HARROWGATE PARK

NATURE-BASED SOLUTIONS TO CURB ILLEGAL DUMPING

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SPRING / FALL 2021

PROJECT INTRODUCTION

HARROWGATE PARK AS A COMMUNITY ASSET

Harrowgate Park is a 5-acre park located in Philadelphia, Pennsylvania. For some, it was known as Harrowgate Square. The neighborhood was built around the square in the early 1800s. The park features a veteran's memorial, a playground, and walking paths. The park hosts various events and community projects organized by Friends of Harrowgate Park. Founded in 2015, Friends of Harrowgate Park's (FHP) mission is to empower the neighborhood's diverse community to activate and advocate for a vibrant, welcoming green space.

ILLEGAL DUMPING IN HARROWGATE PARK AND ITS VICINITY

Located near the intersection of Jasper and Schiller Streets, the south corner of Harrowgate Park is a popular location for illegal dumping. Due to parking restrictions near a fire hydrant on Jasper Street, vehicles have ample clearance to use the crosswalk curb as a ramp to back vehicles into the park and offload waste. FHP routinely addresses this illegal dumping through volunteer-led cleanups and 311 service requests; however, a long-term physical deterrent is critical to ensuring the sustainability of their efforts. Additionally, redirecting volunteer hours and financial resources spent cleaning directly contributes to the group's ability to develop programming for the space and pursue other beautification projects.

Individuals choose to illegally dispose of waste for several logistical and financial reasons. Accordingly, most discussions on ways to curb illegal dumping focus on policy-level solutions; however, this information is of limited use to volunteer organizations seeking immediate, concrete solutions

A NEW GARDEN

Through a literature review of best practices to curb illegal dumping and community feedback, pro bono landscape architects Charlotte Barrows and Jenny Lauer with Nelson Byrd Woltz designed a unique garden planting plan for the southern corner of Harrowgate Park to support FHP's efforts to curb illegal dumping.

In addition to informing garden design, the research will facilitate future conversations with Harrowgate's residents, helping them identify and advocate for more anti-dumping strategies fostering a sense of momentum and support. Overall the goals of this project and design are to develop a nature-based solution to test mitigations intended to deter illegal dumping. Which provides an opportunity to directly address a problem that significantly impacts Philadelphia communities and identify replicable solutions.

Michelle Lee Delgado, Department of Landscape Architecture and Horticulture
Temple University in collaboration with Kyle Hearing and Allyson Church
Graduate Research Award: Sustainability Program recipient 2021

In fulfillment of the GRASP Summer/Fall 2021 Grant. With great appreciation to the Office of Sustainability at Temple University for their support of this scholarship.

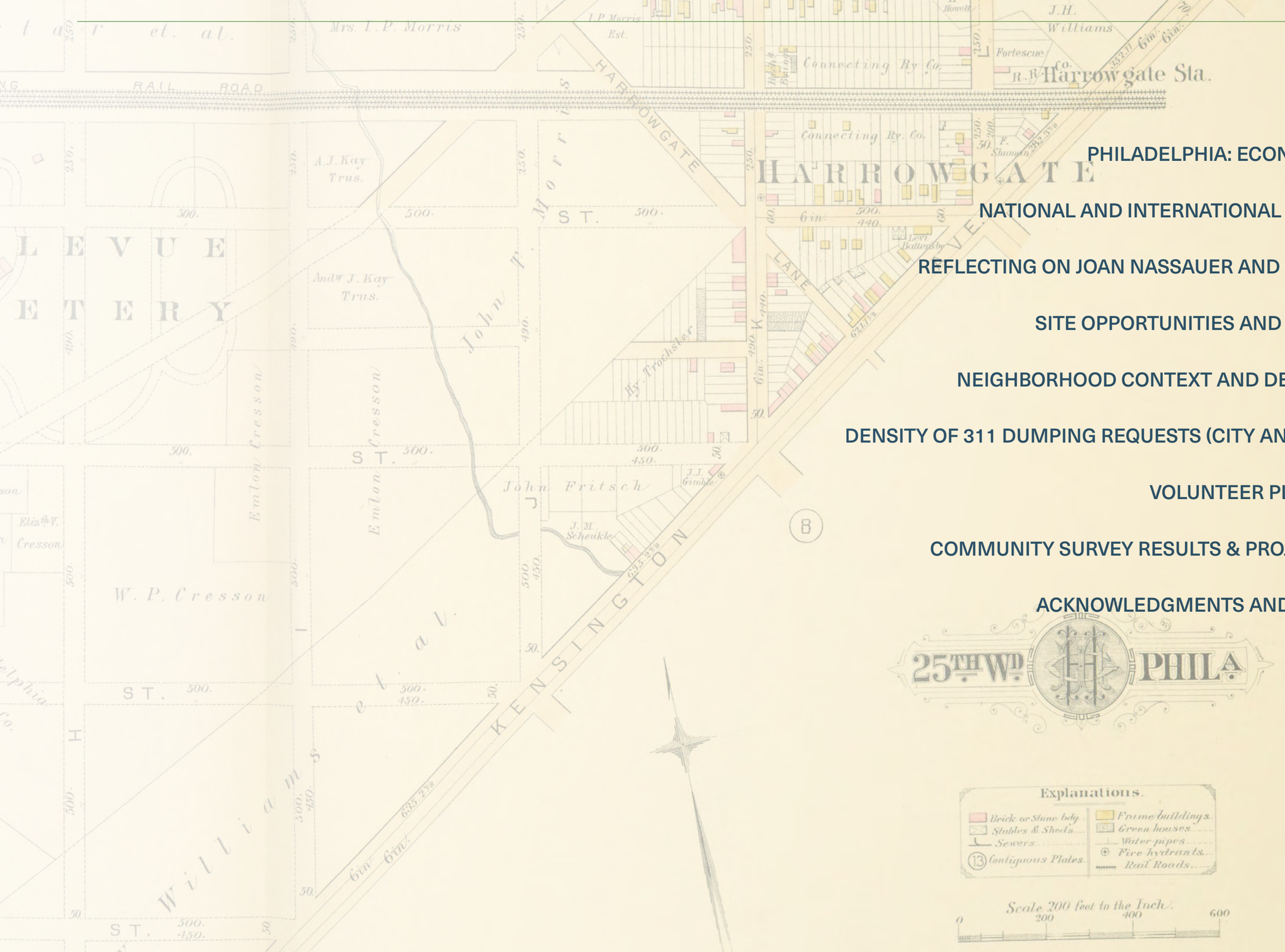
GRASP
Graduate Research Award
A Sustainability Program

FRIENDS OF HARROWGATE PARK

IMPACT

Nelson Byrd Woltz
Landscape Architects

Photos of Harrowgate Park from 1977
Photogrpahed by Frederick A. Meyer
Temple University Libraries
Special Collections Research Center
George D. McDowell Philadelphia Evening
Bulletin Collection



1886 Historic Map of Harrowgate Neighborhood

PHILADELPHIA: ECONOMIC IMPACT

A study commissioned by Keep Pennsylvania Beautiful and prepared by Burns & McDonnell discovered that nine cities in Pennsylvania spend more than $68.5 million annually on prevention, education, abatement, and enforcement efforts to address litter and illegal dumping throughout their respective communities. Keep Philadelphia Beautiful is an affiliate of Keep America Beautiful, a nonprofit community improvement organization. Keep Philadelphia Beautiful equips and empowers communities to beautify and strengthen their neighborhoods through community training and microgrants, clean-ups, and environmental education. The study measures the economic impact of litter and illegal dumping on Pennsylvania's communities, an impact that is often overlooked and rarely tracked at the municipal level. The Zero Waste and Litter Cabinet and the Philadelphia Managing Director's Office actually led and helped fund the Philadelphia portion of the study.

