

# Cambridge Urban Forest Master Plan

## Task Force Meeting #13

February 6, 2020



CAMBRIDGE  
DEPARTMENT  
OF PUBLIC  
**THE  
WORKS**



## GOALS FOR THE MEETING

To hear feedback on alternative approaches to updating the tree protection ordinance. This will inform future discussions with the City Council.

STRATEGY PRIORITIES

SUMMARY OF EXISTING ORDINANCE

AMENDMENT OPTIONS

NEXT STEPS/DISCUSSION

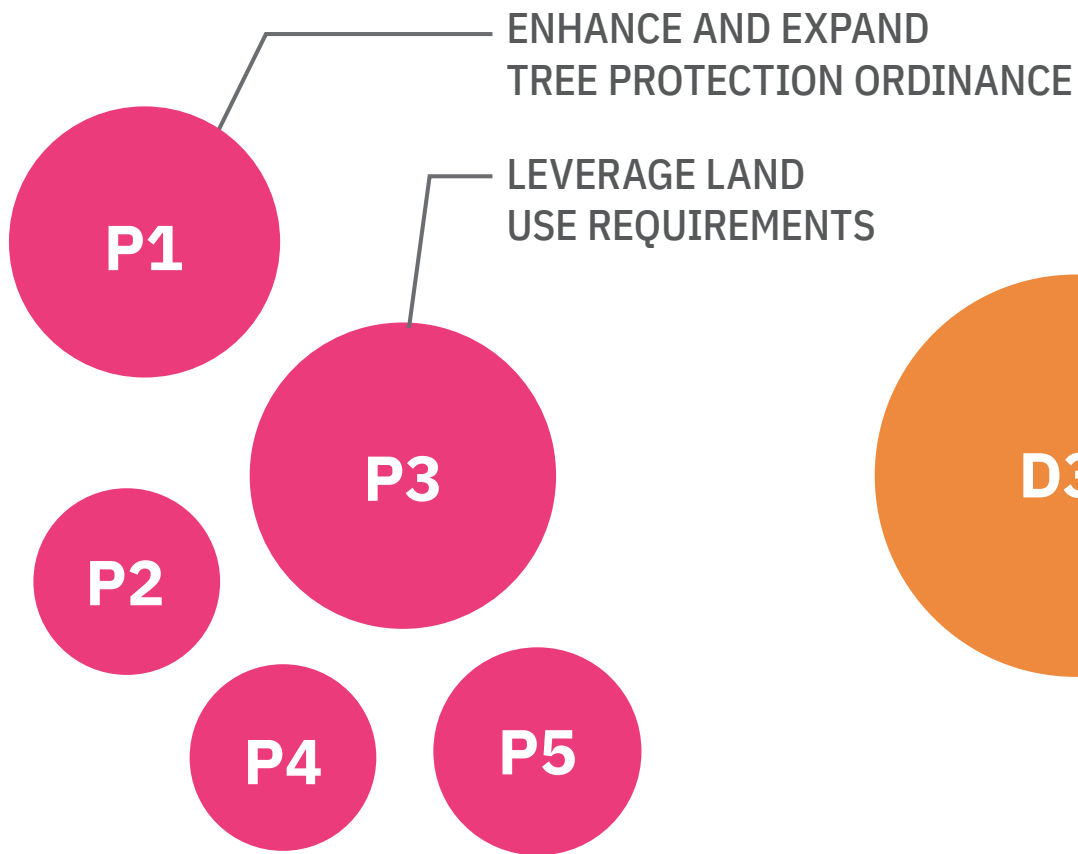
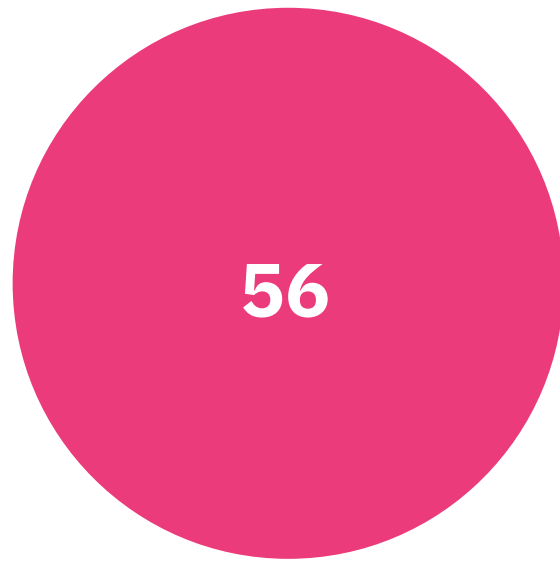
STRATEGY PRIORITIES

SUMMARY OF EXISTING ORDINANCE

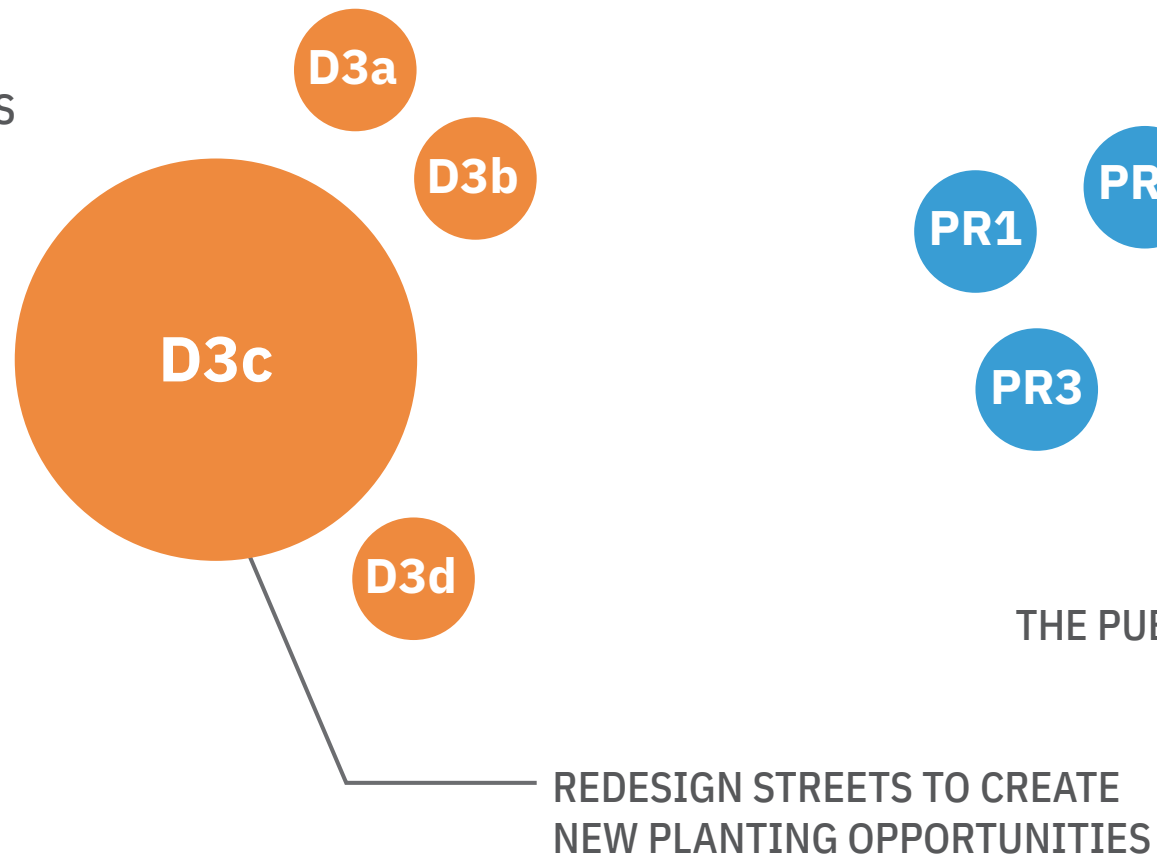
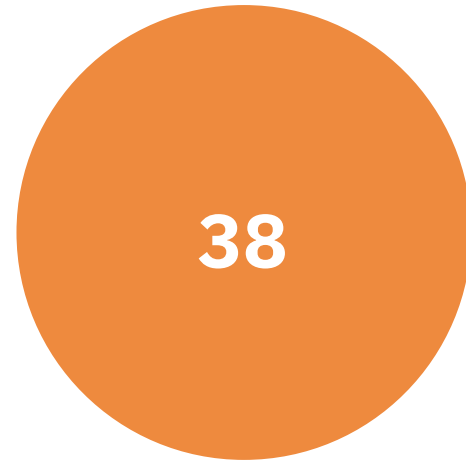
AMENDMENT OPTIONS

NEXT STEPS/DISCUSSION

# POLICY



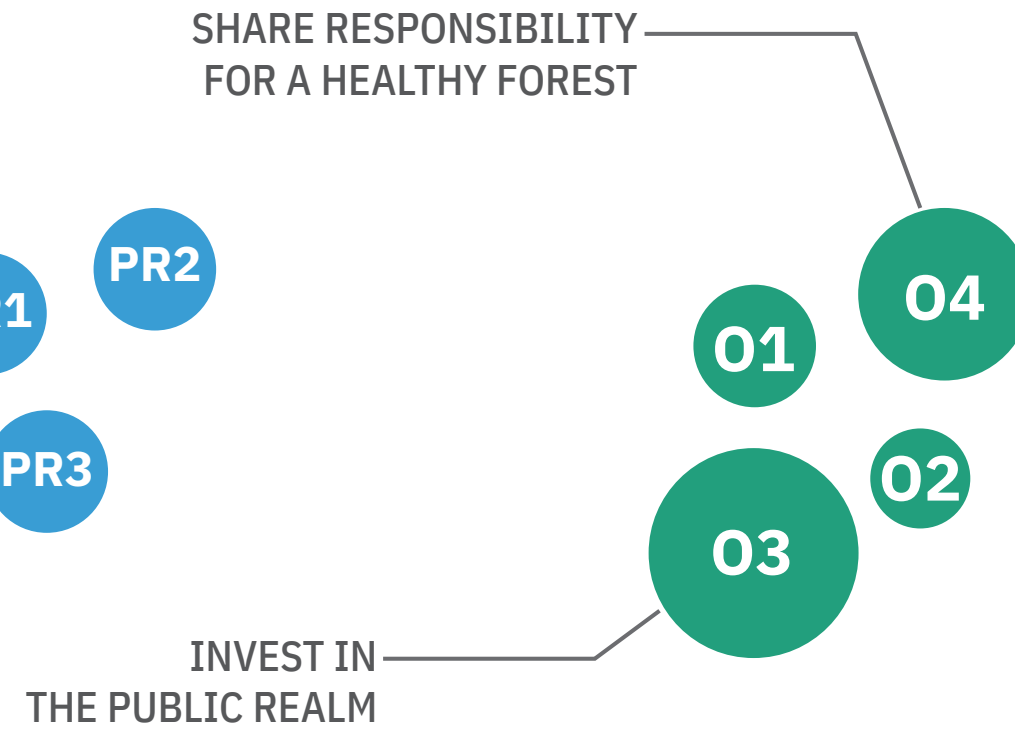
# DESIGN



# PRACTICE



# OUTREACH & EDUCATION



STRATEGY PRIORITIES

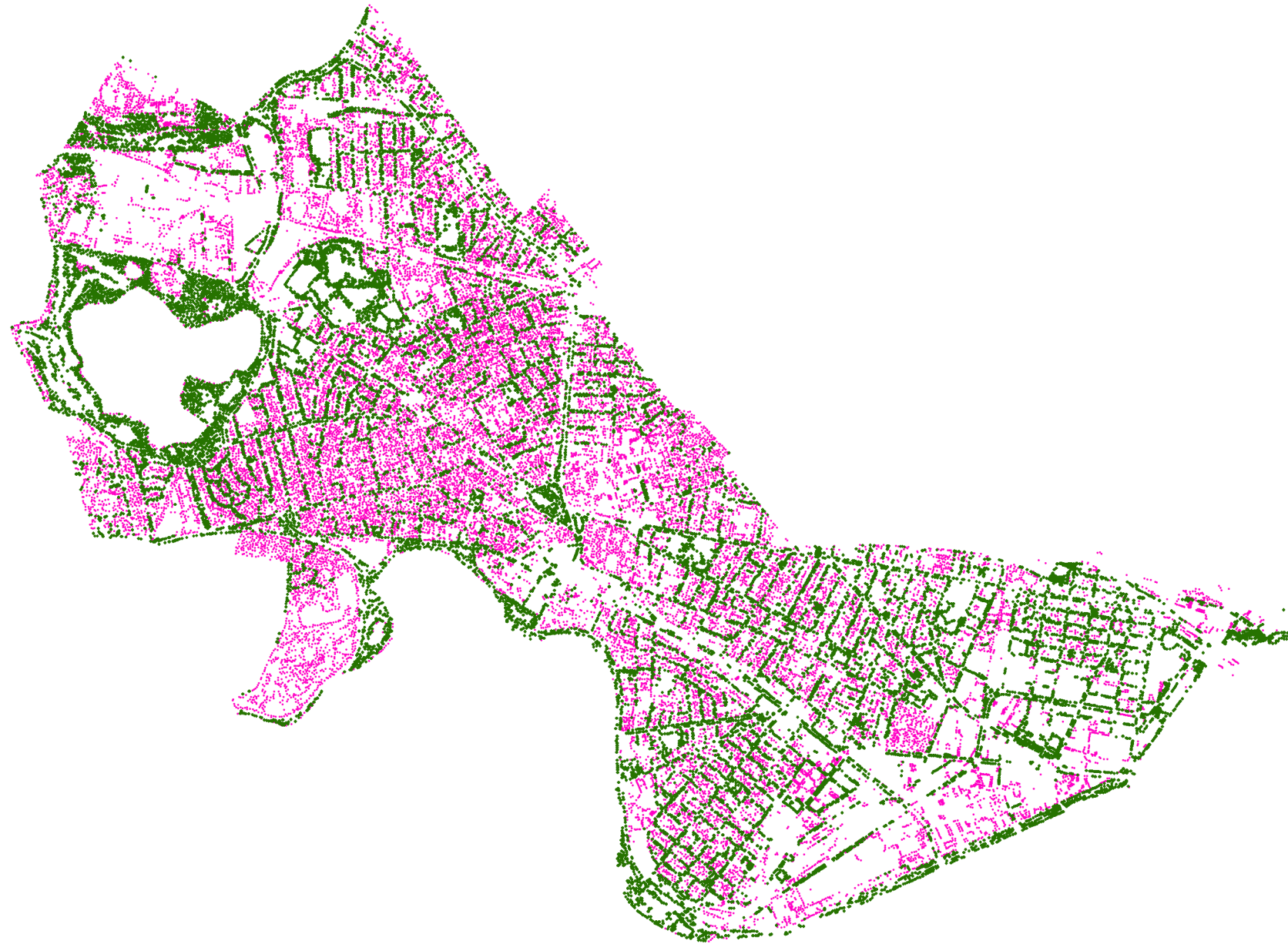
SUMMARY OF EXISTING ORDINANCE

AMENDMENT OPTIONS

NEXT STEPS/DISCUSSION

# FINDINGS

Private property represents 72% of the total loss since 2009 and 58% of the total 2018 canopy



