

Cambridge Urban Forest Master Plan

Task Force meeting #1

June 12, 2018



CAMBRIDGE
DEPARTMENT
OF PUBLIC
THE WORKS



REED HILDERBRAND



OPENING REMARKS

DESIGN TEAM PRESENTATION

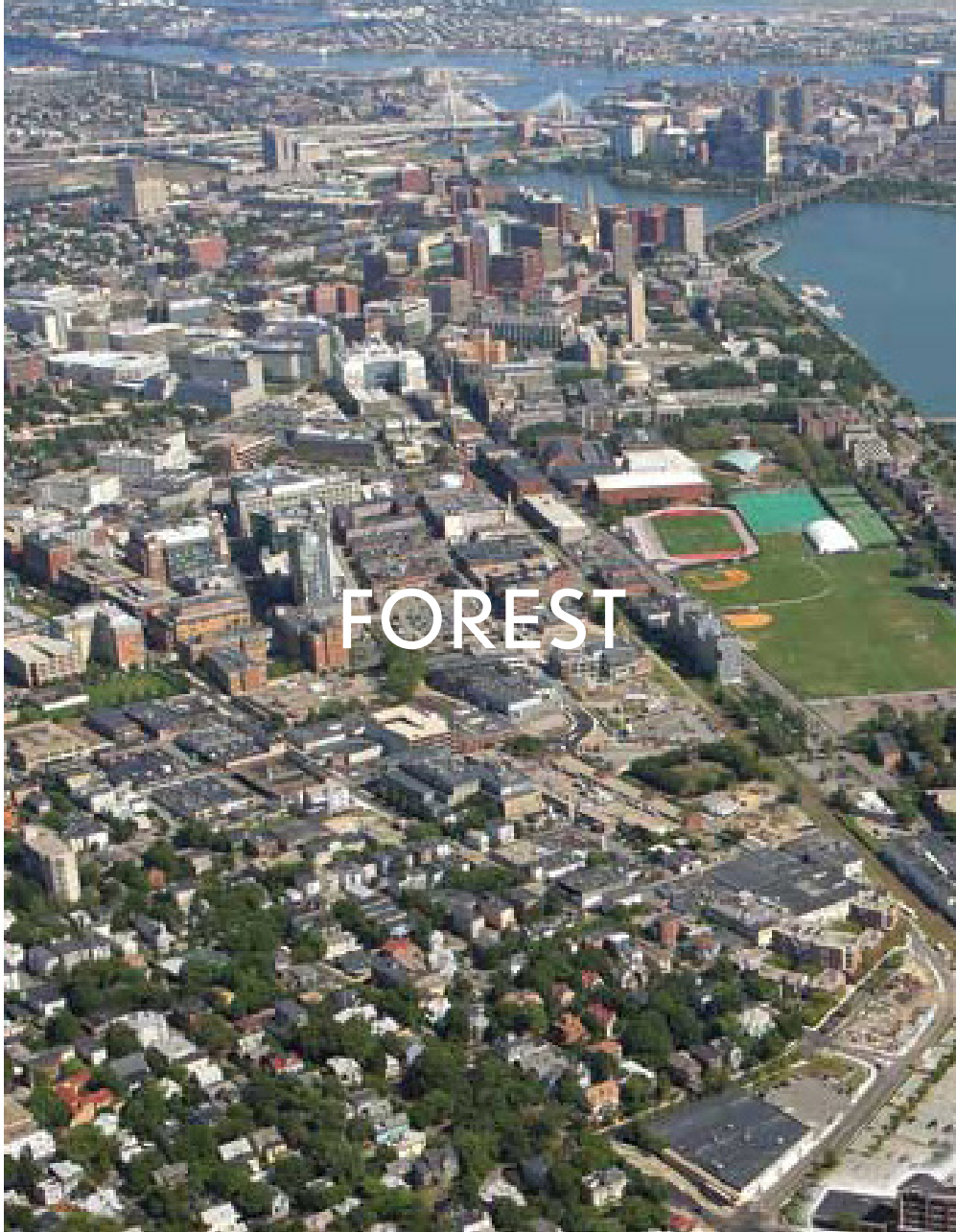
BREAK OUT SESSION

REPORT BACK

PUBLIC COMMENT

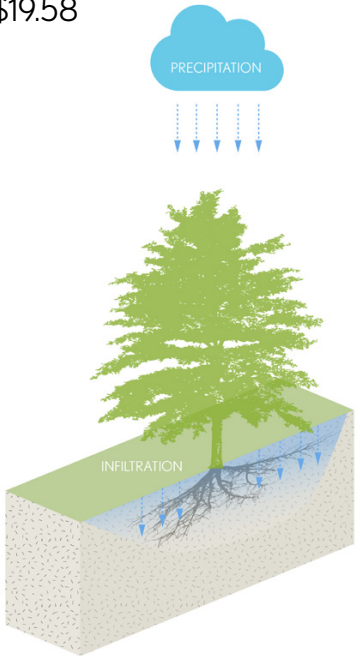
TASK FORCE SCHEDULE DISCUSSION

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

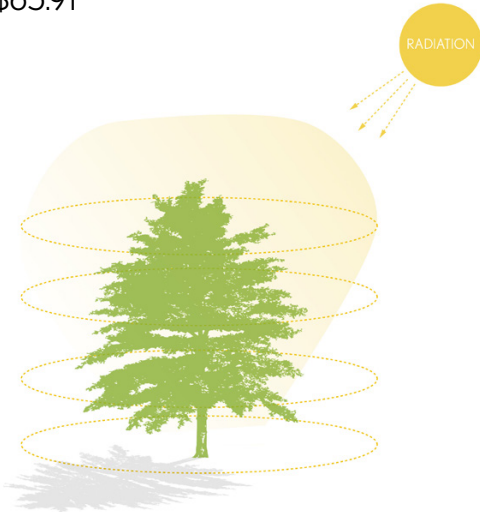


WORKING FROM DATA | **QUANTIFYING THE BENEFITS OF THE URBAN FOREST**

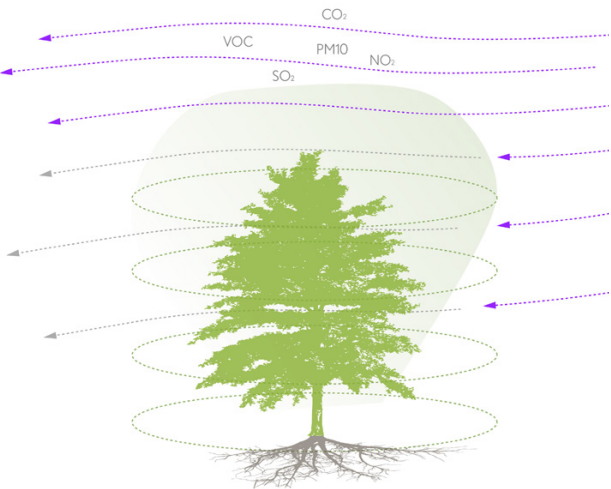
STORMWATER
Stormwater: \$19.58



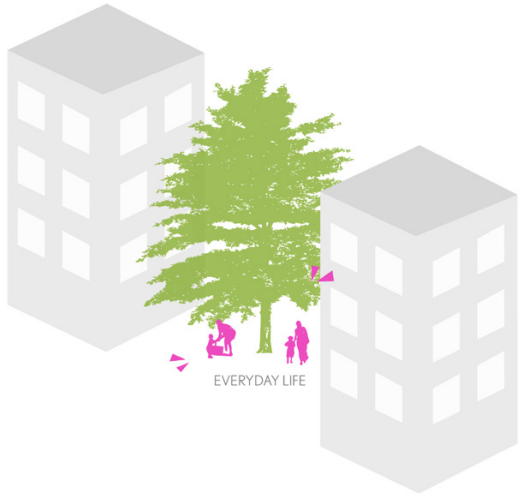
ENERGY SAVED
Energy: \$65.91



CO₂ & AIR QUALITY
CO₂: \$2.21
Air Quality: \$12.81



PROPERTY VALUE
Add Value: \$276.55



Ecosystem services for an average Pin Oak in Cambridge

Source: i-Tree Streets - Annual Savings for Average Pin Oak in Cambridge

Cultural Value

We need to know
where to act

ANALYTICS

Research
Impact Analysis
Cost / Benefit Analysis
Scenario Planning

We need to know
how to do it

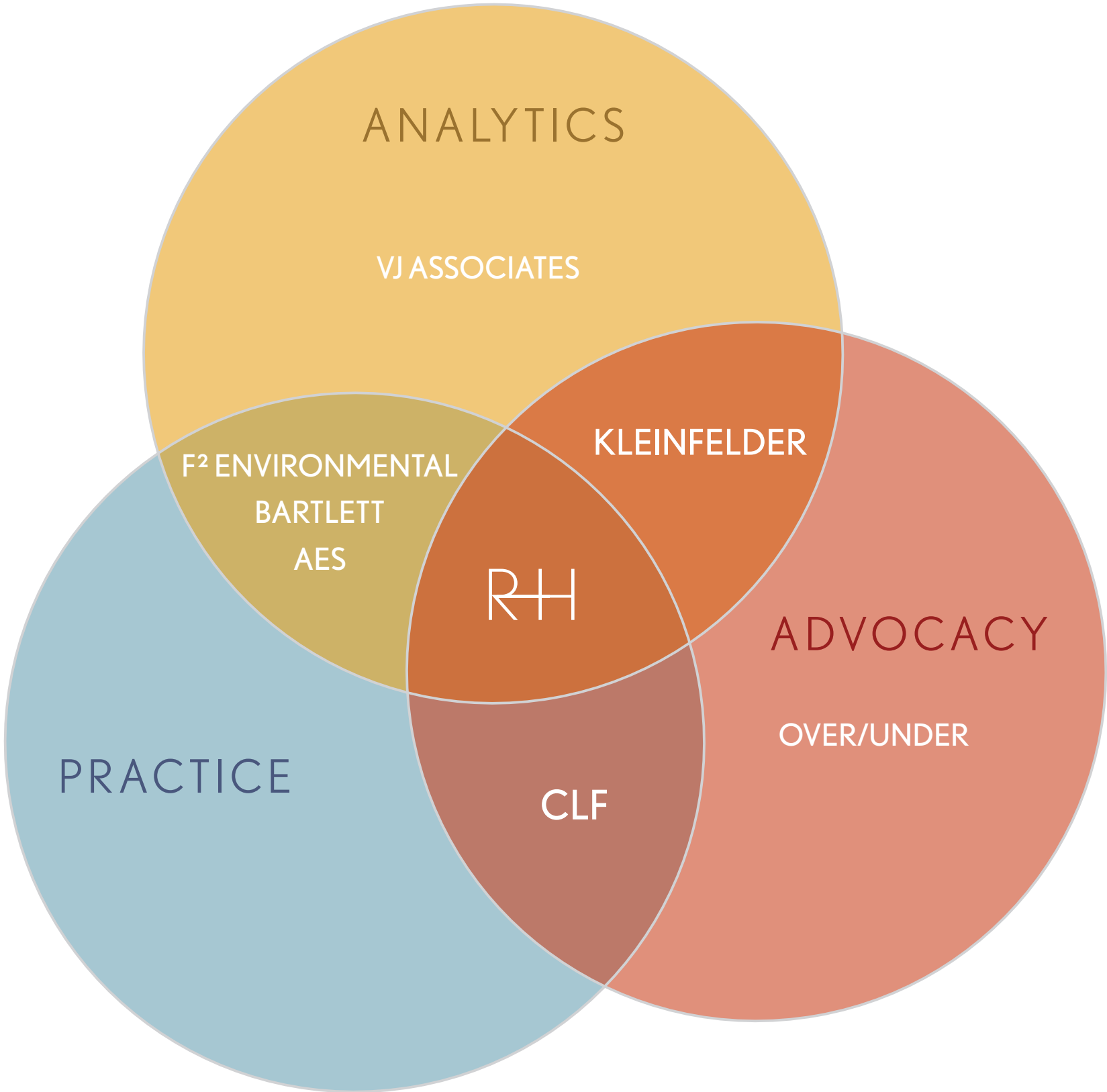
PRACTICE

Standards and Guidelines
Care and Maintenance

We need to know
how to make it happen

ADVOCACY

Education
Policy
Incentives
Commitments





Nathalie Beauvais, Kleinfelder



Deanna Moran, CLF



Chris Grimley, Over Under



Kim Chapman, AES



Steven Apfelbaum, AES



Nick Martin, Bartlett



Mike Sherwood, Bartlett



Eric T Fleisher, F2 Environmental



Clive Tysoe, VJ Associates

Barbara Murphy-Warrington, Resident

Louise Weed, Resident

Caitlin McDonough Mackenzie, Resident

Ahron Lerman, Resident

Kathleen Fitzgerald, Resident

Tessa Mae Buono, Resident

Elena Saporta, Resident

Randa Ghattas, Resident

Lena Jean Nahan, Resident

Conrad Crawford, Resident

Denise Jillson, Resident, Exec. Director of Harvard Square Business Assoc.

