

# Lancaster Composting Co-Ops

## Program Evaluation and White Paper

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# Background

This white paper and program evaluation reflects on lessons learned from our first year of operations as a pilot program. We hope that this paper is useful in informing other like-minded initiatives around the country.

The Lancaster Composting Co-Ops (LCC) are a volunteer-led community initiative that enables Lancaster residents to participate in reducing waste by creating high quality compost. The Lancaster Composting Co-ops aim to make the benefits of composting accessible to all residents of the city of Lancaster, PA.

Membership in LCC is free and open to the public; members are required to simply attend a 1-hour orientation session, sign a member agreement that provides an active email address for communication, and are asked to contribute by participating in occasional compost maintenance workdays. Each bin becomes its own co-op site, operating under the umbrella of LCC, which provides the organizational support, training, and other resources to help each bin operate successfully.

This project began in April 2021, with three bin locations established in public-serving locations in the city of Lancaster, PA (Musser Park, the New Holland Ave. Recycling Facility, and Behind Culliton Park). Prior to this, Lancaster residents had zero alternatives beyond their own backyards to divert organic food and garden scraps from the general waste stream. Composting is a mainstream activity in American cities, although it is less common, and rarely mandated as a social practice in small cities. The compost co-op began partnering with the City of Lancaster to address the existing community desire for sustainability, initially funded with a seed grant from the Center for Sustained Engagement with Lancaster through Franklin & Marshall College, and in September 2021 receiving an additional grant from Keep Pennsylvania Beautiful / GIANT Foundation.

## Overview of Research Methods

The research presented here derives primarily from two surveys as well as extensive participant-observation. The first survey is the initial member survey,

(54 respondents), and the second is a survey that was given to members who had participated in co-op activities for between 9 and 14 months (41 respondents), administered in June 2022. Respondents who indicated a willingness to be interviewed were then met in follow-up interviews (16), which were recorded and lasted between 30 minutes - 1 hour in length. The primary researcher is also actively embedded in the life of the co-op organization's leadership, and thus brings considerable participant-observation experience to understanding and observing the workings of the organization and its programs.

# Who and What is the Lancaster Compost Co-operative?

## A. Core Organizational Team and Structures

The Lancaster Composting Co-Ops is registered as a Pennsylvania unincorporated nonprofit association. We have informally established a core organizing team comprised of the following roles and individuals:

1. Public and city-facing leader (Eve Bratman)
2. Back-end operations and communications leader (Zhenya Karelina)
3. City of Lancaster Liaison (Gabrielle Diakow / Cory Simo)
4. Captain Liaison (Antonia Heinenkamp)

In addition to the “core” team, the organization relies heavily on each compost co-op site captain to lead training events, organize composting workdays, and take on other outreach activities, as deemed necessary. Some sites have multiple captains (between 2-4), whereas others only have one, and still manage to run successfully. We also have members who serve as informal backup contributors to the co-op by taking on leadership roles and responsibilities, including assistance with bin maintenance, communications, and public relations.

## B. Member Demographics

- a. Residency: Over eighty percent of Lancaster Compost Co-op members are Lancaster City residents. Approximately three quarters of the members have lived in their current neighborhoods for under three years. The majority of members - at least those who filled out the initial member survey - reside near Musser Park. Cabbage Hill, Chestnut Hill, East Lampeter Township, College Park, Ross, Marietta, and Stadium District are also neighborhoods represented by members.
- b. Age: Roughly half of the members who completed our survey are in the 26-34 age bracket. No participation is reported in the under-18 age bracket. Membership is lowest in the 75+ and 35-44 age brackets.
- c. Gender orientation: About 75 percent of survey respondents identify as female. Roughly six percent of members who responded to our survey do not identify with a gender binary.

- d. Racial and ethnic identity: Almost ninety percent of members listed their ethnic identity as white. At least one member identified as being part of one or more of the following ethnicities: American/Armenian, Asian American, Buryat Mongolian, Hispanic/LatinX, Irish-Italian, Jewish, or European. For purposes of maximizing our sense of diversity and inclusion, the question of racial/ethnic identity was left open-ended on our member survey.
- e. Household size: The large majority of members have 1-2 adults in their household, although we do know that many of our composting co-op members also have children under the age of 18 in their homes. Over half of the members compost for a two-person household. Institutions have, at times, been composting with the co-op already, on an informal basis: most notably, Central Market's compost was regularly picked up and brought to the New Holland Ave. bin for about 6 months.
- f. Previous composting experience: Over half of members had occasional or consistent compost experience prior to joining the co-op. In our follow-up interviews, many respondents indicated a wide range of such experiences, including participating in curbside compost pick-up programs in other cities, backyard composting, and backyard composting while experiencing significant challenges.

