Cambridge Urban Forest Master Plan

Task Force Meeting #11

April 25, 2019

CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

REED HILDERBRAND

KLEINFELDER Bright People. Right Solutions.

clf conservation law foundation

BARTLETT TREE EXPERTS SCIENTIFIC TREE CARE SINCE 1907

APPLIED ECOLOGICAL SERVICES

F²

ELLANA inc Construction Consultants

CANOPY LOSS INVESTIGATIONS

SCENARIO TESTING

TASK FORCE TAKEAWAYS

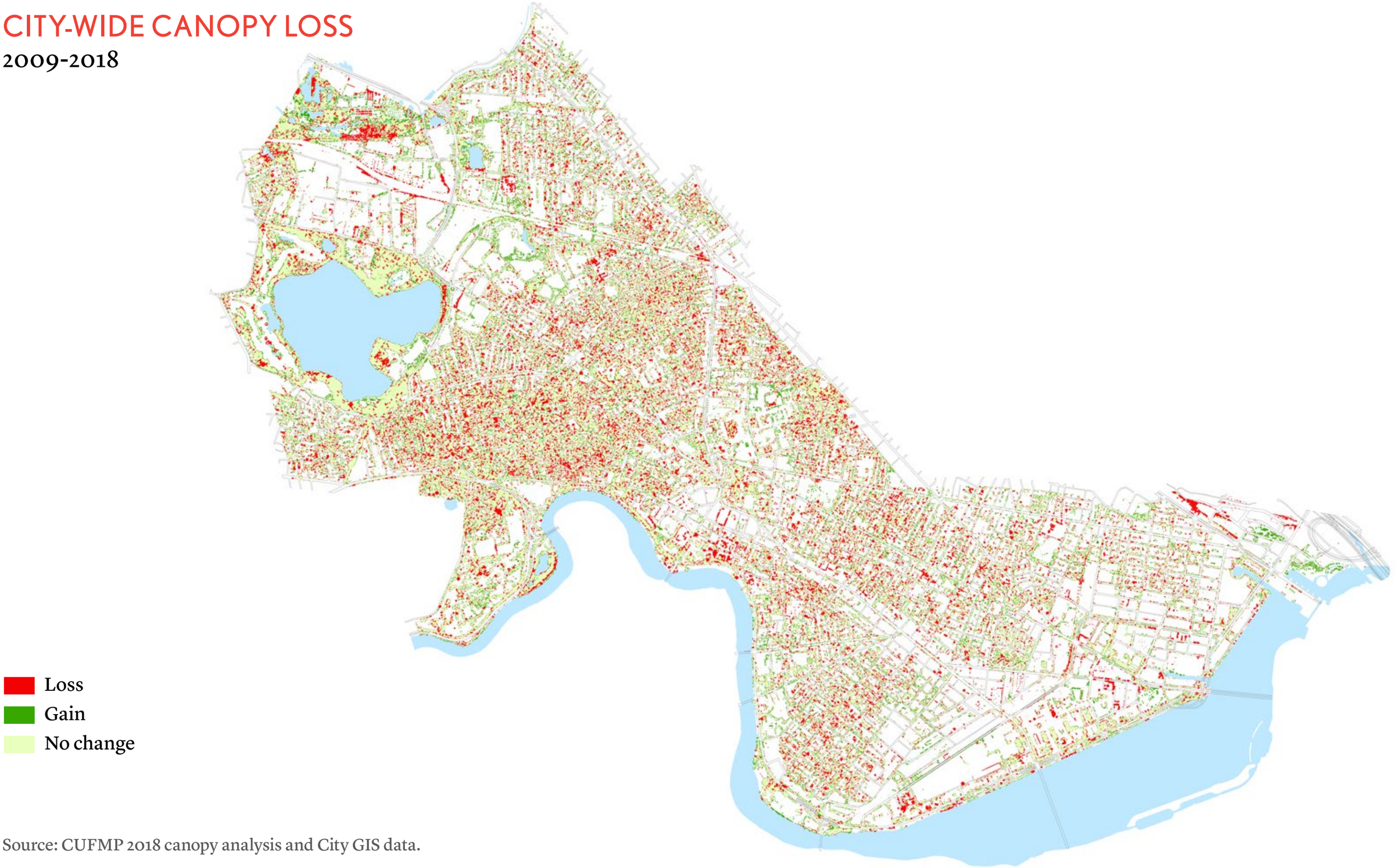
CANOPY LOSS INVESTIGATIONS

SCENARIO TESTING

TASK FORCE TAKEAWAYS

CITY-WIDE CANOPY LOSS

2009-2018



Source: CUFMP 2018 canopy analysis and City GIS data.

Data in this study has been modified
using an updated analysis of the loss rate
between 2009 and 2018 rather than 2014 and 2018.

Ongoing research by University of Vermont will provide a final analysis of 2018 canopy.

Today, Cambridge has **26%** of its land area covered by canopy.

Between 2009 and 2018, Cambridge's canopy declined on average by 16.4 acres* every year.

At this rate, canopy cover would be **21.6% in 2030**.

*Source: CUFMP 2018 canopy analysis

To assess potential causes of tree removals in Cambridge between 2009-2018, we asked three questions:

1 Is loss associated with an **increase in impervious area**?

Compare impervious cover (2010-2018) and canopy change (2009-2018)

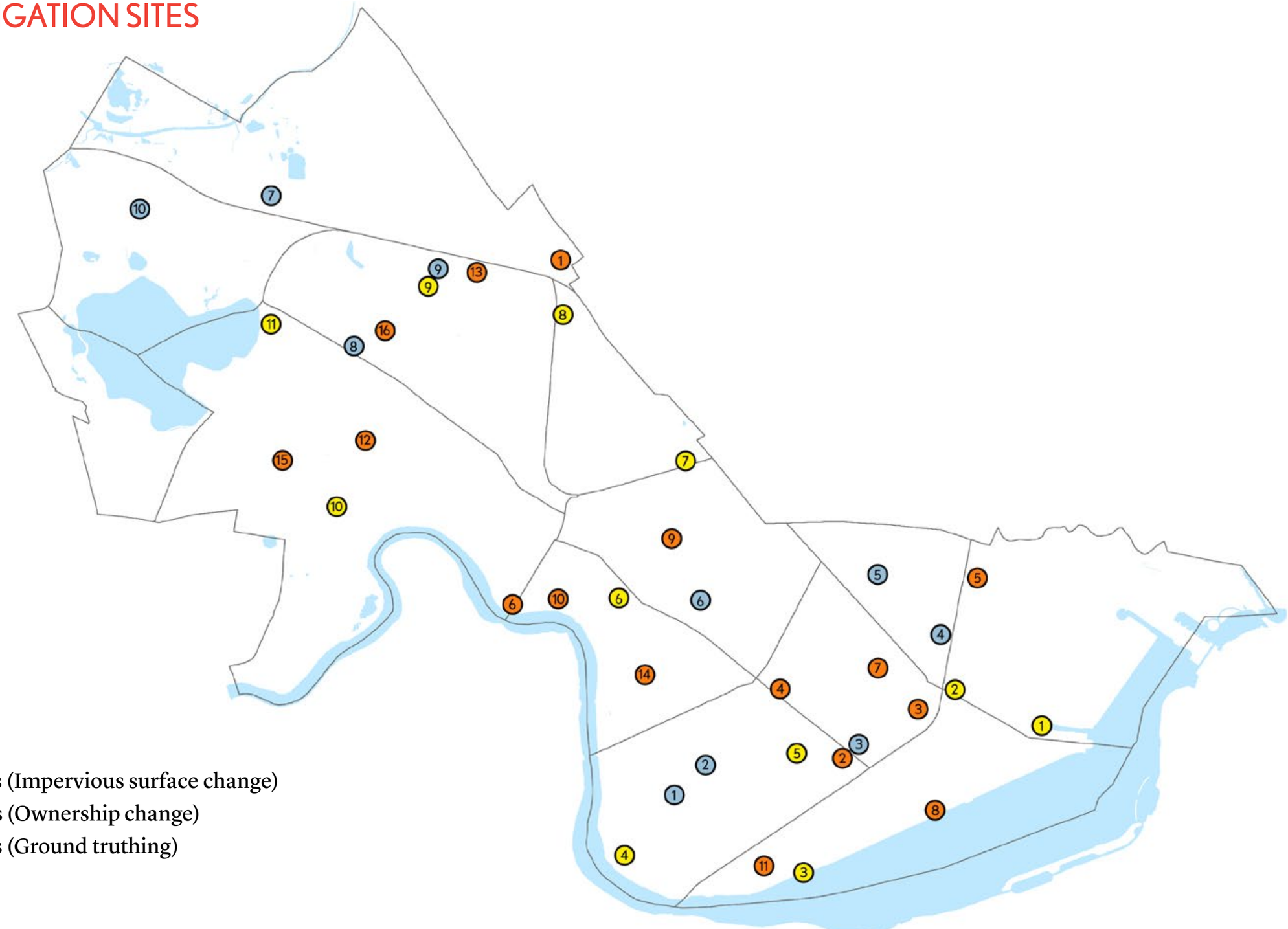
2 Is loss associated with **property sales**?

Compare 2015-2017 parcel sales and canopy change (2014-2018)

3 What **other causes** are there for canopy loss?

Undertake field investigation by visiting sites of loss.

LOSS INVESTIGATION SITES



- Task 1 sites (Impervious surface change)
- Task 2 sites (Ownership change)
- Task 3 sites (Ground truthing)

IMPERVIOUS AREA CHANGE

Methodology

Using the aerial mapping

overlay

change in **impervious cover** between 2010 and 2018

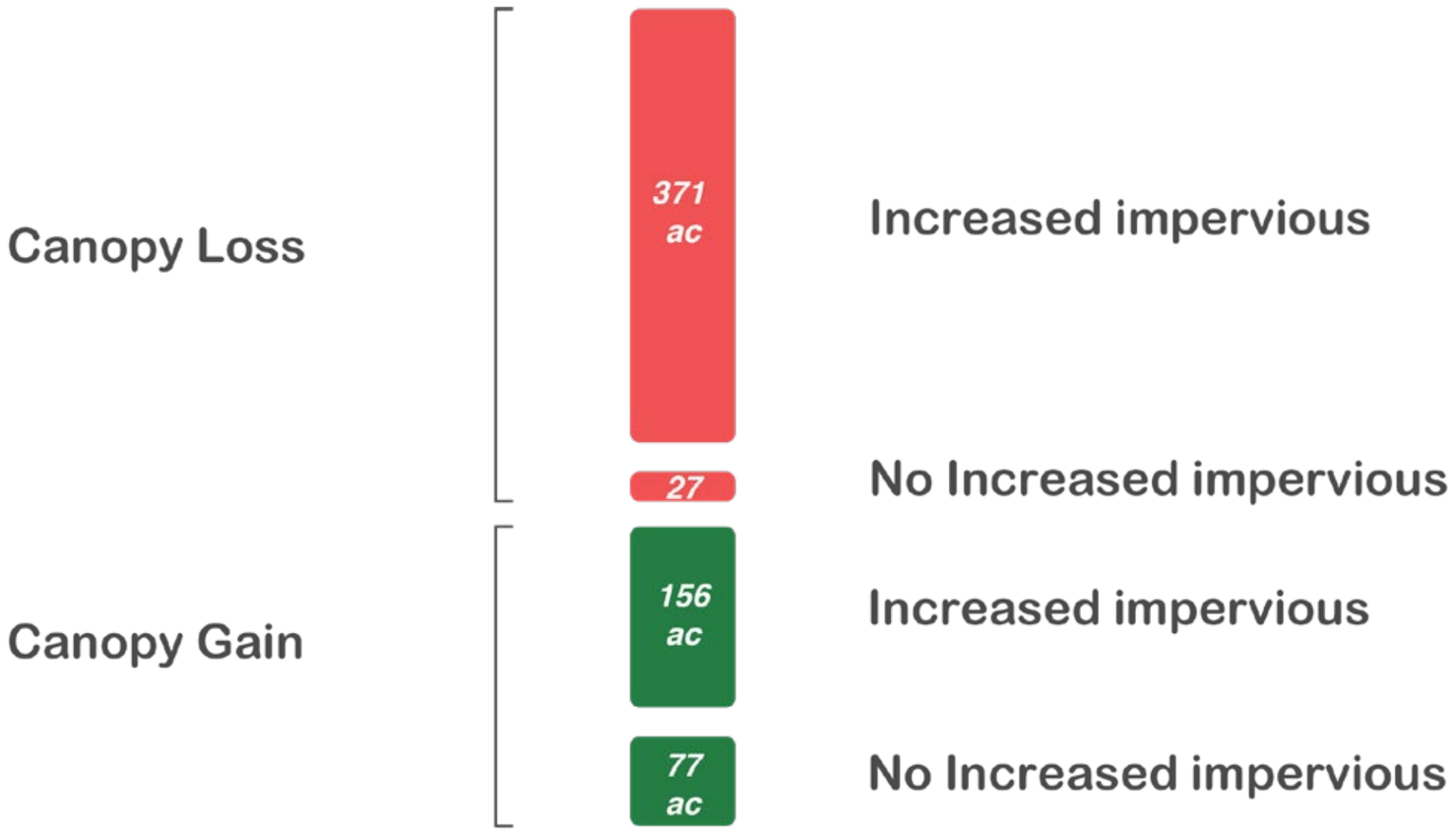
and

change in **canopy cover** between 2009 and 2018 to

assess correlation

IMPERVIOUS AREA CHANGE – PRELIMINARY FINDINGS

Increased impervious area is correlated with significant canopy loss



Using the aerial mapping and city records

overlay

property sales from 2015 to 2017

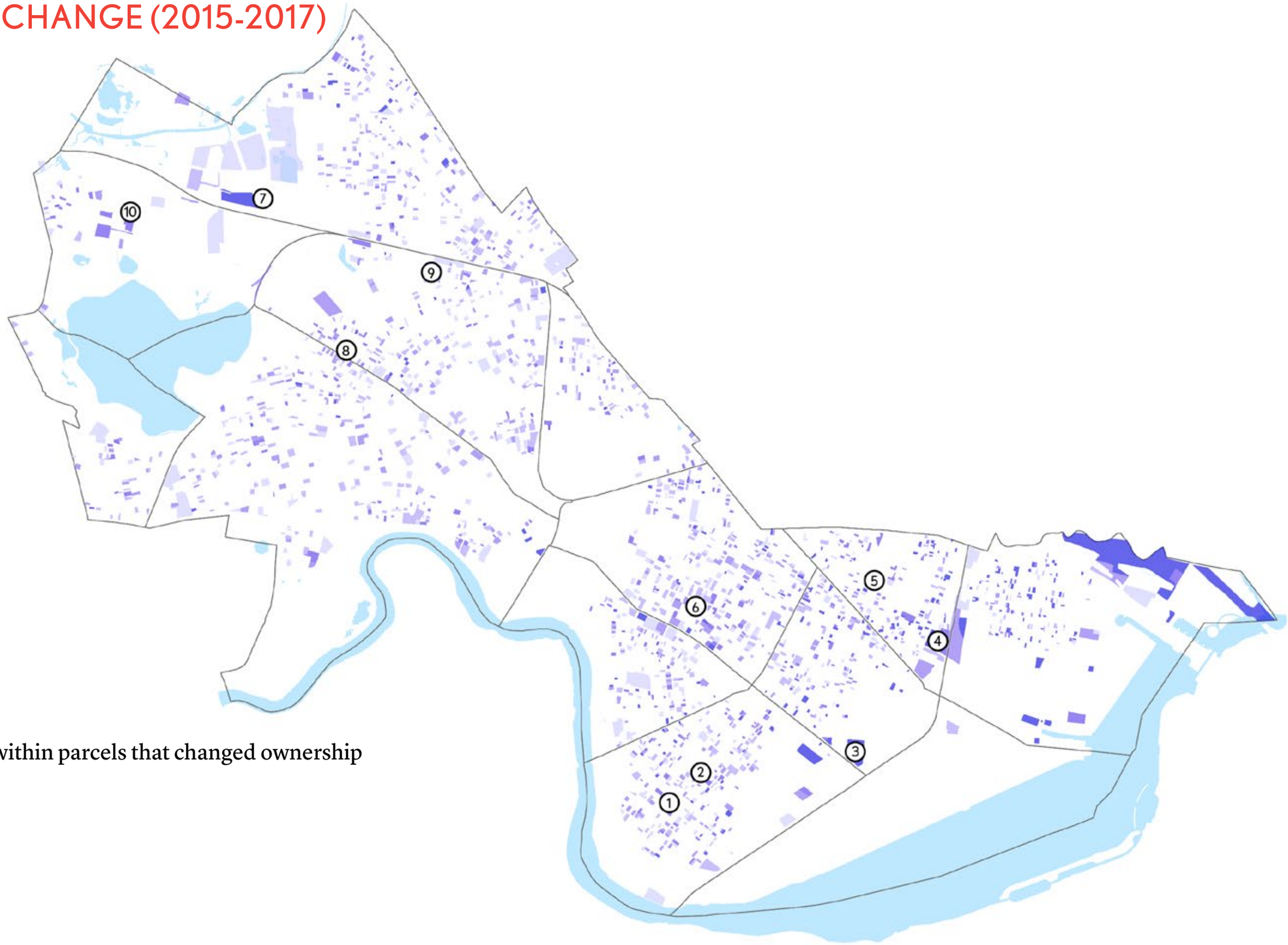
and

change in **canopy cover** between 2014 and 2018 to

assess correlation

OWNERSHIP CHANGE (2015-2017)

Selected sites



Percent canopy loss within parcels that changed ownership and show losses

- 0.2-15%
- 15-32%
- 32-53%
- 53-79%
- 79-100%

OWNERSHIP CHANGE – FINDINGS

18% of total canopy loss is associated with land sold from 2015 to 2017

2,945 parcel sales took place from January 1, 2015 to December 31, 2017 in Cambridge

22.3 acres of canopy loss (of 330 total gross loss) was on land sold during that time.

10.5 acres (almost half) of 22.3 acre loss was associated with just 179 parcels.

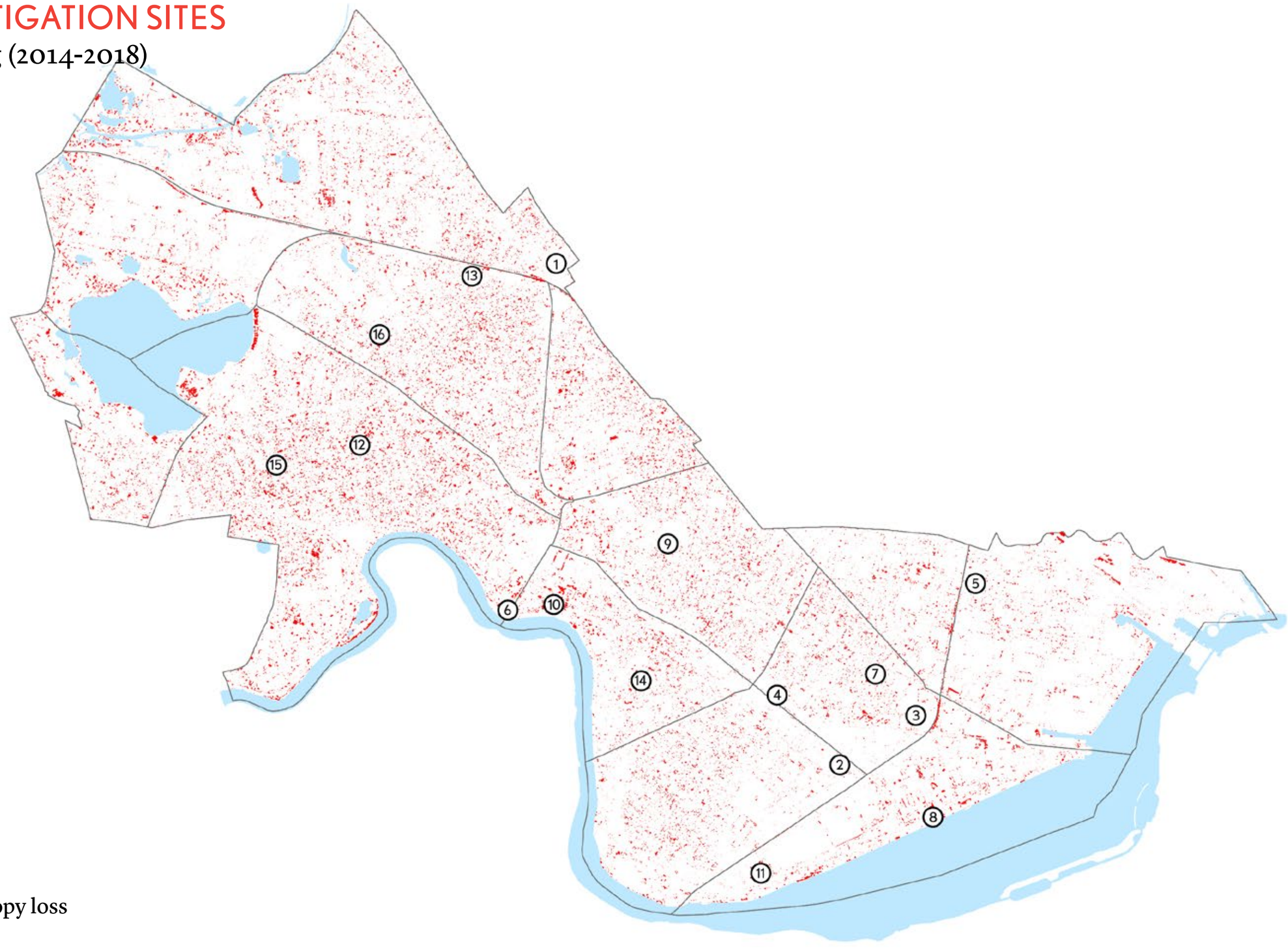
1,100 parcels showed only minor losses.

29 parcels contributed 2.9 acres of new canopy.

313 parcels contributed 4.1 acres of new canopy.

FIELD INVESTIGATION SITES

Ground truthing (2014-2018)



2014-2018 Canopy loss

These studies suggest an association between four conditions and canopy loss.

— New construction

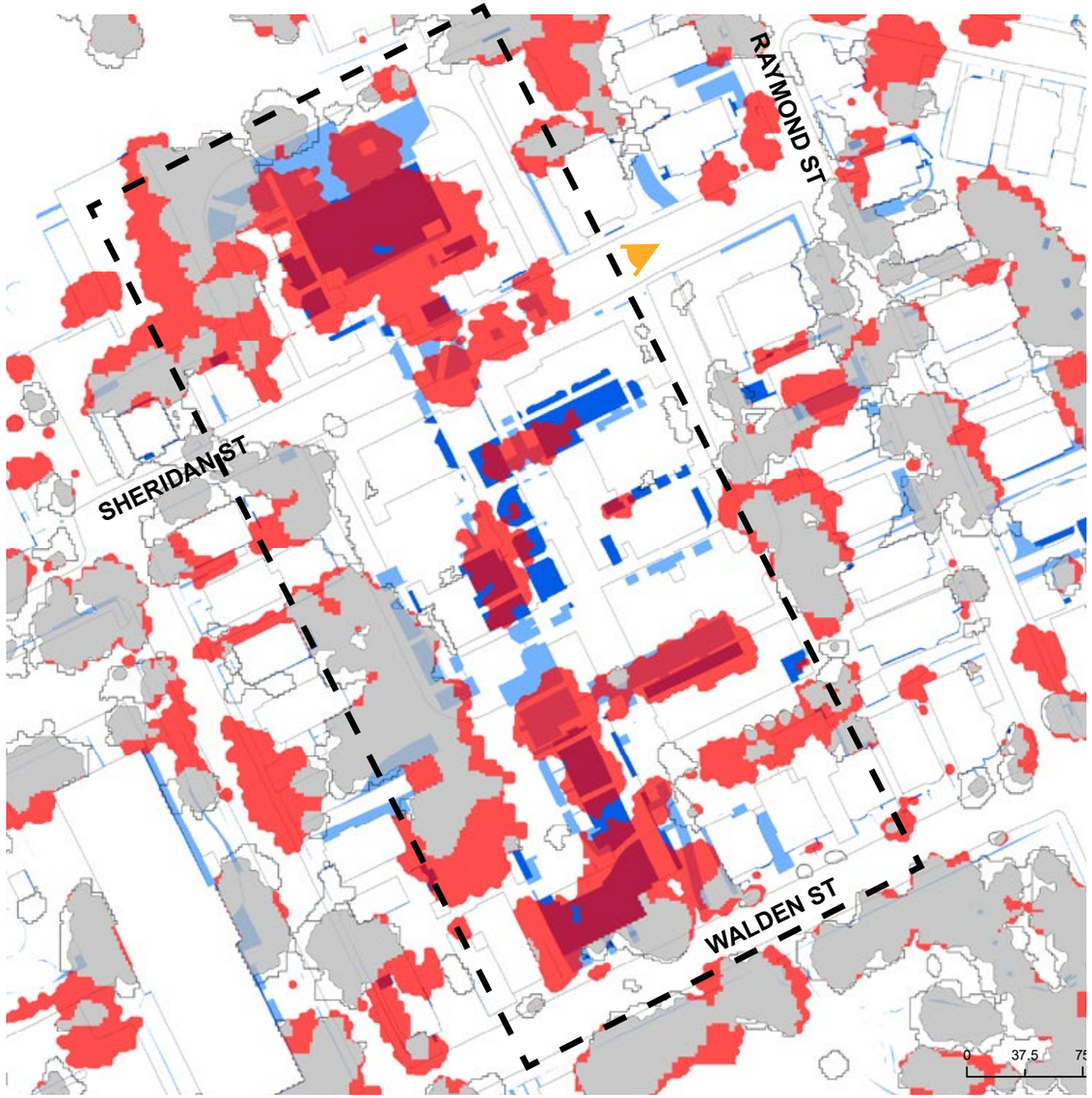
— Renovation & Site Improvements

— Mortality (declining health)

— Miscellaneous decisions by individual owners

NEW CONSTRUCTION

Tree removal is associated with a new development.
New structures and eliminating pervious surfaces affected the tree canopy.



2009-2018 Canopy loss
Canopy gain
No canopy change
New structure
New pavement
Study area
Viewpoint

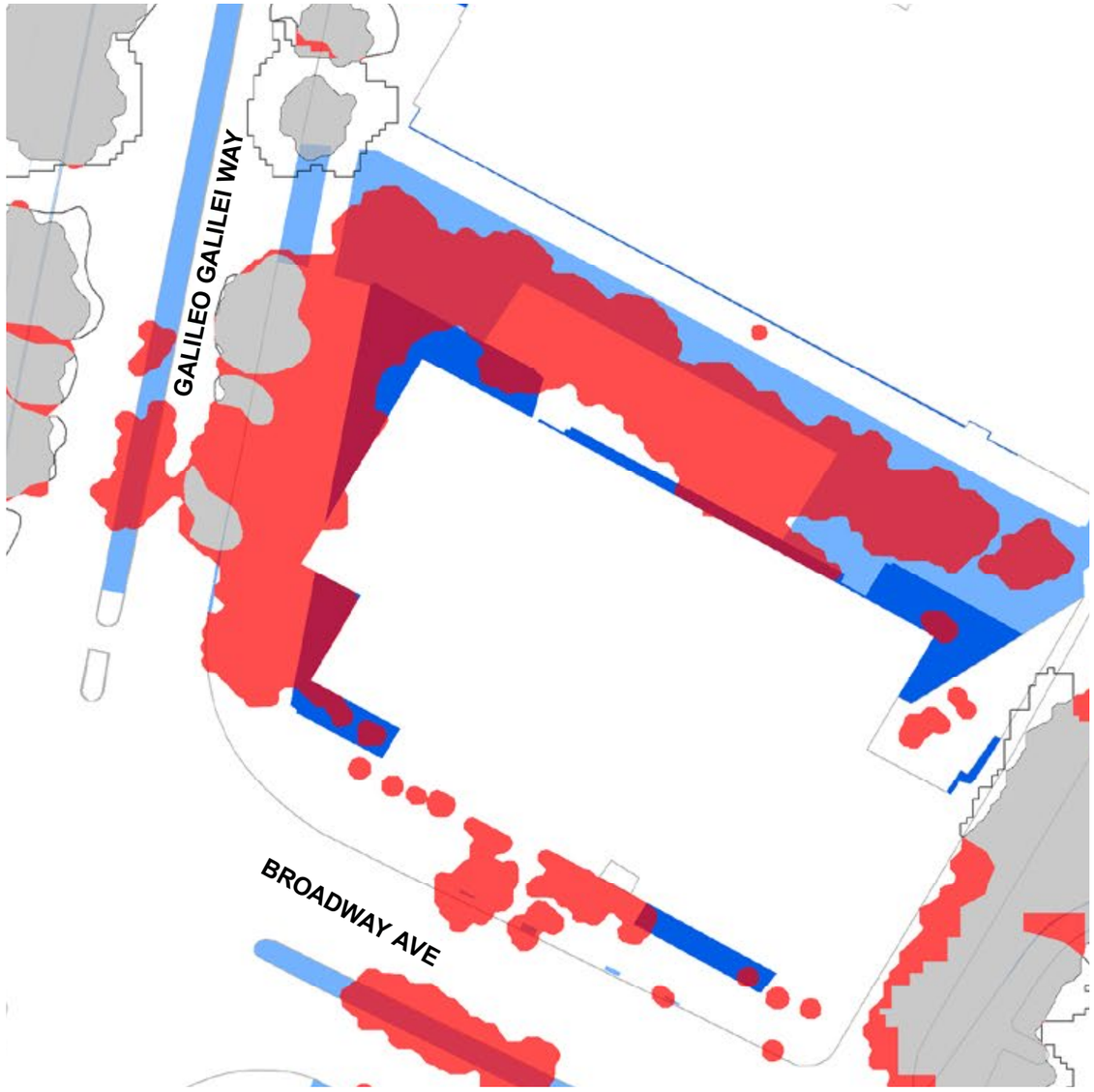
2011

2018

Project type: Residential

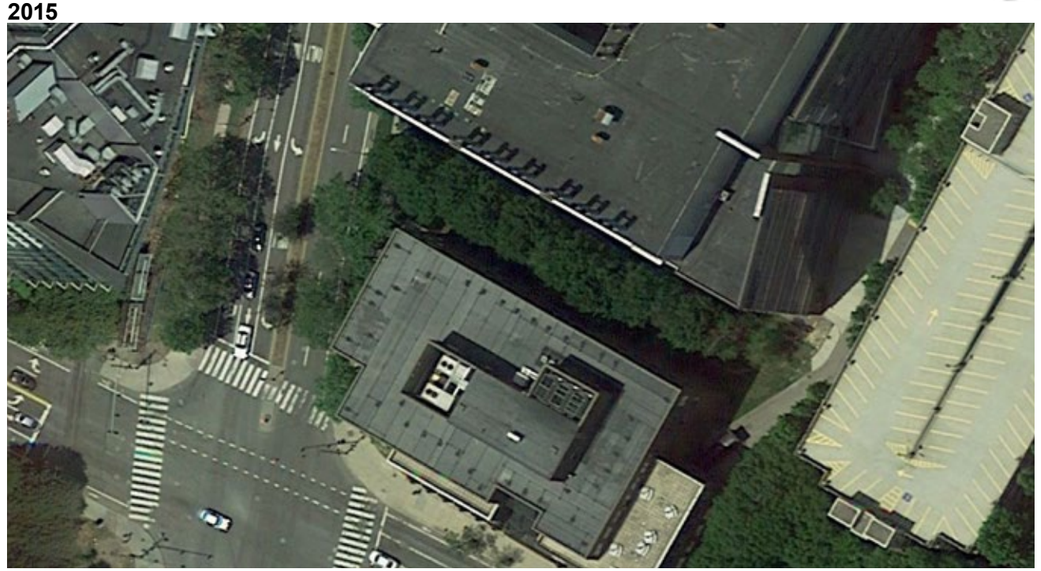
NEW CONSTRUCTION

Tree removal is associated with construction of a new commercial building on Broadway Ave. Street design change also impacted trees in the median.