Over five years (2014 through 2018), the Pennsylvania Department of Transportation spent over $65 million removing litter and debris from within highway rights-of-way across the state. The most effective way to prevent illegal dumping is to have affordable and convenient legal methods of waste disposal, especially for large household items, electronics, and tires.

Philadelphia spends about $48.4 million annually on litter and illegal dumping clean-up, prevention, and abatement. A combined 89% of this funding still goes toward abatement instead of more proactive preventative measures. Abatement might include the installation and monitoring of surveillance cameras. Prevention includes managing six Sanitation Convenience Centers that accept single-stream recyclables, electronics, tires, and household hazardous waste, solar-powered Big Belly trash receptacles, and public programs like Community Cans, which provides supplementary litter cans for businesses and community groups.

In 2018, 24,682 people reported to 311 in regards to illegal dumping. "Heightened public awareness may have encouraged more residents to believe it was worth the effort to report dumping. Service requests for illegal dumping to the city's 311 system jumped 23% in 2018 compared to the previous year and another 7% in 2019."[1]

There are many reasons people dump illegally. For some, construction waste fees are too costly, or items are too difficult to put out for curbside pickup. Others cannot wait until the next collection day, do not see the harm in it, or do not fear prosecution if its clear dumping regulations are not enforced. In some cases, people dump illegally to hide evidence of other illegal activity.

Negative impacts of illegal dumping and littering impact community pride and decrease property values. It can be discouraging, making outdoor recreation dangerous and unsafe for children to play. Litter attracts pests, rodents, and mosquitos, causing harm to human health. Waste washed down storm drains enter the waterway, polluting ground and surface water harming fish and wildlife.

"TO STOP ILLEGAL DUMPING WE NEED TO FOLLOW THE PLAN ALREADY LAID OUT AND CONTINUE OUR PROSECUTION OF COMPANIES THAT DUMP ON NEIGHBORHOODS, WHILE ALSO ACCEPTING THAT WE ACCOMPLISH NOTHING BY ARRESTING THE LOW-INCOME WORKER WHO IS CAUGHT DUMPING FOR THESE COMPANIES."

NICOLAS ESPOSITO

FORMER DIRECTOR OF PHILADELPHIA'S ZERO WASTE & LITTER CABINET

1 https://whyy.org/articles/sanitation-solutions-how-hidden-cameras-became-phillys-fiercest-weapon-in-the-war-on-dumping/

NATIONAL AND INTERNATIONAL CASE STUDIES

ALAMEDA COUNTY, CALIFORNIA

Alameda County is located in California in the United States and is home to Oakland. The "Alameda County Illegal Dumping Pilot - Final Report," prepared by the office of Alameda County Supervisor Nate Miley, offers an exploration of scalable, replicable solutions to illegal dumping.

The pilot implemented two sites considered "hotspots" within the county. The report claimed their pilot was successful as perceived through community member and business surveys before, during, and after the pilot. The surveys, "based on the perceptions of community members, satisfaction with the City and County's efforts to address illegal dumping increased by 11 points during the first year of the pilot, while the share that was unsatisfied dropped 18 points, showing a significant positive shift in perceptions during the pilot period." Past efforts to curb illegal dumping included planting trees, placing concrete barriers and planter boxes to block unlawful dumping spots. Still, the reports claims, "without a consistent enforcement effort by the City, these efforts have had a minimal impact on the overall quality of the street and surrounding neighborhood."

Alameda County implemented a three-pronged approach, including education, eradication, and enforcement (3Es). Each prong was viewed through a proactive and reactive lens for how each element can be considered. Proactive examples included youth and civic engagement, education and beautification efforts, and publicizing enforcement. Reactive practices included targeted outreach, engaging nearby residents, removal of dumping, and investigating dumping leads.

The report emphasizes the collaboration of a broad, cross-sector coalition that includes local faith and nonprofit community groups, elected officials, the public sector, the private sector, and civil society to clean and beautify the area. It also identifies community organizing as a "key to sustainability." Nearby communities were encouraged to attend feedback and training events, "inviting community members to provide feedback on the pilot, and learn how to engage with the efforts to prevent, clean, and deter illegal dumping." A toolkit was developed "as part of the community training efforts and was specifically adapted to include the role of residents, neighbors, and community as it relates to each of the stages of illegal dumping. The ultimate goal of resilience building is to assist the community developing the skills and resources needed to address these issues autonomously." Another example of this community engagement from the report was a Community Potluck series. Community members were invited to come together and 'take back the space.' Potlucks were specifically held at dumping hotspots and troubled areas to change hearts and minds about the utilization of the space.

Philadelphia's Streets Department, Parks & Recreation Department, and the Friends of Harrowgate Park can utilize specific strategies from the Alameda County report. The 3E framework, education of sanitation centers and how to report illegal dumping, activating the sites of issue, collaborative coalition building, and partnerships with local residents.

NEW SOUTH WALES, AUSTRAILIA

The Riverina Eastern Regional Organisation of Councils (REROC) is a voluntary association of 9 General Purpose councils and two water county councils located in the eastern Riverina of New South Wales, Australia.

The REROC Region covers an area of almost 40,000 sq kilometers and a population of approximately 140,000. With a population density of 3.5 people per sq kilometer, which drops to 2.5 people per sq kilometer when the urban population of NSW's largest inland City Wagga Wagga is not included, there are ample locations available for people to dump waste illegally.

The vision set by the REROC Illegal Dumping Strategy was to decrease illegal dumping in the REROC Region by 20% by 2019. Goals included minimizing the incidents of illegal dumping in the REROC Region, driving positive long-term change in community attitudes and behaviors to prevent illegal dumping, and reducing the social, environmental, health, and financial impact of illegal dumping. The report identified six strategies to decrease illegal dumping:

1. Identification – building an evidence base and identifying hotspots
2. Mitigation – implementing measures that discourage illegal dumping
3. Strategic Enforcement – increase waste compliance and enforcement
4. Capacity Building – improve Member Councils' skills and capacity to address illegal dumping
5. Education – raise awareness of what constitutes illegal dumping and the problems it generates
6. Community Engagement – build partnerships that motivate communities to promote and support the reduction of illegal dumping

Both the NSW EPA and Queensland's DEH have identified five illegal dumping mechanisms to address the behaviors and contexts associated with the dumping:

- Make Dumping Harder
- Increase the Risk
- Reduce the Rewards
- Reduce Provocations
- Remove Excuses

A follow-up to the report has been requested to see what actions have benefited the site the most.

This case study prompted questions for the Philadelphia Streets Department related to what kind of information (or community outreach) does the Street Department send out to Philly RCOs, Friends' groups, and Recreation Centers and if there any resources or alternatives for low-income homeowners who might not be able to afford the dumping fee.

Education and coalition building were again emphasized as a strategy in this report, additionally, the strategies of mitigation and identification would be useful for Philadelphia's Parks & Recreation Department and the Friends of Harrowgate Park.

HOUSTON, TEXAS

On November 4th, I attended a virtual meeting held between the City of Houston and the City of Dallas. The purpose of the meeting was for both cities to share their programs and strategies for illegal tire dumping, hoping to learn from one another. While this meeting was strictly related to illicit tire dumping, it was great to witness two of Texas' largest cities coming together to discuss an issue that affects cities everywhere.

Houston's Scrap Tire Program has collected 176,411 tires over the past 7 years. Dumped tires are a fire hazard, mosquito vector breeding, pollution, and nuisance. This issue costs the City of Houston's Solid Waste Management Department $1 million annually and does not include the regular trash schedule. The City of Houston took a significant step in proactive prevention by visiting 4,300 businesses that source tires. They learned that many were unaware that the Texas Commission on Environmental Quality has rules regarding scrap tire businesses. Many of the scrap tires end up cut up and put in dumpsters/landfills, which is illegal on a state level. While visiting the businesses, the Solid Waste Management Department would give civil citations to businesses not following the code. Houston learned that these citations work and have seen a reduction in the dumping of illegal tires.

