Final Report:
Trees for Watertown’s Teens for Trees Program
Summer 2019

www.tfwteensfortrees.org

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Executive Summary

We are proud to present a full report on Trees for Watertown’s 2019 Teens for Trees program. This was the third year of the program. We continued to learn and experiment, and built on the lessons and successes of past summers, in pursuit of our mission to grow teen leaders and trees in Watertown, to increase teens’ understanding and appreciation of the town’s trees, and to grow awareness among the public about why trees matter.

We are proud of the work that our group of six Watertown teens achieved this year including:

- Learning about basic arboriculture and the benefits and maintenance challenges of the urban forest, through discussions with Watertown’s Tree Warden and field trips to experts at local institutions.
- Inventorying 1,500 street trees and empty planting sites.
- Engaging with 200 residents in a variety of ways to raise awareness of the importance of urban trees.
- Pruning and caring for 100 public shade trees.
- Collaborating with local partners, especially Watertown’s Department of Public Works, the town’s Tree Warden, and Mount Auburn Cemetery, to carry out the goals stated above.

This Fall, two of the teens continued developing their community leadership skills by organizing a multigenerational volunteer leaf-raking program, to aid elderly and infirm residents who need help clearing yards and sidewalks of leaves. Eleven homes were visited and over 100 bags of leaves were collected.

Thinking ahead to 2020’s program, we look forward to increased collaboration and partnerships with town officials, residents and institutions. We would like to increase the program focus on tree care and community engagement. To help achieve these goals we are exploring the possibility to expand the program duration to 8 weeks, and to shift to a wage-based teen hiring model.

We are immensely grateful for the community-wide support this program has received from local foundations, corporations, and individuals. We are especially grateful for the support provided by Watertown’s Department of Public Works, particularly Watertown’s Forestry Supervisor-Tree Warden, Chris Hayward. We look forward to continued success in increasing public awareness of the importance of our urban forest and in building a network of activists and supporters who recognize the vital role of trees in our environment.
Overview and Goals

Trees for Watertown’s Teens for Trees (TFW T4T) program just completed its third summer. This year the program hired six Watertown teenagers to learn about, care for, and share their vision of a healthy urban forest in Watertown, MA. In this report we share with you the goals of the program, the activities completed by the participants, and the challenges that lie ahead.

Program Goals
TFW T4T’s 2019 program was informed by previous summers’ work, input provided by past teens, an advisory board, and community members. This year’s program focused on four major goals:

1) Providing meaningful learning and educational opportunities for teens about the importance of urban trees;
2) Completing Watertown’s street tree inventory begun last summer;
3) Caring for street trees through pruning and site cleaning;
4) Educating residents about the importance of urban trees through targeted and general outreach.

Each program goal was supported by various activities and assessed according to a logic model shared in this report.

Participants and recruitment
This summer’s cohort of teens included 6 Watertown residents, including one returning teen from last summer, three current Watertown High School (WHS) students, and two incoming WHS students. There were 4 male students and 2 female students in the group. The five teens new to the program worked 120 hours and received an internship stipend of $1,000; the returning teen was paid at the rate of $14 per hour for a total of $1165. Further demographic data can be found later in the report. The teens met daily, Monday through Friday, from 9am to 1pm for six weeks from late June through early August. Each day, teens wore bright green T4T shirts as a program and safety identifier.

Teens wearing their program shirts
Funding and In-Kind Support
This program was supported by several local foundations and corporations. Major financial support came from Watertown Community Foundation, Mount Auburn Cemetery, Sasaki, Republic Services, Wilder Co., and a generous resident who provided matching funds for citizen donations. In-kind donations for a program fundraising event came from Branch Line Restaurant, Home Depot, Intelligentsia Coffee, Comic Stop, Vicki Lee Bakery, Moseian Center for the Arts, Tabrizi Bakery, American Cleaners, Red Leaf Cafe, Demo’s Restaurant, Farina’s, Central Rock, Russo’s and Miss Maria’s School of Dance. Dozens of community members gave generously to support this year’s program. Several others, including senior DPW staff, volunteered time and expertise toward both program content and fundraising.

Report overview
In the following pages you’ll find detailed analysis of the program that discusses the work of the teens and highlights and accomplishments of the program, shares some of the artistic and outreach work done by the teens, and suggests new avenues for future summer programs.

Teens in the program learning and enjoying time around Watertown’s trees.

Program Summary
The 2019 T4T program was designed to advance three major growth outcomes: that teens grow into knowledgeable, hardworking, and civically engaged tree ambassadors, that residents grow into active tree stewards and advocates, and that the urban forest grows in health and size. Teens engaged in three types of activities to address these goals: learning from field trips, expert guidance, and group research; caring for street trees and the urban forest through inventory and data collection, as well as tree maintenance; and sharing their findings with the Watertown community through outreach and a photo-based project.

In this report, we organize activities into one of six categories (Table 1). Each day, after the usual morning planning meeting, teens participated in several activities to stay engaged and to meet multiple programmatic goals. The full list of daily activities is available online at this link.
<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Activity Category</th>
<th>Number of Program Days Including Each Activity (Percentage of Total Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn</td>
<td>(1) Field Trips, Expert Guidance</td>
<td>15 (50%)</td>
</tr>
<tr>
<td></td>
<td>(2) Research</td>
<td>4 (13%)</td>
</tr>
<tr>
<td>Care</td>
<td>(3) Inventory and Data Collection</td>
<td>19 (63%)</td>
</tr>
<tr>
<td></td>
<td>(4) Public Tree Maintenance</td>
<td>11 (36%)</td>
</tr>
<tr>
<td>Share</td>
<td>(5) Outreach</td>
<td>17 (56%)</td>
</tr>
<tr>
<td></td>
<td>(6) Photo-Based Project</td>
<td>6 (20%)</td>
</tr>
</tbody>
</table>

**Table 1.** T4T consisted of three types of activities, which were broken down into six activity categories. Teen participated in each activity to differing degrees, depicted here out of the 30 total program days.

**Theory of Change**

The Program Coordinator, Program Evaluator, Program Director, and TFW T4T advisory board developed a Theory of Change to map how growth outcomes would be achieved through program activities. Major activities (blue watering cans) collectively promote the growth outcomes (green canopies), thanks to critical partnerships with Watertown Department of Public Works (DPW), Mount Auburn Cemetery (MAC), and others (yellow sun). T4T also contributed toward a possible Fall Community Planting Event through an outreach campaign in West Watertown. Evaluation strategies (pink circles) measured how well program activities contribute to desired growth outcomes.

![TFW T4T 2019 Theory of Change](image)
Evaluation Plan

Five strategies were developed to evaluate the 2019 program. Table 2 summarizes the evaluation strategies; for more detailed information, see Appendix B.

<table>
<thead>
<tr>
<th>Evaluation Strategy</th>
<th>Activity or Outcome Evaluated</th>
<th>How it was evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pre/post knowledge survey</td>
<td>Learn</td>
<td>Online surveys before and after T4T that asked teens about their knowledge of tree benefits, tree stewardship, and forestry dynamics in general and in Watertown</td>
</tr>
<tr>
<td>2. Number of trees inventoried and stewarded</td>
<td>Care</td>
<td>Counted the number of trees inventoried and trees stewarded using OpenTreeMap</td>
</tr>
<tr>
<td>3. Number of residents engaged</td>
<td>Share</td>
<td>Daily Recollection Log, OpenTreeMap, and Resident Tree Interest Survey</td>
</tr>
<tr>
<td>4. Resident Tree Interest Survey</td>
<td>Residents become active stewards and advocates</td>
<td>Survey of residents’ interest in participating in a Fall Community Planting Event</td>
</tr>
<tr>
<td>5. Photo project focus group</td>
<td>Teens become knowledgeable and civically engaged tree ambassadors</td>
<td>Focus group-style conversation with teens about their photo projects and presentations, including a pile sorting activity to find similarities and differences among presentations.</td>
</tr>
</tbody>
</table>

Table 2. Evaluation strategies, including each strategy’s focus and methods.

In addition, the Coordinator collected the quantitative metrics on miles walked (via iPhone app) and hours and attendance of all teens (via TimeStation App). Daily Activities were tracked via a Daily Recollection Log.

Overview of Major Activities

(1) Field Trips and Expert Guidance
The teens had expert guidance, educational experiences, or field trips on 15 of the 30 program days (50%). Teens learned about trees through the lenses of stewardship, botany, art, forest bathing, civic engagement, activism, history, data science, landscape design and more. They therefore experienced the values and functions of trees holistically. Due in part to the increased partnership between T4T, MAC, and the DPW, the teens engaged in 14 expert/field experiences that were entirely new to the program this year.

Notably, teens met with Tree Warden, Chris Hayward, consistently throughout the course of the program (green rows in Table 3). Teens often viewed their role in the program as “helping Chris” through public tree maintenance; one teen said he viewed Chris as his “tree father” and another described Chris as having “the best vibes”. They asked after him often and always looked forward to seeing him.
Teens also visited MAC on a consistent basis (purple rows in Table 3). Exposure to the quantity and quality of trees in the historic, private cemetery inspired the teens. The Coordinator used these opportunities as inspiration and as a model for the teens to think about how to increase residents’ awareness and engagement of public tree care. Teens were also exposed to a variety of horticultural careers at the cemetery that they hadn’t known existed. See Table 3 below for a list of experts and field trips experienced by the 2019 teens.