2009-2018 Canopy loss
Canopy gain
No canopy change
New structure
New pavement

2015

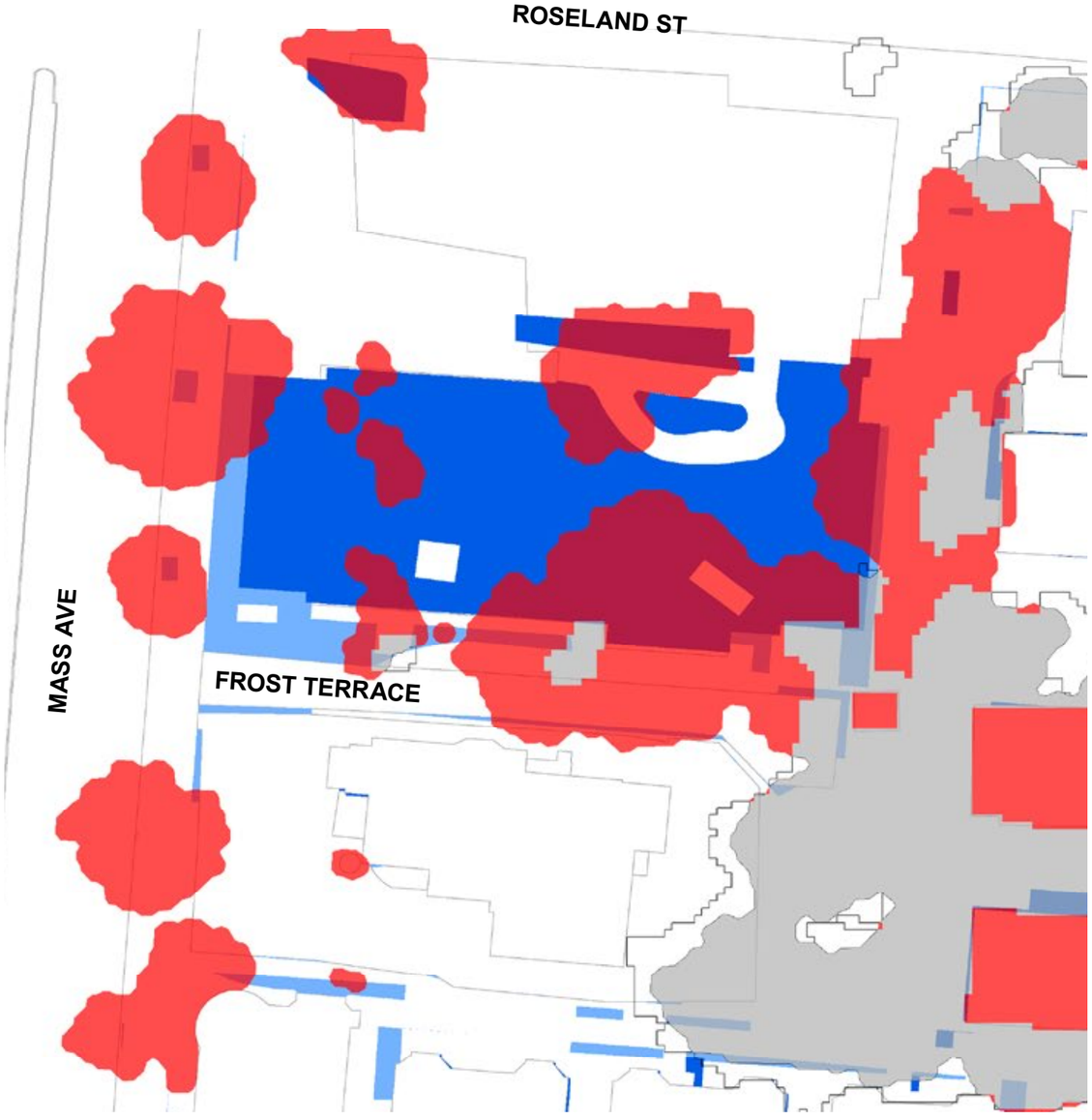


2018

Project type: Commercial

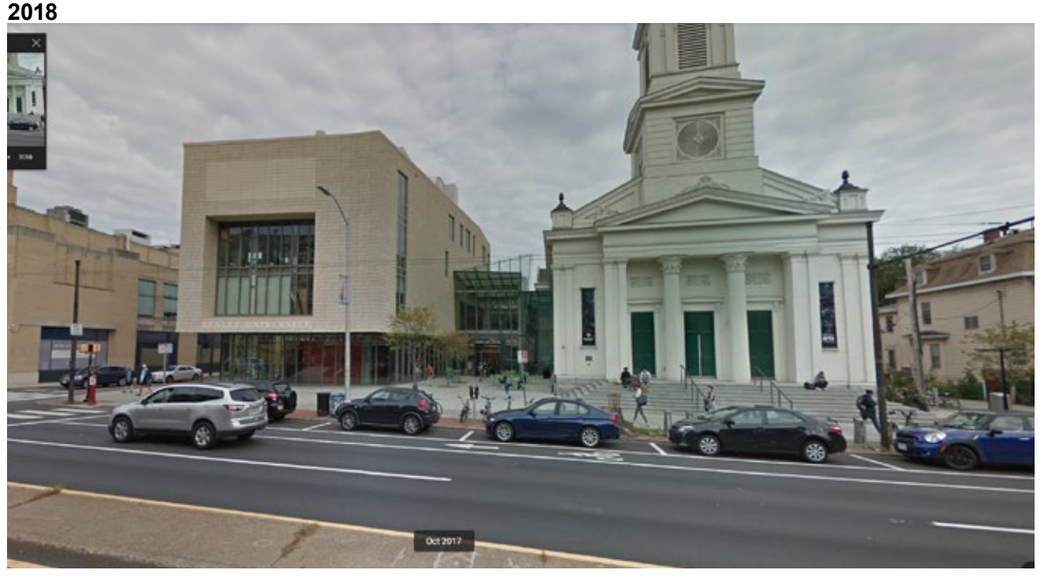
NEW CONSTRUCTION

Tree removal from the green space on Mass Ave is associated with relocating the church



2010

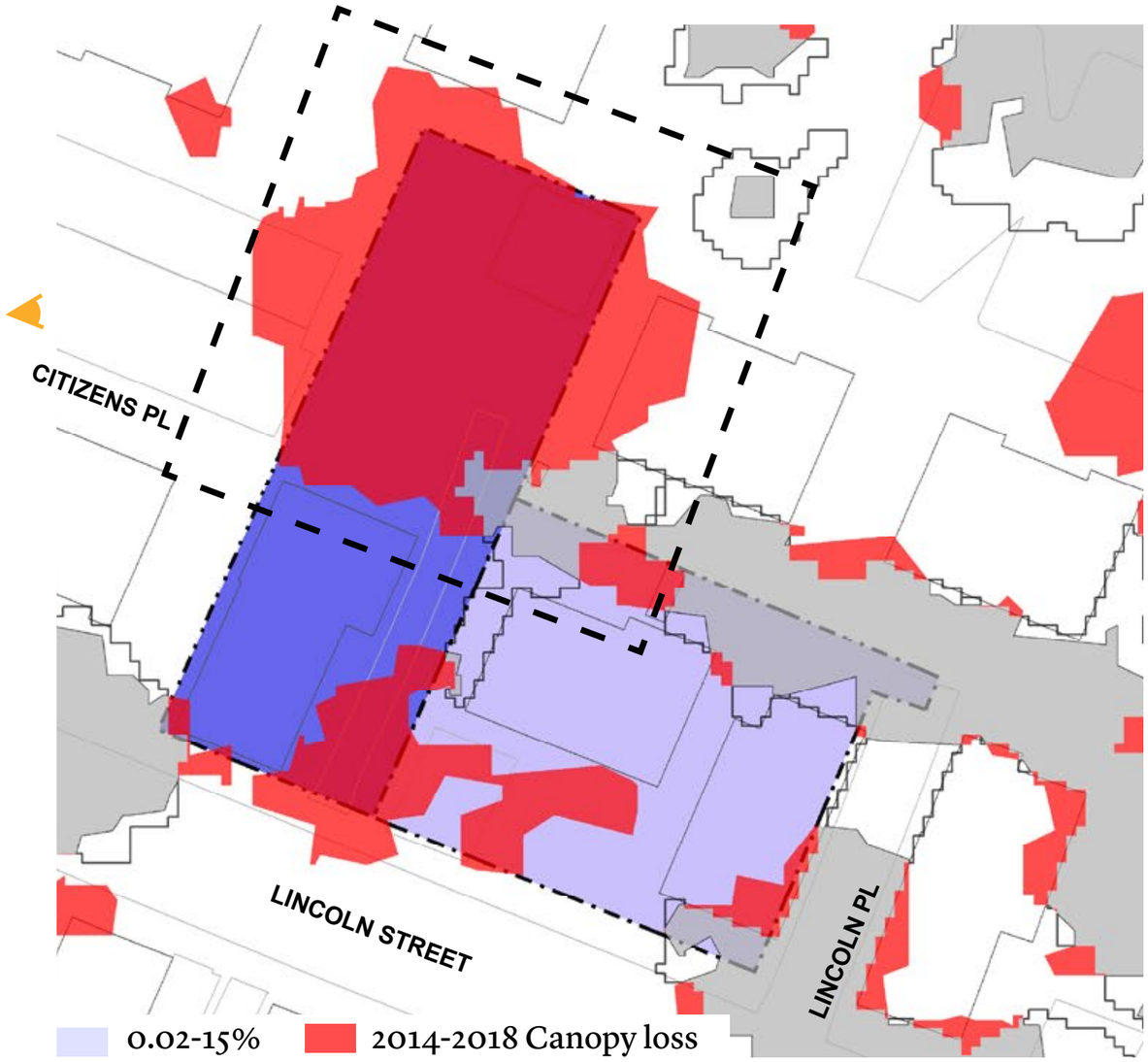
2018



Project type: Institutional, Lesley University

NEW CONSTRUCTION

Tree removal on Lincoln Street is associated with a new residential building.



2011

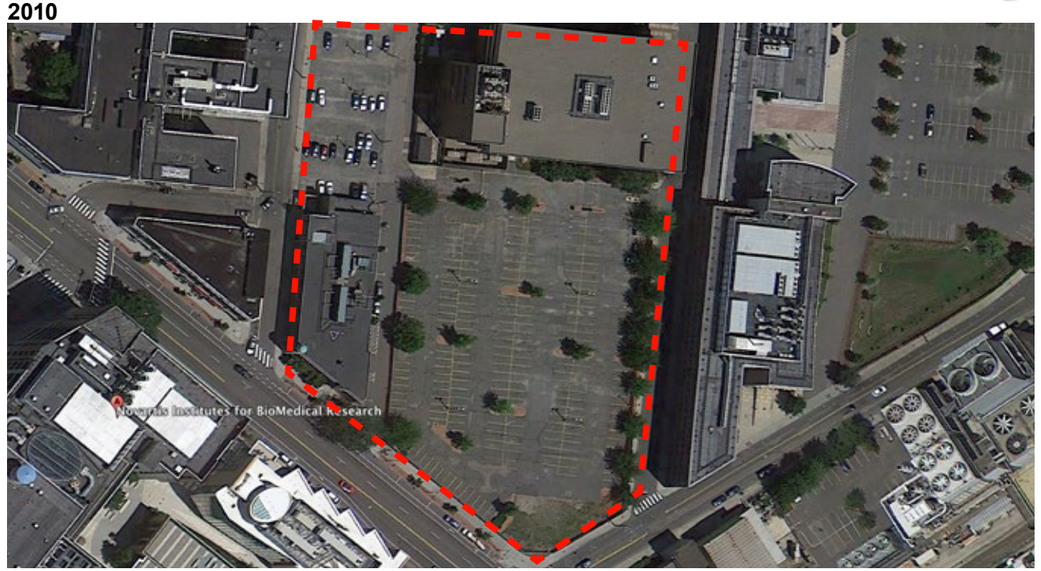
2018

Project type: Residential

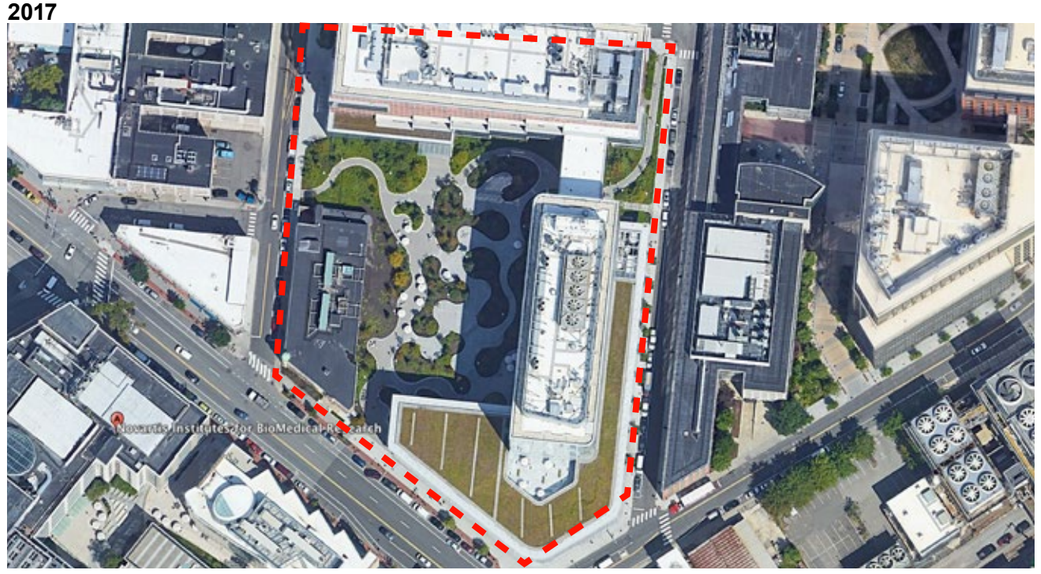
NEW CONSTRUCTION

Novartis replaced the parking lot and trees, however the project provides an open space with new trees and a green roof

2010



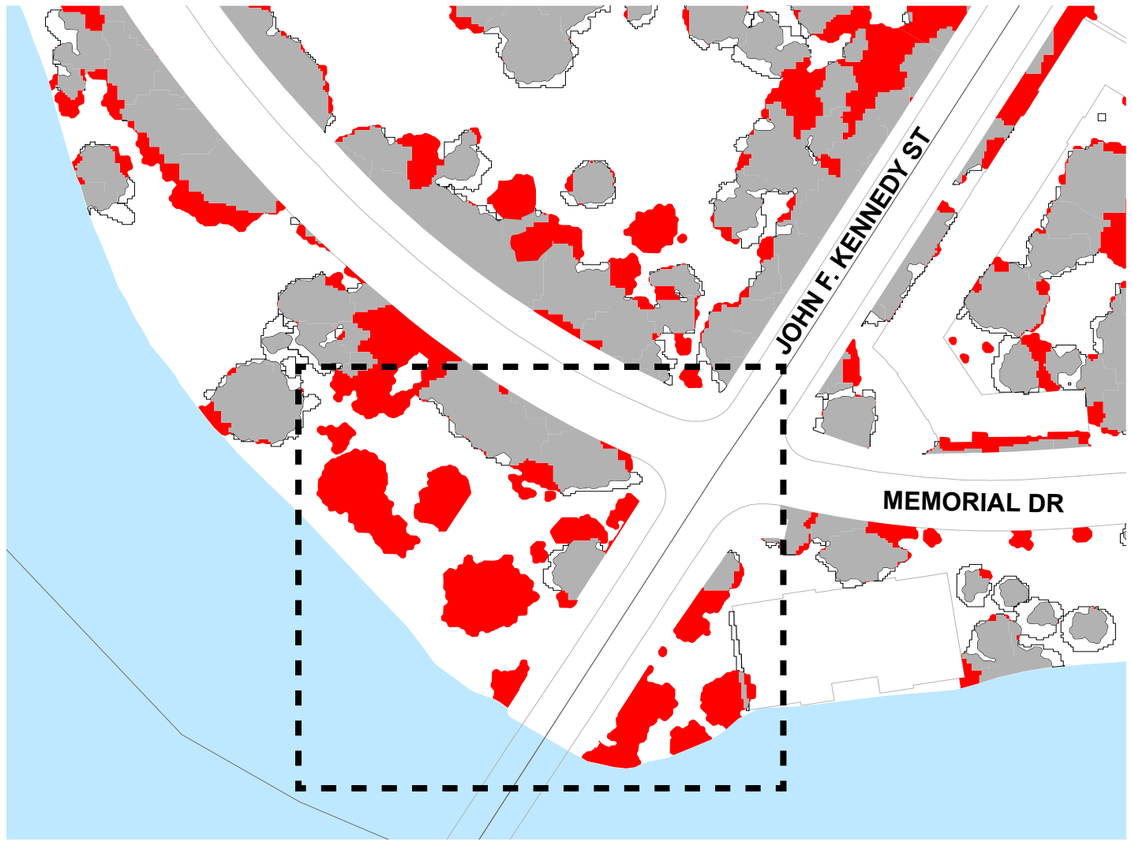
2017



Project type: Commercial

NEW CONSTRUCTION

During the restoration of Anderson Memorial Bridge, most of the trees along the river were removed.



2014-2018 Canopy loss
Canopy gain
No canopy change
Study area

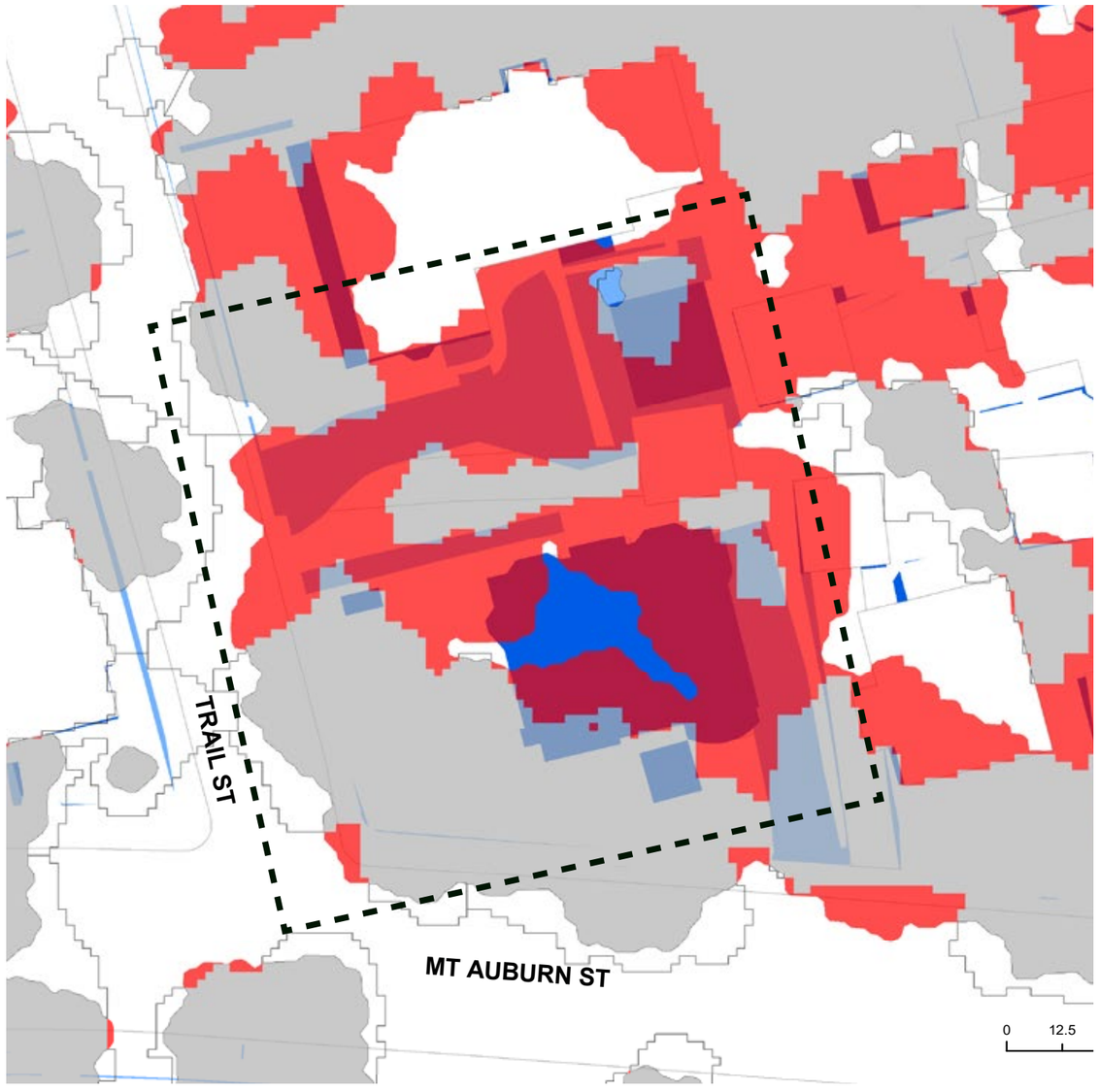
2010

2018

Project type: State (DCR + Mass DOT)

RENOVATION

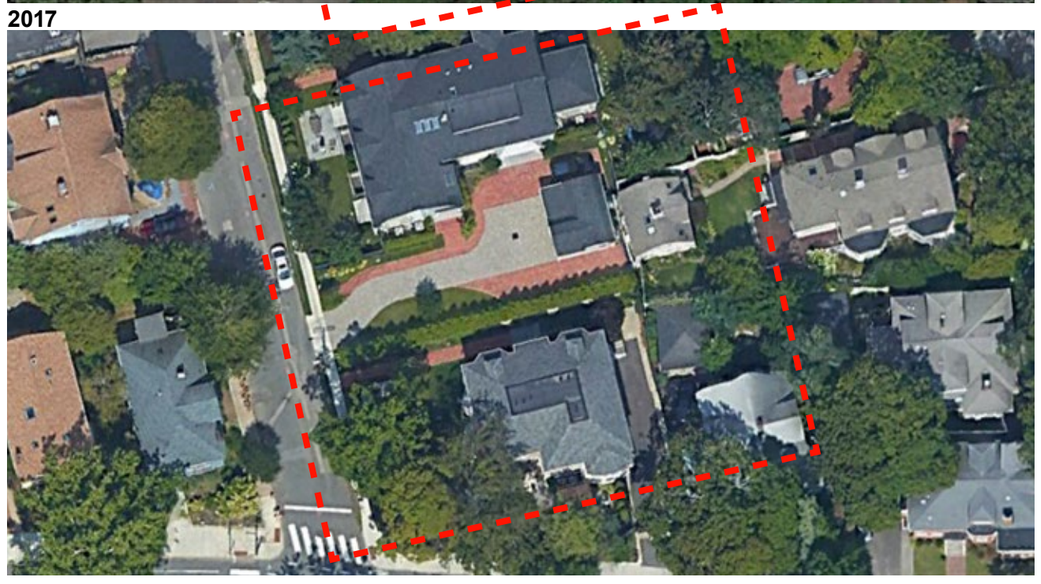
Tree removal is associated with a yard renovation and new construction near Mt Auburn St.



2009-2018 Canopy loss
Canopy gain
No canopy change
New structure
New pavement
Study area

2010

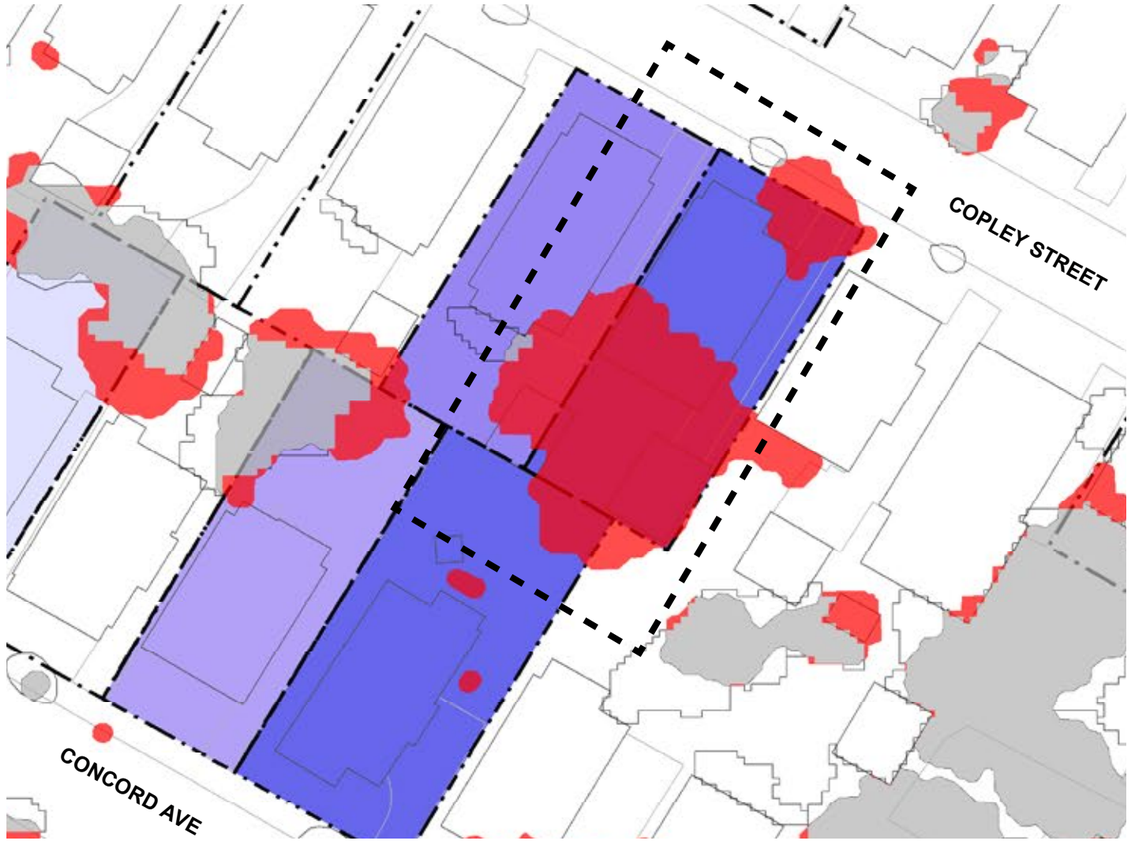
2017



Project type: Residential

RENOVATION

Trees removal associated with a backyard renovation on Copley Street after ownership change.



