

MEETING NOTES



ISSUE DATE

April 18, 2019

MEETING DATE

March 28, 2019

LOCATION

Cambridge
Rindge and
Latin School

CLIENT

City of
Cambridge

PROJECT

Name/Number
Urban Forest
Master Plan
2953

RE

Task Force
Meeting 10

ATTENDEES

City of
Cambridge
City of
Cambridge
Task Force
Reed
Hilderbrand

Introduction:

Catherine Woodbury announced the two replacements on the Task Force team, Megan Nichols Tomkins as the Chamber of Commerce representative and Joe Bendar as the Cambridge Housing Representative and everyone introduced themselves.

Eric Kramer reviewed the schedule:

This week's meeting includes the outreach about the value of urban forest. It's a living process and the work of the TF has informed about where to focus and where to dig deeper. We will continue through conversation and engagement rather than solving it all or coming to a conclusion.

Next Task Force meeting will be on climate modeling, heat island modeling loss investigations, cost benefit analysis. We will take the work and develop a report, like a white paper. All findings and feedback will be in one place.

This process will take a few months, and then we will come back together in early fall with some meetings when TF has had time to digest and we can continue the conversation. We are setting out a framework. The report will set up a roadmap – some is policy, some is political, some is practice.

Design Team Presentation

Summary of the presentation and task force comments follows:

Outreach – precedents and approaches and which ones could be applicable

Resiliency – planning ahead- what species should we be planting

Canopy Valuation – how do we understand the value (monetary and on terms we cannot monetize)

OUTREACH

Outreach tries to respond some of these questions:

How do you engage the community, how do you talk about the share responsibility?

How do you communicate the value of trees?

Outreach to schools:

- Can build on existing school curriculum about the services that trees provide
- Utilizing ready-made lesson content from Audubon Society or Project Learning Tree which incorporates i-Tree and also Trees Louisville's science curriculum unit on ecosystem services

TF: How you communicate municipal goals into curriculum is a hard challenge, hard to input into the curriculum because teachers themselves are too hard pressed. Creating context between municipal team and the City needs strategic conversation. I'm happy to help with this. What are the right vectors?

Supporting citizen science projects: There are examples of air quality monitoring which is one of the benefits that the forest provides

Organizing tree tours for citizens: This was something David used to implement, tours foster support between community and DPW.

Public installations:

Publicizing ecosystem benefits, educating people on dollar value of trees, an example David Buckley Borden's *Tree Box* (Put something in to get something out). Another immediate example of tree health as a public education, Voice of Nature by Thijs Biersketer.

A report card on the forest:

What is the result of all of these efforts: a report on the forest – dialogue with the City. Goals and where we are. A yearly check-in.

How do you get people to take action?

Improving the online tree map to engage citizens:

The infrastructure is there with information of tree locations and species. However, there are engaging examples of online database- NYC as a precedent- it is clickable, tells how many times it's favorited, tree care, ecological benefits, "favorite" button, and you can input your activity.

TF: How often is the inventory updated for NYC?

Owen: Cambridge would maybe update on a 6 year cycle per pruning contract (can be done at the same time). DPW needs to put a front face onto Cartegraph. Anytime the tree is touched it will be documented. ClickFix would go into the database.

Supporting community planting efforts:
Community care for the tree and more efficient allocation of resources.
Employ young adults for job training

Publicize existing programs more:
Adopt a Tree program, Junior Forestry program

How do you stem loss?

Engage with citizen science projects to protect threatened species:
An example, Tree Snap: App on your phone. Collaboration between various research groups and universities and focused on at risk trees (hemlock, larch, etc). You take a photo of a healthy individual so researchers can take genetic samples of that tree.

Pest monitoring:
There are examples that can support City's efforts such as Backyard Bark Beetles and Sudden Oak Death

Outreach to local businesses:
Asian Longhorn beetle- city of Worcester lost 35k trees.
Number of interceptions of contaminated wood palettes are on the rise – so very important for businesses to inspect that it has a stamp

How do you grow canopy?

Publicizing existing programs such as Back of Sidewalk program

Partnerships: We are looking into ways to partner with agencies.

