Young Tree Care Survey

2019 Report

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Compiled for: City of Palo Alto

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I.   Introduction

Canopy plants and cares for trees where people need them the most. Our mission is to grow the urban tree canopy in Midpeninsula communities for the benefit of all. Our vision is a day when every resident of the Midpeninsula can step outside to walk, play, and thrive under the shade of healthy trees.

The Young Tree Care Survey seeks to educate homeowners on the proper care of young trees, to notify the City of Palo Alto of any problems with young street trees that need to be addressed, and to engage community volunteers in the process, including some "first aid" tree care. Young publicly-owned trees are on the front line of our urban forest and must tolerate the harshest urban conditions. Once established, they provide some of the greatest benefits to our city and residents.

Noteworthy Program Changes in 2019

- The one big difference this year was shortening the length of time to complete the survey to just July and August. Previous summers Canopy would host a training in June and in July, but this year we devoted June to Great Oak Count Trainings and then hosted back-to-back weekend trainings in July for YTCS.
- Last year the debut of Tree Plotter made huge improvements in data collection and volunteer experience. This year we were even more determined to perform quality control checks on data as it was coming in, online and in person.
- We dramatically improved the Tip Cards that volunteers receive at training and carry with them to reference as they survey trees. Compared to last years', the instructions are much more clear while remaining detailed, because they are now formatted as a stack of half-sheets stapled together in the corner. As you flip through the pages, each one systematically instructs each step in the survey process, and includes photos of how to enter the information into Tree Plotter. This now serves as a model instruction manual that is portable and user-friendly.
- Like in 2018, we have provided online interactive maps of the actionable data, so that City staff can quickly and easily access information about which trees need immediate care. The map URLs are available at the end of this report - we highly recommend reviewing them and using in any staff assignments.
- Canopy was able to continue working with Julisa Lopez as the Tree Survey Intern, who continued to earn an hourly stipend through the Pursuit of Excellence scholarship. This summer concludes 15 months of dedicated work, the longest any single intern has held the position.

II.   Methodology

The Canopy Young Tree Care Survey (YTCS) takes place in the summer months and surveys most publicly-owned street and park trees planted in Palo Alto in the past five planting seasons. At each site where trees are surveyed, a brochure is provided to homeowners with a review of their tree and tips on how to care for it. Survey results for all trees are compiled and shared in a detailed report to the City's Public Works Urban Forestry Section to alert staff about trees in need of care, and as a way to assess trends over the years. Results of the survey are also posted on Canopy's website, canopy.org.

This year, we continued to use our new software, Tree Plotter, to manage the city's young tree inventory. To access the map, users simply type in the web address on their mobile devices, create an account or log in using their social media account, and follow our instructions to find their route. Similar to last year, the majority of volunteers were high school students, with most routes completed by students from Palo Alto, East Palo Alto, and Mountain View. Our young volunteers were enthusiastic about using their smartphones to survey trees, and after a relatively short training session on how to use Tree Plotter, most found it very intuitive and set off surveying trees with very few complications.

This year we recruited 70 volunteers, who together logged approximately 371 hours surveying trees. YTCS is a wonderful opportunity for volunteers to get outside, and derive a meaningful experience by taking part in caring for trees in their community.

Image 1: Volunteers during a morning training session before heading off to survey trees.

Public Engagement

70 volunteers
371 hours spent surveying trees (not including Intern time)
One Tree Survey Intern, approximately 20 hours per week for 11 weeks
High school students again took Nature Wellness Walks and heard about the benefits of trees
723 households received "Is Your Tree Thirsty?" postcards and YTCS brochures

Overview of Main Steps

These are the main steps for executing the Young Tree Care Survey.

