

Know Your Audience: Social Research to Target Dog Waste

Salem Sound Coastwatch/Greenscapes North Shore Coalition

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Purpose of Study

This study examines the barriers pet owners face when picking up dog waste to provide effective future solutions to reduce polluted stormwater for Greenscapes North Coalition MS4 municipalities. While focused on Salem residents, information learned through the resident survey and municipal interviews prepares the Greenscapes North Coalition to implement future effective research studies within other Greenscapes member communities.

Researching target audiences at the community level is essential for MS4 stormwater outreach and education. Therefore, community based social marketing (CBSM) techniques were utilized throughout the creation of the survey questions, as well as the interview process. Target audiences were surveyed at the community level to pinpoint key actions that will result in behavioral changes and encourage residents to pick up after their pets.

Introduction to the Problem

Pet waste left in public areas is a known issue for many of Greenscapes municipal partners. Salem Massachusetts is no exception to the pet waste issue. From April to June, Salem Sound Coastwatch (SSCW) staff mapped the GPS coordinates of pet waste found in various locations of the city. Through this process, 96 piles of pet waste were identified in public spaces. It was unfeasible to survey all public spaces and streets in Salem, but it is justified to assume that the issue of pet waste is much larger than what was surveyed (*Figure 1*). Pet waste is identified by the EPA as a nonpoint-source pollutant that can negatively impact human health and local water ways.

The EPA reports that the bacteria produced within a few days from 100 dogs produces enough bacteria to close off a 20-mile area to swimming and shellfish ([EPA](#)). Salem Massachusetts has 2,200 licensed dogs. The level of potential bacteria is staggering.

[An article](#) posted by the City of Eugene Oregon states that one gram of dog waste contains 23 million fecal coliform bacteria. However, dogs produce roughly 0.75 pounds (or 340.2 grams) of waste a day (*Eugene Public Works*). Equating to 8,164,800,000 fecal coliform bacteria per dog per day. Therefore, on average, dogs in Salem produce 1,650 pounds of waste a day, with 1.347192e+13 fecal coliform bacteria day. If the pet waste is not properly disposed of, these bacteria can wash into local storm drains and sources of drinking water during precipitation events.

Excess fecal coliform bacteria in the water poses a health risk to human health and is responsible for beach closures each year. In June 2024 during one of the hottest days of the summer, over [20](#) beaches in Massachusetts were closed for swimming due to high fecal coliform bacteria levels.

Not only is this disappointing for those seeking relief from extreme heat, but excess bacteria and nutrients in waterways is detrimental to wildlife. In addition to bacteria, pet waste contains high concentrations of nitrogen and phosphorous. Research from the Chesapeake Bay Watershed estimates that dogs excrete 50 million pounds of nitrogen and 11 million pounds of phosphorous a year in the Chesapeake Bay Watershed ([Wood](#)). The excess nutrients from pet waste can disrupt the ecology within water bodies, contributing to excess algae production. Algae in waterways causes a decrease in dissolved oxygen content, causing harm to fish and other wildlife. which can increase algae production causing a decrease in dissolved oxygen for aquatic life.

The research on pet waste is clear that waste that is not properly disposed of poses a health and environmental risk to our communities. However, many pet owners still choose to not pick up. Theories as to why pet owners might not pick up waste include:

- Lack of education
- Lack of public trash barrels
- Lack of access to dog bags
- General laziness

Each of these theories can be classified as a “perceived” barrier, something that prevents an action from being completed. Understanding an individual’s perceived barrier is the first step in formulating potential solutions to these barriers. For this study, community based social marketing (CBSM) techniques were used to understand residents perceived barriers.

CBSM has emerged as an effective alternative to traditional education campaigns. CBSM is based on social science research demonstrating that behavioral changes are most often effectively achieved through initiatives delivered at the community level. These initiatives are research based and focus on removing the barriers that prevent individuals from performing a certain action. CBSM combines social marketing skills with multiple behavioral changing “tools” drawn from social psychology, environmental psychology, and other behavioral sciences. The techniques of CBSM have proven to yield substantial and measurable changes in behavioral – an approach well suited for the complex challenges posed in pet waste production programs.

Methodology:

Literature Review:

This study began with the accumulation of research on similar projects from other cities in the United States. Research allowed SSCW to create a survey that would provide a list of barriers residents experience when picking up after their pet. In addition, those surveyed were asked what would persuade them or others to pick up after their pet. The CBSM membership was utilized, providing information on community forums and sourcing articles.

Municipal Interviews:

Municipal input was a valuable resource in determining areas that could potentially be marked as a target location. Salem’s Park Department, DPW, Beautification Committee, and Maritime National Historic Site were all contacted for a phone interview. Each interviewee was asked the following:

- Share locations where pet waste is a known issue
- How often do you receive public complaints about pet waste?
- Why do you think pet waste is an issue in Salem?