The City of Houston practices internal and external stakeholder engagement, internally the Solid Waste Management, Health and Human Services, and Police Department all meet to discuss practices and policies. Externally engagement included tire shops and tire transporters, focusing on the issue's root. The previous two case studies support this practice of coalition building. Further investigation on the collaborative practices of the Philadelphia Streets department would benefit the future prevention of illegal dumping.

REFLECTING ON JOAN NASSAUER AND CUES TO CARE

In her 1995 paper titled, “Messy Ecosystems, Orderly Frames,” Joan Iverson Nassauer, FASLA, works in the field of ecological design and coined the term “cues to care.” The idea is that humans can take actions that show that a landscape is cared for. This can be perceived through the lenses of neatness, stewardship, and naturalness. The key idea is recognizing a landscape element with a shared cultural and social connotation. In a paper published in 2020, Nassauer and her colleague Jiayang Li searched scholarly literature to see how cues to care have been used in research. They reviewed 212 papers that cite Nassauer and cues to care. Most studies were about locales in North America, Europe, Australia and New Zealand, with few studies in Asia, South America, or Africa reported in English language scholarly publications.[1] They found 149 papers describing a specific landscape element as a cue to care. The most common findings were mowing, followed by structures, straightness, vegetation type, planting style, neatness and order, pathways, signs, patch delineation, management practice, and wildlife accommodation. Nassauer will continue to theorize cues to care to prevent it from becoming a catchy slogan and with the hope of helping landscape designers and management at local scales affect global change.

Nassauer’s work acknowledges that landscapes are affected by the human perception of the landscape. Of some of the strategies explored in the case studies, the only one that stands out as a cue to care is education through a sign or signage. Design is not often considered when it comes to issues related to illegal dumping. The garden for Harrowgate Park aims to curb the illegal dumping that frequently happens on that corner through a nature-based design solution. The hope is that the garden itself becomes a cue to care. Other cues to care strategies employed on this project relate to structures (a little library), signage, and patch delineation.

As previously mentioned, illegal dumping can affect community pride and is also a cue to neglect. Friends of Harrowgate Park frequently work to prevent any cues of neglect that tend to occur in the park with organized clean-ups and events that foster community pride. Most Philadelphia neighborhood parks have a “scenic aesthetic,” the aesthetics that signal a park is a park include lawn, trees, and sometimes benches (there are no benches in Harrowgate Park).

Ultimately many parks in Philadelphia lack the texture of a more “natural” environment because of a lack of shrubs and herbaceous species. This lack reveals a missed opportunity to connect people with plants and other biotic elements. The corner garden provides an opportunity for people to connect with shrubs and herbaceous species found in woodlands. The plant selection also provides habitat for various insects, birds, and mammals.

“CARE MAY BE A WAY TO ENGAGE PEOPLE IN PLANETARY STEWARDSHIP BY CONNECTING THEIR RESPONSES TO WHAT THEY NOTICE IN EVERYDAY LIFE WITH THEIR EFFECT ON LARGER ENVIRONMENTAL SYSTEMS. “[2]

1Jiayang Li and Joan Iverson Nassauer, “Cues to Care: A Systematic Analytical Review,” Landscape and Urban Planning 201 (2020): p. 103821, https://doi.org/10.1016/j.landurbplan.2020.103821.

2 Joan Iverson Nassauer, “Care and Stewardship: From Home to Planet,” Landscape and Urban Planning 100, no. 4 (2011): pp. 321-323, https://doi.org/10.1016/j.landurbplan.2011.02.022.

HARROWGATE PARK CORNER GARDEN PLANT LIST

‘Purple Pixie’ bishop’s hat
Epimedium grandiflorum 'Purple Pixie'

heartleaf foamflower
Tiarella cordifolia

‘Lady In Red’ fern
Athyrium filix-femina var. angustum
‘Lady in Red’

summersweet
Clethra alnifolia

‘Red Sprite’ winterberry
Ilex verticillata ‘Red Sprite’

‘Gro-lo’ Fragrant Sumac
Athyrium filix-femina var. angustum
‘Lady in Red’