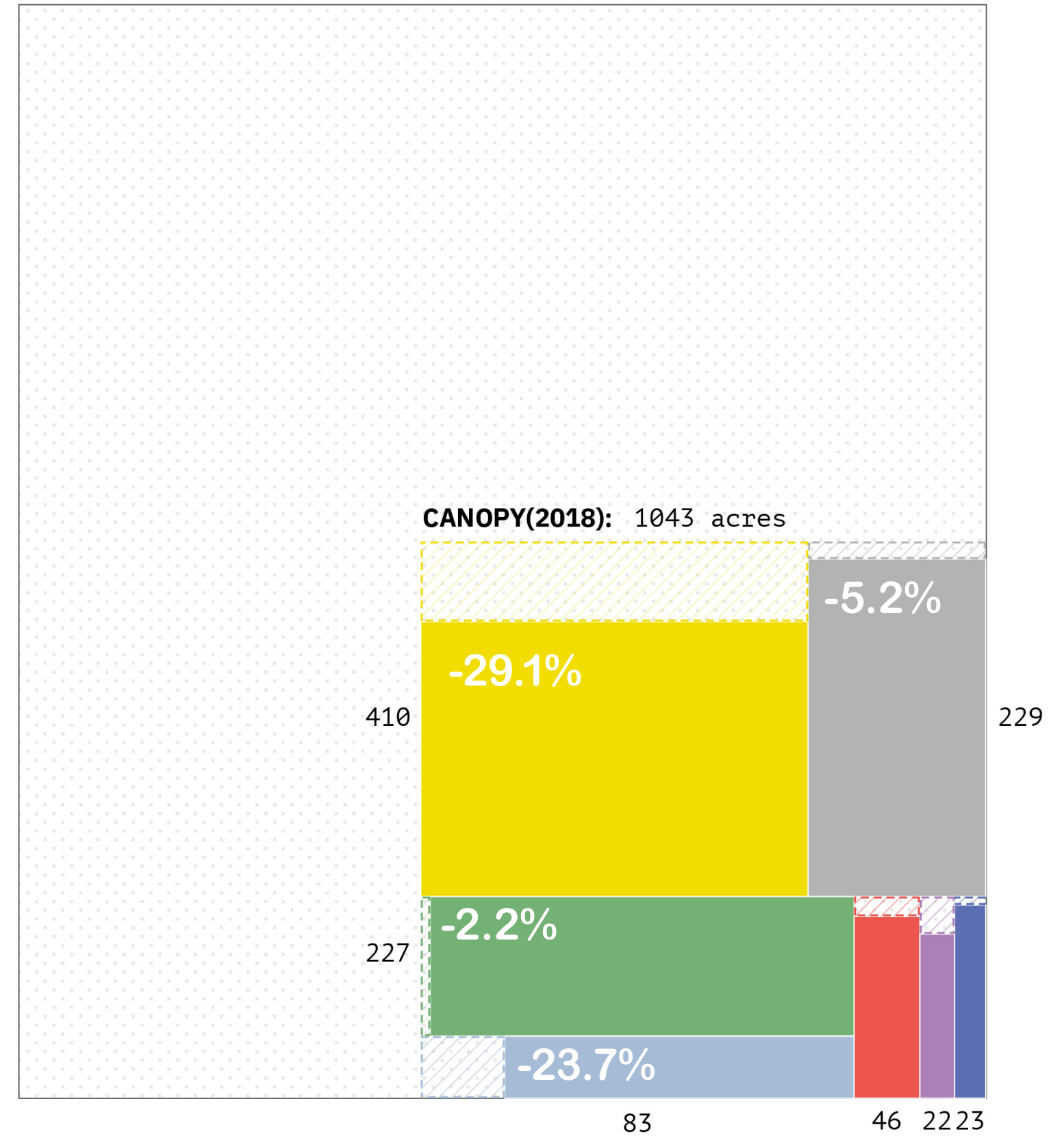
## 2018 CANOPY

- CITY AND STATE OWNED TREES
- PRIVATE TREES

REED HILDERBRAND

CAMBRIDGE URBAN FOREST MASTER PLAN

## AREA OF CAMBRIDGE CITY

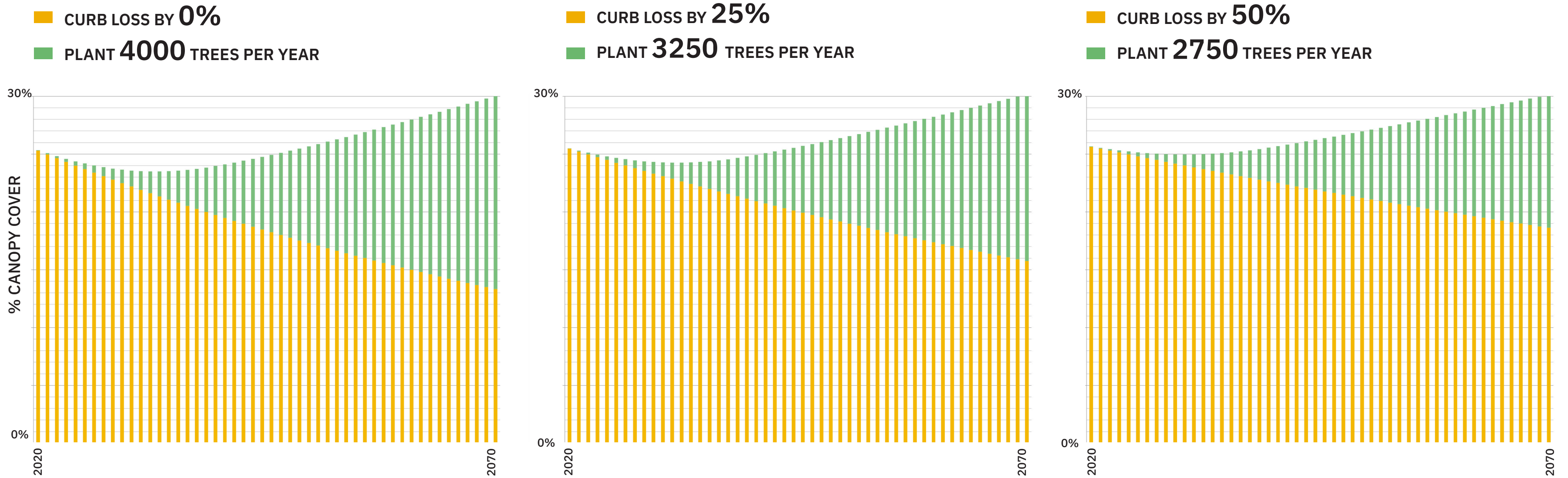


- RESIDENTIAL
- ROW
- OPEN SPACE
- INSTITUTIONAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC

TASK FORCE MEETING 13 | FEBRUARY 6, 2020

# SHARED RESPONSIBILITY

Understand the importance of curbing loss to reaching 30% canopy cover

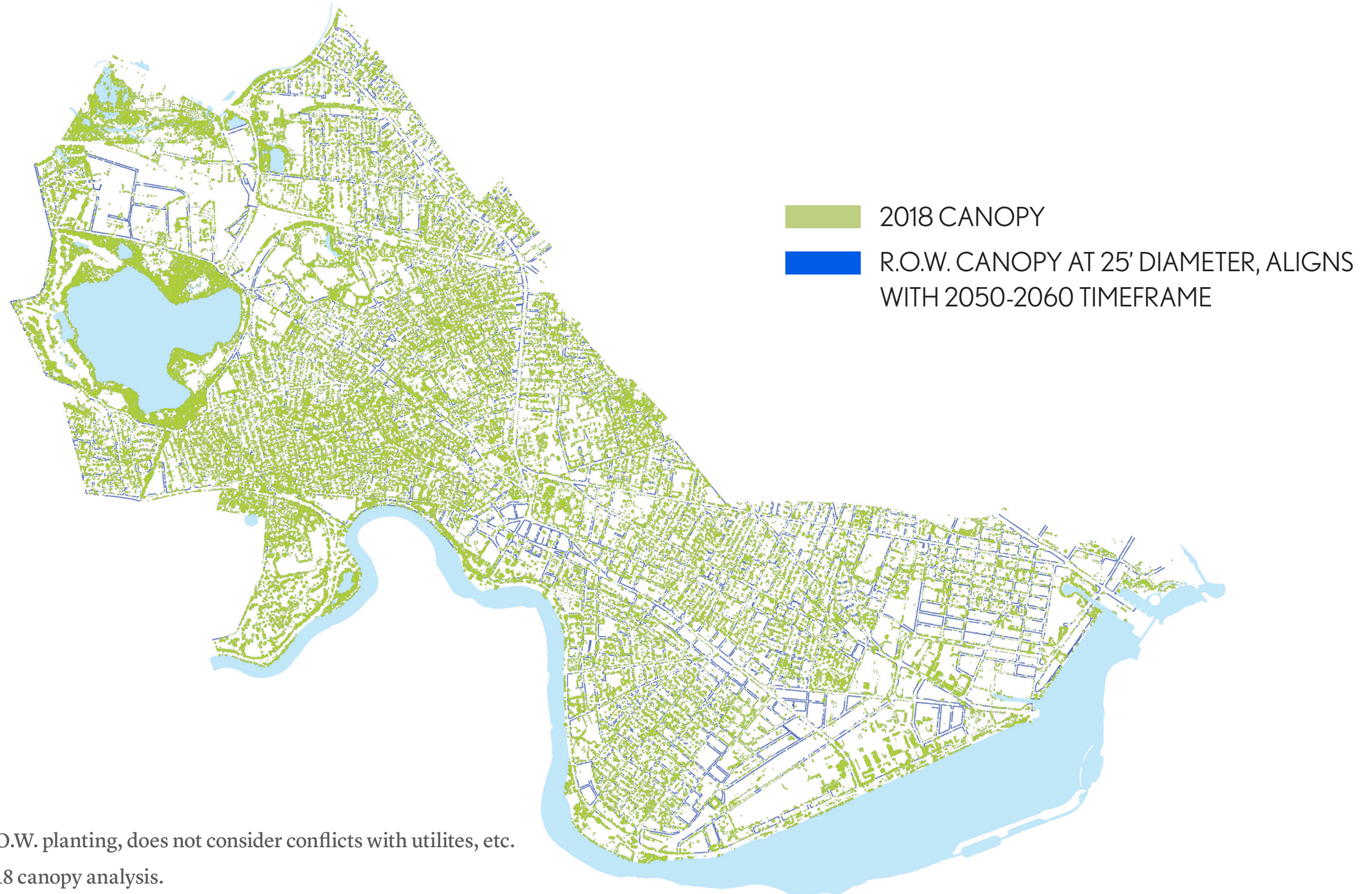




# RESILIENCE

## Shade the Public Realm

12,000 NEW RIGHT OF WAY  
TREES AT MATURITY INCREASE  
CANOPY COVER FROM  
26% TO 27.5%\* CITYWIDE



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

Source: and CUFMP 2018 canopy analysis.

# TREE PROTECTION ORDINANCE

Is well suited to ...

- Establishing city policies for urban canopy management
- Establishing dedicated funds for tree mitigation and planting
- Establishing dedicated structures, permitting programs, and/or review process
- Collecting and distributing fees in exchange for tree removal
- Setting standards for tree removal, replacement plantings, pruning, etc.
- Setting standards for tree protection during construction



## TREE PROTECTION ORDINANCE

Must be supported by allied efforts in ...

- Zoning Requirements to encourage planting
- Capital and Operating expenditures and infrastructure enhancement
- Urban Design Standard updates
- Education and outreach
- Partnerships with institutions and groups

# EXISTING ORDINANCE

## Overview

1. What's protected?
2. What's the current process?
3. What's the cost and who is paying?
4. What's happened over the last year?
5. What sunsets and what remains?

## EXISTING ORDINANCE

What is protected?

### SPECIAL PERMITS PROJECTS

all significant trees (over 8" dbh) require mitigation

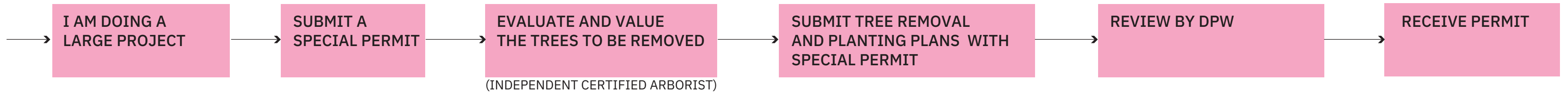
### ALL OTHER PROPERTY TYPES

significant trees (over 8" dbh) require a permit

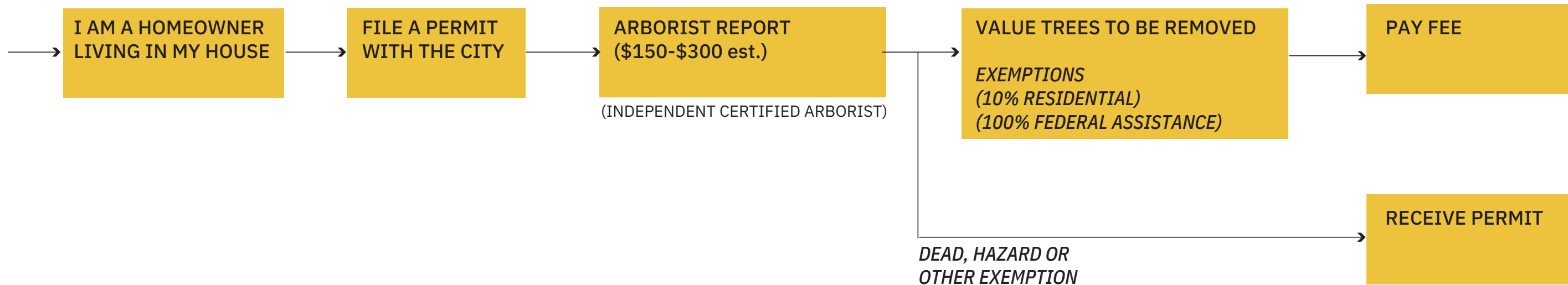
# EXISTING ORDINANCE

What is the process?