Maggie Booz, Resident, CPP Co-chair

Florrie Wescoat, Resident, CPP Co-chair

Caitlin Tamposi, Representative of the Chamber of Commerce

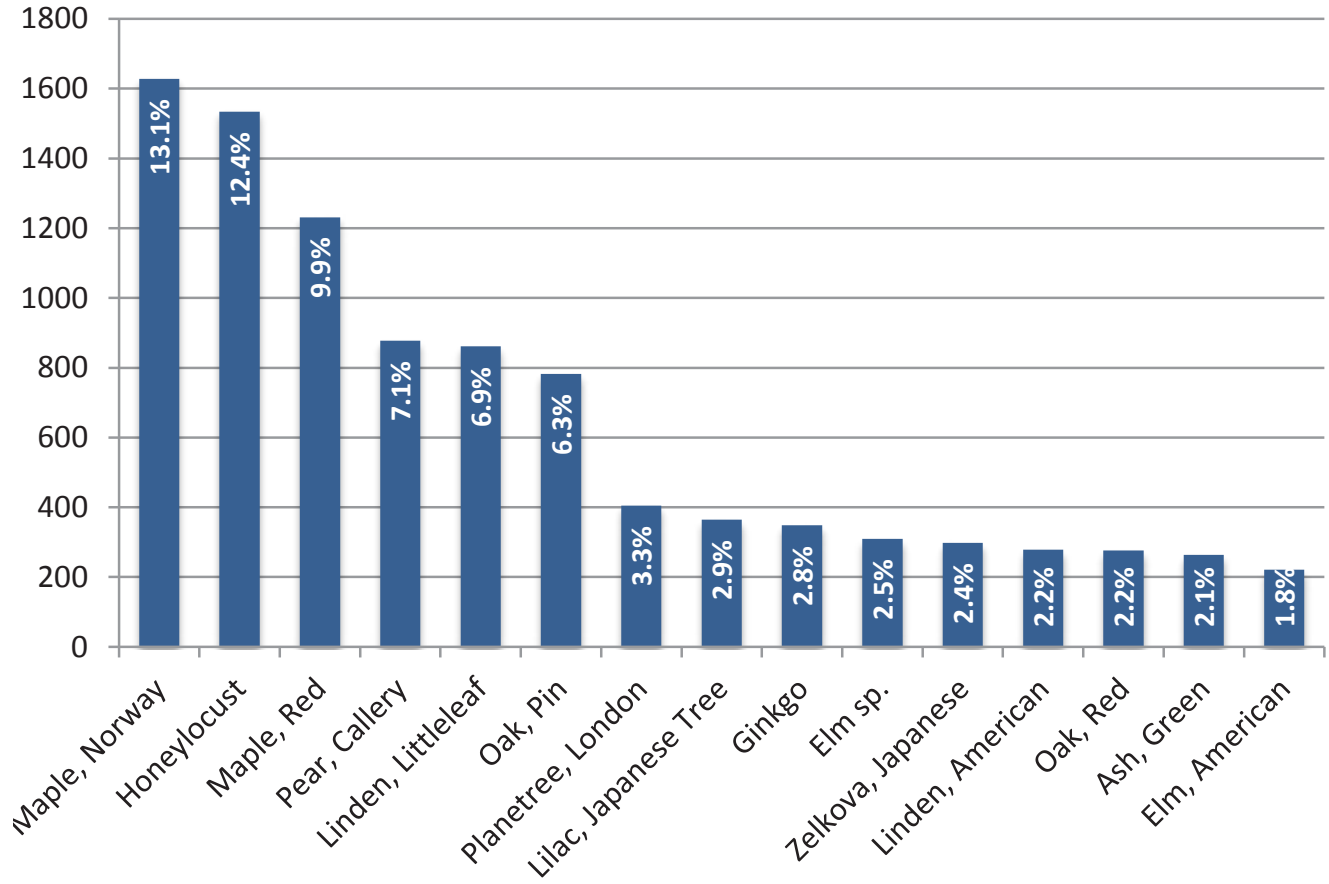
Laura Tenny, MIT Representative

Mark Verkennis, Harvard University Representative

Tom Evans, Cambridge Redevelopment Authority Representative

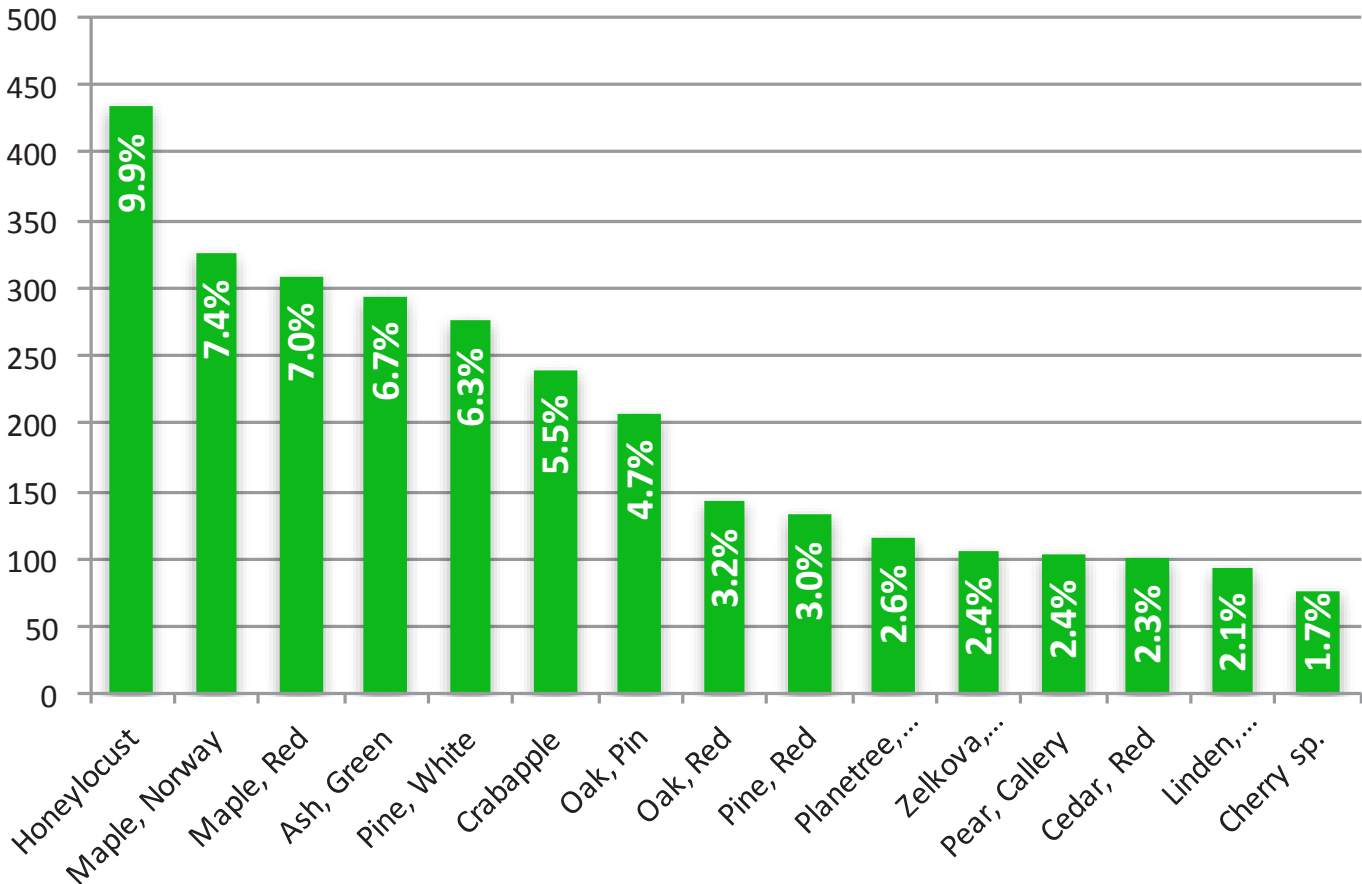
Michael Johnston, Cambridge Housing Authority Representative

what is the state of the urban forest today?