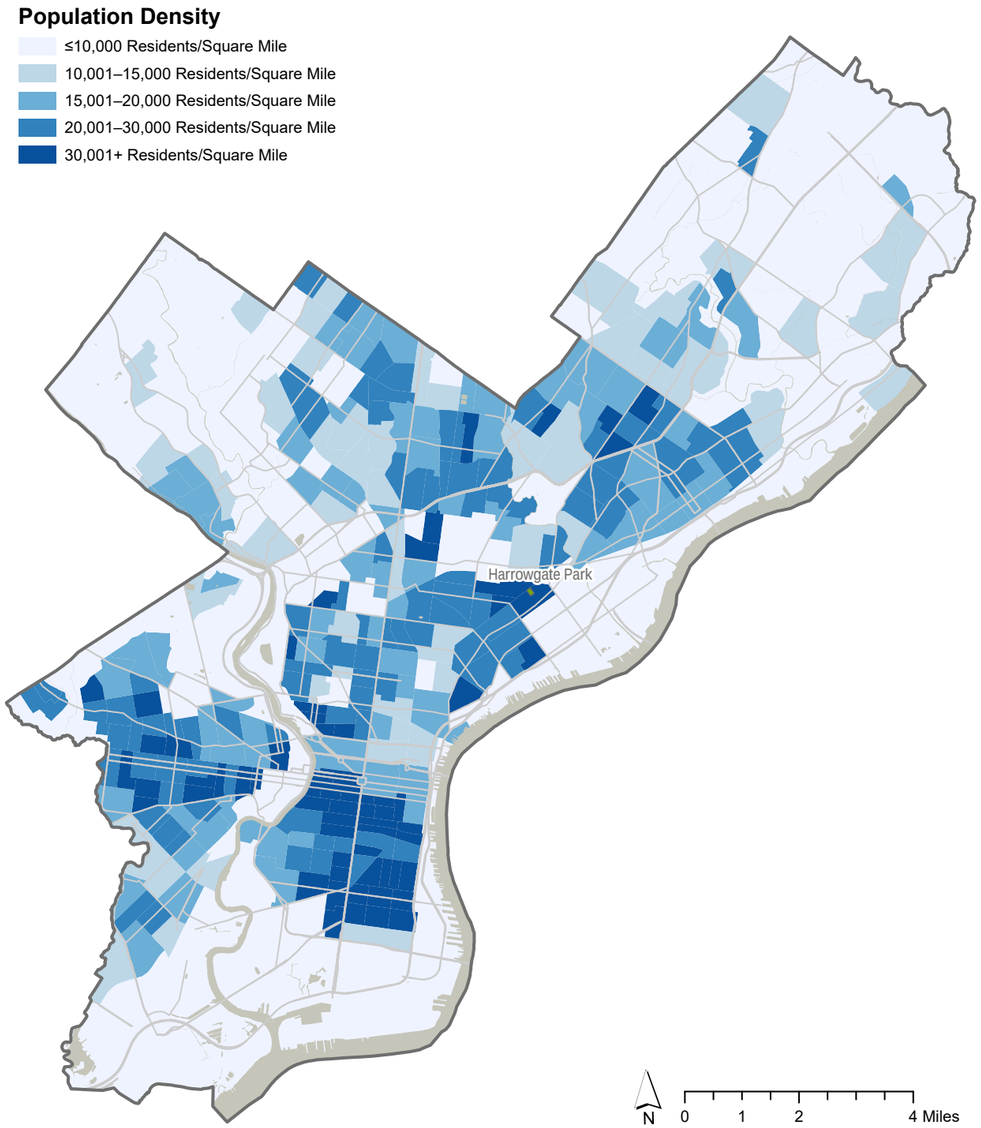
witchhazel
Hamamelis virginiana

Pennsylvania sedge - underplanting
Carex pensylvanica

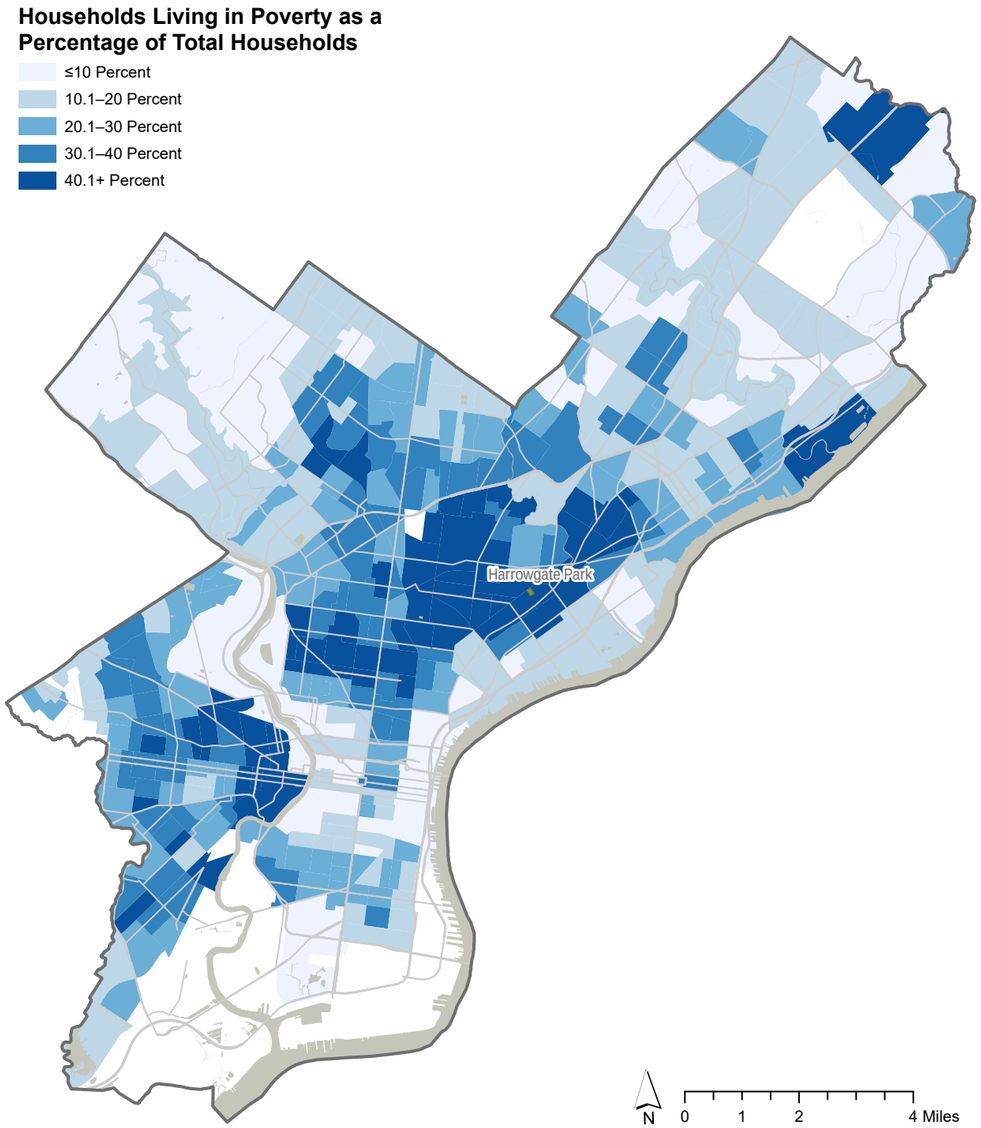
Planting design by Nelson Byrd Woltz

Funding by Impact Services and Temple's Office of Sustainability
GRASP Grant (Michelle Lee Delgado and Kyle Hearing)