<table>
<thead>
<tr>
<th>Date 2019</th>
<th>Site</th>
<th>Expert/(s)</th>
<th>Topic</th>
<th>Visited in prior years</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 27</td>
<td>MAC</td>
<td>Jim Gorman, MAC Docent</td>
<td>Tree identification by leaves</td>
<td>2017, 2018</td>
</tr>
<tr>
<td>June 28</td>
<td>Columbia Street, Russell Ave</td>
<td>Chris Hayward, Watertown Tree Warden</td>
<td>Introduction to the DPW, pruning safely and effectively</td>
<td>New</td>
</tr>
<tr>
<td>July 8</td>
<td>WHS to the Charles River</td>
<td>Peter Del Tredici, Arnold Arboretum Emeritus, botanist</td>
<td>The body language of trees, native versus invasive species</td>
<td>2018</td>
</tr>
<tr>
<td>July 11</td>
<td>Mount Auburn Street</td>
<td>Chris Hayward, Watertown Tree Warden</td>
<td>Engaging residents, ideas for a new tree planting request form, importance of tree watering</td>
<td>New</td>
</tr>
<tr>
<td>July 12</td>
<td>MAC</td>
<td>Kristin Follet and Jerry Mendenhall, MAC horticulturist and Assistant Greenhouse Manager</td>
<td>Starting trees from seed, design of an automated ecological nursery, genetic preservation of trees, tree grafting and propagation</td>
<td>New</td>
</tr>
<tr>
<td>July 17</td>
<td>WHS and surrounding streets</td>
<td>Larry Raskin, local nature and street photographer</td>
<td>Street tree photography and principles of mindfulness</td>
<td>New</td>
</tr>
<tr>
<td>July 18</td>
<td>MAC</td>
<td>Dave Barnett, President of MAC</td>
<td>Designing and carrying out an ecological vision for the future, listening to the needs of many groups while protecting trees</td>
<td>New</td>
</tr>
<tr>
<td>July 24</td>
<td>WHS &amp; MAC</td>
<td>Carole Smith-Berney, local nature photographer</td>
<td>Nature photography connected to place, photo session in MAC</td>
<td>New</td>
</tr>
<tr>
<td>July 25</td>
<td>Streets of Watertown</td>
<td>David Meshoulam, T4T Program Director</td>
<td>Inventory and connection to last year’s work</td>
<td>New</td>
</tr>
<tr>
<td>July 29</td>
<td>Streets near the DPW</td>
<td>Genie Johnson, local naturalist, David Meshoulam, T4T Program Director, and Chris Hayward, Watertown Tree Warden</td>
<td>Identification of “Jelly Palms”, illumination on hard-to-identify species</td>
<td>New</td>
</tr>
<tr>
<td>July 30</td>
<td>Harvard University</td>
<td>Ashley Hoffman, Program Coordinator of Speak for the Trees Boston, and the Teen Urban Tree Corps teens</td>
<td>Engaged Boston program teens and shared similarities and differences in our summer tree experiences</td>
<td>New</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Expert</td>
<td>Activity</td>
<td>New/Year</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>July 30</td>
<td>Harvard University</td>
<td>Michaela Schmull, Walter Kittredge</td>
<td>Introduced to Harvard’s collection of 5 million+ botanical samples</td>
<td>New</td>
</tr>
<tr>
<td>July 30</td>
<td>The Harvard Museum of Natural History</td>
<td>NA</td>
<td>Cataloging and representing trees as sculptures</td>
<td>2017, 2018</td>
</tr>
<tr>
<td>July 30</td>
<td>Harvard University</td>
<td>Gretchen Legler, eco-feminist and Masters Candidate at Harvard Divinity School</td>
<td>Activism around protection of trees</td>
<td>New</td>
</tr>
<tr>
<td>August 1</td>
<td>MAC</td>
<td>Samantha Richardson, Plant Records Manager</td>
<td>Creating publicly accessible information about cemetery trees past and present. Cataloging plant specs through maps, signs, and databases</td>
<td>New</td>
</tr>
<tr>
<td>August 2</td>
<td>West Watertown Streets</td>
<td>Ellen Menounos, local landscape designer and horticulturist</td>
<td>Assessing potential planting sites for trees to make recommendations to residents in target Fall Tree Planting neighborhood</td>
<td>New</td>
</tr>
<tr>
<td>August 5</td>
<td>WHS</td>
<td>Evan Kuras, Program Evaluator</td>
<td>Focus group about final comparative photography projects</td>
<td>New</td>
</tr>
<tr>
<td>August 5</td>
<td>Program Director's Home in Watertown</td>
<td>Chris Hayward, David Meshoulam, Libby Shaw (President of TFW), Evan Kuras, Larry Raskin, Carole Smith-Berney, TFW members, Watertown residents, teens’ families</td>
<td>Teens present their comparative photo projects of trees on the streets of Watertown and trees in MAC</td>
<td>2018</td>
</tr>
<tr>
<td>August 7</td>
<td>Town Hall Tree Hearing</td>
<td>Chris Hayward, Watertown Tree Warden</td>
<td>Civic process surrounding town tree removals</td>
<td>2018</td>
</tr>
</tbody>
</table>

**Table 3.** Field trips and experiences with experts during T4T, including the topic and whether the trip or experience was new. Green rows highlight experiences with Department of Public Works (DPW); purple rows highlight experiences at Mount Auburn Cemetery (MAC).
A teen examines a sapling genetically identical to Isaac Newton’s apple tree at the MAC greenhouse on July 12.

Teens attend and speak on behalf of trees slated for removal at a tree hearing in town hall on August 7.

Teens meet with TUTC of Speak for the Trees Boston and Gretchen Legler outside the Harvard Natural History Museum to discuss activism around tree removal on July 30.

Teens pose with an enormous beech tree after taking a tour of MAC with President Dave Barnett on July 18.

(2) Tree Research
Throughout the summer, teens answered a group of research questions about trees provided by the Coordinator. Teens took time to investigate these questions at home or at the WHS Library. They were assigned to produce answers to some questions independently or in pairs. Using their findings, teens made videos, essays, illustrations and infographics. Example questions included, “What are 7 of the most famous or interesting trees in the world? Why are they interesting?” and “How do trees impact public health in urban environments?”
How do trees filter air pollutants? Describe the biological processes. How could this impact Watertown?

Notes:
https://www.state.sc.us/forest/urbben.htm

- They trap and hold things like ash, and pollen and smoke
- Dangerous gases like CO2 are absorbed and turned into oxygen
- Within a year if enough CO is absorbed, it can equal the same amount as when you drive your car 26,000 miles
- The trees absorb through the pores in the leaf surface
- Particulates become trapped in the leaves and are then filtered
- They absorb carbon dioxide and other dangerous gases and turns it into oxygen by when the pores of the leaves absorb the gases they are then filtered by the leaf, steam and twigs then they are washed onto the ground by rainfall

https://blog.ecoia.org/how-trees-reduce-air-pollution-world-environment-day/
- Examples of particle odors and pollutants gases are nitrogen oxides, ammonia and sulfur dioxide settle on the leaves of a tree.
- The tree absorbs these gases through their stomata or pores and filter the gases to separate the chemicals from the air
- Trees also change greenhouse gas effect by trapping the heat which causes the ground level ozone levels to reduce and give off oxygen

Impact:
- Make air less polluted=good for lungs
- Makes it a safer place to live
Teens also went through the inventory data to create graphs summarizing characteristics of street tree and empty planting sites. An example bar graph characterizing empty planting sites is below:

![Number of each type of planting site in Watertown, MA (2019)](image)

Although the teens only spent 4 of their 30 days doing research on past data and on the importance of trees in town; from this research they created a great deal of useful and engaging material.

(3) Inventory and Data Collection
As in years past, one of the primary activities in T4T was conducting a street tree inventory to show the current condition and distribution of Watertown’s street forest. The town’s previous tree inventory was completed in 2008 by Davey Tree. To the best of his ability, Watertown’s Tree Warden Chris Hayward, added new trees to the Davey inventory as they were planted and removed trees from the database as they were taken down. He shared the most recent data with the former T4T Program Coordinator in Summer 2017. The town’s database included information on each tree’s coordinate location, a unique numeric identifier assigned to the tree, and each tree’s species, size (DBH), and health as of 2008 (unless planted later), as well as other relevant notes regarding new plantings and tree removals. The town’s data included approximately 4,000 trees and 500 vacant sites. For the purposes of the town’s inventory, a site was considered vacant if a tree had been located there previously but had to be removed.

To ensure comparison across the two inventories, the prior Coordinator used the Tree Warden’s information as a base layer of the participants’ mapping work in OpenTreeMap ([opentreemap.org/watertownma](opentreemap.org/watertownma)). The map for 2017’s inventory incorporated only each tree’s
location and unique identifying number. Other information, including species, size, and health, were left blank. This allowed for a full audit of the inventory. Teens in the 2017 program carried out a pilot project where they remeasured a small subset of trees’ species, size, and health. In 2018, the program focused on collecting data on street trees. During summer 2018 the group collected data on 3,053 trees, and 3,095 empty planting sites. Nearly 1,000 trees and empty planting sites remained to be inventoried at the end of 2018.

After proper training in tree identification by Jim Gorman, Docent at MAC, the 2019 teens were tasked with accurately species-identifying, measuring, and assessing the health of the remaining trees in the inventory using OpenTreeMap.

*Teens show an employee of a local bakery how to measure a London Plane tree for inventory.*
Working in pairs, teens approached each tree with a partner and compare it to the pre-populated map. They then used the OpenTreeMap app to collect the following information:

- **Tree species.** (Unknown species were marked as “Jelly Palm” for follow-up by TFW volunteers and trained arborists.)
- **Degree of confidence in species identification**
  - “I am SURE I know what species this tree is.”
  - “I’m sorta certain.”
  - “I have NO idea what this tree is.”
- **Size of tree, measured as Circumference at Breast Height (CBH),** which was then translated by the software into the industry standard Diameter at Breast Height (DBH)
- **General health of tree on a 5-level scale:**
  - Good: 80%-100% green
  - Fair: 50%-80% green
  - Poor: 1%-50% green
  - Dead but standing (no green)
  - Stump

In addition, teens were taught to identify new street-tree planting sites using streetscape criteria as articulated by the Tree Warden. This included a minimum of 48” (4 feet) sidewalk clearance, as required by the ADA (American Disabilities Act), and a minimum of 24” (2 feet) for a tree planting site. Therefore, for a street site to be considered appropriate for the planting of a street tree, a minimal sidewalk width of 72” (6 feet) was required. If there was sufficient space for a tree, potential planting sites were categorized as either a planting strip, concrete sidewalk that required a cutout, a former tree pit with dirt, or a former tree pit with an asphalt covering. In addition, teens noted whether there were utility wires above the planting site to assist in determining which sized tree would be appropriate for that site. Teens were unable to note underground utilities and other considerations taken into account by DPW, including distance from driveway and stop signs. The total number of empty planting sites should be considered a ceiling and not a floor of possible tree planting locations.