0.02-15%
15-32%
32-53%
53-79%
79-100%

2014-2018 Canopy loss
Canopy gain
No canopy change
Study area
Property line of sold parcels

2010

2017

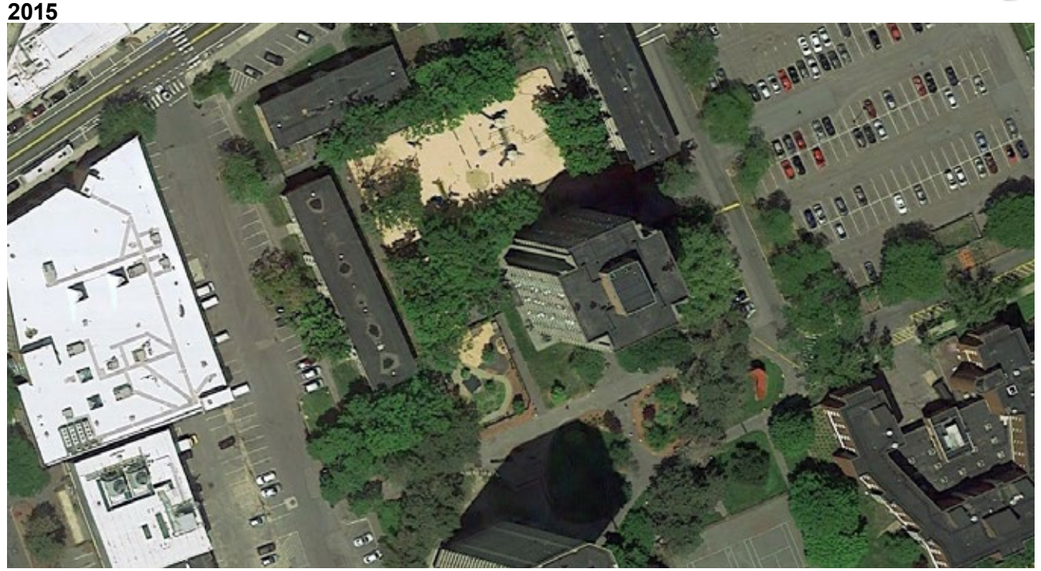
Project type: Residential

RENOVATION

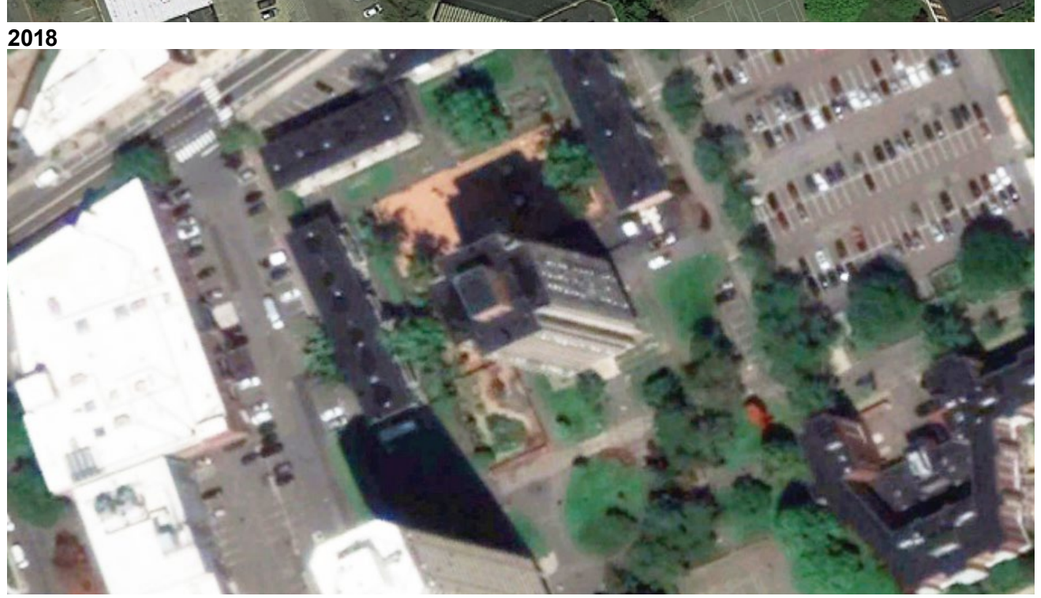
Tree removal is asociated with the MIT Westgate complex renovation.

2009-2018 Canopy loss
Canopy gain
No canopy change

2015



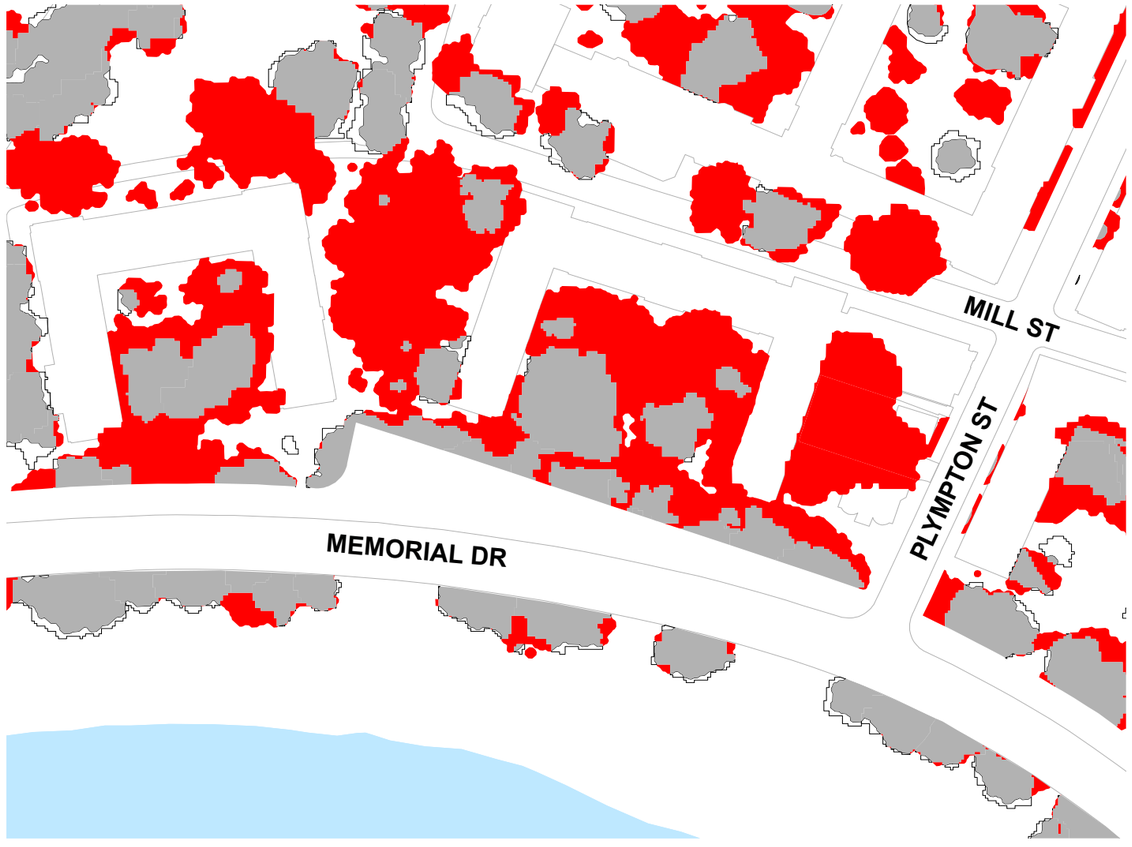
2018



Project type: Institutional

RENOVATION

Tree removal is associated with the Harvard Winthrop House renovation.



2014-2018 Canopy loss
Canopy gain
No canopy change

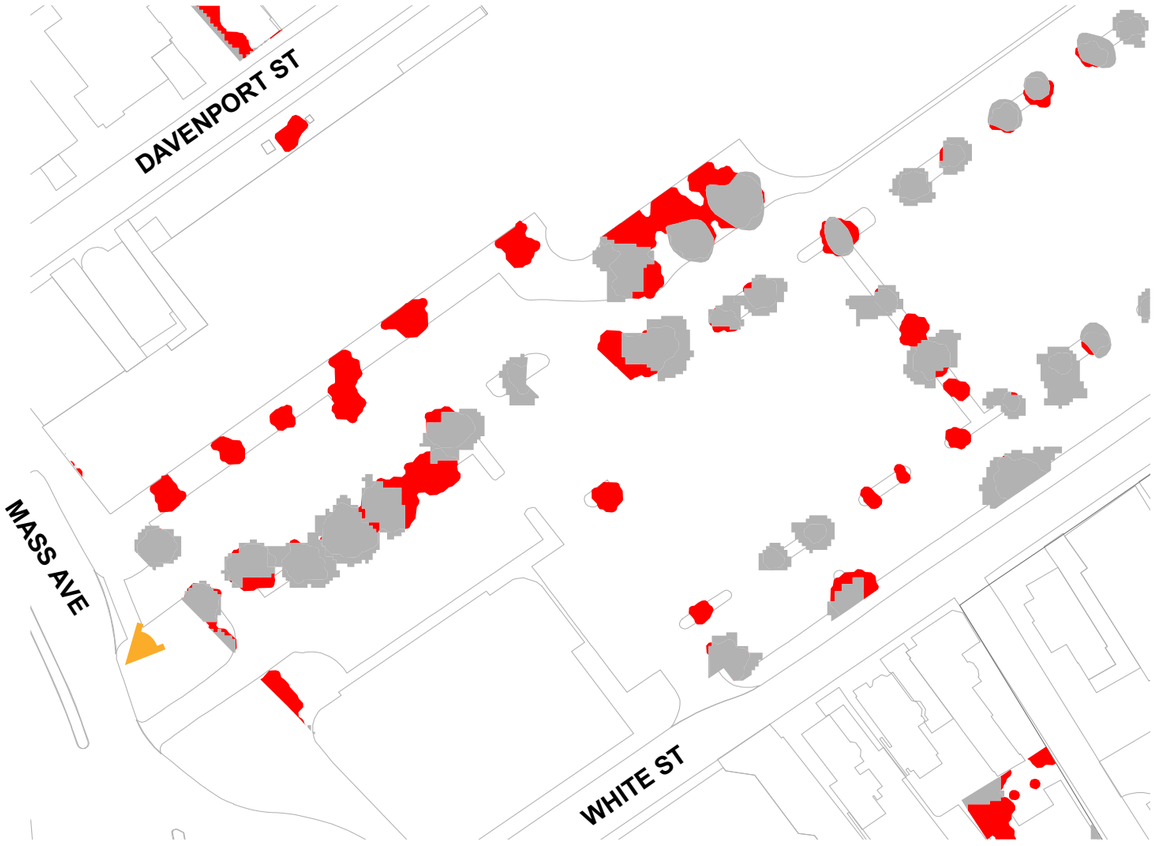
2010

2018

Project type: Institutional

MORTALITY

Trees at the Porter Square parking lot were replaced by new small trees.



2014-2018 Canopy loss
Canopy gain
No canopy change

2013

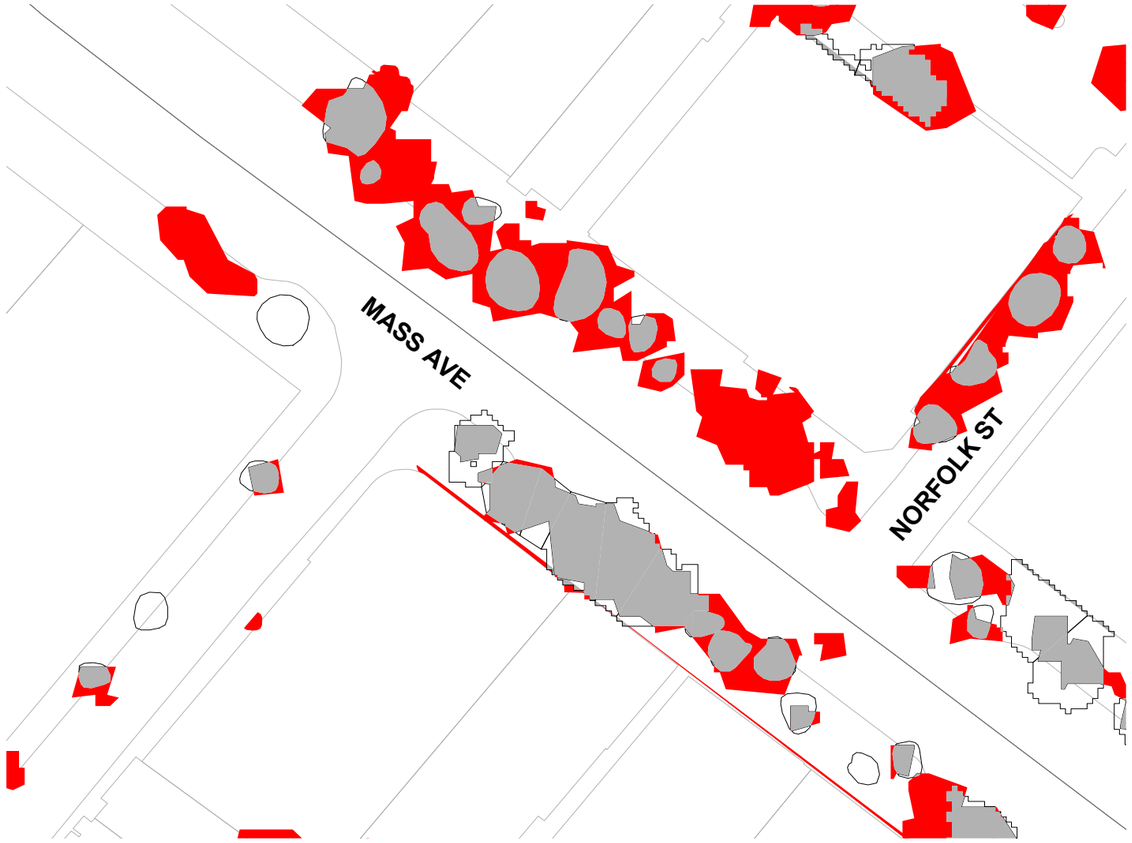
2016

Project type: Commercial

UNCATEGORIZED

Trees on Mass Ave were removed due to infrastructure renovation and lost to mortality

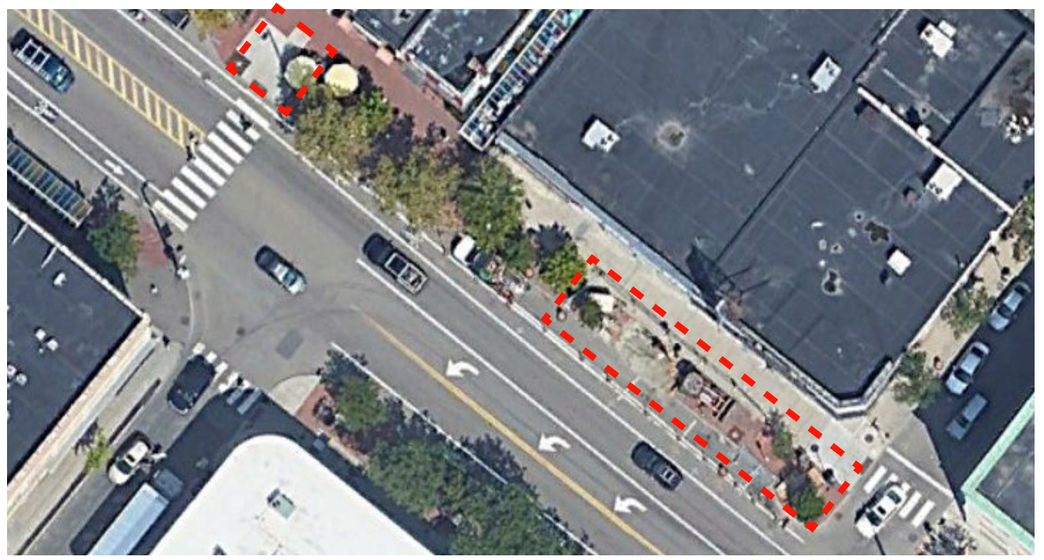
3



2014-2018 Canopy loss
Canopy gain
No canopy change

2013

2017

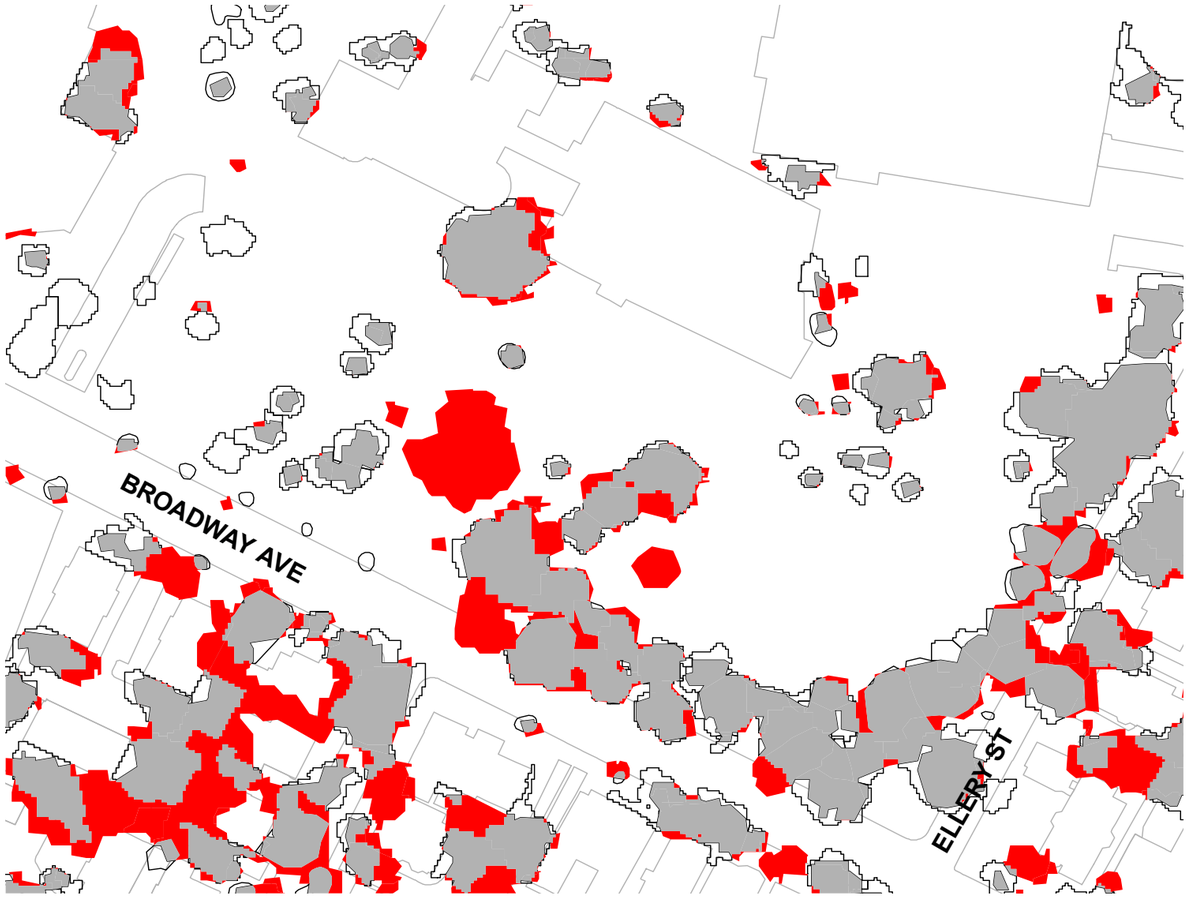


Project type: Public ROW

UNCATEGORIZED

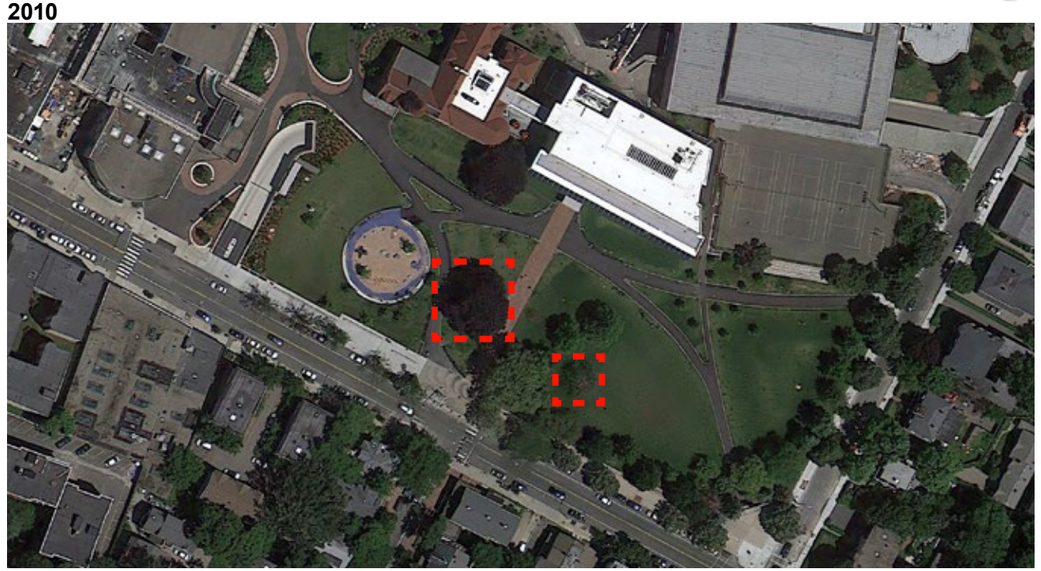
Two trees at the Cambridge Public Library died due to construction activity and transplanting

3

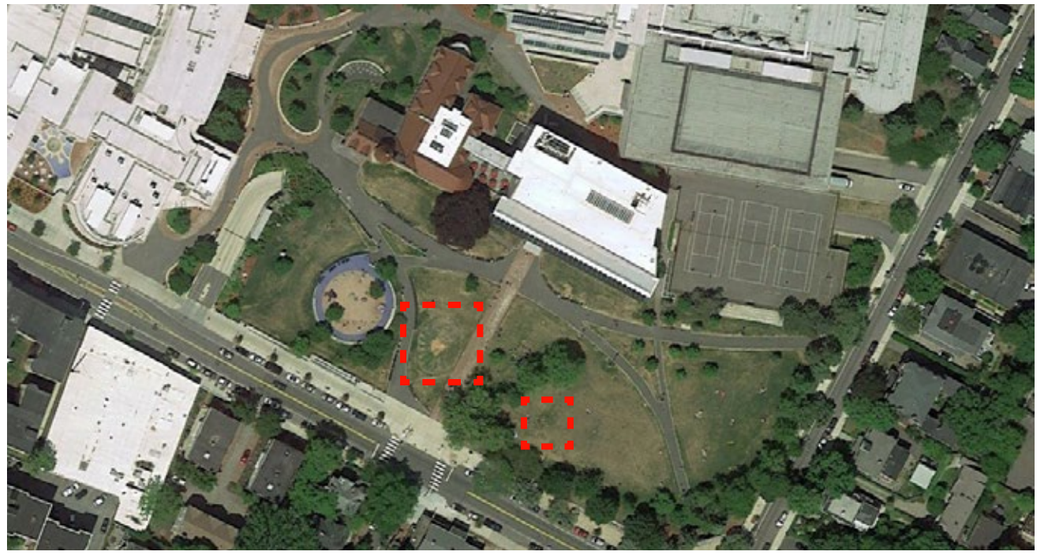


2014-2018 Canopy loss
Canopy gain
No canopy change

2010



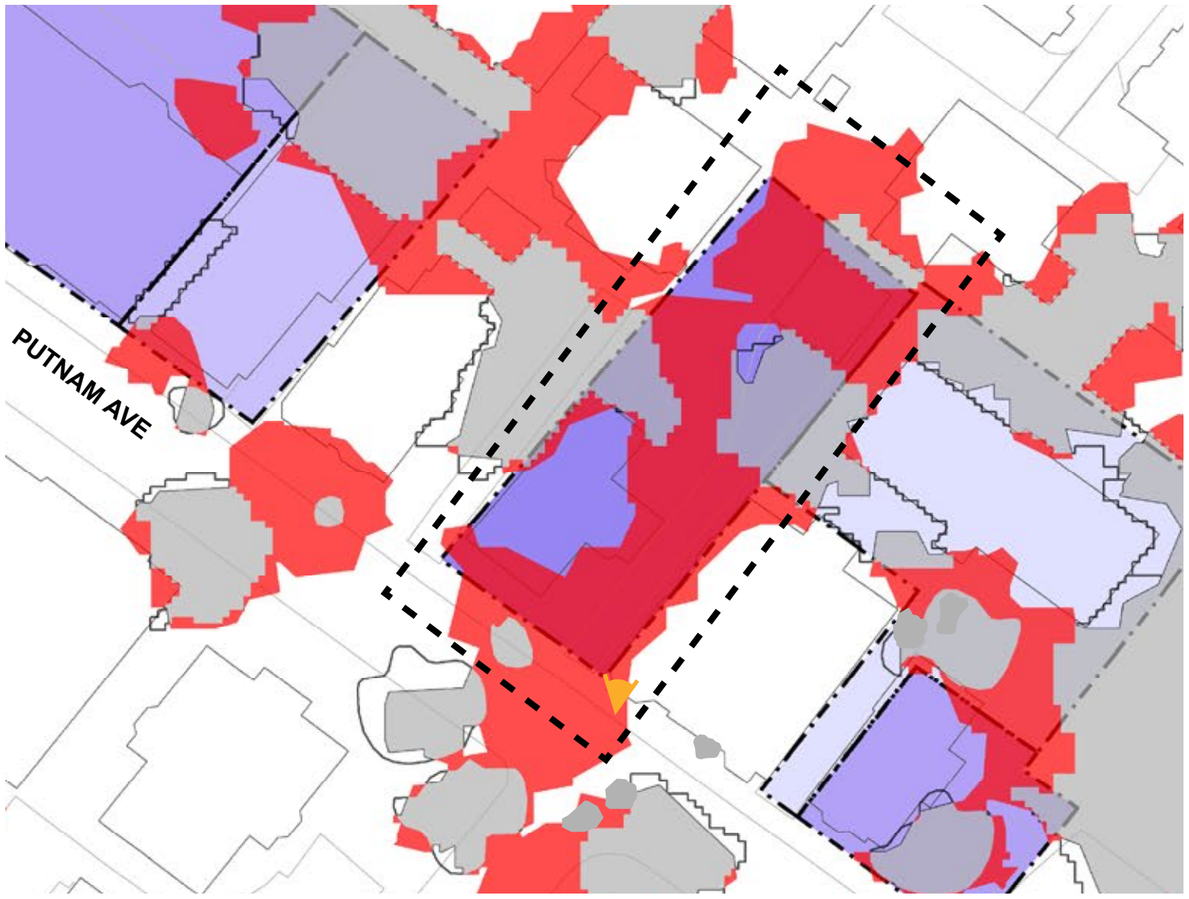
2015



Project type: Public

UNCATEGORIZED

Two large trees on Putnam Ave were removed after ownership change



0.02-15%
15-32%
32-53%
53-79%
79-100%

2014-2018 Canopy loss
Canopy gain
No canopy change
Study area
Property line of sold parcels

2011

2015

Project type: Residential

These studies suggest an association between four conditions and canopy loss.

— New construction

— Renovation & Site Improvements

— Mortality (declining health)

— Miscellaneous decisions by individual owners

CANOPY LOSS INVESTIGATIONS

SCENARIO MODELING

TASK FORCE TAKEAWAYS

What might canopy cover look like in 2030 & 2070 given the threats of climate change?

What is the potential for canopy to mitigate the urban heat island?

CANOPY CHANGE MODEL
Methodology updates

— Rename the “climate model” to “**canopy change model**”

— Model loss using **canopy area** rather than individual trees
(*benefit: loss rate can be calibrated to observed loss rate rather than using literature-based removal rate)*

— Define a baseline **net loss rate** (1.55% of canopy per year)
(*accounts for growth and prevailing planting rate*)

— Project a **conservative** and an **accelerated** loss rate for the scenarios
conservative loss: model impact of hardiness zone shift and loss of ash trees on private properties due to EAB
accelerated loss: double the impact of pest and diseases on each species

The **species composition** of the future forest is influenced by suceptibility of individual species to climate risks, particularly pest and diseases.

Flooding was found to have a potentially **minimal impact** on the canopy.

Drought was found to have a potentially **moderate impact** on the existing tree canopy.

The findings from this simulation will inform city-wide tree **species recommendations*** and include location-specific selection criteria, for example:

Plant only **flood tolerant species** in flood-prone areas and **drought tolerant species** near impervious surfaces.

