOPY COVER
North Cambridge — 26% Coverage
CANOPY COVER
Cambridge Highlands — 28% Coverage
CANOPY COVER
Strawberry Hill — 37% Coverage
LAND USE
Generalized land use

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
LAND USE

Generalized land use relationship to canopy cover

- **COMMERCIAL**
  - Mixed Use Commercial
  - Office
  - Office/R&D
  - Vacant Commercial

- **OPEN SPACE**
  - Cemetery
  - Privately-Owned Open Space
  - Public Open Space

- **INDUSTRIAL**
  - Mixed Use Industrial
  - Utility
  - Vacant Industrial

- **INSTITUTIONAL**
  - Charitable/Religious
  - Education Residential
  - Health
  - Higher Education
  - Mixed-Use Education

- **PUBLIC**
  - Education
  - Government Operations

- **RESIDENTIAL**
  - Assisted Living/Boarding
  - Mixed Use Residential
  - Vacant Residential

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
LAND USE
Generalized relationship to canopy cover - East Cambridge
13% canopy cover

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018

CANOPY COVER BY LAND USE

LAND USE AS % OF NEIGHBORHOOD LAND AREA
LAND USE
Generalized relationship to canopy cover - Mid Cambridge
29% canopy cover

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
LAND USE
Generalized relationship to canopy cover - West Cambridge
42% canopy cover

Source: Prepared by RH Team according to the City of Cambridge GIS Data, 2018
Tree canopy relative percent change and absolute percent change were summarized for each Census Block Group in Cambridge (Figure 7 and Figure 8). Of 88 groups, only 8 had relative tree canopy gain. Of these groups where tree canopy increased, only one group increased tree canopy by more than 6%. An East Cambridge group at North Point Park experienced the largest gain of tree canopy at 47%.

80 groups experienced relative tree canopy loss. A group behind the MBTA Maintenance Facility in Somerville had the most tree canopy loss at 34%. 46 groups experienced less than 10% tree canopy loss. 80 Census Block Groups also experienced absolute tree canopy loss, although every group had less than 8% loss.

Eight groups also had absolute tree canopy gain, although all gains were less than 2%.

Source: 2014 UVM Study
URBAN HEAT ISLAND AND CANOPY COVER

Predicted heat impacts 2070

CAMBRIDGE HIGHLANDS 28%
NORTH CAMBRIDGE 26%
NEIGHBORHOOD NINE 33%
AGASSIZ 33%
MID-CAMBRIDGE 29%
WELLINGTON-HARRINGTON 19%
THE PORT 22%
EAST CAMBRIDGE 13%
AREA 2 / MIT 18%
CAMBRIDGEPORT 22%
RIVERSIDE 27%
WEST CAMBRIDGE 42%
STRAWBERRY HILL 37%
PROGRESS UPDATE
INITIAL SPATIAL ANALYSIS
PROJECT GOALS
DISCUSSION AND QUESTIONS
PUBLIC COMMENTS
What is the vision?

How do we set measurable goals?
To maintain, plan, build, and sustain a healthy, connective urban forest at a time when the urban forest is more important than ever before.
PROJECT GOALS
What is the most effective metric of success?
## PROJECT GOALS
Canopy cover goals for northeastern cities

<table>
<thead>
<tr>
<th>CITY</th>
<th>% COVER FOR THE YEAR CITY'S CANOPY GOAL SET</th>
<th>RECENT CANOPY COVER MEASUREMENT</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMBRIDGE</td>
<td>N/A</td>
<td>29%</td>
<td>?</td>
</tr>
<tr>
<td>BALTIMORE</td>
<td>20% (2007)</td>
<td>28.5% (2013)</td>
<td>40% (2036)</td>
</tr>
<tr>
<td>HARTFORD</td>
<td>25% (2013)</td>
<td>-</td>
<td>35% (ONGOING)</td>
</tr>
<tr>
<td>NEW YORK CITY</td>
<td>24% (2006)</td>
<td>20.9% (2013)</td>
<td>36% (2036)</td>
</tr>
<tr>
<td>PHILADELPHIA</td>
<td>20% (2011)</td>
<td>20.8% (2013)</td>
<td>30% (2025)</td>
</tr>
</tbody>
</table>

*Source: D.J. Nowak et al., Environmental Pollution 178 (2013), 229-236
## PROJECT GOALS
Relevant goals from draft of Envision Cambridge

### CLIMATE & ENVIRONMENT
- Protect lives and livelihoods of Cambridge community members, particularly those who are at greater risk of climate change and environmental impacts.
- Maintain sustainable water resources by taking action to reduce water usage, manage stormwater runoff, and improve the quality of surface water and groundwater.