*For more detailed information about member demographics and motivations for joining the co-op, please refer to Appendix A.*

## C. Joining the Co-op: Members' Motivations, Outreach, and Barriers to Entry

- a. Motivations for joining: Reducing household waste is top priority expressed among 66.6% of members. This was echoed in our follow-up interviews. Forty percent of members were second-most motivated to join in an effort to support the city's sustainability and cost saving efforts. Developing compost knowledge and skills, as well as improving the quality of local soil, were ranked as least motivating by 29.6 and 27.7% of members, respectively. Getting to know neighbors better was one of several motivators for joining the co-op, though not the primary motivator (see Appendix A).

Beyond the initial motivations for joining the co-op, several interviewees expressed that their experiences thus far of

composting involved the pleasant experience of joining together with like-minded individuals in the community as an unexpected benefit of joining the co-op. Many interviewees also commented that they had a greater level of skills, self-confidence, and knowledge as a result of participating in the orientations and workdays. Several interviewees shared that composting leads them to think differently and more proactively about reducing their household waste, indicating a virtuous cycle of refuse management and waste reduction.

- b. Outreach: People come to learn about the LCC through a variety of means: word-of-mouth, social media, the occasional news stories in LNP about the co-op, and stopping at the bins themselves. There has been no targeted marketing and advertising program, to date.
- c. Barriers to Entry and Exiting Members: It is hard to know why people might not be interested in joining the co-op, as the population we have focused on are current members of the co-op, rather than unaffiliated members of the general public. That said, our current growth and rates of membership are significant, as several of our bins are at capacity with membership, with more demand in some locations than we can ultimately meet. It is widely believed that composting policy mandates, curbside pickup access, and a sort of local tipping point of composting participation that leads to “normalcy” of composting all help to foster broader participation in composting. For many individuals, there is a not insignificant learning curve in beginning to simply separate food scraps at home, which entails finding satisfactory physical household compost storage containers, a compost bucket storage location, and beginning to make a habit of food scrap separation.

While the benefits of composting are generally widely known, our program currently lacks informational materials and the capacity to conduct meetings in languages other than English. The program also is currently limited in being able to provide bins and conduct targeted outreach with the local populations that live in larger apartment complexes, although apartment residents are a significant target audience for this initiative.

There seems to be a minor, and fairly standard rate of “melt” of members in our program, that is, members who do not participate or decide to leave the co-op formally. The first form of “melt” entails those who express interest in attending events over

Eventbrite but do not come to the orientation session to formalize their membership. This melt is somewhat, but not entirely offset by people who attend the orientation session without having registered in advance. Another, more difficult to quantify melt consists of members who we count in our records, but whom we suspect are not actively participating at the bin location or attending events, as they are not actively in touch, and seem to not actively be contributing to the bin. On one or two occasions, people have written to formally “cancel” their membership; we do not (yet) have a formal exit survey instrument. Reasons may include: not actively participating, moving elsewhere, etc. Having better estimates of standard melt rates could help to better refine our membership data, allowing for more precise bin capacity estimates, outreach, and a more clear process for new member onboarding.

## 1. 1<sup>st</sup> Year Program Evaluation

### **A. Participants’ overall reactions to the initiative**

- a. Most members express that the bins are convenient, well-designed, easy to use, and a helpful and fun tool for community building and limiting food waste.
- b. For most, participating in a compost co-op is a reasonable small-scale change that, in addition to impacting local and individual sustainability, has the potential to influence larger-scale climate change movements. The Compost Co-Op fulfills both individual and collective needs, and meets an existing desire for residents to adopt actions that align with sustainability values.
- c. Meeting neighbors, getting to know others with common interests, and working collectively to maintain the bin are positive aspects to this model. Members generally feel that these aspects might be lost if a curbside compost pickup service were to be implemented. That said, a curbside option could be appealing to many individuals, and does not appear to be in competition with our model in many respects: our model is free to users, low-cost in terms of capital expenditures and operations, and carbon-negative. Curbside options becoming available could also help to

foster a more widespread culture of composting and sustainability activities, benefitting all.