*Refer to Forest Resiliency section of Task Force 10 presentation

CANOPY CHANGE MODEL
Scenarios

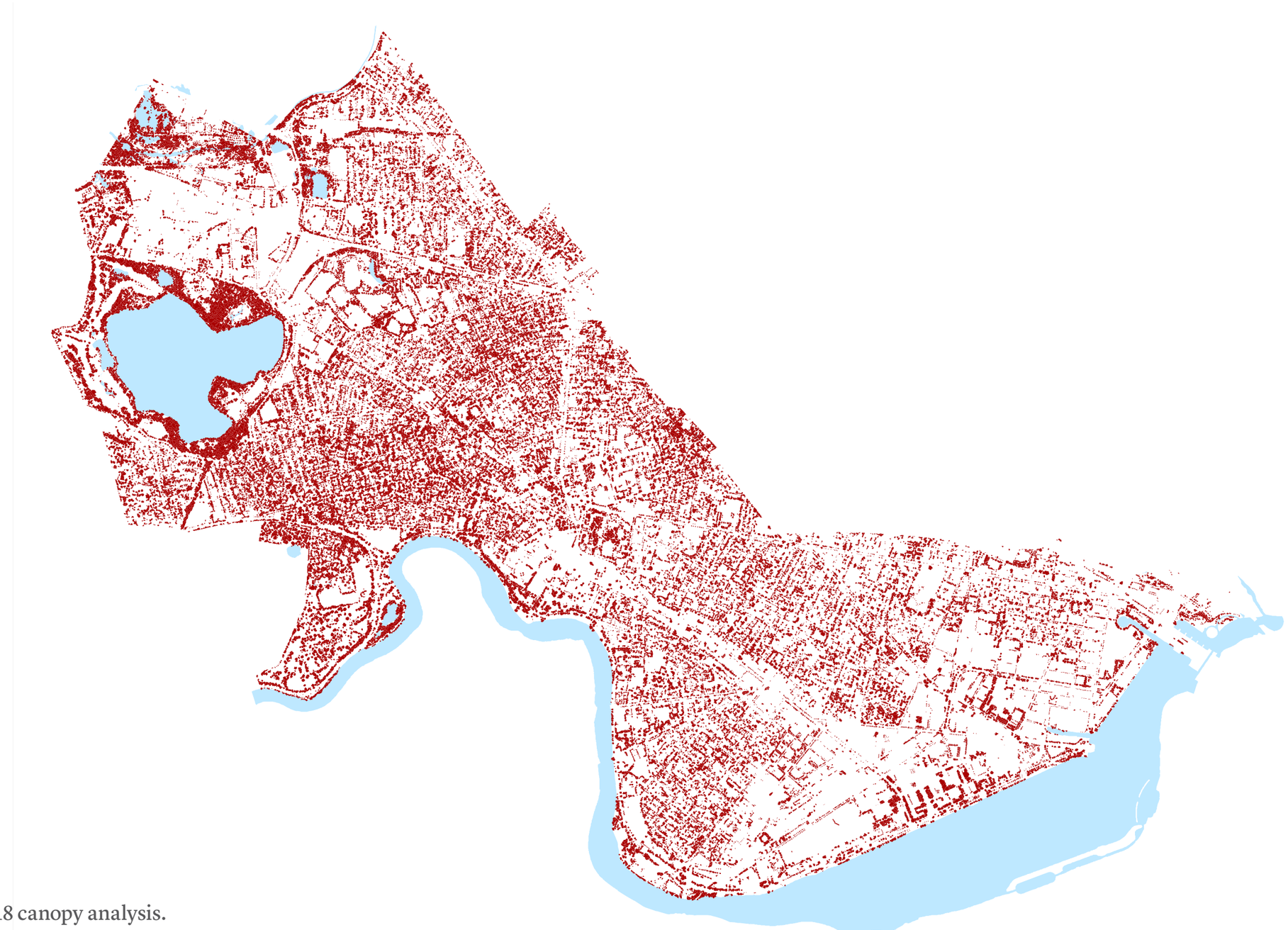
- 2030, 2050 and 2070 Baseline
  - existing and potential pests and diseases
  - temperature change and hardiness zone shift

- 2030 Flooding
  - areas experiencing standing water > 24 hrs in a simulated 100 yr flood event

- 2050 Drought
  - a moderate drought event is projected to occur once every 30 years within the 2035 to 2064 timeframe (Hayhoe et al 2006)

2018 CANOPY COVER

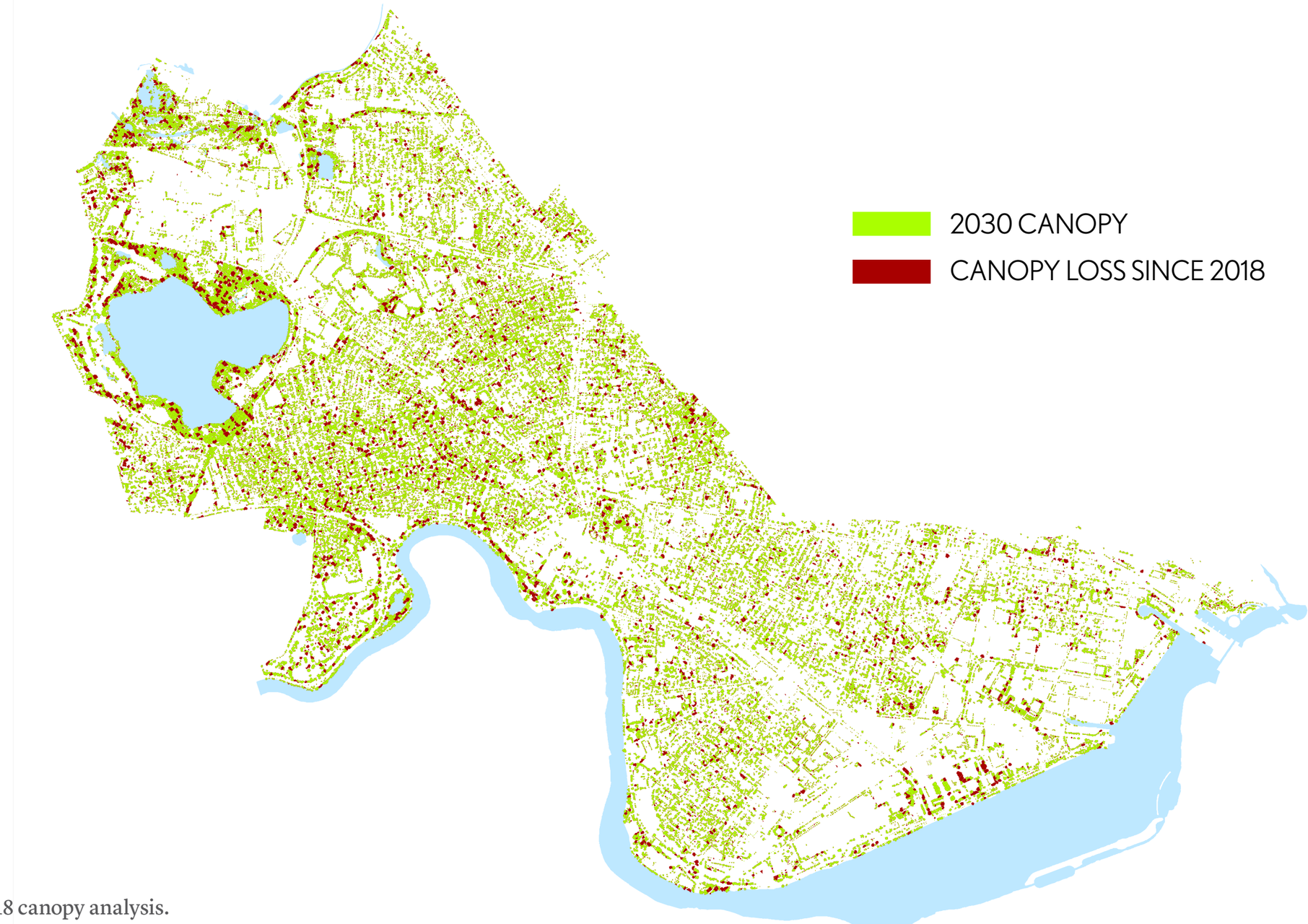
26% canopy cover



Source: CUFMP 2018 canopy analysis.

2030 CONSERVATIVE LOSS SCENARIO

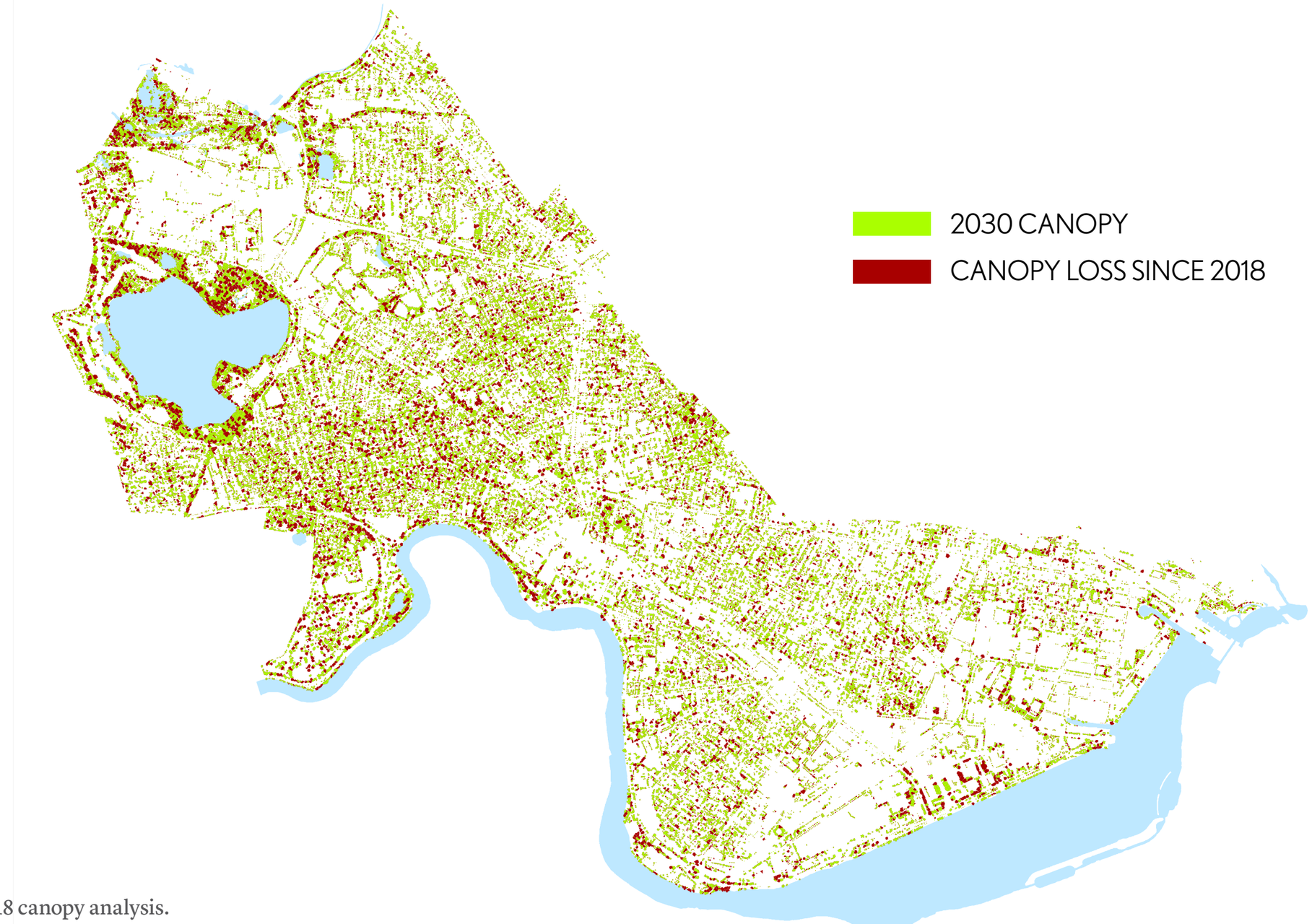
Considering temperature shifts/EAB threat the loss rate of 1.55% increases to 1.8%, resulting in 21.0% total canopy cover.



Source: CUFMP 2018 canopy analysis.

2030 ACCELERATED LOSS SCENARIO

Doubling the impact of pests/diseases on each species the total annual loss rate increases to 3.2%, resulting in 17.6% total canopy cover.



Source: CUFMP 2018 canopy analysis.

BASELINE SCENARIO IMPACT

Which species thrive and which do not?
Honeylocust becomes the most dominant species.

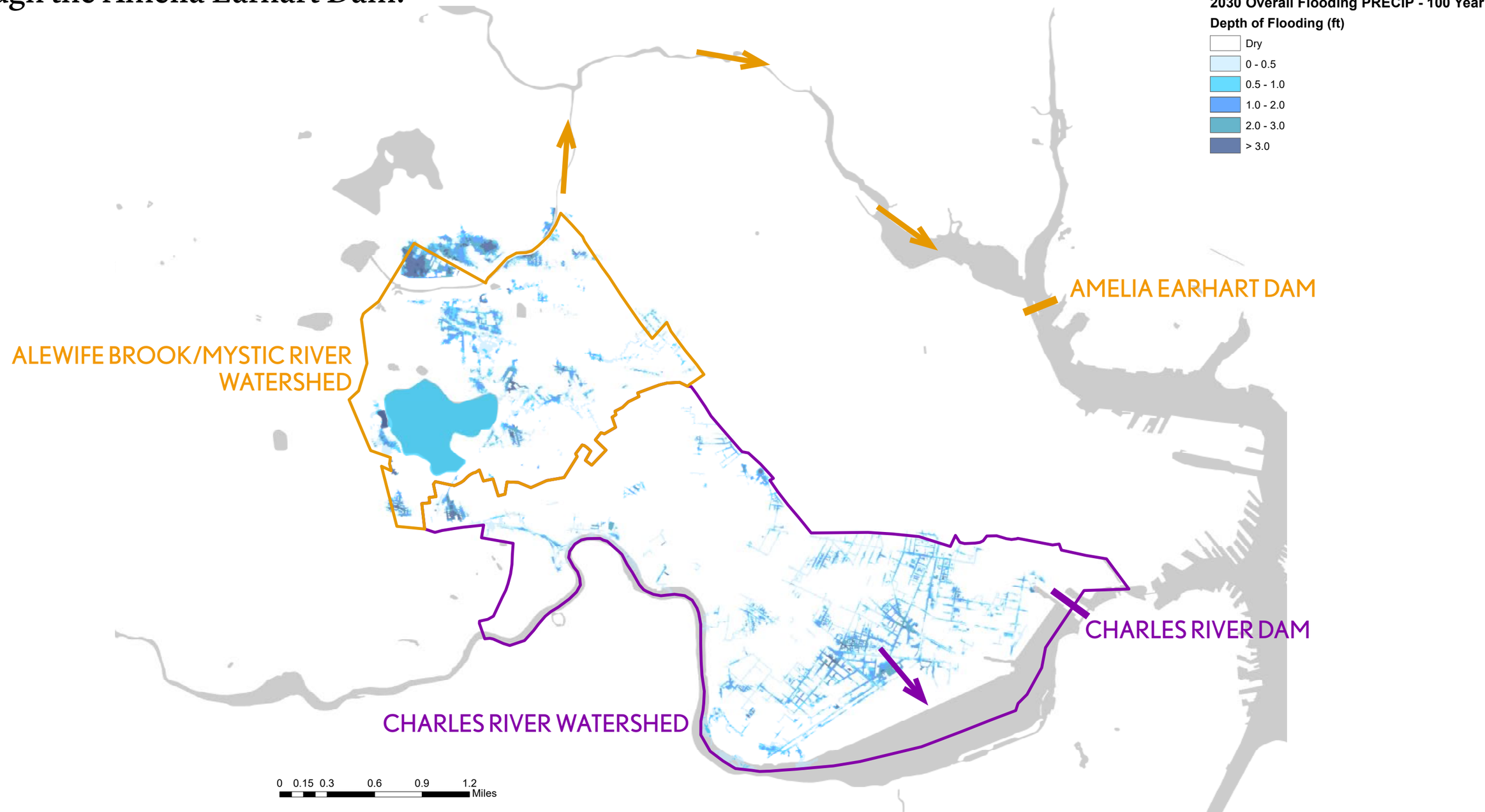
Most Common Species Cambridge 2030	% surviving from 2018*
Common thornless honeylocust	78-88%
Norway maple	65-81%
Pin Oak	65-81%
Red Maple	65-81%
Northern Red Oak	65-81%
London Planetree	65-81%
Littleleaf Linden	65-81%
Sycamore	65-81%
Sugar Maple	65-81%
Callery Pear	65-81%
Zelkova	92-95%

Best Performers Cambridge 2030
Dawn Redwood
Northern Catalpa
Black Locust
Kentucky Coffeetree
Amur Maackia
Serviceberry
Amur Corktree
Magnolia
Japanese Snowbell
Ginkgo
Japanese Lilac Tree
Zelkova

* range represents conservative and accelerated loss scenarios

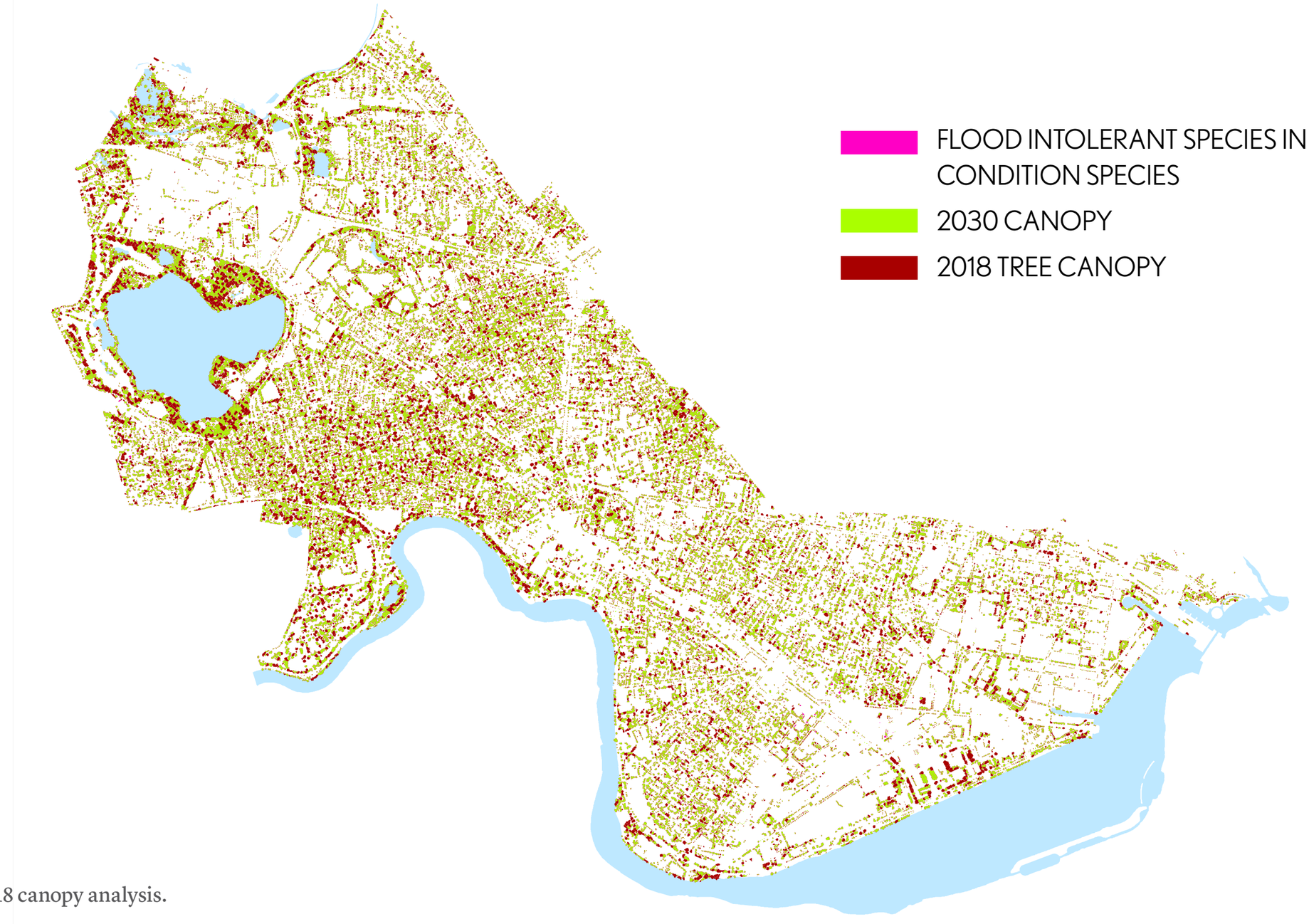
CLIMATE EVENT: FLOODING

One-third of Cambridge is with the Alewife Brook watershed and discharges through the Amelia Earhart Dam.



CLIMATE EVENT: FLOODING

The flooding event resulted in 0.2% additional mortality (~0.7 acres of loss) from the 2030 baseline scenario— resulting in **minimal reduction of canopy** in 2030.



Source: CUFMP 2018 canopy analysis.

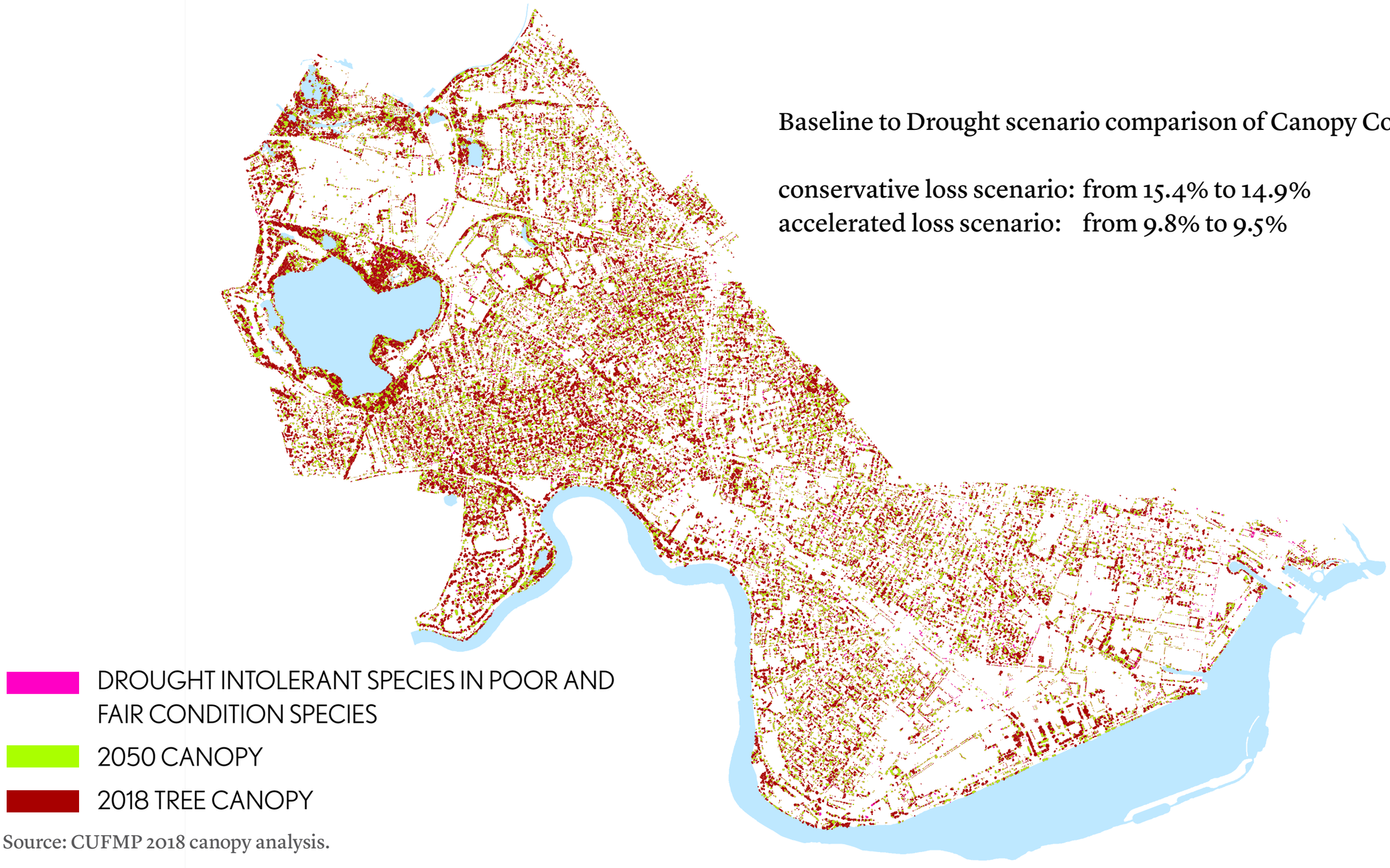
CLIMATE EVENT: FLOODING
Impacted species

	additional mortality from 2030 baseline*
Flowering Dogwood	0 to -3%
Austrian Pine	-1.4% to -1.7%
Hedge Maple	-0.9 to -1.2%
Eastern White Pine	-0.8 to -1%
Callery Pear	-0.3%
Basswood	-0.3 to 0.4%
Norway Maple	-0.3%
Cherry	-0.3%
Ginkgo	-0.2%
White Oak	-0.2 to -0.3%
Japanese Maple	-0.2%
Japanese Lilac Tree	-0.1%
Northern Red Oak	-0.1%

* range represents conservative and accelerated loss scenarios

CLIMATE EVENT : DROUGHT

The moderate drought event resulted in 3.2% additional mortality, or a loss of 14 to 20 acres of canopy from the 2050 baseline scenario



Baseline to Drought scenario comparison of Canopy Cover in 2050:

conservative loss scenario: from 15.4% to 14.9%
accelerated loss scenario: from 9.8% to 9.5%

Source: CUFMP 2018 canopy analysis.

CLIMATE EVENT IMPACTS : 2050 BASELINE + MODERATE DROUGHT

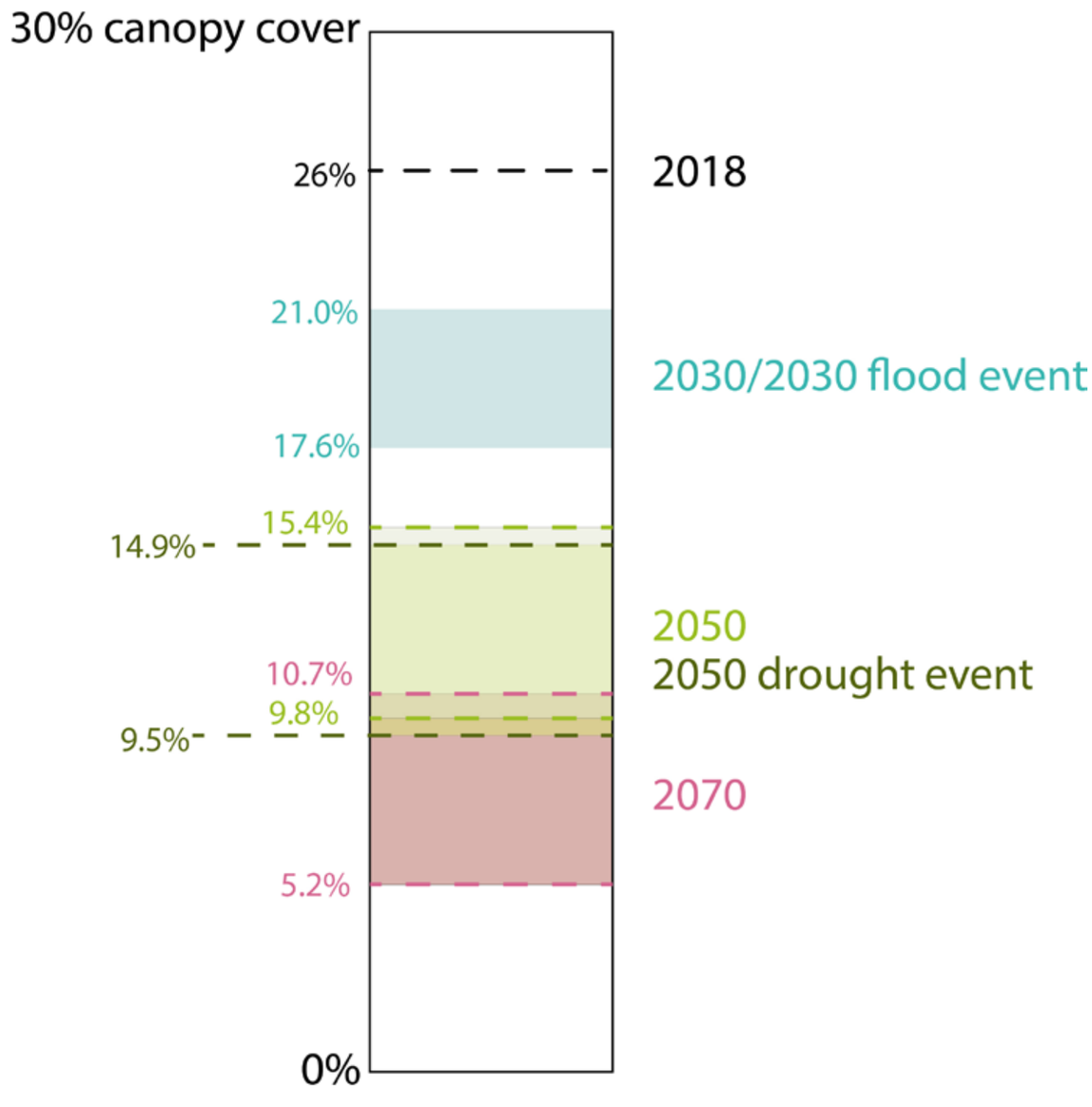
Impacted Species

	additional mortality from 2050 baseline*
Canadian Hemlock	92.4%
Red Maple	26.2%
Eastern White Pine	24.0%
American Hornbeam	23.1%
White Ash	22.6%
Basswood	22.3%
Downy Serviceberry	20.7%
Hornbeam	20.6%
Magnolia	15.0%
Serviceberry	9.5%
Sugar Maple	9.2%
Tree of Heaven	9.0%
Eastern Black Oak	8.9%
Eastern Arborvitae	8.4%
Flowering Dogwood	7.8%
Northern Red Oak	5.0%
White Oak	2.7%

*represents conservative loss scenarios

CANOPY CHANGE MODEL SUMMARY

Annual net loss rate ranges from 1.8% to 3.2%.