15 most abundant City-owned street trees in Cambridge

Source: Earthwatch Institute, Urban Forest Management Plan, 2016



15 most abundant City-owned park trees in Cambridge

Source: Earthwatch Institute, Urban Forest Management Plan, 2016



Source: Google Earth, 2018



Hazard Tree Classification

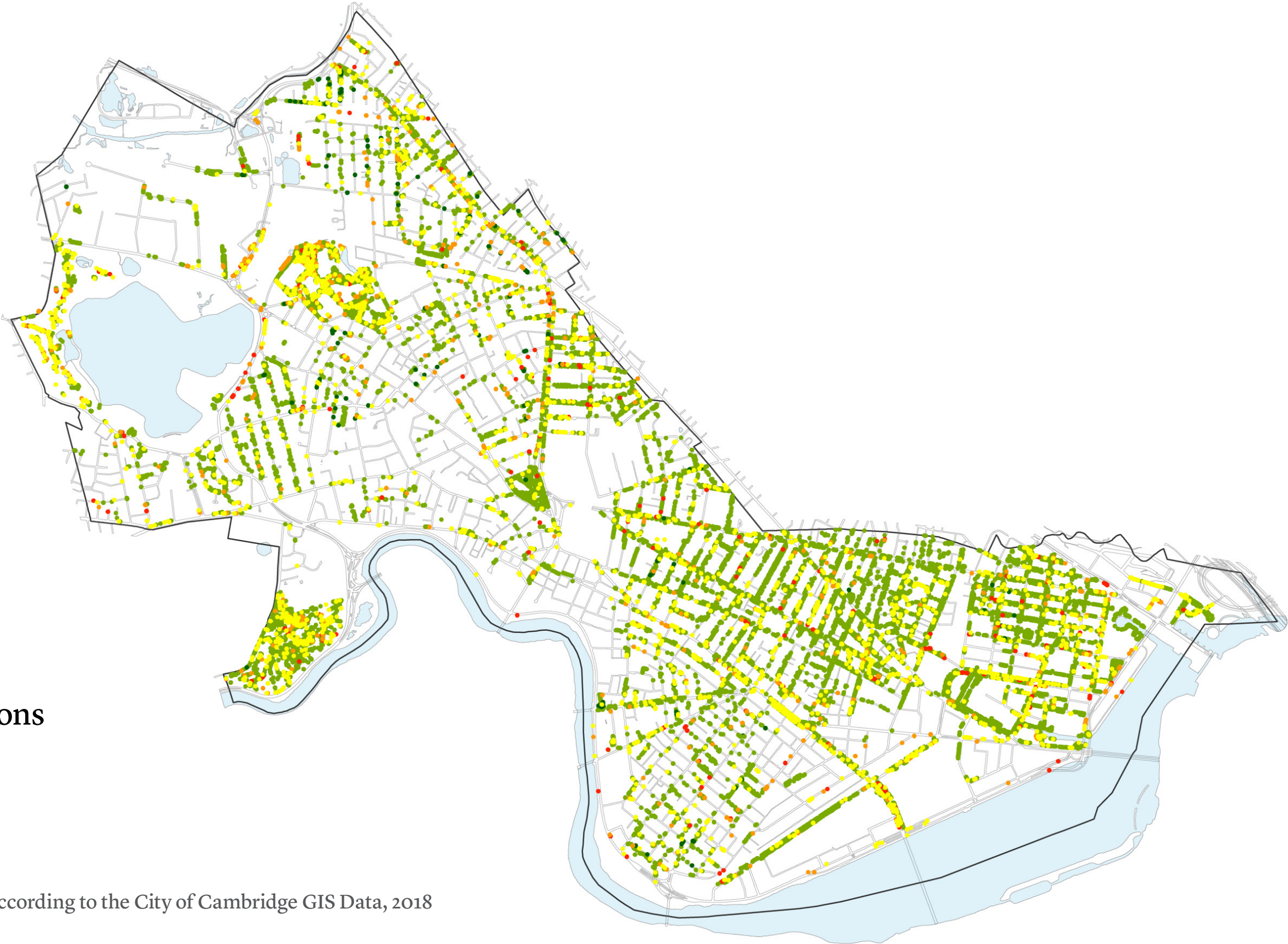
Species Group: Ash

Height: >20 ft

Proximity:<25 ft

Tree Canopy Mapping

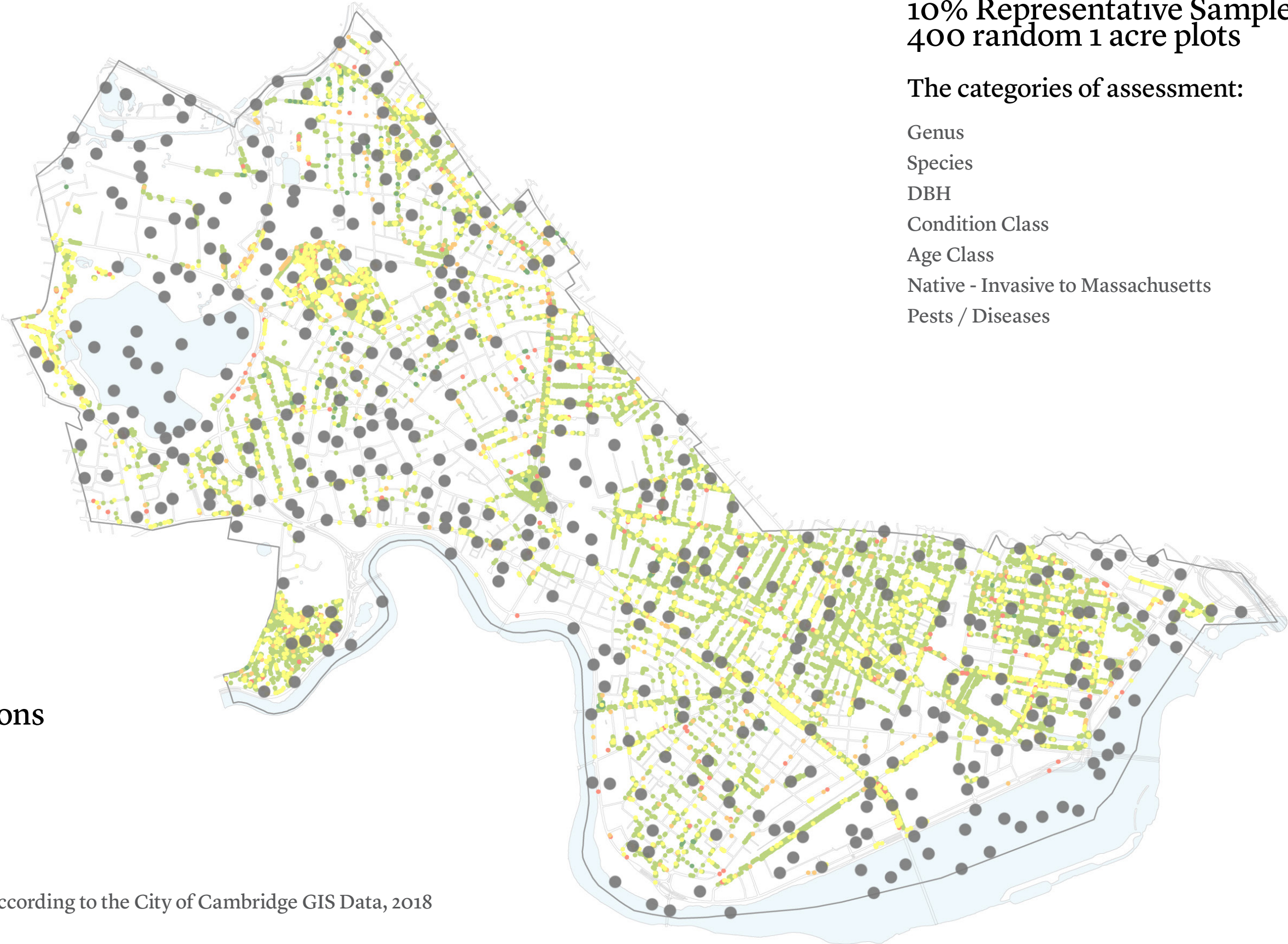
Source: AES



Tree Health Conditions

- Good
- Fair
- Poor
- Dead

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



Tree Health Conditions

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

how is the forest maintained and managed?



Healthy and stressed trees



Tree assessment



Tree soils section / axonometric view



Soil sample analysis

*how could we generate an impact
through policy and engagement?*

Chapter 8.66 - TREE PROTECTION

Sections:

8.66.010 - Short Title

This Chapter may be cited as the Tree Protection Ordinance of the City of Cambridge.

(1277, Added, 08/02/2004)

8.66.020 - Statement of Purpose

The City Council hereby finds that the preservation of existing trees and the promotion of new tree planting is a public purpose that protects the public health, welfare, environment and aesthetics of the City of Cambridge and its citizens.

The urban forest serves a wide variety of functions, which promote the health, safety and welfare of residents. These functions include:

- (a) conserving energy, by providing shade and evaporative cooling through transpiration;
- (b) improving local and global air quality by absorbing carbon dioxide and ozone, absorbing particulate matter, and producing oxygen;
- (c) reducing wind speed and directing air flow;
- (d) reducing noise pollution;
- (e) providing habitat for birds, small mammals, and other wildlife;
- (f) reducing storm runoff and the potential for soil erosion;
- (g) increasing real property values; and
- (h) enhancing visual and aesthetic qualities that attract visitors and businesses.

Significant Trees. Any tree or trees larger than 8" DBH which is on a lot or which has been removed from the lot within one year prior to the submission of a Tree Study to the City Arborist.

Tree Protection Plan. This plan may be either a separate drawing or part of a landscape plan, and shall include the following information:

- a) Drawings of tree protection measures and (i) their location on the lot, including Tree Save Areas, and the location, height and DBH of Significant Trees and an indication of which Significant Trees would remain on the site, or (ii) in the event that any Significant Trees are proposed to be removed, the location of those Significant Trees, and the location, height and DBH of Replacement Trees which are proposed to be planted on the lot if feasible, or (iii) in the event that Replacement Trees are not proposed to be planted on the lot, the total sum, as identified in the Mitigation Plan, to be paid to the City to be deposited into the Tree Replacement Fund, shall be required to be submitted together with the Tree Protection Plan;
- b) A schedule for planting the proposed Replacement Trees and a representation that such trees will be inspected and, if necessary, treated by a Certified Arborist once a year for five years; and
- c) Such other information as is required by the City Arborist pursuant to applicable regulations.

Tree Save Area. The area surrounding a tree which must remain undisturbed so as to prevent damage to the tree.

Tree Study. The information submitted to the City Arborist, which shall include a Tree Survey, a Tree Protection Plan, and, if applicable, a Mitigation Plan.

Tree Survey. A plan showing the location, type, height and DBH of all trees on a lot.

8.66.050 - Procedure for Large Projects

- a. In any project which requires a special permit under §§ 4.26.I - 4.26.3, §19.20, §11.12.1, §11.12.2, or §11.12.3 of the Zoning Ordinance, the application for the special permit shall include a Tree Study, which shall first have been submitted to the City Arborist not less than twenty-one (21) days prior to the submission of the application for a special permit. The Tree Study shall be reviewed by the City Arborist, who shall certify that he has reviewed it, indicating whether it is complete and complies with the applicable provisions of this Chapter and regulations promulgated thereunder. The City Arborist shall refer the Tree Study with his certification and recommendations to the Planning Board, to assist the Planning Board in establishing any conditions that may be required as a result of the findings of the Tree Study in connection with the issuance of a special permit.
- b. Regarding any project which includes a building of 25,000 square feet or more and which is subject to the provisions of § 19.50 of the Zoning Ordinance, the materials submitted to the Inspectional Services Department with the application for a building permit shall include a Tree Study, together with a certification from the City Arborist that the applicant has submitted the Tree Study for review to the City Arborist not less than twenty-one (21) days prior to the submission of the application for a building permit, and that the Tree Study is complete and complies with the applicable provisions of this Chapter and regulations promulgated thereunder. The owner of the lot shall be required to commit to comply with all provisions of the Tree Study and the applicable provisions of this Chapter and regulations promulgated hereunder in the application for a building permit.

(1277, Added, 08/02/2004)

8.66.060 - Tree Replacement

If Significant Trees are to be removed from a lot in connection with the development of a project subject to the provisions of this Chapter, upon approval of any project subject to the provisions of [§8.66.050\(a\)](#) of this Chapter by grant of a special permit from the Planning Board, or submission to the Inspectional Services Department of certification from the City Arborist under the provisions of [§8.66.050\(b\)](#) of this Chapter, the owner of the lot shall either plan Replacement Trees on the same lot in accordance with the schedule set forth in the Tree Study, or he shall pay the estimated cost of Replacement Trees and associated costs for the maintenance of said trees pursuant to the Mitigation Plan, if applicable, to the City to be deposited into the Tree Replacement Fund. In addition, the owner of the lot shall, prior to the issuance of a building permit, post and file a bond with the City Clerk in the amount of the total costs set forth in the Mitigation Plan, but in no event less than five thousand dollars (\$5,000.00), with one or more sureties conditioned to the faithful observance of the conditions and specifications of the Tree Protection Plan and, if applicable, the Mitigation Plan.

(1277, Added, 08/02/2004)

8.66.070 - Tree Replacement Fund

There is hereby established a Tree Replacement Fund which shall be held by the City Treasurer in an account and administered in accordance with applicable provisions of the General Laws. Any payments into the Tree Replacement Fund required by [§8.66.060](#) shall be deposited in said Fund, and shall be used solely for the purpose of buying, planting and maintaining trees in the City.

Cambridge Tree Ordinance



UFAC Toolkit

UFAC has prepared a [Toolkit](#) to assist neighborhood associations and groups interested in organizing tree planting events that qualify for free trees that may be provided through the City of Dallas MOWmentum and for the Reforestation Fund. Trees from these programs are targeted for planting in City of Dallas street medians and in the “parkway”, which in most neighborhoods is the strip of grassy area between the sidewalk and the street.

[TOOLKIT](#)

In the [Toolkit](#) Table 3.1 List of Sample Forms, Letters, and Checklist consists of examples of Forms/Letters/Checklist to assist Neighborhoods to organize a tree planting project, identify volunteers and supporters, obtain and plant trees, and follow-up after the tree-planting event. These sample documents are go-by’s and can to altered for your specific Neighborhood Tree Planting Project needs. Below are links to editable versions of the examples shown in the [Toolkit](#) that you can download and modify.

Coming Events

- June 19, 2018
 - [UFAC Meeting](#) at 6:00 pm

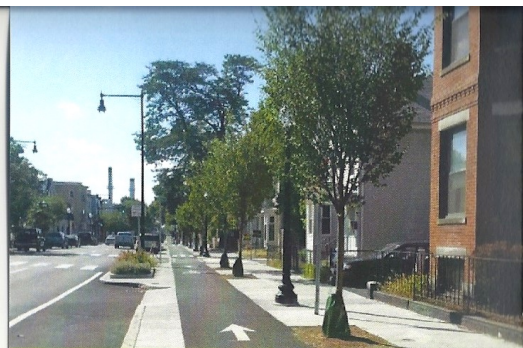
UFAC on Facebook



Helpful Links

1. Dallas City Arborist
2. TAMU Tree Guide
3. UFAC Tree Guide
4. MOWmentum Program
5. UFAC Bulletin
6. UFAC BOLETIN INFORMATIVO
7. Planting & caring for trees in your yard
8. Plantación y cuidado de los árboles de su jardín
9. [Alliance for Community Trees](#)
10. Turtle Creek Park Study
11. Texas Forest Service

City of Dallas Urban forest Policies



**CITY OF CAMBRIDGE
URBAN FORESTRY FACTS**

- 🌿 The Arbor Day Foundation has recognized Cambridge as a Tree City for the past 25 years
- 🌿 There are over 100 tree species and cultivars planted and maintained throughout the City
- 🌿 The DPW's Urban Forestry Division maintains 19,000 trees and growing
- 🌿 The most common species in the city are Honeylocust, Norway Maple, Red Maple, Pin Oak, and Littleleaf
- 🌿 Trees are pruned at least once every 6 years
- 🌿 We plant smaller diameter trees because they establish quickly with proper care

VOLUNTEER OPPORTUNITIES

The Committee on Public Planting: The committee typically meets the 2nd Wednesday of the month at the DPW to discuss tree planting opportunities as well as other tree related issues.

HOW YOU CAN HELP

If you have a newly-planted tree or young tree in front of your home or business, the DPW encourages you to do the following:

WATER, WATER, WATER

Water your tree between May and November. If your tree has a green gator bag attached to the trunk, fill the bag once a week. If you would like a gator bag, please contact the DPW. Without a gator bag, use a gallon milk jug or equivalent, and water the tree with 15-20 gallons of water at least once per week.

PROTECT

- ① Do not curb your dog in a tree well. Dog urine can be harmful to young trees.
- ② Do not fertilize your young tree. Most fertilizers promote canopy growth instead of tree root growth.
- ③ Do not lock your bikes to trees. A small wound on the trunk could lead to a lifetime of problems for the tree.
- ④ Do not place raised edges around a tree well. They may create a poor environment for the tree to thrive and present a trip hazard.