- d. Members express a desire to expand the compost co-op to a more diverse range of community members, so as to engage a broader spectrum of racial and social identities within the co-op membership. An increase in co-op presence at more neighborhood-level community events and developing signage and related materials in other languages are two suggested routes for achieving this goal.
- e. Most members expressed high levels of satisfaction and positive experiences with the LCC initiative. Aesthetic complications, such as occasional encounters with bugs and bad odor, as well as accessibility concerns, such as hard-to-lift bin lids and un-walkable bin sites (New Holland Ave in particular) are the main concerns expressed by members. Members would also like to see an increase in social programming and communication within bin sites.

*For more detailed information about participant reactions to the program, please refer to Appendix A.*

## **B. Composting volume and drop-off frequency**

Members in the Lancaster Compost Co-Op (186 members to date) drop off their food waste in their respective bins. At times members have switched bin locations, as Lancaster Composting Co-Op continues to expand; these members are only counted once.

- a) The Year 1 survey and the household bin size estimates led to the following calculations, which are based on the following data (see Appendix B for more detailed methodologies):
  - i) A typical household is approximately 1.977 individuals.
  - ii) 368 individuals' worth of food waste being delivered to LCC compost bins throughout the year.
  - iii) Each individual household on average drops off 35.33 lbs of food waste per month, with slight increases based on the size of the household.
  - iv) The co-op diverts **approximately 16,638 pounds of food waste each month** from the solid waste stream. **Annualized, that's 199,656 lbs of food waste that the Lancaster Composting Co-op then turns into a beneficial soil amendment.** That's about the

same weight as 33 pickup trucks. Or, in other terms, the same weight as around 15 and a half African Elephants (the big ones!), or 90,562,364,352 black ants every year!

## C. Environmental Sustainability Contributions

By reducing the amount of food waste, and allowing food to avoid transit to both landfills and the county waste-to-energy incinerator plant, this initiative contributes a positive environmental impact to the City of Lancaster and the broader community.

Specifically in terms of net greenhouse gas (GHG) emissions reductions, the project **alleviates approximately 39.36 tons of CO2 equivalent monthly and 472.32 tons of CO2 equivalent annually**. This is the equivalent of driving almost 100,000 miles every month (imagine driving from New York City to Los Angeles 40 times per month - or flying the same distance 8 times per year!)

The above estimate is a conservative one, based on the amount of food waste being dropped off at the compost bins (see Appendix B), plus the carbon emissions equivalent to *half* of the approximate amount of yard waste and browns that are used in the compost bins. This assumption is premised upon the rationale that only half of the browns that are used for composting would have actually ended up in the landfill, because leaf and yard waste collection does occur in Lancaster, with yard waste being processed at a facility in Reading, PA and turned into mulch.

- a. In addition to the alleviation of CO2 equivalents through the process of composting food waste, there are additional upstream and downstream elements of the composting operations itself, that are significant, yet unquantified, socio-ecological benefits of our operations. These include the following:
  - i. Respondents to our survey indicate that they are predominately walking to the bins as they drop off their household's contributions, or, when driving, pairing quick compost bin drop-off trips with other car-based errands, such as recycling drop-offs at New Holland Ave., or grocery shopping. Generally it can be assumed that there are little to no impacts on neighborhood parking as a result of the initiative.

- ii. There is an additional, unaccounted for savings in cost and emissions of somewhat lighter garbage trucks.
- iii. Carbon-negative operations: Of note, composting in our model is almost an entirely carbon-negative process, given that it relies exclusively on physical labor in order to turn the compost. Heavy machinery is required at landfills, to run waste incinerators, and even to manage larger-scale commercial composting operations, whereas the LCC model requires minimal start-up equipment and no machinery in its operations.
- iv. Park visitation: Approximately 44% of survey respondents reported a slight or considerable increase in the duration and frequency of time spent in parks, since composting with Lancaster Compost Co-Ops. Members are actively encouraged to pick up park waste when dropping off their compost and participating in workdays as part of their member orientation.

## **D. Financial Implications**

The Lancaster Composting Co-op reduces the amount of food waste being contributed to the general waste stream. This yields a cost-savings to the city of Lancaster, in addition to fostering the city's commitments to address global warming.

- a) There is an approximate net cost savings of \$5,215 per year to the City in tipping fees, at the current rate of \$80/ton of organic waste and \$35/ton of yard waste. This calculation is based on the current membership of the Lancaster Composting Co-op (approximately 368 individuals, 186 households). If extrapolated out to 5% of Lancaster, this would save the city approximately \$86,916 per year. If 15% of the city of Lancaster participated in the initiative then it would save the city over \$260,754. If all of Lancaster's 60,000 residents composted, the savings would be approximately \$1,738,361 a year.
- b) The above also assumes approximately half of the cost of the tonnage in leaves used at the compost bins. This is at a rate of \$35 a ton.
  - i) Of the 10.30 tons of yard waste that is required monthly for each compost bin , only half (5.15) would have likely ended up getting picked up by the City of Lancaster. in addition, this tries to take

into account the fact that this yard waste is reused rather than sitting in landfills.