NEIGHBORHOOD CONTEXT AND DEMOGRAPHICS

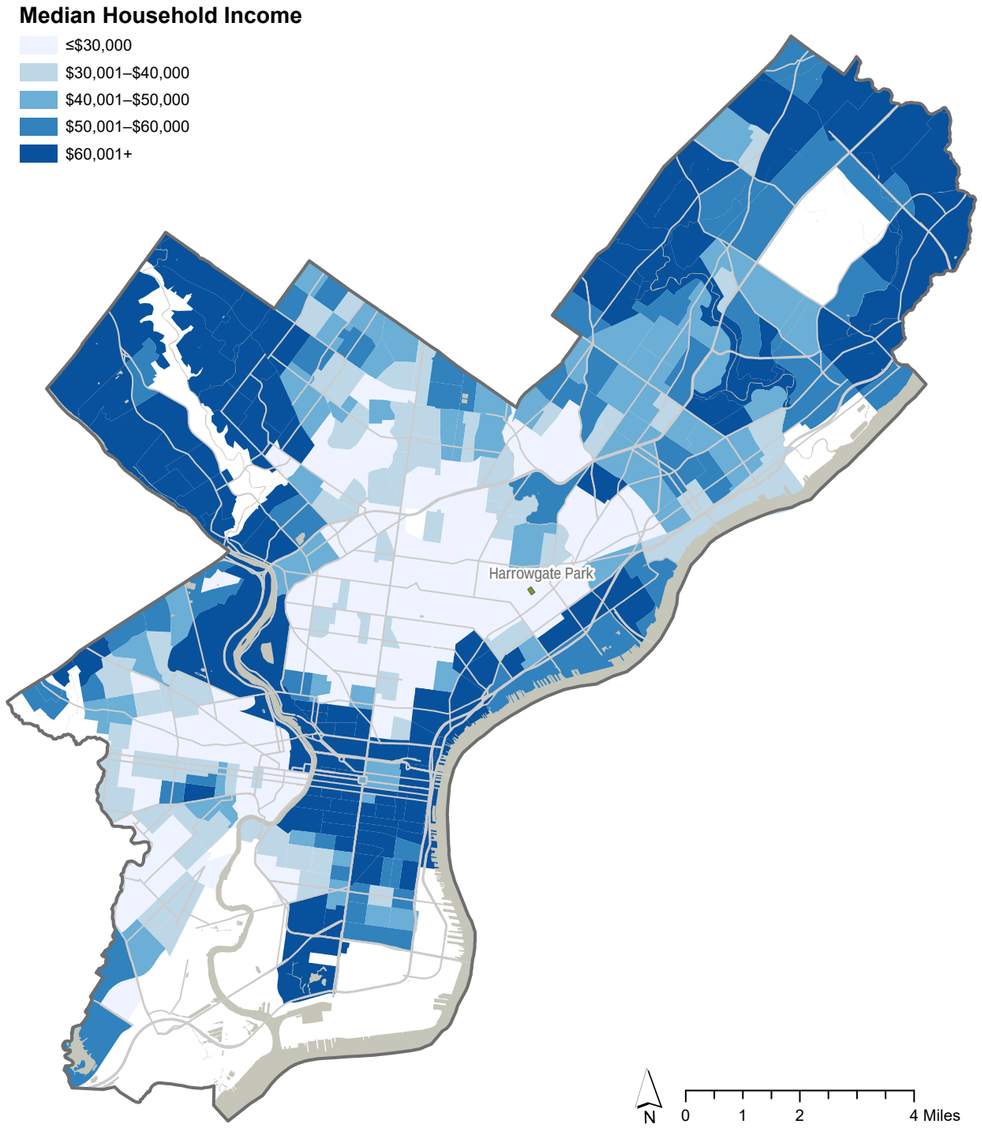


Population Desnity: 33,991 Resident Per Square Mile

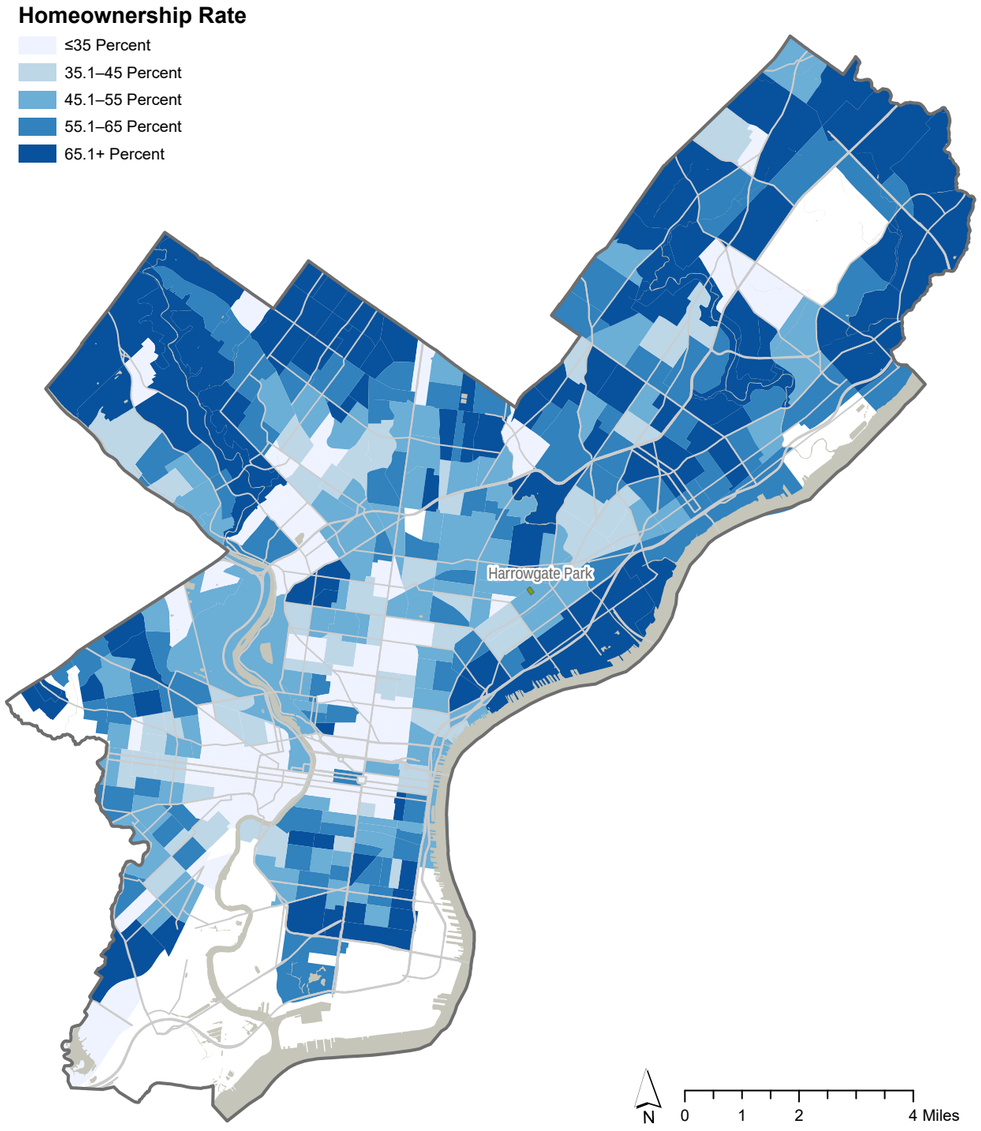


Estimated Percentage of Households in Poverty: 46.09%

GIS analysis provided by Friends of Harrowgate Park in collaboration with Temple University Department of Landscape Architecture

