



PARK
OVER PLASTIC
HUDSON RIVER PK

Hudson River Park's *Park Over Plastic* Initiative

Waste Audit & Community Perceptions of Plastic Use 2019

December 10, 2019

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Executive Summary

As a waterfront park, Hudson River Park (the Park), sees firsthand the impacts of plastics on the river and wildlife. For the last four years, the Park has been a leader in regional macroplastics and microplastics research and developed an ongoing monitoring program to understand concentrations of plastic pollution within the Park's Estuarine Sanctuary and shorelines. In 2019, the Park developed the Park Over Plastic initiative (POP) to reduce the use of plastic in Hudson River Park and educate on the impacts of plastic in the Park's sanctuary waters. POP intends to foster a growing alliance of Park staff, visitors, tenant businesses, and other stakeholders to support their mission to reduce plastic pollution in the Park. Building on its history of implementing environmental best practices, the Park also hopes to become a local leader in single-use plastic reduction and create a model for parks across the country working towards plastic-free goals.

In spring 2019, the Park partnered with Knology to gain a baseline understanding of the use of and perspectives on plastics among Park employees, members of the public who visit the Park, and businesses that are tenants of the Park. To gain this understanding, the Knology team analyzed the results of an audit of waste and recycling receptacles throughout the Park. In parallel, they interviewed leaders of tenant businesses, surveyed Park visitors, and also surveyed Park staff. The findings reveal a conscientious and supportive community that is ready to embrace POP.

Visitors were overall interested in supporting the initiative to reduce plastic use in the Park, even though they knew little about it. Those who live near the Park felt it was harder to recycle in the Park than those who live farther away felt about recycling in the Park. They suggested adding more recycling bins to resolve this problem. Younger visitors were more influenced by social pressure to reduce plastic in the Park, whereas older groups were more motivated by financial incentives. Tenant businesses in the Park are motivated to reduce plastic use and many of them are already leading environmental initiatives in addition to their commitment to the POP. Tenants identified ways to support the initiative that resonate with their specific business. However, many also raised concerns about the financial costs of eliminating single-use plastic, especially for smaller businesses. A waste audit revealed potential sites to focus POP interventions, while helping to understand recycling behaviors, and subsequently interventions which will help reduce plastic use in the Park.

Additionally, we found a community of staff that are motivated, interested, and eager to help advance POP, most of whom already knew about the initiative and were confident about their ability to support it. To properly support POP, they called for additional resources in their office space, such as alternatives to plastic and reusable products. They also advocated for training to grow their knowledge and skills around plastics.

These baseline findings point to several opportunities to strengthen POP. Education materials about reducing plastic use should go hand in hand with communication strategies that are relevant and accessible to visitors, tenants, and Park staff. These materials should reflect each group's priorities, and be designed around their needs. It may also be helpful to connect POP to broader sustainability programs and strategies at the Park to help stakeholders contextualize the importance of this work and their role in it. Additionally, gathering input about POP from residents who live near the Park could help activate the surrounding community around the initiative. Lastly, to measure POP's impact as the study progresses, Knology recommends continuing to conduct waste audits to test progress, in parallel with surveys and interviews.



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Introduction

Hudson River Park (the Park) crosses a range of unique neighborhoods in New York City, offering multiple recreational and educational activities for local residents and city visitors, and plays an important role in protecting the Hudson River ecosystem. In 2019, the Park developed POP to foster a growing alliance of Park staff, visitors, and tenants to actively reduce plastic consumption in the Park, and to provide education on the impacts of plastic in the Park's estuarine sanctuary waters. Led by a team of Park staff, POP aims to engage a diverse group of stakeholders who have direct contact with the Park in supporting the initiative and build a community advancing its goals.

The same year, the Park partnered with Knology (formerly New Knowledge Organization Ltd.) to evaluate the POP program. This report presents the results of the first year of the evaluation.

An Overview of the POP Initiative

For the last four years, the Park has been a leading voice in regional macroplastics and microplastics research. During that time, the Park developed a monitoring program to understand concentrations of plastic pollution within the Park's Estuarine Sanctuary and shorelines. In 2019, the Park launched POP, a new initiative to reduce plastic consumption in the Park, and educate Park users and stakeholders on the impacts of plastics. With POP, Hudson River Park aims to become a local leader in single-use plastic reduction and create a model for parks across the country working towards plastic-free goals.

As part of the initiative, the Park ceased nearly all purchasing and use of single-use plastics at its offices and operational areas. It also vetted suitable green alternatives which were compiled in a resource called the *Green Resource Guide*, to help Park staff easily identify plastic alternatives and provide staff with refillable water bottles for use during work. The Park also asked all tenants (groups that hold a lease with the Park, such as concessionaires or non-profit organizations) to do the same and sign onto a Green Partnership Agreement. The agreement stipulates that the tenant or occupant will discontinue the distribution and sale of single-use plastic bottles, straws, stirrers, and flatware, and use green products instead. So far, 14 tenants have become Green Partners, while others are making efforts to reduce their plastic use. These plastic reduction standards are now integrated into the Park's leases and permits, so that all future tenants, occupants, and events are required to become Green Partners and be supportive of the initiative.

To accommodate the transition away from single-use plastics to green products, the Park has installed additional recycling bins throughout the Park, as well as water fountains and portable hydrations stations in key areas to encourage park-goers to make use of reusable water bottles. A comprehensive communication strategy has also been paired with these new plastic reduction features, helping Park users understand the POP goal and negative impact plastics have on the Park. Most recently, the Park worked with their local Coca Cola distributor to update select vending machines within the Park to sell only canned products.

After months of discussion, the Park is now a pilot site for Coca Cola to test canned still water and replace their plastic single-use water bottles. A full update of all the beverage vending machines in the Park is anticipated for early 2020. Lastly, the Park has created an educational curriculum on plastic pollution for school groups and is hosting free public education programs on plastic pollution and reduction at programs like Big City Fishing and Open Field Lab.

POP builds on steps the Park has already taken to implement environmental best practices, including reduced consumption, and composting and recycling strategies to minimize the Park's carbon footprint. Last year alone, the Park composted 400,000 lbs. of food scraps and horticultural waste. And with over 400 educational programs and activities, the Park also actively works to transform the way people think about the urban waters that surround them.

Evaluation

In spring 2019, the Park partnered with Knology to support an evaluation of the POP initiative. The evaluation will be conducted in two phases:

1. An initial phase in summer 2019, in conjunction with the launch of POP, designed to gain a baseline understanding of plastic consumption in the Park.
2. A follow-up phase in spring 2020 to measure the impact of the initiative a year later, as observed in the physical plastic waste and the community's support of POP.

The initial phase of the evaluation consisted of two components: A) A single-use plastic waste audit that reviewed contents of recycling and landfill bags from select locations around the Park; and b) Surveys and interviews with Park staff, tenants of the Park, and visitors to the Park to understand the Park community's attitudes, actions, and motivations toward reducing single-use plastic.

This report presents the results of the initial phase as described above. Using a mixed-methods approach that included qualitative and quantitative data, the study produced a nuanced picture of the ways in which the diverse Park community thinks about and acts to reduce single-use plastic. This information is supplemented by the findings from the plastic waste audit. These results will be used by the Park to inform development and refinement of the educational and outreach resources to advance POP.

In preparation for this report, the Park provided historical information about the development of POP and raw data from the waste audit, as well as supported the Knology team in their data collection efforts. After the waste audit, surveys, and interviews were complete, Knology reviewed and analyzed all information, and independently produced drafts of this report. Park staff then reviewed initial drafts of the report and gave feedback to help interpret and contextualize the findings. For the remainder of the report, Knology uses "we" to refer to the evaluation team.



Key Terms

Green Partnership Agreement: The Park has asked all existing tenants to sign onto a Green Partnership Agreement that requires the discontinuation of the sale of single-use plastic bottles, straws, and plastic stirrers. Effective summer 2019, all new tenants have been required to sign onto the agreement going forward.

Green Resource Guide: The Park has compiled a guide to sustainable, biodegradable alternatives for a range of products, from garbage bags to straws. All products in the guide have undergone a careful vetting process to ensure that they meet green standards and are suitable alternatives to existing products. This guide is shared with tenants and permittees and is also [available on the Park website](#).

Hudson River Park: Hudson River Park (the Park) has transformed four miles of decaying piers and parking lots along Manhattan's West Side into a beloved, urban recreational paradise. Attracting 17 million visits each year, the Park offers a myriad of recreational and educational activities for local residents and visitors alike, and plays a critical role in protecting the Hudson River environment itself. The Park includes approximately 400 water acres designated as an estuarine sanctuary by New York State law.

Hudson River Park Estuarine Sanctuary: A state-designated protected area including approximately 400 open in-water acres of Hudson River Park, from the bulkhead to the pier-head line, excluding the piers and float bridge.

Hudson River Park Friends: An independent nonprofit organization dedicated to the completion, care and enhancement of the Hudson River Park, which also serves as the designated fundraising partner of the Hudson River Park Trust.

Hudson River Park Trust: Hudson River Park Trust is a partnership between New York State and City that is charged with the design, construction, maintenance, and operation of the four-mile Hudson River Park. As a public benefit corporation, Hudson River Park Trust is governed by a thirteen-member Board of Directors. The Trust employs a focused, diverse staff with experience in parks, design, finance, science, education, public policy, operations and maintenance.

Macroplastics: A type of plastic marine debris that is generally larger than 5mm in diameter.

Marine Debris: Man-made materials or litter that indirectly and directly enter our marine systems and persist, causing harmful health impacts on wildlife and the greater ecosystem.

Microplastics: A type of plastic marine debris that is smaller than 5mm in size and comes from a variety of sources including: degrading macroplastics, poly-based clothing, and products that include tiny manufactured pieces of plastic commonly called microbeads.