Pet Waste Map:

Before surveying Salem residents, it was imperative to understand what barriers the community may experience. Understanding a perceived barrier allows a survey to be created without bias and

accusatory language. By separating barriers into categories, it was clear that preliminary scouting of Salem was needed. Each survey location notes whether there is access to public trash barrels, public signage, and amount of pet waste left in public places.

Survey 123 was used to map locations where pet waste was found in public spaces. It was required to note if the waste was in a bag. An option was included to provide a picture of the location or note where waste is located such as on the sidewalk, tree pit, or in the grass. The Survey 123 link was distributed to SSCW staff & board, Salem Beautification Committee, and shared by the Salem's Sustainability, Energy, and Resiliency Committee.

Pet waste was mapped beginning on April 12th and continues to be mapped.

Pet Waste Survey:

The pet waste survey was modeled after The Raleigh Scoop pet waste survey. Below are the questions asked throughout the survey process:

- Do you think it makes a difference when you pick up after your pet?
- How do you feel about pet waste in public spaces?
- How frequently do you pick up after your pet?
- Are you more likely to pick up your pet's waste when someone is watching?
- If you haven't picked up your pet's waste in the past, why didn't you?
- What do you think would encourage you/others to pick up after your pet?
- Are you local to the area?

Survey 123 was used to input all survey results, but the survey was conducted on paper. It was important for the survey to feel like a conversation and that residents felt like they could answer without feeling shame. Therefore, the survey was conducted in a conversational manner.

Pet waste surveys began on June 6th in the following locations: Leslie's Retreat, Salem Common, Forest River Park, Forest River Conservation Area, Salem Bike Path, and The Point Neighborhood (which includes Palmer Cove and Lafayette Park). The last survey was conducted on June 25th.

Data Analysis:

Data were downloaded from Survey 1 2 3 to create graphs in Microsoft Excel.

Graphs using all survey results were created to show accumulative results. Differences between target areas were examined.

Locations include Salem Common, Forest River Park, Bike Path, Leslie's Retreat Park, Public Parks (Derby Wharf and Forest River Conservation Area), and The Point (Lafayette Park, Palmer Cove, and public streets). Interpretation of these results is a visual comparison between target areas.

Results

Pet Waste Map:

To determine locations in which SSCW surveyed Salem residents, a map of pet waste was created. This visualization allowed us to determine our target areas. GPS locations were pinpointed using ESRI's software Survey 123. The survey link was given to SSCW staff, Salem's Sustainability, Energy, and Resilience Committee, and Salem's Beautification volunteers.

Throughout this process, SSCW and outside resources identified 96 areas where dog waste was left on public spaces. Out of the 96 records, 84 were unbagged and the remaining 12 were found in dog bags.

Initial review of the dog waste map showed the following areas to have the greatest amount of pet waste in public spaces and thus were the target areas: *Leslie's Retreat Park, Salem Common, Forest River Park, and Salem's The Point neighborhood (El Punto).*