### URBAN FORM
- Create a connected network of high-quality open spaces that link all residents to local and regional natural assets, that are inclusive of all people.

### COMMUNITY WELLBEING
- Ensure access to resources that support health and well-being.

### HOUSING
- Support high-quality housing that is healthy, climate-resilient, and energy-efficient without increasing costs for low and moderate income individual and families.

### ECONOMY
- Support efforts to erase racial and gender disparities in economic opportunity.

### MOBILITY
- Ensure that the city transportation system supports shared community spaces and enhances neighborhood streets.
- Create an easy-to-understand, integrated, continuous, and comfortable transportation network
PROJECT GOALS
Relevant strategies from Draft CCPR Alewife

RESILIENT URBAN FOREST

• Reduce the urban heat island effect by increasing the urban forest canopy, developing a comprehensive urban forest management plan, and continuing urban forest maintenance efforts.

ENHANCED OUTDOOR THERMAL COMFORT

• Develop “cool corridors” aligned with bike and pedestrian routes and MBTA bus stops to enhance outdoor thermal comfort for transit users.

REDUCE IMPERVIOUS AREA

• Reduce impervious area of upstream parcels to limit flooding at downstream parcels. Evaluate the implementation of a combination of grey and green infrastructure in parcels upstream of flood-prone areas to reduce runoff from impervious areas.

GREEN INFRASTRUCTURE OPPORTUNITIES

• Implement Green Infrastructure to improve water quality and reduce flooding impacts from smaller rainfall events and mitigate urban heat islands.
PROJECT GOALS
A layered approach to success
## Vision

To build, maintain, and sustain a healthy, connective urban forest at a time when the urban forest is more important than ever before.

### PEOPLE:
A forest that contributes to residents' well-being

<table>
<thead>
<tr>
<th>Goals</th>
<th>Evaluative Criteria</th>
<th>Baseline</th>
<th>2030 Target</th>
<th>2070 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce urban heat island effects</td>
<td>Degrees above city avg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance citywide stormwater management</td>
<td>Runoff volume</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase equity in distribution of canopy cover</td>
<td>Canopy cover by vulnerable population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve air quality</td>
<td>Air pollutants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create aesthetically pleasing streetscapes</td>
<td>Property value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance pedestrian outdoor thermal comfort</td>
<td>Sidewalk temperatures re: city avg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase carbon sequestration</td>
<td>Carbon sequestration</td>
<td></td>
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</tr>
</tbody>
</table>

### TREES:
A healthy forest whose trees live longer and thrive during predicted changing climate conditions

<table>
<thead>
<tr>
<th>Goals</th>
<th>Evaluative Criteria</th>
<th>Baseline</th>
<th>2030 Target</th>
<th>2070 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve soils health</td>
<td>Soil metric</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve tree health</td>
<td>% trees in good health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve street tree lifespan</td>
<td>Avg life of street tree</td>
<td></td>
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</tr>
</tbody>
</table>

### FOREST:
A forest that supports a resilient, connected ecosystem

<table>
<thead>
<tr>
<th>Goals</th>
<th>Evaluative Criteria</th>
<th>Baseline</th>
<th>2030 Target</th>
<th>2070 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance habitat</td>
<td>Canopy connectivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversify forest composition</td>
<td>Shannon Index</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan for disaster response (nor'easter, drought)</td>
<td>Increased disaster resiliency</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TASK FORCE MEETING SCHEDULE

JUNE 12  
Introduction

JUNE 28  
RESEARCH: Regulation and Management

JULY 26  
RESEARCH: Goal Setting

AUGUST 30  
RESEARCH: Analysis and Findings

SEPTEMBER 27  
TESTING: Baseline Change Model

OCTOBER 25  
TESTING: Impact Analysis

NOVEMBER 29  
TESTING: Impact Analysis (2)

DECEMBER 20  
PROPOSAL DEVELOPMENT

JANUARY 31  
PROPOSAL DEVELOPMENT

FEBRUARY 28  
DRAFT DOCUMENTATION

MARCH 28  
DRAFT DOCUMENTATION

APRIL 25  
DRAFT DOCUMENTATION
www.cambridgema.gov/ufmp