Park Over Plastic: A Hudson River Park initiative launched in May 2019 among Park staff, vendors, and community members to help reduce our plastic footprint and improve the health of the Hudson River.

Polylactic Acid (PLA): PLA is a plastic substitute made from fermented plant starch (usually corn). It is biodegradable and sometimes compostable, depending on the brand.

Single-Use Plastic: Plastic products, like water bottles, food containers, and bags, that are commonly used only one time before they are disposed in landfills or recycling systems.



Methods

Knology worked closely with Park staff to develop a set of qualitative and quantitative tools to assess the community's attitudes, actions, and motivations to support POP. Knology researchers and Park staff also collaborated on implementing these instruments for data collection with various Park stakeholders, including Park staff, Park tenants, and Park visitors. We refer to these stakeholder groups together as the Park community throughout this report. In addition, to support the audit of POP, Knology researchers worked with Park staff to collect and measure plastic waste at select locations in the Park.

Waste Audit

As part of the initial phase, the Park, with support of Knology staff, conducted a waste audit. Knology staff provided recommendations on methods for the audit that Park staff members could use or adapt. The waste audit consisted of reviewing the contents of recycling and landfill bags, collected by maintenance staff at various locations around the Park, specifically looking for contaminants. In landfill bags, all recyclable products were considered contaminants while in recycling bags, all non-recyclables were considered contaminants. Park staff drafted a data sheet that was approved by Knology and used to count and weigh different categories of contaminants in each bag. The scale used during the waste audit is a Uline Washdown Platform Scale with a range of .05lbs to 200lbs.

Common recyclable plastics were organized into seven categories listed below (Cowan, 2012):

- N^o 1 – PETE (Polyethylene Terephthalate). Used in plastic drink bottles, plastic cups and peanut butter jars.
- N^o 2 – HDPE (High density Polyethylene). Used in products such as milk jugs, and larger liquid bottles.
- N^o 3 – PVC (Polyvinyl Chloride). Used in common products such as shampoo/soap containers, and oil bottles.
- N^o 4 – LDPE (Low-density Polyethylene). Used in products such as wrappers, and plastic bags.
- N^o 5 – PP (Polypropylene). Used in products such as yogurt containers, bottle caps, and potato chip bags.
- N^o 6 – PS (Polystyrene). Used in products such as take-out food containers, egg cartons and some plastic cutlery.
- N^o 7 – Other (Including PLA). Used in products such as hard plastic bottles as well as compostable cups and lids.

In 2018, the New York City Department of Sanitation released an updated set of resources, including a video titled *What To Recycle In NYC 2018* that reflects changes made to recycling program since 2013 (NYC Sanitation, 2018). New York City has two streams of recycling: 1) paper and cardboard, and 2) metal, glass, plastic, and cartons. For plastics, all rigid plastics

are accepted, including items across all seven categories listed above. However, not all items in each category are accepted. For example, food wrappers, chip bags, and plastic bags are not acceptable recyclables in New York City. A list of recyclables is found on the New York City government website (<https://www1.nyc.gov/assets/dsny/site/services/recycling/what-to-recycle>).

Initially, a trial audit was conducted on July 11, 2019 from 1:00 pm to 3:00 pm in order to familiarize Park staff with the audit procedures and to test the efficiency of the data sheet. During the trial audit, contaminants were not categorized as described above for landfill bags; however, Park staff corrected this during the full audit. The date of the trial audit was also purposefully scheduled prior to the addition of new signage about the initiative in the Park. Updates were made to the original data sheet after the trial waste audit was conducted, and subsequently, a second version of the data sheet was made for use during the remaining two full audit days. These two days were intended to happen after new signage had been in place in order to capture potential behavior change due to signage. Unfortunately, no signage had yet been placed in the park, so data from all three days can be considered as pre-signage baseline. Signage was rolled out toward the end of August 2019. Table 1 indicates the dates, locations and number of bags collected. Locations are marked by their proximity to landmarks in the Park.

Knology staff participated in two of the three full audit days in order to understand the process and contexts where the work was done. Knology researchers will assemble a protocol document for the Park to use in future waste audits. This document will be a stand-alone document that outlines all forms and materials needed, as well as all procedures to follow, in order to conduct a waste audit. The Park will conduct another waste audit again in 2020.

Table 1. Waste audit bag pick-up location and number of bags analyzed.

Date of audit	Location(s) of bag pick-up	Number of recycling bags	Number of trash bags	Trial or Full audit
July 11, 2019	Pier 25	3	3	Trial
	Pier 45			
	Pier 51			
August 16, 2019	Pier 25	5	6	Full
	Pier 40 (Admin)			
	Pier 40 (Cart yard)			
	Pier 45*			
	Pier 51			
August 20, 2019	14 th Street Park	7	7	Full
	Hudson River Community Sailing			
	Chelsea Waterside Park			
	Pier 84			
	Frying Pan			
	Clinton Cove			
	Pier 62			

Note. *indicates that an event had occurred within 24 hours prior to pick up.

Community Perceptions

Approach & Instruments

Visitors

The survey aimed to gain a baseline level of understanding of visitors' opinions and actions around single-use plastic containers and alternatives. In a later phase of the project, the survey will be deployed again to track how opinions and actions have changed in connection to the Park Over Plastic initiative. The visitor survey was deployed onsite in the Park with visitors at locations that were strategically selected by Park and Knology staff members. Some sites were also locations for the plastic waste audit conducted by the Park. The survey asks visitors about their attitudes, knowledge, and actions related to reducing and recycling plastic.

Visitors were asked to read a consent form to sign if they were willing to participate. If a visitor was accompanied by a child, the respondent was asked to note that the minor was not the person taking the survey and if the minor was helping to provide answers with the respondent.

Surveys were collected by both Knology researchers and Park staff. Before data collection began, Knology led a training session for Park staff to learn the protocol and data collection best practices.

All instruments can be found in the Appendix to this report.

Tenants

Two instruments were deployed in order to capture how Park tenants supported the POP. The Park has engaged with approximately 30 tenant businesses and 14 of these tenant businesses have signed a single-use plastic reduction agreement, known as the Green Partnership Agreement, to support POP. The Park has provided tenants with resources for reducing their plastic consumption, including a Green Resource Guide that lists sources for purchasing alternatives to single-use plastics.

Knology split tenant data collection into two parts to capture both the thoughts of the tenant leadership, who may not be onsite often, and the onsite managers and staff who will be charged with implementing the decisions of business owners. The instruments were developed as follows:

- **Short interview protocol** to capture motivations of tenant leadership for joining POP and perceptions of making business changes that will reduce overall single-use plastic consumption. Knology staff conducted interviews by phone, which were audio-recorded if the tenant permitted. The interview protocol was developed with follow-up conversations in mind.
- **Short survey** for onsite staff at tenants' businesses about the implementation of business changes and observations of daily single-use plastic consumption. This survey was still in the data collection phase at the time of this report publication.

Park Staff

A survey was deployed with Park staff in order to capture a baseline level understanding of their knowledge and support of POP, as well as the personal actions they take, and their thoughts on barriers they may face to help advance the goals of the initiative. In a later phase of the project, the survey will be deployed again to track how their opinions and actions have changed as a result of the initiative. As the Park continues to provide educational materials and resources to its staff, the survey will track staff capacity building over time to support the initiative.

Participants

Visitors

Knology researchers and Park staff obtained 224 surveys with signed consent forms during 14 data collection days at various locations and times across the Park. Table 2 outlines the data collection days, locations, events and surveys collected. Surveys that were collected but did not have the consent form signed were not included in analysis.

Table 2. List of data collection days, whether data collection coincided with Park events, and number of surveys collected.

Date	Location	Event	Event Name	Number of Surveys Collected
8/5/19	Pier 51	Yes	Big City Fishing	19
8/5/19	Pier 25	Yes	Big City Fishing	29
8/10/19	Pier 84	Yes	Science Saturday	12
8/11/19	Pier 84	Yes	Big City Fishing	16
8/12/19	Pier 40	No	N/A	17
8/12/19	Pier 25	Yes	Big City Fishing	8
8/15/19	Pier 45	Yes	Healthy on The Hudson (Yoga)	37
8/19/19	Pier 51	Yes	Big City Fishing	3
8/19/19	Pier 25	Yes	Big City Fishing	30
8/20/19	14 th St. Park	No	N/A	29
8/21/19	Pier 66	No	N/A	5
8/21/19	Pier 62/ by Fresh & Co	No	N/A	5
8/21/19	Chelsea Waterside Park / Pier 62	No	N/A	11
8/25/19	Pier 84	Yes	Big City Fishing	3

Of the 224 individuals who participated, 111 identified as women, 86 as men, and 3 selected *choose not to respond*. Two respondents selected non-binary and one provided a non-sense answer. The rest of the respondents left the survey blank. Table 3 shows demographic distribution of the race and ethnicity of the survey respondents.

Table 3. Distribution of the race/ethnicity of Visitor survey respondents.

Race/Ethnicity	Number of Surveys Collected
White/Caucasian	97
Asian	35
Hispanic or Latinx	32
Black or African American	18
Middle Eastern	2
Multi-racial	11
Native American	1
Prefer to self-describe	8
Choose not to respond	10

Note. Respondents were allowed to select all races and ethnicities that apply so the total exceeds the total surveys received. Seventeen respondents left this question blank.

From the 224 surveys collected, 201 respondents indicated the age group they belong to (Table 4). The remaining survey respondents left this question blank.

Table 4. Number of surveys collected by age range.

Age range	Number of Surveys Collected
18 to 24	37
25 to 44	104
45 to 64	47
65 years and over	13

Of the 224 surveys collected, 208 respondents indicated if they live, or do not live, in the general neighborhood surrounding the Park (Table 5). The remaining survey respondents left this question blank.