## SPECIAL PERMITS PROJECTS



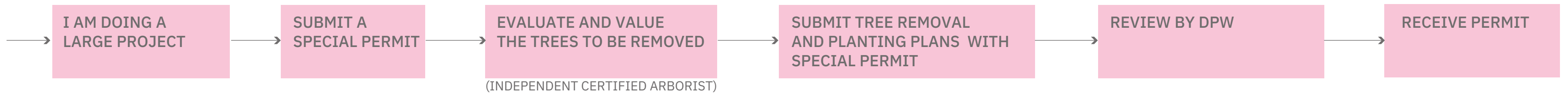
## ALL OTHER PROPERTY TYPES



# EXISTING ORDINANCE

What is the cost for voluntary removals?

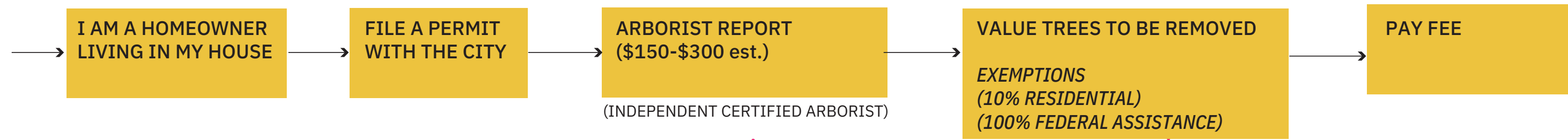
## SPECIAL PERMITS PROJECTS



# EXISTING ORDINANCE

What is the cost for voluntary removals?

## ALL OTHER PROPERTY TYPES



### ARBORIST REPORT FOR ALL TREES (EVEN IF DEAD OR DYING)

\$50 - \$150:  
site visit to determine whether the tree is significant and/or qualified for removal as hazard, etc.

\$250 - \$300:  
site visit to evaluate the tree, on-line permitting



### MITIGATION FEE BASED ON TRUNK DIAMETER FORMULA

(x 0.1 for homeowners)  
(x 0 for those of Federal assistance)

$$\text{VALUE} = \text{TYP. REPLACEMENT FOR 2" CAL} \times \frac{\text{TOTAL CALIPER INCHES OF TREE}}{2 \text{ IN (TYPICAL)}} \times 0.1$$

\$1,700  
(COST, PLANTING, & 3 YRS OF WATERING)



## EXISTING ORDINANCE

What happened over the last year?

**376** permits received

**347** permits approved

**19** permits declined

**10** permits stopped

**57** Norway Maple trees

**41** Hemlock

**23** Elm

**21** White pine

**20** Ash trees

**17** Sugar Maple

**17** Red Oak trees

## EXISTING ORDINANCE

What happened over the last year?

### REASONS FOR REMOVAL

- 263** of approved permits were for dead or dangerous trees
- 36** permits, City Parks Project
- 22** permits, to provide a healthier tree canopy on the property
- 10** permits, tree poses a significant impact to an adjacent existing structure
- 9** permits, significant utility infrastructure project
- 7** permits, emergency circumstances

## EXISTING ORDINANCE

What happened over the last year?

### REASONS FOR DENIAL

- 11** permits: did not reapply– application incomplete
- 7** permits: did not reapply– did not meet category requirements
- 1** permit: incorrect category

## EXISTING ORDINANCE

### Moratorium

A moratorium on issuing permits, except in the case of hazard, began March 11, 2019 and will expire on February 25, 2020.

City Council is considering extending the moratorium until permanent changes to the Tree Protection Ordinance can be approved.

STRATEGY PRIORITIES

SUMMARY OF EXISTING ORDINANCE

AMENDMENT OPTIONS

NEXT STEPS/DISCUSSION

## PROPOSED ADDITIONS

Enhance ordinance impact

DRAFT FOR DISCUSSION ONLY

### **Fund**

Enable the Tree Fund to be used in more flexible ways

### **Enforce**

Institute a performance bond system to ensure follow through

**Intent**

Enable the Tree Fund to be used in more flexible ways.

**Action**

Allow for funding of outreach and education programs.

Allow for funding that plant trees outside of city property.

**Precedent**

Atlanta: dedicates a specific portion of funds to educational outreach, administrative costs, salaries of city staff, and honoraria for tree commission members.

Portland: funds may be used to plant tree on public or private property, purchase conservation easements for the perpetual retention of trees and tree canopy and acquire land to permanently protect existing trees or groves.

## **Intent**

To ensure that trees survive for at least a few years after planting.

## **Action**

Require a two year bond be posted after final inspection of property prior to issuing CO with site inspection at 12 and 24 month periods and perhaps a longer timeframe.

## **Precedent**

Savannah, GA: requires that a two-year bond be posted after the final inspection of the property prior to issuing the C.O. At the 12 and 24 month periods after the date of the bond, there is a site inspection to check conditions of trees. The administrator can require the property to address any items that may affect the future viability of the required trees at both inspection periods. The guidelines document recommends a period longer than two years.



## VALUES

To be represented in the ordinance amendment

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Trees are a shared resource

Trees provide benefits to the city

Not all trees are equal

Replanting in kind is preferred, but not all sites and project types are the same

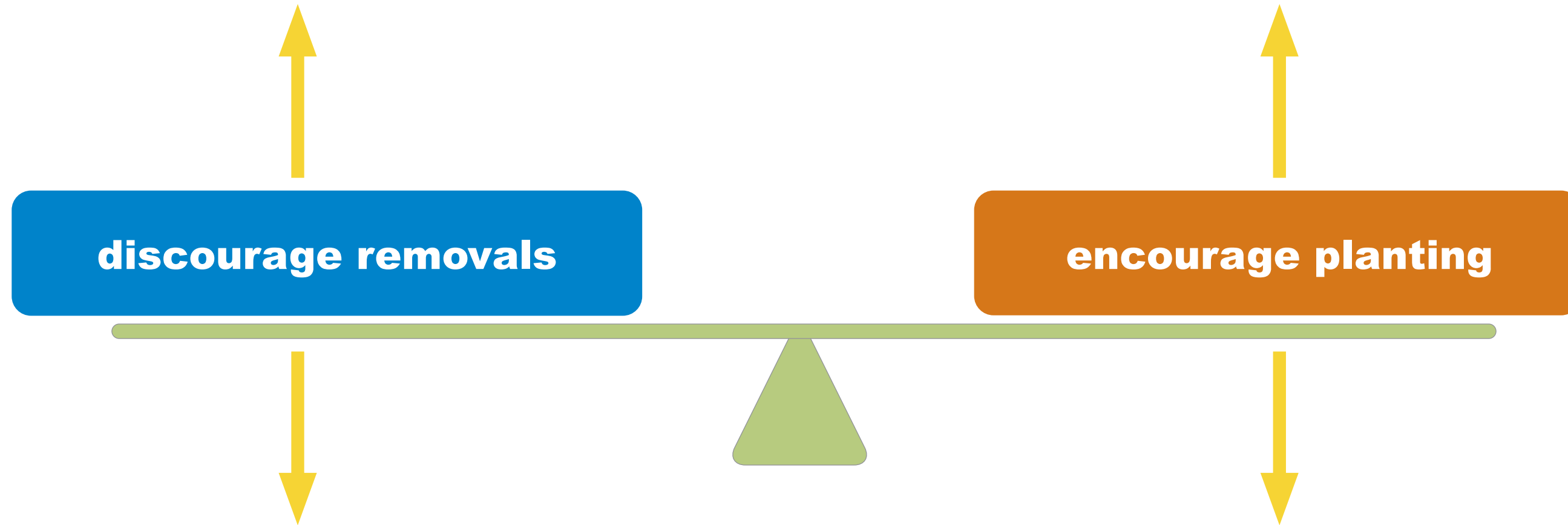
The process should be simple and objective

The process should be equitable

# COMPETING INTERESTS

To be balanced in the ordinance amendment

DRAFT FOR DISCUSSION ONLY



## PRINCIPLES

To be represented in the ordinance amendment

DRAFT FOR DISCUSSION ONLY

### **Everyone should be subject to the ordinance**

All property types are under the jurisdiction of the ordinance

### **Protect more trees**

All trees over 6” dbh are covered by the ordinance (currently 8”)

### **Protect the largest trees**

Increase mitigation for larger trees

### **Ensure equitable application of the ordinance**

Exempt those on federal assistance from any fees

### **Encourage replanting on private property**

Expand the uses of mitigation funds

## COMPARABLE REGULATIONS

### Requirements (removal or destruction)

City/town	Trees on private property are within jurisdiction (outside of development process)	Exemptions other than dead/hazardous condition	Special/heightened requirements for Heritage/Exceptional trees or the equivalent	City/town has policies on planting or canopy loss	Zoning-esque landscape and design standards are included in tree protection ordinance	Requires compliance prior to inspection or C.O.
Atlanta, GA	✓	✓		✓	✓	✓
Dallas, TX	✓	✓			✓	✓
Seattle, WA	✓	✓	✓			
Portland, OR	✓	✓	✓	✓	✓	
Austin, TX	✓	✓	✓			
Providence, RI	✓	✓			✓	
New York, NY		✓				
Washington, DC	✓		✓			
Nashville, TN	✓	✓	✓			✓
Tampa, FL	✓	✓	✓		✓	✓
Cambridge, MA	✓	✓				

\*Tree protection requirements were either recently revised, currently undergoing revision, or being considered for revision

# PRECEDENT – REMOVALS

From other cities

NO PERMITS ISSUED FOR REMOVAL OR DESTRUCTION OF ANY LIVING AND NON-HAZARDOUS TREE (>6" DBH OR GREATER) WITH FEW EXCEPTIONS

ATLANTA, GA

PERMIT REQUIRED FOR REMOVAL OF ALL CITY TREES 3-INCH DBH OR GREATER AND PRIVATE TREES 12-INCH DBH OR GREATER, WITH FEW EXCEPTIONS

PORTLAND, OR

REMOVAL OF HERITAGE TREE ONLY APPROVED WITH A VARIANCE FROM LAND USE COMMISSION UNLESS IT IS AN IMMINENT HAZARD. TWO PERMITTING PATHS BASED ON TREE SIZE AND OTHER CRITERIA, ALLOWS REMOVAL OF UP TO 4 HEALTHY, NON-NUISANCE TREES PER YEAR.

AUSTIN, TX

NO PROTECTION OF TREES ON PRIVATE PROPERTY EXCEPT DURING DEVELOPMENT. REQUIREMENTS FOR TREES REMOVED DURING DEVELOPMENT ARE RULED BY ZONING.

NEW YORK, NY

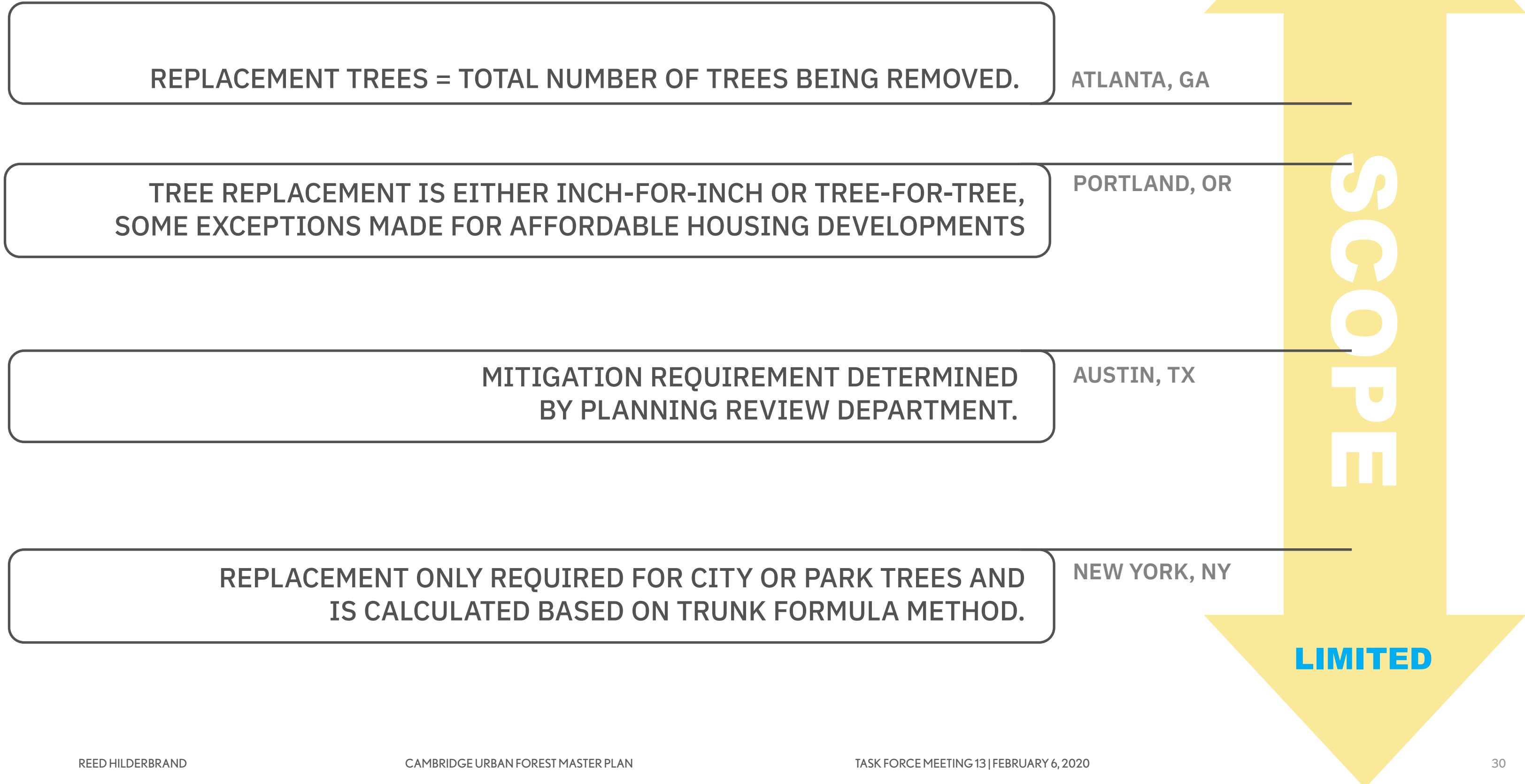
**COMPRE-  
HENSIVE**

**SCOPE**

**LIMITED**

# PRECEDENT – MITIGATION

From other cities



## PRECEDENT Mitigation fee comparison

City/town	Tree fund or account maintained separate from general account	Mitigation or replanting requirements for trees removed during development	Mitigation or replanting requirements for individual property owners outside of development process	Requires performance guarantees/bonds/covenants for maintenance	Permit or notice required for pruning (private property)	Standards or guidance for pruning (private property)	Prohibits excessive pruning
Atlanta, GA*	✓	✓	✓			✓	✓
Dallas, TX*		✓	✓				✓
Seattle, WA*		✓	✓			✓	
Portland, OR	✓	✓	✓	✓	✓	✓	✓
Austin, TX*		✓	✓		✓		✓
Providence, RI		✓					
Arlington, MA	✓	✓					
New York, NY	✓	✓					
Washington, DC	✓	✓	✓	✓			
Nashville, TN*	✓	✓	✓				✓
Tampa, FL*	✓	✓	✓		✓	✓	
Cambridge, MA*	✓	✓	✓				