1. Request the City of Palo Alto TreeKeeper data: import trees planted within the last year.
2. Perform formatting and quality control checks on TreeKeeper data to prepare for smooth import into Tree Plotter.
3. Upload trees into Tree Plotter, and create survey routes for volunteers. To create the routes, 15-25 trees are grouped by location and bounded inside a polygon so that volunteers can easily see just the trees they are going to survey, and not those in other routes.
4. Prepare tip cards for volunteers detailing how to use Tree Plotter when surveying trees.
5. In early June, mail the first round of "Is Your Tree Thirsty?" postcards to residences with a tree in the survey. The second round of postcards is mailed at the end of July.
6. Assemble survey instructions/materials: map containing total number of routes in the survey, individual route maps, brochures for each house with trees, DSH tapes, moisture probes, pens, safety vests, clipboards, and Canopy satchels.
7. Host YTCS trainings:both consecutively in the month of July. Volunteers arrive at 9am to participate in a 40 minute training on how to use Tree Plotter and how to survey a young tree. Volunteers then form groups, and each is given a route that they can walk, bike, or drive to. Routes are completed by about 12:30 pm, and volunteers are given the opportunity to a) return the materials, or b) check out routes and materials to survey more trees on their own time over the next week. Many volunteers opt to check out routes, as high schoolers will meet up after summer school classes in the afternoons to get more service hours.
8. Quality control checks are necessary with this type of program, so as routes are completed it is the Tree Survey Intern's job to complete the routes where trees were left unsurveyed, distribute leftover brochures, and look for trees marked "not found" by volunteers.
9. Once all of the trees are surveyed, start writing the YTCS report, and provide maps and/or lists of red flag, thirsty, and missing trees, along with maps of actionable items like trees needing stakes removed/fixed, more mulch, etc.
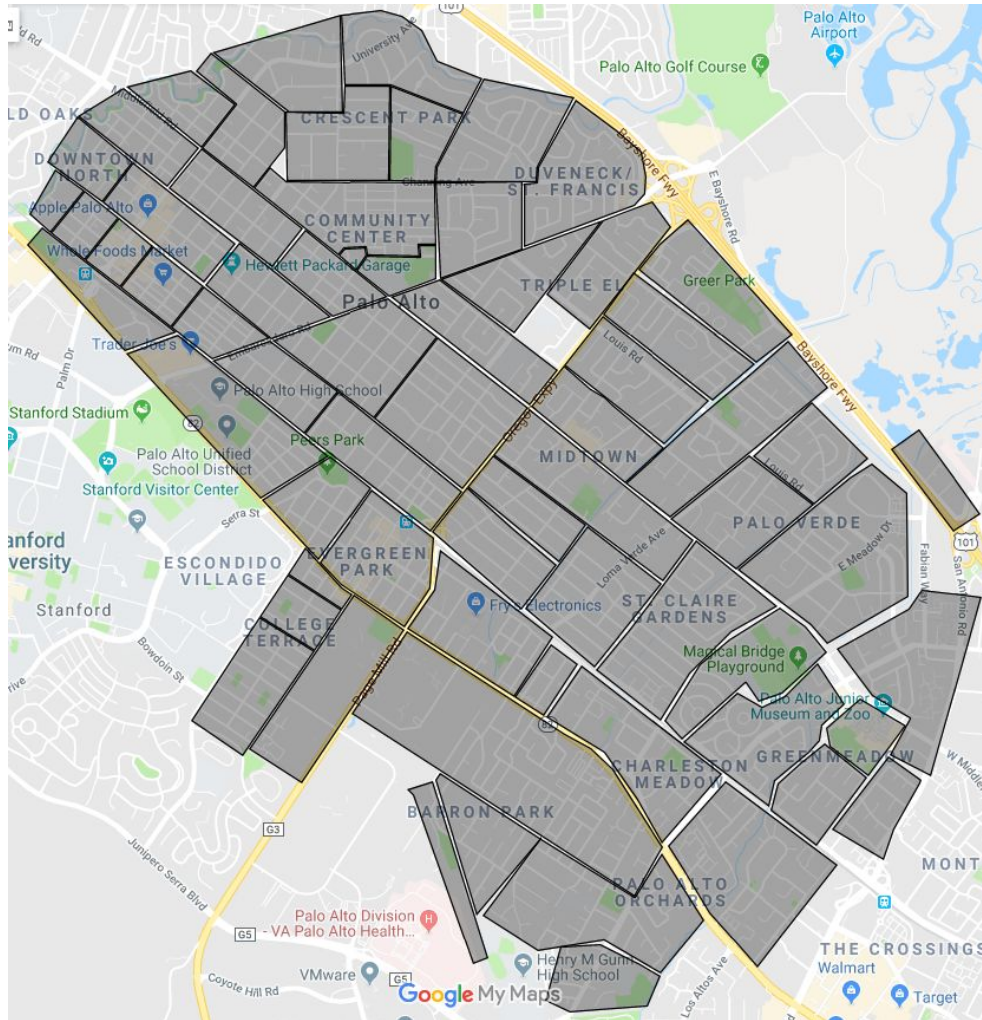
Image 2: Canopy created 69 routes to survey in 2019.

Volunteers distributed our "Young Tree Care Survey" brochure with tips on watering and protecting young trees and information about the value of the urban forest. Volunteer surveyors filled out the back of brochures with survey information related to the young trees' urgent needs, and included notes to direct resident attention to their trees. It was left at the door of each residence and additional blank brochures were handed out to residents that approached volunteers with questions about the survey, city trees, and/or Canopy.

Each survey team was equipped with a clipboard, pen, individual map of their route, smartphones logged into Tree Plotter, pre-labeled brochures for each survey address, a soil moisture probe, DSH tape, and safety vests. Volunteers were trained, grouped into teams, and assigned routes that could be completed within a 2-3 hour span. Many surveys were completed during the two scheduled survey trainings. After the trainings, several volunteers checked out survey materials and completed other routes on their own time. The 69 surveys were completed during July and August 2019.