- ii) For reference, the cost of construction in 2022 of a single 3-bay compost bin unit was \$2,520.

## 2. Public Relations

### A. Outreach

The main communications from the co-op to its members are centralized from our [LancasterCompost@gmail.com](mailto:LancasterCompost@gmail.com) web address. Our website, [LancasterCompost.us](http://LancasterCompost.us), is being regularly updated with necessary changes to simplify, recruit, and assist with community outreach, including:

- The addition of a waitlist for sites that are at full membership capacity
- A comprehensive list of media exposures
- Thorough responses to “Frequently Asked Questions”
- Up-to-date information on all bin co-op locations

Our website links our membership orientation and workday events through Eventbrite, which, as a platform, is also independently searchable. The Eventbrite platform is free and allows for basic registration information to be compiled in a spreadsheet, with automated event reminder emails. Instagram is also a primary mode of communication for the co-op, with over 500 followers to date. Our Facebook page is scarcely used in terms of inter co-op communication, though it exists and directs viewers to our other social media platforms.

We also conducted community outreach in person by participating in the Musser Park Earth Day event, and tabling outside of the Veg Fest event that took place in Buchanan Park. These events relied heavily on volunteer efforts from among our membership, and more such events are likely, including at the mid-September Paw Paw festival at the Horn Farm Center.

### B. Community Engagement

In choosing compost site locations, LCC has, since its inception, actively consulted with community members. The process for establishing a bin typically involves first speaking with the City of Lancaster about potential sites, and then conducting outreach with existing community organizations, such as any key neighborhood associations about their community’s interest. Drawing

upon such meetings, community leaders suggest willing and competent local site captain(s). Following these initial discussions, specific sites are assessed for bin placement and suitability, with considerations given for sightlines, accessibility, safety, ground slope and terrain, and other factors.

Captains are trained annually, at a training event offered in conjunction with the support of the Penn State Master Gardeners. Captains are provided with an orientation script, best practices instruction, and flyers to distribute among their new members, as well as basic equipment.

Our experiences thus far have emphasized the importance of conducting additional flyering and active community engagement prior to bin installation. This is especially important in the high-visibility and high-traffic locations of public parks that are nearby to residential properties. Importantly, once compost bins are established and operational, nearby residents have expressed no significant concerns about the composting activities. In the lead-up to bin establishment, however, concerns have at times arisen from some community members about unsightliness, concerns about safety, odors, litter, and the like. Most such concerns are ultimately non-issues when bins are maintained properly. In addition to the concerns expressed by what is often a small but vocal constituency of neighbors, it is important to note that many community members also express appreciation and excitement for new bins coming into their neighborhood.

A significant lesson learned from our first year of operations is that advance outreach and public communications *before* compost bins are set in place - including through flyering, public listening sessions, and posting to neighborhood social media websites, are all important tools in developing a greater level of public engagement and support, while destigmatizing assumptions about compost and serving to educate the public about the initiative.

## **C. Outreach Within and Beyond Lancaster**

Our partnership with the City of Lancaster has been crucial in ensuring the success of the initiative, especially thanks to their provision of park and gathering space, the heavy equipment necessary to move compost bins, and acceptance of liability within our member agreement. The initiative has been generously supported with the financial support of Franklin and Marshall College's Center for Sustained Engagement with Lancaster (\$11,000, 2019), and a

\$15,000 Healing the Planet grant from Keep Pennsylvania Beautiful / GIANT Corporation (2021).

Our local partnerships and collaborators included the following:

- Penn State Extension Master Gardeners (captain trainings and ongoing compost bin health consultations)
- Lemon Street Market (Linear Park bin)
- Franklin & Marshall College (research support and pilot funding)
- Blackbirds Environmental Justice (children's educational programming)
- Passenger Coffee (donations of coffee for work social events)
- Discerning Eye Community Agriculture (Linear Park bin)

One of the missions of the co-op is to support other cooperatives. To date we have consulted and supported a number of inquiries regarding expanding composting through our model.