\*Tree protection requirements were either recently revised, currently undergoing revision, or being considered for revision

## PRECEDENT

### City of Tampa — Complex Mitigation

- tree mitigation is based on tree species, shape and type for both removal and proposed
- tree replacement can occur on public or private property, on-site or off-site
- review criteria includes demonstration that tree at maturity will not interfere with utilities, structures, ADA compliance, site triangle visibility
- gives owners flexibility in moving structures/varying setbacks in order to save protected trees
- one-year maintenance agreement is required



## PRECEDENTS

### Summary

- mitigation requirements range quite extensively, and can vary greatly in complexity
- tree ordinances focus on curbing loss, not incentivizing tree planting
- other vectors for incentivizing tree planting on private property include:
  - Cool Factor (under development by the Zoning Resiliency Task Force)
  - Zoning ordinance requirements
    - canopy cover requirements

The following concepts are not specific proposals but represent alternative strategies to be considered.

Each strategy has different impacts and potential consequences.

## OPTIONS

**Permit Only** — for data gathering

**One for One** — encourage the long-term replacement of the forest

**Some for One** — size matters, more quickly replace the resource value of the forest

**Trunk Area** — trees have inherent and shared value — replace the value of the tree

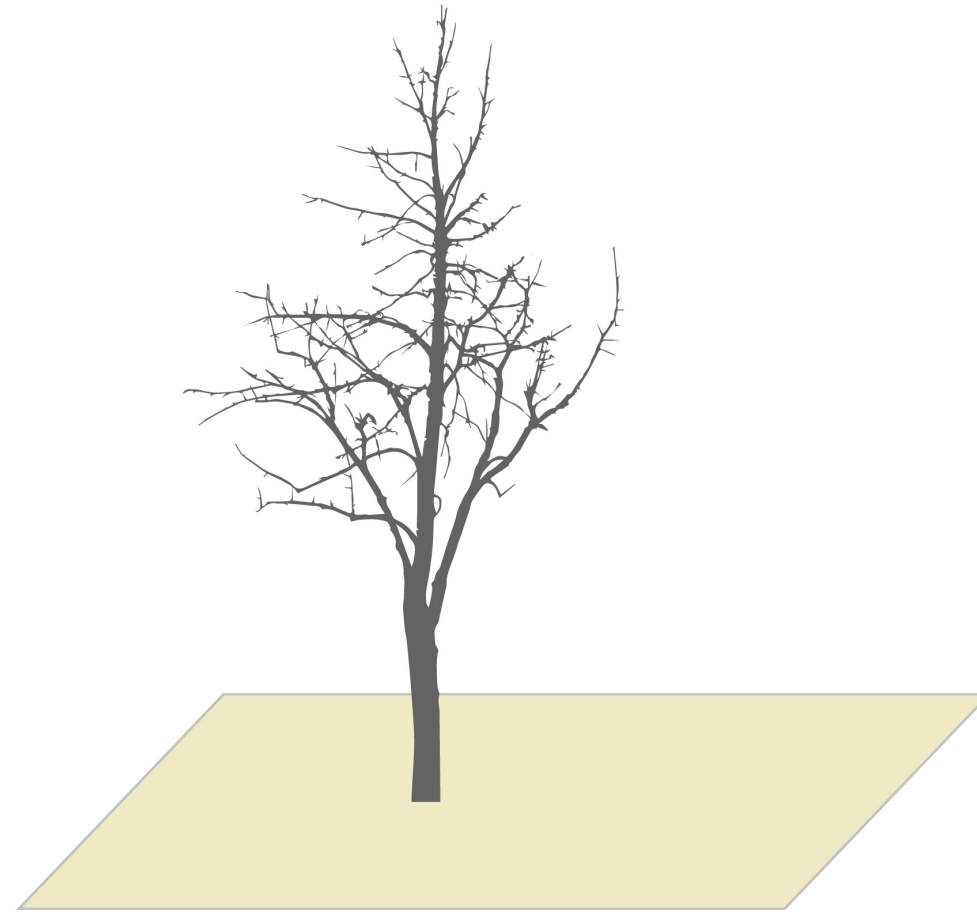
**Cool Factor** — trees work for the city — link value to impact on cooling

## IN ALL CASES

Always allow removal of dead or hazardous trees

DRAFT FOR DISCUSSION ONLY

1. Get Arborist evaluation
2. File permit
3. Receive approval /  
No mitigation required
4. Receive free replacement  
if desired



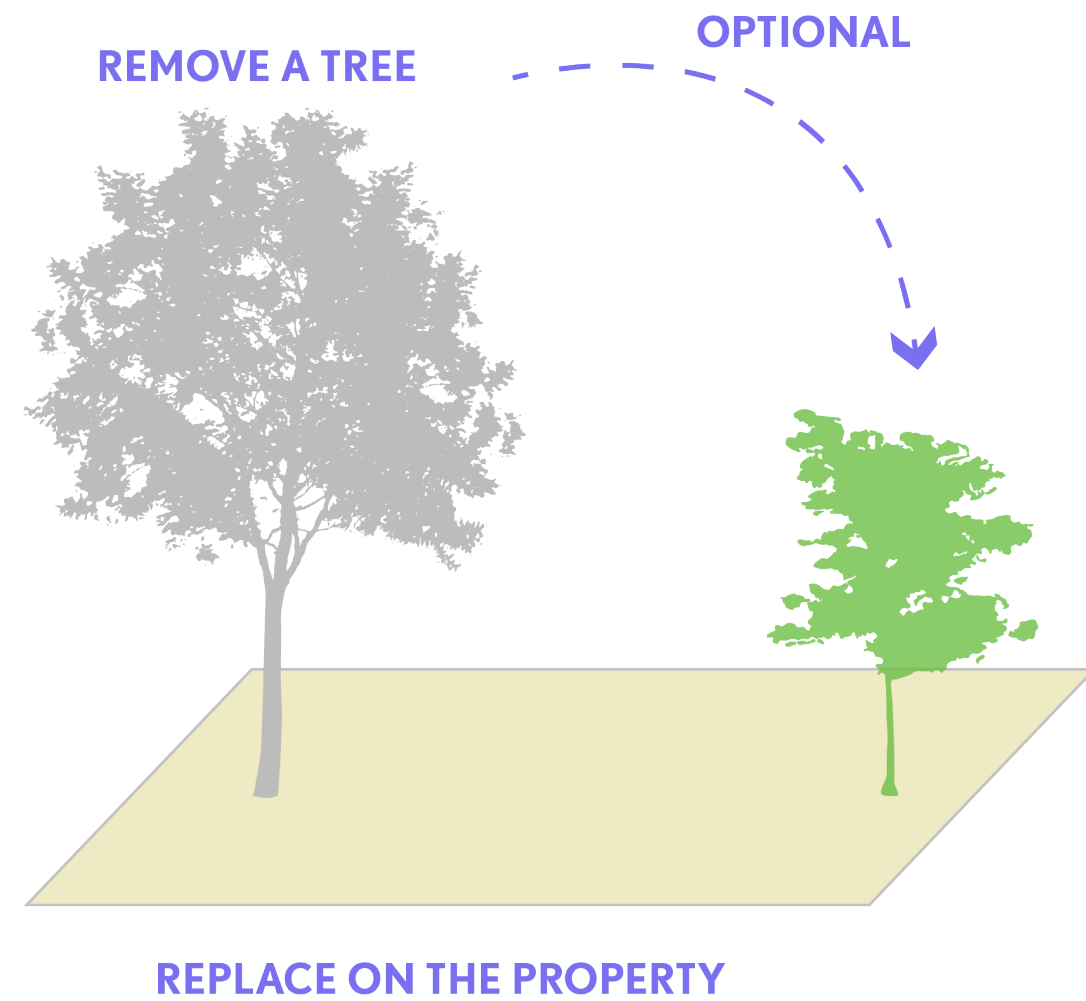
**DEAD TREE ON THE PROPERTY**

## PERMIT ONLY

Pull a permit so the City can document canopy loss

DRAFT FOR DISCUSSION ONLY

1. File permit
2. Receive approval /  
No mitigation required
3. Receive free replacement  
if desired



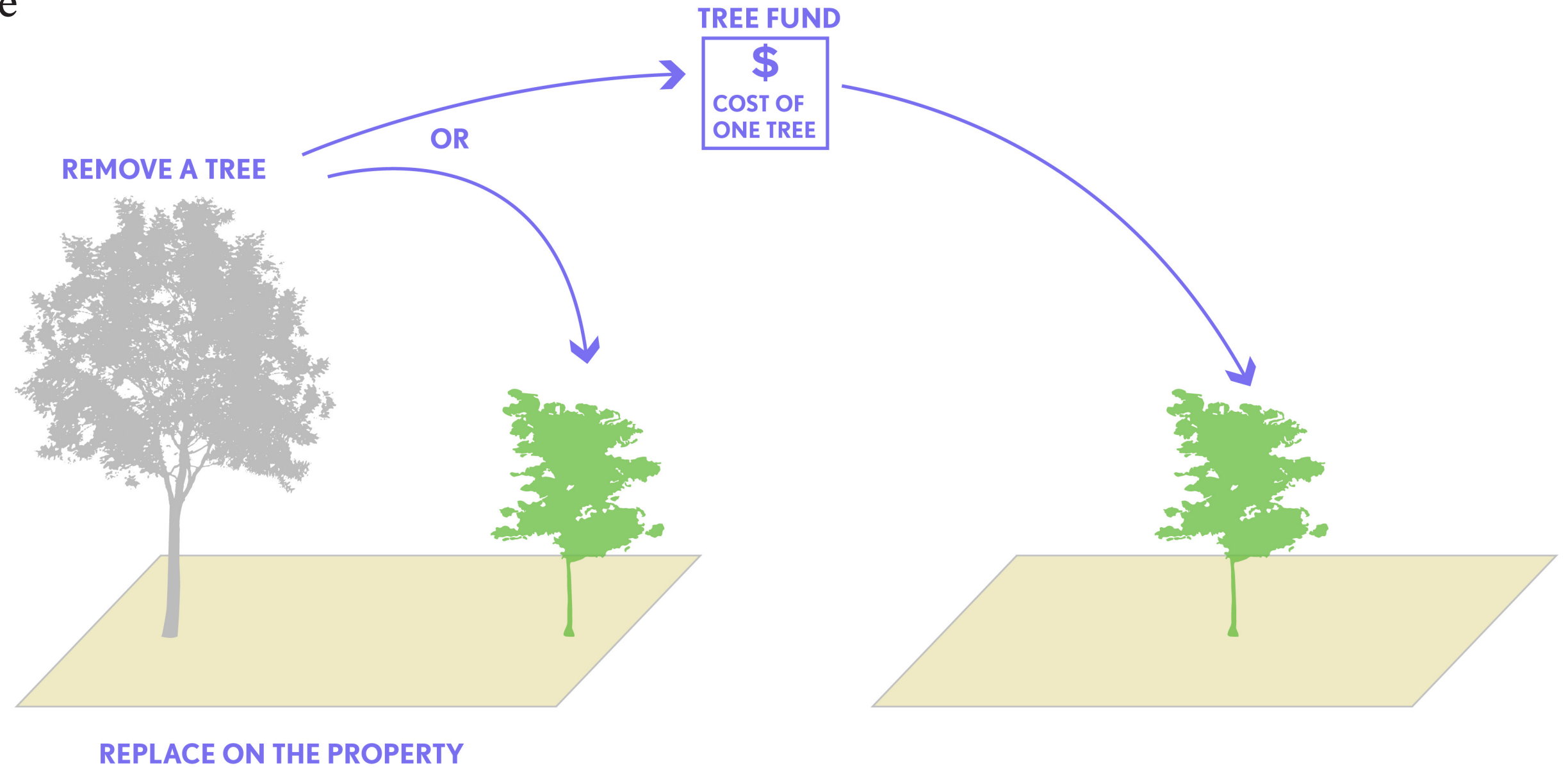
# VOLUNTARY REMOVAL STRATEGY 1

## Replace trees One for One

1. File permit
2. Replant on site *or*  
Pay to support replanting elsewhere
3. Receive free replacement  
if on assistance

### Notes:

- all trees are treated equally,  
though could consider special  
protections for large trees