In past years more emphasis was placed on volunteers performing "first care" on young street trees, with gloves and pruners provided to allow immediate actions to be taken (Eg. removing suckers and

weeding). The last two years we did not provide these kinds of additional materials, because a) typically the high school volunteers are not comfortable doing these sorts of tasks, and b) the increased number of trees to be surveyed this year was already an ambitious task that we wanted to prioritize.
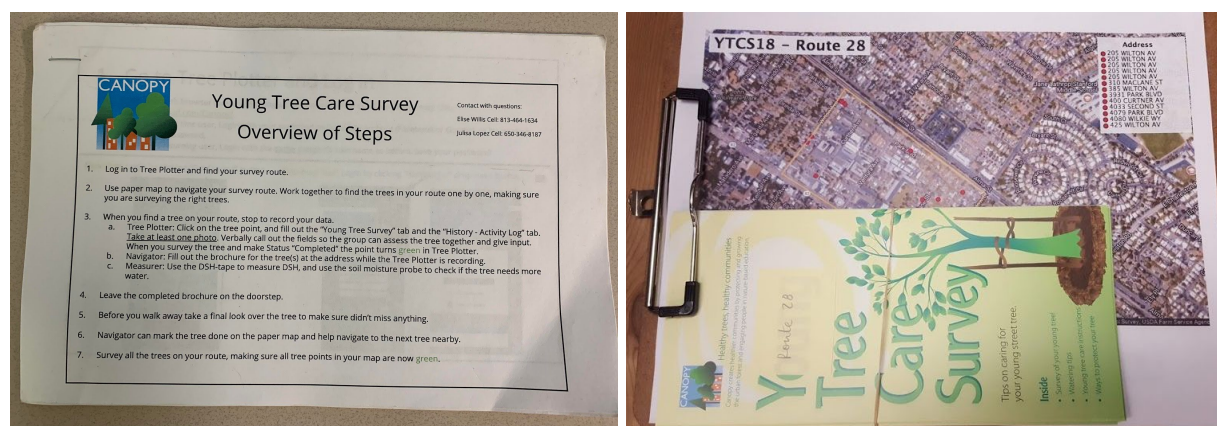

Image 3: Volunteers receive a clipboard with survey tip sheets (left), a route map and brochures (right), a DSH tape, soil moisture probe, and a Canopy satchel to keep it all together.
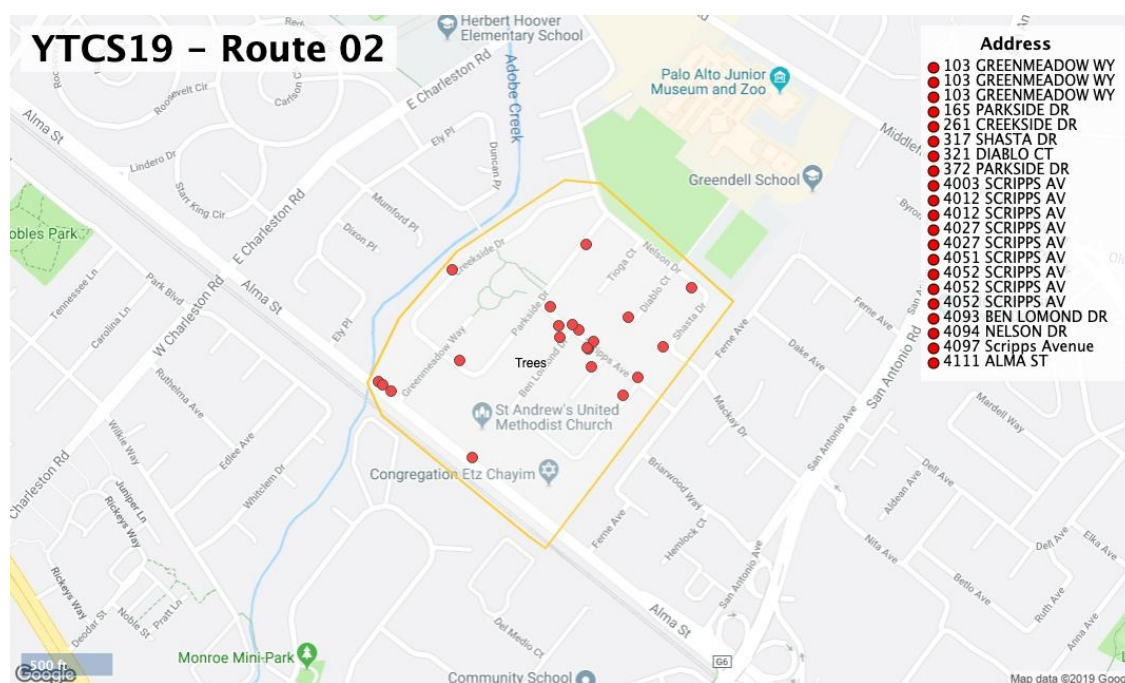

Image 4: Close-up of a survey route map, which displays the route name, area to survey, tree points, legend with addresses with trees, and street names to help navigate.