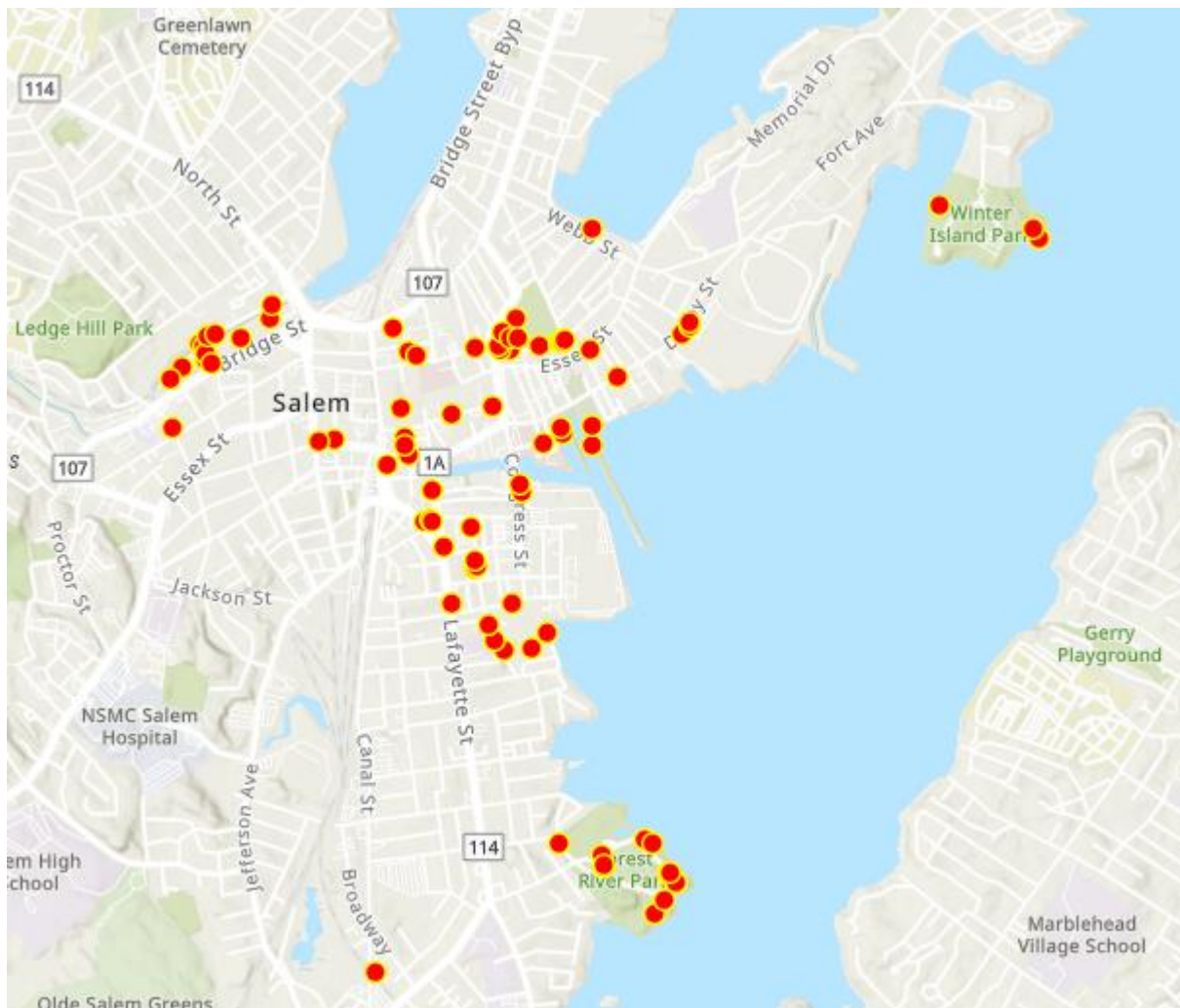


Figure 1. Each point visualizes pet waste found in Salem from May 1st to June 25th.

The following maps below represent dog waste found in target areas determined after a review of total pet waste in Salem.

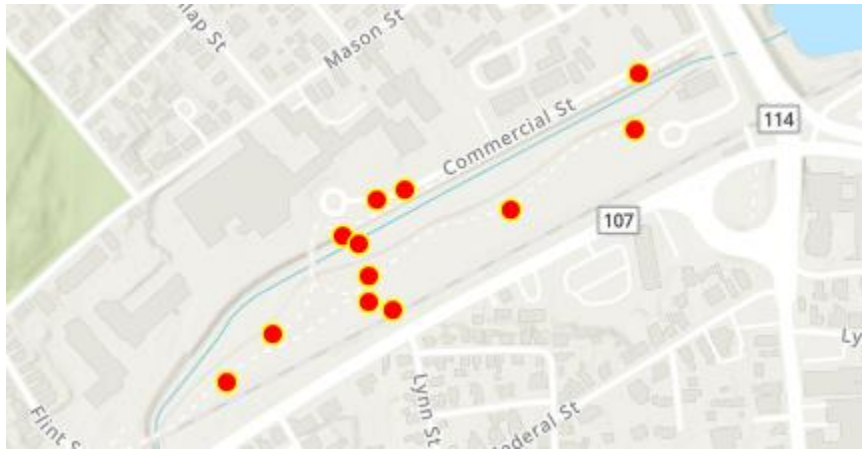


Figure 2. Visualizes pet waste found at Leslie's Retreat Park. There were 12 piles of pet waste found. Please note, there is a dog park here.

Leslie's Retreat Park is utilized by many Salem residents. It's important to note that there is no public trash barrel in the parking lot for the dog park. Dog bag stations are present, but they are not stocked. Leslie's Retreat is within walking distance of several environmental justice communities. *Note: This was identified as an area of interest through the municipal interviews.*

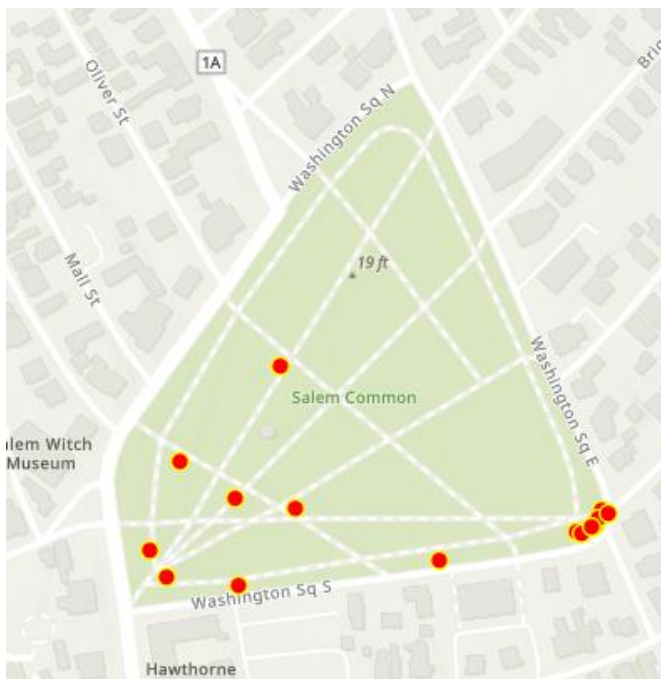


Figure 3. Visualizes pet waste found in the Salem Common. There were 17 piles of pet waste found within the Common. The majority of waste was found near the entrance on the east corner along Washington Sq E Street.