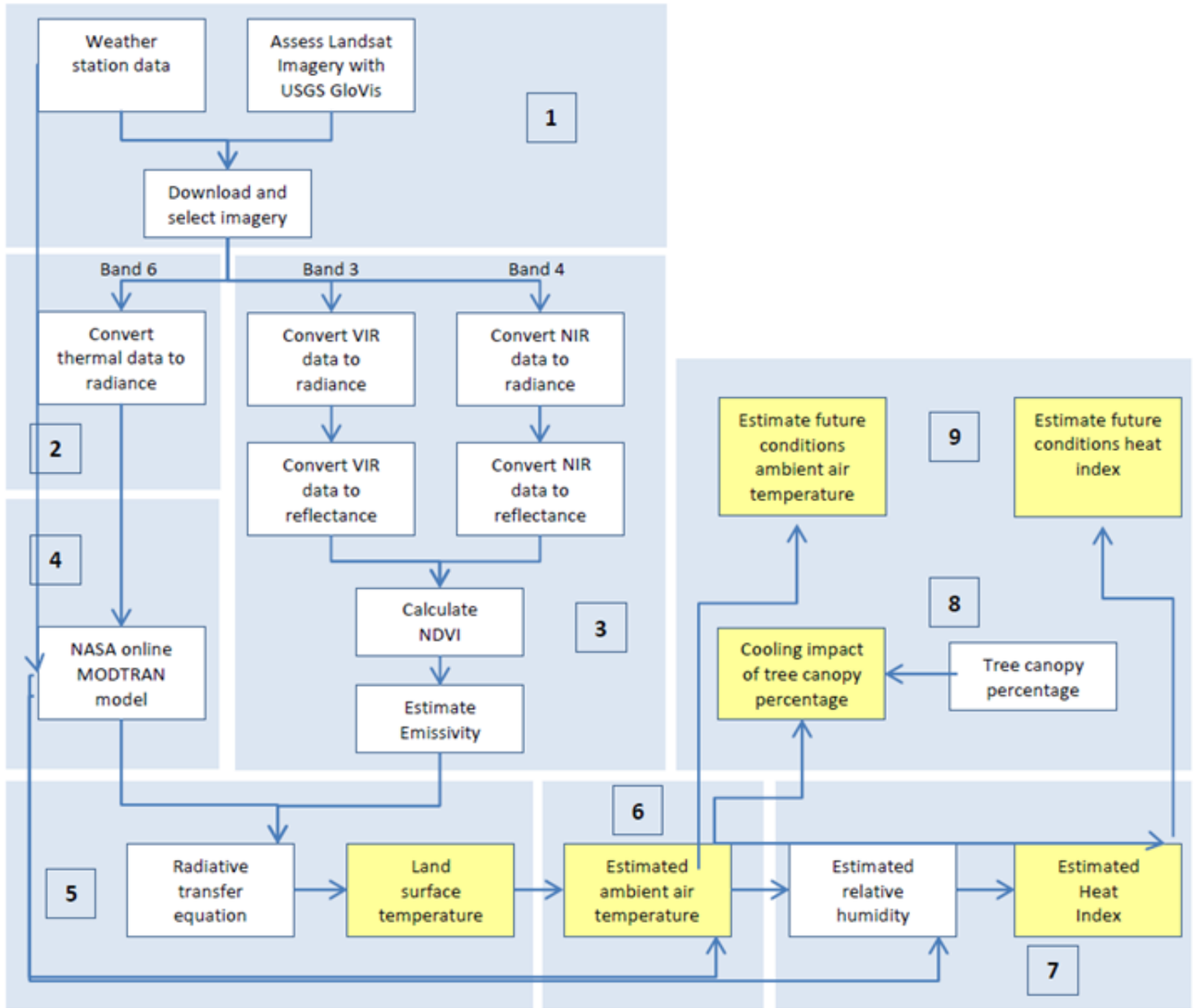
*ranges within each event indicate the conservative/accelerate loss rates

How much can tree planting mitigate heat island?

What strategies move the needle?

HEAT ISLAND MODELING - METHODOLOGY

Estimating Urban Heat Island (UHI) from Land Surface Temperature Data

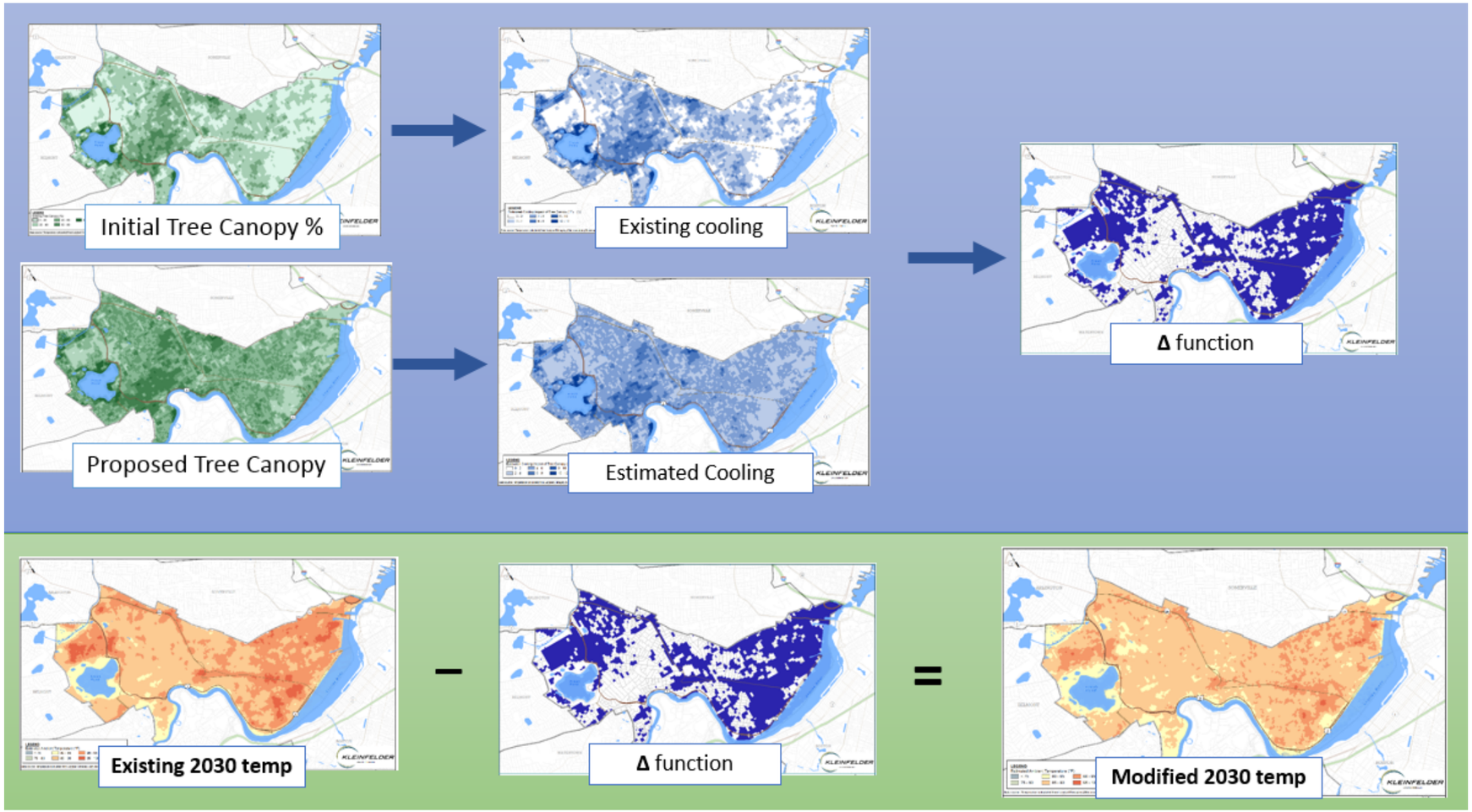


Process for mapping heat index

Source: Appendix D Urban Heat Island Protocol for mapping Temperature Projections, Kleinfelder for the City of Cambridge, November 2015

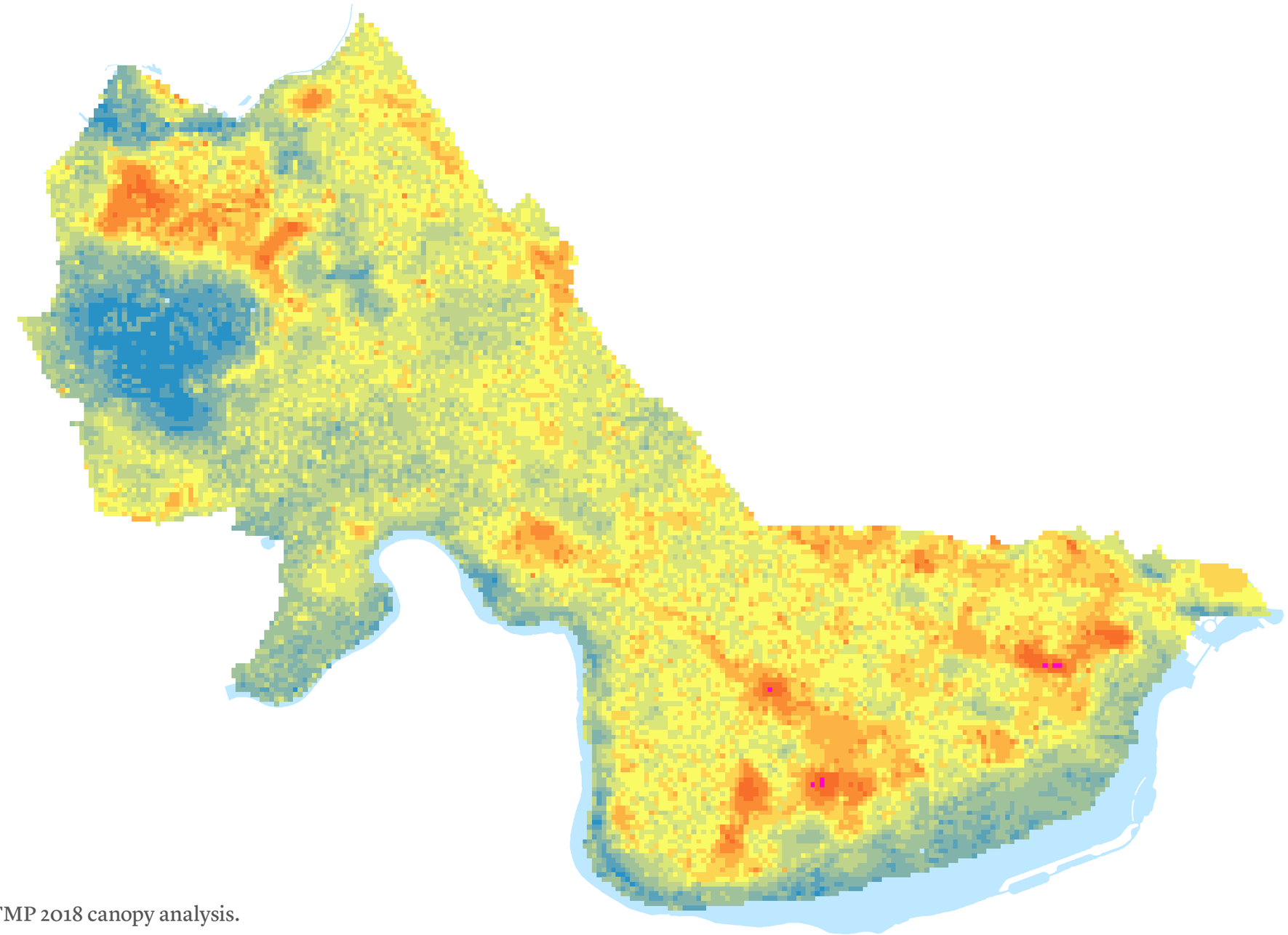
HEAT ISLAND MODELING - METHODOLOGY

Impact of Expanding Urban Forest Canopy in UHI Model



Source: Appendix B Green Infrastructure Analysis and Urban Heat Island Modeling – DRAFT, Kleinfelder for the City of Cambridge, August 2017

HEAT ISLAND MODELING – 2018 CANOPY



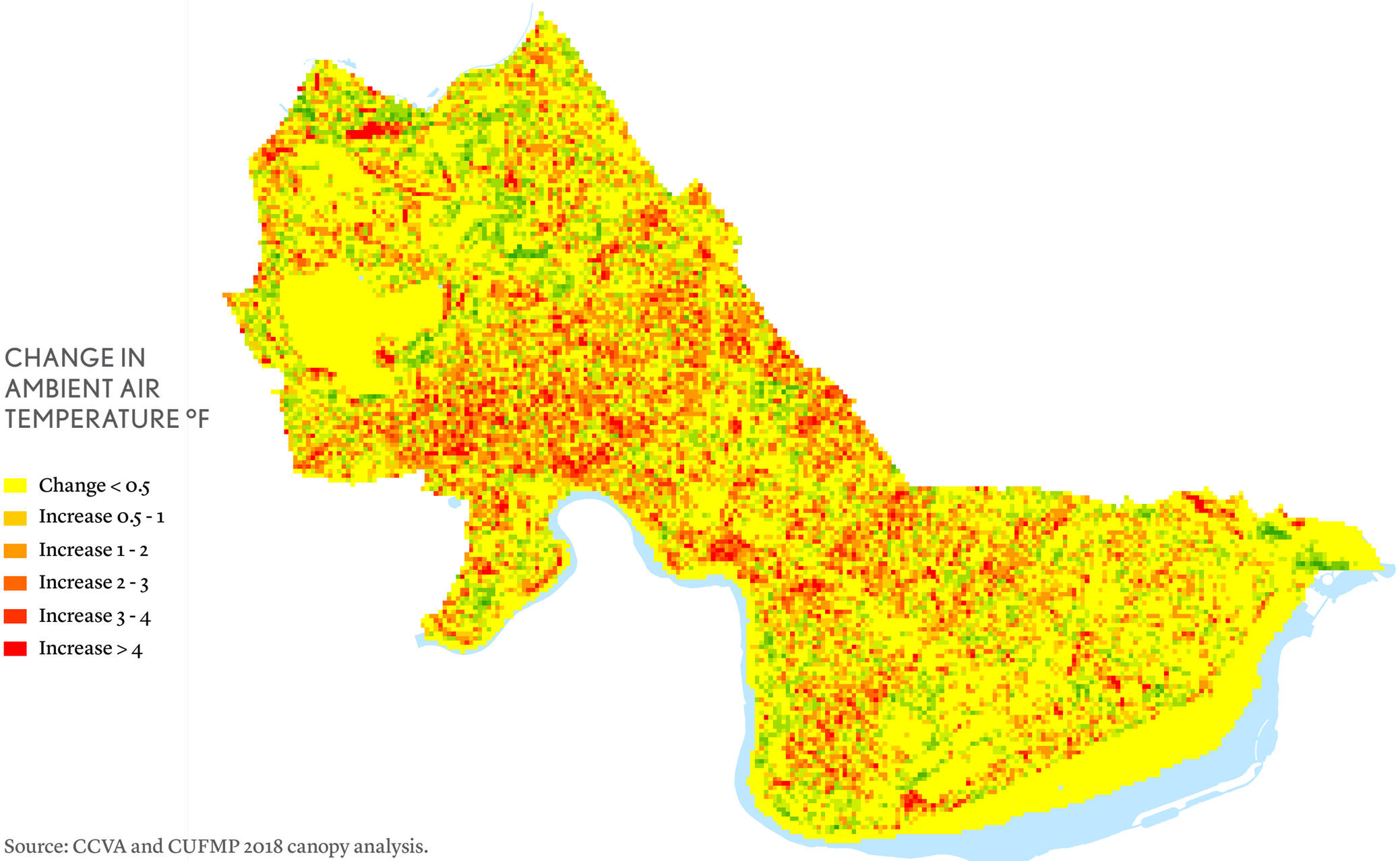
ESTIMATED AMBIENT AIR TEMPERATURE OF A 90°F DAY

- 80 or Below
- 80 - 82
- 82 - 84
- 84 - 86
- 86 - 88
- 88 - 90
- 90 - 92
- 92 - 94
- 94 - 96
- 96 - 98
- 98 - 100

Source: CCVA and CUFMP 2018 canopy analysis.

HEAT ISLAND MODELING – 2018 CANOPY

39% of the city experienced an increase in temperature (> 0.5 °F) since 2009
19% experienced cooling (> 0.5 °F).



Source: CCVA and CUFMP 2018 canopy analysis.

What happens to ambient temperature if ...

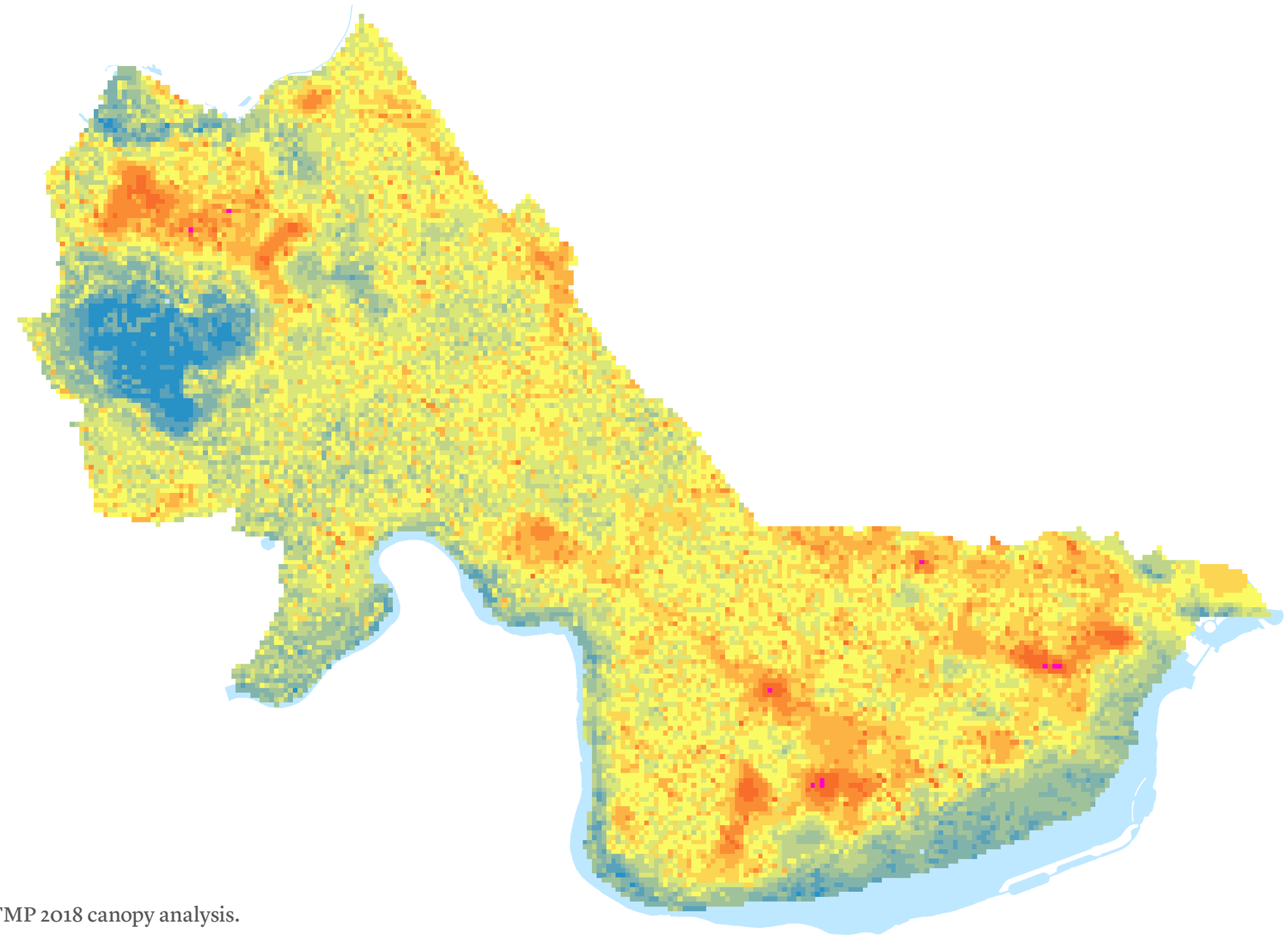
we do not stem loss or grow canopy and climate change accerlerates loss?

we are able to maximize planting in the right of way?

we implement strategies and incentives to increase canopy? (East Cambridge + Mid Cambridge case studies)

HEAT ISLAND MODELING – 2030 CANOPY

Accelerated loss scenario (17.8% canopy cover)



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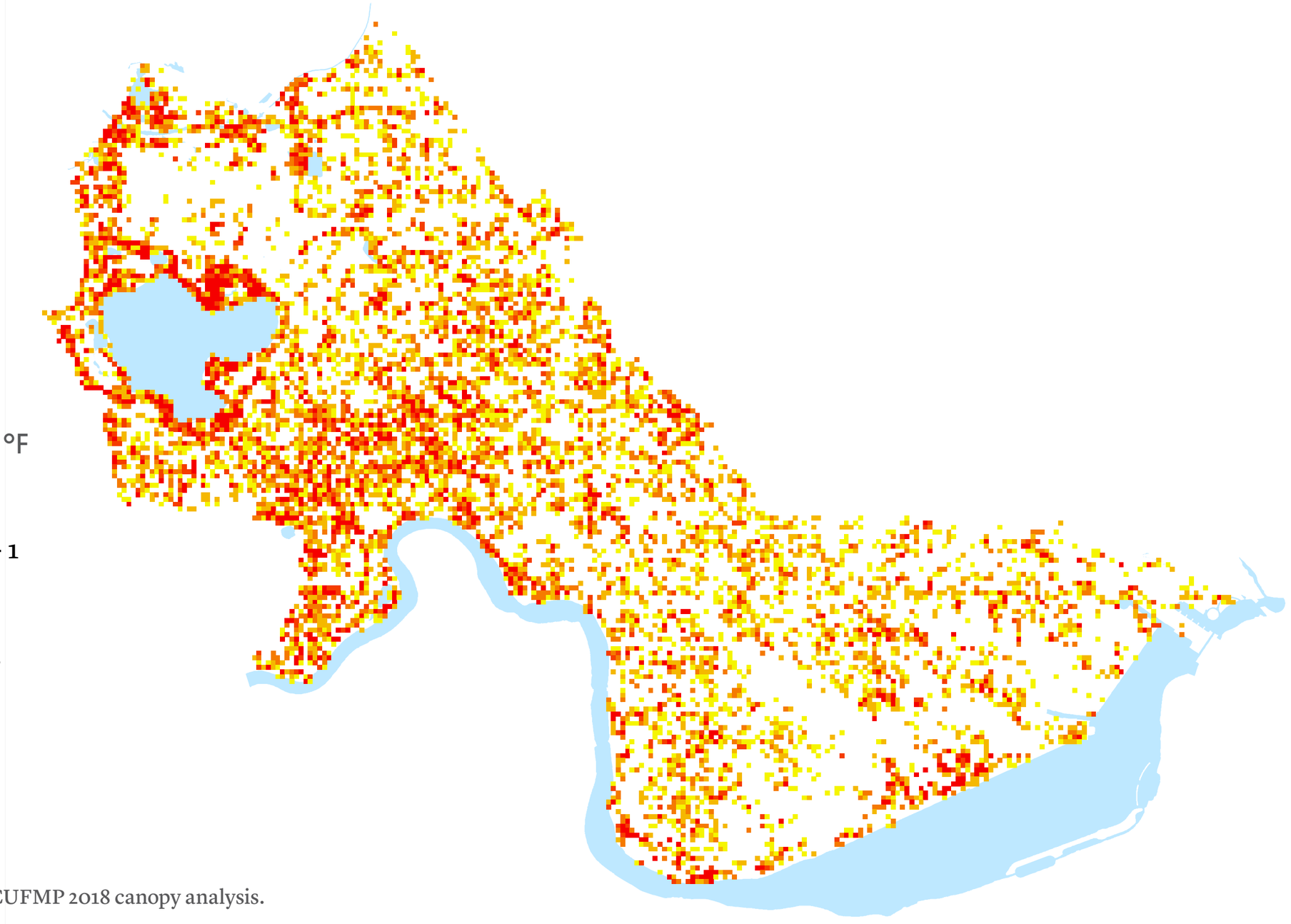
Source: CCVA and CUFMP 2018 canopy analysis.

HEAT ISLAND MODELING – 2030 CANOPY

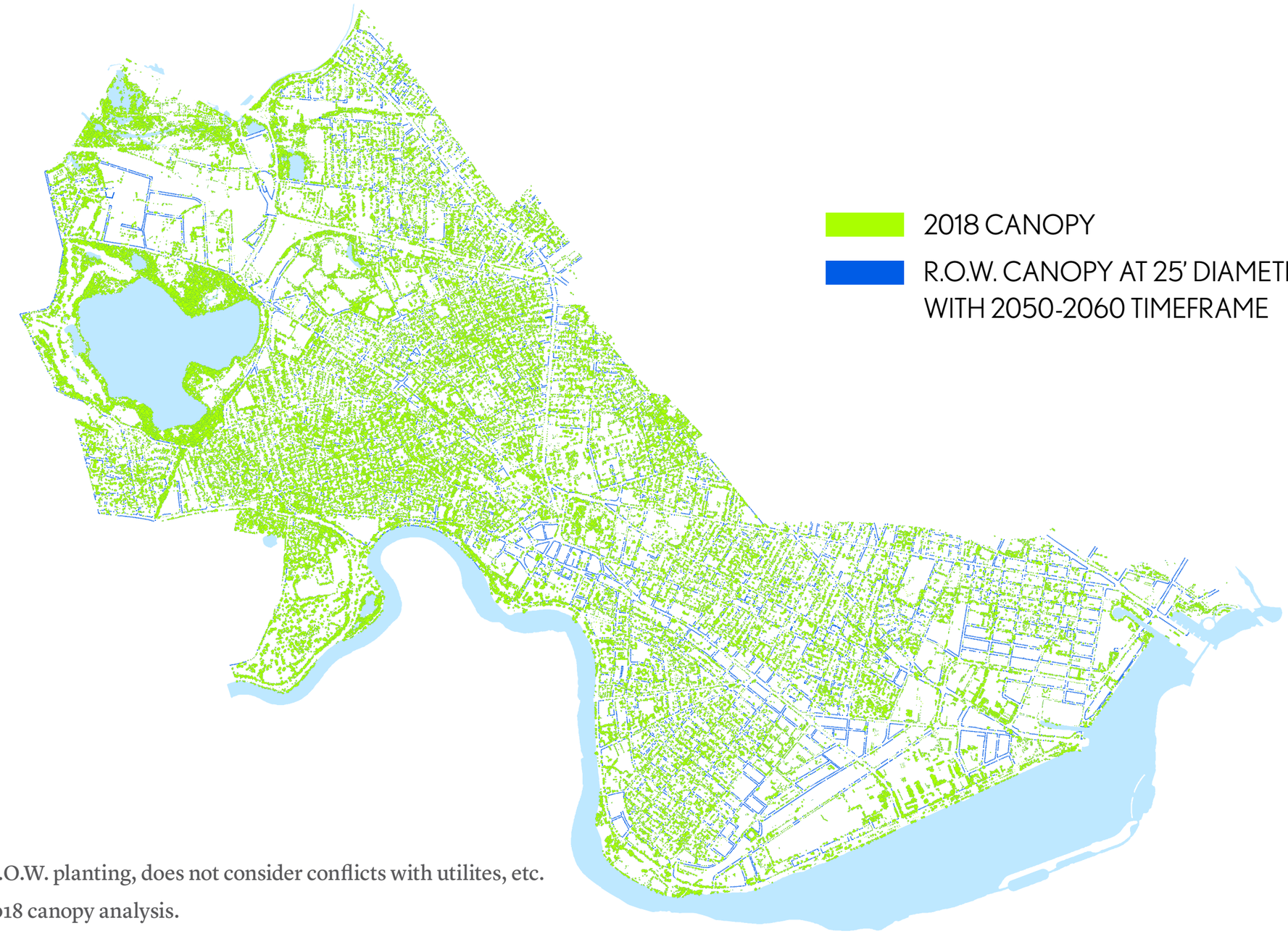
38% of the city experienced an increase in temperature (> 0.5 °F) since 2009 under an accelerated loss scenario



Source: CCVA and CUFMP 2018 canopy analysis.