Our "Is Your Tree Thirsty?" campaign accompanies the survey each year to raise awareness about tree care and tree watering among the general public. Large banners reading "Is Your Tree Thirsty?" are prominently displayed at the train overpasses of University Ave and Embarcadero Rd. We also sent a watering reminder postcard to each residence where a tree had been planted in the last five years. Postcards contain information on proper watering practices and our web address for more information.

Image 5. "Is your tree thirsty" postcard mailing (front and back)

Image 6: Surveying a tree in Tree Plotter includes filling out a "Young Tree Survey" tab with survey findings (left column), and noting the actions taken in the "Activity Log" tab (right column).

Canopy Staff Routes

During the route making process we took note of several routes where locating specific trees would be difficult for volunteers and reserved them for the Canopy staff to complete. These areas included: Rinconada Park, Bol Park, trees by the Baylands, Stanford research park, and by the VA. Many of the trees in the parks are not geolocated properly, and therefore have been surveyed only in a cursory manner. More detailed review of each of these areas is presented in the Survey Results section.

Like last year, quality control was conducted by Julisa Lopez, the Young Survey Intern, and her sister Natalia. As volunteers completed their routes, Julisa and Natalia searched for any trees reported as not found or accidentally missed, and delivered brochures to residences where volunteers forgot to leave them. This took significantly less time than previous years, however Julisa and Natalia did have to complete *many* more routes on their own because fewer volunteers checked out routes this year. Out of the 69 routes created for the survey this year, Julisa and Natlaia completed 29. On average it takes approximately 2 hours to complete each route, so Julisa and Natalia dedicated about 60 hours total to complete the last stretch of the survey. All in all though, this was much more efficient than when general volunteers check out routes, because Julisa and Natalia are experienced and faster at surveying.

Image 7: Julisa, Natalie, and Elise during some tree surveying in 2019.

III. Survey Results

The following table summarizes the results of the survey. The far left hand column lists the survey fields, and the far right hand columns list the total number of trees for which the answer was "true," and the percentage of the total. The middle columns are the percentages from the previous five surveys for comparison.

Following the table are several graphs for easier visualization of important results. An explanation and evaluation of many of the individual items follows in the Evaluation section of this report.

General	2014	2015	2016	2017	2018	2019 #	2019 %
Trees Surveyed	556	712	948	1065	1438	1566	-
Trees Planted in previous 5 years	850	920	1114	1380	1310	1566	-
Condition Rating	**2014**	**2015**	**2016**	**2017**	**2018**	**2019 #**	**2019 %**
Excellent	20%	24%	28%	35%	22.7%	304	19.4%
Good	45%	46%	43%	42%	62.7%	1030	65.8%
Fair	27%	16%	15%	12%	9.4%	152	9.7%
Poor	7%	6%	6%	3%	3.6%	34	2.2%
Dead	1%	1%	1%	1%	0.5%	20	1.3%
Red Flag*	6%	4%	2%	2%	1.3%	32	2.0%
Tree Not Found	3%	1%	2%	3%	5%	80	5.1%
No Rating Recorded	-	-	-	2%	1%	13	0.8%
Did not survey	-	-	-	2%	8.3%	-	-
Homeowner Concerns	**2014**	**2015**	**2016**	**2017**	**2018**	**2019 #**	**2019 %**
Needs water	39%	51%	29%	36%	37%	835	53.3%
Over-watered	-	2%	4%	2%	3.4%	29	1.9%
Needs mulch	29%	38%	31%	23%	21.6%	394	25.2%
Lawn or other competing plants	18%	25%	23%	20%	15.4%	247	15.8%
Needs weeding	-	-	-	-	14%	243	15.5%
Weeded by surveyor	2%	5%	4%	14%	0%	0	0%
Mechanical damage or injury	5%	10%	5%	6%	1.3%	32	2.0%
City Concerns	**2014**	**2015**	**2016**	**2017**	**2018**	**2019 #**	**2019 %**
Needs basin re-building	6%	21%	21%	21%	23%	436	27.8%
Suckers need to be pruned	5%	10%	9%	5%	7.2%	168	10.7%
Suckers pruned by surveyor	4%	11%	8%	14%	0%	2	0.1%
Needs to be re-staked/re-strapped	6%	11%	7%	8%	7.8%	107	6.8%
Stakes need to be removed	29%	11%	11%	16%	14.2%	208	13.3%
Root flare buried	9%	16%	19%	19%	12.7%	129	8.2%
Root flare cleared today	9%	-	-	5%	0%	0	0%
Needs major pruning	-	-	-	-	-	-	-
Needs structural pruning	14%	11%	15%	10%	9.3%	114	7.3%
Needs clearance pruning	10%	7%	4%	5%	5.8%	91	5.8%