Table 5. Number of responses by category to the question: *Do you live in the neighborhood?*

Age range	Number of Surveys Collected
Respondent lives in neighborhood	141
Respondent does not live in neighborhood	67

Note. This question was open to interpretation by respondents. No explicit zip code or location was provided to the respondents.

Response Rates

A partial response rate was collected on a separate form during data collection efforts that indicated the number of people who declined to participate in the survey and the reason why they declined, if applicable. This form was used only during 11 of the 14 data collection days, so the response rate is considered partial. Of those who were approached, roughly 52% participated in the survey.

The majority of those who declined to participate gave no reason for declining. From those who gave explicit reasons for declining, 28 indicated that they were in a rush to get somewhere, while 8 declined due to language barriers. An additional 5 declined because they, or their partner/company, had already taken the survey at another time. Two individuals did not take the survey because they were “not from here.”

Tenants

Tenants volunteered their time to speak with Knology researchers about POP. Each interview lasted 15-30 minutes and Knology researchers spoke with leadership from ten distinct tenants in the Park. Of the ten tenants that were interviewed, six had previously signed the Park’s Green Partnership Agreement, while the other four had not yet signed on.

Table 6. List of the tenants who volunteered to be interviewed about POP.

Tenant	Signed on to Green Partnership Agreement
USS Intrepid Museum	No
The Frying Pan	No
Village Community Boathouse	Yes
Chelsea Piers	No
Manhattan Kayak Company	Yes
Manhattan Youth	Yes
Hudson River Community Sailing	Yes
Manhattan Community Boathouse	No
Trapeze School	Yes
Classic Car Club	Yes

Park Staff

Park staff were asked to take a survey about POP. There are 81 full-time Park staff members, and 39 part-time and seasonal Park staff members. Overall, we received 60 responses from 46 full-time staff members (57%), as well as 6 part-time staff members and 8 seasonal-staff employees (36%).

Of the 60 individuals that responded to the survey, 25 identified as women, 29 men, one individual self-described as “they,” and five selected *choose not to respond* or left the survey blank.

Table 7 shows demographic distribution of the race and ethnicity of the survey respondents. Of the 58 survey takers, four self-described.

Table 7. Distribution of the race and ethnicity of Park Staff survey respondents.

Race/Ethnicity	Number of Surveys collected
White/Caucasian	31
Hispanic or Latinx	7
Asian	6
Black or African American	4
Multi-racial	2
Prefer to self-describe	4
Choose not to respond	9

Notes. (N = 58). Respondents could select all races and ethnicities that apply, so total selected may exceed the total surveys received. Two survey respondents left this question blank. One self-described as “*South Asian*”, one as “*Puerto Rican*”, one as “*ethnic white*”, and the other as “*human*.”

From the 60 surveys, 51 respondents indicated the age group they belong to (Table 8).

Table 8. Number of surveys collected by age range.

Age range	Number of Surveys collected
18 to 24	6
25 to 44	34
45 to 64	10
65 years and over	1
Choose not to respond	7

Note. (N = 58). Two respondents left the question blank.

Staff from thirteen different departments of the Park responded to the survey. In order to protect anonymity, in table 9 below, we report the departments represented in the survey, but do not report how many responses we received by department.

Table 9. Park departments from which at least one staff member responded to the survey.

Park Departments	
Estuary Lab	Legal
Executive	Maintenance
Facilities	Operations
Finance	Property Management, Design and Construction
Horticulture	Public Programs
Human Resources	Real Estate
IT	

Analysis

Visitors

For analysis of the community surveys, survey responses were compared by both age and location of respondent. Age analysis consisted of four groups, 18-24 years, 25-44 years, 45-64 years, and 65+ years (Table 4). Surveys were also compared by where the respondent lived in proximity to the Park (Table 5).

Responses to open-ended questions were separated out, coded by a Knology researcher, and then reported as percentages in the text. Unlike the categories provided in advance for the quantitative questions, qualitative codes were developed through an iterative process as new themes arose while the researcher read through the responses. For a full code book, see Appendix E.

Tenants

Interview notes and recordings were initially organized by the modules, or topics, around which the interview protocols were designed. Responses to each module were then analyzed by a researcher for major themes within each module. The major themes are described in the report, organized by the following themes: motivation for reducing plastic, current support of the initiative, concerns and barriers to reducing plastic use, and requested support for reducing plastic use.

Park Staff

Park staff surveys were analyzed in aggregate with breakdowns by staff status (Full-time, part-time, seasonal) in tables. Due to small sample-sizes for part-time and seasonal staff, these categories could not be compared. Quantitative survey responses are presented as counts, averages or percentages, to best convey staff responses. Responses to open-ended questions were coded by a Knology researcher, and are reported as counts in text.



Results: Waste Audit

Trial Audit

Recycling Bags

Using the Uline Washdown Platform Scale to weigh the bags, the data sheets from the trial audit conducted on July 11, 2019 note that about 47%, or 13.76lbs, of the total weight (29.20lbs) of the recycling bags was the recyclables that were counted. Contaminants (non-recyclables) weighed in at 14.3lbs, or 49%, of the total weight. Table 10 lists the weight of each bag by location and the total weight of all recycling bags.

Table 10. Recycling bags collected for the trial audit by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)	Weight of contaminants	% Weight of contaminants
Pier 25	12.60	5.5	44%
Pier 45	6.20	1.4	23%
Pier 51	10.40	7.4	71%
Total	29.20	14.3	49%

Table 11 details the breakdown of recyclable types by tally and by weight. Items in Table 11, and Table 14 below, were identified by Park staff prior to the trial audit as potential categories for common items that might be found in recycling and landfill bags. These categories were eventually refined for the full audit after reviewing the trial audit data sheets. Straws, plastic cups, lids and beverage bottles were the most common items found in the recycling bags. Over 600 lids were counted on the Pier 51 recycling bag data sheet.

Table 11. Count and weight of recyclables in the trail audit recycling bags.

Categories (Plastic Only)	Tally	Weight (lbs./oz.)
Beverage bottles	21	2.4
Liquid containers	2	0.3
Food packaging/wrappers	5	0.1
Plastic bags	0	0
Foam Fragments	0	0
Straws	32	0.05
Utensils	8	0.15
Foam or Plastic Cups	40	2.4
Plastic fragments	1	0.01
Other Items	663*	9.25
Total	772	13.76

Note. *Other items include bottle caps(8), cans (4), compostable caps and utensils (16), glass bottles (7), lids (627), and paper straws (1). Park staff noted that there were 6 full sleeves of about 100 lids that were recycled.

In Table 12 below, tallies of the trial audit recyclables are presented by recyclable number. No weight by recycling number was calculated.

Table 12. Count of recyclables by plastic type in the trial audit recycling bags.

Plastic Types	Tally
1 - PET	47
2 - HDPE	2
3 - V	1
4 - LDPE	0
5 - PP	26
6 - PS	603
7 - Other (including PLA)	22

An additional 14.40lb of contaminants were found in the recycling bags. Contaminants included all non-recyclables, such as chip bags, diapers, drink boxes, dog waste, food wrappers, plastic bags and paper cups. An additional 0.14oz were not accounted for on the data sheets. For the trial audit, plastic straws were considered a recyclable.

Landfill Bags

Total bag weights and locations are presented in Table 13. Contaminants in the landfill bags, or recyclable products, were not calculated by weight during the trial audit. Instead, recyclables found in the landfill bags were tallied by type, similar to the protocol used for the recyclable bags. On the Pier 45 landfill datasheet, a weight count of 7.05lbs of the glass bottles (5) and cans (3) was included, as well as an overall plastics weight count of 2.35lbs. No other data sheet noted weights of recyclables, therefore Table 13 presents only a complete tally of all recyclable items found in the landfill bags without subsequent weight.

Table 13. Landfill bags collected for the trial audit by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)
Pier 25	13.75
Pier 45	15.35
Pier 51	10.85
Total	39.95

Note. Contaminants (recyclables) were not explicitly weighed during the trial audit for the landfill bags.

Table 14 reflects the total counts of all recyclable types counted in the landfill bags during the trial audit.

Table 14. Count of recyclables in trial audit landfill bags.

Categories (Plastic Only)	Tally
Beverage bottles:	9
Liquid containers:	0
Food packaging/wrappers:	8
Plastic bags:	0
Foam Fragments:	0
Straws:	4
Utensils:	0
Foam or Plastic Cups:	20
Plastic fragments:	0
Other Items	25
Total	66

Note. Other items include cans (5), compostable caps and utensils (8), glass bottles (5), lids (7).

Recyclables were also counted by plastic type for two of three data sheets. Due to incomplete information for Pier 51, no comparisons were made between the recyclables found in the landfill bags (Table 15) and recyclables found in the recycling bags (Table 12).

Table 15. Count of recyclables by plastic type in trial audit landfill bags.

Plastic Types	Tally
1 - PET	20
2 - HDPE	0
3 - V	0
4 - LDPE	0
5 - PP	5
6 - PS	1
7 - Other (including PLA)	3

Note. Table presents data of two of three sheets. The data sheet for Pier 51 did not breakdown recyclables by type of plastic.

Full Audit

Before the full audit was conducted, adjustments were made to the data sheet by Park staff to better identify contaminants in both recycling and landfill bags. In addition, more attention was paid to specifically identifying plastic alternative products. The data sheets were updated during the course of data collection after gathering feedback from staff who participated in the waste audit.