WEED

Keep the tree weed-free. Weeds can compete by consuming valuable resources that a young tree needs to become established.

MULCH

Every spring, mulch the tree well with 2-3 inches of shredded bark or wood chips, keeping mulch away from the trunk.

BE ALERT

Emerald Ash Borer (EAB) is a threat to our ash trees. The EAB is an emerald-green metallic beetle, so small that seven of them could fit on the head of a penny! Look for tiny, D-shaped exit holes in the bark of ash trees, die-back in the upper third of the tree canopy, and sprouting of branches just below this dead area. Contact the City Arborist if you find a beetle or have questions.



"Trees can be a stimulus to economic development, attracting new business and tourism. Commercial retail areas are more attractive to shoppers, apartments rent more quickly, tenants stay longer, and space in a wooded setting is more valuable to sell or rent."
- The Arbor Day Foundation

Cambridge Today

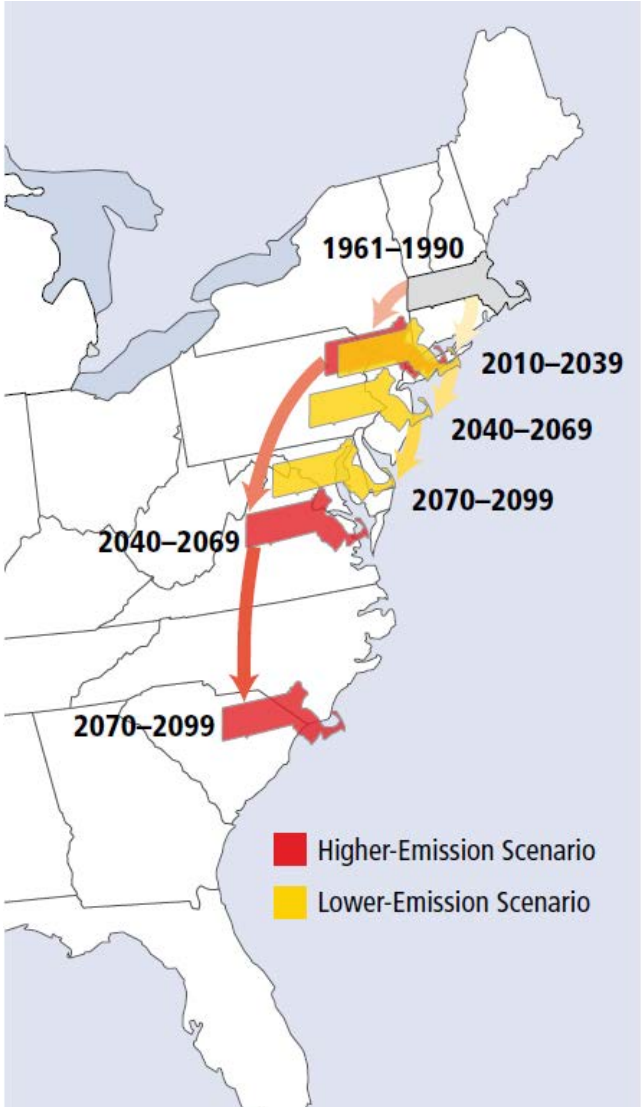
An interim report from the Envision Cambridge planning process



what are the risks to the urban forest?

Climate Projections & Key Impacts

Temperature



Source: Army Corps of Engineers

Precipitation

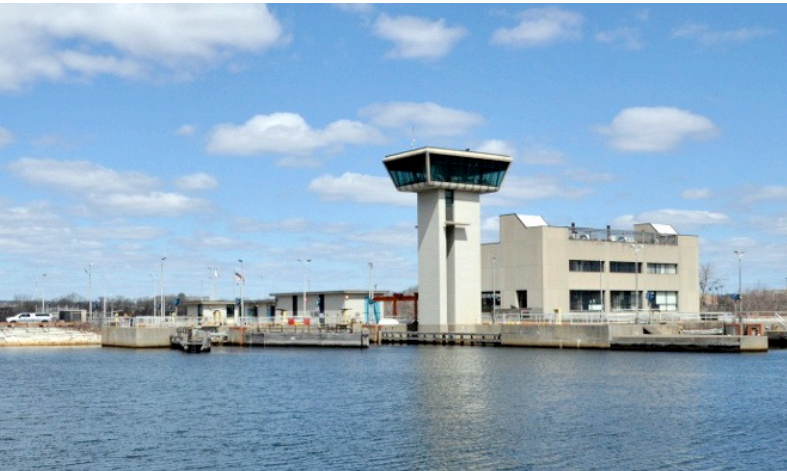


[Friends of Alewife Reservation \(FAR\)](#)

More extreme events



Sea Level Rise (SLR)



Amelia Earhart Dam (Source: MaUSHarbors.com)



Charles River Dam (Source: New England District, US Army Corps of Engineers, 2015)

Increasing Temperatures – Increasing Heat Vulnerability

By 2030, the number of days above 90 F could triple



1971 - 2000
(Baseline)

2015 - 2044
(2030)

2055 - 2084
(2070)

■ Above 90°F - Low Scenario
 ■ Above 90°F - High Scenario
 ■ Above 100°F - Low Scenario
 ■ High 100°F - High Scenario

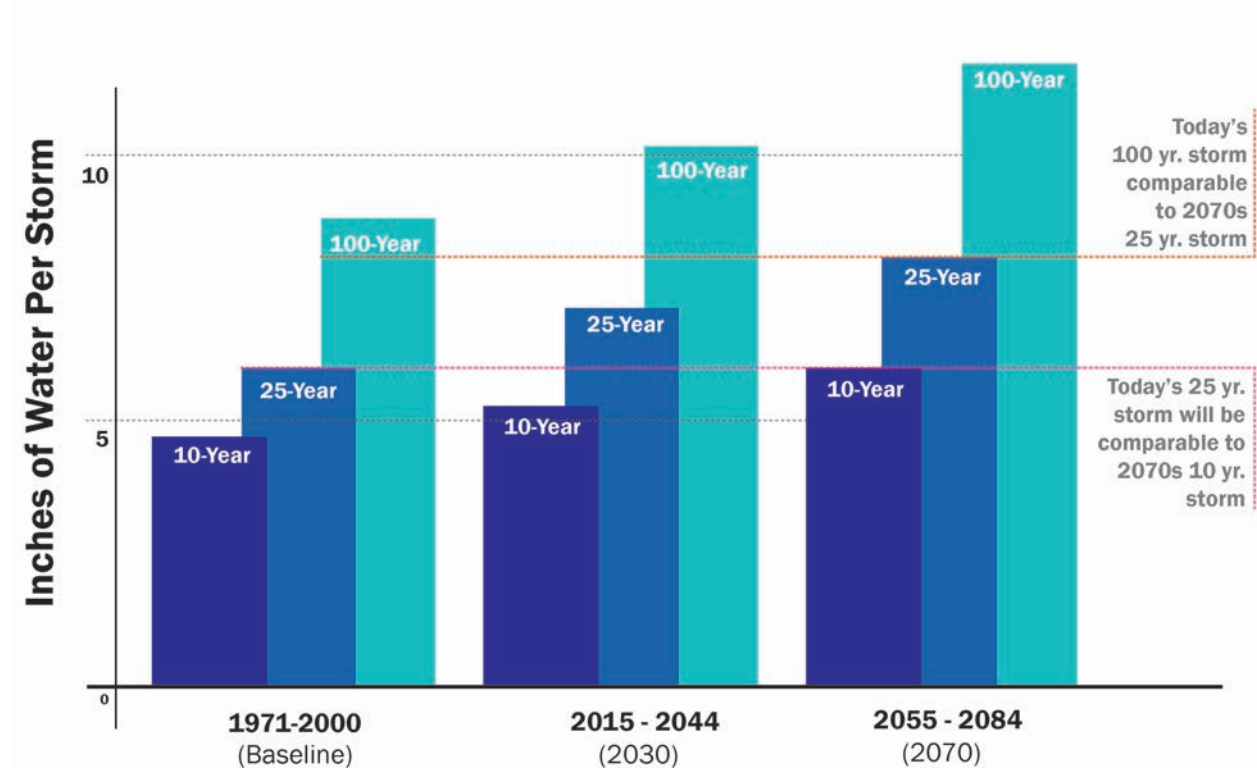
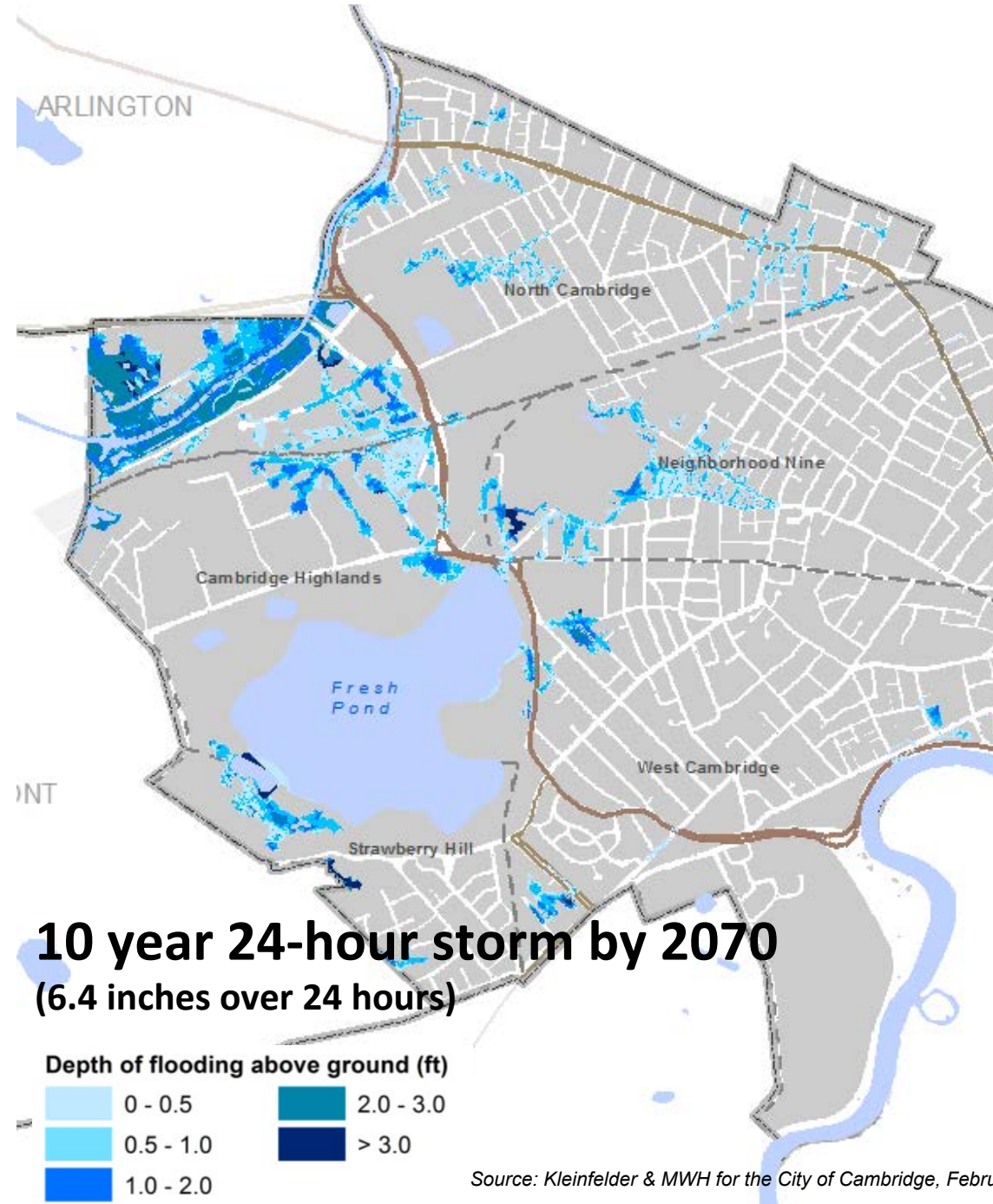
*Summer is considered to be the 91 days of June through August



Boston Marathon, April 16, 2012 (above 80F)