MAXIMIZE RIGHT OF WAY PLANTING

12,000 new Right of Way trees at maturity increase canopy cover from 26% to 29.4%*



2018 CANOPY

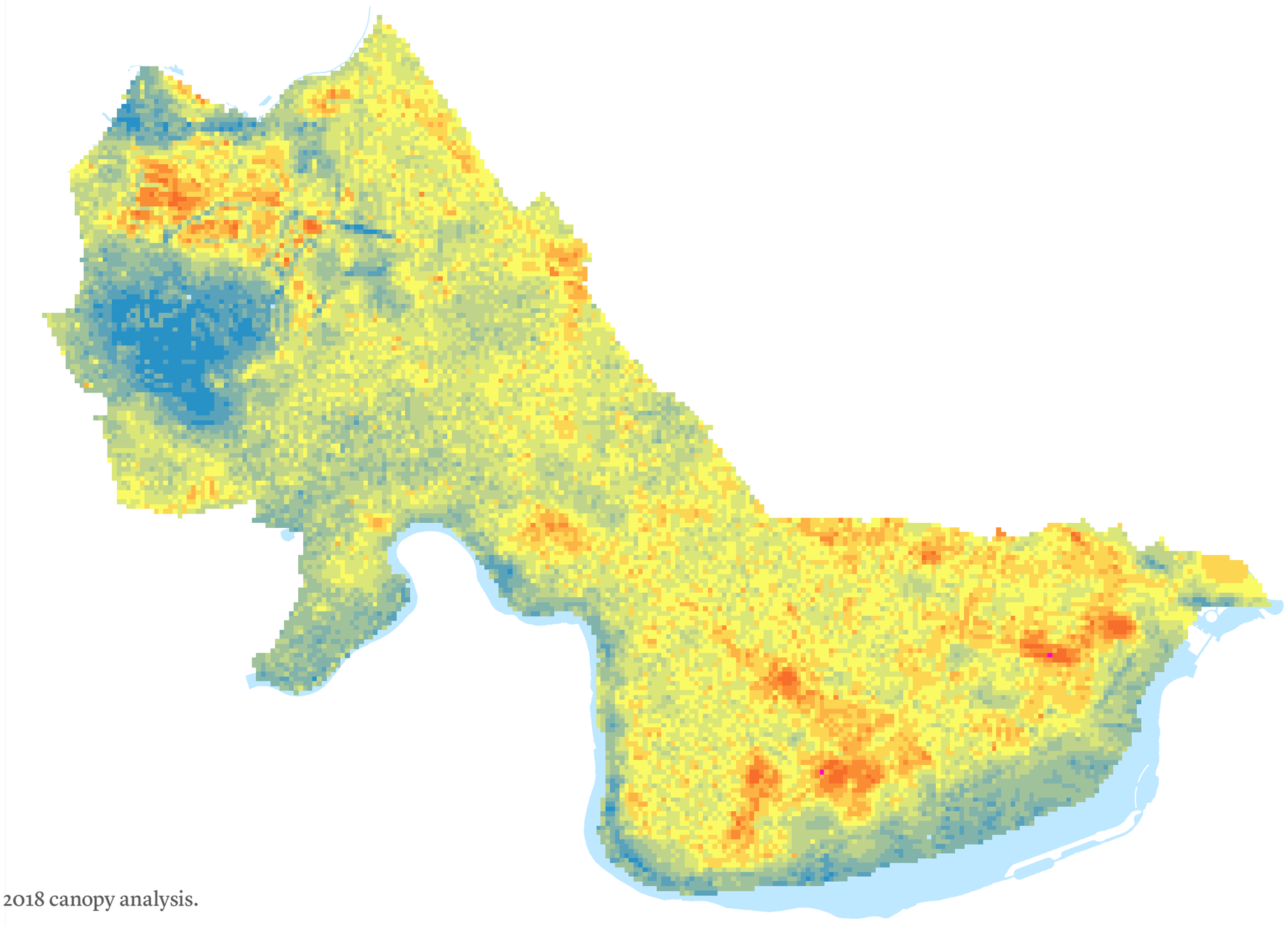
R.O.W. CANOPY AT 25' DIAMETER, ALIGNS WITH 2050-2060 TIMEFRAME

*Idealized scheme of R.O.W. planting, does not consider conflicts with utilites, etc.

Source: and CUFMP 2018 canopy analysis.

MAXIMIZE RIGHT OF WAY PLANTING

2018 canopy plus 12,000 new Right of Way trees at maturity



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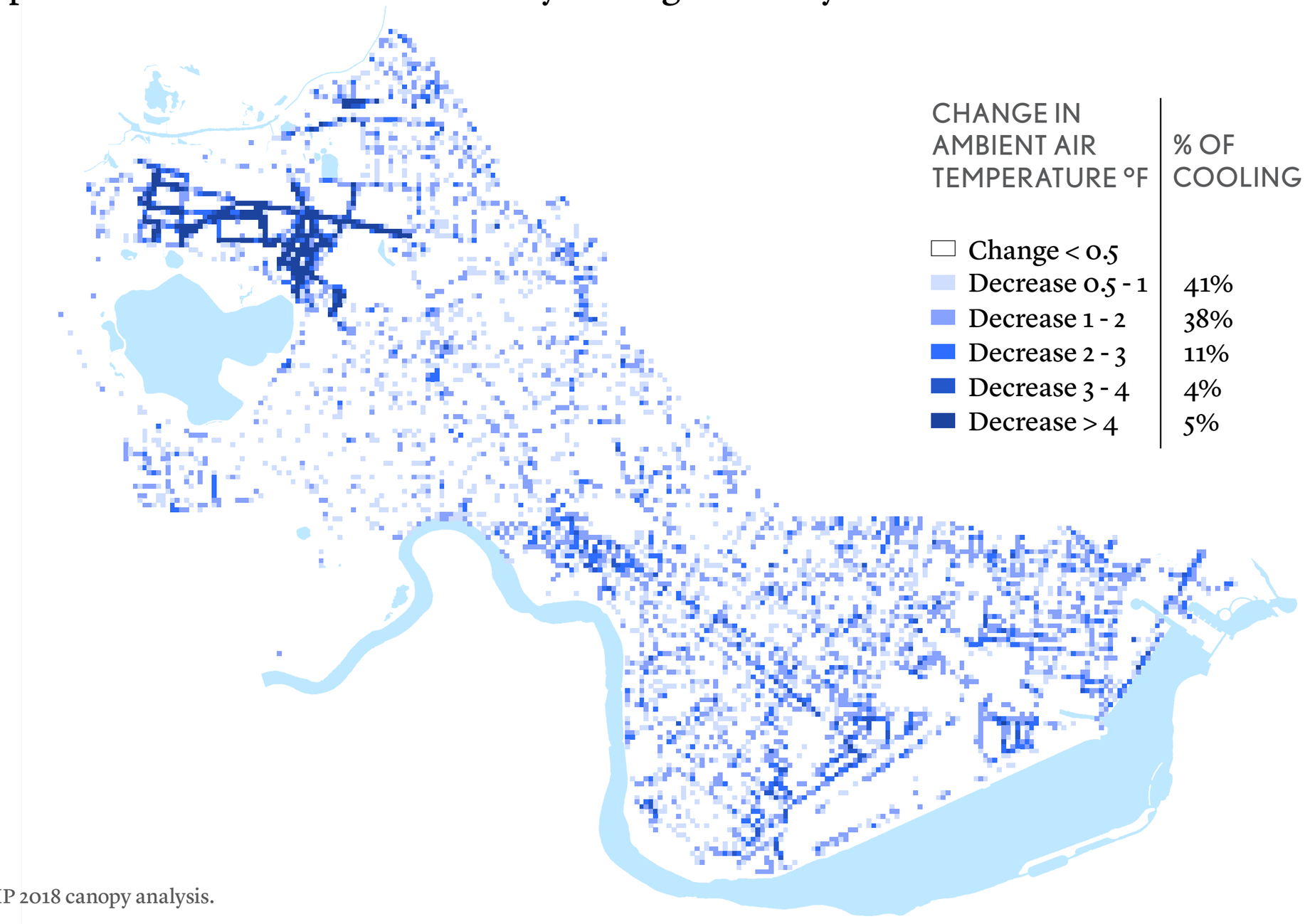
Source: and CUFMP 2018 canopy analysis.

MAXIMIZE RIGHT OF WAY PLANTING

25% of the city experienced a decrease in temperature (> 0.5 °F) since 2009
Cooling is pervasive and creates continuity through the city.

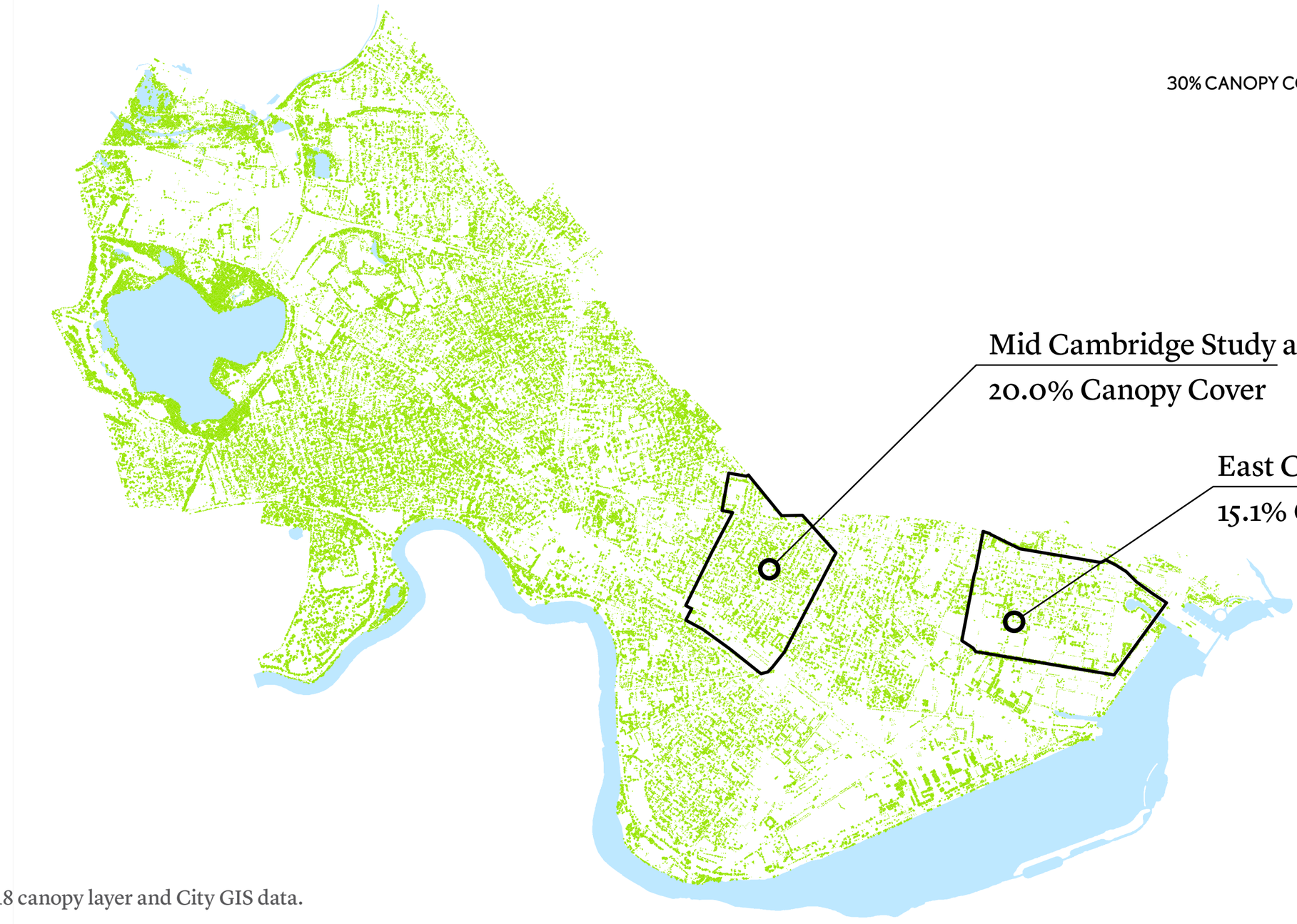


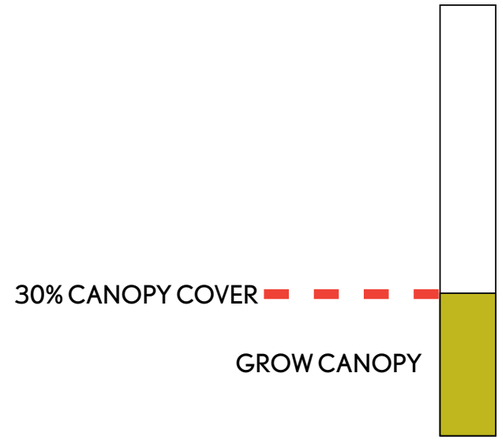
CHANGE IN AMBIENT AIR TEMPERATURE °F	% OF COOLING
Change < 0.5	
Decrease 0.5 - 1	41%
Decrease 1 - 2	38%
Decrease 2 - 3	11%
Decrease 3 - 4	4%
Decrease > 4	5%

Source: and CUFMP 2018 canopy analysis.

NEIGHBORHOOD CASE STUDIES

East Cambridge and Mid Cambridge have canopy cover lower than the city average.

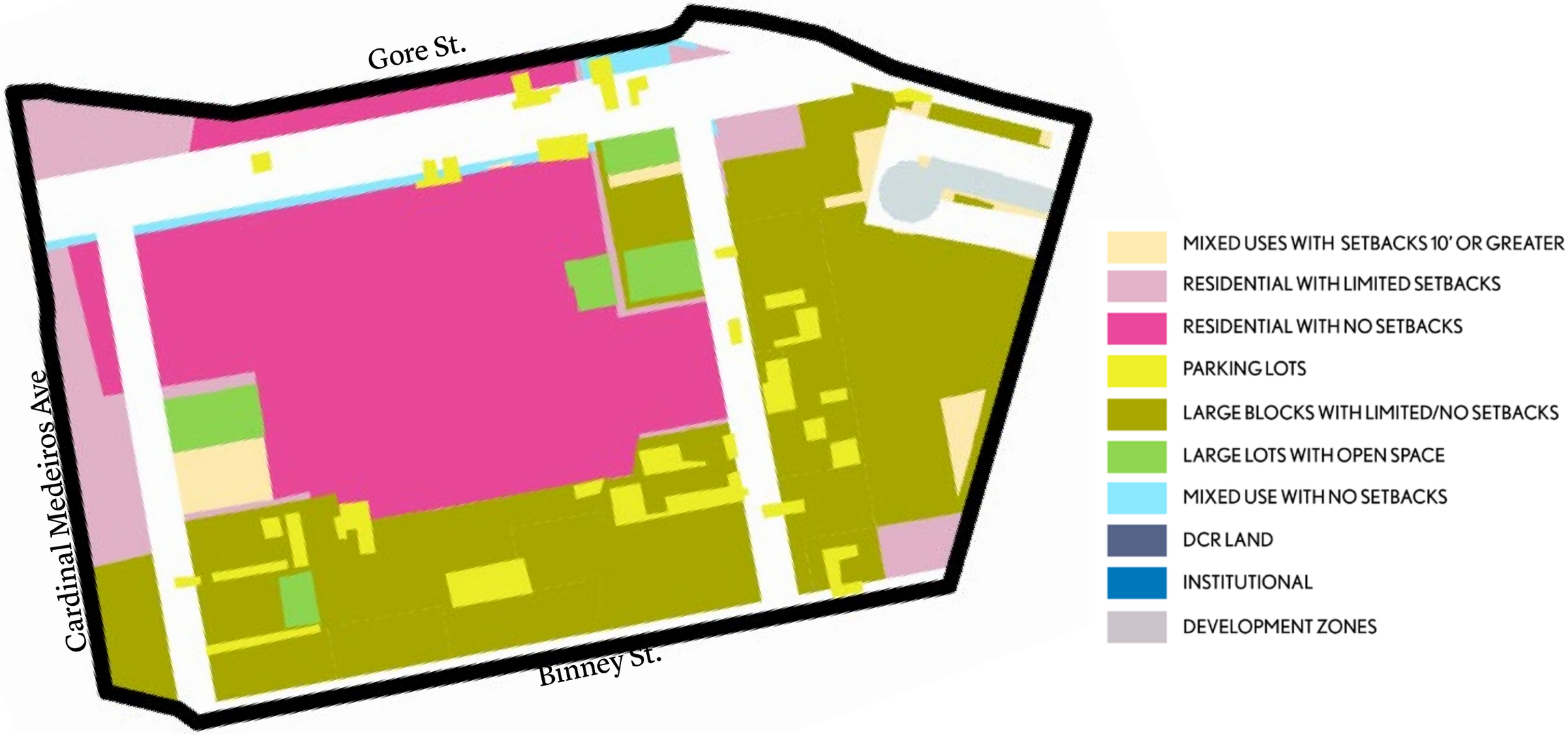




Source: CUFMP 2018 canopy layer and City GIS data.

EAST CAMBRIDGE CASE STUDY

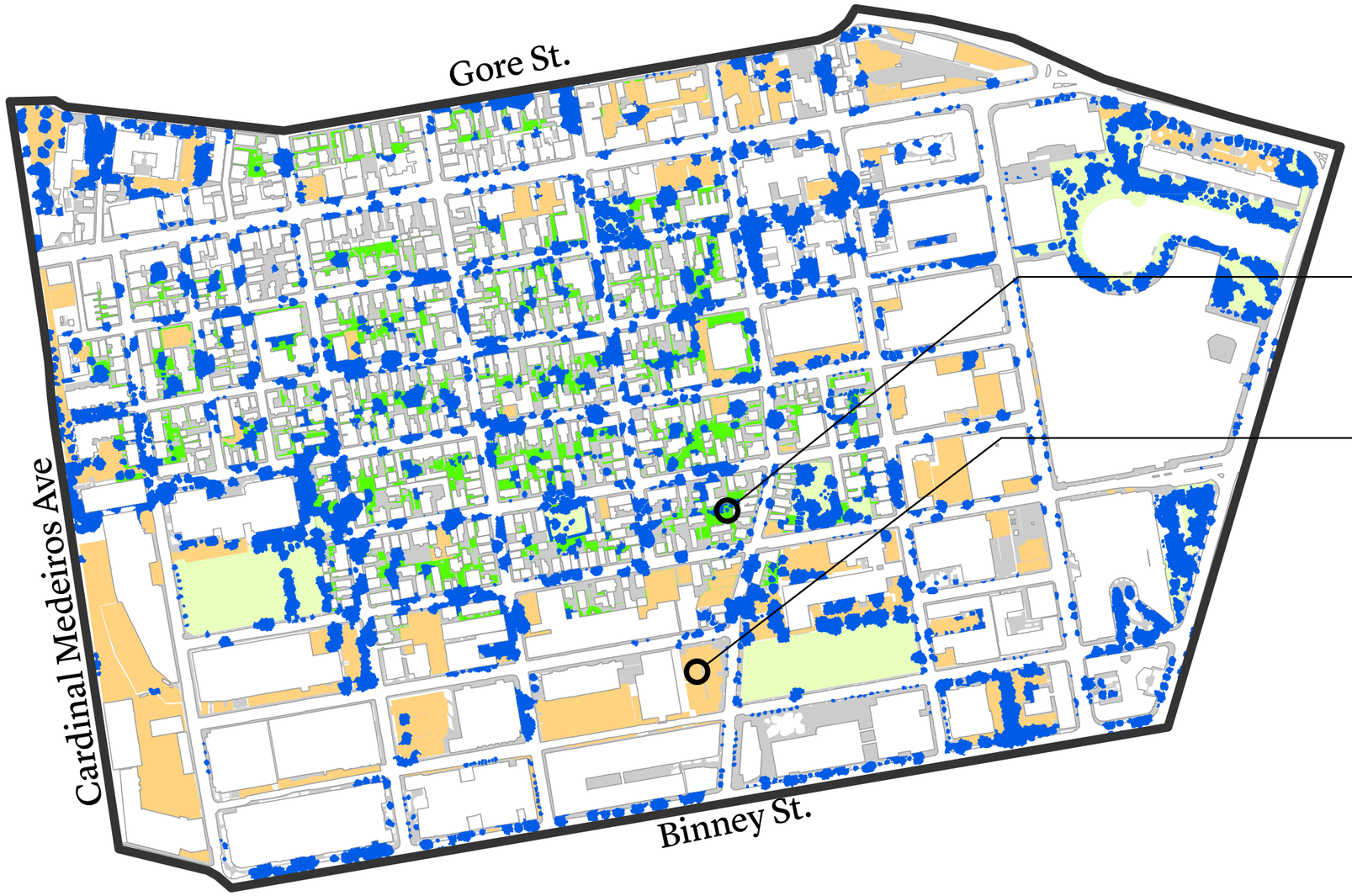
Properties are primarily residences with no front yard setbacks and large blocks with limited setbacks.



Source: CUFMP 2018 canopy analysis and City GIS data.

EAST CAMBRIDGE CASE STUDY

Existing canopy cover (2018)



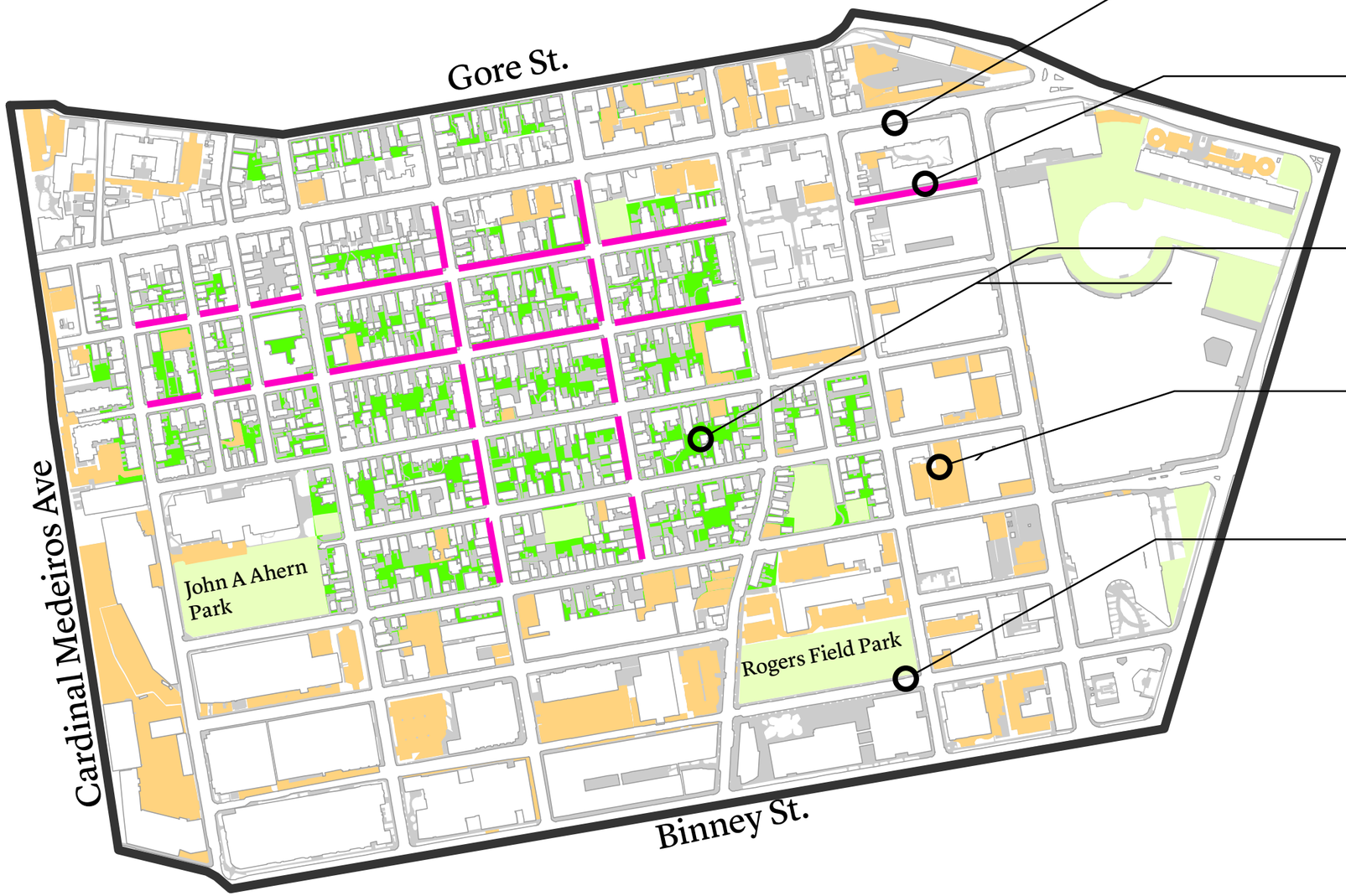
- 2018 CANOPY COVER
- PARKING LOTS
- LIMITED SETBACKS
- FRONT YARD SETBACKS > 10'
- IMPERVIOUS AREA
- BUILDINGS/ROAD

Residential areas have a high percentage of imperviousness

Large areas without canopy tend to be associated with buildings and parking lots

EAST CAMBRIDGE CASE STUDY

Planting opportunities are primarily on streets, in backyards, and parking lots.