The 2019 teens inventoried 771 trees and 843 empty planting sites over 19 of the 30 program days (63% of work days), for a total of 4,218 street trees assessed, measured, and identified, and 4,278 empty planting sites (opportunities for new trees) measured and marked. As of fall 2019, there remain 23 sites to be visited in the Watertown street tree inventory. Teens also performed “quality assurance,” checking former entries for species and size accuracy in the field, and marking if the condition of any trees had changed. In particular, teens noted when trees inventoried in the past two years had been removed and if new trees had been planted. These efforts were meant not only to correct any errors in past inventory efforts, but to account for plantings and tree removals occurring in the past two years.

On July 11, the Coordinator asked the teens to articulate why they were doing the street tree inventory. One response was emblematic: “To give data to the town so they know how healthy their trees are, and give them the option to either plant more trees, take care of the trees they have, or hopefully both.” Teens viewed the inventory as a data-driven contribution to the town that could ultimately improve urban forest health, help residents “enjoy the trees,” and help the teens “learn more about trees and the different types.”
On the third day of the program teens were taught basic pruning and tree maintenance by Watertown’s Tree Warden, Chris Hayward. Teens learned how tree pruning benefits both trees and residents. Using basic pruners, handsaws, and rakes donated by Home Depot, as well as eye protection, gloves, and safety vests from the DPW, teens pruned numerous street trees throughout the summer. Teens performed maintenance on street trees on 11 out of the 30 program days (36% of program days).

During this work teens focused on removing branches from pedestrian paths, pruning branches out of street traffic paths (from the sidewalk only), and eliminating crossing branches that can rub bark and cause rot. They took care to make clean cuts that allow a tree to heal using minimal energy and with the least potential for infestation. Teens also removed sucker shoots and sprouts that sap a tree’s energy. Teens only pruned within a reasonable line of sight and within reasonable reach. As a precaution, branches that were out of reach were left for Chris and his trained arborists to remove.

To support better tree health, teens also removed guy wires from young trees when necessary and possible. They also pulled weeds and raked the soil at the base of street trees to minimize competition and aerate the soil. When necessary, they flattened excessive mulch (often called “mulch volcanoes” although luckily, they did not encounter this often among public shade trees in Watertown. Over the course of the summer teens stewarded approximately 100 street trees.
The brush at the base of an oak tree on Watertown Street, before (left) and after (right) teen stewardship on July 2, 2019. The removal of brush reduces competition and provides better aeration for the tree.

(5) Outreach: Material Design, Distribution, and Public Engagement
As the inventory neared completion, teens began to shift focus to utilizing strategies, materials and instruments to connect Watertown residents with the DPW and TFW. The goal of these connections was explicitly to get more town trees requested by residents and planted by DPW, and to have residents advocate for more public street trees as a way to green their town. Specific goals for outreach suggested by the Coordinator and Tree Warden included 1) making residents aware of the DPW’s role in planting town trees and 2) making tree planting more accessible by updating and creating a digital version of an existing tree planting request form. Through these efforts the program would increase planting requests and support the expansion of the Forestry Department budget to plant more trees. Another goal was finding a neighborhood lacking in tree canopy and to begin to strategize around a community tree planting event in the fall. Teens performed outreach related tasks on 17 of the 30 program days (56%).

**Outreach Goal 1: Motivate residents to request more public trees from the DPW**

**Approach: Redesign the Tree Planting Request Form and make it Accessible**

Teens, the Coordinator, and the Tree Warden worked together to update the format and language for the town’s tree planting request form. Previously, the tree-planting request form was only available directly from the DPW office or printed from the DPW website and then mailed to the DPW. The Tree Warden reported that printed and mailed forms often contained errors and that filing them at the DPW was a challenge. To solve this problem, teens used the original form as a template to create a Google form that could be linked to the DPW. The form was optimized by the Program Director with the support of the Tree Warden for user friendliness and made available at bit.ly/treewatertown and through a scannable QR code. Tree Warden’s phone number and email were also included.
Online form for Watertown public tree planting requests created in July 2019

I live in Watertown, MA and I want a public shade tree!

Are you a Watertown resident interested in a tree in front of your home, either along the sidewalk or in your front yard? Look no further! Trees for Watertown and TFW Teens for Trees is proud to partner with DPW and interested residents to ensure a greener and healthier town by planting public shade trees. Please fill out the form below and we'll get in touch with you.

Your name: *

Short answer text

Street address for tree: *

Teens also wanted to redesign door hangers promoting the program from the previous year, which they suggested were not eye catching. Teens and Coordinator decided to create new door hangers to try to promote awareness of the DPW’s role in tree planting and provide access to a link where residents could fill out an online form to request a town tree. Teens appeared overwhelmed by the idea of starting from scratch, so the Coordinator laid out sections in a template for the teens to tweak. Teens worked on the design using a design interface provided by Vistaprint, a print media design website, and provided feedback on various drafts. Input from the Coordinator, the teens, the Program Director, and TFW President resulted in an engaging final design that included information about the program, contacts to members of relevant partnerships, and a link and QR code to the new tree request form. The hanger also prominently featured a photograph of a honeylocust by Carl Deye, 2019 program participant.
Hello, Neighbor!
We noticed an empty planting site for a tree in front of this location!
Did you know that you can ask the Town of Watertown to plant a tree for you?
You just need to ask your Tree Warden, Chris Hayward!

Type the link below into your phone or browser, or scan the QR code and request your new tree!

bit.ly/treewatertown
Or Call: 617-972-6420
Forestry Division, Watertown
Dpt. of Public Works
Monday - Friday
7 a.m. - 3:30 p.m.

We are Teens for Trees, a group of Watertown teens employed by Trees for Watertown each summer.
We’ve been collecting information on Watertown’s street trees.
We also measure sites where new trees could be planted. We work with the Department of Public Works to share that the town can plant trees in:
- a planting strip along the sidewalk
- a front yard
- a tree pit
- a tree pit covered by asphalt
- even concrete can be cut to plant a tree!

Why do we think a tree can be planted here?
We measured an empty planting site here! Check it out at opentreemap.org/watertownma

Let’s connect!
To learn more about Teens for Trees, email Program Director, David Meshoulam:
david@tfwtcensfortrees.org
or visit tfwtcensfortrees.org
facebook.com/tfwt4t
instagram.com/tfwt4t

Want to join Trees for Watertown or learn more about protecting public shade trees? Visit treesforwatertown.org

Email Chris Hayward, Watertown Tree Warden, about Town tree planting, care, and removal: chayward@watertown-ma.gov
Teens then assessed the best way to distribute the door hangers, using OpenTreeMap to identify streets with multiple empty planting sites. Teens chose Laurel, Boylston, School and Concord streets in East Watertown. They hung door hangers on residences near empty planting sites with major viability for new trees. For example, they targeted homes with wide planting strip, a lack of overhead wires, and available green space for trees. Teens knocked on doors and hung door hanger during program hours. In addition, a few teens did this work as makeup work. Teens also used door hangers during canvassing in West Watertown on Chapman, King, Warren, Fayette, and Lexington streets, Highland and Grandview ave, and Heather road. As of August 16, 2019, 3 residents have already requested trees through the door hanger Google form.

**Outreach Goal 2: Find a Neighborhood for a Fall Community Tree Planting**

**Solution:** Flyers and door-to-door canvassing with Resident Interest Survey

Another goal was choosing a neighborhood with several planting sites and low overall tree canopy to pilot the idea of a DPW and TFW supported community tree planting event in the Fall. Teens and the Coordinator used tree canopy coverage maps (produced by last year’s teens using iTree Canopy software) to target a neighborhood with low tree canopy and high planting permeability.
From the 2018 T4T Final Report: “Results are from analysis through iTREE Canopy (canopy.itreetools.org) The tree canopy in Watertown ranges from 13% to 36%. West Watertown has the lowest coverage.”

From the 2018 T4T Final Report: “Permeability is a measurement of “softscape” (dirt, grass) Areas with low tree coverage that have high areas of permeable surface (ie, dirt and grass) are an opportunity for trees!”

Teens decided that Precinct 11, in West Watertown, with the second lowest canopy coverage (16.9%) and the 5th highest permeability (34.4%) would be a good candidate for a community outreach and tree planting. Teens then examined OpenTreeMap to find streets in Precinct 11 with multiple empty planting sites. The teens settled on Chapman, King, and Heather streets, with surrounding Grandview and Warren streets as a target neighborhood. The teens wanted to do in person outreach with materials they designed, so they chose to canvass in the neighborhood with flyers they co-created and collect data on resident interest through a teen/Coordinator/Evaluator-designed survey (online survey, no longer accepting responses: tinyurl.com/TFWtreeinterestsurvey; pdf version: tinyurl.com/tfwtreeinterestsurvey-pdf). Before embarking on canvassing, however, the teens coordinated their efforts with Tree Warden Hayward.
Once the neighborhood was approved, teens co-created scripts, embedded them in a Google Form survey, and practiced how they would represent themselves and the program to residents. Using the free web-based platform Canva, Teens designed a flyer about the tree planting and how it would benefit Watertown and its residents.

On August 6, teens knocked on 63 doors between 3pm and 6pm as captured by their Resident Interest survey form, and made contact with 20 residents. (Residents did not answer the door at 43 [68%] of the homes teens visited). When residents did not answer, teens left the tree planting request door hangers or community tree planting information flyers. Door hangers and flyers were distributed on the following streets: King Street, Chapman Street, Grandview Ave, and Warren Street. For a summary of canvassing outcomes, see Program Outcomes section.
Additional Outreach
Two teens attended the Watertown Farmers Market after program hours on August 7, engaging local vendors and residents with information about their pruning and inventory work, invasive tree pests, and TFW. Scattered, riotous thunderstorms plagued the market, so it was attended by few. Teens shared with market-goers copies of the West Watertown Community Tree Planting flyer and the last remaining door hanger. The Coordinator estimates that about 10 full conversations with residents were had at this event.