August 16 – Recycling Bags

The data sheets for the recycling bags for the full audit conducted on August 16, 2019 noted 5 bags that varied by weight from 1.3lb to 9.75lb (Table 16). Initially, calculations showed that about 73%, or 17.93lbs, of the total weight (24.5lbs) of the recycling bags was accounted by the recyclables that were counted. Common brands of recyclables found were Dasani plastic water bottles as well as plastic alternative cups and lids from Le Pain Quotidian, Shake Shack, and Juice Press. Contaminants weighed in at about 7lbs, or 29% of the total weight, indicating a potential weight measurement error or rounding error during data collection.

When looking closer at the data sheets, Knology researchers noticed that the data sheet from Pier 25 indicated a combined weight of recyclables and contaminants (4.16lbs) that was higher than the total weight that was noted (3.8lbs). When adjusting up to the combined weight for this potential rounding or scale measurement error, recyclables account for 72% of the total weight of the bags, and contaminants account for 28% of the bags.

Table 16. Recycling bags collected for the full audit on August 16, 2019 by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)	Weight of contaminants	% Weight of contaminants
Pier 45 (event)	8.1	2.45	30%
Pier 40	1.55	0.65	42%
Pier 25*	3.8	2.05	49%
Pier 40	1.3	0.00	0%
Pier 51	9.75	1.85	19%
Total	24.5	7.00	28%

Note. *Pier 25 data sheet accounted for more combined weight between recyclables and contaminants (4.16lbs) than the total value noted on the data sheet.

The types of recyclables to be counted were updated from the trial audit to the full audit. In particular, plastics were parsed out into multiple categories. Table 17 below reflects the total counts of all recyclable types counted in the recycling bags during the August 16, 2019 full audit.

Table 17. Count and weight of all recyclables in August 16, 2019 full audit recycling bags.

Categories (Plastic Only)	Tally	Weight
Plastic Beverage bottles:	42	2.9
Plastic non-beverage containers	0	0
Plastic food packaging	17	0.4
Plastic bags:	0	0
Plastic lids	32	0.35
Plastic cups	30	1.45
Plastic utensils	7	0.16
Plastic straws	17	0.12
Plastic fragments:	0	0
Foam cups	0	0
Foam fragments	0	0
Bottle caps	0	0
PLA (plant based)*	21	N/A
Aluminum Cans	33	1.15
Glass	13	10.65
Other*	1	0.05
Total	213	17.23

Note. *On two data sheets, Hudson River Park and Knology staff tallied PLA (plant-based) items in a separate location without weight. For consistency, all tallies are presented here and again in Table 17 but no weight is provided. The one Other item counted was a plastic toy.

Plastic alternatives were counted in both the table above and pulled out separately to be weighed. All values are included in the results presented above. A total of 1lb of plastic alternative products, including PLA Cups, PLA cup lid, PLA utensils was weighed. Adjusting for the total weight of the Pier 25 bag, 1lb is equivalent to 4% of the total weight of all recyclable bags. Recyclables were also counted by plastic type, as they were in the trial audit (Table 18).

Table 18. Count of plastic alternatives by type in August 16, 2019 full audit recycling bags.

Plastic Alternatives	Tally
PLA cups	14
PLA cup lids	5
PLA utensils	2
Paper cups	1
Paper straws	6

The table below reflects the total counts recyclables by recycling number that were counted in the recycling bags during the August 16, 2019 full audit.

Table 19. Count of recyclables by plastic type in the August 16, 2019 recycling bags.

Plastic Types	Tally
1 - PET	66
2 - HDPE	0
3 - V	0
4 - LDPE	0
5 - PP	19
6 - PS	11
7 - Other (including PLA)*	28*

Note. *For N^o7 recyclables, PLA items were not counted consistently. For consistency, categories were merged to provide an estimate of total tallied N^o7 recyclables.

August 16 – Landfill Bags

Six landfill bag data sheets from August 16, 2019 noted some varying numbers that made analysis difficult. On the Pier 45 data sheet and the Manhattan Youth sheet, the total weight of plastic recyclables, or contaminants, was higher than the total identified weight of the bag by 2.15lb and 2.25lb respectively. Due to these high discrepancies in total weight, no adjustments in weight were made to either sheet. A list of total bag weight as indicated on the respective data sheet is presented in Table 20.

Table 20. Landfill bags collected for the full audit on August 16, 2019 by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)	Weight of contaminants	% Weight of contaminants
Pier 45 (event)*	7.35*	-	-
Pier 40	12.1-	0.43	4%
Pier 25	16.1-	2.21	14%
Pier 40	7.50	6.90	92%
Pier 51	6.05	1.65	27%
Manhattan Youth*	1.75*	-	-
Total	50.85	11.19	29%

Note. *For Pier 45 and Manhattan Youth data sheets, total weight indicated was less than the weight calculated for all recyclables.

The weight of contaminants by percentage of the total weight is calculated, excluding Pier 45 and Manhattan Youth. Total tallies for recyclables removed from landfill bags are presented in Table 19 without weight, while the total number of plastic alternatives is presented in Table 20, and the total by recycling number is presented in Table 21.

Table 21. Count of all recyclables in August 16, 2019 full audit landfill bags.

Categories (Plastic Only)	Tally
Plastic Beverage bottles:	14
Plastic non-beverage containers	0
Plastic food packaging	39
Plastic bags:	3
Plastic lids	29
Plastic cups	47
Plastic utensils	17
Plastic straws	14
Plastic fragments:	1
Foam cups	3
Foam fragments	0
Bottle caps	0
PLA (plant-based)*	0
Aluminum Cans	9
Glass	3
Other:	2
Total	181

Note. Other items found were two latex gloves.

A combined total of fifteen PLA cups, lids and utensils were put in landfill bags (Table 20), rather than recycled or composted. Other alternatives included papers cups, straws and food packaging.

Table 22. Count of plastic alternatives by type in August 16, 2019 full audit recycling bags.

Plastic Alternatives	Tally
PLA cups	13
PLA cup lids	1
PLA utensils	1
Paper cups	10
Paper straws	1
Paper food packaging	3

Recyclables were also counted by plastic type. Comparing values in Table 23 below for recyclables counted in the landfill bags with recyclables counted in the recycling bags (Table 18), we find that more than double the amount of N^o.1 PET plastics were counted in the recycling bags than in the landfill bags, indicating an honest effort of park users to recycle these items. One example of a positive difference was at Pier 45, where an event was held within 24 hours prior to bag pick-up. Park users recycled 27 N^o.1 recyclables and threw away only 4.

Table 23. Count of recyclables by plastic type in the August 16, 2019 full audit landfill bags.

Plastic Type	Tally
1 - PET	30
2 - HDPE	0
3 - V	0
4 - LDPE	0
5 - PP	27
6 - PS	22
7 - Other (including PLA)*	23*

Note. *For N^o7 plastic recyclables, PLA items were not included consistently throughout in the category. Categories were merged to provide an estimate of total tallied N^o7 recyclables.

In contrast, we see that 8 more N^o5 PP plastic and 11 more N^o6 PS plastic items were thrown away than recycled, indicating a potential lack of knowledge of what can and cannot be recycled in recycling bins by Park users. One example of a stark contrast was at Pier 25, where seventeen N^o6 recyclables were thrown away while only 4 were recycled.

August 20 – Recycling Bags

The data sheets for the recycling bags for the full audit conducted on August 20, 2019 noted 7 bags that varied by weight from 17.05lb to 1.95lb. In two cases, total weight noted was less than combined weight for all components weighed separately.

Table 24. Recycling bags collected for the full audit on August 20, 2019 by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)	Weight of contaminants	% Weight of contaminants
14 th Street Park	8.95	2.55	28%
Hudson River Community Sailing*	1.95*	0.3	15%
Chelsea Waterside Park	3.25	2.45	75%
Pier 84*	17.05*	11.35	62%
Frying Pan	10.55	0.01	0%
Clinton Cove	2.05	0	0%
Pier 62	18.55	6.2	33%
Total	62.35	22.86	36%

Note. *Total weight noted above was less than combined weight for all components identified in the Hudson River Community Sailing and for Pier 84 recycling bags by 0.07oz and 0.45oz respectively.

Weight total for the Hudson River Community Sailing and Pier 84 bags were adjusted up from the reported amount to the full total of all recyclables, contaminants, and PLA products noted. In total, all bags weighed 63.77lb and recyclables accounted for 60%, or 38.26 of the total weight. Contaminants weighed 22.86lb or 36% of the total weight. For the bags from Chelsea Waterside Park and Pier 84, contaminants accounted for 75% and 62% of the total weight of the bag, respectively. Data collectors noted that at Pier 84, recycling bins and trash bins were not next to each other. The high percentage of contaminants indicates that Pier 84 could be a place to monitor more closely and expand the initiative.

Additional adjustments were made to the data sheet between the August 16 and August 20 full audit days toward categorizing plastic alternative products. Specifically, PLA items were no longer counted in this section. Table 23 below reflects the total counts of all recyclable types counted in the recycling bags during the August 16, 2019 full audit.

Table 25. Count and weight of all recyclables in the August 20, 2019 full audit recycling bags.

Categories (Plastic Only)	Tally	Weight
Plastic Beverage bottles:	76	6.9
Plastic non-beverage containers	11	0.3
Plastic food packaging	24	1
Plastic bags:	0	0
Plastic lids	28	0.26
Plastic cups	55	1.66
Plastic utensils	13	0.2
Plastic straws	17	0.12
Plastic fragments:	0	0
Foam cups	0	0
Foam fragments	0	0
Bottle caps	0	0
Aluminum Cans	11	0.41
Glass	18	13.75
Other*	2	0.15
Total	255	24.75

Note. *The other items counted were box cartons for boxed water.

Plastic alternatives were counted and accounted for 2%, or 0.95lb, of the total weight of 62.35lb. Twenty-five PLA cups and four PLA cup lids were counted. Recyclables were also counted by recycling number. The 14th Street Park bag contained eleven kefir bottles which are more rigid N^o.2 recyclable plastics.