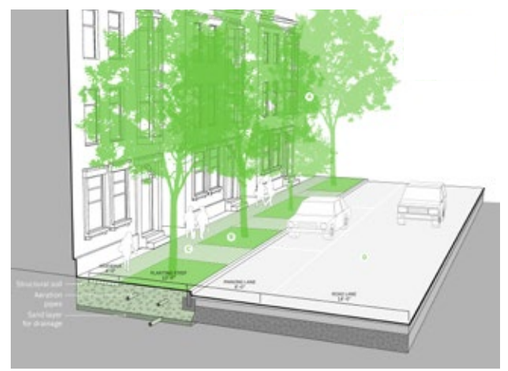
Increase R.O.W. planting

Lane diets for 4 streets- converted to one ways

Encourage backyard plantings (20% cover)

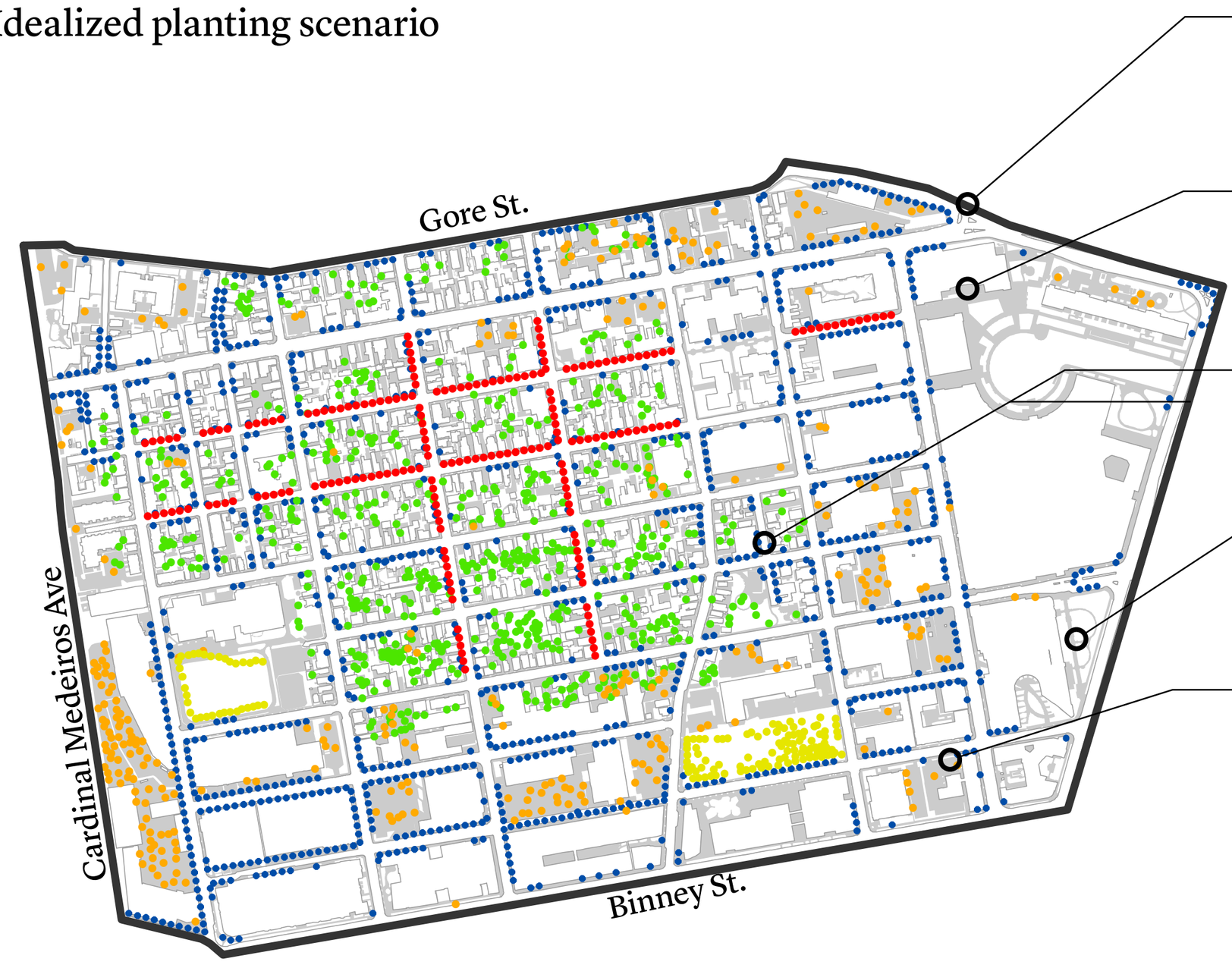
Increase canopy cover on parking lots (13% cover)

Buffer existing open spaces with more trees



EAST CAMBRIDGE CASE STUDY

Idealized planting scenario



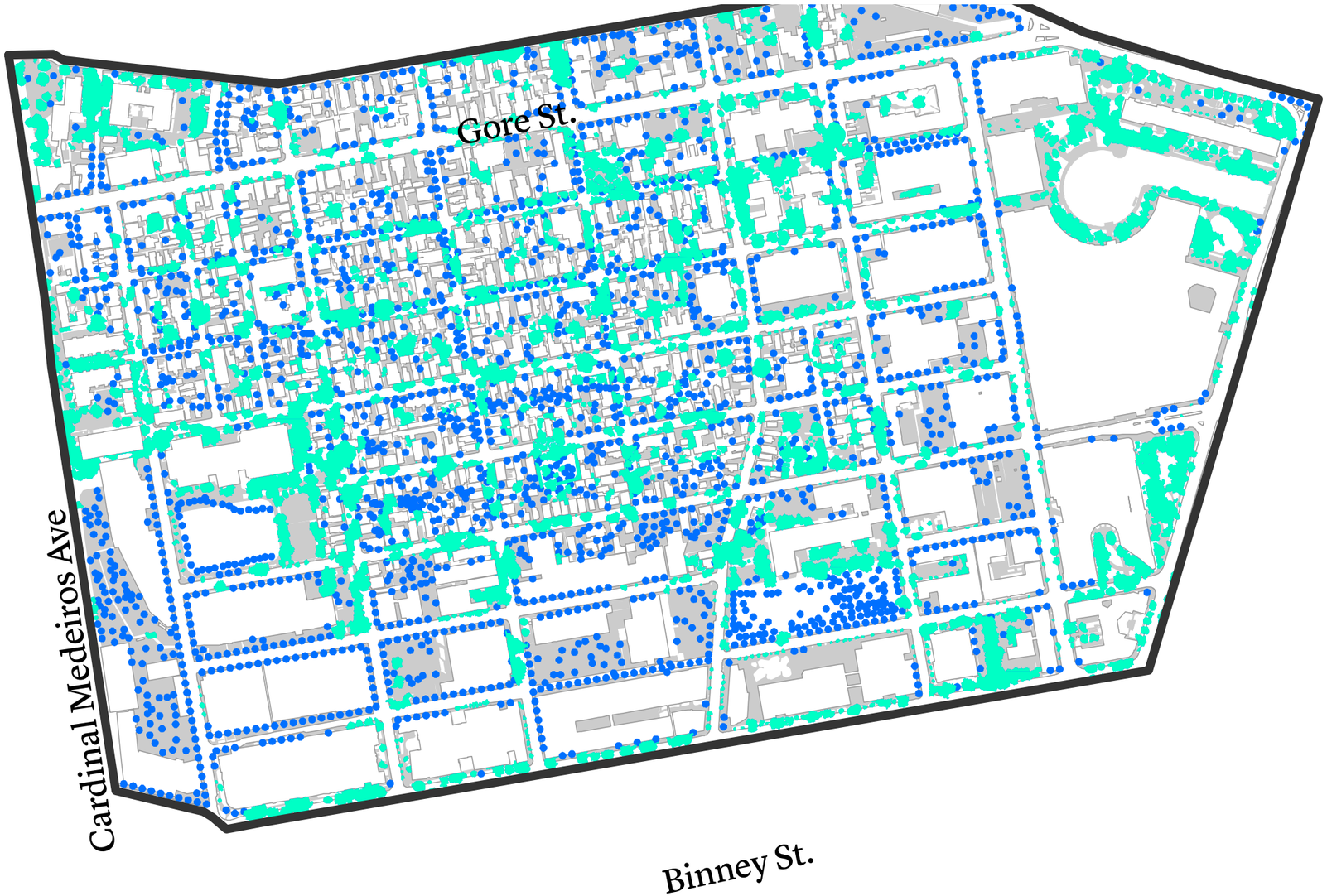
- R.O.W. planting*: 30’ tree spacing (611 trees)
- Lane diets: 30’ tree spacing (195 trees)
- Backyard planting: 30% canopy cover (575 trees)
- Parking Lots: 30% canopy cover (297 trees)
- Increase buffer planting for parks and Rogers Field Park planting (134 trees)

1814 trees

*Idealized scheme of R.O.W. planting, does not consider conflicts with utilites, etc.

EAST CAMBRIDGE CASE STUDY

In an idealized scenario, by 2050 canopy increases from 15.1% to 25.4%

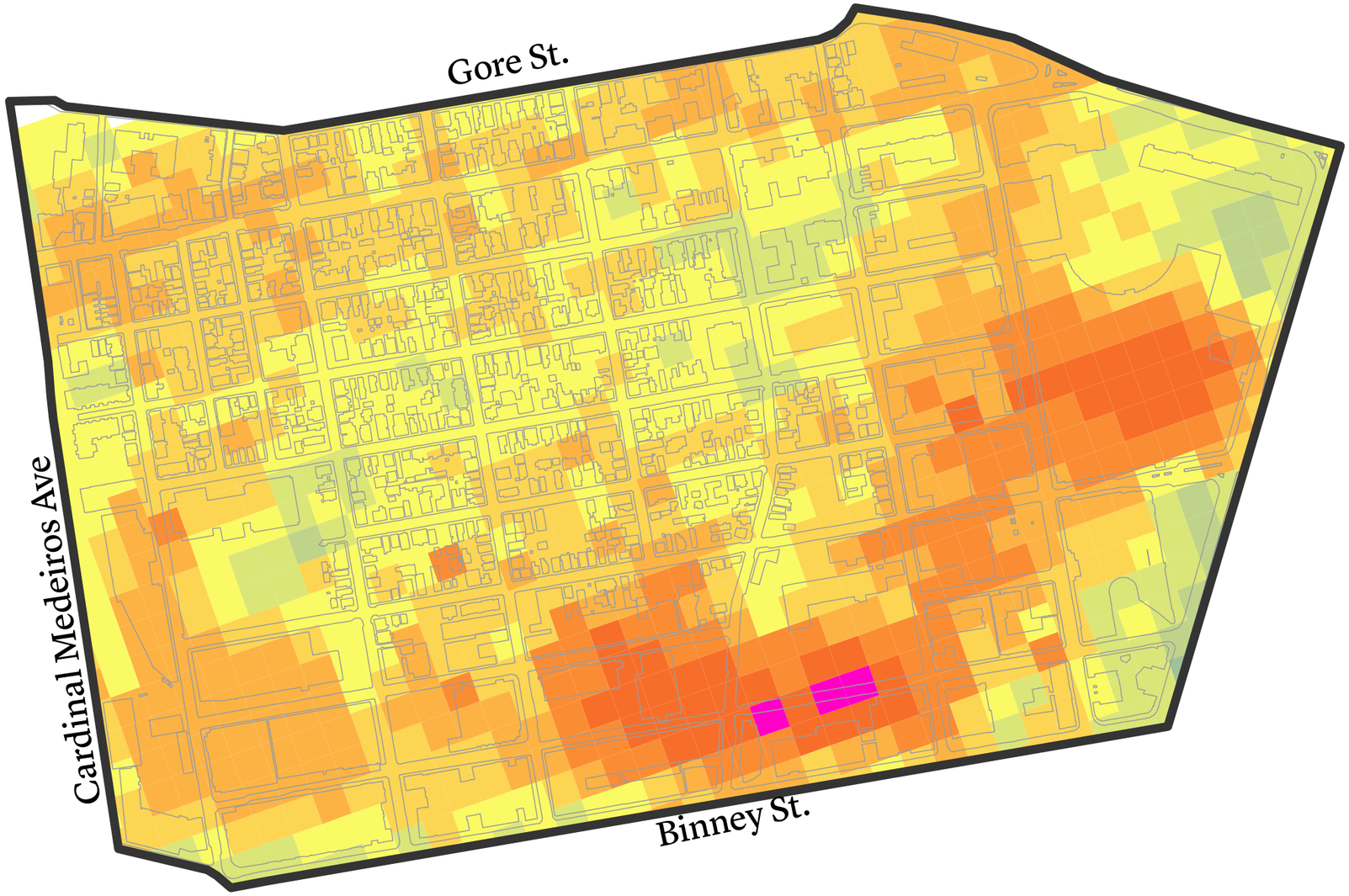


2018 CANOPY COVER

CANOPY COVER WITH PLANTING STRATEGIES

EAST CAMBRIDGE CASE STUDY

2018 Canopy



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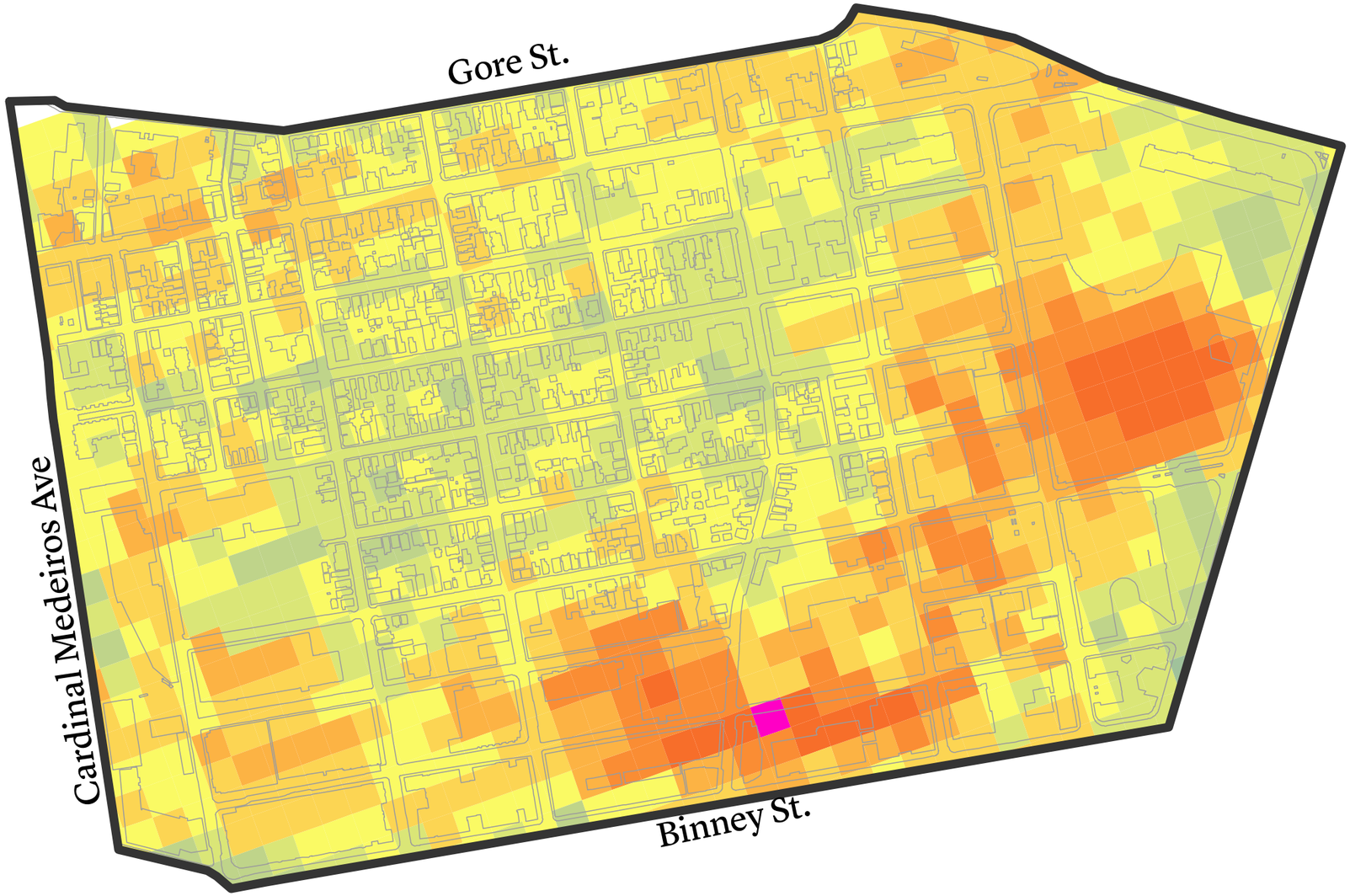
EAST CAMBRIDGE CASE STUDY

Heat island modeling results of idealized planting scenario



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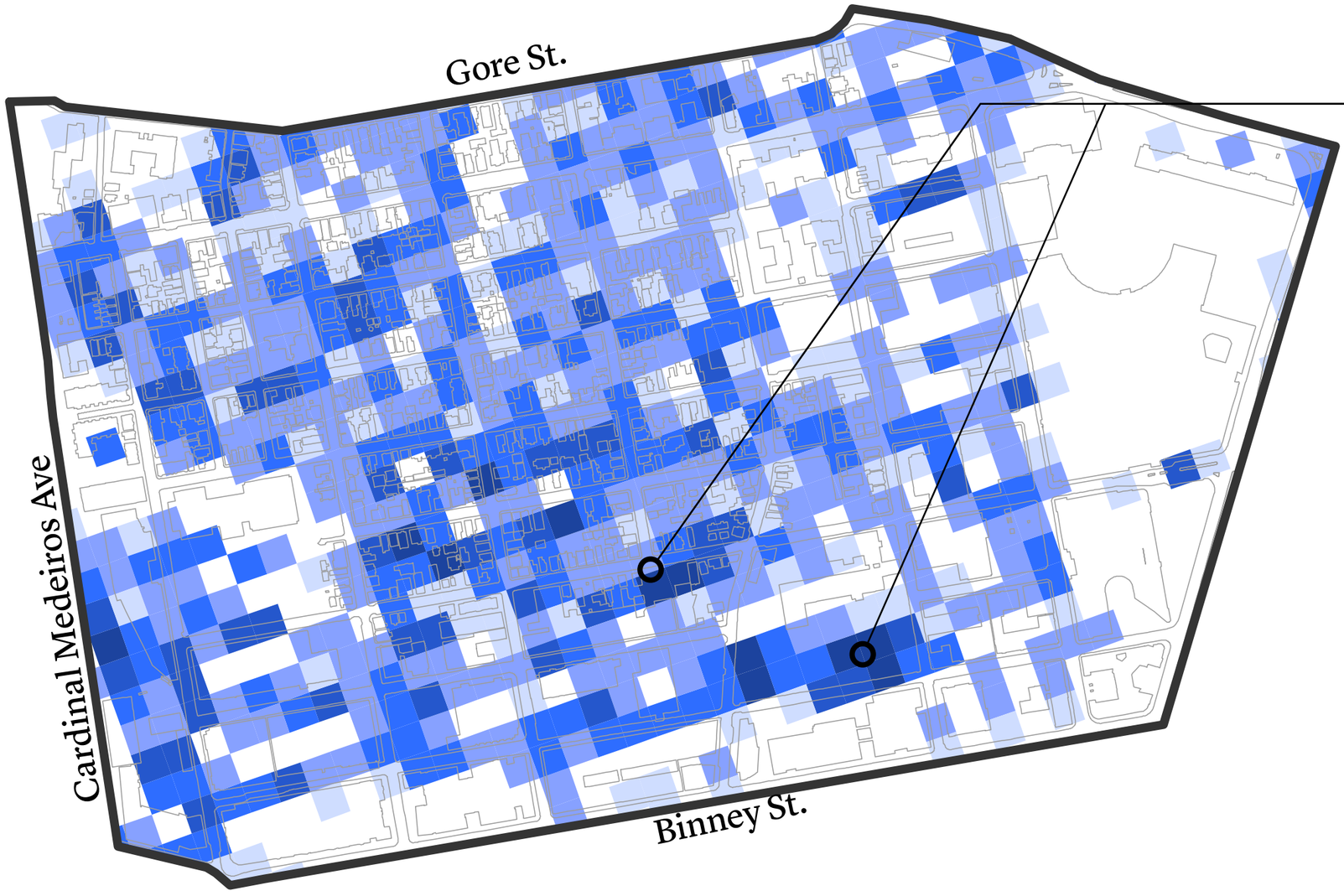
EAST CAMBRIDGE CASE STUDY

62% of East Cambridge experiences cooling of 0.5 degrees or more

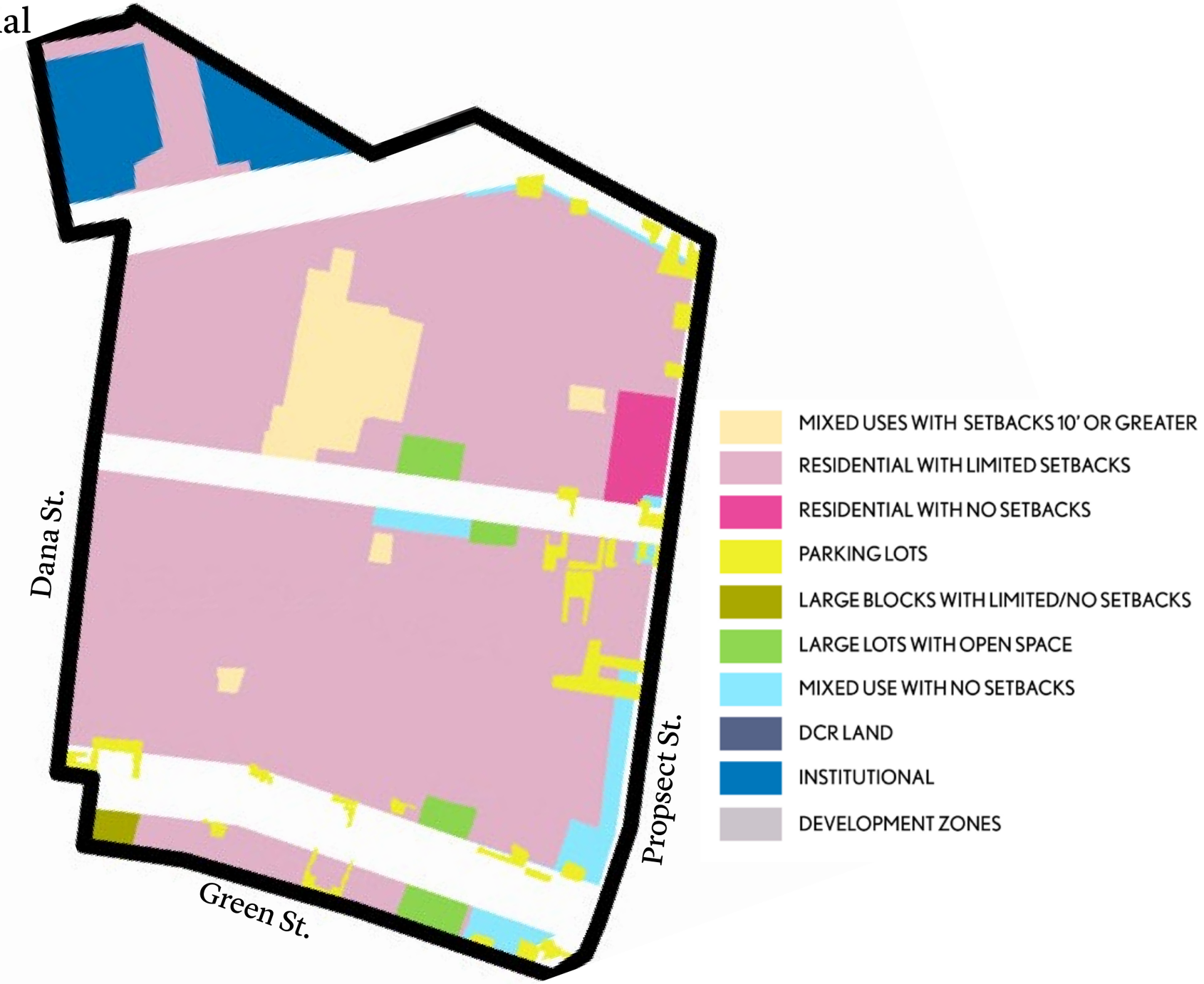


Clustered backyard plantings and dense park plantings results

CHANGE IN AMBIENT AIR TEMPERATURE °F	% OF COOLING
Change < 0.5	
Decrease 0.5 - 1	22%
Decrease 1 - 2	43%
Decrease 2 - 3	24%
Decrease 3 - 4	9%
Decrease > 4	2%

MID CAMBRIDGE CASE STUDY

Properties are primarily residential with limited setbacks with some mixed uses.



MID CAMBRIDGE CASE STUDY

20.3% canopy cover (2018)

2018 CANOPY COVER

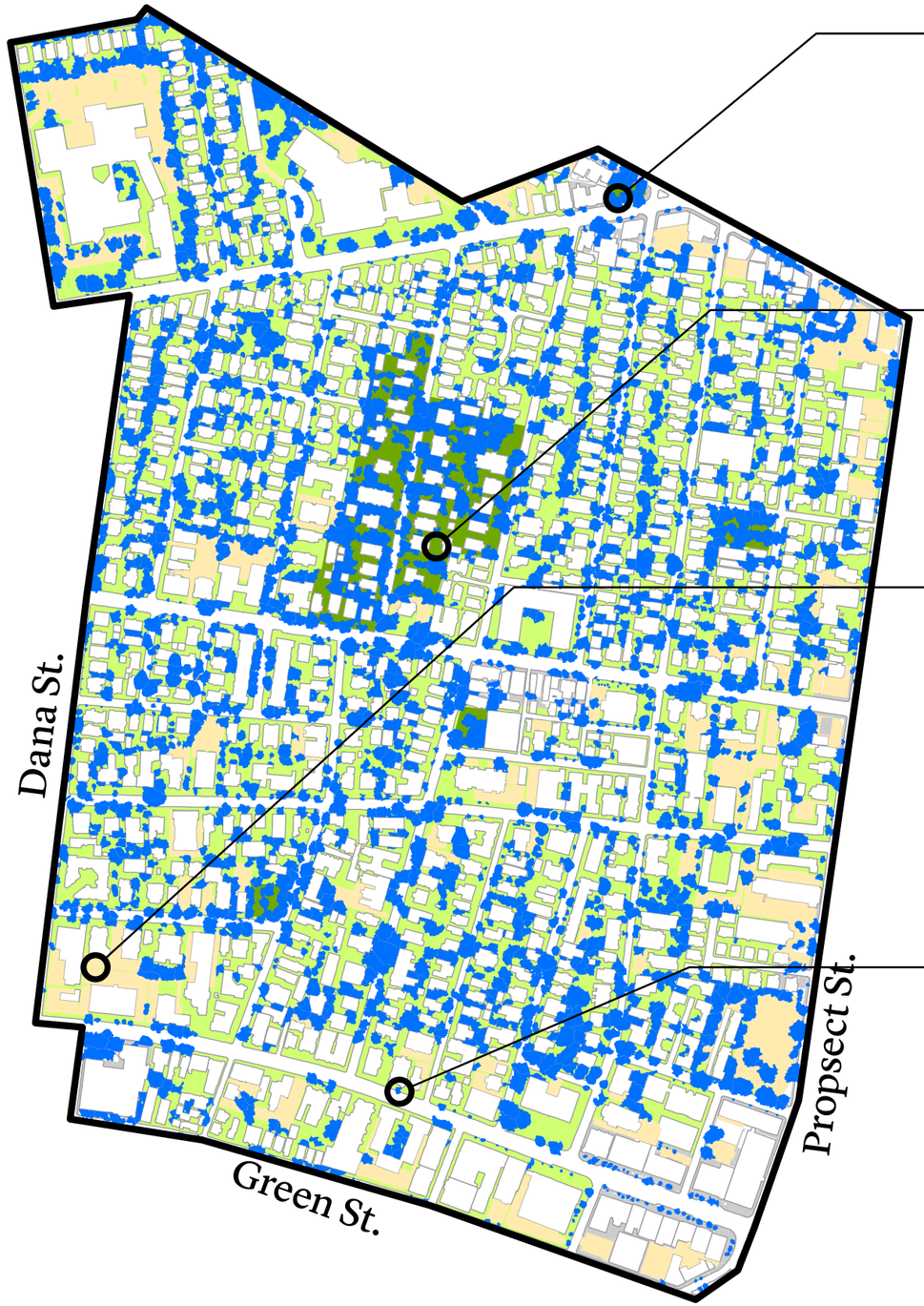
PARKING LOTS

LIMITED SETBACKS

FRONT YARD SETBACKS > 10'

IMPERVIOUS AREA

BUILDINGS/ROAD



Not reflecting Inman Square development

Canopy most dense in areas with front yard setback greater than 10'

Large areas without canopy tend to be associated with buildings and parking lots

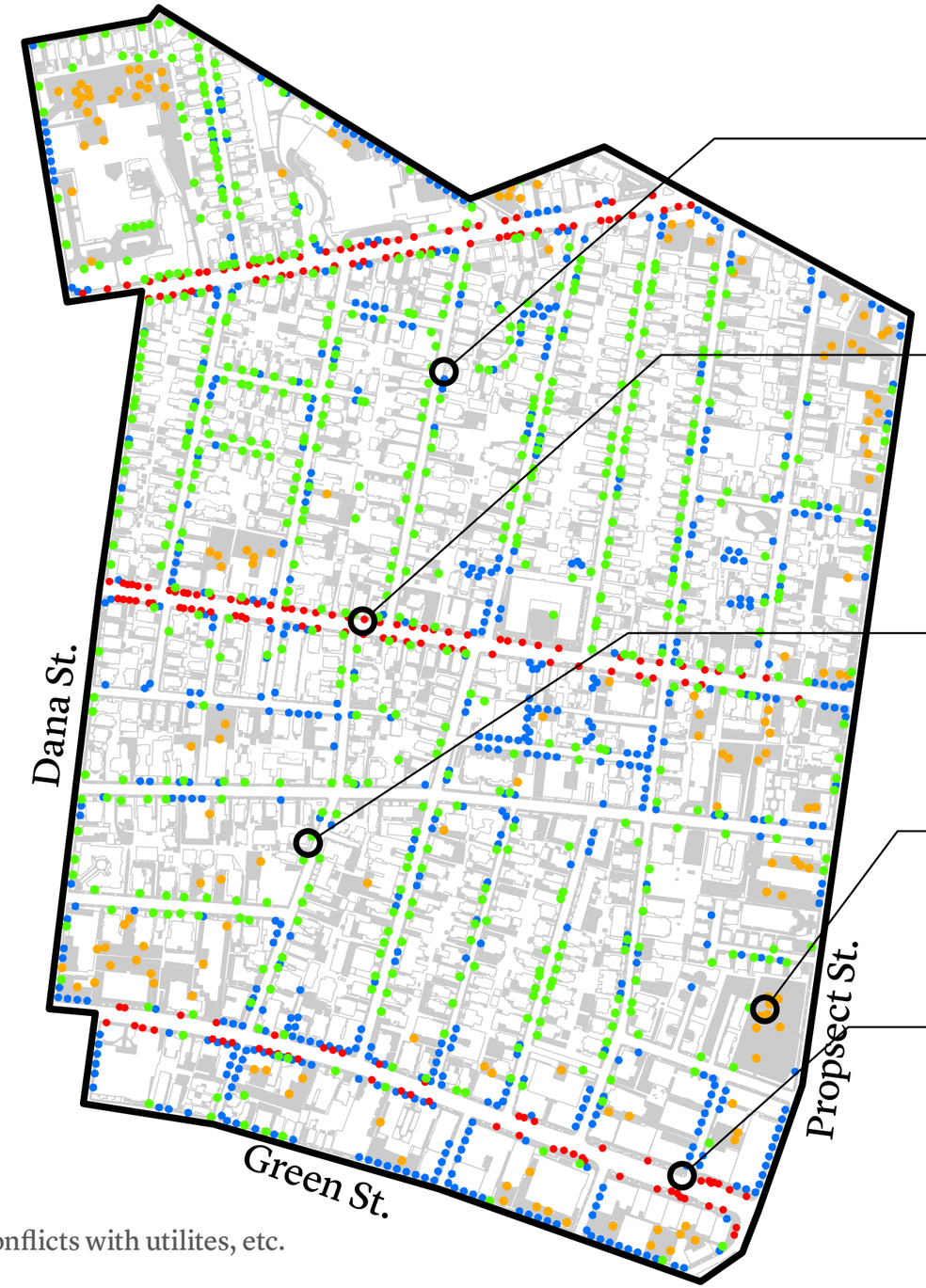
Lack of canopy along Mass Avenue

MID CAMBRIDGE CASE STUDY

Planting opportunities are along streets, in front yards, and in parking lots

*Idealized scheme of R.O.W. planting, does not consider conflicts with utilites, etc.