Salem Common is heavily trafficked by dog owners throughout the day. It was noted that public signage is posted along the outermost walking path of the Common stating the laws regarding pet waste removal and the associated non-compliance fine of \$50. Trash barrels are visible from all locations in the Common.



Figure 4. Visualizes pet waste found in Forest River Park. 12 piles of pet waste were found in the park. All pet waste was found alongside the walking path in the grass.

Forest River Park is heavily utilized by residents, especially in the warmer months. There are a few trash barrels located throughout the park (one by each entrance). Residents mentioned that in winter months, the park is limited to one public trash bin. This park is within walking distance of several of Salem's environmental justice communities.

Note: there is an old dog bag station that is in poor condition and not stocked. This area was identified as a target area through the municipal interviews.

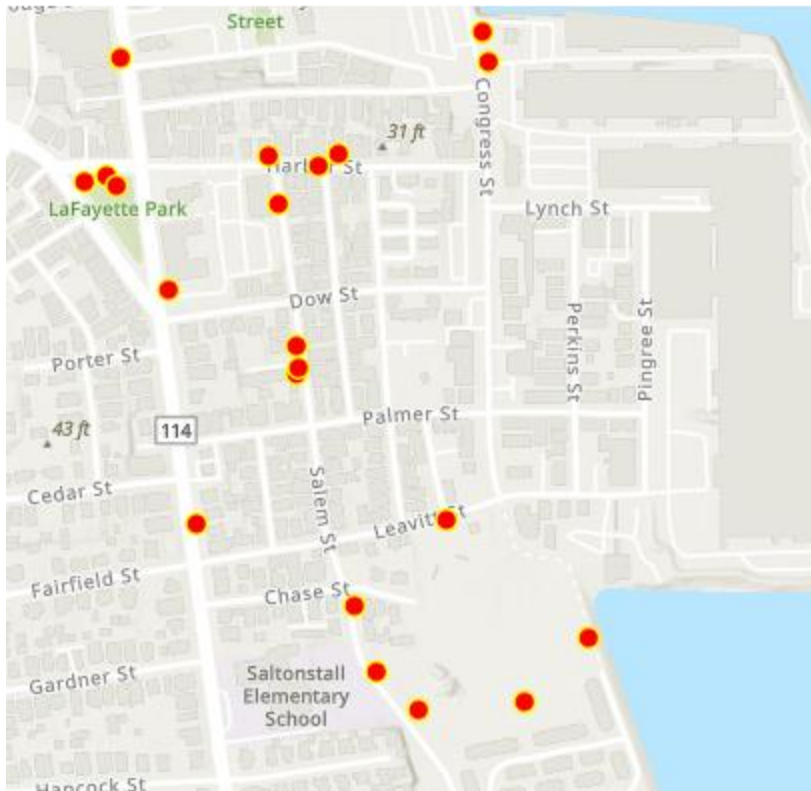


Figure 5. Visualizes pet waste found in The Point (El Punto) neighborhood in Salem, including Palmer Cove Park (grey space below Leavitt Street). In total, 21 piles of pet waste were identified, mostly in tree pits along sidewalks.

The Point Neighborhood (El Punto) is home to over 3,000 residents. Salem's most densely populated area, it is an environmental justice neighborhood. The largest open green space is Palmer Cove. Though smaller green spaces exist such as Mary Jane Lee Park and Lafayette Park. All these locations were scouted. It was noted that along city sidewalks, public trash barrels were nonexistent. The majority of pet waste along sidewalks was found inside public tree pits. Both Palmer Cove and Lafayette Park have at least two public trash barrels, but pet waste is still found in large quantities.

Note: The Point Neighborhood was identified as a high priority, as pet waste is a known issue in the parks and on sidewalks.