## VOLUNTARY REMOVAL STRATEGY 2

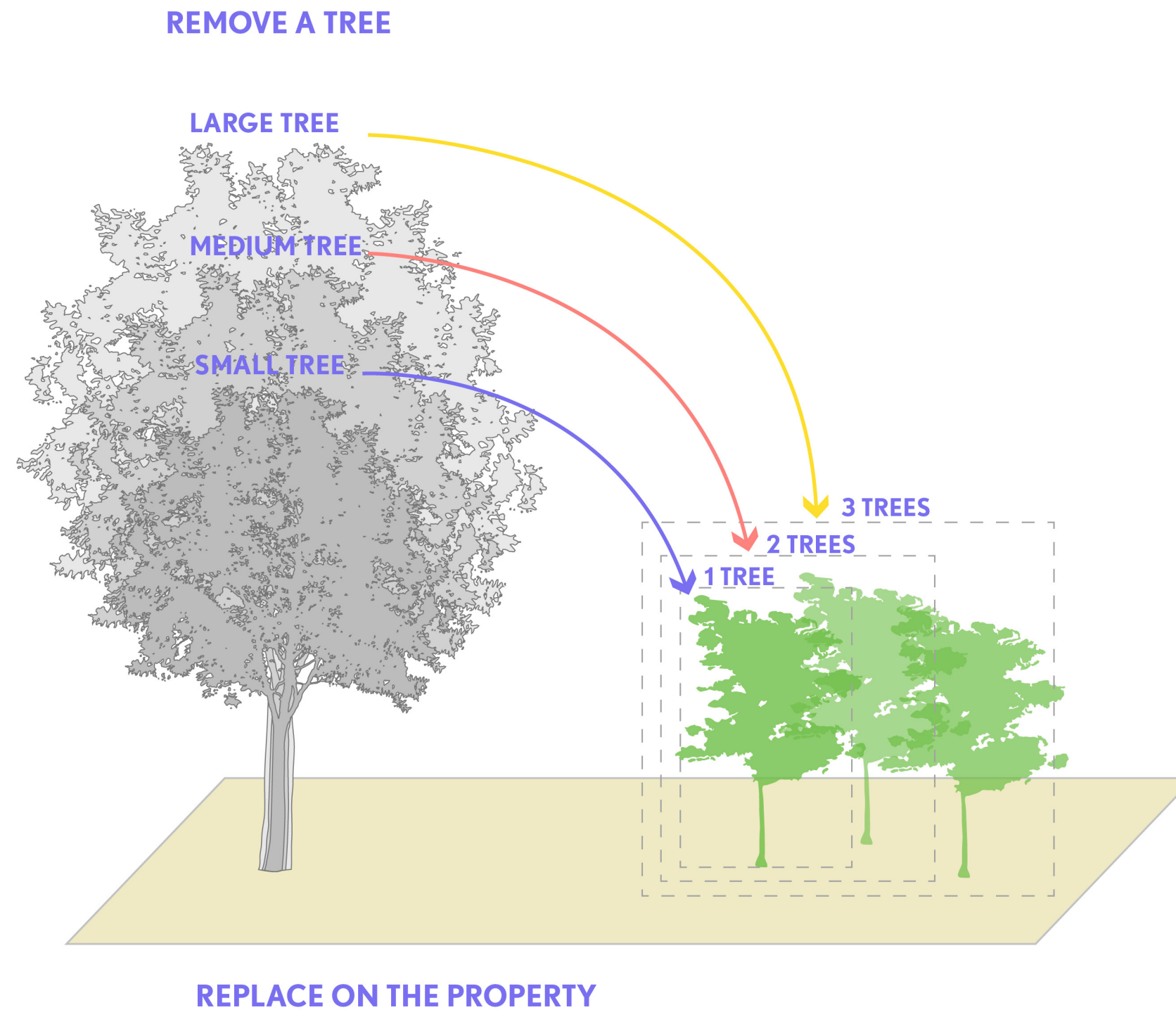
Replace trees based on size

DRAFT FOR DISCUSSION ONLY

1. File permit
2. Replant on site
3. Receive free replacement if on assistance

### Notes:

- larger trees require increased mitigation
- health and location are not considered



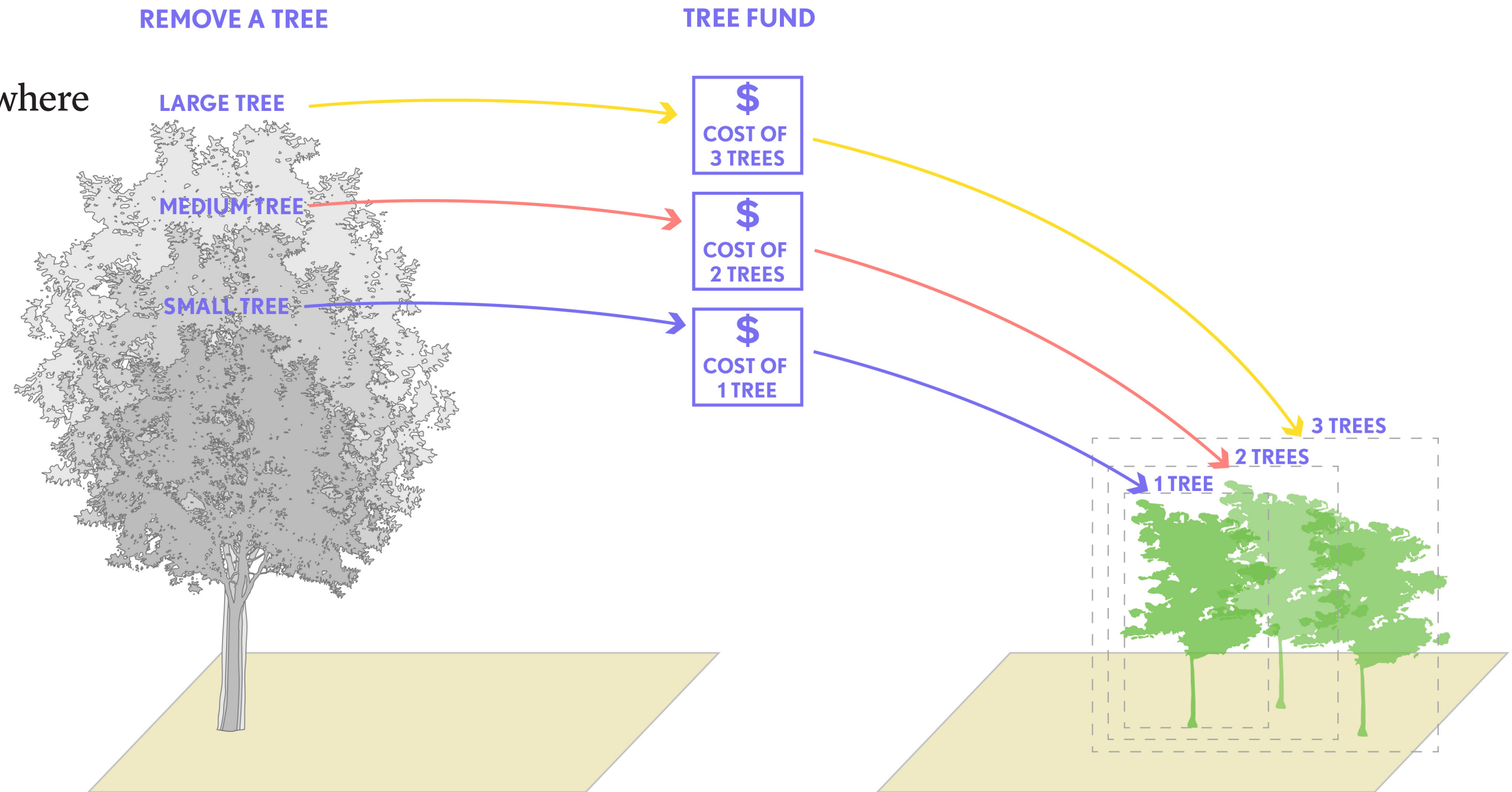
# VOLUNTARY REMOVAL STRATEGY 2

Replace trees based on size

1. File permit
2. Pay to support replanting elsewhere
3. Receive free replacement if on assistance

### Notes:

- larger trees require increased mitigation
- health and location are not considered





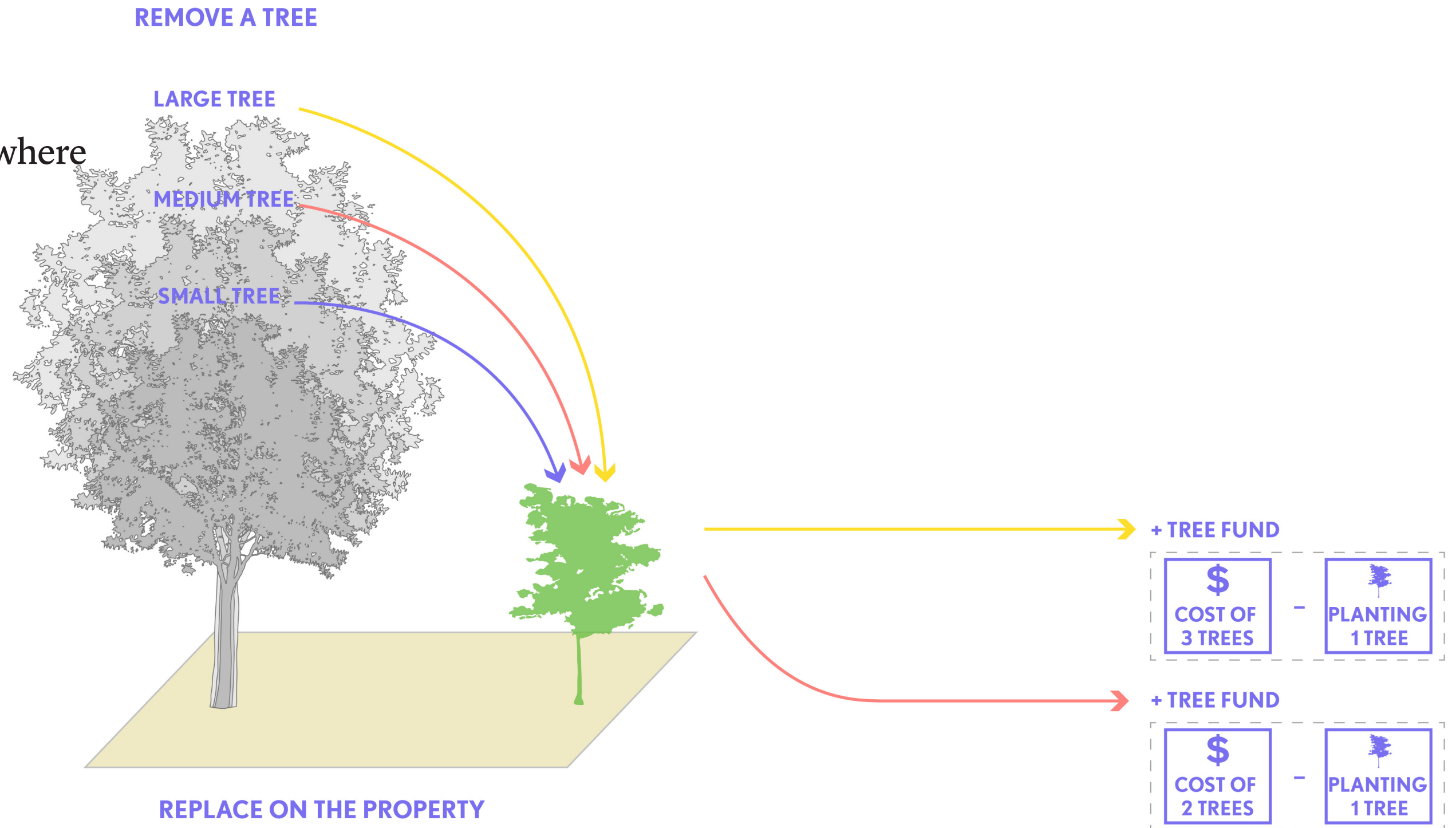
# VOLUNTARY REMOVAL STRATEGY 2

Replace trees based on size

1. File permit
2. Replant on site *and* Pay to support replanting elsewhere
3. Receive free replacement if on assistance

## Notes:

- larger trees require increased mitigation
- health and location are not considered