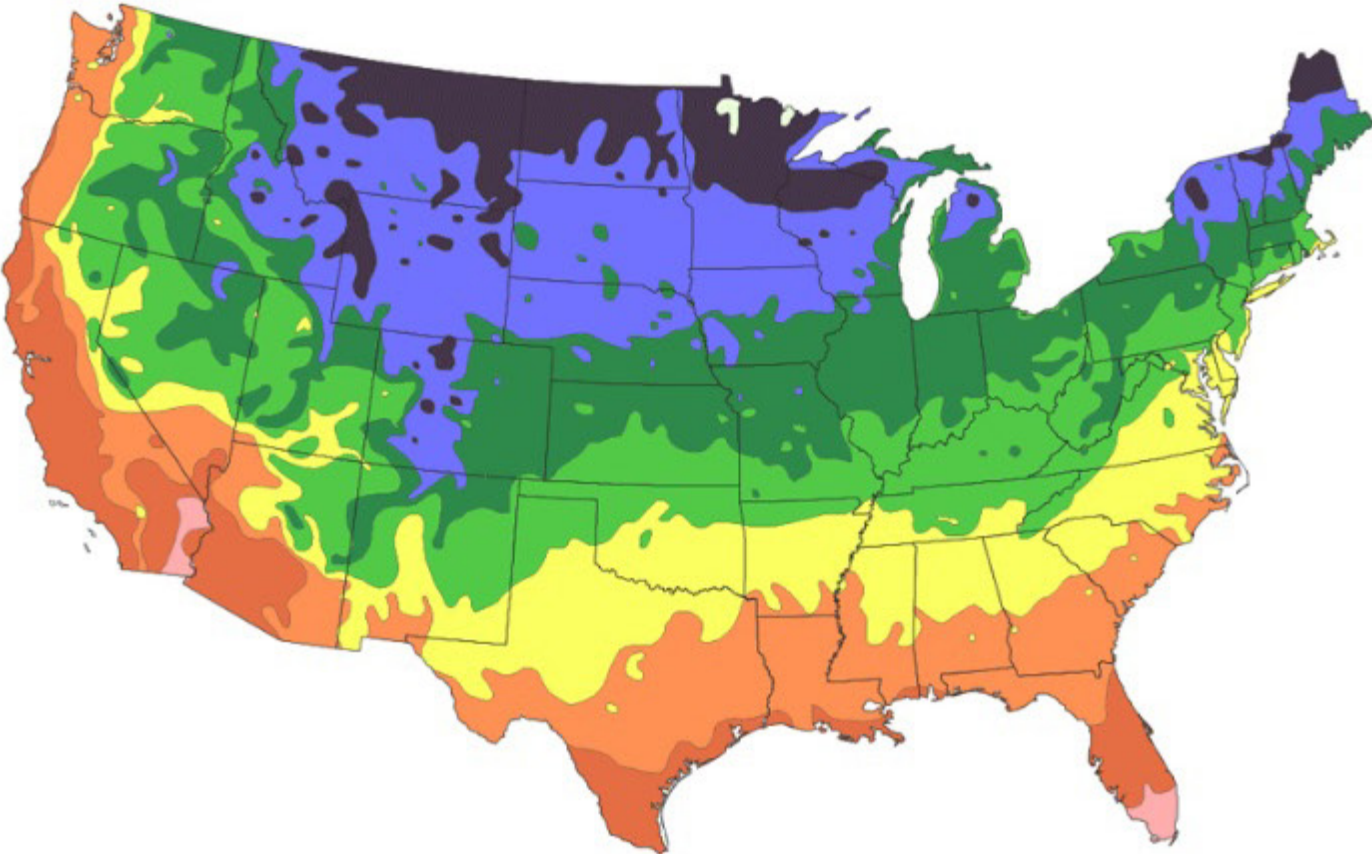
- More frequent & longer heat waves
- Temperatures exacerbated by urban heat island affect
- Extreme hot days will shift most areas from “cautious” for human health to “extreme caution”; Alewife Quad “dangerous”
- Average temps will be warmer

Increasing Intensity of Precipitation - Flooding

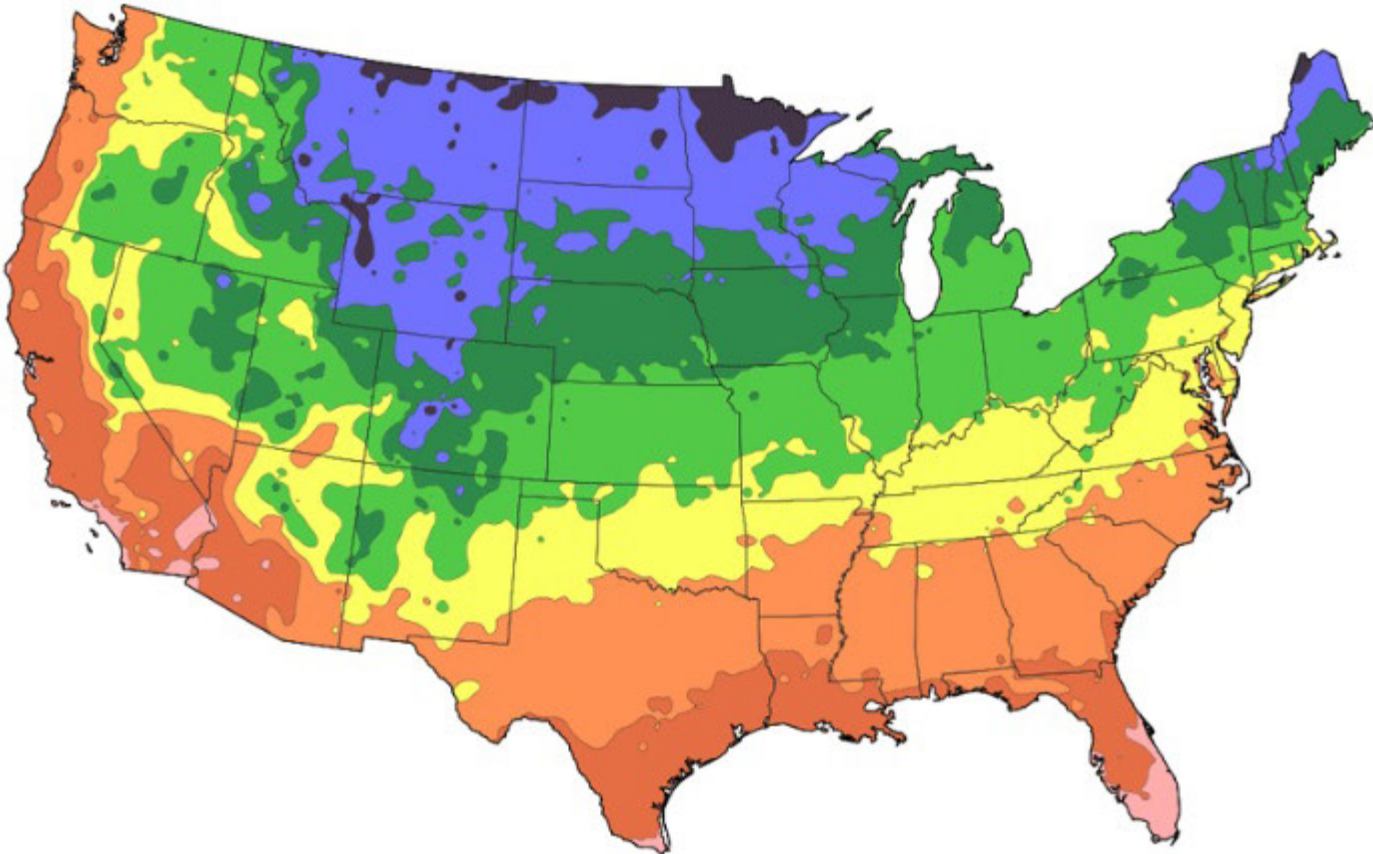


Precipitation projections, CCVA Part 1, City of Cambridge
(Source: Kleinfelder based on ATMOS projections, Nov. 2015)

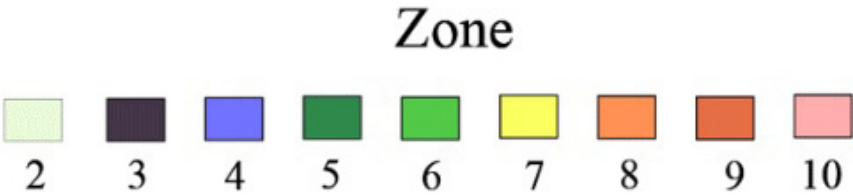
- Rain and snow will fall harder
- More rain and snow in the winter and spring
- Overbank flooding from Alewife Brook will worsen
- Street flooding will worsen