These include the following:

New Mexico Compost Coalition

Lebanon County community food forest initiative

Akron Mennonite Church in Akron, PA

Girl Scout (Gold Award proposal)

Two individuals exploring the prospects of establishing their own small compost businesses

A scholarly journal article is also in the process of being researched and written, and the model will be presented at the upcoming PROP (Pennsylvania Recyclers of Pennsylvania) conference (7/28/2022). A presentation proposal for the national Compost 2023 conference has also been submitted (April 2023).

The scholarly journal article, likely to be submitted to the journal *Land* by early October 2022, will focus on the ways in which conventional approaches to solid waste management, including in the sub-sector of composting, tend to rely upon neoliberal logics of sustainability: they are privately paid for and managed out of the public view, with the process of composting itself handled by employees or heavy machinery. In contrast, the paper presents the decentralized composting co-operative model in use in Lancaster, PA, Washington DC and Philadelphia PA, among other cities. Using research interviews and program evaluation data from the case of Lancaster, Pennsylvania, the article explores the challenges, along with the advantages, of successfully implementing and expanding the model, with relevant lessons concerning public-private collaborations, citizen outreach and

communications, and environmental impacts. We will argue that beyond physical indicators such as carbon emissions and soil quality, the primary benefits of such efforts include social network strengthening, citizen skill-building, and the viability of a low-cost, flexible intervention that fosters urban sustainability. Not only is composting an important part of green infrastructure, but an important axis through which social resilience and local self-reliance become realized.

## 3. Future Directions and Growth

### A. Short and Medium Term Considerations

Looking to the **short-term future**, there are still two additional compost bins that are built and awaiting placement in the city. Prospective locations continue to be discussed and finalized; these include near Greenwood Avenue, in Southwest, in Sixth Ward Park, Reservoir Park, and in the PCAD / Lancaster Police park at Prince and Chestnut Streets, downtown. Captains are already trained for the Greenwood Avenue and Sixth Ward Park locations.

In the **medium-term**, a few key priorities for our next steps have arisen as viable, attainable strategic goals for the next 1-2 years. It is relevant to keep in mind that the organization needs to balance its volunteers' energy and our vision of making composting accessible to all residents of Lancaster with the capacity of its members and the organizing team. The co-operative's members also express an interest in getting to know each other and to socialize across bin locations. To that end, we would like to have the leadership of the co-op consider the following priorities:

- Establishing a formal Memorandum of Agreement (MOA) with City of Lancaster: This step could be helpful in standardizing our operations and expectations as we move forward. Key issues to delineate include communication roles and physical responsibilities, e.g. for sourcing browns at the bins, maintaining broken locks or other incidentals, especially so as to safeguard the LCC's autonomy in making decisions about compost management, establishing community partnerships, and running events.
- Organizational formalization: Registering LCC as a PA nonprofit, 501(c)3 nonprofit, or potentially a consumer co-op business would help the organization by simplifying our ability to expand operations in

settings other than City of Lancaster properties, allowing us to obtain basic liability insurance, and to accept donations. Some costs would be likely involved, as would a process of establishing a formal board of directors, by-laws, and the like. A mid-winter annual meeting of LCC membership could also cultivate more participation and member engagement, regardless of the organization's formal structure.

- Educational events and programming: Members have expressed a desire to see more community - including all-co-op community, through events and shared activities. Ideas have surfaced with leaders willing to lead: a compost book club, a fungi-compost nexus educational workshop (likely in partnership with the Lancaster Science Factory), to do more child-centered programming, and a spirituality and ecology discussion group. Such events should likely be pay-what-you can, to keep accessibility a priority, while also helping to offset costs.

- Outreach and Website: Additionally helpful communications tools to develop in the future include a monthly all-co-op newsletter, and adding webpage buttons for translation into other languages. More Spanish-language materials would also be very helpful, especially from a diversity perspective, so that our co-op can better be reflective of and serve the Lancaster population as a whole.

- Bin aesthetics: The compost bins have already generated considerable interest from participants who hope to beautify the bins through painting them. A prospective art competition with submissions from the students in the School District of Lancaster is being currently discussed, along with the input from the Lancaster Office of Public Art.

- Wrap-around activities and amenities: Local bin captains at Buchanan Park are also championing ideas about establishing Little Free Libraries and garden sites nearby the compost bins. The Musser Park co-op is exploring prospects for compost sales or donations, as they have an abundance on their hands. The Behind Culliton Park bin is hosting monthly community potluck dinners at the picnic tables near the bin. Such initiatives may well be indicative of the broader sense of community empowerment and championing of local sustainability and strengthening of social networks that the compost co-op has fostered.