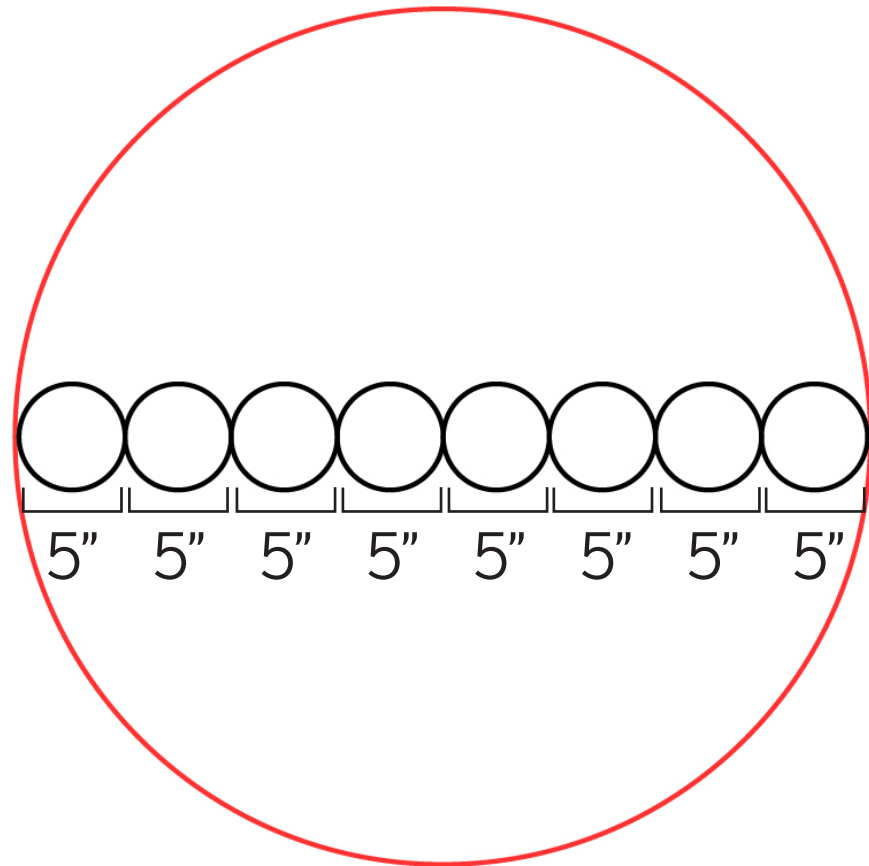


# VOLUNTARY REMOVAL STRATEGY 3

Value trees based on trunk area formula

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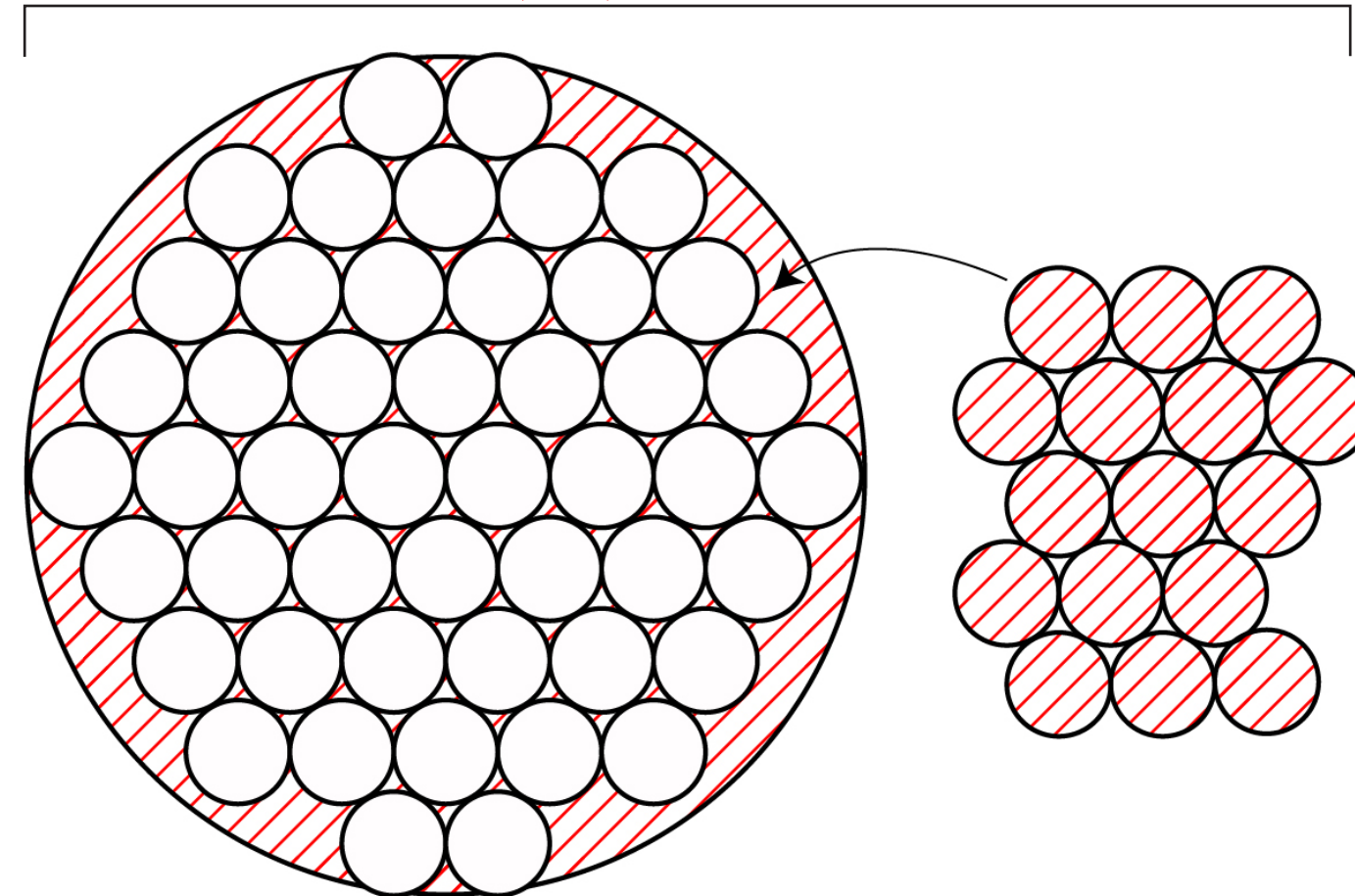
40" diameter = (8) 5" Trees



Replacing trees by  
“caliper inch”



(64) 5" Trees



Replacing trees by  
“trunk area”

# VOLUNTARY REMOVAL STRATEGY 3

Value trees based on trunk area formula

DRAFT FOR DISCUSSION ONLY



1. Get arborist assessment
2. File permit
3. Pay to support replanting elsewhere

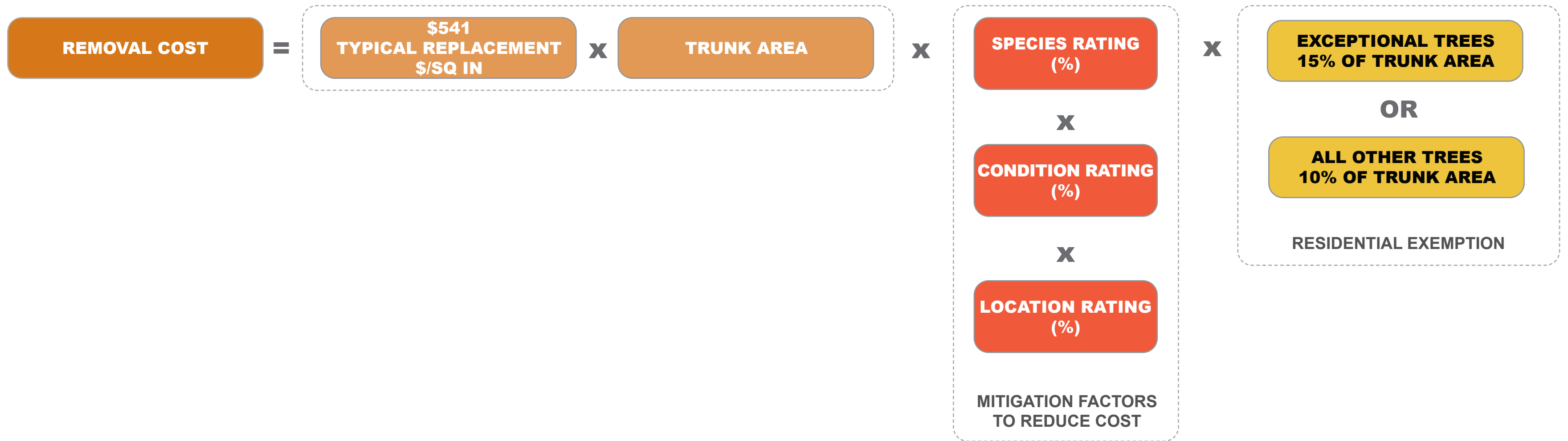
## Notes:

- arborist evaluation is required
- mitigation increases with size
- species, health, location are modifying factors
- homeowner exemption could be significant
- those on federal assistance could be exempt from any fees
- could only apply to Special Permit projects

# VOLUNTARY REMOVAL STRATEGY 3

Value trees based on trunk area formula

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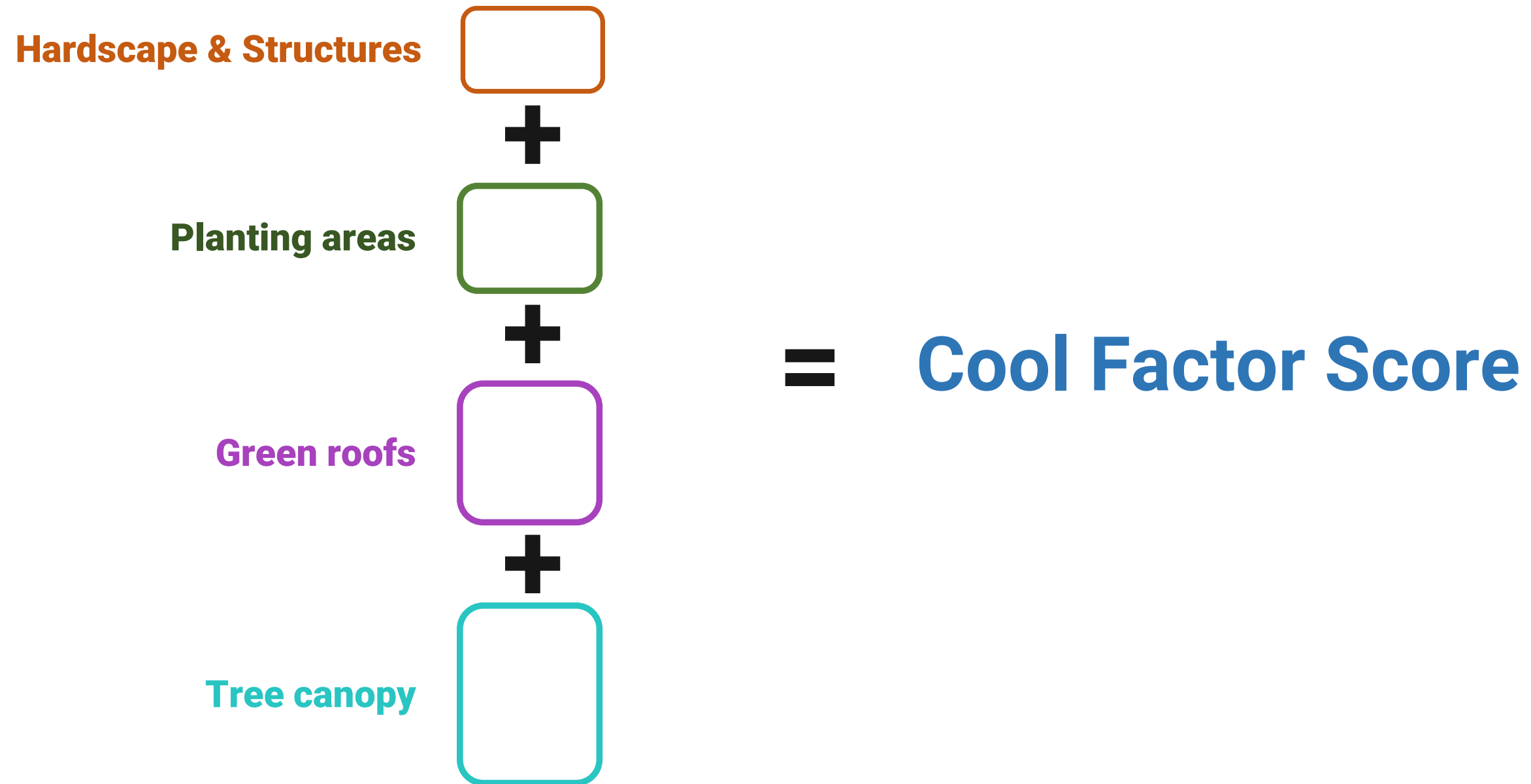
# COST OF TREE REMOVALS

Larger trees are valued more under the trunk area formula

			HOMEOWNER (x .1)			NON-HOMEOWNER		
	DEAD / HAZARD	ASSISTANCE	TRUNK DIAMETER (EXISTING)	TRUNK AREA DECLINING HEALTH (X.5)	TRUNK AREA GOOD HEALTH	TRUNK DIAMETER (EXISTING)	TRUNK AREA DECLINING HEALTH (X.5)	TRUNK AREA GOOD HEALTH
8" RED MAPLE	\$0	\$0	\$680	\$ 543	\$ 1,222	\$6,800	\$ 5,432	\$ 12,221
12" AILANTHUS	\$0	\$0	\$1,020	\$ 153	\$ 344	\$10,200	\$ 1,529	\$ 3,440
12" RED MAPLE	\$0	\$0	\$1,020	\$ 1,223	\$ 2,752	\$10,200	\$ 12,231	\$ 27,520
24" RED OAK	\$0	\$0	\$2,040	\$ 5,504	\$ 12,384	\$20,400	\$ 55,039	\$ 123,838
24" NORWAY MAPLE	\$0	\$0	\$2,040	\$ 3,669	\$ 8,256	\$20,400	\$ 36,693	\$ 82,559
30" PLANE TREE	\$0	\$0	\$2,550	\$ 10,033	\$ 22,575	\$25,500	\$ 66,888	\$ 150,498
30" AILANTHUS	\$0	\$0	\$2,550	\$ 1,433	\$ 3,225	\$25,500	\$ 9,555	\$ 21,500

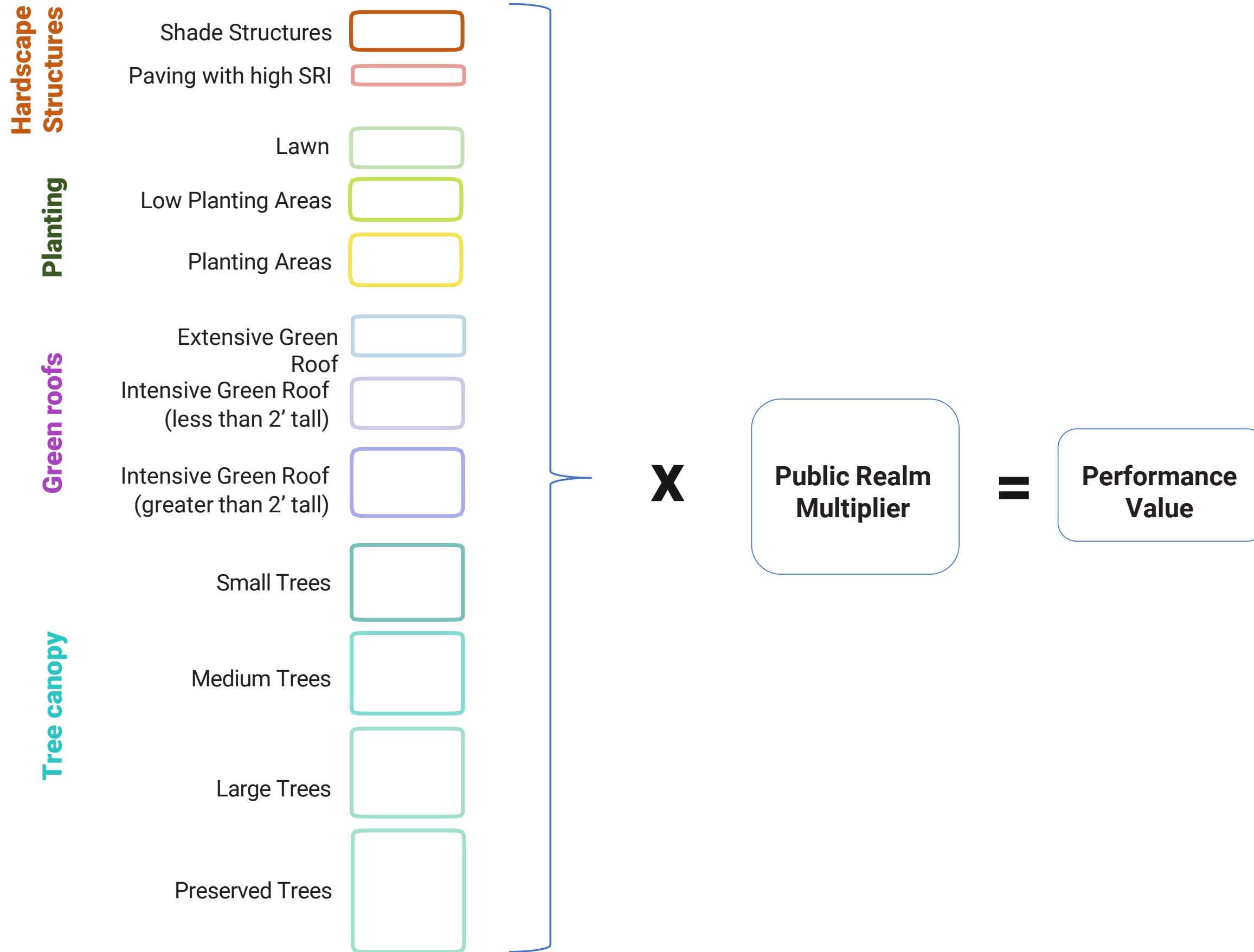
## ALTERNATE APPROACH – COOL FACTOR

A property owner selects and implements several strategies to reduce heat from a menu of options in order to meet a set score, the *cool factor*.