Table 26. Count of recyclables by plastic type in the August 20, 2019 full audit recycling bags.

Recycling Number	Tally
1 – PET	107
2 – HDPE	11
3 – V	0
4 – LDPE	2
5 – PP	17
6 – PS	23
7 – Other (including PLA)*	29

Note. *For N^o.7 recyclables, all 29 items were PLA items.

August 20 – Landfill Bags

Data sheets for 7 landfill bags from the August 20, 2019 waste audit weighed in from 5.05lb to 21.85lb (Table 25).

Table 27. Landfill bags collected for the full audit on August 20, 2019 by weight.

Location of bag pick-up	Weight of bag (lbs./oz.)	Weight of contaminants	% Weight of contaminants
14th Street Park	10.35	0.45	4%
Hudson River Community Sailing*	10.95	1.5	14%
Chelsea Waterside Park	21.85	0.5	2%
Pier 84*	17.2	5	29%
Frying Pan	8.5	1.4	16%
Clinton Cove	5.05	5.05	100%
Pier 62	16.5	0.85	5%
Total	90.4	29.5	16%

In general, the inconsistencies of data collection that occurred during the August 16 waste audit were not found on the August 20 data sheets. However, on the data sheet for Clinton Cove, a note was provided that all trash in the landfill bag was paper or cardboard, though no weight was given for contaminants. Given this note, Knology researchers used the total weight of the bag as the weight of contaminants.

Pier 84 also had a high percentage of contaminants, weighing in at 5lb, or 29% of the total weight of the bag. In total, including the adjustment made for Clinton Cove, about 16%, or 14.75lb, of the total weight (90.4lb) of all bags was found in contaminants. Such contaminants included, plastic lids, plastic bottles, cardboard, paper, PLA cups, bamboo plates, straws and utensils. A complete list of all plastic contaminants found in the August 20 landfill bags is found in Table 28 below.

Table 28. Count of all recyclables in August 20, 2019 full audit landfill bags.

Categories (Plastic Only)	Tally
Plastic Beverage bottles:	13
Plastic non-beverage containers	1
Plastic food packaging	27
Plastic bags:	0
Plastic lids	11
Plastic cups	54
Plastic utensils	34
Plastic straws	5
Plastic fragments:	1
Foam cups	0
Foam fragments	0
Bottle caps	0
Aluminum Cans	8
Glass	1
Other:	12
Total	167

Note. Other items found were paper cartons and aluminum food packaging.

A combined total of forty-two PLA cups were thrown away, rather than recycled or composted. At Pier 84, this was particularly drastic, with thirty-six PLA cups being thrown away. An additional 8 paper straws were found at Pier 84. As indicated before, Pier 84 recycling bins and trash bins are not located near each other.

Recyclables were also counted by plastic type. Comparing values in Table 29 below for recyclables counted in the landfill bags with recyclables counted in the recycling bags (Table 26), we again find that more than double the amount of N^o1 recyclable items were counted in the recycling bags than in the landfill bags. One example of a positive difference was at 14th Street Park. Park users recycled 34 N^o1 recyclables and threw away only 3. At Hudson River Community Sailing, 23 N^o1 recyclables were recycled and none were thrown away.

Table 29. Count of recyclables by plastic type in the August 20, 2019 full audit landfill bags.

Plastic Type	Tally
1 - PET	50
2 - HDPE	2
3 - V	0
4 - LDPE	0
5 - PP	20
6 - PS	18
7 - Other (including PLA)*	44

Note. * For N^o7 PLA plastic, all 44 items were PLA items.

In contrast, we see about more N^o5 PP plastic and about the same number of N^o6 PS plastic recyclable items were thrown away than recycled. One example of a stark contrast was at P62, where eleven N^o6 PS plastic recyclables were thrown away while none were recycled.



Results: Community Perceptions

Visitors' Survey

Knowledge of POP

The vast majority of visitor survey respondents (86%) had not heard of POP prior to taking the survey. Eleven people who live in the neighborhood and nine individuals who don't live in the neighborhood had heard of POP.

Table 30. Percent of survey respondents that had heard of Park Over Plastic

<i>Have you heard of Park Over Plastic?</i>	<i>n = 208</i>	<i>Percent</i>
Yes	21	10%
No	178	86%
I'm not sure	9	4%

Out of the total 66 people who answered the question *How or where did you hear about it (the POP initiative)?*, ten respondents indicated they had heard about the initiative online, and 2 reported they had seen a sign about the initiative. We found that age group and proximity to the Park has little impact on how respondents found out about POP.

The majority of all respondents accurately indicated the mission of POP based on the name; 52 respondents, or 34%, said it is about eliminating / reducing plastic, while 28%, or 43 respondents said that name Park Over Plastic suggested it is about protecting the park or keeping it clean.

Respondents living in the neighborhood showed a greater ability to indicate what POP is about (Table 31). A total of 61% of neighborhood residents identified that the name suggests eliminating or decreasing plastic and plastic use, while only 25% of respondents who don't live in the neighborhood provided that same response. At the same time, for a small portion of respondents the name of the initiative was misleading. Out of the overall respondents, 7 interpreted it to mean that the Park wants to build a park that is literally on top of plastic.

Table 31. Responses to the meaning of the name *Park over Plastic*, by location.

	Live in neighborhood (n = 38)		Do not live in neighborhood (n = 104)	
	n	%	n	%
Eliminating / decreasing plastic use	23	61%	29	28%
Protecting the park / keeping the park beautiful	11	29%	31	30%
Prioritizing nature / putting the park before plastic	7	18%	12	12%
Recycling	1	3%	14	13%
The park literally on top of plastic	3	8%	3	3%
General environmentalism	3	8%	12	12%
Keeping plastic out of the water	2	5%	1	>1%
Awareness	2	5%	1	>1%
Garbage Removal	1	3%	1	>1%
Don't know	3	8%	2	2%

Note. Responses could fall into more than one coding category so total percentage may exceed 100%.

Motivations for Reducing Plastic Use

Survey respondents were asked to rate different motivations for reducing plastic use on a scale from *Strongly Disagree* (1) to *Strongly Agree* (7). Overall responses indicated that the greatest motivations for reducing plastic use is to protect the environment and to protect one's own health (Table 32). In addition, respondents also reported a high level of motivation to support POP. However, given the high levels of respondents who hadn't heard of POP prior to taking this survey (Table 30), we encourage interpreting this finding cautiously.

Table 32. Reasons why Park users choose to reduce plastic use.

	n	M	SD
To help protect the environment	215	4.70	0.77
To protect my health	208	3.96	1.19
To support the Park Over Plastic initiative	177	3.90	1.53
Because my friends or family ask me to	196	3.00	1.55
For financial incentives (e.g., when I return cans or bottles)	197	2.90	1.59

When comparing responses by age group, respondents age 65 and older ranked financial incentive as a higher motivation than any other group ($M = 3.7, SD = 1.93$), compared to the means of the other groups ranging from ($M = 2.53, SD = 1.45$) to ($M = 3, SD = 1.61$). On the other hand, people ages 18-25 marked the influence of friends and family higher than any other age group ($M = 3.6, SD = 1.1$), compared to other groups ranging from ($M = 2.5, SD = 1.42$) to ($M = 3.1, SD = 1.59$).

Perceptions of Recycling Opportunities

A total of 40% of overall survey respondents indicated that it is easy or very easy to recycle in Hudson River Park. Interestingly, only 27% of those who live near the Park said that recycling in the Park is an easy or very easy endeavor in comparison to 45% of those who don't live in the neighborhood (Table 33). Additionally, respondents who live near the park were more likely to suggest more recycling bins (25%) than respondents that don't live near the park.

Table 33. Responses to how easy it is to recycle in the park by location.

	Live in neighborhood (<i>n</i> = 56)		Do not live in neighborhood (<i>n</i> = 123)	
	<i>n</i>	%	<i>n</i>	%
Very Easy / Easy	15	27%	55	45%
Moderately Easy	10	18%	20	16%
Not easy / Hard	14	25%	20	16%
Neutral	2	4%	4	3%
Requested more recycling bins	14	25%	15	12%
Believe there are enough of recycling bins	2	4%	17	14%
Requested more signs	0	0%	3	2%
Not sure	2	4%	9	7%
NA / Miscellaneous	1	2%	4	3%

Note. Responses could fall into more than one coding category so total proportions may exceed 100%. Miscellaneous answers included “good”, and “Very important to keep it clean/healthy for all”.

Support to Reduce Plastic Use

When asked how the Park could help reduce plastic in the park, respondents were asked to rank a selection of six actions in order from *most important* (1) to *least important* (6). Results were consistent across age groups and location, and indicated that survey respondents are most interested in community-based and infrastructure-based changes. The highest ranked priority was providing more plastic recycling bins ($M = 2.66$). This was followed by urging local business owners to provide alternatives to plastic ($M = 3.26$) and creating clear signs on where to recycle plastic containers ($M = 2.62$).

Table 34. Overall responses ranking the ways the Park can help reduce plastic.

Ways the Park could help reduce plastic in Hudson River Park	<i>n</i>	<i>M</i>	<i>SD</i>
Provide more plastic recycling bins	140	2.64	1.59
Create clear signs on where to recycle plastic containers	140	3.24	1.60
Urge local business owners to provide alternatives to plastic containers	140	3.25	1.71
Provide more drinking fountains	140	3.63	1.71
Provide information on alternatives to plastic containers	140	4.11	1.60
Provide educational resources for why we should reduce plastic use	140	4.19	1.56

Personal & Household Actions

Respondents varied in frequency of personal actions related to the avoidance or use of plastics in their daily lives, like drinking tap water, drinking from single-use containers, using reusable water bottles, ordering food with plastic or Styrofoam packaging, and using plastic straws. Regardless of where respondents live or age group, the majority of respondents use tap water instead of bottled water every day. We also found that about half of respondents use a reusable water bottle every day. Overall, 92% of respondents reported that they recycle at least half of their plastic recyclables at home including the 59% who recycle all of the recyclable plastic they use at home. However, comparisons between age groups showed that those who are 18-25 order food with plastic / Styrofoam packaging and use plastic straws more often than the other groups.