* Calculated differently before 2014

Condition Rating

Poor
2.2%

Fair
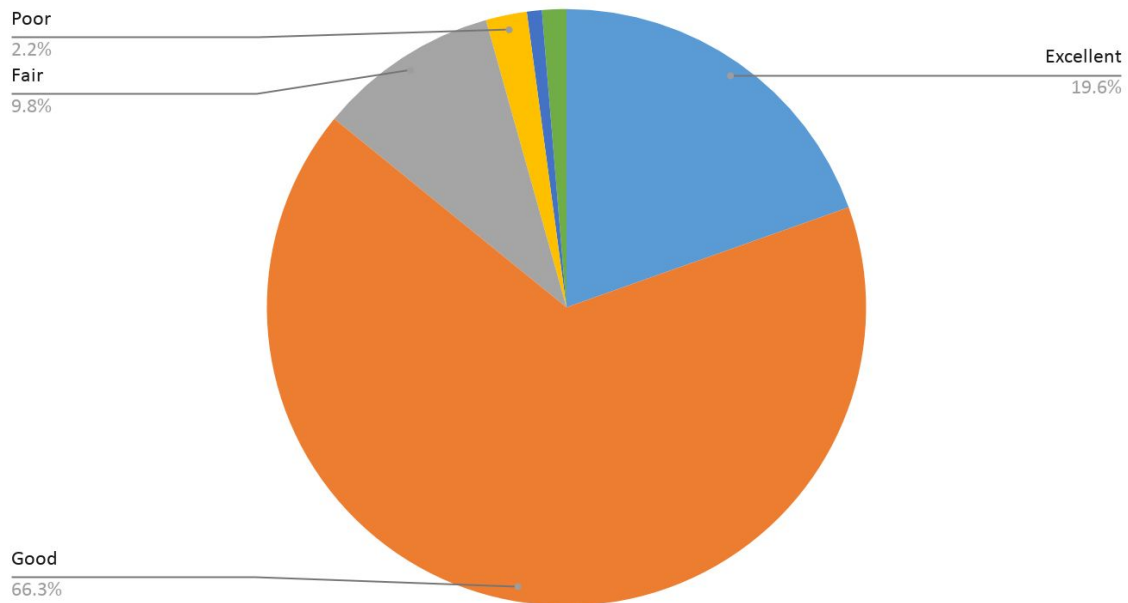9.8%

Excellent
19.6%

Good
66.3%

Figure 1. Condition Ratings for trees surveyed (by percent) for 2019.

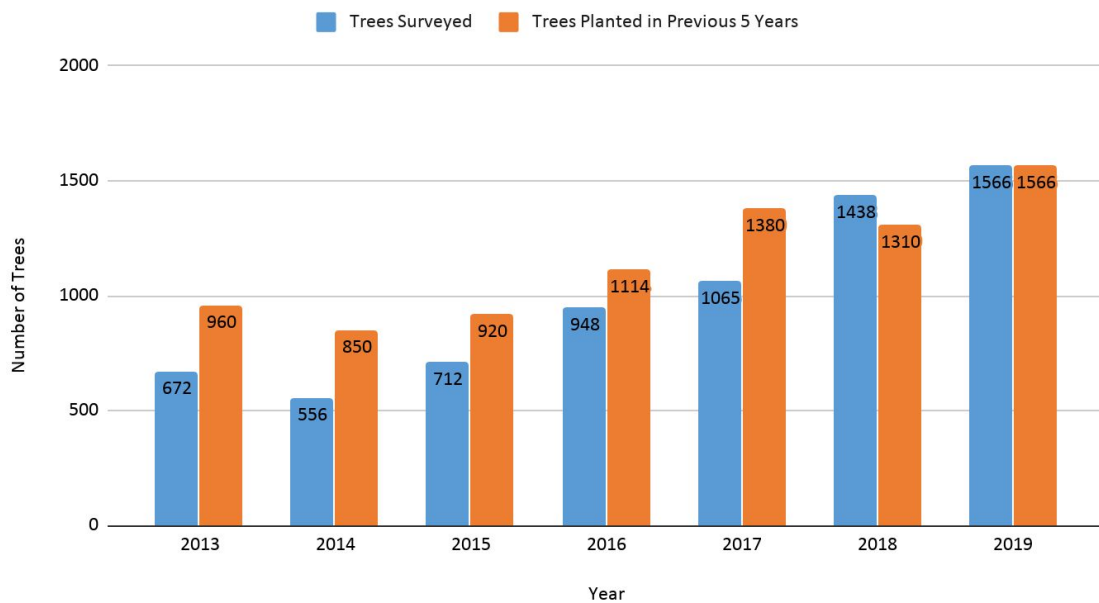## Comparison of Trees Planted to Trees Surveyed