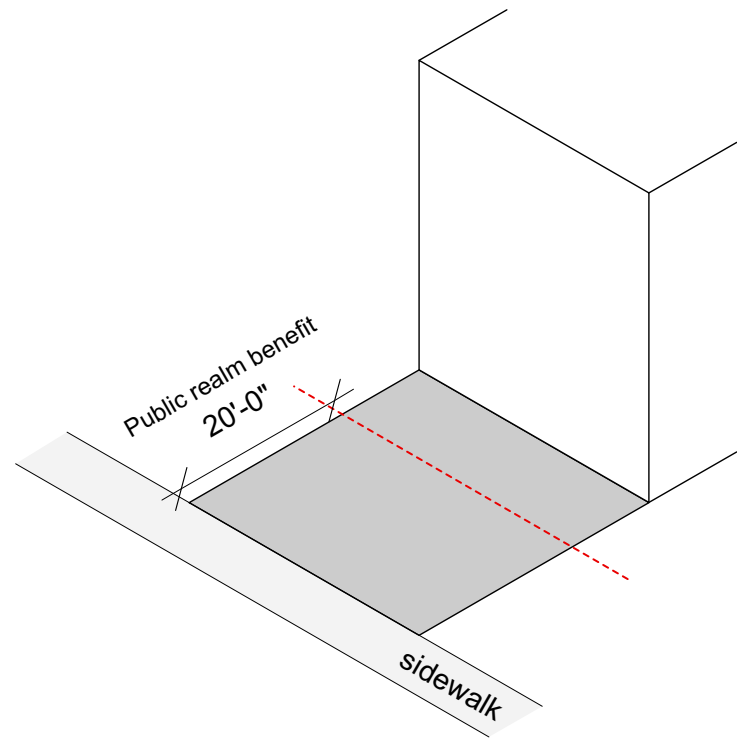
# COOL FACTOR

Menu of options



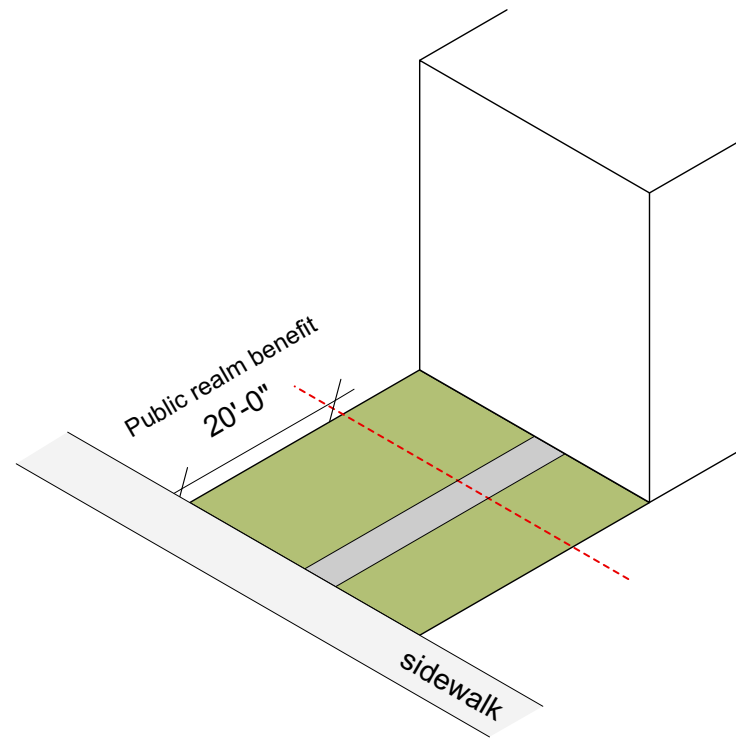
# COOL FACTOR

Cool factor encourages a range of strategies toward a goal



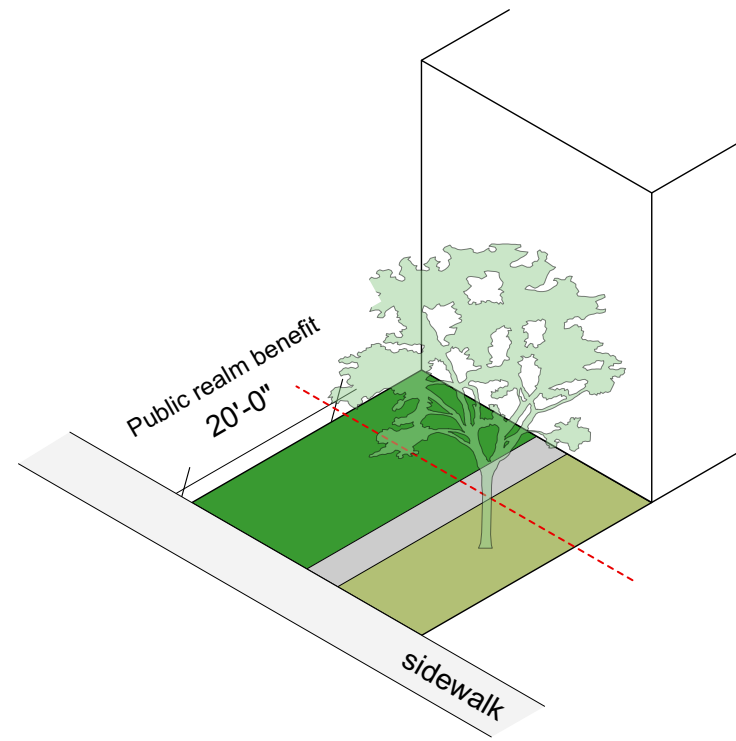
0.15

high SRI paving



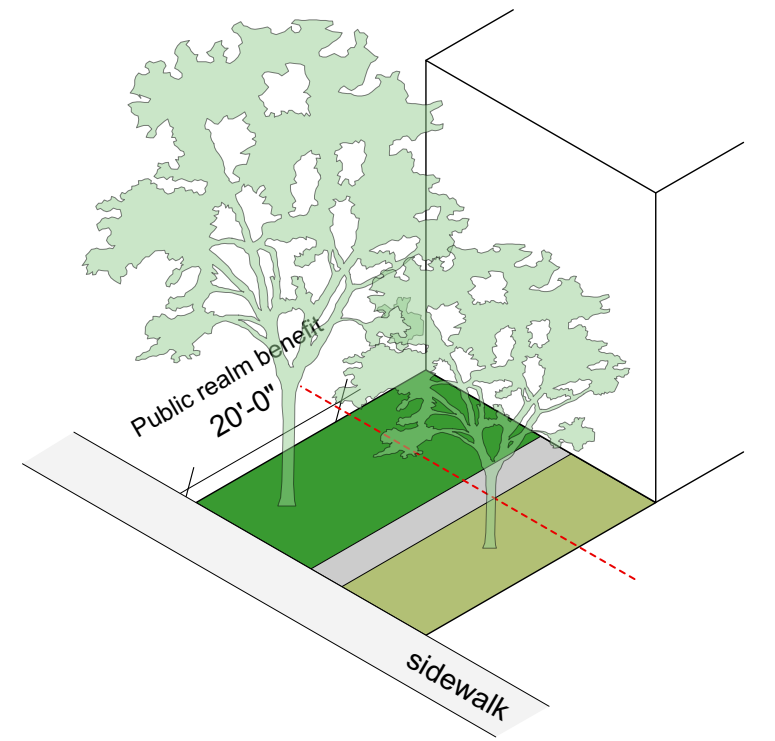
0.28

turf  
high SRI paving



0.57

medium tree  
planting  
turf  
high SRI paving



1.02

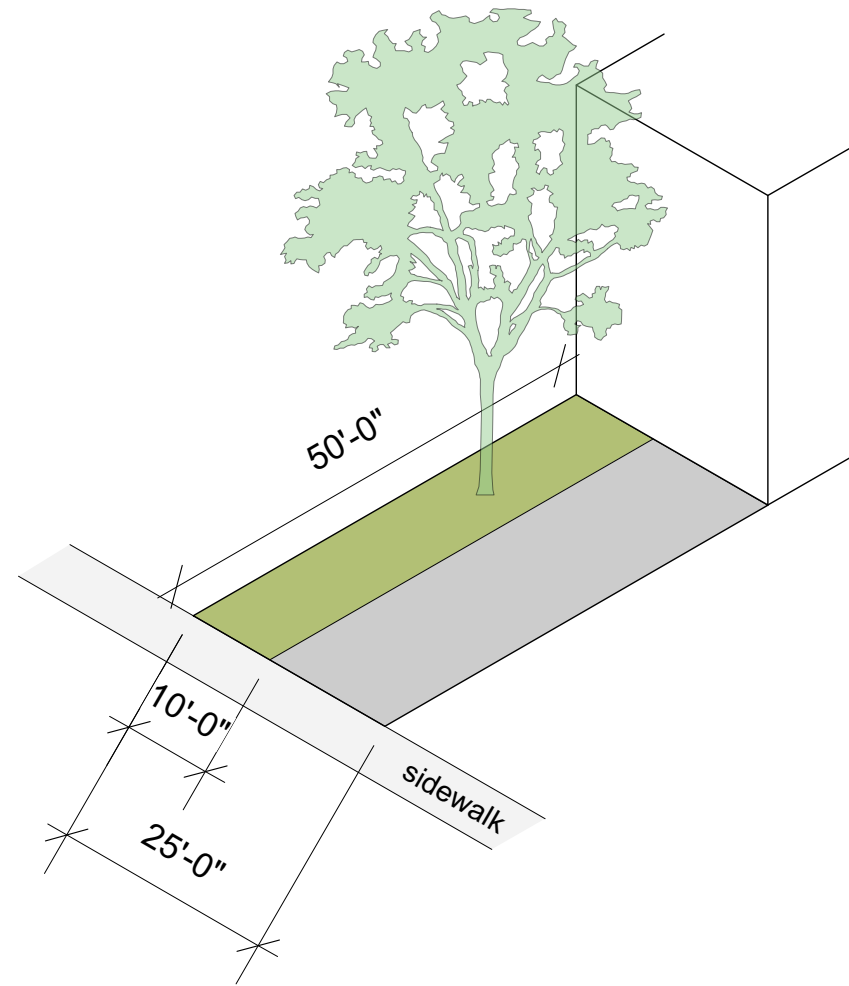
medium and large tree  
planting  
turf  
high SRI paving



## COOL FACTOR

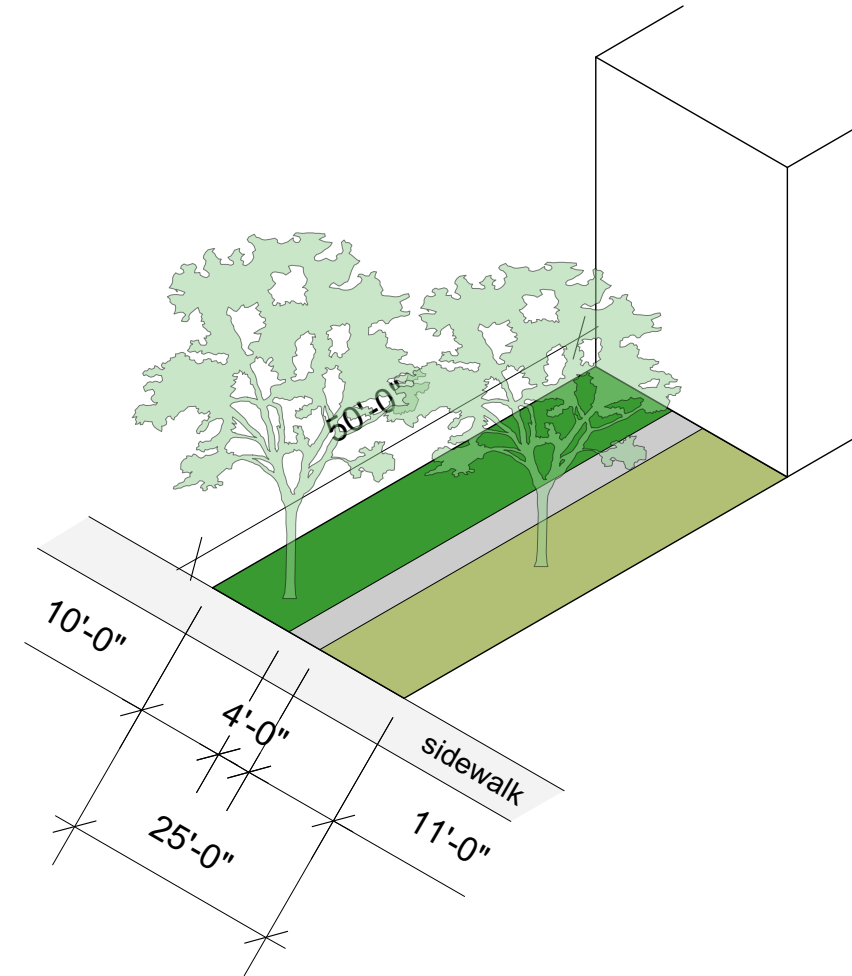
Removing a 24" Red Oak

Mitigation option of replacing the tree with landscape components that equal or exceed its Cool Factor score