## **B. Implications for Other Urban Areas**

Given the high costs of municipality-wide compost pickup, especially in the current fiscally-constrained and politically-unmotivated environment, there is little likelihood of a widespread policy measure or municipal program that will mandate universal composting in our area. Community-based composting is growing around the country, largely led by small hauling operations and pay-for-service business models. The model offered by the Lancaster Compost Co-ops, which builds on a similar model already in place in Washington, DC, offers a viable alternative for cities of similar sizes as both Lancaster, PA (population approx. 60,000) and Washington DC (population approx. 700,000).

The model's major strengths include its citizen empowerment, its low capital and operations costs, its carbon emissions reductions and waste management cost savings, and its decentralization. As composting becomes a visible activity in the locations where people already reside and recreate, our research suggests that the initiative of composting may well lead to other forms of environmental stewardship (waste pickup, gardening), alongside the development of stronger social networks through compost maintenance events and programming which allow like-minded neighbors to engage with each other. In this sense, the composting co-operative model is one in which resilience is fostered through development of a social infrastructure, in addition to the physical infrastructure of the compost itself.

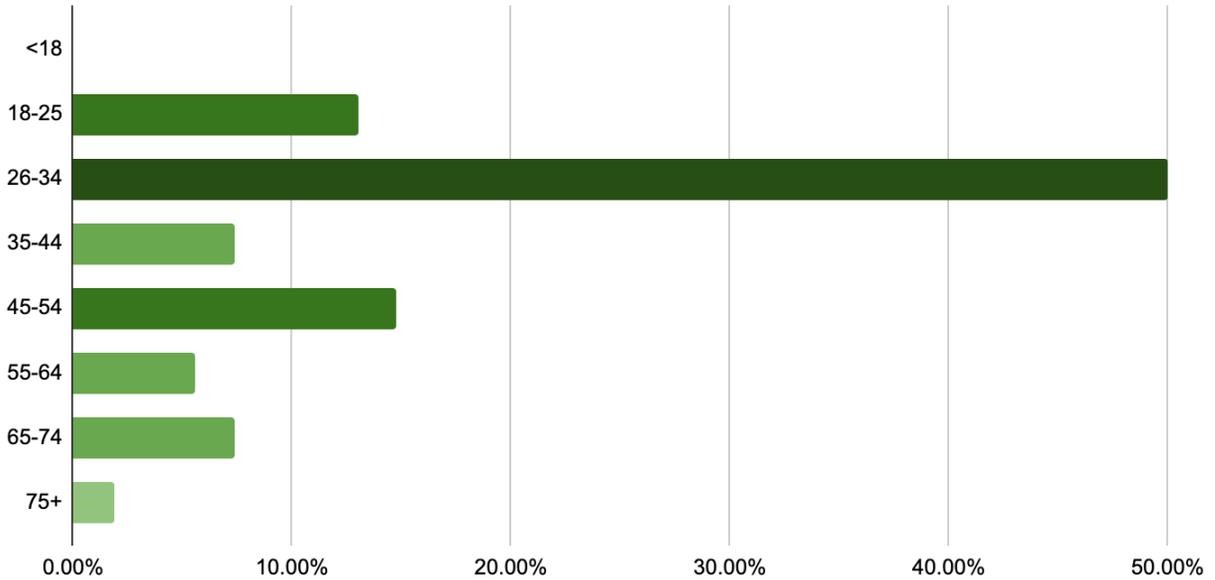
Adding what is essentially an organic waste processing amenity to park spaces certainly challenges some residents' notions of the functions and aesthetics of park spaces, leading to what in our experience has sometimes been strong initial pushback against particular bin locations. Through active public engagement, alongside a strong commitment from community members and city staff alike to ensure healthy compost maintenance, the Lancaster Composting Co-operative experience also indicates that such critiques can be reasonably resolved and overcome. Public education and member awareness about compost contamination, similarly, is addressed through ongoing communications and awareness-raising efforts. Even in places where robust markets already exist for curbside compost pick-ups, such as Washington DC and Philadelphia, PA, the model of community composting co-operatives is growing and thriving. As an opportunity for urban residents to reduce their household waste at no financial cost, while engaging in making compost together, and collectively deciding what to do with it thereafter, the

model also is an important tool for fostering an equitable and empowering approach to sustainability on a local scale.