Figure 2. Chart comparing the number of trees planted in the previous 5 years to the number of trees surveyed.
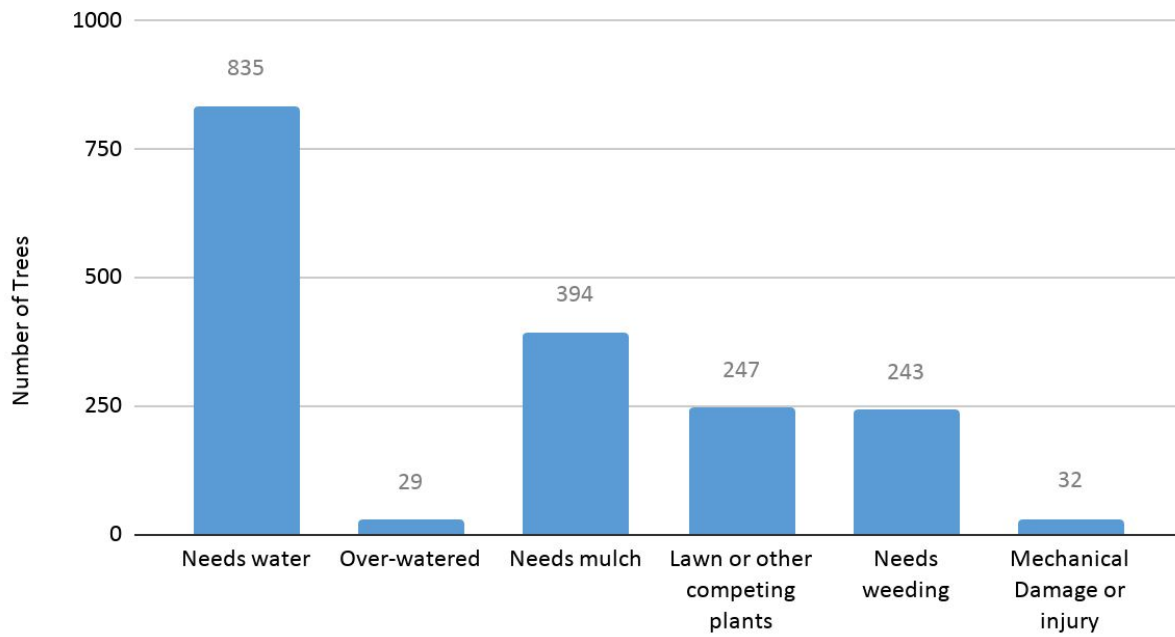
Homeowner Concerns

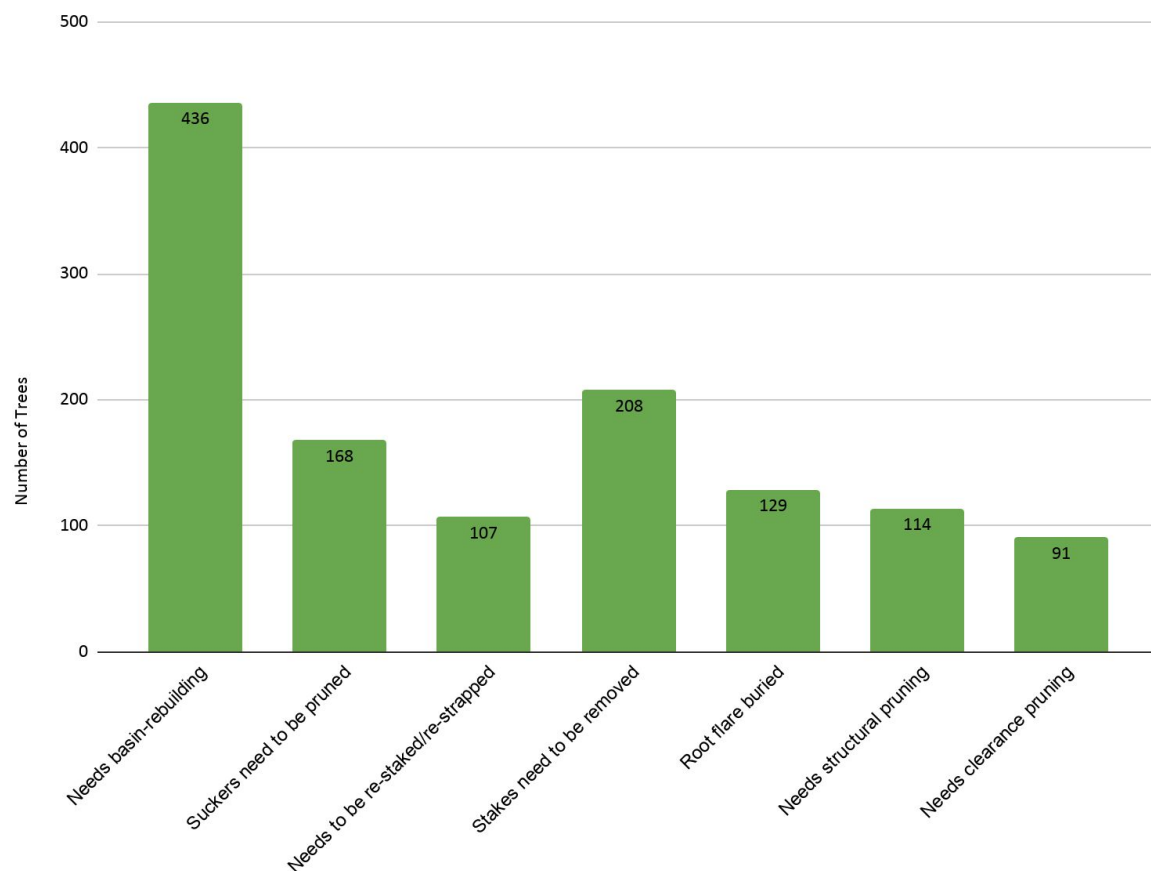*Figure 3. Number of trees with homeowner concerns recorded for 2019.*

City Concerns

Figure 4. Number of trees with city concerns recorded for 2019.