0.44

large tree  
with lawn and asphalt



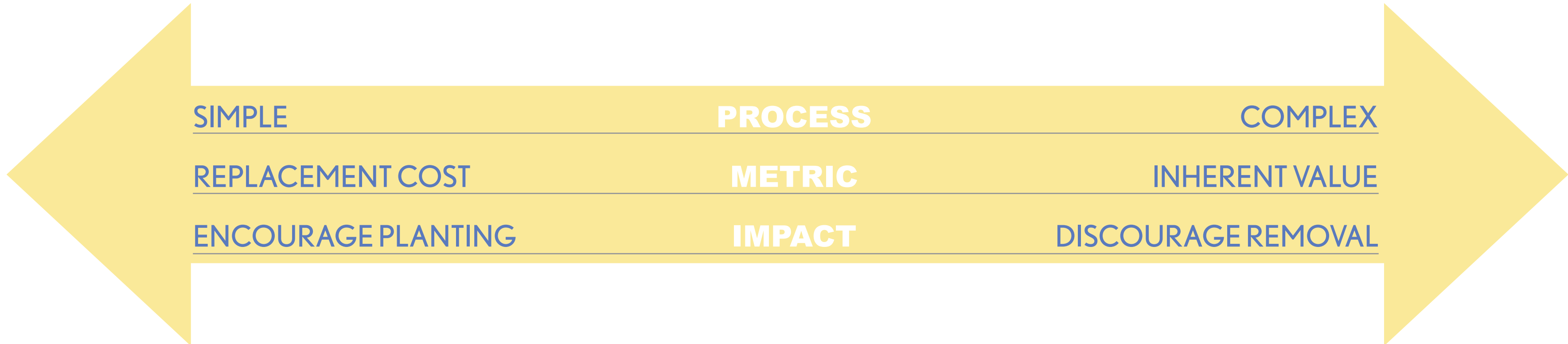
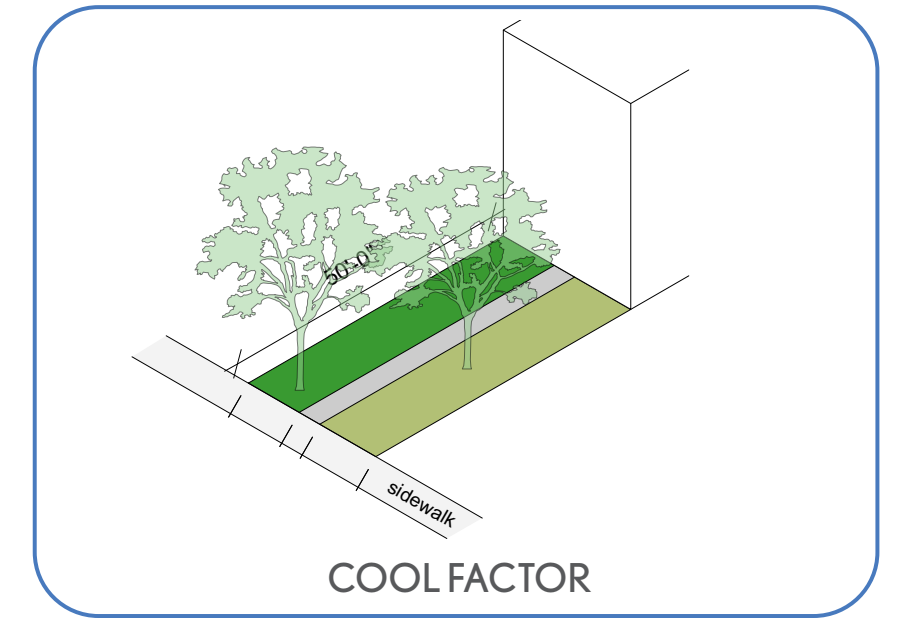
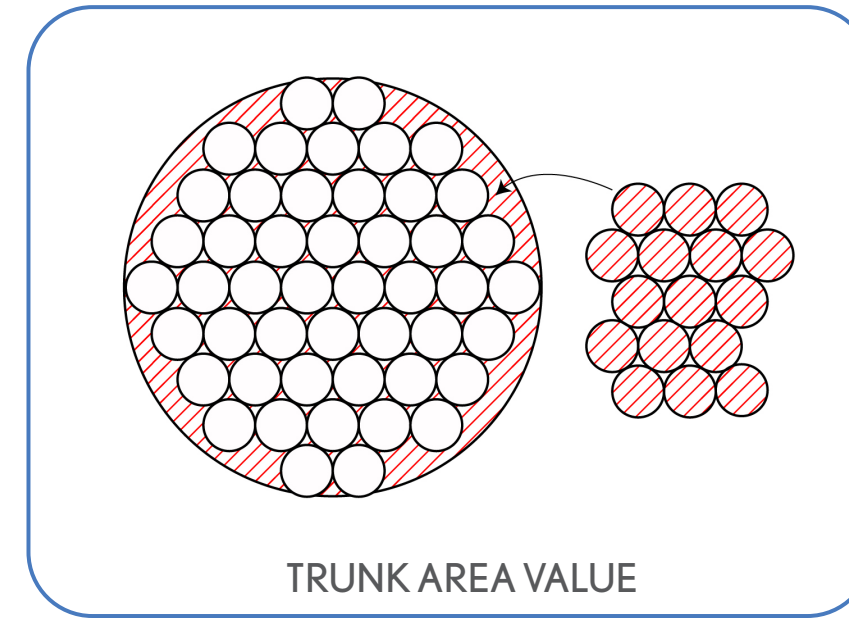
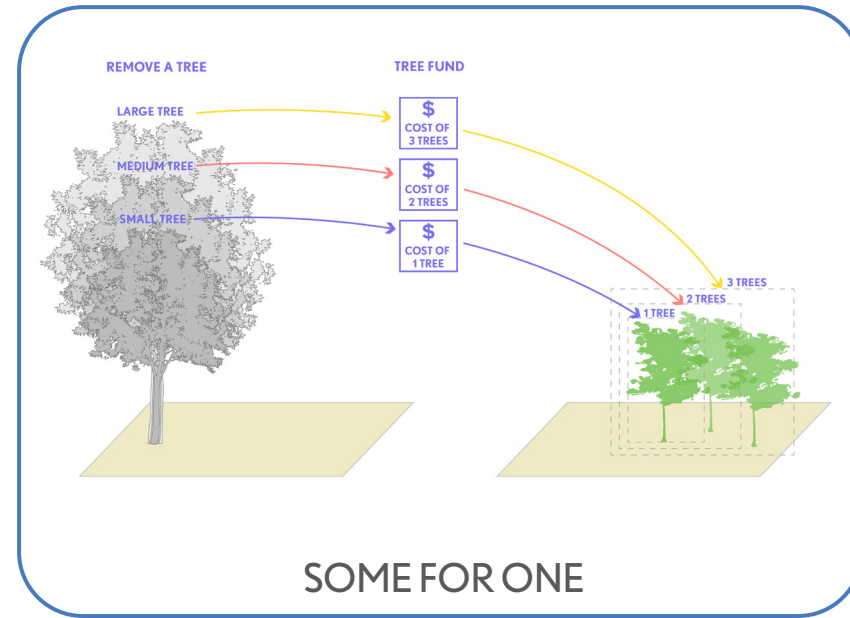
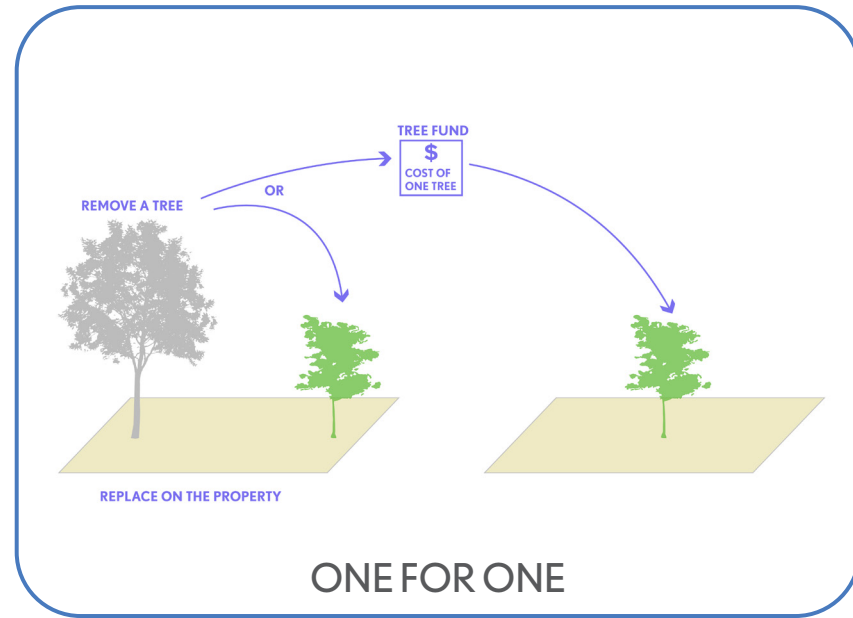
0.55

plant two medium trees  
create planting beds replace portion of  
asphalt with lawn

# MITIGATION APPROACHES

## Summary of Strategies

DRAFT FOR DISCUSSION ONLY



STRATEGY PRIORITIES

SUMMARY OF EXISTING ORDINANCE

AMENDMENT OPTIONS

NEXT STEPS/DISCUSSION

## NEXT STEPS

From this discussion, the consultants will refine tree removal options and ordinance recommendations for the DPW to review. DPW will then present a series of draft ordinance recommendations and alternatives for City Council's consideration.

## DISCUSSION

Should tree removal require a permit?

Should all property types and owners be covered by the process?

— If not, who should be covered?

— Should there be different approaches for different owners: residents, businesses, institutions, developers?

Should there be a cost associated with removal?

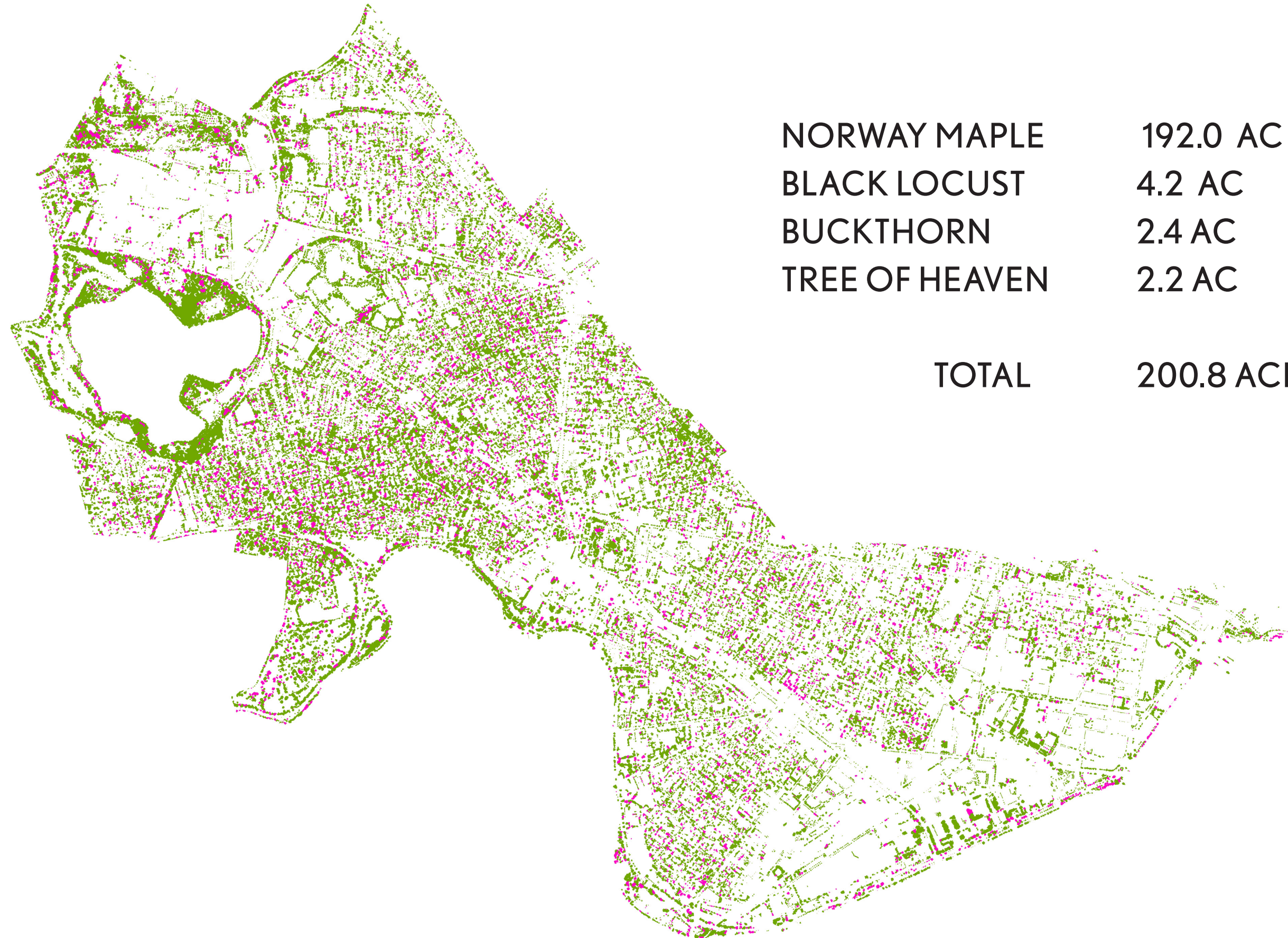
- Should costs be calibrated to size, species, condition, etc?
- Should the city's largest trees have special protection?

Should invasive species  
be removed without penalty?



## DISCUSSION

INVASIVE SPECIES MAKE UP 19% OF THE CITY'S TOTAL CANOPY COVER



Should the City mitigate costs  
(considering issues of equity)?

— permit / arborist review costs

— replanting costs

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