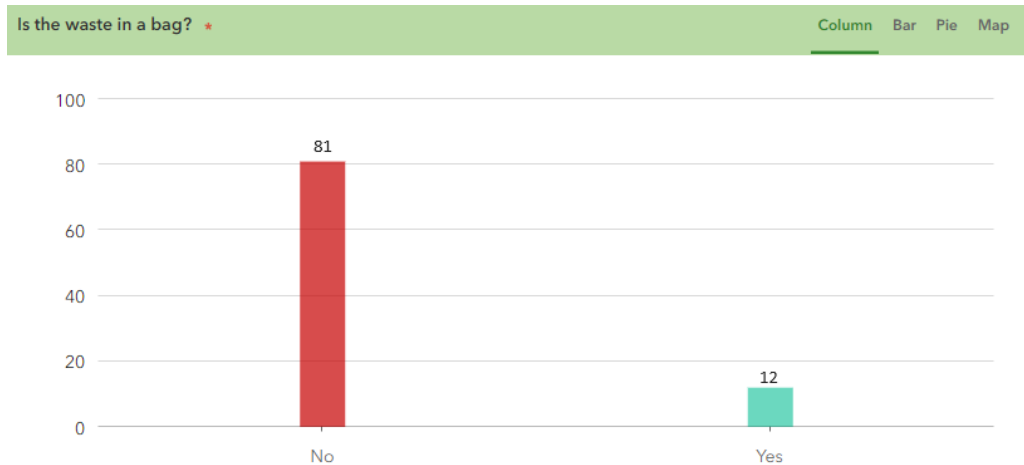
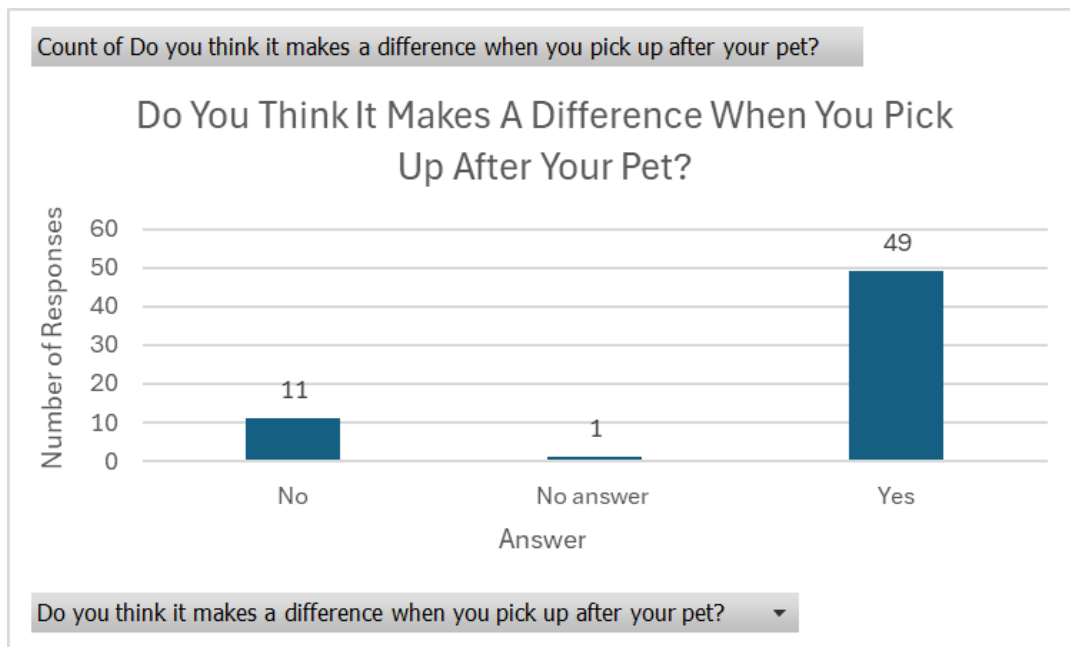


Figure 6. Total waste piles found unbagged compared to bagged (n=93).

Of the 93 recorded dog waste piles, 81 were not in bags. Twelve (12) were left behind in “biodegradable” dog bags.

Interview Survey Results:

Total: 61 respondents



Figures 7. Total number of respondents (n=61) who do not believe it makes a difference to pick up after your pet compared to those who believe it does make a difference.

Within each area surveyed in Salem: Eighteen percent (n=11) do not believe it makes a difference if they pick up after their pet. Eighty-two percent (n=49) respondents indicated it does make a difference.

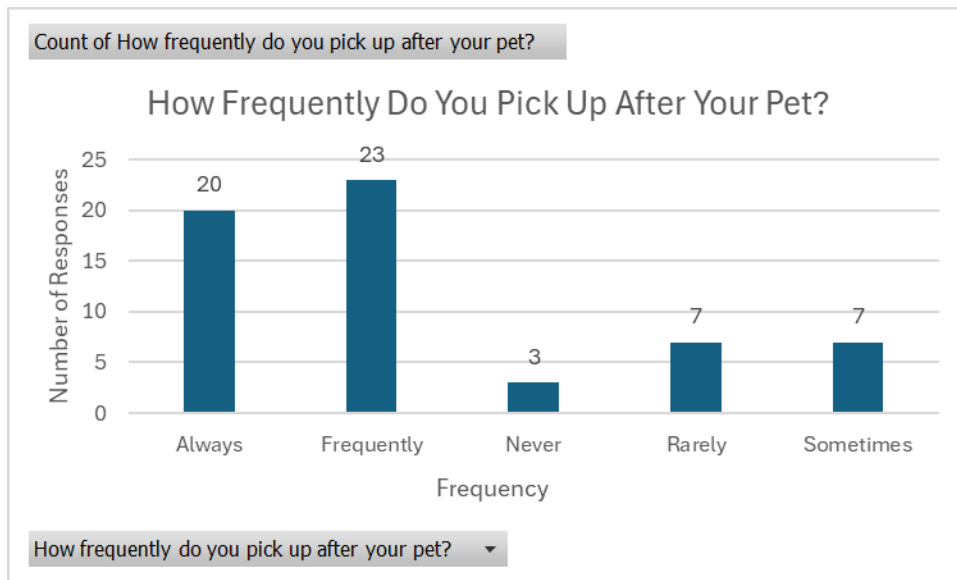


Figure 8. Total number of respondents (n=61) that reported the frequency in which they pick up after their pet.