Park review

As mentioned in the Methodology section, here is a more detailed summation of areas that were surveyed by Canopy, but because some lacked proper geolocation for some of the points and that there are so many young trees that it would take too long for volunteers to reasonably complete.

- Rinconada Park: Several trees were geolocated properly in Rinconada, and overall many of the trees in the park look good. Some may need to have mulch applied and stakes removed.
- Lucie Stern: Many trees appeared to be in good condition, but definitely need mulch applied around the base of the trees. Some may be getting clipped by weedwackers other mechanical equipment at the base of the trunk. Long-term, this area with predominantly native oaks and buckeyes should be converted from irrigated turf to a low water use groundcover.
- Bol Park: Most of the trees located in Bol Park and along the Bol Bike Path were not surveyed individually. Instead, we walked the path and found several young trees that appear green and healthy, but made notes for specific trees that are dead and should be removed and/or replaced

at some point. Over the last couple of years the public has raised some concerns about lack of or faulty irrigation, so this is something that is important to monitor.
- Mitchell Park: Most trees were found, but some geolocations and species designations in the data were incorrect. Several trees near the Magical Bridge and in the parking lot look small and in need of a little attention (namely mulch and water).

IV. Evaluation and Discussion

We surveyed a total of 1,566 trees this year. This number has risen steadily for the last few years, and this year's increase of 128 trees is an indicator that tree planting is continuing to increase and our data quality is continuing to improve.

Snapshot of the Data

Number of trees surveyed: 1,566
Most common condition rating: Good
Number of dead trees: 20
Number of Red Flag trees (need immediate attention): 32
Number of trees that need stakes removed or fixed: 315

Most common Homeowner Concern: Needs water (53.3%)
Most common City Concern: Basin needs rebuilding (27.8%)
Trees with competing lawn/plants/need weeding (31%)

The **"Trees planted in the previous 5 years"** line in the table, and in Figure 2, shows that tree planting numbers decreased slightly, from 1,380 in 2017 to 1,310 planted this last year. However, through the South Palo Alto Tree Initiative and goal of a 98% street tree occupancy rate, Canopy and the City's Urban Forestry Division have continued to increase tree planting numbers, and more trees planted means more trees we are able to survey. Figure 2 also shows that number of trees surveyed has increased steadily over the last few years, and Canopy volunteers surveyed more trees this year, 128 more than 2018.

"Condition Rating" is evaluated for each tree on the scale "Excellent, Good, Fair, Poor, Dead," the way the City does. Although these ratings are subjective and will vary based on the tree knowledge of the volunteer and the trainer, clear written definitions of each value are distributed and reviewed at each survey training. The trees receiving a rating of "Excellent" dropped from 22.7% in 2017 to 19.4% this year. This decrease could be related to the fact that the condition rating for "Good" increased as well. Good ratings are also bound to be more common than Excellent, because most volunteers who were new to surveying would rather opt for a reasonable estimate of "Good" condition. The rest of the condition ratings decreased compared with previous years; the "Fair" rating increased from 9.4% in 2018 to 9.7% in 2018, "Poor" decreased from 3.6% in 2018 to 2.2% in 2019, and finally "Dead" trees increased from 0.5% in 2018 to 1.3% in 2019. It should also be noted that there were trees that were marked as "No Rating Recorded" because these trees were not found by volunteers.

Volunteers and staff reported that 80 trees could not be found, which could be due to the high number of vacant sites and construction areas all around the city. On many occasions, these trees were located

inside the gated construction areas, where it was very difficult to spot them. And in many cases trees that were previously removed and uploaded from the TreeKeeper inventory as Vacant or Proposed sites have yet to be planted.

"Red Flag" was added as a category in 2012 and was adjusted in 2014 to give the surveyors—instead of the survey administrator—the discretion to mark a tree as "Red Flag." 32 trees (2.0%) were labeled as "Red Flag" by surveyors and staff. We ask surveyors to use this label sparingly so the trees most in need of care can be identified and given care.