Table 35. Proportion of plastic recyclables respondent recycles at home.

Percent of plastic recycled at home	<i>n</i>	%
All of it	123	59%
More than half of it	49	23%
Half	20	10%
Less than half	11	5%
None	6	3%

Note. *N* = 209.

Tenant Businesses

Interviews with Leaders

Motivations to Support Reducing Plastic

Overall the tenants we spoke with are in support of taking action to reduce or eliminate single-use plastics in Hudson River Park. Most indicated that though switching to plastic alternative products has a higher financial cost, it is understood to be the morally “right” thing for businesses and organizations to do. Some specifically indicated that environmental stewardship is a major component of their organizations’ mission.

Outside of the initiative, almost all tenants had some sort of sustainability or environmental initiative in place (e.g. switching to renewable energy, composting food waste). Additionally, many were already taking steps to reduce plastic, especially by eliminating plastic water bottles from their business. One group even mentioned that they had been working on reducing plastic for the past ten years. Another tenant set up their own water filtering system so they can provide drinking water to clients and encourage them to use reusable water bottles. Those who already had environmental initiative in place felt that the POP initiative aligned with and supported their organizations' goal. Some shared that their organization was committed to promoting sustainability through other ways in addition to reducing single-use plastic.

Many tenants shared that helping keep the river clean is a priority for the organizations that take visitors out onto the water (e.g. boating, kayaking, rowing), or for those that provide places for people to look at the river (e.g. restaurants, piers, museums, festivals). A tenant shared that sometimes their clients *"get a little spooked out"* when they see a lot of plastic bottles floating in the water and it *"reinforces the idea that the river is polluted and that is not positive."*

From a business perspective, we heard from multiple tenants that it can be beneficial to show your business is socially conscious. For example, one vendor expressed that their paying members expect them to have the *"best"* of everything and that includes plastic alternatives that don't harm the environment.

Current Support of POP

Tenants' high motivation to phase out plastic was further reinforced as they described being highly supportive of POP. Additionally, they are glad to be a part of a collective of people working together to improve the Park. One said that they were proud of the Park's commitment to eliminating plastic: *"it's really important to show that you are behind something that supports your environment. Not only for the park to see that more businesses are stepping behind them with this initiative, but also putting our name behind it."*

Though the majority of tenants were working to reduce single use plastic before they heard of the initiative, we heard from various tenants that POP has helped push them further toward action. For example, one tenant shared that though they had already eliminated plastic water bottles, the initiative has motivated them to also stop buying plastic utensils when their organization holds events. They said, *"We have a large stock pile [of single-use plastic products] so we aren't gonna throw them out... we're going to use them up but then going forward we are going to try to use bamboo or some better material."*

Tenants communicate with their staff about strategies and expectations about reducing single-use plastic. They also mentioned talking about POP during weekly meetings, and occasionally in email updates. One tenant shared that they instruct staff not to automatically give out plastic straws in drinks that customers order, and instead provide them only if requested. Other businesses support the elimination of plastic throughout their staff by installing water bottle fill stations, or providing a dishwasher to encourage employees to bring their lunch in reusable containers. Multiple tenants shared that most staff members have reusable bottles, but that they provide reusable water cups for staff to use as well.

POP appears to have inspired tenants to take specific actions beyond their initial environmental goals. One shared that the initiative encouraged them to switch from plastic water bottles to boxed water. They shared, *"We were using [plastic-bottled water brand] before the green initiative happened and we got rid of that, and now we sell only boxed water. We started that this year [after signing on to the POP initiative]."* Another shared that since they have the Park's water bottle fill station nearby, they send clients who sign up for events *"a confirmation email that says bring a refillable canister."*

Only a handful of tenants we spoke with were familiar with the Green Resource Guide, and only one had used the online resources provided by the Park, but didn't clarify whether it was the Green Resource Guide. A few were unfamiliar with either, asked to have it sent to them again, or mentioned that other members of their staff had seen the resources.

Those who hadn't utilized the Green Resource Guide shared that they generally rely on their vendors to keep them up to date on the best alternative products on the market. They shared that is how they learned about options like palm leaf plates and sugar cane forks. One tenant shared that since they purchase so many products it's best if they can all come from one place, which is why use the EcoProducts company. Others shared that their knowledge of alternative products comes from online, however no one shared specific websites. Another who had seen the Green Resource Guide thought it should include more information about alternatives to plastic bags, including garbage bags.

Multiple tenants indicated that their vendors show a lot of interest in plastic alternative products, and one tenant felt that reducing plastic use *"is the direction of the market"*.

Additional Support Needed

We heard that some tenants would benefit from additional support more than others mostly due to proximity to recycling bins in the park, the operating hours or seasons of their organization, and the type and volume of waste their organization produces. Multiple organizations shared they didn't need additional support, while others requested the Park provide biodegradable trash bags to their tenants who purchase garbage bags from the Park and find a way to stop independent vendors from selling bottled water to park visitors.

Additionally, one tenant shared that a sign or a plaque to hang on their building demonstrating their commitment to the initiative to passersby would be a nice addition. This person thought this approach would help them know if their neighbor is participating, and make it easier to hold each other accountable if they saw another participating organization accumulating a lot of plastic waste.

Some were frustrated that the campaign focuses only on plastic, and voiced that plastic is only one aspect of sustainability. One tenant shared that *"[The Park] should be thinking about more than just plastic. Plastic is a big problem, but there are other things you can do. There are a lot of other things tenants can do that contribute to the overall "green" goal that go beyond plastic bottles. My opinion is you don't just look at one thing, you look at it holistically..., force some of the tenants to commit beyond just plastic bottles..."* Another tenant suggested the Park could take stronger action by adding language about single-use plastic regulation into the leases of new tenants in the park.

We also heard the suggestion that the initiative should focus on strategically removing plastic from the river in places where it naturally accumulates and which are particularly visible to Park visitors.

Barriers & Concerns

The financial burden of eliminating single-use plastic was mentioned by almost all tenants indicating the cost is one of the primary barriers for tenants. One organization shared that because their organization is small and mostly volunteer-run, it's not financially feasible to entirely phase out plastic. They shared that they *"Will not never be able to phase out plastic without financial support because the alternatives aren't very good and are really expensive. Eliminating plastic is the right thing to do, but other than that, [it has] no real value and will cost a lot of money."*

Another shared that they're unsure if switching to alternative products is a smart business move because even though it's the morally right thing to do, it's profitable to sell bottled water and spending more money on eco-friendly products may take money away from other missions the organization has. Fortunately, multiple tenants shared that the business is moving in the right direction, and with increasing demand for plastic alternatives, the more affordable they will become.

Another challenge is that many activities that occur in the Park require visitors and participants to stay hydrated and many people aren't always prepared with a reusable water bottle. To help with this, one organization shared that they ordered a bunch of metal water bottles that people can borrow or purchase while they are participating in one of the organization's events. Another challenge we heard from one tenant is that because of the demand for water in the Park, non-tenant vendors sometimes sell single-use water bottles to people standing in lines or walking in the park, which is hard to control.

Contracts that include vending machines containing single-use plastic items is another challenge facing multiple tenants. One tenant shared that though they have other sustainability programs going on, the only reason they couldn't sign the Green Park Initiative was because they have a contract with Coca Cola, and Coca Cola uses plastic bottles in vending machines. When asked about interest in addressing the vending machines, one tenant responded that they are hoping Coca Cola will soon switch to canned beverages.

Walking long distances every day to deliver their recycling was another obstacle mentioned. Another tenant added that the Park supplies garbage bags for their business, and in order to eliminate plastic entirely the Park would have to provide biodegradable trash bags. These bags, however, generally aren't strong enough, the tenant commented. One tenant voiced general disappointment that New York City hasn't implemented a plastic bag ban.

Park Staff

Knowledge & Support of POP

Staff have been charged by Park leadership to embrace POP and integrate its practices into their daily work life and the events they facilitate. Of 46 full-time staff members who participated in the survey, 44 had previous knowledge of POP, while 1 respondent had not heard of the initiative and 1 was unsure. All six of the part-time staff and 6 of the 8 seasonal-staff employees had previous knowledge of the initiative. Overall, all staff felt moderately to very confident that they would be able to support the initiative given the resources provided to them (Table 36).

Table 36. Park staff’s level of confidence in supporting the POP initiative given the resources provided to them.

Staff type	Very confident	Moderately confident	A little confident	Not at all confident
Full-time staff	31	13	2	0
Part-time staff	3	3	0	0
Seasonal staff	5	3	0	0
Total	39	19	2	0

Note. N = 60.

When asked what they had heard about POP, staff responses (N = 54) were remarkably consistent, indicating a high degree of awareness about the initiative. Most staff mentioned what they considered to be POP’s goal – the **reduction** or **elimination** of single-use plastics, or minimizing the use or availability of these materials as a step toward completely ridding the park of plastic. In the words of one staff member, “HRPT is trying to use as little plastic as possible if not eliminate all together.” Twenty responses focused primarily on reduction, using the words *reduce*, *reducing*, *reduction* or a synonym to convey the same idea. Meanwhile, 13 responses noted complete elimination as the goal, using words like *eliminate* and its variants. Another six responses included both ideas – reducing and ultimately eliminating all plastic in the Park. Many answers also included specific examples of single-use plastics, such as cups, straws, cutlery, and disposable bags.