A resident (center) poses with teens and the Coordinator after pruning a branch on Robbins Road

(6) Comparative Photo Project: MAC Trees Versus Watertown’s Street Trees
Throughout the summer, each teen developed his or her own independent photography research project to compare Watertown’s street trees with trees found in MAC. This project was designed to encourage the teens’ exploration of the effects of human engagement, stewardship, funding and resources on trees in public versus private settings specific to Watertown’s urban forest. Teens often noticed that public shade trees weather more abuse and that the responsibility for their stewardship is often controversial among residents. They generally observed that MAC’s trees have ample space and protection and are stewarded very intentionally by a private team of arborists and horticulturalists. Teens therefore were tasked with taking photos of trees in these two settings and creating a project around their observations. Larry Raskin, a TFW member and local nature and street photographer, was a consistent, supportive presence with the teens. He shared techniques with them to aid in their photography of street trees.
Carole Smith Berney shows teens her photos of trees of personal significance in Watertown. Photo taken by a teen in MAC. The cemetery was observed to have “better vibes” and better lighting for photos of trees than the streets of Watertown, in part due to greater shade and canopy in the cemetery.

Carole Smith Berney, another TFW member and nature photographer, presented her work to the teens and supported them in a photography session in MAC. The teens were then challenged to present their photos and findings in whatever format inspired them. Throughout the process of this project, teens identified unique themes of personal interest. They crafted public presentations that they delivered during the final program potluck on August 5, 2019. This project was designed to combine three elements:

1) Tree knowledge and experience gained during T4T;
2) Teen feelings and observations about trees and their care in different environments;
3) Communication strategies for conveying messages publicly.

This final project was an opportunity for teens to showcase themselves as knowledgeable, caring, articulate, and civically engaged tree advocates.
Program Outcomes

The View of the Forest

Overall, T4T met its goals of caring for street trees, outreaching to residents, and educating teens about the importance of the urban forest. In the process, the six teens logged over 127 in-program hours (30 4-hour days plus 7 hours at the potluck and Farmers Market) with a grand total of 723.1 person-hours. The five teens doing T4T-sponsored or Watertown Community Foundation Internships exceeded their 120 hour requirement by up to 3.4 hours each and the teen hired as an employee of the program (“Teen Leader”) worked 115.7 hours. Attendance was high for the majority of the program, with only one teen absent on each of 13 days and two teens absent on 1 day. Collectively, teens walked over 1.3 million steps and nearly 600 miles! Each participant walked approximately 200,00 steps, 100 miles, over the course of the program, or about 3.5 miles per day.

Importantly, teens built deep connections with trees and became invested in the future of Watertown’s urban forest. While teens did not complete Watertown’s street tree inventory, as of September 12, 2019, only 40 sites remain and we expect to complete the inventory this Fall. Table 4, below, summarizes the results of five evaluation strategies implemented in summer 2019. The text that follows captures other major outcomes of the T4T program, including expectations before the program and highlights after the program.
Evaluation Strategy | Results Summary
---|---
1. Pre/post knowledge survey | Teens learned how many street trees there are in Watertown, could collectively name 22 species, and gained an expansive view of the benefits that street trees provide Watertown. Teens learned the importance of street tree stewardship and all six teens could name the major players involved with caring for Watertown’s urban forest. Teens felt that lack of stewardship was one of the major challenges facing Watertown’s urban forest.

2. Number of trees inventoried and stewarded | Teens measured and inventoried 771 trees, recorded 843 empty planting sites, and stewarded over 100 trees (pruning, weeding and removing guy wires)

3. Number of residents engaged | Teens engaged approximately 200 residents, through conversations on the street, at the Farmers Market, at the tree hearing, at sites of tree interest, through canvassing for a tree planting, and through door hangers and flyers distributed at homes.

4. Resident Tree Interest Survey | Teens knocked on 63 doors, made contact with 20 residents, and logged 11 full conversations. Contacted residents were overall supportive of the Community Tree Planting Event and almost half said they wanted to receive a tree and/or participate in the event directly.

5. Photo project focus group | Teens demonstrated their deep connection with trees and concerns for the future of Watertown’s urban forest. Teens noted that well-cared for vs. neglected trees have consequences for tree health and ecosystems services, including shade, beauty, and human relationships with trees. Many teens used persuasive personal stories to encourage Watertown and its residents to plant more trees and take better care of them.

Table 4. Summary results of each evaluation strategy. See “View of the Trees” section for detailed findings from each strategy.

**Realized Expectations**
Teens came into T4T expecting to learn about trees (n=4) and care for their environment (n=3). Similarly, teens expected that Watertown would benefit from T4T because the teens would directly improve tree quality and/or quantity (n=4) and motivate residents to become more excited about trees and tree care (n=3). At the end of the program, teens’ expectations were mostly realized. Teens said they benefited from the program because they gained knowledge about trees (n=5) and helped care for them directly (n=3). One teen even said they benefited from T4T because, “I can brag to people how much knowledge I have of trees!!” Similarly, teens felt they aided Watertown through helping the Tree Warden by nearly completing the inventory (n=2), and by caring directly for trees in an effective and publicly visible way (n=4).

**Highlights of the Program**
Teen highlights from the post-program survey centered on the educational and experiential value of the program (for example, field trips), the opportunity to care directly for trees through
stewardship, and the chance to witness the beautiful scenery of MAC. For one teen, doing maintenance was a highlight specifically because they felt they were good at it.

Teens were generally well prepared for work, communicative about their needs, and committed to doing an excellent job. They were given a T4T handbook (Appendix A) on their first day, and a parent of a teen participant remarked that she read it over with her child and was committed to helping him meet the responsibilities of a first job. Many teens viewed themselves as assistants to Chris Hayward, Tree Warden. Some referred to him as their “boss” and some told residents that they “work for Chris”. Many had a sense that they were working on behalf of the town.

MAC became a special space for the group. Teens often remarked that they could not believe a place like this was in Watertown. They were given ample time to explore and relax in the cemetery and experience being surrounded by a large quantity of healthy trees. They said the air smelled better and they simply felt ecstatic being in the cemetery without being able to pinpoint why. MAC’s staff was exceptionally well prepared, thoughtful, and encouraging of the teens’ work. They exposed the teens to horticultural concepts they had never even imagined. The teens loved working with the MAC staff and we hope our partnership with them continues to grow.

This year’s T4T program took a strengths-based approach, meaning that teens who struggled with certain tasks were encouraged to use their unique skills and favorite activities to explore unfamiliar concepts. For example, a teen who was generally afraid of and distracted by bugs (and therefore did not enjoy maintenance as much as other teens) was encouraged to explore nearby streets and take photos of trees because photography was an activity they had expressed interest and confidence in. A teen who struggled with internet research due to lack of access to internet at home was encouraged to draw their analysis for their final presentation because sketchbook drawing was something they had expressed interest and confidence in. Teens were therefore supported to use what they already liked and felt good about to delve into greater tree appreciation.

One teen would regularly communicate with their Coordinator, entirely unprompted via text message, about dead street trees they saw, lush trees noticed on vacation, and trees they would want to plant at their future home. Another teen shared a deeply vulnerable and beautiful story about the tree in their backyard at a Housing Development, where they would regularly go to cry, or when they needed solitude. This teen referred to the tree as “a friend”. The teen showed the group the tree, climbed inside it, and told everyone reasons to love it.

Teens and Coordinator also grew in their care for one another. Showing signs of apprehension about teens they didn’t know or didn’t know well in the first week, by the end the group was laughing, friendly, and familiar with one another. Teens shared snacks, bus money, visited each others’ homes and favorite trees, some of which held deep significance and memories for these adolescents. The group even paid respects at the grave of one of the teens departed loved ones at Ridgelawn Cemetery. This social and emotional connection and growth is crucial. Trees are emblematic of this kind of care, and stewardship of trees requires and begets care between people, places, and nature.
The View of the Trees

The five evaluation strategies showed how T4T met its goals in 2019. What follows is a discussion of findings from each strategy.

1. Pre/post knowledge survey
Online surveys before and after the program asked teens about urban forestry dynamics in general and in Watertown specifically, the benefits of urban trees, and the structure of urban tree stewardship, including major players in Watertown.

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-Survey Answer</th>
<th>Post-Survey Answers</th>
<th>Objective Met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Approximately how many street trees do you think there are in Watertown?</td>
<td>Responses ranged from 250-5,000 trees. The median estimate was 1,000.</td>
<td>Five teens responded with 5,000 trees and one teen said 20,000.</td>
<td>2017: yes 2018: yes 2019: yes</td>
</tr>
<tr>
<td>Answer: 5,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. How many different species of street trees do you think there are in Watertown? Name as many as you can.

**Answer: Over 15. Among most common include Norway maple, Honeylocust, Callery Pear, Northern Red Oak, Linden, Cherry, Zelkova, Ginkgo, Elm, Red Maple, Pin Oak, London Planetree.**

Responses ranged from 3 to 10 species.

Teens were able to name between one and ten species and collectively named thirteen. The most commonly named species were oak (6 times) and pine (4 times). Some teens were confused about tree species such as the “christmas tree” and “evergreen.”

Responses ranged from 10 to 20 species.

Teens were able to name between 11 and 16 unique species and collectively named 22 (n=3). The following trees were each named by three teens: Norway maple, Red maple, Sugar maple, Pin oak, Red oak, Littleleaf linden, London planetree, Cherry, and Honey locust.

3. Of the trees you just listed, which do you think is the most common in Watertown? Why do you think this is?

**Answer: Norway Maple.**

Oak (4 teens), Norway maple (1 teen), and “don’t know” (1 teen). Teens justified their answer through facts they have learned (like that Norway maples are invasive) or trees they have seen around.

Norway maple (5 teens), London plane (1 teen). Teens thought Norway maples were most common because they are invasive, provide shade, and do well in our climate.

4. List up to 5 important things a street tree in Watertown needs to live a long and healthy life. Why does a street tree need those things?

**Answer could include: Sunlight, water, soil, stewardship.**

The most common responses were water (n=6), sunlight (n=5), and healthy soil (n=4). Two teens brought up stewardship-related items such as pruning, soil aeration, and ensuring trees get the right amount of water (not too little and not too much).

All teens (n=6) said trees needed water and sunlight and some form of stewardship, be it pruning or protection. 4 teens mentioned trees needed room to grow their canopy and their roots.

5. List up to 5 benefits that you think street trees provide Watertown and its residents.

**Answer could include: Cooler air, cleaner air, aesthetic value, biodiversity, economic value,**

The most common responses were oxygen (n=6) and shade (n=4). Fewer teens mentioned ecosystem services related to water quality (n=2), fruit provision (n=2), and cultural value (n=2; beauty and mental health benefits).