"Needs Water" increased from 37% in 2018 to 53.3% in 2019. We account for some of this increase to volunteer error. As some could have judged a tree by its physical state (if it had dry leaves, dry-looking topsoil, etc.), rather than by using a moisture probe to check the moisture of the soil. However, many trees still showed signs of needing water, which could be due to residents' lack of watering and the cumulative effects of the long summer heat. Residents and business owners often don't realize that the City counts on them to water street trees adjacent to their residence, so the postcard mailing and brochures continue to make a difference by bringing much-needed awareness to tree stewardship.

For the fourth year, we collected data for trees that are overwatered. Overwatered trees decreased from 3.4% in 2018 to 1.9% this year. Although there was a slight decrease in numbers, this metric still proves to be difficult to measure, because a tree that has just been watered may appear overwatered even if it is then allowed to dry out between waterings.

"Needs Mulch" has increased each year since 2016, from 21.6% in 2018 to 25.2% in 2019. Using mulch effectively is one of the best ways to conserve water in the landscape and has many other benefits for the tree. We recommend that the City continue to provide free mulch pick up in the summer. Residents should be able to replenish mulch on the street trees adjacent to their homes as well as on their own trees, yet there is no formal program to help people to do so. It might be worthwhile to amend next year's brochures to include a list of the locations where residents can access free mulch as well as some basic tips on how and when it is best to replenish mulch on young trees..

Trees marked as having significant "**Mechanical Damage or Injury**" was at 2%, about a 1% increase since last year. This increase could be traced back to the fact that we surveyed more trees this year than ever before or just the fact that some trees have been damaged throughout the past year.

"Rebuild Basin" increased from 23% in 2018 to 27.8% this year. With an almost 5% increase can accounted to the fact that volunteers were not given clear instructions on the fact that only young trees depend on the state of their basin. However, we would also like to call attention to the city's contracted water truck that forcefully waters some of these trees, completely blowing away mulch the basins' structure which some residents have complained about.

Pruning Needs have increased slightly throughout the past year. Trees needing suckers to be pruned has increased significantly from 7.2% in 2018 to 10.7 % this year. This is important to mention as this is an issue that should be addressed quickly. Young trees in the city are in need of both structural and clearance pruning, and addressing this need can significantly reduce the need for much more costly tree work later in the tree's life. Volunteers are given clear instructions on how to identify trees in need of structural and clearance pruning.

"Stakes Need To Be Removed" We have received some comments from volunteers addressing the fact that many of the trees that were marked to have their stakes removed in the previous year, still had their stakes. This is something that should be addressed in a timely manner.

V.   Action Items

Canopy has created individual interactive maps to view the tree data collected during the survey, which we recommend you review and consider taking actions to resolve. Click the words underlined/blue to view a saved map. When the map opens you will be able to see the tree points, but in order to interact with each tree you need to Log In.

Note: The base map can be changed by going Tools>In the Map>Map>Base Tiles, and changing to Google Hybrid map to some other preferred map.

- Red flag trees needing immediate attention
- Condition ratings: In the Legend, click the checkbox on the left of the condition ratings to turn the points on and off. To easily view **Dead** trees that need to be removed and replaced, make sure all the boxes are unchecked except for the one next to Dead.
- Trees needing stake removal or fix (re-strap, re-position, etc)
- Thirsty trees: Surveyors noted that 835 trees need more water. Some trees in parks and commercial areas are thirsty, but many are spread throughout the residential areas.
- All the trees that need some kind of pruning: Map displays by DBH (DSH), and you can toggle the size on and off to see larger or smaller DSH ranges. With this display, you might want to prioritize the trees with larger DSH range in case pruning needs are greater. Conversely, you could prioritize pruning for trees in the smaller DSH range category in order to tackle issues and establish good structure early. Below we have also included separate maps for individual pruning:
  - Structural pruning needs
  - Clearance pruning needs
  - Need suckers pruned

BONUS: Spa Day Map

Here is a map of trees that need a spa day. In order to maximize City staff time, performing young tree care, it could be helpful to create a workflow in which staff visit trees with the intent to provide water, mulch, weeding, stake removal, unbury root flare, rebuild watering basin, and pruning. Contact us if you need assistance using the map to modify any of these fields (Eg. you just want to focus on giving a spa day to trees needing pruning and mulch, but not the other items).

VI. Conclusion

Canopy's annual Young Tree Care Survey engages the community in caring for Palo Alto's young trees in a way no other program manages to do. It is vital that the City of Palo Alto and Canopy continue to prioritize this program, in order to ensure young tree survival into the future and bring increased awareness to our trees. The Young Tree Care Survey helps our urban forest managers understand the state of our recently planted public trees, and pinpoints what actions need to be taken to care for each tree that needs it. By harnessing the power of volunteers, the City of Palo Alto avoids paying staff and contractors for hundreds of hours that volunteers choose to spend checking on trees throughout the City. And by the end of the long and dry summer, previously ignored trees get the water and care they need from homeowners and City staff, who now know exactly what to do to help our urban forest thrive.

If you have any questions, or recommendations on how the survey can be improved, please send an email to Community Forestry Program Manager Elise Willis, elise@canopy.org.