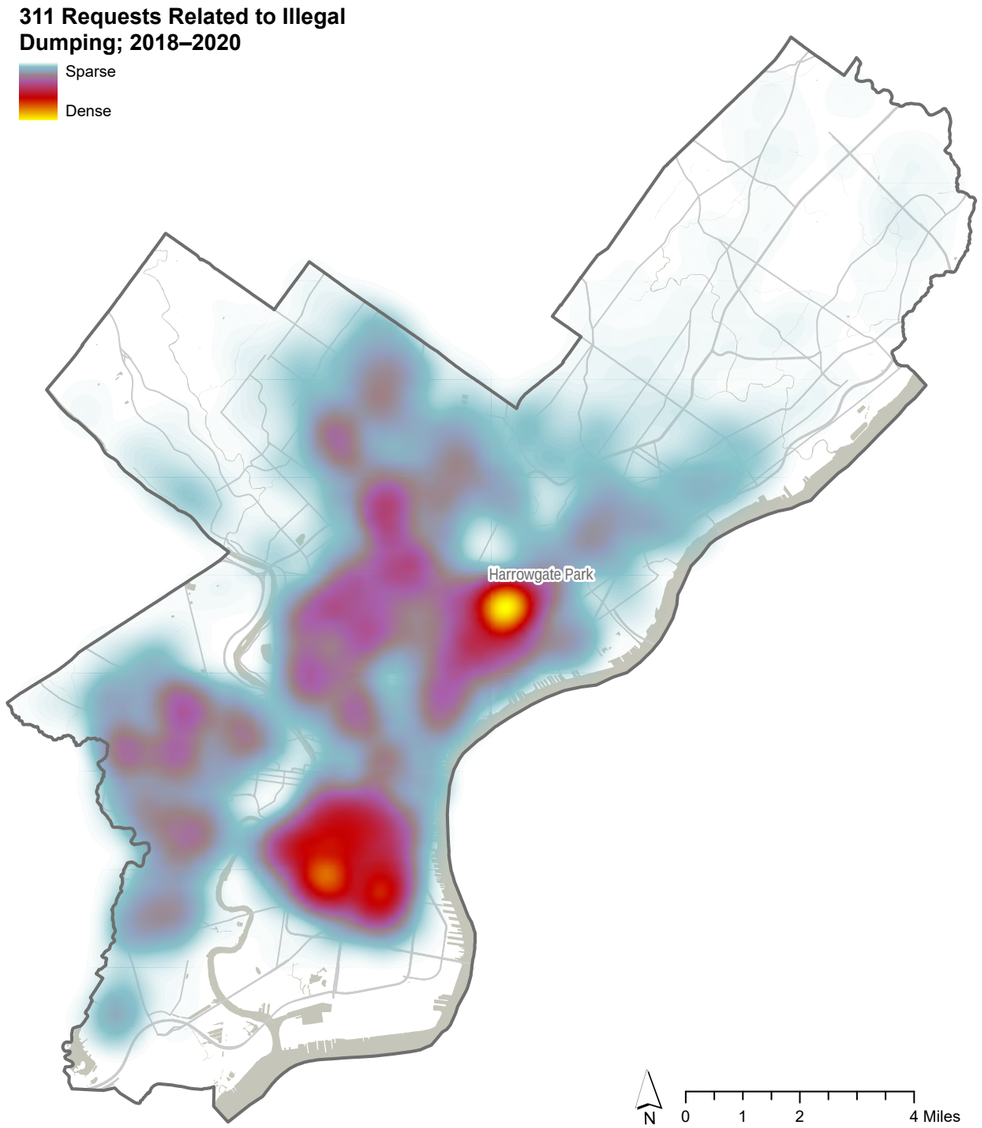


Estimated Median Household Income $26,008



Estimated Percentage of Homeowners 47.82%

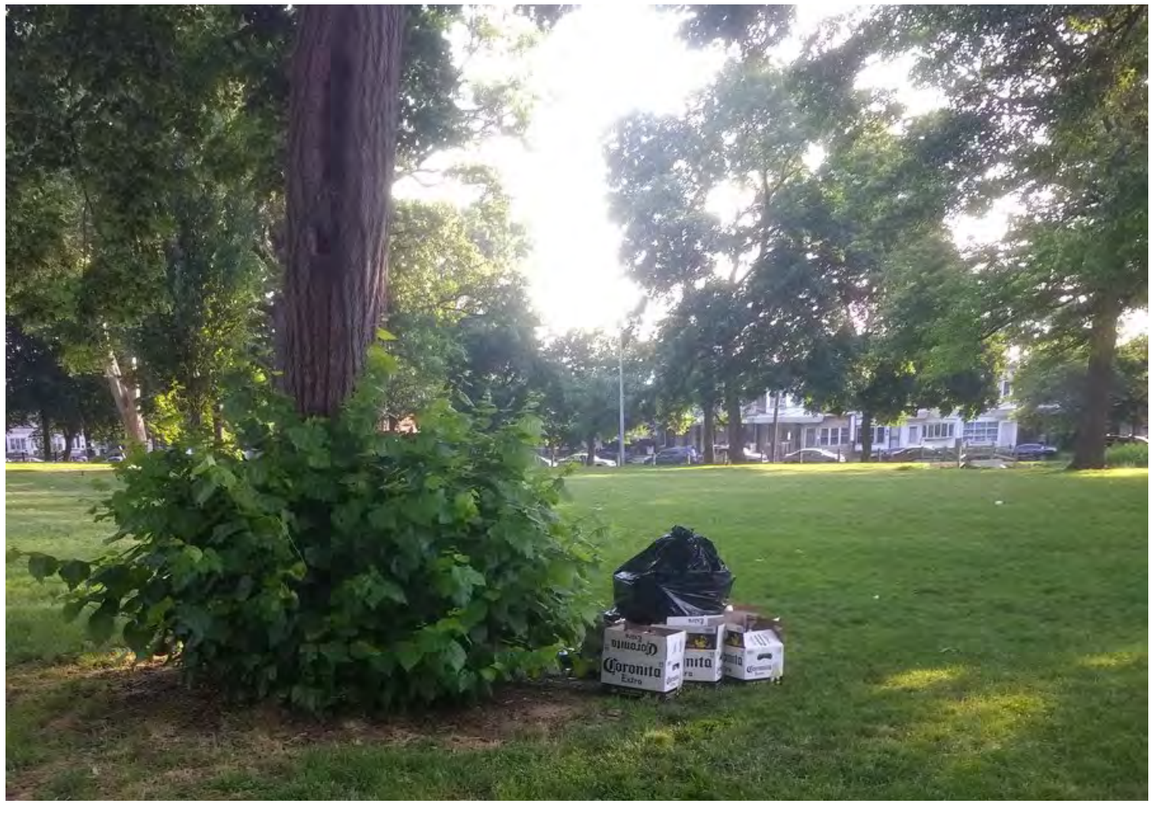
DENSITY OF 311 DUMPING REQUESTS



Density of 311 Dumping Reports

Density of 311 Dumping Reports

WASTE ANALYSIS FROM 311 PHOTOS



SITE OPPORTUNITIES AND CONSTRAINTS

SITE OPPORTUNITIES

Friends of Harrowgate Park (FHP) has been working to beautify the park and empower residents to activate and advocate for a vibrant, welcoming space since its inception in 2016. As a result, FHP has hosted many events in the park, including a story walk for children. The trust that FHP has gained in the neighborhood is an opportunity to keep up the momentum for a loving and caring park. The park also includes a few stormwater tools that provide an opportunity for neighbors to learn more about stormwater and its effect on their environment.

Harrowgate Park

Rain Garden
Stormwater runoff
Drainage Area for stormwater feature

Above: A map showing the planned location of four green stormwater tools in Harrowgate Park. Source: used with permission from the Philadelphia Water Department.

SITE CONSTRAINTS

Many of the site constraints were directly related to financial costs. Physical deterrents at active dumping areas are recommended if appropriate. This might include gates, large boulders, and guide rails. There was discussion about the use of bollards and about the possibility of extending the perimeter fence along the central path for 15-20' along the inside edge, preventing vehicles from approaching but not from accessing the path itself in the case of emergency or fire access. The planting design is limited to the area where the soil is and does not impact the design of the curb cut or sidewalk, which needs repair.