All Park staff were asked to rate their own knowledge about reducing plastic waste from *I don’t know anything* (0) to *I know a lot* (100). Overall, staff reported a moderate level of confidence in their own knowledge, returning an average score of 72.7 with a standard deviation of 21.5. Staff members frequently noted specific ways that the goal of reducing plastic waste would be achieved, such as educating the public, working with vendors, conducting research on plastic pollution, installing water bottle re-fillers, and ensuring vending machines only sell beverages in recyclable cans. Eleven responses conveyed the idea of partnerships – how the Park is working with tenants, permittees, concessionaires / vendors, employees, and visitors to the park to achieve POP’s goals. Three stated that the desired outcome of reducing single-use plastic consumption would be a cleaner environment that is better for wildlife. Only one person mentioned a timeline for the initiative (2020) and did so with a question mark to indicate uncertainty.

Staff saw various roles for themselves when asked how they can support POP ($N = 55$). The vast majority of responses ($n = 45$) referred to Park staff collectively and suggested various ways that, together, they can work toward achieving the goals of reducing and eliminating single use plastic. For example, one suggested, *"Making better decisions in recycling, choosing alternative plastics when necessary, educating each other and spreading the word."* Another thought that staff members could *"lead by example and consider opportunities to reduce plastics in everything we do."*

Other responses ($n = 10$) took a more personal tone and were written in the first person singular. These respondents documented ways that they, as individuals, were currently contributing to the initiative or could do so in the future. One said, *"I myself have stopped using plastic bottles (unless I intend to re-use many times prior to recycling), and have switched to reusable metal bottles for coffee and water."* Others considered their context – i.e., the department where they work or their job responsibilities – as affording them opportunities to support the initiative. These job-specific opportunities included pursuing related research, or making conscious choices about office supplies: *"I can start using sustainable materials that use less plastic and aren't hazardous to the environment."* Whether they made generalized or personalized comments, our analysis showed that all respondents clearly thought that staff play a supportive role and were able to list concrete action steps.

A number of staff members ($n = 14$) saw their role as helping to educate or encourage others, especially family and friends, about reducing plastic consumption and promoting awareness of the negative consequences of plastic pollution. Similarly, several staff thought it was their role to set an example through their own actions ($n = 5$). For example, *"Bring reusable plastic or metal water bottles to work and pack your lunch in reusable containers [and] lead by example and consider opportunities to reduce plastics in everything we do."*

Survey responses indicated that having access to certain resources would help Park staff further advance the goals of the POP initiative. Fifty-three staff members answered this question, while seven left it blank and four indicated that they already had what they needed. Not all ideas were explained clearly enough to interpret (e.g., one-word responses such as "video" or "water bottles"). One respondent suggested they might actually be part of providing needed resources, given their role in finance.

Meaningful answers to this question can be grouped into two main categories: physical resources ($n = 20$) and knowledge or skills ($n = 15$) resources. Those who cited physical resources primarily noted the need for sustainable alternatives to items currently used by staff. For example, one wrote, *"access to reusable mugs & cutlery in the office,"* and another commented, *"containers that are biodegradable that would work with transporting lunches and/or beverages."* In some cases, responses cited positive developments that should be continued, such as providing staff with refillable bottles, installing more water bottle refill stations throughout the park, and replacing plastic bottles with aluminum cans in vending machines.

Intangible responses largely referenced staff members' lack of awareness and need for additional information, such as *"a list of alternatives/brands that are known to be plastic free."* Some responses also mentioned existing resources that were already having a positive effect, such as a poster providing information on reducing plastic. Other specific intangible

ideas included the following (in some cases, the bulleted themes represent ideas mentioned in multiple survey responses).

- **Provide purchasing guidelines:** *“Tips on where to buy more sustainable products, and where to find information on products / alternatives that I rely on (like laundry detergent and Chapstick).”*
- **Train staff in strategic communication:** *“Helping with language/strategy for sharing information with friends and family without seeming preachy and condescending.”*
- **Clarify priorities:** *“A clearer Park vision around sustainability goals.”*
- **Keep staff up-to-date:** *“Updated information on Park Over Plastic as it becomes available, and details about the initiative as it progresses.”*

Many of the suggestions were concrete and actionable, and have been included in the list of recommendations at the end of this report.

Personal Actions

Park staff were asked about a number of personal actions they take toward reducing plastic waste. Over 90% of staff members drink tap water between once a week and everyday (Table 37).

Table 37. Responses to the question *How often do you drink tap water?*

Staff status	Every Day	More than once a week	Once a week	More than once a month	Once a month	Every few months	Never
Full-time staff	35	5	1	0	0	1	4
Part-time staff	5	1	0	0	0	0	0
Seasonal staff	7	1	0	0	0	0	0
Total	47	7	1	0	0	1	4
Percentage	78%	12%	2%	0%	0%	2%	7%

Note. N = 60.

Thirty-three percent of staff members drink water from single-use plastic containers at least once a week (Table 38). Nineteen percent never drink water from single-use plastic containers.

Table 38. Responses to the question, *How often do you drink water from single-use plastic containers?*

Staff status	Every Day	More than once a week	Once a week	More than once a month	Once a month	Every few months	Never
Full-time staff	2	6	8	7	7	8	7
Part-time staff	0	1	1	0	0	1	3
Seasonal staff	1	0	1	1	2	2	1
Total	3	7	9	8	9	11	11
Percentage	5%	12%	16%	14%	16%	19%	19%

Note. N = 58.

At Work

Ninety percent of staff members recycle more than half of their plastic recyclables *at work* (Table 39).

Table 39. Responses to the question, *Approximately, what proportion of plastic recyclables do you recycle at work?*

Staff status	All of it	More than half	Half	Less than half	None
Full-time staff	26	15	3	2	0
Part-time staff	3	3	0	0	0
Seasonal staff	3	4	1	0	0
Total	32	22	4	2	0
Percentage	53%	37%	7%	3%	0%

Note. N = 60

Most staff members indicated (Table 40) that they were likely to recycle beverage bottles (76%) and take-out containers (63%) and while under half said that they typically recycle utensils (47%). Twelve staff members provided additional responses of other types of single-use plastics they typically would recycle, including: cleaning products (2), cups (2), packing materials (1), rigid plastic containers (3), and yogurt containers (1). One of the twelve staff members noted they “wash single-use utensils and re-use”, one said they recycle “everything possible,” while another noted they recycle plastic bags.

Table 40. Responses to the question, *Which of the following single-use plastic items do you recycle at work?*

Staff status	Beverage bottles	Utensils	Take-out containers
Full-time staff	35	20	27
Part-time staff	5	3	5
Seasonal staff	5	5	5
Total	45	28	37
Percentage	76%	47%	63%

Note. N = 59. Select all that apply question. One respondent left all options blank.

At Home

Staff members noted that they were slightly more likely to recycle all of the plastic used *at home* (62%) than they were *at work* (53%).

Table 41. Responses to the question, *Approximately, what proportion of plastic recyclables do you recycle at home?*

Staff status	All of it	More than half	Half	Less than half	None
Full-time staff	29	14	0	1	2
Part-time staff	3	3	0	0	0
Seasonal staff	5	1	1	0	1
Total	37	18	0	2	3
Percentage	62%	30%	0%	3%	5%

Note. N = 60.

All categories of items are recycled at higher rates *at home* than *at work*. Most staff members indicated (Table 42) that they were likely to recycle beverage bottles (89%) and take-out containers (71%) *at home*, while half said that they typically recycle utensils. Seven staff members provided additional responses of other types of single-use plastics they typically recycle, including: cleaning products (1), general food packaging/containers (4), toiletries (1), and yogurt containers (1). One of the staff members noted they recycle “*all plastics*.”

Table 42. Responses to the question *Which of the following single-use plastic items do you recycle at home?*

Staff status	Beverage bottles	Utensils	Take-out containers
Full-time staff	39	20	32
Part-time staff	5	3	5
Seasonal staff	6	5	3
Total	50	28	40
Percentage	89%	50%	71%

Note. N = 56. Select all that apply question. Those who selected “None” in Table 41 skipped this question. One additional respondent left this question blank.

Barriers to Reducing Plastic Use

Park staff were asked to about barriers they experience in reducing plastic use. Table 43 details responses to specific barriers faced by Park staff. For most items, staff disagreed that these are barriers they face when reducing plastic use. However, most staff (63%) agreed or strongly agreed that local businesses that they frequent do not provide alternatives to plastic containers.

Table 43. Responses to the Barriers staff felt they faced (N = 60)

	Strongly Agree		Agree		Neither Agree nor Disagree		Disagree		Strongly Disagree	
	n	%	n	%	n	%	n	%	n	%
I have limited information about alternatives to single-use plastics	1	2%	8	13%	7	12%	26	26%	18	30%
There are limited options from local businesses to get alternatives to plastic containers	6	10%	32	53%	9	15%	8	8%	5	8%
I'm concerned about the hygiene of the recycling bins.	1	2%	7	12%	13	22%	16	16%	23	38%
Recycling can be a lot of effort	2	3%	7	12%	6	10%	23	23%	22	37%
There is unclear signage on recycling bins	3	5%	9	15%	11	18%	20	20%	17	28%

Note. Bolded values indicated highest percentage in each row.

Park staff were asked to list other barriers they experience to using fewer single-use plastic items at Hudson River Park. Twenty-eight people provided an answer to this question. The vast majority described obstacles that were seemingly within the Park's ability to control, where overcoming the perceived barrier was a matter of decision making or setting priorities consistent with POP. Five staff members wrote about the vending machines, mostly noting that items being sold from machines are wrapped in plastic. One response strongly recommended (in all caps) that vending machines be removed completely. However, another noted the Park's relationship with the Coca Cola as a sponsor, potentially indicating a financial disincentive for removing the machines.