- Multi agency partnerships (MA Greening Gateway Cities),
- Public and private partnerships (Green Tacoma Partnership),
- Carbon credits based on tree plantings (Trees Charlotte)
- Partnerships with institutions and organizations (Tree Pittsburgh)

MEETING NOTES



Owen: City is having discussions with law department on public/private partnership and potential use of mitigation funds from large projects and directed towards replanting on private property, there are significant challenges from the state Constitution. Hopefully by late summer City will have a response on whether there is a work around. DPW has talked to DCR.

TF: DCR is working in Springfield and planting trees on private property. Talk to mayor of Springfield?

TF: - carbon credits- sold to meet carbon reduction goals?

TF: Back of Sidewalk program?

Owen: It is allowed through state law but beyond that, anti-aid amendment prohibits actions that improve private property

Summary of Recommendations:

- Advocate for the value of trees in education curriculum
- Support citizen science projects
- Organize tree tours for citizens to engage with trees
- Continue to publicize ecosystem benefits of trees
- Support alternative education approaches, art installations
- Publish annual reports to give feedback on progress
- Improve the online tree map to engage citizens
- Promote existing City programs
- Educate local businesses about dangers of pest outbreaks
- Partnership outreach

TF: These all seem like disparate activities but bringing these all together would be important through a communications strategy. Cambridge is unique because of all the different types of people. Memorial grove- make the trees the statement. How do you communicate about these trees? We are challenged by the broader consolidated strategy.

We would have a larger strategy, working on what that is with the City to figure out the best way. Want to roll out with one voice, wants to feel like one program.

TF: Could you define individual “sacred” trees of Cambridge. These could be really powerful.

MEETING NOTES



Communication plan is needed: a way of thinking about the front matter of the report. What messages come out, who are the target audiences, and who will back it up?

TF: Tree appreciation is like music/art appreciation. How do you instill this?

TF: Economic model- what this is doing for you. We don't talk enough about the inherent value and the beauty. There's literary, spiritual. Have you seen a dollar of services work?

On a political level. About a decade ago, Mayor Daley in Chicago said he was going to plant 5000 more trees. Mayor Bloomberg's million trees program was about reaching to boroughs. Expectations raising which could be hard to navigate. We have evidence that people value space that the trees make on public ROW. We need to select and promote most potent of these messages.

Dollar values for cities works more for Parks departments to get money into tree fund for city departments than to raise value for individual citizens.

TF: Arnold Arboretum - can we look at how they foster appreciation for trees?

Really amps messaging part of the forest.

TF: Talk suggest that putting a dollar value on the tree take away from the overall value of the tree. SUNY researcher suggested this. Celebration of trees through having talks...

Intellectual and artistic capital is extraordinary and should acknowledge and celebrating. WEB Dubois example. Arbor Day - who in our community would champion this? Who has a voice that could reach a lot of people?

TF: Do we want images- great trees of Cambridge?

FOREST RESILIENCY

We are at a moment when the forest is ever more important
Forward looking more explicitly, trees we plant today are the forest of tomorrow.

We started by looking at the City's current list. Red= low condition from on the ground at Cambridge. Blue= exceeds diversity target. Yellow= high susceptibility on climate risk.

Why these four species? Would we not blacklisted? Flagging and not blacklisting. Salt is a killer of Tilia. Constrained soil volumes.

Salt tolerance column

Can we weigh the native trees? For residential land owners The importance of native versus non native

Within a genus, there does not seem to be a significant difference between natives and non-natives

Street trees- looking for the best performers

We used this database to put together street tree recommendations. But will make this database available to the public to use.

TF: May be worth mentioning this list does not include any invasive species

Gary: This has been controversial for 30 years, literature search, there is a strong community that will push natives but we are taking a position here on street trees.

City is a garden, we are not in a woodland environment.

TF: From a paleo perspective New England forest is young, there is no native flora, there isn't one.

City is not self-regulating. Would not meet your diversity target if you would only plant natives.

We are shaping policy but don't want to shape values- important to

MEETING NOTES



communicate this.

Black locust- exception?