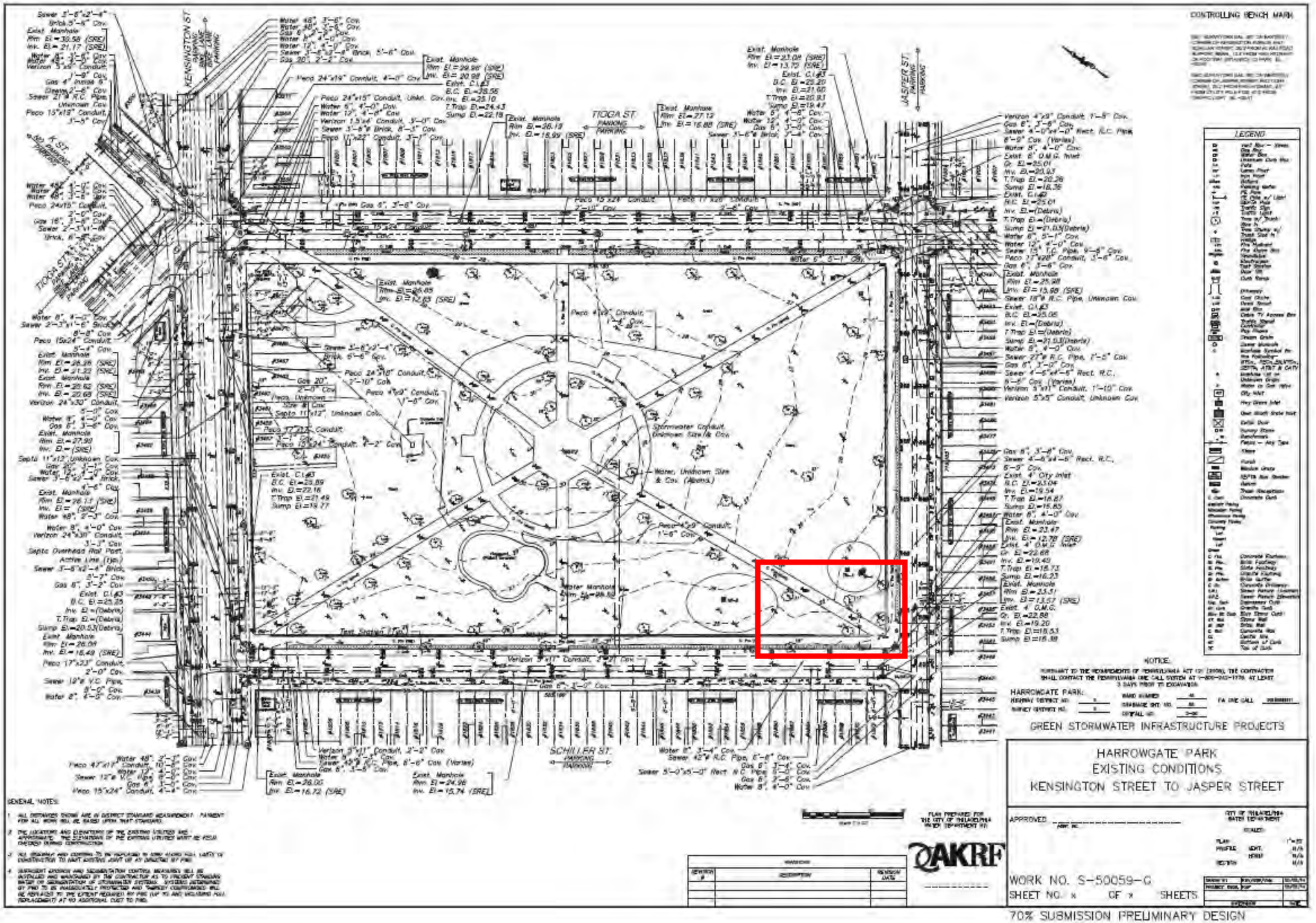
Design Sketch Idea by NBW

Google Maps, July 2019

Google Maps, September 2018

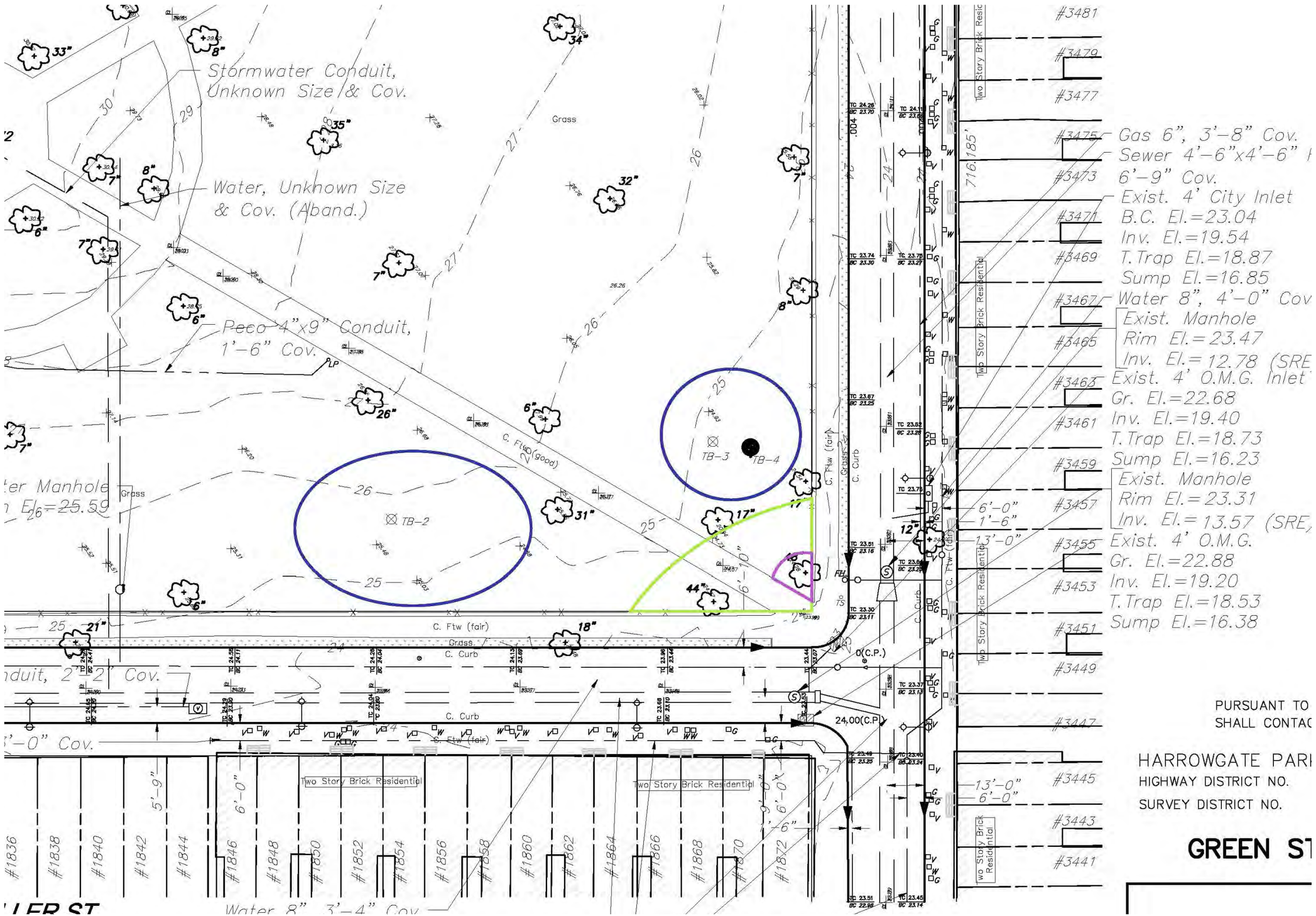
Google Maps, August 2019

OVERALL SURVEY - HARROWGATE PARK



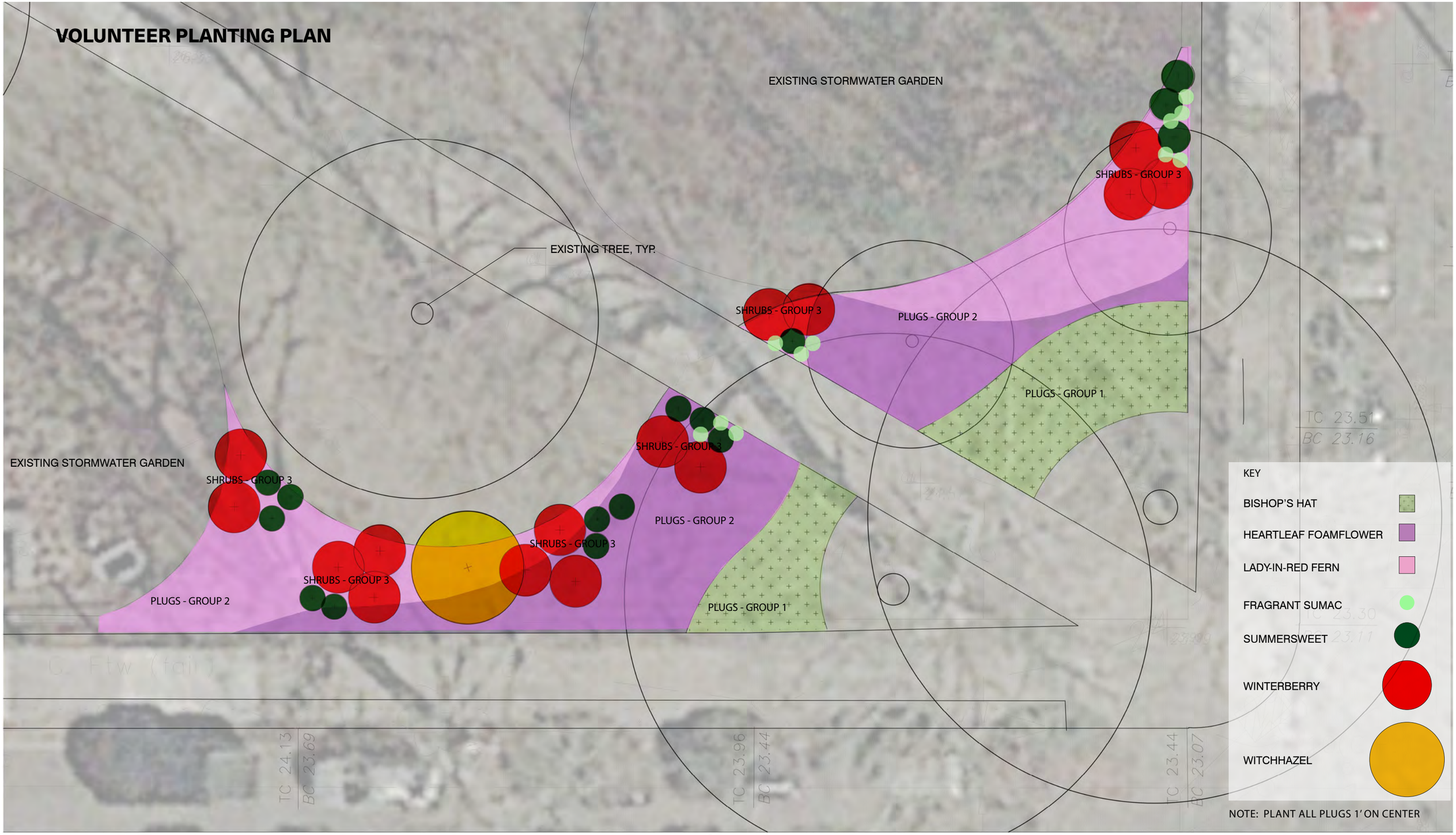
Source: used with permission from the Philadelphia Water Department.