Other barriers suggested to reduce plastic use included providing an alternative to plastic drinking fountain cups and adding more and larger recycling bins to encourage people to recycle. *"There are just not enough recycling bins throughout the park to making recycling easier for the average person. These bins tend to fill up rather quickly on Sundays."* Another staff member commented on the general lack of clarity when it comes to the proper way to

recycle: *“Trying to find what is recyclable and what isn't, is always hard for me, especially when there are multiple recycle bins for different items that aren't marked properly.”*

Three respondents commented on the need for the Park to help staff members cut down on plastic use in kitchen areas – either by installing dishwashers, supplying reusable dishes, or having the kitchens cleaned. The need for dishwashing soap and sponges to be able to wash and reuse plastic utensils was mentioned as a specific need for the West 26th Street maintenance building. One respondent thought that improving the kitchens was unlikely and suggested that, at the very least, compostable utensils replace the current plastic cutlery for employee use.

The final group of barriers that emerged in staff survey responses related to plastic packaging ($n = 3$), mostly concerning shipping. This, too, was seen by at least one respondent as being within the control of Hudson River Park to address: *“STOP purchasing plastic products! Demand that suppliers STOP shipping us products in plastic containers.”*

A few responses mentioned barriers that lie outside the control of the Park, such as the use of plastics by local restaurants for takeout containers, businesses that assume customers want plastic lids or bags without giving them the option, the wind blowing plastic into the river, or simply wondering whether the Park's drinking water was actually safe for consumption. Staff did not suggest ways the Park could overcome these barriers.



Discussion & Recommendations

This baseline study provided valuable insights on how the community that is directly interacting with the Park in distinct ways can play a role in supporting the POP effort to reduce plastic use. Overall, the mixed method study revealed that the community comprising visitors to the Park, tenant businesses, and staff at the Park, are all motivated and eager to support the initiative. At the same time, the waste audit demonstrated that plastics are still a commonly used product in the Park, and their compliance with recycling efforts can be improved.

Importance of the Waste Audit

The waste audit analysis provided additional insights about Park user recycling behaviors, particularly around recycling N^o1, N^o5 and N^o6 recyclables. It identified locations where a lot of contaminants were found in the recycling containers (e.g., Pier 84), which could serve as potential test sites to study the effects of signage to be developed. Across sites, the Park can be strategic about information and placement when thinking about signs to include, considering target audiences and the types of plastic that are most common.

Inconsistencies in data collection occurred in the waste audit, leading to difficulties in aggregation. Recorded weight was not necessarily an error in calculation, rather a choice that data collectors made in documenting the data. Specific challenges to consider are how lightweight plastics such as straws, bottle caps, and wrappers are weighed and then noted on the data sheet. Another point to consider is how the presence of liquid in plastic containers is accounted for on the data sheet. For the next phase of the initiative, there are opportunities to refine the data collection sheet, so that true recyclable values and weights are counted consistently.

POP Resonates with Visitors, Especially Nearby Residents

At this early stage, even though visitors are generally not aware of the initiative, they indicated interest in support of POP's vision to reduce plastic use in the Park. Considering the majority had just recently learned about POP it is hard to gauge whether their motivation will be enduring. However, those who live in the vicinity of the Park were slightly more aware of the initiative, having seen signs in the Park and online resources, suggesting that preliminary efforts undertaken to promote the initiative are reaching nearby residents who are likely to be more frequent visitors to the park than other visitors. Those living near the Park also feel it's harder to recycle in the Park, and requested more recycling bins and water fountains. This may be tied to their greater familiarity with the neighborhood, suggesting they may be a prime group to engage in identifying key locations for new bins.

While all visitors were strongly motivated to reduce plastic use for its positive implications on the environment, subgroups of visitors expressed different motivations. Younger visitors' responses, in comparison to older visitor's responses, indicated that they are more influenced by pro-environmental social pressure from friends and families. On the other

hand, older groups were more motivated by financial incentives. We see opportunities here for designing signage that may especially appeal to these subgroups of Park visitors.

Visitors are also attentive to the larger social context and physical infrastructure of the Park as they provided suggestions for how the Park can continue to support plastic reduction. They ranked adding more recycling bins and engaging local businesses to provide alternatives for plastic as the highest need, aligning with what the initiative is already doing.

Tenants Can Be Active Allies

The tenant businesses in the Park are a deeply motivated group, several of whom are also independently leading environmental initiatives at their own organization in addition to their commitment to the initiative. Across different types of businesses, from non-profits catering to a niche audience (e.g., kayakers), to larger for-profit businesses that cater to wider audiences (e.g., tourists in New York City), the interest and moral commitment to support the initiative is strong.

This diversity in types of businesses, their priorities, and financial needs determined their level of commitment to POP. A common concern is the financial costs of eliminating single-use plastic, which is especially relevant for the smaller businesses. Saying that, most tenants rely on their vendors to provide alternatives to plastic, or have independently looked for options to replace plastics. Most had not used or were not aware of the online resources created through the initiative, including the Green Resource Guide that identifies sustainable alternatives. This finding suggests that the Park could do more outreach around the resources being created specifically for the tenants.

Staff at tenants' businesses is a key audience that the outreach can also target to ensure business-wide buy-in for the Initiative. To support this, in the next year, Knology will work closely with the Park and their tenants to assess tenant staff's awareness and needs with regards to single use plastic reduction.

Tenants were also attentive to the broader context in which the initiative was being developed, especially those with existing strategies or commitments to sustainability. They emphasized that plastic use reduction was one specific approach to commit to environmental protection, among a suite of other interconnected environmental issues that the Park could support. In essence, we see a key implication here for the POP initiative – that at least some of the tenants may be able to provide insights and guidance to complement the initiative through other environment-focused issues.

Park Staff Are Primed to Support POP

Park staff's perspectives indicate that they are a key audience for the Park to support and engage more actively in the initiative. They are motivated, interested, and eager to help advance plastic reduction and elimination within the Park. They are already exemplifying good stewardship by reducing plastic use at home and work, indicating they can be role models for the Park community, including new staff.

Some staff creatively and expansively conceptualize how they could leverage their specific role at the Park to support the initiative. This behavior not only aligns the asks of the

initiative to their roles and responsibilities at the Park, but will likely reduce perceptions of burden if they are asked to increase support of the initiative.

Most staff already know about the initiative, and feel confident in their capacity to help support it. However, they expressed the need for more resources to become stronger champions for the initiative so that they can support others in the Park community in reducing plastic use. Somewhat similar to the visitors who were interested in the physical infrastructure of the park, staff were attentive to the physical resources available at work (including access to plastic alternatives) that could help them reduce their personal plastic use. At the same time, they expressed more need for information to grow their knowledge and skills. For example, some Park staff were aware of barriers that lay outside the regulation of the Park, such as the use of plastics by local restaurants for takeout containers, businesses that assume customers want plastic lids or bags without giving them the option, or the wind blowing plastic into the river, and yet unsure how to help. We interpret these rich insights from staff as indicators that staff would appreciate an active training to becoming more knowledgeable, skilled, and engaged agents in supporting the initiative.

Recommendations

Based on these findings, we make the following recommendations.

1. Create outreach materials and identify communication strategies to reach and support visitors, tenants, and Park staff reduce plastic use.
 - a. For visitors, develop materials that appeal to the group as a whole, and also ones specifically aimed at youth and older audiences (emphasizing social and financial benefits, respectively). To be more inclusive of all age groups, signage and information could specifically focus on monetary benefits from reducing plastic use and draw attention to messages from youth supporting the initiative.
 - b. Create more outreach (e.g., messages) and physical infrastructure (e.g., bins) about disposal of PLA products in the appropriate ways.
 - c. For tenants, emphasize and highlight the Green Resource Guide and other resources that may offset costs for eliminating use of plastics altogether.
 - d. Recruit a small group of tenant advocates, who have existing commitments to sustainability, to serve as advisors as the initiative progresses. We see this as a way to continue to foster their support of the initiative, while also learning from their experience.
 - e. Support tenants' public commitment to the Initiative, by developing signs that tenants can display and reinforce their interest and action towards reducing single-use plastic.
 - f. For Park staff, provide a capacity building training to engage them more deeply in the initiative. We recommend a comprehensive strategy that not only builds their skills and competencies, but also identifies how the initiative aligns with the Park's larger mission. This approach could include more information about recycling options; trainings on how to communicate strategically with Park visitors and their social groups; developing a strategy

to help staff leverage their specific role at the Park to advance the park, as well as engaging staff members in refining and expanding POP.

2. Leverage broader sustainability programs and strategies at the Park (beyond plastic reduction) that could help complement and support POP. This may simultaneously be a way to engage staff in strategizing about how their work at the Park can support and advance the initiative.
3. Engage residents who live near the Park in the initiative. Volunteering or feedback opportunities may help identify the most appropriate locations for additional infrastructure in the Park (e.g., recycling bins, water fountains), as well as ways the surrounding community can support the waste audit.
4. Identify key locations from the waste audit that may be useful to test the progress of the initiative. Interpretive signage can be piloted around those sites to monitor the use of single-use plastic with the aim to track its reduction over time and increase recycling over time.
5. Conduct a waste audit training with staff so that all recyclables are understood, and data collection sheets are appropriately filled in. Document staff questions, as these may help inform the development of signage.
 - a. Refine the approach to weighing and counting small plastics, and how to handle liquids in bottles. Update the protocol to reflect the revised approach so that data collection guidelines are clear and easy to follow.

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