The most common responses clean air (n=5), shade (n=5), and cultural value (n=4; beauty & aesthetics). More teens mentioned regulating ecosystem services: improving water quality (n=3), cooling homes (n=3), &
6. There are many individuals, groups, and organizations involved with caring for Watertown’s street trees. List as many of these people or groups as you can.

*Answer: DPW, TFW, Tree Warden.*

7. In your opinion, what is one major challenge facing Watertown’s urban forest? What could be done about it?

*Answer: Various answers accepted.*
From these results, it is fair to say that T4T accomplished its goal of educating teens in urban forestry and related processes in the Watertown context. Teens learned how many street trees there are in Watertown and could collectively name 22 species, including both common (e.g., Littleleaf linden) and rare (e.g., Osage orange) species. Teens gained a more expansive view of the benefits that street trees provide Watertown, with a greater emphasis on regulating ecosystem services and aesthetic or cultural value. Importantly, teens learned the importance of street tree stewardship: all six teens referenced human care in the post-program question about the needs of trees and all six teens could name between one and three of the major players involved with caring for Watertown’s urban forest. Indeed, teens felt that lack of stewardship was one of the major challenges facing Watertown’s urban forest.

2. Number of Trees Inventoried and Stewarded
Teens measured and inventoried 771 trees and measured 843 empty planting sites over the course of 19 program days. This information was captured in OpenTreeMap (OTM). This adds to the work of two previous summers, for 4,218 total street trees assessed, measured, and identified, and 4,278 empty planting sites (opportunities for new trees) measured and marked. Teens pruned and removed guy wires from at least 65 trees as marked by stewardship notes in OpenTreeMap. It is estimated that, in reality, teens stewarded 100-130 trees over the course of the summer, but due to various data constraints (the late addition of the stewardship notes feature in OTM and the fact that OTM crashed on iPhones when logging stewardship), the group was unable to log every stewardship effort.

3. Number of Residents Engaged
Approximately 200 residents were engaged over the course of the summer, with more exposure from outreach materials posted at residences with multiple inhabitants.

~100 residences received door hangers in the last week of the program. Many homes have multiple residents, thereby maximizing engagement!
~10 residents attended the tree hearing on August 7, at which the teens spoke.
~10 residents engaged with teens who had set up a table at the Farmers Market.
~14 noted conversations with residents while doing field work (from the daily logs and OTM notes).
~20 informal conversations: brief discussions with passersby who would ask what we were doing and we would quickly explain the program.
~12+ residents engaged through canvassing from the Resident Tree Interest Survey
~15 residents received flyers about the Community Tree Planting when not at home
~4 employees at a Bakery in Watertown during a field trip.
~1 owner of a local establishment, Ali at Dizin Frutti Berri during a field trip.
~32 experts and teens in the Greater Boston Area from Watertown, MAC, Harvard, Somerville, through notes from the daily log on field trips and the potluck presentation.
4. Resident Tree Interest Survey
On August 6, teens knocked on 63 doors and logged their data through a Resident Tree Interest Survey. They made contact with members of 20 residences. At 8 of the homes where teens made contact, they were either told by residents that they were “too busy to talk” (3 homes) or were refused by neighbors who didn’t want to be contacted (5 homes). Teens and Coordinator had “full conversations” with neighbors at 12 of the homes (60% of homes where residents answered the door, and 19% of the homes teens visited that day).

Of the 11 residents with logged conversations…
- 7 “loved the idea” of a community tree planting in their neighborhood;
- 4 said they needed more information;
- 5 were interested in receiving a tree on their sidewalk during the event;
- 5 five said they were “maybe” interested in a tree;
- 5 residents were interested in participating in the event directly;
- 4 residents wanted to learn more from the Tree Warden;
- 1 wanted to join the TFW email list.

5. Photography Project Focus Group
Throughout the summer, each teen developed his or her own independent photography research project to compare Watertown street trees with MAC trees (See description in Overview of Major Activities, Section 6). Teens identified unique themes of personal interest and crafted public presentations that they delivered during the final program potluck on August 5, 2019. What follows are brief summaries of each project:

**Camila** drew two pictures of trees: a willow tree and a park tree. She finds willows magical because of their connections to fairy tales, their drooping canopy, their twisted trunks, and the sounds and motions they make in the wind. To Camila, trees that are well cared for are beautiful, like the willow tree and those in MAC. But any tree that is cared for and loved can be magical too.

**Brianna** focused on how light filters through trees in different environments. She discussed the public health benefits of shade, which may be greater in MAC because there is a denser canopy. Her detailed notes combine observation and analysis, which she recorded as a video. The main takeaway: plant more street trees to provide more shade.
Matt compared street trees and MAC trees, noting that the same species grow in both places, though street trees have it harder. He noted that seeing large trees in MAC gave him a good feeling, like being lightweight, but that street trees can make him feel good too. One specific tree in town makes him “feel like I can be who I am.” If we plant more trees, there will be trees for everyone, and everyone can feel that way too.

Alex told the story of his favorite tree that he climbs when he feels upset or wants to be alone. One time, he was very angry at his brother and almost hurt the tree but decided not to, for which he is thankful. Alex noted that he likes MAC trees, especially the view from the tower. “It smells like you’re free,” he said. Overall, his presentation focused on the ways trees can make people feel: protected, safe, and connected.

Carl discussed his instinctive reactions to trees through photography. Features of MAC, such as wildlife, gravestones, and ponds, contribute to good photo vibes. Street trees are challenging to photograph because of harsh light and urban clutter. Plus, good vibes come from trees that are “well taken care of.” The solution? Improve the environment around street trees to make it more interesting and take better care of the trees.

Dylan focused on how space affects tree canopy. Pictures of MAC trees, with plenty of space to grow, show “how much tree there is.” In contrast, street trees suffer from wires and other obstructions such that trees cannot be their best selves. Dylan highlighted the importance of considering the canopy needs of trees when planting them, including alternatives like planting in yards rather than on the street.
Before presenting their projects at the potluck, teens participated in a group pile sorting activity to find similarities and differences among their presentations. Pile sorting consisted of four rounds, detailed below. Overall, the pile sorting activity revealed patterns and important themes among the presentations that teens tended to gravitate toward.

**Round 1: Problems Addressed**
Teens identified four problems that their presentations addressed (orange cards/highlights). Teens felt that most of their presentations addressed problem that people do not notice, appreciate, or care about trees, though three presentations address the lack of stewardship (Camila) and the need to improve the vibe of the street (Carl and Dylan) as well. Only one presentation focused primarily on a biophysical challenge faced by trees, or that there is not enough space for street trees.

**Round 2: Audience Takeaways**
Teens identified four takeaways in their presentations (green cards/highlights). Most teens felt that their presentations encouraged residents to demand more trees, though two presentations argued that we must consider the needs of trees when planting and that citizens should steward/water their trees. In addition, one presentation encouraged people to fight and speak for the trees.
Round 3: Presentation Format
Teens used four presentation formats (pink cards/highlights). Four teens combined **powerpoint** with **storytelling**, one teen used her own **drawings**, and one teen made a **video** (although she presented live during the potluck). Teens were nervous about presenting during the potluck, and two opted to use a Q&A format with the Coordinator. The remaining teens wrote scripts, which they either memorized or read during the presentation. Many of the teens felt proud of their work, with one teen (Alex) noting that he wanted his effort to be visible through the color backgrounds he carefully chose for his slides.

4) Communication Strategies
Teens identified three communication strategies that they used in their presentations (white cards/underlines) that they arranged in a spectrum, with **Analysis** and **Personal stories** on either end and **Persuasion** in the middle. Five teens used their presentations to **persuade** their audience of a certain point, with two using **analysis** (structured comparisons) for their argument, one using a **personal story**, and two relying more on their arguments alone. The sixth teen did not feel like he was trying to persuade the audience but rather wanted to share a **personal story**.
The photo project provided an opportunity for teens to both reflect on their experiences with trees and to act as tree ambassadors in a public setting. An overall theme that emerged from the presentations was that trees tend to fall into one of two categories: well-cared for and healthy or neglected and unhealthy. Healthy trees can be magical and contribute to special human relationships, such as those discussed by Camila, Matt, and Alex. Unhealthy trees contribute to bad vibes and are visible examples of poor planning, as discussed by Carl and Dylan. Teens generally felt that trees in MAC were healthier, had better vibes, and were well-cared for, while street trees were in need of love and stewardship. But teens also insisted that if people took better care in planting and stewarding their street trees, they could belong in the healthy, magical category as well.

The problems and solutions identified by teens suggest they view a broken cycle in which residents don’t actively appreciate street trees. This, they believed, explained why residents do not engage in stewardship, so trees are are neglected and this prevents any magic or personal connection from happening, which is why residents don’t appreciate street trees. Many teens felt this cycle personally, either because they had a prior personal connection with a tree or because participating in T4T helped them notice and actively start appreciating trees. Tellingly, it was around feelings that many of the teens structured their presentations, by using persuasion and personal stories to make their arguments: namely, that Watertown and its residents should plant more trees and take better care of them, which will provide more ecosystem services and powerful human connections.

**Additional Branches**

Beyond the five evaluation strategies reported above, the Evaluator and Coordinator collected other information and feedback using the pre/post program survey. Program staff predicted that participation in T4T might increase teens’ interests in forestry-related careers, increase their sense of attachment to Watertown, and drive them to become more active ambassadors for the urban forest through conversations with members of the public. In addition, survey questions asked teens to provide general feedback and to assess the various field trips and experiences with experts. Finally, the survey asked teens about their prior work experience, demographics, and other background information.