Within each area surveyed in Salem respondents indicated: 20 (33%) always pick up after their pet, 23 (38%) frequently, 7 (12%) rarely, 7 (12) sometimes, and 3 (5%) never.

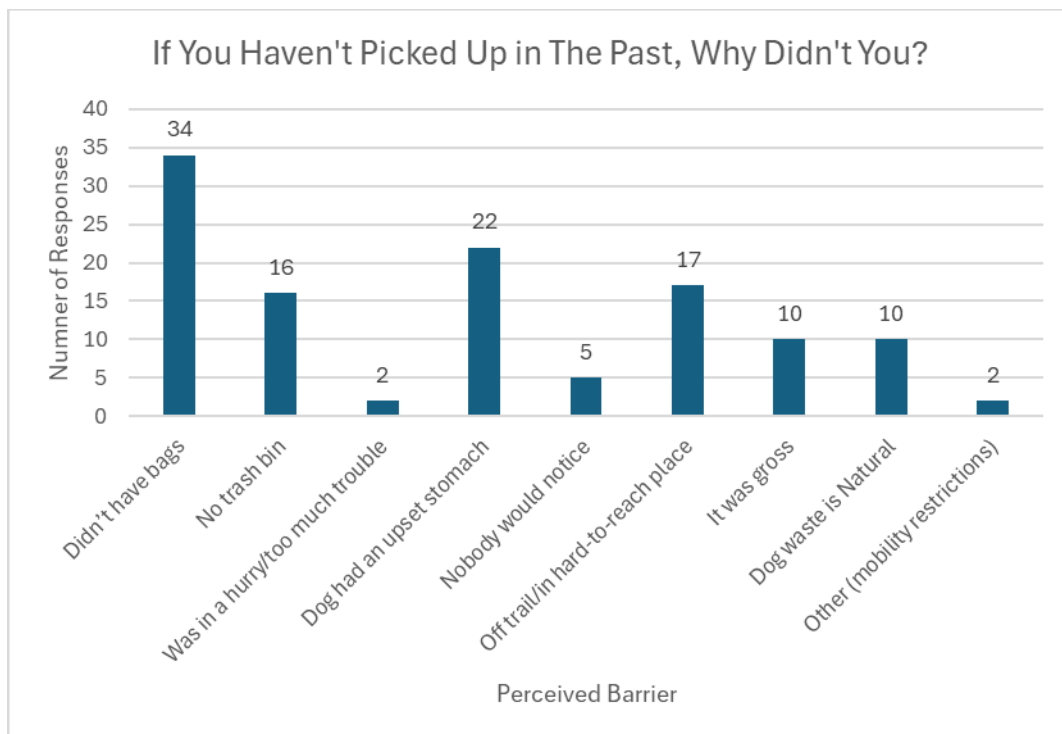


Figure 9. Total number of respondents (n=61) that reported the barriers experienced when picking up after their pet.

Of the 61 residents surveyed: 34 didn't have bags, 22 do not pick up if their pet has an upset stomach, 17 were off trail or in hard-to-reach places, 16 did not have access to trash bins, 10 thought it was gross, 10 believed dog waste is natural, 5 do not if no one will notice it, 2 were in too much of a hurry, and 2 had mobility restrictions.