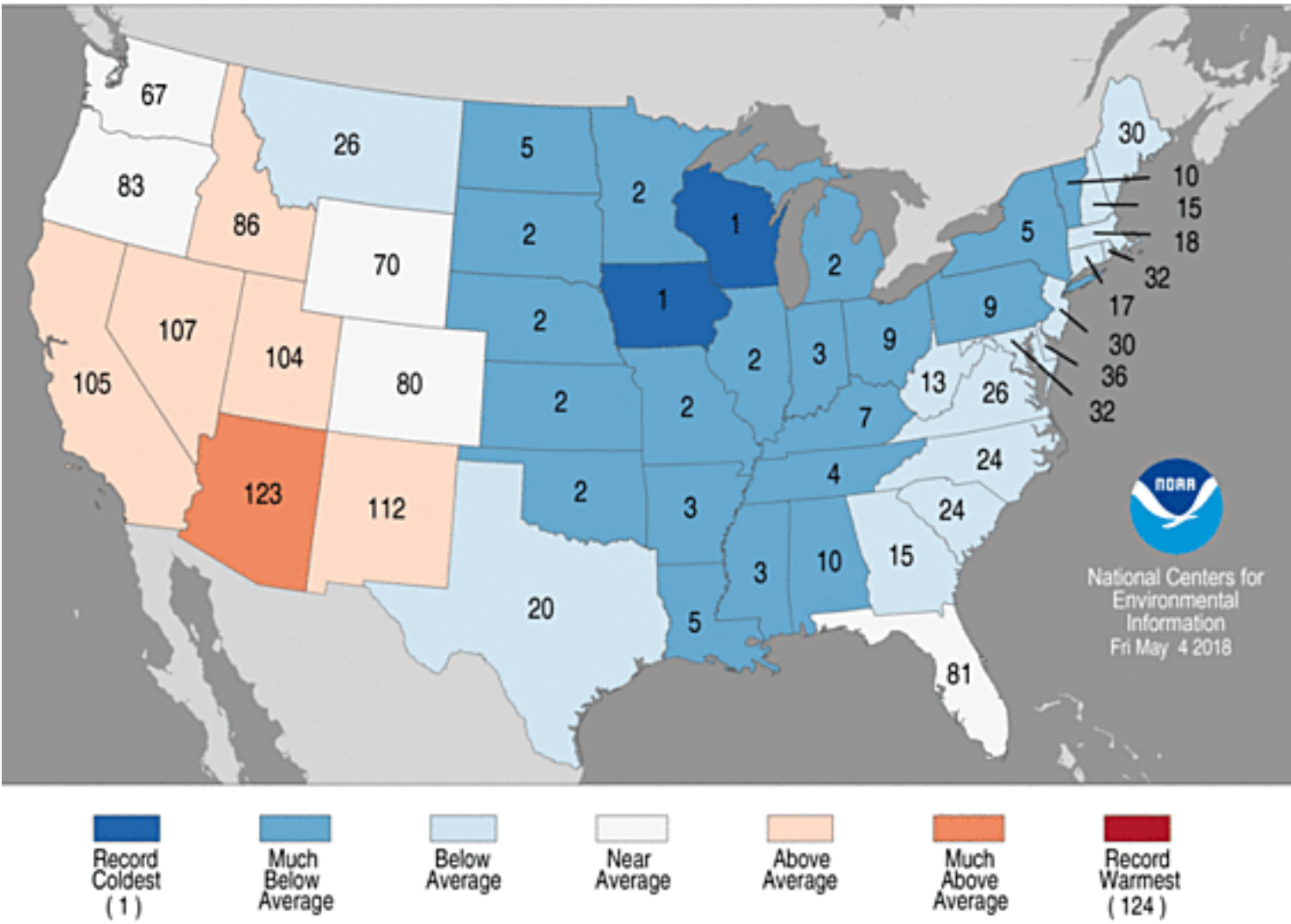
1990 USDA Plant Hardiness Zone Maps



2015 USDA Plant Hardiness Zone Maps

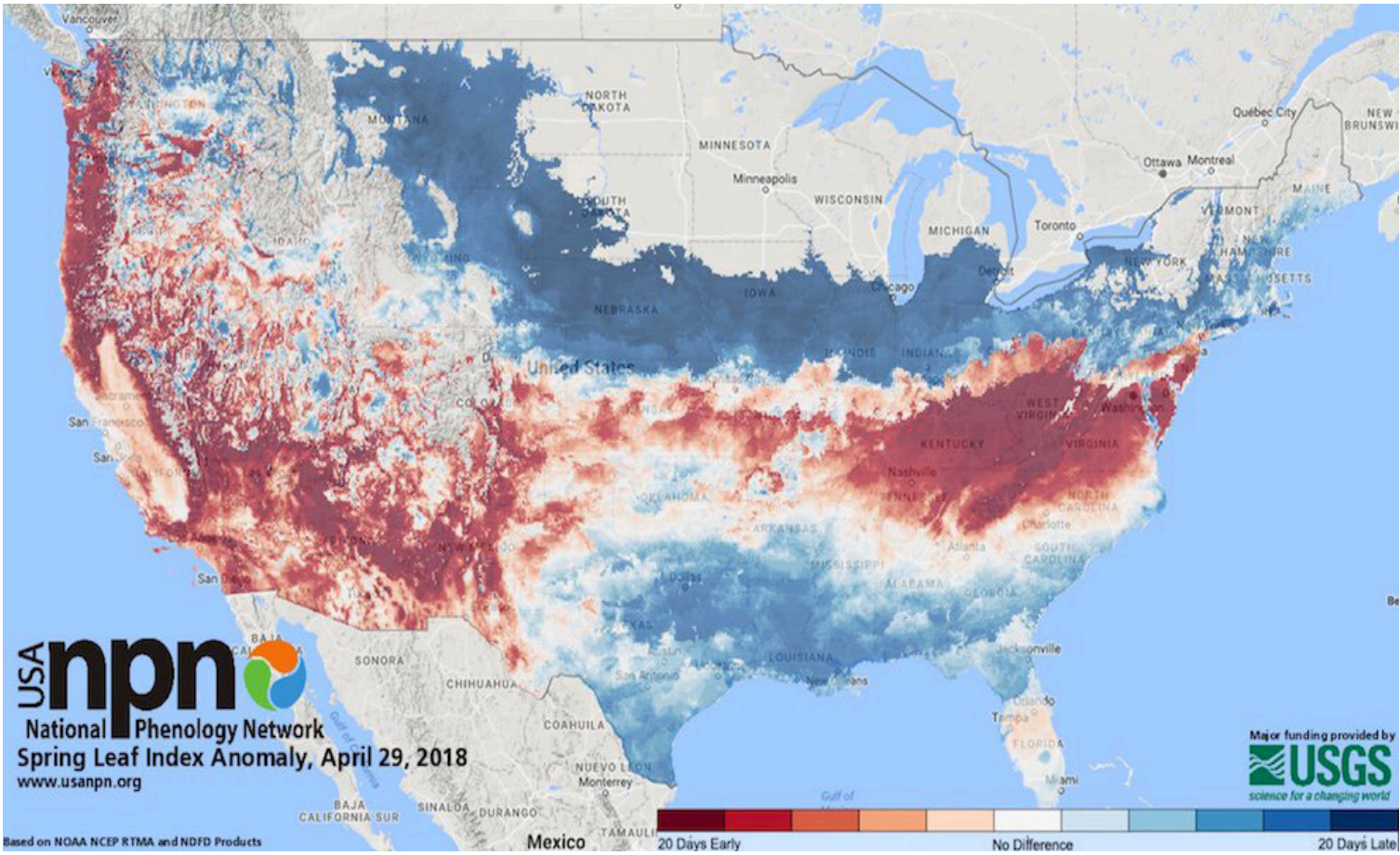


RISK | TEMPERATURE ANOMALIES



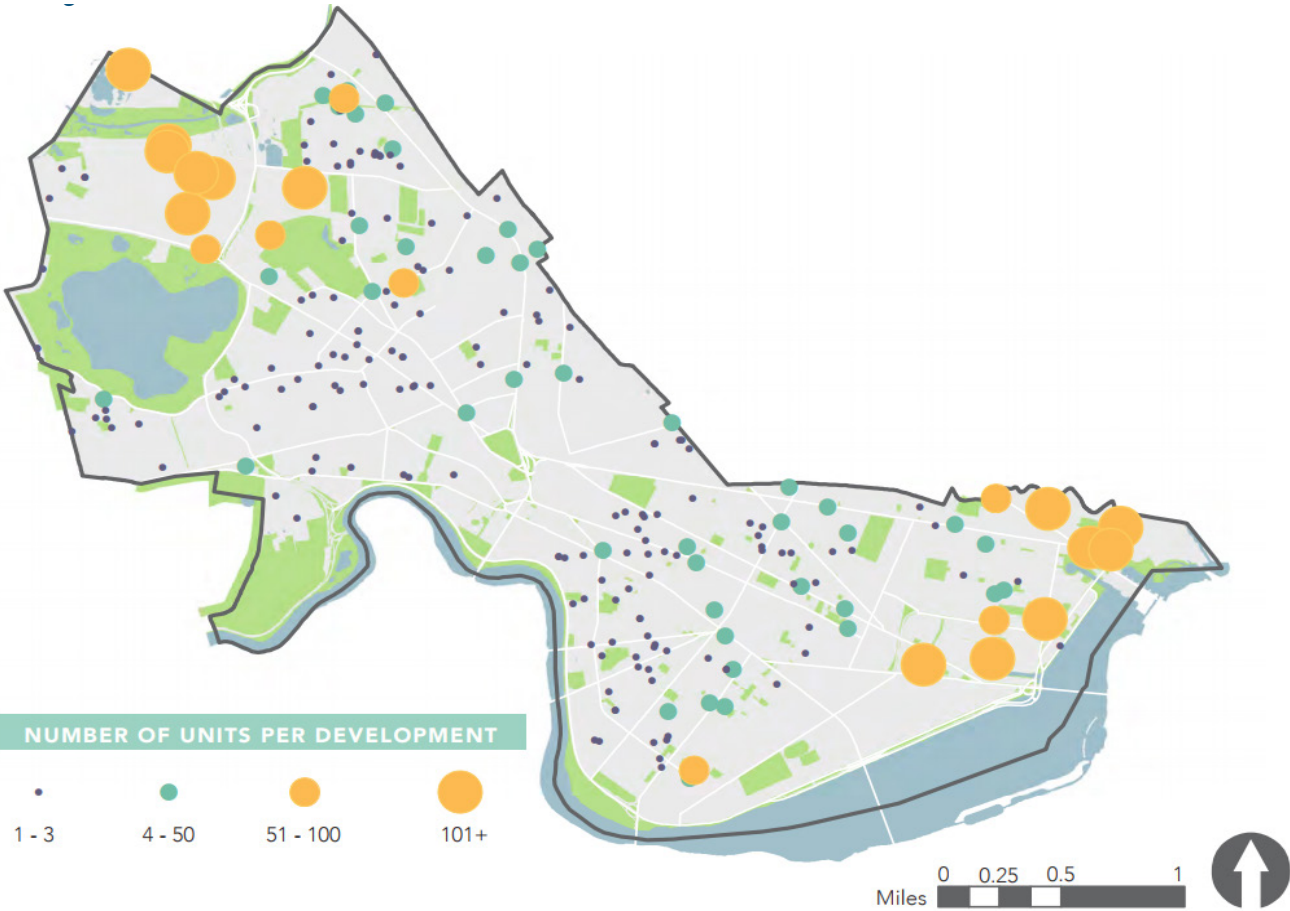
Statewide Average Temperature Ranks - April 2018
Period: 1895-2018

Source: National Center for Environmental Information



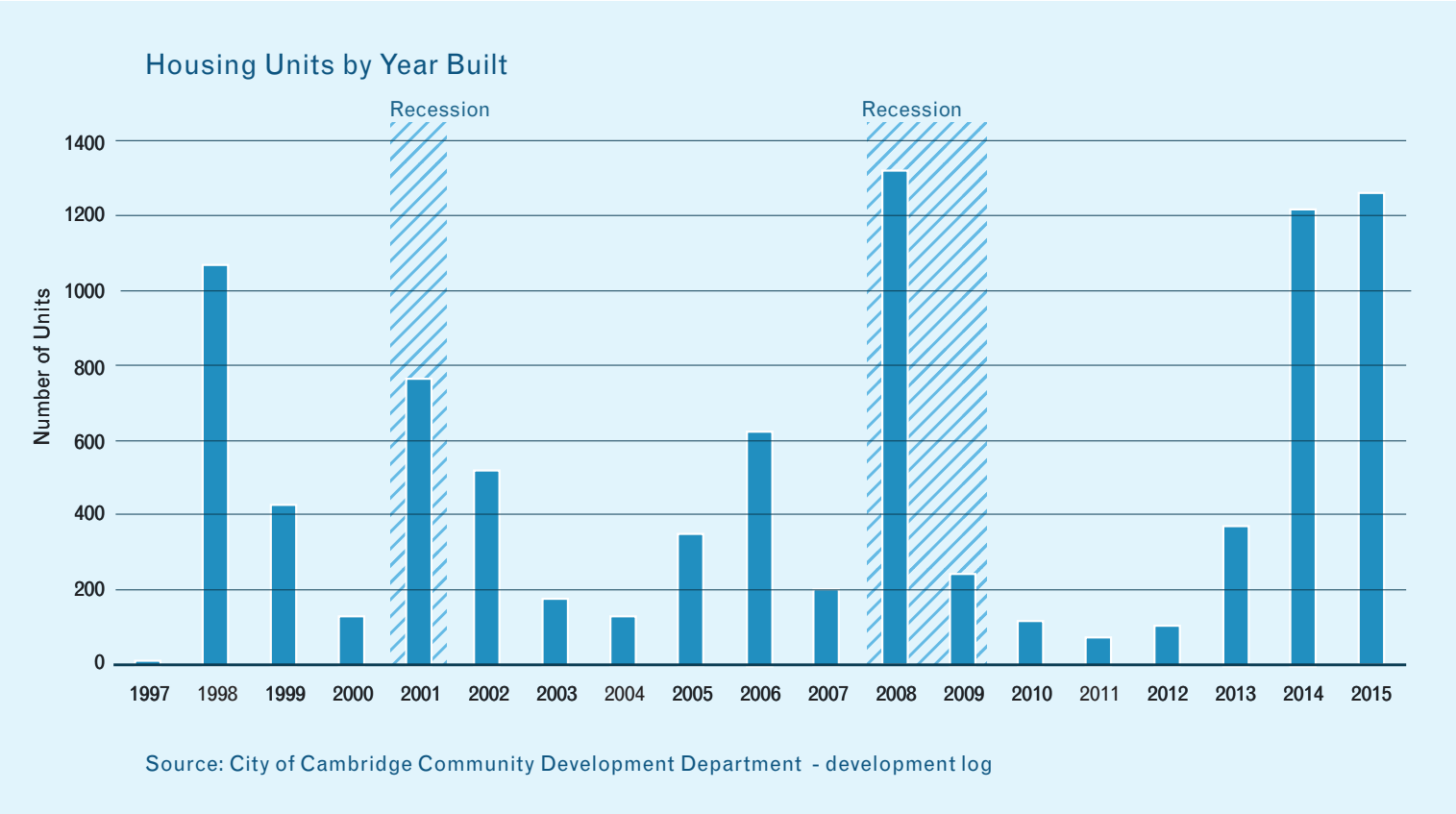
Spring Leaf Index Anomaly - April 29, 2018