*Forestry-related Careers*

 Teens were exposed to numerous professionals in fields related to tree and plant science, landscaping, forest management, parks and recreation, communications, and government and nonprofit management. Before T4T, teens reported low interest in these fields on average, with the highest interest in communications (media and content creation, graphic art and design). After the program, average interest remained low and actually decreased slightly for each field, with the greatest decrease in communications (Figure 1). At the individual level, most teens reported only minor changes in interest. For example, one teen became more interested in government or nonprofit management and less interested in landscaping while another teen become more interested in communications and less interested in parks and recreation.
Figure 1. Teen interest in various forestry-related careers before and after T4T.
0 = Not interested; 1 = Somewhat interested; 2 = Very interested

Attitudes towards Watertown

We evaluated how strongly teens felt attached to Watertown and how those attitudes might have changed as a result of T4T. Before T4T, teens’ attachment to Watertown was slightly higher than the midpoint (Table 5; a value of 3 corresponds to “neutral” on a five-point scale) and higher than values from Kudryavtsev et al. (2012) and from the 2018 T4T program. After the 2019 T4T program, place attachment scores were slightly higher but not significantly different (paired t-test, p-value > 0.1). Our results echo those of Kudryavtsev et al. (2012), who found that teens’ place attachment to the Bronx, New York, did not change after participating in an environmental education and stewardship program of similar length to T4T. It is possible that T4T teens did not feel more attached to Watertown after participating in the program, but rather felt attached to specific places, such as MAC. Kudryavtsev et al. (2012) suggest a similar dynamic may have been at play in their study.

<table>
<thead>
<tr>
<th>Place Attachment</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
<th>Difference in Mean</th>
<th>Significance</th>
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<tr>
<td>2019 Pre-program</td>
<td>3.39</td>
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<td>2 - 4.83</td>
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<td>p-value &gt; 0.1</td>
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<td>2.17 - 5</td>
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<tr>
<td>2018 Pre-program</td>
<td>2.98</td>
<td>1.15</td>
<td>1 - 4.37</td>
<td>0.12</td>
<td>p-value = 0.02</td>
</tr>
<tr>
<td>2018 Post-program</td>
<td>2.86</td>
<td>0.99</td>
<td>1 - 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Results of Place Attachment survey, 2018 and 2019
Note: We dropped two questions from the Place Attachment scale due to concerns that some teens did not fully read the survey questions and answer appropriately. Most questions from the scale were worded positively, (for example, “I am more satisfied in Watertown than in other places”) such that selecting “strongly agree” indicates strong place attachment. However, two questions were worded negatively (for example, “There are better places to be than Watertown”), such that selecting “strongly agree” indicates weak place attachment. Therefore, if a respondent were to select “strongly agree” for all questions, it is likely they did not fully read the question text. Given that three teens responded in this manner, we dropped the two negatively worded questions in order to increase internal validity.

Street Tree Ambassadorship
In order to gauge teens everyday engagement with trees, we asked teens how frequently they talked about various tree-related topics before the T4T program, how likely they would be in general to discuss these topics with someone they don’t know, how frequently they actually talked about these topics over the summer, and their likelihood of engaging in future conversations with someone they don’t know (Figure 2). During T4T, teens spoke more frequently about how to request a street tree, street tree benefits, and the challenges street trees face compared with before (dark blue vs. light blue bars). Before T4T, teens said they were somewhat to very likely to talk about all five tree topics with someone they didn’t know. After the program, teens said they were less likely to have these conversations in the future (light green vs. dark green bars).

![Figure 2. Teen conversations about street tree topics before and after T4T. Blue bars: 0 = Never; 1 = Sometimes; 2 = Often Green bars: 0 = Not likely; 1 = Somewhat likely; 2 = Very likely](image-url)
T4T effectively provided opportunities for teens to engage in street tree ambassadorship, as shown by the increased frequency with which teens spoke about various tree-related topics during the program. However, after the program teens felt they were less likely to speak about trees with people they didn’t know compared with before the program. It is possible that, after gaining experience speaking with residents about trees, teens suspected that having such conversations in the future may be challenging on their own and outside the structure of a formal program. Indeed most teens rarely spoke about tree-related topics before the program, with the most frequent conversation concerning why they were involved with T4T.

Program feedback
The post-program survey asked teens what they might change to improve the T4T program. Suggestions included: facilitating rides for some of the field trips, moving the program one hour earlier, increasing or varying the field trips, and finding other ways to get more involved with public education besides doorknocking. In 2018, teens raised concerns that the late end time interfered with sports or work, but given the option of starting earlier, ending later, or having longer days, the consensus was for keeping the same time. Teens in 2019 did not raise the timing issue as a major concern; therefore future programs should maintain the 9am-1pm schedule.

A teen remarked on July 2nd that she liked doing the inventory, and in general it gave the teens a sense of efficacy. However, many days were extremely hot, making work walking all across town exhausting. The OpenTreeMap app would sap phone battery life, and it would sometimes glitch at inopportune moments or perform differently for Android users versus iPhone users. These factors caused inventory work to frustrate the teens a lot of the time. This frustration was balanced with several types of activities to work on throughout the program.

Field trips and experiences with experts
In the post-program survey, teens were asked about field trips and experiences with experts. In general, teens seemed to have enjoyed these experiences, ranking most as either “very important” or “somewhat important.” Experiences at MAC and with Chris Hayward were rated as particularly important by the teens, perhaps reflecting stronger relationships forged with both partners this year. When asked which experience they enjoyed the most, three teens selected MAC, saying “it was fun and engaging,” that they “loved seeing the view of Boston” [from the tower] and that “it was just the best.” As noted elsewhere in the report, many teens similarly enjoyed working with Chris Hayward. It was with Chris and Jim Gorman of MAC that teens also said they learned the most, specifically around identifying tree species.
Regarding experiences that teens felt were the least important, enjoyed the least, or learned the least from, teens felt that the nature and photography walks with Peter del Tredici, Carole Smith Berney, and Larry Raskin provided little practical information and/or consisted of “a lot of information crammed into a few hours.” Other teens did not enjoy certain experiences, such as visiting the herbaria, meeting the Divinity Oak, and going on a photo walk, if they did not find them interesting or entertaining. Finally, some teens used the post-program survey to underscore that they found the inventory to be hot and require a lot of walking.

Overall, teens most valued the field trips and experiences with experts, especially those involving Chris Hayward or MAC. Teens felt these experiences were engaging, interesting, and useful for their work. These findings show that T4T better aligned external experiences with teen interests in 2019 compared with 2018. As the program continues to grow, an effort should be made to ensure future experiences continue in this fashion, building on strong relationships with partners and including activities that capture the teens interests.

Prior work experience, demographics, and other background information
The group was made up of 4 males and 2 females, 3 self-identified as white, 1 as Latino, and 2 as multiple ethnicities. For the majority, this was their first job; it seemed to provide them with a sense of value and responsibility. In terms of background, parents had various educational backgrounds, with 2 have college degrees, 3 having high-school degrees, and 1 have some primary school education. In terms of age, 2 teens were rising freshmen, 2 were rising sophomores, 1 was a rising junior, and 1 was a rising senior. Additional diversity included cognitive and emotional special needs, including one participant in a special needs program. In short, the teens represented much of the diversity found in Watertown. For a full breakdown, see Appendix C.

Media Coverage
This year’s program received less media coverage than past years. Although several articles were written leading up to the program, including articles in Watertown News sharing the employment opportunity with the community, efforts to have a reporter visit the program or interview the teens did not materialize.
Final Celebration

On Monday, August 5, a final celebratory potluck was held in the backyard of the Program Director, David Meshoulam. Teens, their families, the Coordinator, Evaluator, Chris Hayward, and other supporters were in attendance. Several people spoke, including David, Libby, Chris, and Emily. The highlight of the program was a presentation by each of the teens. Each prepared comments and a slideshow of photographs or visuals that they shared with the group. Some of the presentations focused on the structure of trees found in Watertown vs. MAC while others spoke poetically about the power of trees and their feelings towards a specific tree. The teens had given much thought to and practiced their presentations.

Teens give presentations at a potluck on August 5th.

Continued Projects for Teens

One goal of T4T is to serve as an outreach arm of Watertown’s DPW by strategically helping the town in engaging community members and developing goodwill between residents and the Tree Warden. Although initial efforts to develop a Fall Community Planting event fell short, teens began the process of gauging interest, recruiting volunteers, and identifying “influencers” who would rally their neighbors. Follow-up will be necessary to build relationships and interest in carrying out a community planting event. The hope is that the foundation laid by the teens will lead to future planting events in 2020.

In the Fall the program aims to continue engaging community members through two projects:

- A select group of teens from the program will reflect on the lessons learned by the program and share their knowledge during public comment period at a town council meeting.
- Teens will help organize, with Chris Hayward, a fall leaf raking program. This program will provide residents in need of assistance with free leaf-raking. The T4T teens will help advertise the opportunity to their peers at WHS and DPW and TFW will advertise the program to Watertown residents.
Needs and Challenges

In many respects, as outlined above, T4T met many of its goals as articulated in the theory of change. In this section we reflect on needs and challenges and present ideas for increasing the impact of T4T and, much like caring for a tree or a forest, ensuring its long-term sustainability and growth.

Increasing impact

1. **Watering as a key point of stewardship.**

   T4T met impact goals suggested in 2018 to increase the amount of stewardship activities and increase collaboration with town officials, including the Tree Warden. However, one aspect of public tree stewardship still that was not met was tree watering. The watering needs of public trees are often not met in town due to confusion/disagreement around responsibility: according to the Tree Warden, some residents have expressed that the water they pay for shouldn’t be used to support a town tree, even if the resident personally requests the tree from the town. If the town supplies all the water for new trees through the Forestry Department, the department loses time and money (that could be used on pruning or planting) on an inefficient and environmentally harmful watering process (driving a multi-gallon tankard around the town). This left teens confused about how to approach residents about watering their trees. Teens attempted to knock on doors near young trees with empty gator bags to ask if they could use a spigot and hose to water a street tree, but the resident was never home for any of these attempts. With climate change creating hotter and hotter summers, newly planted street trees are at greater risk of decline from lack of watering. Other towns in Greater Boston employ people to ride around on bikes watering public trees. Teens and Coordinator could look to alternate models of urban tree watering or outreach to come up with an effective, holistic stewardship plan that works for the program and the trees.

   Relatedly, in order to track watering and other stewardship tasks, the program needs to determine how to log stewardship activities in OTM without the app crashing on iPhones. This issue has been raised with the software developers and we hope a fix to this problem in the coming weeks.