# Appendix A: Demographic Information

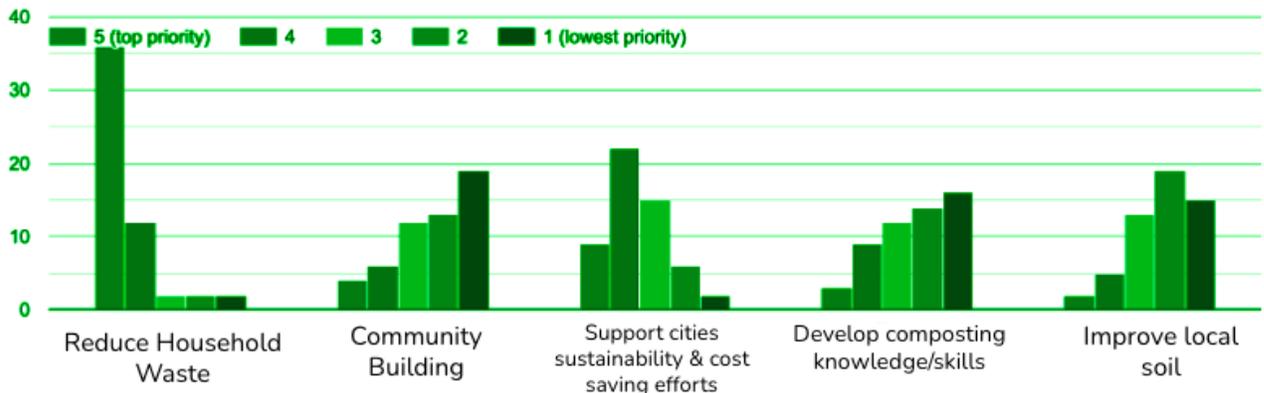
From the Initial Survey (April 2021)

## Member Age: Majority between 26-34



54 respondents answered the question: Which age group best describes you?

## Motivations of Involvement: Reducing Household Waste a Top Priority

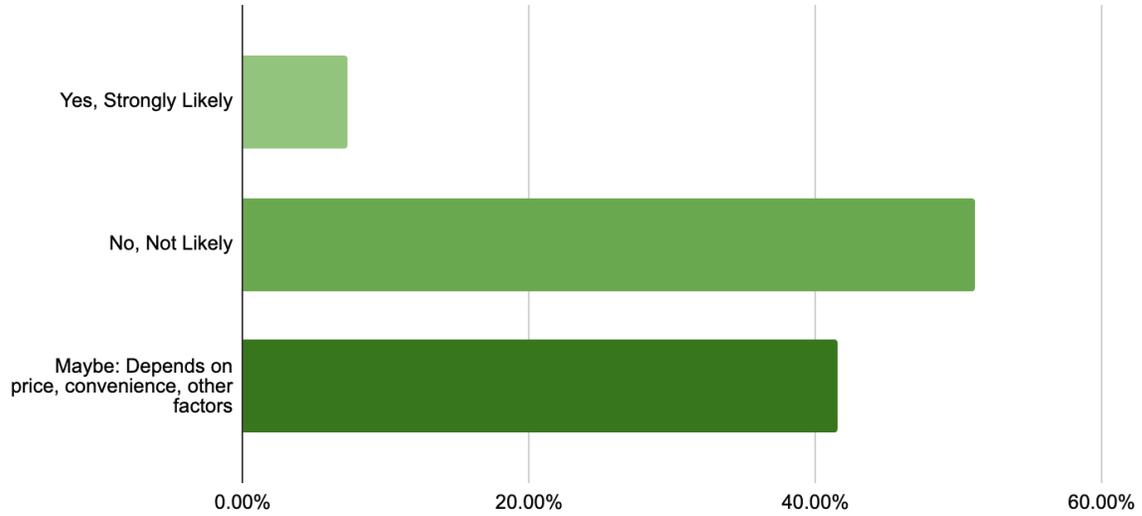


54 respondents answered the question: If you had to rank the reasons for your involvement, how would you prioritize the following motivations for joining this initiative?