Source: National Phenology Network



New Housing by Number of Units, 2010-2016

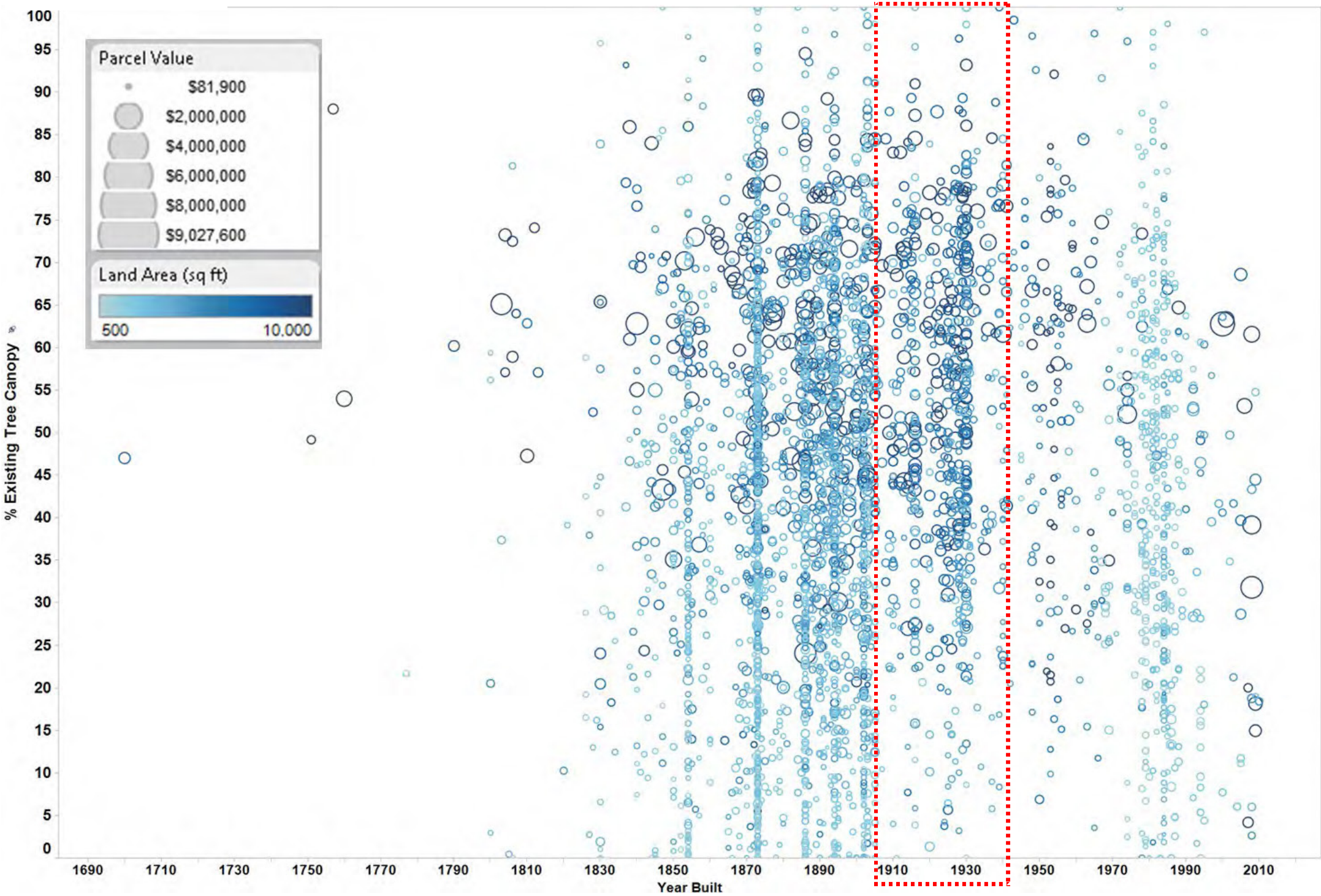
Source: Cambridge Housing Market Profile, 2016



More than 2000 new housing units were built in Cambridge between 2014-2015

Source: City of Cambridge Community Development Department; Envision Cambridge Analysis

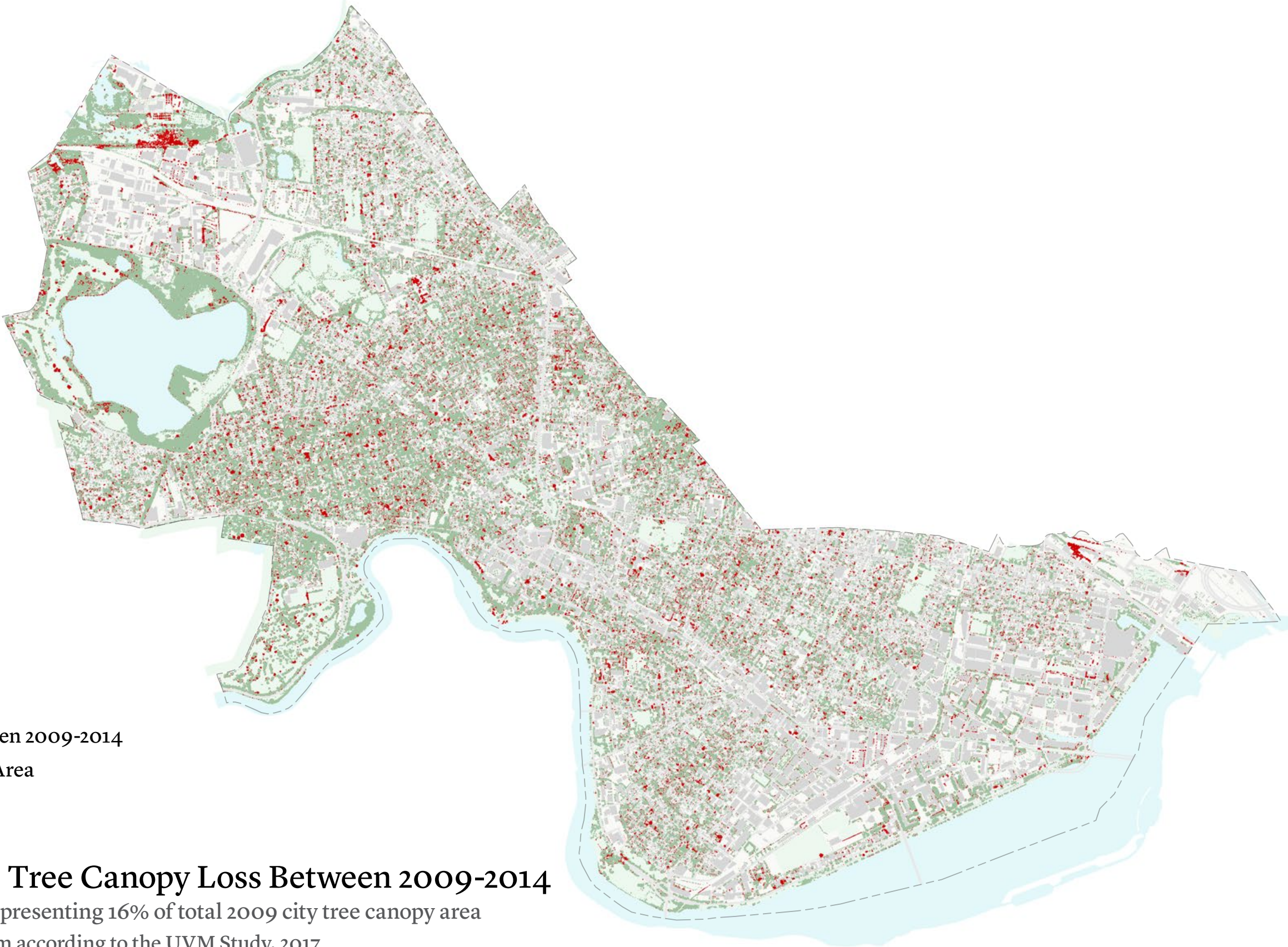
RISK | DEVELOPMENT (RISK AND OPPORTUNITY)



Percentage of existing tree canopy in relation to year built, parcel value and land area for single family residential parcels

Source: University of Vermont Tree Study, 2012

why act?

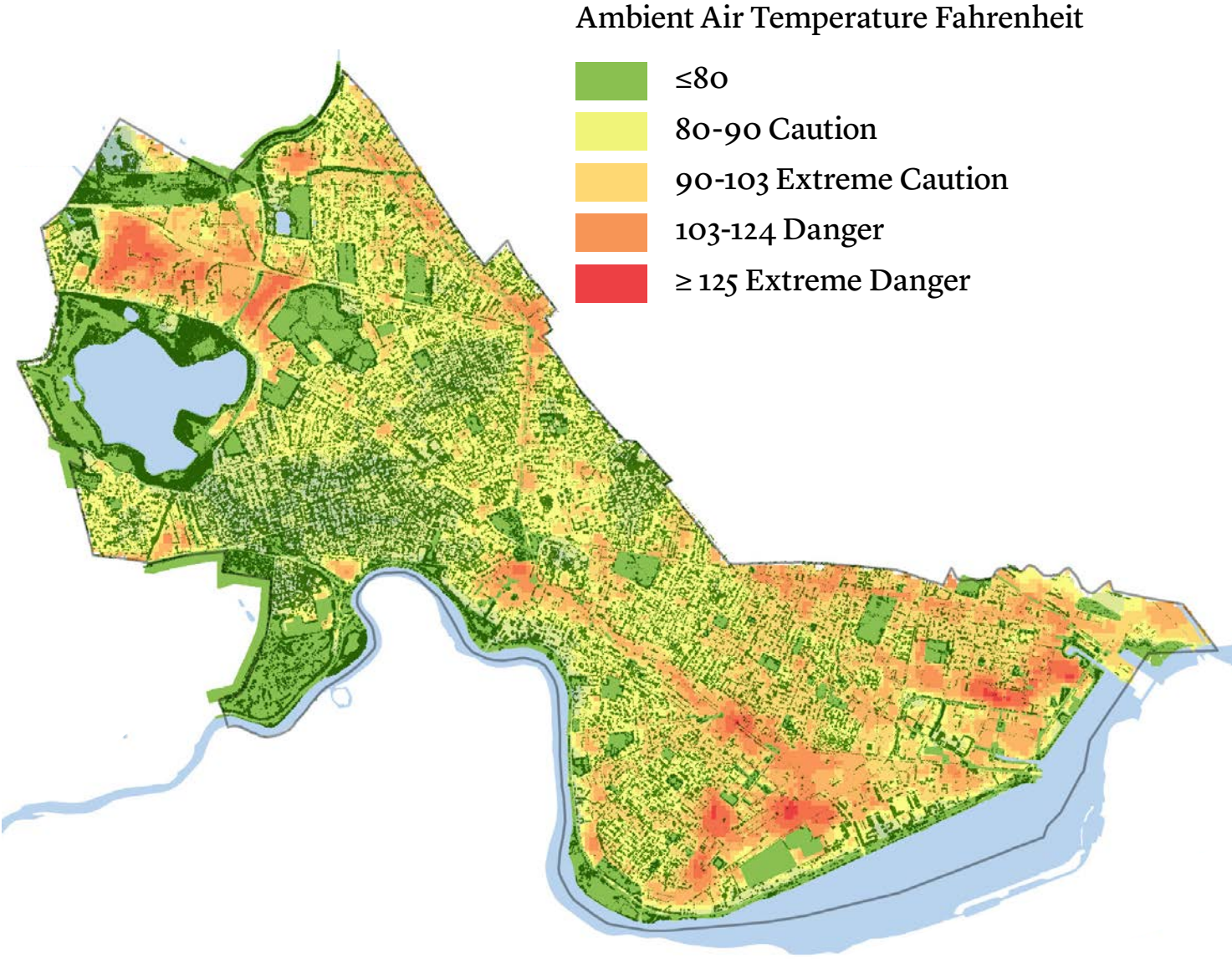


- Tree canopy loss between 2009-2014
- Existing 2014 Canopy Area
- Open Areas

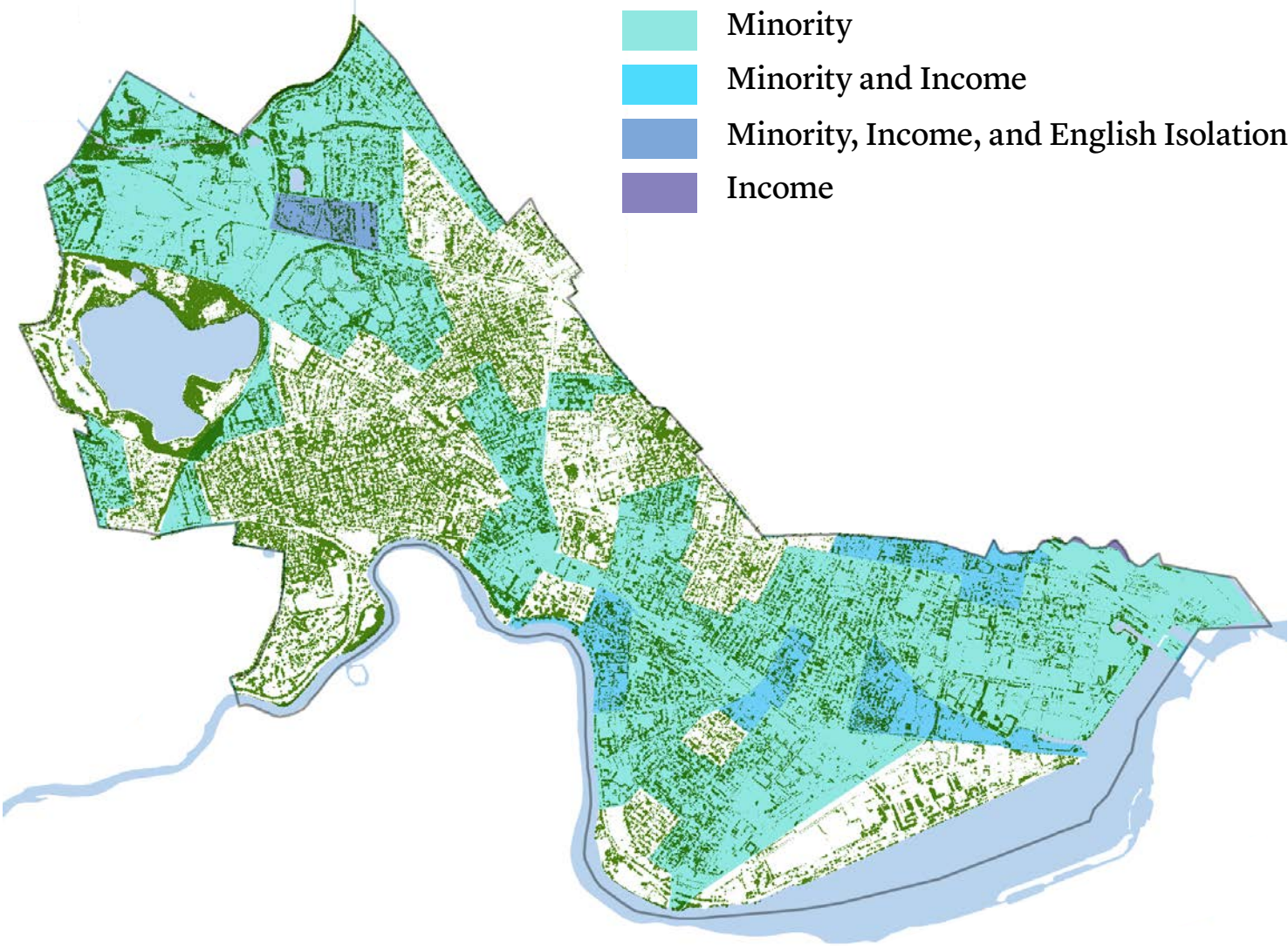
City of Cambridge Tree Canopy Loss Between 2009-2014