2. **Teens need to be adequately prepared by their Coordinator and with their team before meeting speakers and members of the public.**

   Early in the program, an expert visitor would arrive and begin asking teens questions, only to be met with the sounds of proverbial crickets. Teens were much more engaged with visitors when they had at least 30 minutes with their team to discuss what they wanted to gain from the interaction, writing down questions they may want to ask, and sharing those questions with their team. Role play also proved to be incredibly useful when preparing teens to communicate with residents; if teens were questioned about a potential stump speech, they often claimed to know exactly what to say about the program. In the field, however, they would be caught off-guard and seem sheepish when asked by residents about what they were doing. When role play was used to help the teens practice canvassing, they recognized their weak talking points and found ways to overcome them. Role play as early as possible and for as many situations as possible would make the teens realize that they are going to be “performing” when representing the
program -- kicking up the adrenaline and making them think more critically about how to best represent themselves with strangers. If done early, this could also give them opportunities to perform for and get to know one another. It is therefore important to essentialize the goals of the program so that the teens have something to work with and become excited about early on, when they don’t yet have personal experiences with the program to lean on. Our hope is that the outreach materials produced in 2019 will improve the public engagement process by both summarizing key programmatic information for teens and by providing ready-made materials that teens can distribute to residents.

3. **Experts need to be prepared with strategies for teen education based on child development.**

In comments to the Coordinator, several experts shared that they were very excited to be working with the teens, but then they were unsure if their presentations were connecting with them. The majority of the time, this perception by experts stems from understandable gaps in knowledge about adolescent development – including that:

- Teens do not sleep the same way adults do and are often groggy at 10am.
- Teens often need hands-on/kinesthetic/physical learning to better process information.
- Teens need to be given responsibility and assignments already in process and asked for input.
- Teens need to have an outline of the activities explained so they can formulate expectations for their shared time with speakers and have those expectations honored.
- Teens have diverse ways of processing information, which may be misperceived as disinterest.

These are realities that professional educators and a Coordinator can mediate, but only to a certain extent. Moving forward, the Coordinator could communicate with experts prior to meeting the teens to collaborate about ways to modify styles of engagement to meet the developmental needs of teenagers. This way, teens will get even more from programming and the anxieties some adults have may be assuaged!

Some strategies are:

- Asking teens about their physical, mental, and emotional well-being before task-engagement to build rapport and gauge any resistance or disconnect that may manifest.
- Incorporating hands-on activities as part of a dialogue, using props and tools, games or challenges to physically engage teens.
- Avoiding “presentations” or “lectures” in favor of activity, organized discussion, and field visits.
- Clearly scheduling breaks for the bathroom, food, and stretching into meetings with experts.
- Assigning teens in pairs to complete some task related to the topic, and to share back.
- Trusting that teens are curious and asking them what they’re thinking about and observing.
4. Diversity Matters
Efforts should be made to diversify the experts and partners that teens interact with in order to better reflect the diversity of program participants. We celebrate the contributions of numerous women experts to T4T this year and plan to continue this level of engagement in the future. It would also be valuable to engage more experts of color, as well as experts in their 20s and 30s that may be well positioned to relate to the teens in terms of viable career paths in today's economy. Future evaluations could support this effort by collecting and tracking demographic information from T4T partners in order to identify gaps or highlight successes.

Ensuring Sustainability

1. As T4T wraps the inventory and shifts towards other goals, future activities and learning outcomes should include more environmental communication and advocacy. Urban tree planning, planting and protection are all heavily affected by local civics and politics. We recommend meetings and workshops with experts in youth-based organizing for environmental advocacy and urban planning, as a shift to teach teens to effectively communicate the necessity of planting and protecting trees. In addition to this, basic tree species identification, hands-on horticultural activities in green spaces like MAC, and practical work like street tree stewardship, are recommended to continue so that teens are learning about forestry while growing in useful ambassadorship for their town Forestry Department. In addition to strategizing around invitations to experts, the Coordinator recommends advertising the work program as one centered on tree ambassadorship and advocacy, and recruiting teens explicitly interested in that kind of challenge.

2. Teens relied on opportunities to make up work in order to meet the 120 hour minimum. While the teens were aware that they would be working for six weeks, they explained to their Coordinator that their families had vacations planned that conflicted with regular program hours. The teens were very communicative about these scheduling conflicts. However, due to the time-restricted nature of the program and the 120-hour minimum work requirements to receive stipends, the Coordinator worked with teens outside of program hours more than anticipated to assign and follow up on make-up work. In the future, there should be better communication with teens and their families prior to the program start so that everyone can effectively plan to balance work and time away. There should also be some consequences planned for excessive reliance on make-up opportunities.

3. T4T could consider hiring a Program Assistant, perhaps a college intern. The coordination of this year's program was no small feat, and as an educator, the Coordinator felt pulled in many directions, balancing scheduled meetings with experts, emails, phone calls, and administrative work outside of program hours in addition to actual educational strategy and preparation. While the Teen Leader was an invaluable resource to the Coordinator, an older intern, perhaps one studying environmental education at a nearby college, is recommended to assist the Coordinator with workload. From the Coordinator's experiences in numerous educational programs, teaching teams including coordinators, older interns, and peer leaders are proven to create dynamics of leadership that are horizontal and supportive. A well-supported teaching team is always beneficial to the students, and advertising an internship position to colleges could create more publicity and partnerships for the program.
Similarly, the program would benefit from relationships that continue beyond the end of the program. Teens build a strong relationship with the Coordinator, but that position ends at the end of the program. An ongoing relationship with the town’s Tree Warden would help engage the teens in year-round tree-focused projects. An ongoing relationship with a member of Watertown’s tree activist community would make it easier for the teens to stay active participants in longer-term organizational projects such as neighborhood plantings.

4. T4T was fortunate to find such wide and deep support from the community, from foundations, local companies, and generous individuals. Without the financial support of these individuals and companies the program would not have been possible. As TFW considers running the program in future summers, it should continue nurturing these relationships while also continuing to consider additional sources of funding from town departments such as DPW, Recreation, and Education, local foundations, and individuals. This is particularly important if the program is to grow. A financially sustainable model should be developed to ensure that the T4T program can continue to grow and develop.

5. One crucial area of development is a program structure that supports the needs of the town. TFW and T4T should continue to work in concert with municipal officials to determine how the work of the teens can support the needs of the DPW Forestry Department and the urban forest itself. This includes soliciting feedback from elected officials and town employees about what makes a healthy urban forest, what areas require the most support, and how residents can take a more active role in being part of the solution. Only through a co-beneficial relationship can the town and its residents ensure the continued health and vitality of the urban forest for generations to come.
Sponsors and Supporters

Thank you to our extensive network of supporters including the generous residents of Watertown and the following major corporate donors:
## Detailed Budget

### EXPENSES

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**TOTAL PROGRAM EXPENSES**  

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**Total Income: $19,082.62**
Appendix A: Teens for Trees 2019 Handbook

Teens for Trees (T4T) 2019 Handbook

This manual serves as a guide for all Teens for Trees staff for the summer of 2019. Teens for Trees is run by Trees for Watertown. All participants of the program are expected to read and understand all policies prior to commencing work. All team members must meet a 120-hour service minimum to receive their stipend or community service hours by the completion of the program. We will begin June 26th, 2019 and our target end date is August 7th, 2019 (makeup hours available during and shortly following the program). We will be finishing Watertown’s street tree inventory using a phone app called Open Tree Map. We will be trained by professionals in a variety of career fields on ways to care for, advocate for, and appreciate trees. We will be creating outreach materials to get our neighbors interested in protecting the urban forest.

GENERAL EXPECTATIONS

Be on time.

Treat T4T like a job, not like summer camp. Your coordinator will write you a glowing recommendation for any job you apply to (even years down the line!) if you prove that you can respect your team by being on time, engaged, and ready to work. The team will often be on the move, so make time to meet at the designated meeting point (most often WHS, dependent on if we have a special field trip on a particular day). If you are not on time, expect that the team will leave for work on the streets or the planned field trip, without you (which would be sad!).

General expectations are to:

Meet at WHS at 9am and leave to work until 1pm, Monday through Friday.

Any difference in scheduling due to a special speaker or field trip will be communicated to you well in advance. Your hours will be tracked by using a pin code to clock in and out of an app called TimeStation on the coordinator’s phone.

If you miss hours due to tardiness, you will be expected to make them up to meet your 120 hours requirement, and makeup options are limited. Thus, it is in your best interest to be on time every single day.

Be prepared.

Have the proper footwear, clothes, water, snacks, and backpack to walk for up to four hours a day. Your phone needs to be near full charge to use the Open Tree Map App to inventory trees. You will notice that certain streets have very few shade trees, and this will make working outside HOT. Bring a hat, and wear or bring sunscreen. Get enough sleep and eat a good meal to get you through four hours of training and work. Use the restroom during meeting time at WHS so that you are comfortable while we are out on the streets.
Be communicative.

We want you to thrive in and outside of the program. If you have a scheduling conflict, it is best to contact your coordinator as early and through as many channels as possible (text and email preferred, so any agreed upon changes are in writing). Your coordinator will work with you to find makeup work opportunities in advance, but options are limited. Prior commitments (vacations, sports, other work or volunteer opportunities) will be honored as long as there is enough time in advance to find you makeup hours. If you do not leave enough time for your coordinator to find you makeup opportunities (2 weeks advance notice), you may lose hours and not meet your 120-hour service requirement. Prioritize the T4T program to ensure you receive your stipend or community service hours. Work your other plans around the program and your coordinator will be as flexible as they deem reasonable to help you make your minimum service requirement.

Be kind, compassionate, and respectful.

We will be getting to know each other and our neighbors. Mistakes are how we grow, awkward and beautiful and awesome moments will all happen this summer. Let’s support each other as much as possible. Embrace and rise to challenges. Bring your unique self and honor the differences of others. If you have suggestions or need help, tell your coordinator – your happiness, health, ideas and feedback matter. Have fun and love trees.

Cell phone use:

Cell phones should be on but silent during the program, and only used to do inventory using the Open Tree Map app, contact members of your T4T team, or for emergencies. Tell your friends, parents, and anyone else who may like to meet with you before and after the program about your program hours so you can stay focused. We generally meet for four short hours, and they are action-packed -- we need your full attention!

Rainy Days - we still work!

We will be meeting and working on rainy days -- there are indoor projects for T4T, too! These days will most often be used to create outreach materials like newsletters, art, and projects to reflect on and share our work with T4T with the community. You will be expected to be on time and ready to work even if we are not outside doing inventory!