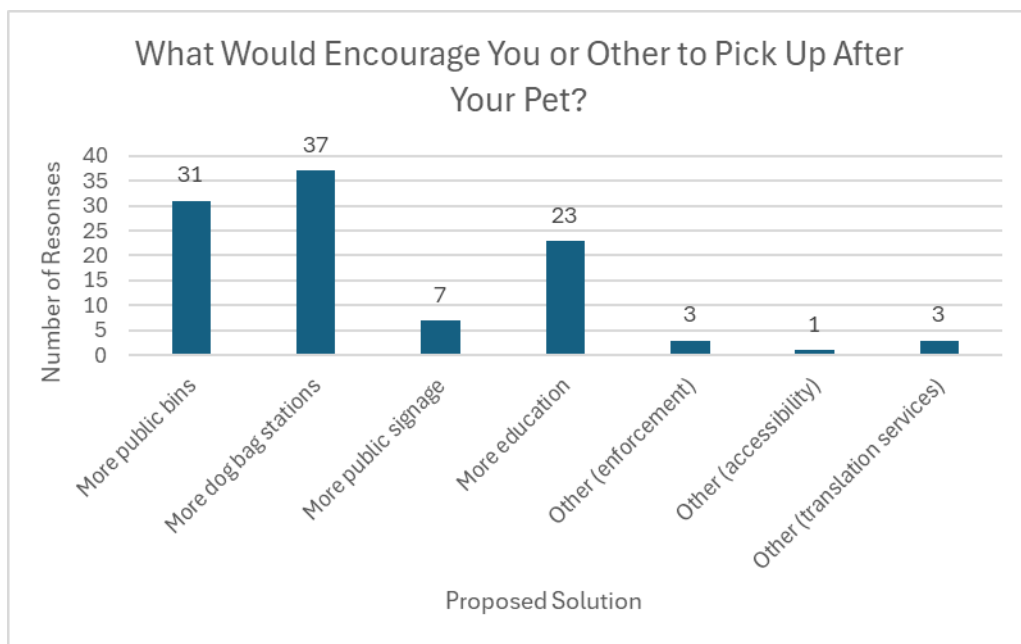


Figure 10. Breakdown of possible solutions (n=61).

Sixty-one respondents indicated what they believed would be a useful action in urging residents to pick up after their pets. The top three requested actions include: more pet waste stations (37), more public bins (31), and more education on the health risks of pet waste (23).

Discussion:

Pet Waste Map:

The map of pet waste found in Salem is a great visual for both residents, stakeholders, and SSCW staff. By scouting out these areas and noting trash barrels and dog bag stations, SSCW gained insight as to why people might not be picking up after their pet before starting the surveying process. For example, residents in The Point neighborhood may not have the available resources to effectively pick up after their pet (lack of public trash barrels and lack of dog bags). Likewise, the Salem Common has trash barrels within eyesight in every section of the park. This allowed us to enter the survey process with information tailored to these specific locations, already noting the potential barriers residents may face.

Survey:

Barriers:

Sixty-one individuals were surveyed in Salem to provide insight into the potential barriers preventing them from picking up their pets.

The following is the number surveyed at each location. Salem Commons: 11 participants, Forest River Park: 11 participants, Salem Bike Path: 6 participants, Leslie's Retreat Park: 7 participants, The Point Neighborhood (Palmer Cove, Lafayette Park, and street interviews).

Eight-two percent (82%) indicated that it makes a difference when picking up after their pet, while 18% did not (Figure 8). When compared to respondents' answers about the frequency in which they pick up after their pet, another story emerges; 33% indicated they always pick up, 38% frequently, 12% rarely, 12% sometimes, and 5% never (Figure 8). The majority of respondents indicated picking up their pet's waste does make a difference, so it would be assumed that the percentages for "always" or "frequently" picking up pet waste would be higher.

While this may be a case of biased self-reporting, it provides insight to the barriers people may experience when trying to do the right thing – picking up pet waste. Many respondents indicated picking up pet waste does make a difference, but they may experience barriers that have prevented them from completing the desired action.

Over half (n=34) of those surveyed indicated the reason they did not pick up after their pet was because they did not have a dog bag (Figure 9). Through conversations with those surveyed, a handful of respondents would bring one bag on their walk, but their pet would defecate twice. Another common factor was simply running out of bags in the personal dispenser. For future surveys, it would be interesting to find out how many people routinely walk with dog bags and many bags they bring with them. This could potentially be a "Bad Habit" barrier, where pet waste is simply not picked up because the pet owner routinely does not carry bags.

Twenty-two (22) respondents indicated that the dog had an upset stomach, making it nearly impossible to pick up after the pet. While a few of those surveyed indicated they try their best to pick up liquid waste, most of those surveyed indicated it was too much trouble to try.

The third most indicated barrier with 17 responses was pet waste located off trail or in a hard-to-reach place. This response was usually indicated when asked if there were other locations in which their dog is walked. When walking on trails, 4 respondents indicated that there is hesitation in picking up waste off trail due to risks of poison ivy. Five (5) pet owners at Forest River Park indicated off trail as a barrier, particularly on the path that is next to a heavily wooded area. Of the five surveyed, two allowed their pets off leash.

Research indicates that pet owners are more likely to pick up after their pet when a trash bin is within eyesight. Sixteen (16) respondents indicated lack of access to trash bins as a potential barrier. At Salem Common, there are trash bins located around the perimeter of the walking path and access to trash bins had the lowest ranking here. However, all other areas surveyed ranked the lack of trash barrels as the largest barrier, especially in The Point neighborhood. Public streets along the Point do not have public trash bins, and dog waste is frequently found along the base of

tree pits. Through the surveys, it was found that many of those walking their pet in the neighborhood do not want to carry their pets' waste with them to their home.

Lower ranking on the list, with only 10 responses, was the misconception that pet waste is natural. It's important to note that this response was primarily indicated in areas green space and forested areas, such as Forest River Park and Forest River Conservation Area. While respondents in these locations stated that they frequently pick up after their pet, it was usually because there was a risk of others stepping in the waste. While walking in wooded areas, dog waste was viewed as natural and good for the soil. One resident indicated that even at home, they urge their dog to go in ivy patches to help fertilize the soil. This is a case of "misinformation barriers", in which residents believe their actions are beneficial to the environment. In conversation, two residents mentioned manure as an acceptable fertilizer, so it was assumed that pet waste behaves in the same way.