TF: some species support more wildlife – include this to the database.
Elena can get info on bees
Fruits are messy- can be in the backyard

TF: not sure about the climate resiliency score – we need more species and more diversity

Red maple- ALB – check why is it not resilient

How do we be projective? We don't know and want to mitigate risk

TF: Geographical tag- looking within a certain diversity – local diversity

Reevaluate every 6 years when redoing the inventory?

Not on the street- should be diverse as possible

TF: Chinese fringe tree is in the ash family. Would it survive emerald ash borer?

TF: Biggest list – target ratio or range of planting target with guidance

City can run the database to figure out

TF: – Carolina silverbell, Osage orange (seedless variety), magnolias (cucumber magnolia and sweetbay magnolia – has climate adaptation built in – can escape cultivation)

TF: Yellowwood is weak wooded

TF: What about Catalpa and Paulownia?

CANOPY VALUATION

Core concepts- Valuing the forest as a public resource

The most effective way may not be quantifying by monetary value but we studied that for our cost benefit analysis.

We did some literature research. There is a list of urban forest benefits including social and economic benefits, ecosystem services (carbon, air quality, storm water, energy, habitat, noise, micro climate, health related benefits, visual and aesthetic benefits).

We created a short list and highlighted the ones that are quantifiable through i-Tree.

Different methods that people measure tree benefits:

- Methods for measuring benefit:

— top down aerial based approach (remote sensing, aerial photography) - iTree Canopy

— bottom up ground based assessment (individual trees, GIS based) - iTree Eco, CITYgreen

— specific areas of benefit (mathematical models) - iTree Hydro, Kleinfelder's Port modeling

Methods for measuring economic value:

— market prices, surrogate market approach, production function approach, state preference approach, cost based valuation, cost benefit analysis

TF: ISA method of determining the valuation?

That is included in iTree, a way of understanding a one time assessment of tree value that goes into the property value as well.

TF: City of Philadelphia is calculating green infrastructure, tree, stormwater waste, probably according to pervious - impervious surface information. There might be one other way to calculate this with their model.

Kleinfelder is modeling the stormwater benefits in Port.

Since we have Bartlett's 5% survey, we thought that iTree Eco was a good way to evaluate the forest and to extrapolate.

- iTree uses field data along with local hourly air pollution and meteorological data to quantify forest structure, environmental effects,

and values

- benefits depend on tree structure and physiology (e.g. tree size, trunk diameter at breast height, leaf area, leaf biomass, evergreen vs. deciduous)
- We used these inputs: dbh, species, condition, street tree/non street tree, land use
- Outputs:
 - annual functional values (recurring, cumulative value of forest), such as air pollution removal, avoided runoff, carbon sequestration and energy savings
 - one time value (if the tree dies, what are you losing?)- carbon storage and structural value

Air pollution removal:

We examine each value separately and all slides are organized by benefit estimate and value estimate. Benefit estimate used canopy deposition models and also measured values from literature. Value estimate is avoided health impacts (avoided hospital visits etc).

Stormwater runoff:

Pretty limited in iTree Eco. This looks at the interception of vegetation, so it only requires species information

Energy use reduction:

General estimate of the value

Carbon Sequestration:

Looks into the yearly growth of tree

Carbon storage:

Looks at how much an entire tree stores carbon above and below grade.

Structural value:

Loss property value- What if you need to replace the tree?

TF: Faster a tree grows, more it sequesters carbon, and large trees also great at carbon sequestering, another reason to protect them

Summary of results in terms of annual value:

Second column is the extrapolation of the 5% survey to 100%. However,

when we multiplied it with 20, it didn't give us the canopy acres of the current forest. To get to that number, we needed to multiply it with 35. Then, we took the average to get the total benefit. Annual benefit is 1.64 million in those specific benefits we looked at, and one time value is 134.3 million. Overall value is 136 million dollars.

Carbon storage equivalent to:

- amount of carbon emitted in Cambridge in 10 days (estimated 1.4 mil tons/yr)
- annual CO₂ emissions from 20,400 cars
- emissions from 8,360 single-family homes

Nitrogen dioxide removal equivalent to:

- annual NO₂ removal from 500 cars
- 220 single family houses

Sulfur dioxide removal equivalent to:

- annual SO₂ emissions from 2,060 cars

TF: Did you look at what trees do to property values?