200 acres of canopy lost, representing 16% of total 2009 city tree canopy area

Source: Prepared by RH Team according to the UVM Study, 2017



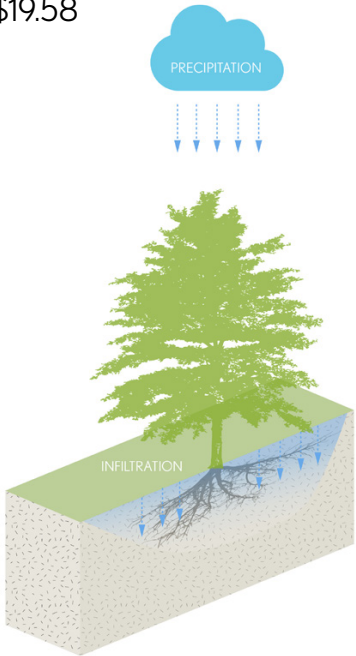
Urban heat island



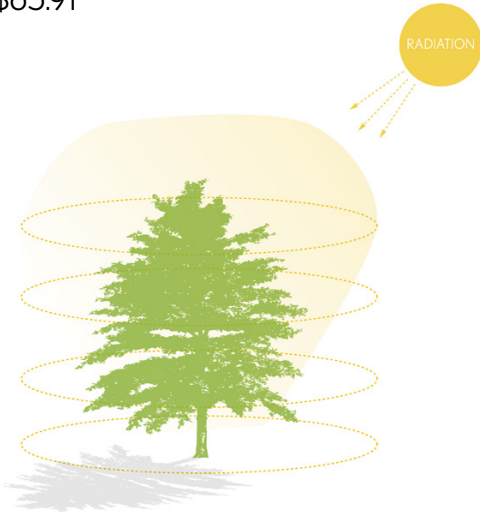
Vulnerable populations

WORKING FROM DATA | **QUANTIFYING THE BENEFITS OF THE URBAN FOREST**

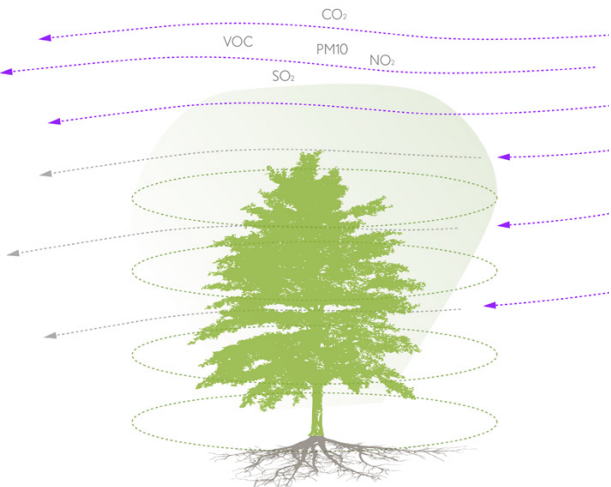
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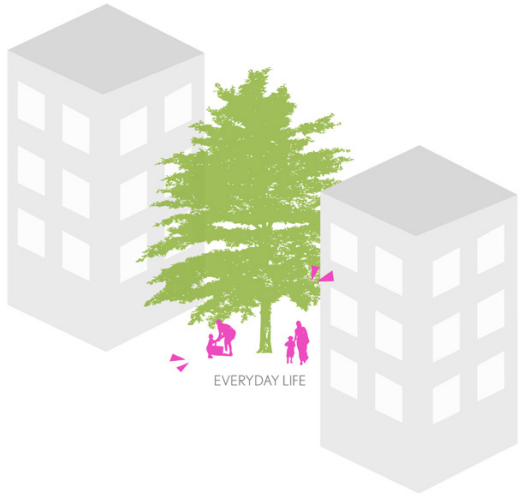
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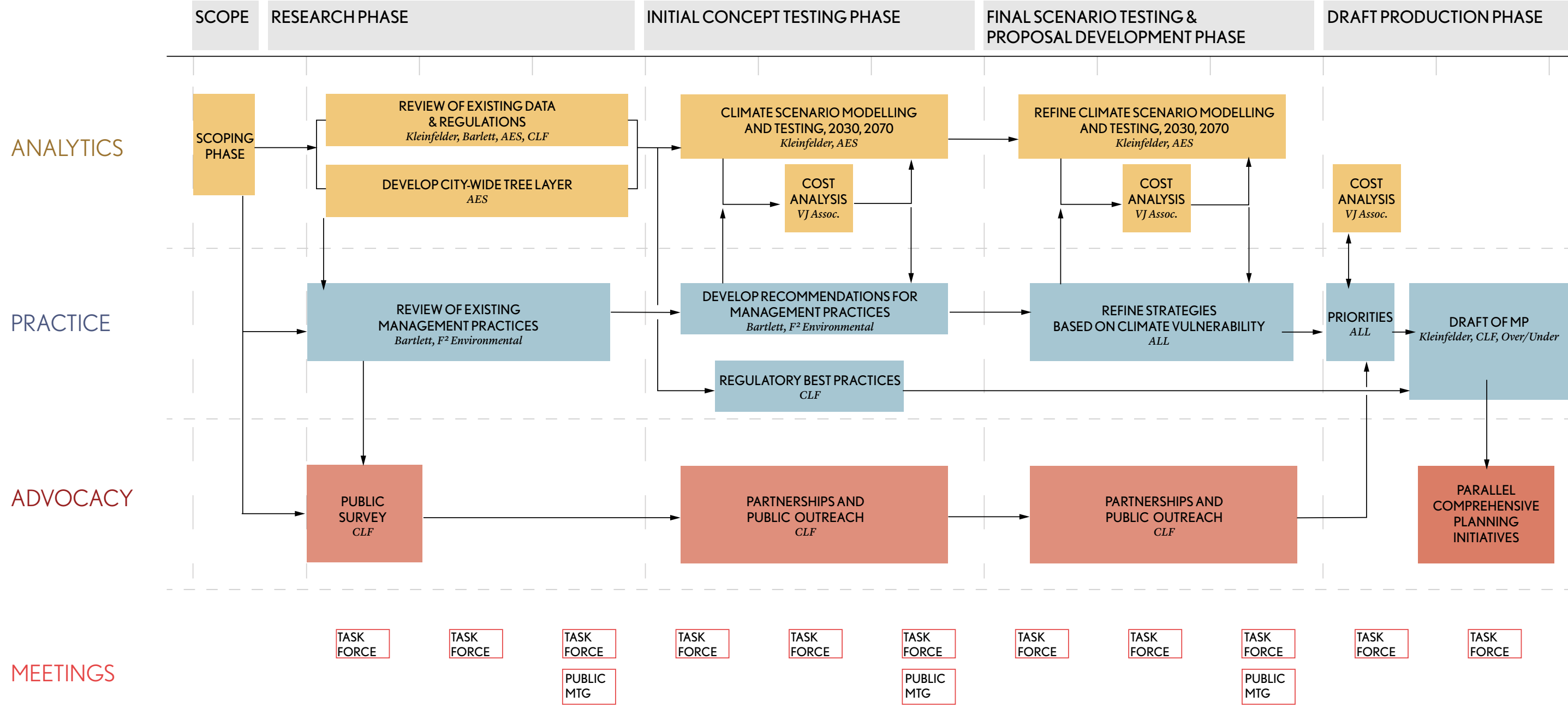


Ecosystem services for an average Pin Oak in Cambridge

Source: i-Tree Streets - Annual Savings for Average Pin Oak in Cambridge

Cultural Value

how do we adjust?



Public Survey

Representative Tree Health Survey

Soils Testing

Satellite Imagery Analysis

Analysis of Best Practices

— Arboriculture

— Soils Management

— Regulation / Policy

BREAK OUT GROUPS

WHAT DATA DO WE NEED?

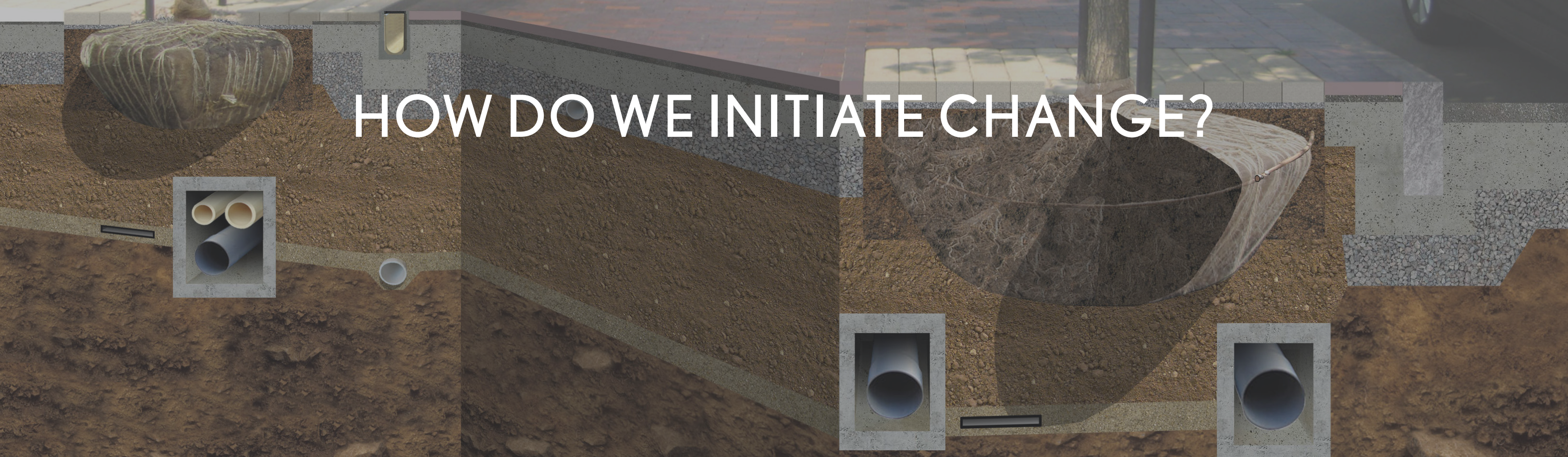
HOW DO WE ASSESS PERFORMANCE?

WHAT ARE THE KEY MODELS TO RUN?

WHAT ARE CURRENT PRACTICES?

WHAT ARE BEST PRACTICES / COMPARABLES?

HOW DO WE INITIATE CHANGE?



HOW DO WE ENGAGE RESIDENTS?

WHO ARE OUR BEST ALLIES / PARTNERS?

WHAT ARE OUR MOST POWERFUL
COMMUNICATION TOOLS?



BREAK OUT GROUPS

REPORT BACK

PUBLIC COMMENT

SCHEDULE

TASK FORCE MEETING SCHEDULE

JUNE 12	Introduction	NOVEMBER 29	PROPOSAL DEVELOPMENT:TBD
JUNE 28	RESEARCH: Regulatory and Management Review	DECEMBER 20	PROPOSAL DEVELOPMENT:TBD
JULY 26	RESEARCH: Initial Findings	JANUARY 31	PROPOSAL DEVELOPMENT:TBD
AUGUST 30	TESTING: Process and Key Questions	FEBRUARY 28	DRAFT DOCUMENTATION: TBD
SEPTEMBER 27	TESTING: Baseline	MARCH 28	DRAFT DOCUMENTATION: TBD
OCTOBER 25	TESTING: Findings		

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