It should be noted that two residents indicated mobility as a barrier. One resident was a wheelchair user and often found it difficult to access public trash bins. Likewise, if the dog were to go off trail or in a hard-to-reach area, it was often impossible for the respondent to pick up. Another resident indicated age as a barrier, noting it can be hard to bend down to pick up waste.

Potential Solutions: (Figure 10)

After discussing the barriers pet owners experience, respondents were asked what would encourage them or others to pick up after their pet. Based on barrier results, it is not surprising that more dog bag stations (37 respondents) and more public trash bins (31 respondents) were requested. Residents indicated that more trash barrels should be present, particularly around neighborhood streets. A dog bag station was requested in the Salem Common, specifically in the east corner where waste is known to accumulate.

Leslie's Retreat Dog Park is another location in which dog bags were heavily requested. There are currently two dog bag stations at the entrance to the dog park, but it has not been maintained. Additionally, Forest River Park has an unstocked dog bag station. Though the location is not easily noticeable, residents would like stations to trail entrances. Nearly all respondents indicated that dog bag stations would be beneficial when sporadically placed throughout Salem.

Interestingly, 23 people requested more education on the health risks of dog waste. Many respondents felt that there is a general lack of knowledge on the impact of pet waste on our waterways and human health. It was noted that the city sends information on pet waste to owners when yearly dog licenses are sent out. However, respondents said that there is far too much information, and it makes it difficult to read and understand.

Many of the locations surveyed in Salem have signage stating it is the law to pick up pet waste. Pet waste signs state there is a \$50 fine, which is not effective as enforcement rarely occurs. At least 5 people indicated that current signs are passive aggressive and do not encourage people to pick up pet waste. Of those surveyed, 7 indicated they would like more signage, although they requested the signage should be more informative on the risks of pet waste and why pet owners should pick up waste.

In the Point neighborhood, three people indicated a need for more translation services and public information. Information should be inclusive and accessible to residents in the neighborhood.

Signage and informational brochures should be posted in English and Spanish. It was noted that many of the residents were not aware of the health risks associated with pet waste.

To implement effective solutions to the pet waste issue in Salem, further research is needed. For example, it would not be feasible to install dog bag stations if the location is not desirable for pet owners. Through these surveys, future focus groups were identified, and questions were created that will further Greenscapes North Coalition's research in developing strategies to test effective solutions.

Focus group 1: Halstead apartment residents

The Halstead apartment complex is next to Leslie's Retreat Park, which has a known pet waste issue. It is assumed that pet owners who live in this complex frequent the park often. The complex's campus has multiple dog bag stations for tenants. It would be good to determine how many people utilize this resource and what they do when away from the dog bag stations.

Questions might include:

- Do you use the dog bags provided by the apartment complex?
- How often is the dog bag station maintained?
- How often do you walk your dog in Leslie's Retreat?
- Does the apartment complex routinely maintain and stock bags?
- Do you make it a habit to always carry dog bags with you?
- How often do you see others from the same complex not picking up waste?

Focus group 2: Leslie's Retreat Dog Park

Leslie's Retreat Dog Park is the only dog park in Salem, frequented by residents all over Salem. Dog bag stations are provided but not stocked, and there are no public bins nearby. The park is located next to the North River.

- Do you bring your own dog bags with you to the park?
- How often is pet waste found inside the dog park?
- Would it be beneficial to include trash receptacles inside the park?
- Would posted information on risks of pet waste be useful?

Focus group 3: Point Neighborhood Residents

The Point neighborhood has a pet waste issue on nearly every street. Pet waste accumulates around the base of trees, found along sidewalks, and public parks. This focus group consists of residents that frequent Lafayette Park, Palmer Cove, and those that do neighborhood walks and be multilingual. The group must include Spanish and Portuguese speakers.

- What languages are the dog license information?
- Would dog bag stations be helpful and if so, where?
- What is the best way to deliver information (post cards, public signage, bulletin boards, email list)?
- Would are your ideas for solving the waste disposal problem in the Point?

Conclusion:

Most of the people interviewed were excited that steps are being taken to help reduce pet waste in public spaces. Many are hoping the city can reduce the barriers that make picking up after their pet difficult. Those who do not pick up were interested in learning about the risks associated with pet waste. Pet owners said that they would be more inclined to pick up pet waste if there were more well-maintained dog bag stations, public street trash bins, and education.

While the survey was created to avoid respondents from feeling accused or guilty, there is the possibility that results are skewed from biased self-reporting. With one-on-one interviews, respondents may feel the need to provide the “desired” answer, rather than a candid one. For future surveying, it is suggested to do in person surveys and distribute an online anonymous survey. The online survey could be posted in local vet clinics, included in yearly dog license tags, posted as a QR code in areas frequented by pet owners, and distributed through online newsletters from SSCW and Salem SERC. In addition, many residents may not realize that pet waste is an issue in Salem. By making the pet waste map public, residents can visualize how much pet waste is left behind.