CLOSE UP SURVEY - HARROWGATE PARK



Source: used with permission from the Philadelphia Water Department.

VOLUNTEER PLANTING PLAN



NOTE: PLANT ALL PLUGS 1' ON CENTER

1 HARROWGATE PARK ENTRY GARDEN PLANTING PLAN
SCALE: 1" = 10'

N

NBW

PLANTING PALETTE

The planting strategy for the garden corner in Harrowgate Park needed to consider a number of challenging conditions, including:

- Surface level roots from existing large trees on-site
- Partial/filtered shade
- Soil compaction
- Urban air pollution
- Possible heavy foot traffic
- Possible vandalism
- Continued issues of illegal dumping

The ideal plants for this space, which are summarized here as a series of options for discussion, are those which form colonies through suckering or other reproductive habits. These selections will allow Friends of Harrowgate Park to install initial pockets of planting outside of the root zones of large trees, where soil is more workable, without disturbing tree roots; plantings will then naturally spread, with supervision from horticultural volunteers, into the area of concern within a few seasons to establish a ground-cover that meets the goals of Harrowgate Park, including the possible reduction of illegal dumping and improved aesthetic and ecological value.

Other considerations that should shape planting selection may include:

- Maintenance staff/time (including volunteer commitment)
- Visibility/porosity of the planting/views to streetscape
- Desired maximum height
- Thematic considerations (pollinator/native garden, etc.)
- Color, texture, sensory qualities of planting

Information & plan provided by Nelson Byrd Woltz

PLUGS - GROUP 1

‘Purple Pixie’ Bishop’s Hat
Epimedium grandiflorum

PLUGS - GROUP 2

Heartleaf Foamflower
Tiarella cordifolia

‘Lady In Red’ Fern
Athyrium filix-femina var. angustum

SHRUBS - GROUP 3

Summersweet
Clethra alnifolia

‘Red Sprite’ Winterberry
Ilex verticillata ‘Red Sprite’

‘Gro-lo’ Fragrant Sumac
Rhus aromatica ‘Gro-Low’

SPECIMEN PLANTING (NBW/FHG)

Witchhazel
Hamamelis virginiana

Pennsylvania Sedge - Underplanting
Carex pensylvanica

COMMUNITY SURVEY RESULTS & PROJECT PROCESS

SAFETY AND DESIGN IN HARROWGATE PARK

Erin Farrell, the Community Engagement Coordinator at Impact Services, surveyed community members that live near the park. The survey asked residents for their opinion about the proposed garden in Harrowgate Park. Farrell received 249 responses. 61% of those respondents live less than three blocks from Harrowgate Park. One hundred sixty-four respondents visit the park every day or at least once a week. Ninety-one (36.8%) respondents said that garbage dumping had influenced their willingness to visit the park and 34.2% of respondents feel completely or somewhat unsafe in Harrowgate Park. Ninety-one (37%) respondents said an entry garden in Harrowgate Park would increase their feeling of safety by providing a more welcoming threshold. The goals for the garden to incorporate in order of popularity included:

- Beauty and increased aesthetics.
- Reduction in crime through “cues to care.”
- A sense of entry into the park.
- The use of native/pollinator plants.

IMPLEMENTATION

On November 6, 2021, volunteers planted over 200 plugs following the Nelson Byrd Woltz planting plan. Volunteers aerated the soil to relieve compaction and used an auger to plant the shrubs. Educational flyers about sanitation centers were distributed around the block and posted at corner stores. Volunteers created hand-painted signs to indicate the newly planted garden is a place to care for. Information about the plants and their ecological relations will be available at the Little Library, encouraging visitors to gain an increased appreciation and education of native plants and habitat creation.

TRACKING PLAN

The planting will take at least a year to establish and three years to grow fully. Tracking will have to remain a yearly initiative for the next five years. Annually the Friends of Harrowgate Park and I will review data from 311 to compare dumping reports before and after planting. The community survey should also be revisited two to three years after the planting matures to see how resident perspectives have changed due to the new corner garden.

I have developed several suggestions for the Friends of Harrowgate Park (FHP) to reduce illegal dumping through this work. Keeping a record of the waste identified can help determine its source. FHP can use an app like Litterati or Glitter may be of use. Continuing education is also essential for FHP to consider. Distributing information about where to dump, how to report dumping via 311, and the cost and damage of trash and dumping will increase people’s awareness and understanding of the issue. Specific suggestions for the park include a trash can lid for the trash can to help prevent the garbage from overflowing out of the can, a community bulletin board in the corner garden for education and community updates. If funding becomes amply available, bollards in all park corners will prevent trucks from backing up onto the sidewalk.

Erin Farrell on planting day.

Kyle Hearing prepares the soil for planting with an auger.

Marissa Rumpf helps plant a shrub.

A Uhaul truck full of compost.

Kyle Hearing prepares compost for planting.

Planting day with many volunteers.

Plant plugs

Temple volunteers plant near the edge of the sidewalk.

Allyson Church teaches a neighbor how to plant a plug.

Flyers about the near by sanitation center posted at the corner store in both English and Spanish.

Temple MLArch Students Allyson Church, Michelle Delgado, and Dana Velazquez.

Jenny Lauer with *Tiarella cordifolia.*

Charlotte Barrows preparing soil for planting.

Group photo of volunteers by Gracie Heim


No dumping or household trash
$2,000
MAXIMUM FINE
Render: Allyson Church in collaboration with NBW

ACKNOWLEDGEMENTS

I want to thank Rebecca Collins and Caroline Burkholder significantly at Temple University's Office of Sustainability for their support in this research endeavor, as well as Gracie Heim for their excellent documentation of the planting project. Special thanks to Charlotte Barrows, Jenny Lauer, and Nelson Byrd Woltz Landscape Architects for their pro-bono planting design, as well as Erin Farrell and Impact Services for providing more funds for planting and community feedback. I also give many thanks to Kyle Hearing, Marissa Rumpf and Allyson Church for their teamwork and collaboration on this project. Thank you to Michelle Feldman and Nicolas Esposito for providing introductory conversations and brainstorming with me, my cousin Javier Frutos and the City of Houston for letting me sit in on one of their meetings. Thank you to Temple student volunteers who helped us put the plants in the ground, Rachel Egner, Gracie Heim, Sterling Johnson, Nasuna Kiyimba, Molly Lawrence, Willow Neske, Maggie Roseto, Kelley Simon, and Dana Velazquez.

Lastly, to the Friends of Harrowgate Park and the community of Harrowgate and Kensington — whose resilience and dedication to keeping Harrowgate safe and beautiful for future children continues to astound me.

Front and Back Cover and Table of Contents Image Courtesy of the Free Library of Philadelphia, Rare Book

Photo by Gracie Heim

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CAMPING PROHIBITED
$2,000
MAXIMUM FINE

25TH WD. PHILA.

HARROWGATE

Harrowgate Sta.

KENSINGTON

RAIL ROAD

Mrs. I. P. Morris

I.P. Morris Est.

Connecting Ry. Co.

J.H. Williams

Fortescue R.R. Co.

A.J. Kay Trus.

Andw J. Kay Trus.

John T. Morris

Hy. Trochsker

J.J. Gimble

John Fritsch

J.M. Scheukle

W. P. Cresson

Emlon Cresson

Eliz.th V. Cresson

Levi Battersby

F. Shannon

Howell

Explanations.

Brick or Stone bdg.	Frame buildings.
Stables & Sheds.	Green houses.
Sewers.	Water pipes.
(13) Contiguous Plates.	Fire hydrants.
	Rail Roads.

Scale 200 feet to the Inch.

0 200 400 600

1886 Historic Map of Harrowgate Neighborhood