It is more about the structural value. But there aren't many studies about the property value except a case study in Georgia. But it is difficult to use that for Cambridge because the house types are different.

The highlighted benefits are not captured in our benefit calculation study, these are demonstrated value but not quantifiable.

There is a lot of research on physical health and mental wellbeing.

Going back to the scenarios of how the forest would look like in the future, we calculated the benefits of forest for each scenario. We came up with a number of \$1551 per acre. The cumulative benefits of forest in 2070, is almost 100 million dollars for no action plan, 141 million dollars for grow canopy and 167 million dollars for reduce loss/grow canopy plan. It is a 67% difference.

TF: Does the city have a greenhouse gas reduction target? And does this calculation help with that?

MEETING NOTES



Owen: The expectation is 80% reduction by 2050.

TF: Last summer, I measured the temperature and it was 98 °F and 89 °F under a tree.

It changes up to 20°F degrees.

Where do we position the ecosystem services values in juxtaposition to the other values? What statement are we making about this kind of calculation? What would be the most actionable messaging around value?

TF: What would be the city worth without the trees?

We are trying to figure out the cost of the potential practices or plantings that city can do, such as doing biological amendments on all trees, depending on the cost, is this a good investment?

TF: How do we tie this back to priorities? Lens of equity in this discussion- implicit in public health. Job workforce training- that seemed to hit on some of the other issues. Urban forestry is a great tool. Want to reach more than a certain person in a socioeconomic class. Tie it back to community building and job force training- building local capacity.

Owen: Conversation that happens all the time with climate change. How can we make the climate change a priority for people that have other priorities

Gateways to address social equity- asthma rates

TF: I've spent a lot of thinking on deferred maintenance – similar curve applied to street trees? What level of investment is required to reverse decline of street trees/ROW trees?

Owen: as they are looking at 1200 trees, what does that mean as a work force, different technologies, etc? How does this actually happen? Life cycle cost of trees.

TF: education: specific recommendations for expanding curriculum – urban forestry trade program? Technical arts program? Other tie ins? Nine mile river watershed organization – started fee for service planting program

targeting at stormwater reduction – review. Gentrification impact: underserved communities see trees as a threat. Do you plant more back yard trees in underserved communities?

TF: slow growing trees – as a characteristic to include? Growth rate? Recs for private vs public should be made clearer

3. Public Comment Period:

Speaker 1: Arborist came to do tree maintenance – maintaining trees will reduce canopy periodically during pruning. Fast growing/hardy trees what we need to get the canopy up quickly, then focus on diversity. Health cost savings- psychological benefits. 10 degree difference between front and back of house due to shading. Stormwater benefit- reduce sewer charges for those people with larger trees. I think we should use shorter term projection rate than the longer term rate.

Speaker 2: I'm unhappy about this discussion focusing on new planting and not about maintaining canopy. City should be protecting large mature trees. Harvard is removing a very large tree. Value of trees is low in the City. Need a large tree ordinance.

Speaker 3: Top down environment – communicate to the City and negotiate to the City to move budget around

Speaker 4: I attended a talk by Andrea Reimer former Vancouver City Councilor - Vancouver has an ambitious goal to become the greenest City – 150,000 trees. Many on private property. Osage Orange? Look to the Midwest for species for trees that grow well in deluges of rain. Community forestry conference at UMass Amherst – presented a different take on native vs non native. Go with natives if you can.

Speaker 5: Executive Director of Green Cambridge, I'm impressed by the level of detail the presentation went into. Our organization is outreach and education focused. Interdisciplinary approaches to valuing tree canopy. Working with Cambridge Latin on environmental curriculum. And DPW on tree planting blitz and engage neighbors. Concert for sycamores this

MEETING NOTES



summer- interdisciplinary approach – art/beauty and science.

TF member: In Envision, why does "Community Wellbeing" have nothing to do with forest, trees, green space.