Making up hours:

There will be a handful of opportunities to make up hours if you have a scheduling conflict. Remember to communicate your needs as early as possible. You may be given the opportunity to go out on weekends and show that you have inventoried or maintained local trees. You may be given other outreach options to make up hours. Remember, it is your responsibility to work 120 service hours by August 7th. When your coordinator gives you flexibility to make up hours, make sure you take the opportunities as early as possible so that you meet your requirement in time.
Tracking your hours:

Each time you meet with your coordinator for the program, you will punch in a code, unique just for you, into an app called “Time Station” on the coordinator’s phone. This is called “clocking in”. When we are done for the day and you are ready to leave, you will do the same process -- meet with your coordinator and type in your four-digit code to “Time Station” on the coordinator’s phone. This is called “clocking out.” If you are making up hours when your coordinator is not present (staying late to inventory extra trees, or working a weekend or extra outreach event), confirm with your coordinator via text and/or email about your additional hours and the coordinator will clock you in and out from TimeStation. This will give us a complete and total picture of your hours for the summer.

About Trees for Watertown and Teens for Trees:

History
Summer 2017 saw the first year of Trees for Watertown’s Teen Tree Stewardship Program. This unique project enrolled 6 local teenagers in learning about, caring for, and advocating for the town’s urban forest. Students assisted the tree warden in collecting data about the condition of street trees, went on field trips in Watertown and the greater Boston area, created advocacy material to educate the public, and presented their understanding of trees to the public at the farmer’s market.

Trees for Watertown hopes to increase the scope and size of this program for summer 2019. This includes providing multiple stewardship services for the trees such as planting, watering, mulching and pruning, creating additional learning opportunities for teens, and crafting a larger outreach project to enroll more residents of Watertown in caring for and advocating for local trees.

Issues
Trees are a valued asset for all communities by providing mental, health, and climate benefits for all of Watertown residents. Town leaders have demonstrated a deep commitment to maintaining a healthy urban forest, but financial and personnel limitations, lack of community engagement and awareness, and increased development have led to an urban canopy that is uneven in distribution, age, and health. Trees for Watertown is committed to raising awareness about the problems facing our urban tree canopy and creating a recognition among the general population about the benefits, needs, and opportunities for trees. The community, by rallying around trees, can begin to care for them, advocate for them, and increase their planting throughout the city.

Goals
Through advocacy, care, and awareness, a group of committed teens will work in collaboration with Chris Hayward and an advisory committee to determine areas of high need in the town. Some of the questions we will pursue include:
- Where in town are trees most needed?
- Where are there available spots for trees, either on the street, back of sidewalk, or in backyards?
- How can the community ensure that more trees are planted?
- What stewardship activities can teens do in order to take care of our trees, including watering, pruning, and mulching?
- How can community members become more engaged in taking care of and advocating for trees?

**Why do Street Tree Inventory?**

Knowledge is power. When we correctly measure, identify, and inventory the trees we have and mark and measure empty planting sites (or potential planting sites), we can create a map of (almost) exactly how many trees Watertown has in 2019. We can compare this information to data from years ago, and we can see how many trees we’ve lost (due to building new buildings, taking trees down, and not taking care of trees that were planted). We can inspire our neighbors, citizens like us, and city officials to

1) Request that DPW plant new trees
2) Take care of newly planted street trees properly so they survive in their baby phase and have support for a long life
3) Protect mature (old and big) shade trees from being taken down or getting sick
4) Encourage Watertown city government officials to design an Urban Forest Master Plan, a series of actions co-created to replenish and protect Watertown’s tree canopy for the future

*We can’t wait to have an incredible summer with you learning about and caring for trees! Thank you for being here, you are making a difference in your community!*
Appendix B: Evaluation Methods

1. Pre/post knowledge survey
Teens completed an online pre-survey, given on June 26, and a post-survey, given after the program ended on August 8. The survey asked teens about the following topics:

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<th>Practices</th>
<th>Diagnostics</th>
<th>Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Urban forestry dynamics in general and in Watertown specifically</td>
<td>● Interest in forestry-related careers</td>
<td>● Street tree ambassador activities</td>
<td>● Expectations of the program for themselves and for Watertown</td>
<td>● Former work experience</td>
</tr>
<tr>
<td>● Benefits of urban trees</td>
<td>● Attachment to Watertown(^1)</td>
<td></td>
<td>● Program highlights and ideas for improvement</td>
<td>● Demographics</td>
</tr>
<tr>
<td>● Urban tree stewardship, including major players in Watertown</td>
<td></td>
<td></td>
<td>● Assessment of field trips and visitors</td>
<td></td>
</tr>
</tbody>
</table>

The 2019 survey was modeled after the 2018 survey with minor modifications. When possible, question wording was maintained in order to compare with results from previous years. Survey responses were coded, scored, and compared between the pre- and post-assessments.

PDFs of survey questions are available upon request.

2. Number of Trees Inventoried and Stewarded
Teens captured their work measuring and inventorying trees and empty planting sites using Open Tree Map. Teens logged their pruning and guy wire removal using the “stewardship notes” feature.

3. Number of Residents Engaged
Contacts with residents were tracked as follows. Teens logged conversations with residents about specific trees in Open Tree map. General conversations about trees or T4T were captured in the daily recollection log\(^2\) by the Coordinator. Conversations about the Fall Community Planting Event were logged through the Resident Tree Interest Survey.

\(^1\) We collected information about teens’ attachment to Watertown using the Place Attachment Scale, adapted from Kudryavtsev et al. (2012), who used the instrument to measure teens’ place attachment in The Bronx. The scale consists of eight Likert style questions (5-point scale from strongly disagree to strongly agree) asking teens to respond to statements such as, “I identify myself strongly with Watertown” and “There are better places to be than Watertown.” Citation: Kudryavtsev, A., M. E. Krasny, and R. C. Stedman. 2012. The impact of environmental education on sense of place among urban youth. Ecosphere 3:Article 29.

\(^2\) Before this question was added to the recollection log on July 3, T4T engaged in outreach conversations with approximately 9 people.
4. Resident Tree Interest Survey
With the goal of engaging residents in West Watertown in a Fall Community Planting Event, T4T conducted a Resident Tree Interest Survey. On the afternoon of August 6, teens went door to door and asked residents the following questions:

1. Were they supportive of the Planting Event idea?
2. Would they like to receive a public shade tree in front of their home during the Planting Event (or at a later date)?
3. Were they interested in helping out for the Planting Event?
4. Would they like to learn more about the public shade tree process, T4T, or TFW?
5. Contact information

For those interested in receiving a tree, we asked if they would prefer the tree on the planting strip or in their front lawn and also if they could commit to watering the tree for the first few years of its life.

Teens also left door hangers on houses in which no one was home.

5. Photography Project Focus Group
Before presenting their independent photography research projects at the potluck (see Earlier Section), the teens participated in a focus group style conversation about their projects and their experiences in the program more generally. The focus group was co-facilitated by the Coordinator and Evaluator. First, each teen presented their project to the group, followed by a short discussion about what problems or issues the presentation addressed and what the audience might gain from the presentation. Next, the teens engaged in a group pile sorting activity to find similarities and differences among the presentations. Rounds of pile sorting included 1) problems addressed, 2) audience takeaways, 3) format of presentation, and 4) communication strategies utilized. In addition, the teens were asked if they had other ideas for ways to sort the presentations. Finally, teens were asked if and how they engage in conversations about trees in their daily lives, outside of the T4T program.

After the focus group, conversation notes were compiled by the Evaluator, coded, and synthesized in the following section.
Recommendations for Future Evaluations

For future pre- and post-program surveys, the following questions should be asked in two parts since, in both 2018 and 2019, not all teens fully answered every question:

- How many different species of street trees do you think there in Watertown? (only accept a number) AND Name as many as you can.
- List up to 3 important things a street tree in Watertown needs to live a long and healthy life. AND Why does a street tree need those things?

For field trip/visitor evaluation, the current question wording is too broad when asking about which “experience” teens enjoyed the most or least. Some teens thought this question asked about “general experiences” rather than “experiences with experts.” Future surveys should be more explicit.

We were surprised at some of the survey results, which seemed at odds with the teens working knowledge of urban forestry and interest in forestry-related careers demonstrated during program. It is possible that the pressures and demands of the survey environment motivated teens to answer questions differently or that teens experienced survey fatigue or misunderstood some of the survey questions. Indeed, the survey took up to 30 minutes for some teens that struggled with reading comprehension. This was a new challenge compared to last year, both because we had a different cohort of teens and because we added more questions. When designing the evaluation in future years, other strategies besides surveys may be more appropriate. For example, instead of a single online survey, the Coordinator can conduct a number of mini assessments that ask about different components such as urban forestry knowledge or demographics. For questions designed for paired pre- and post-program comparisons (e.g., Attachment to Watertown), mini assessments should be completed individually and tracked with a unique identifier. For questions with responses that are aggregated before they are compared (e.g., knowledge of tree species), mini assessments could be completed as a group.
Appendix C: Work Experience, Demographic, and Background Information

| Prior Work Experience | Yes = 2  
<table>
<thead>
<tr>
<th></th>
<th>No = 4</th>
</tr>
</thead>
</table>
| Gender                | Female = 2  
|                       | Male = 4 |
| Race/ Ethnicity       | One race/ethnicity only = 4  
|                       |         |
|                       | White = 3 |
|                       | Hispanic/Latino/Spanish = 1 |
| Multiple race/ethnicity = 2  
|                       |         |
|                       | White and Hispanic/Latino/Spanish = 1 |
|                       | Hispanic/Latino/Spanish, Black/African American, and Asian = 1 |
| Parental Educational Attainment | Some primary school = 1  
|                       |         |
|                       | High school = 3 |
|                       | College = 2 |
| Geography             | Precinct 5 = 1  
|                       |         |
|                       | Precinct 11 = 4 |
|                       | No response = 1 |
| Potential career interests | Interests were diverse and and changed slightly between pre- and post-program surveys. Categories included art or clothing design, illustration, special effects technician, work with trees, marine photography, lawyer, therapist, and firefighter. |

Table 6, Appendix C: Prior work experience, demographic, and background information about teens collected from the pre-survey.