MID CAMBRIDGE CASE STUDY
Idealized planting scenario



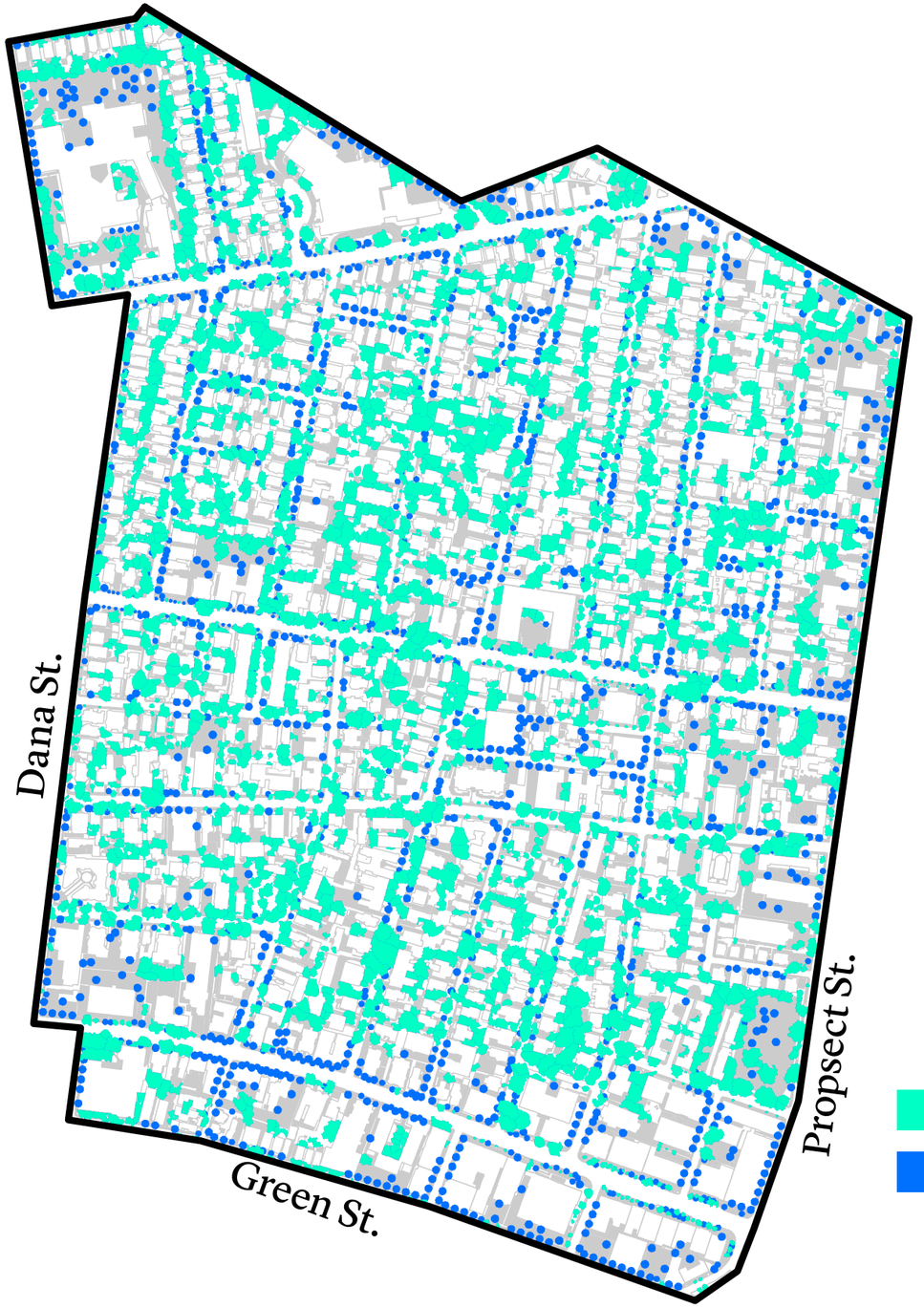
- Increase R.O.W. planting* (985 trees)
- For major streets with limited sidewalk width introduce subcanopy trees (145 trees)
- Increase front yard plantings (596 trees)
- Target 30% canopy cover (148 trees)
- For major streets with generous sidewalk width diversify and stagger trees (145 trees)

2019 trees

*Idealized scheme of R.O.W. planting, does not consider conflicts with utilites, etc.

MID CAMBRIDGE CASE STUDY

In the idealized scenario, canopy increases from 20 to 27%

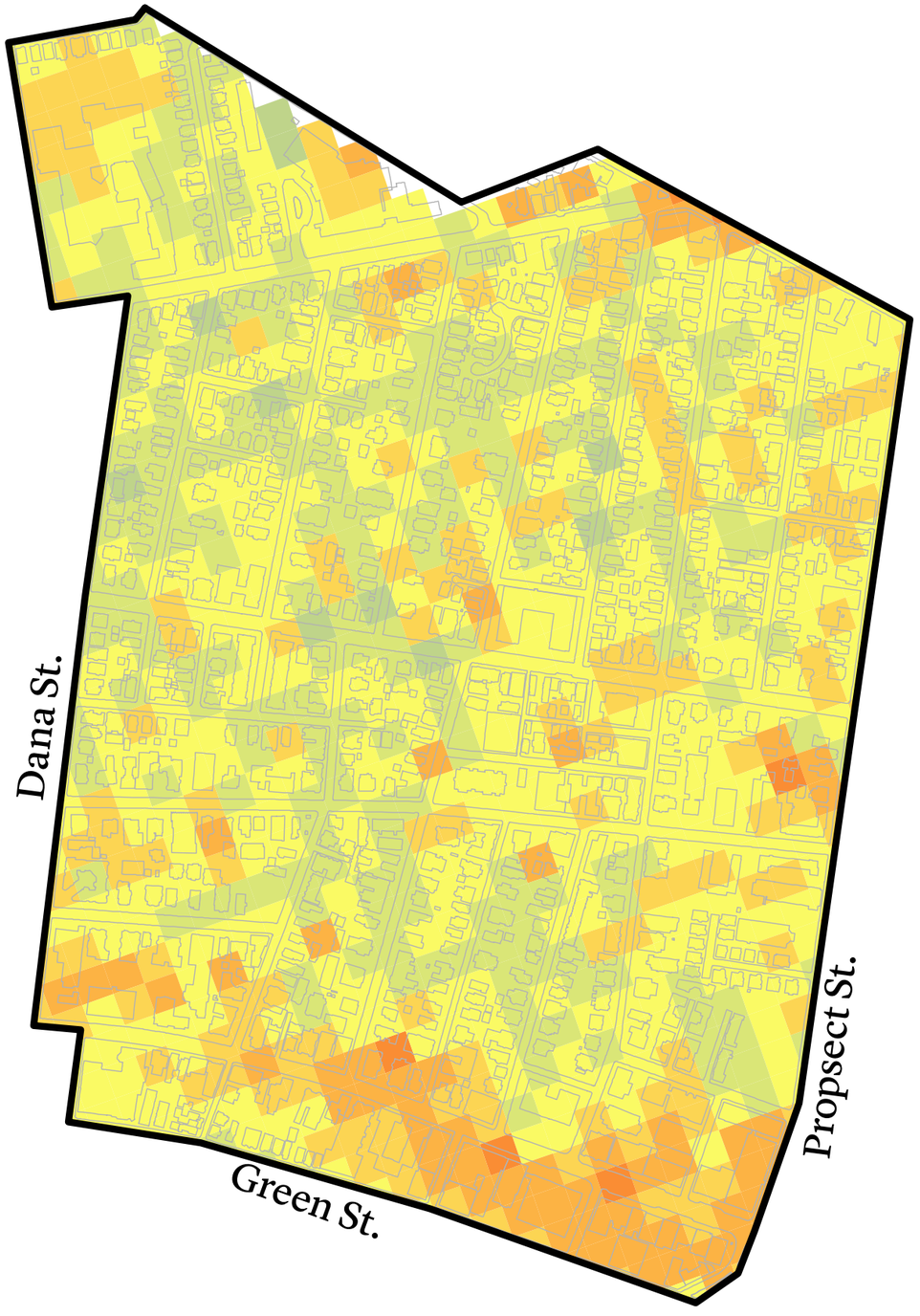


2018 CANOPY COVER

CANOPY COVER WITH PLANTING STRATEGIES

MID CAMBRIDGE CASE STUDY

2018 canopy cover



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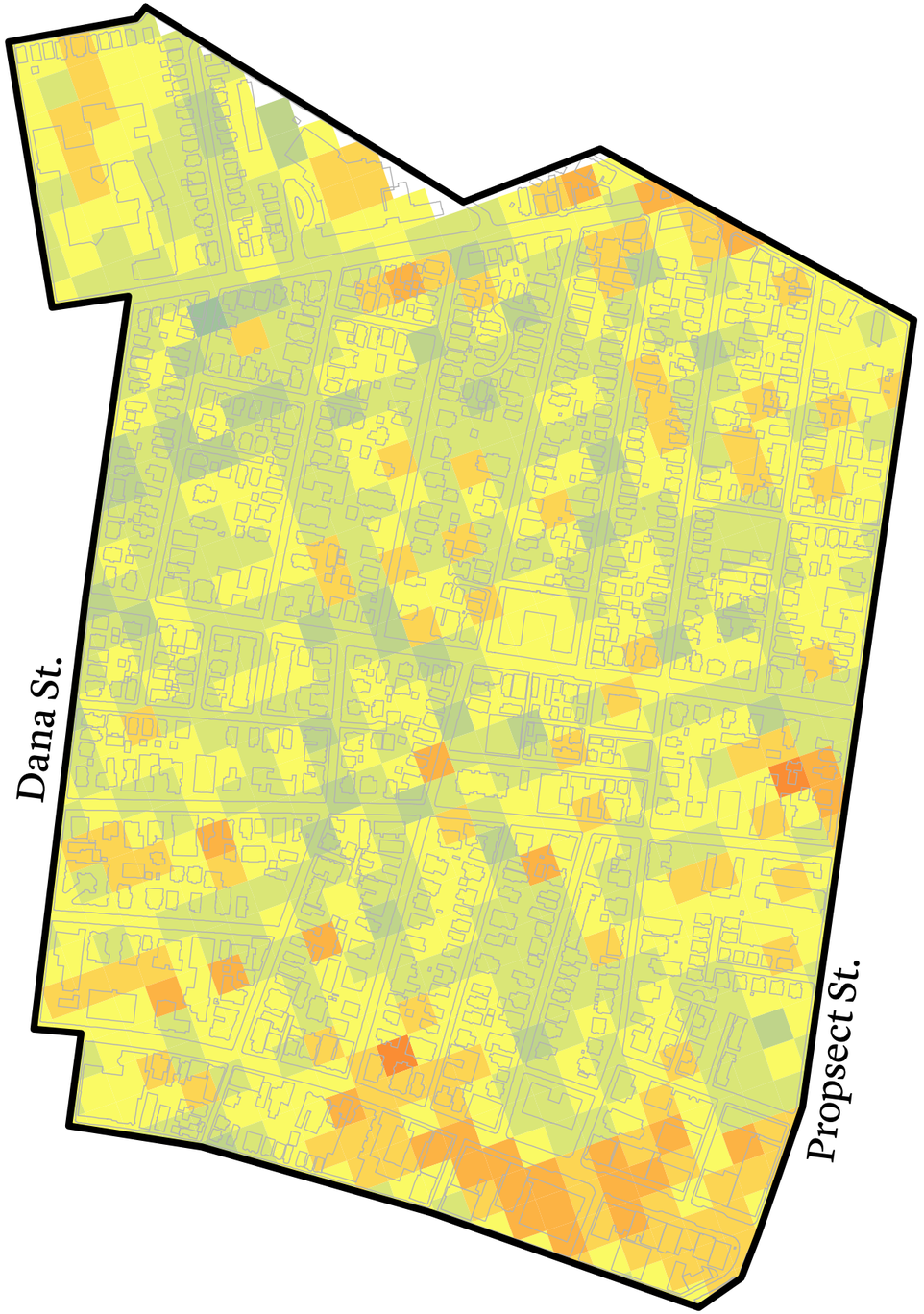
MID CAMBRIDGE CASE STUDY

Heat island modeling results of idealized planting scenario



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MID CAMBRIDGE CASE STUDY

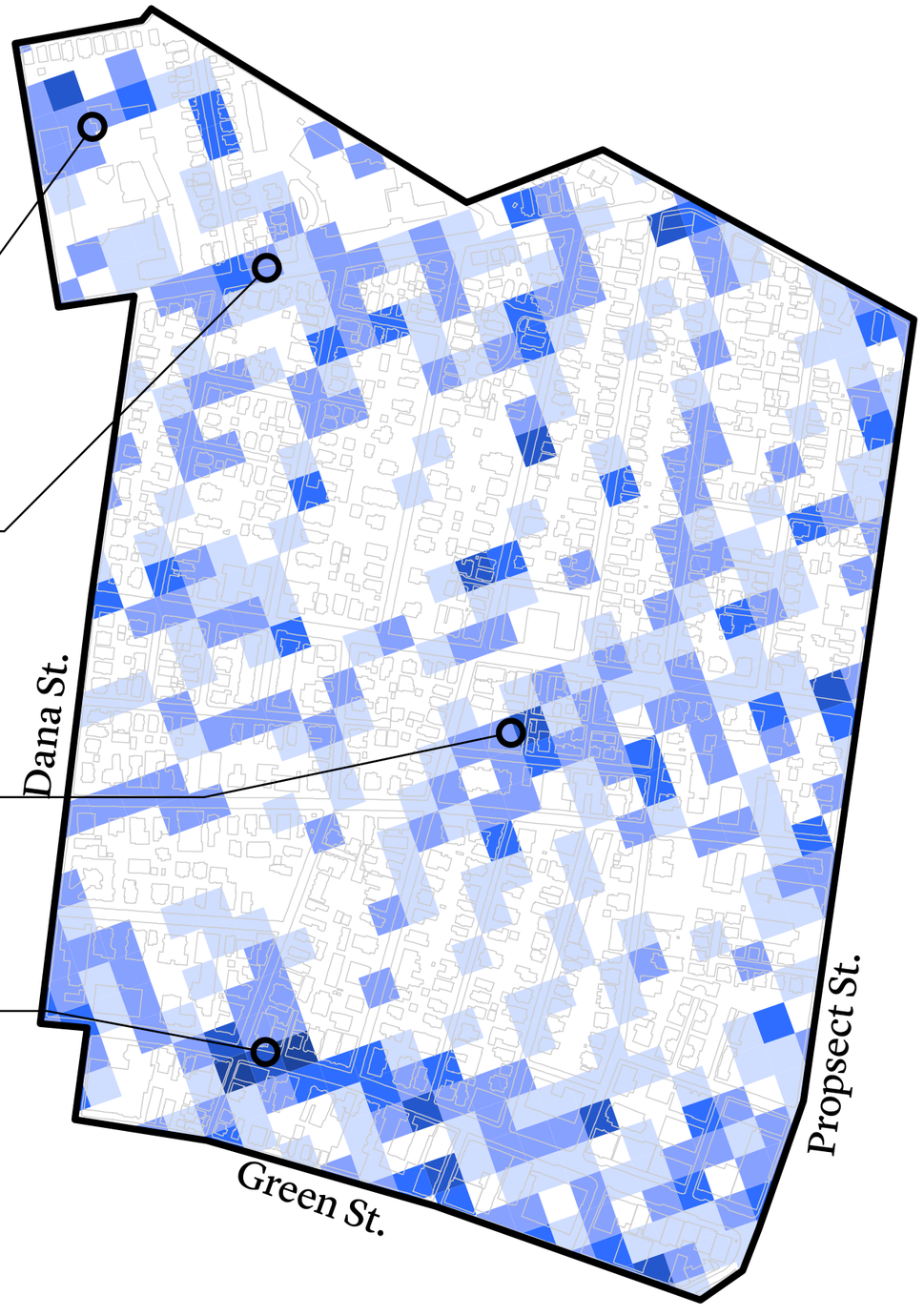
51% of East Cambridge experiences cooling (>0.5 degrees)

Large impact of trees in parking lots with existing limited cover

Combination of front yard trees with subcanopy R.O.W. trees produced some cooling

Area of small alleyways (ROW plantings may not be possible)

Mass Ave experiences significant cooling from street tree planting and parking lot planting



CHANGE IN AMBIENT AIR TEMPERATURE °F	% OF COOLING
Change < 0.5	
Decrease 0.5 - 1	51%
Decrease 1 - 2	38%
Decrease 2 - 3	10%
Decrease 3 - 4	1%
Decrease > 4	0%

— Research shows a nonlinear impact of canopy on urban heat island

— Grouping trees at the city block scale is potentially more impactful (Ziter et al, 2019)

— It is cooler under a tree on turf than it is under a tree in pavement. Removing impervious surfaces and creating cool roofs, green roofs are other strategies that can also reduce UHI.

— 100’ x 100’ grid size of model is coarse does not pick up full impact of individual tree planting

— Tree planting is shown to have an impactful effect on urban heat island mitigation, particluarly within the public realm.

— The scenarios are based on idealized circumstances and planting opportunities may be fewer than presented.

— Planting form (i.e. grouping trees) and large areas of high canopy cover (i.e. Fresh Pond area) have a dissppportionate impact and large areas of existing planting should be a high priority to protect.

CANOPY LOSS INVESTIGATIONS

SCENARIO TESTING

TASK FORCE TAKEAWAYS

ACTIVE PUBLIC PROCESS

Public engagement with the UFMP process has helped to highlight challenges and opportunities

DE-ICING SALTS

COMPACTION - VEHICULAR

MEMO TO THE CAMBRIDGE URBAN FOREST MASTER PLAN – April 22, 2019

The Cambridge Committee on Public Planting offers the following recommendations for the Cambridge Urban Forest Master Plan. We have followed the work of the UFMP/TF over the past 8 months, and appreciate the thoughtful presentations and comments by everyone involved. We look forward to continuing to work together to ensure the most robust tree canopy possible for the health and sustainability of the City, and the environment more broadly.

VISION FOR THE CAMBRIDGE URBAN FOREST

The charge to the UFMP team for the Cambridge urban forest is *"To maintain, plan, build, and sustain a healthy, connective urban forest at a time when the urban forest is more important than ever before"* (Reed Hilderbrand, June 2018 presentation). The function and value of the urban forest is stated in the Cambridge municipal code: trees promote the health, safety, and welfare of residents. They improve air quality, mitigate storm water, cool the City, reduce noise, provide habitat for birds, and increase property values.

Cambridge has reportedly lost 18% of its canopy in the past 9 years and has removed hundreds more trees in early 2019. According to LiDAR data, the loss is accelerating. Protection of existing trees is essential for a sustainable future.

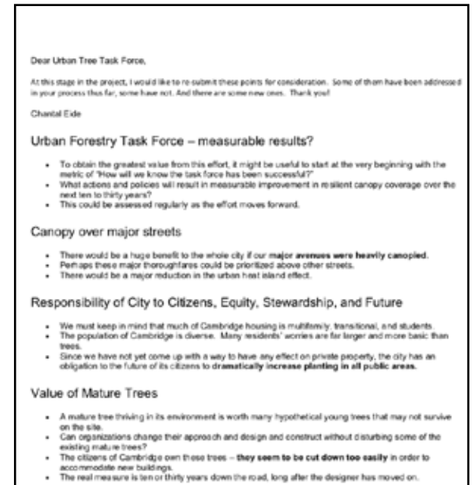
> *"Today, Cambridge has 25.3% of its land area covered by canopy. Cambridge has had an average net loss of 31 acres of canopy cover every year. At this rate, canopy cover will be 16.2% in 2030. Factoring in climate change, it may be 10.5% in 2050 but with a moderate drought it could be 9.5%*
>
> *In order to offset canopy loss (replace 31 acres per year) we need to plant 4,300 3" caliper trees each year, and wait 20 years;*
>
> *For a 1% increase in citywide canopy cover over land area after 20 years (e.g. 25% to 26%), we need to plant 5,633 trees."* (Reed Hilderbrand, Sept. 2018 presentation)

Residents of Cambridge have a deep bond with and love for our urban forest. Tree planting was once again the top winner of last year's participatory budget process, receiving three times as many votes as the second place proposal. Protecting our trees and the land they grow on is part of citizenship for all neighborhoods and citizens of Cambridge. This relationship between trees and people requires the City's strong commitment and stewardship if we are to thrive in a densely built urban environment.

THE CURRENT SITUATION

For the last 10 months, the Tree Task Force has been meeting to talk about ways to protect and grow the urban forest. During that time, hundreds of trees have been cut down at a rapid pace, most recently a wide swath of trees along the "Greenway" between Watertown and Cambridge. The mature trees that once stabilized slopes and provided a tall green respite have now been broadly removed. This action is disturbing and heartbreaking. Other recent areas

2



Dear Urban Tree Task Force,

At this stage in the project, I would like to re-submit these points for consideration. Some of them have been addressed in your process thus far, some have not. And there are some new ones. Thank you!

Chantal Eide

Urban Forestry Task Force – measurable results?

- To obtain the greatest value from this effort, it might be useful to start at the very beginning with the metric of "How will we know the task force has been successful?"
- What actions and policies will result in measurable improvement in resilient canopy coverage over the next ten to thirty years?
- This could be assessed regularly as the effort moves forward.

Canopy over major streets

- There would be a huge benefit to the whole city if our **major avenues were heavily canopied.**
- Perhaps these major thoroughfares could be prioritized above other streets.
- There would be a major reduction in the urban heat island effect.

Responsibility of City to Citizens, Equity, Stewardship, and Future

- We must keep in mind that much of Cambridge housing is multifamily, transitional, and students.
- The population of Cambridge is diverse. Many residents' worries are far larger and more basic than trees.
- Since we have not yet come up with a way to have any effect on private property, the city has an obligation to the future of its citizens to **dramatically increase planting in all public areas.**

Value of Mature Trees

- A mature tree thriving in its environment is worth many hypothetical young trees that may not survive on the site.
- Can organizations change their approach and design and construct without disturbing some of the existing mature trees?
- The citizens of Cambridge own these trees – **they seem to be cut down too easily** in order to accommodate new buildings.
- The real measure is ten or thirty years down the road, long after the designer has moved on.

ADA / Narrow Sidewalks

- ADA regulations are such that trees growing in narrow sidewalks will not be replaced when they fail.

Dear Members of the Urban Forest Task Force,

I am excited the city is working to protect the urban canopy, forest, and green space. I am much less excited about how it's going about doing that. I like to garden, and my yard has plenty of trees. I like my trees. My neighbors have been too. Almost next door, Alexandria has a massive industrial complex with virtually no trees.

My plan for this spring was to replace one of my mulberry trees with an apple tree. Right now, I do this sort of thing for fun. If the city decides that I need permits and permissions to garden and landscape, it will stop being fun, and I'll stop gardening. If trees become a liability or a hassle, the end result will be that I'll have fewer trees. With the law which just passed, I'm planning to start cutting down trees as soon as they are about to reach 8" diameter, and to mostly switch to plants either technically classified as shrubs or that don't grow that big. At the same time, that will do nothing about the growing commercial wasteland with no trees in the Kendall area.

If you'd like to encourage trees, the first step might be to rezone much of the industrial and commercial land in Cambridge. Alexandria is moving quickly to put up street-to-street office buildings, and that [much more so than tree permits and tree tribunals] needs to be stopped if we are to preserve our urban canopy. That's where we really need an emergency zoning measure – not tree permits for Cambridge residents (we like our trees!).

In the longer term, we should rethink our city planning around commercial spaces. Street-to-street buildings are quite unpleasant. Commercial and industrial lands should:

1. Require percentage green space. To make up for lost density, we could allow more height. The green factor proposal seemed nice, although a bit complex for residential owner-occupied properties. It also lacked any carrot for commercial properties which might allow it to pass (e.g. allowing more height in return for green space), and by virtue of not thinking through the holistic issues around it, became politically difficult.
2. Require some amount of space for human-friendly businesses (e.g. cafes, restaurants, child cares, small shops, etc.). If the first floor is designated human-friendly, and the Facebooks, Googles, and biotechs start on the second floor, we've lost very little
3. Mirroring low-income housing, designate some portion of commercial space for small, resident-owned businesses, small nonprofits, arts, maker spaces, and/or community organizations.
4. If increasing density, submit a plan for impact on traffic, public transit, and bicycle transportation

A comprehensive, thought-out rezoning like that could address urban canopy, growth/development, and many other issues, and draw support from many more stakeholders.

If we do go the current path – tree tribunals, permits, and similar – there should not just be fines to the Tree Fund for cutting trees, but also payouts from the Tree Fund for growing new ones. If I cut down a tree to plant a new one in its place, that's a neutral, normal thing to do. Under the current plan, I might be looking at massive fines to do that.

Best wishes,
Piotr

Catherine,

Vice Mayor Devereux suggested I reach out to you with the following thoughts.

I commend the DPW on its efforts to preserve and expand our tree canopy. In reviewing the recent Urban Forest Masterplan presentations (Task Force presentations 5-7) I was surprised to find no mention of one of the biggest obstacles to canopy expansion, namely our reliance on obsolete overhead utility distribution, which renders nearly half of our sidewalks unsuitable for tree planting. While I have no illusion that the conflict between trees and overhead wires can be easily or inexpensively resolved, it seems sensible, while we are evaluating our canopy expansion options, to at least identify and quantify the utility impacts. Canopy preservation alone may not warrant the significant investments undergrounding would require, but in concert with the many other compelling reasons, including maintenance cost, storm resiliency, system modernization, and beautification, it might tip the balance. But to do this, we need data.

I therefore strongly encourage DPW to direct the consultants to address this in their final report, or if it's to late for that, to submit an addendum stating *how many additional trees could be planted on public property if overhead utilities were not a limiting factor, and the potential savings from pruning and damage reduction.*

I would also encourage DPW to consider undergrounding as an opportunity to address a host of challenges we face. In addition to climate change, many of our utilities are undergoing significant technological change, including distributed power generation (e.g., Cogeneration / CHP) and greater reliance wireless technology. Our existing system is a hodgepodge of largely obsolete junk strung haphazardly across the public spaces of our city. There could be real advantages and long term cost savings in a more systematic and maintainable approach. Canopy expansion would be among the many benefits. I'd be interested in knowing whether or how recently DPW has looked into this?

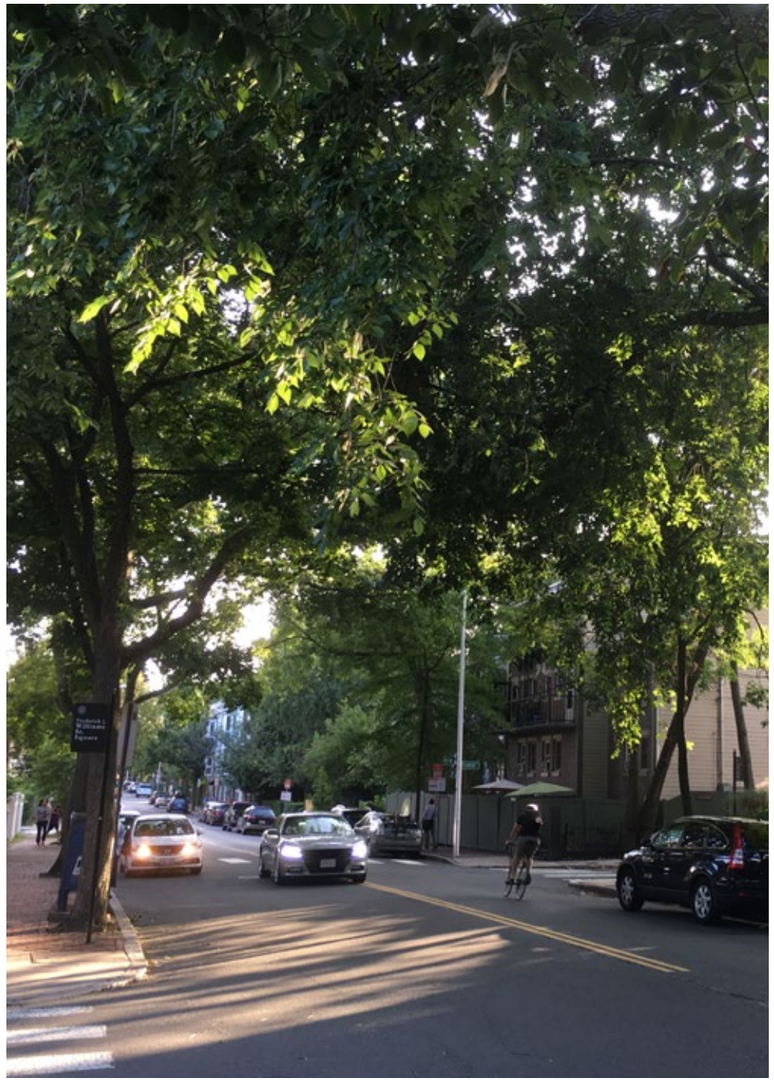
The most practical way to begin implementing of change of this scale would probably be to fold it into existing street or underground utility projects, so the cost could be shared. Perhaps it would be possible to identify potential demonstration projects?

I'd be grateful if you could share these thoughts with the Canopy Task Force, and would be happy to discuss further if you have a few minutes.

Sincerely,

Brad Bellows

ASPIRATIONS



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What is the most impactful thing
you've learned during this process?

What is the most important thing for us
to study and develop during the next phase?

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