From the Year One Survey (June 2022):

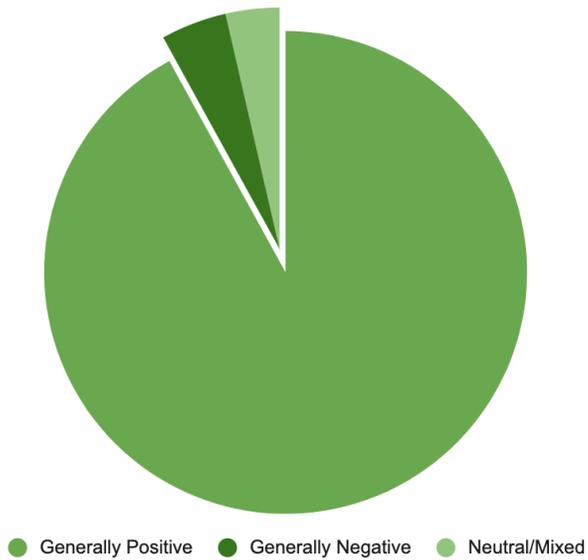
## Private Doorstep Compost Service: Limited Interest

41 Responses to: If a private doorstep compost pick-up service was available that charged a fee to participate, would you be inclined to opt for it instead of being an LCC member?

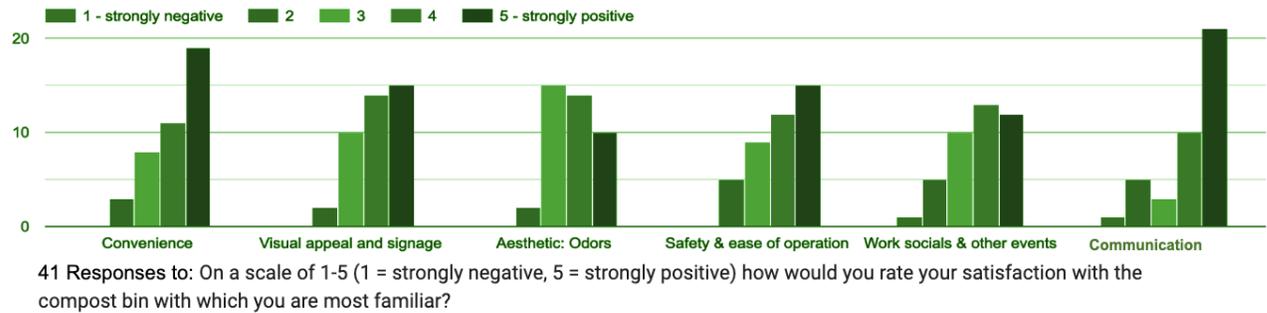


## Bin Descriptions: Generally Positive

41 Responses to: Which words come to mind when you think about the compost bin that you use?



## Bin Satisfaction: Strongly Positive Ratings



# Appendix B: Methodological Notes On Calculating Weights and Volumes

Our survey asked respondents to estimate their amount of compost produced (food waste only) and their frequency of trips to the compost bins. The data was highly variable, and self-reporting is widely known to be unreliable. As a result, we used the following calculations, based on data submitted from a listserv of community composters from across North America. Many other composting operations regularly weigh the food waste that is dropped off/ picked up on a weekly or bi-weekly basis, yielding a more reliable data set than self-reporting. We averaged the median weights from these comparable operations' estimates of their compostable food waste and standardized the estimates into monthly and annual weight calculations. This is the most reliable data and procedure possible, given a significant amount of variability in the data.

Below is a breakdown of responses from members of the community composting coalition on the amounts of food waste dropped off at their compost facilities.

Organization or individual	Household weight	Length of time	Per month weight (used 4 weeks as average reference)	Median for ranges
Gwen (Microhauling Client Success Manager Certified TRUE Zero Waste Advisor)	30-35 lbs	month	30-35 lbs	32.5
Marc S	8-10 lbs	week	32-40 lbs	36
Lisa (Juneau Composts)	6-12 lbs	week	24-48 lbs	36
Molly (Community Compost co)	10 lbs (but for 3 people)	week	26.7 lbs	26.7
Emily (GrowNYC Compost)	7 lbs	week	28 lbs	28
Domingo Medina	8-10 lbs	week	32-40 lbs	36
NRDC Save the food campaign (Emily)	4.8 lbs (per person)	week	38.4 lbs	38.4
Adirondack Worm Farm	22-27 lbs	every 2 weeks	44-54 lbs	49
			Total	282.6
			Avg dropped off weight per month (lbs)	35.325

Using the average dropped off weight per month of 35.325, and the number of members at 186, it would be assumed that approximately 16,658.5 lbs of food waste per month is being dropped off at our compost bins. This can be seen in the table below:

Number of members	Amount of food waste dropped off per month (lbs)	Amount of food waste dropped off per month (tons)	
186	6570.45	3.17925	
	Volume of food waste (cubic yards)	amount of browns being dropped off (cubic yards)	Weight of browns lbs
	14.19103672	56.76414687	21286.55508

The approximate weight of the browns is not simply a 4x multiplication of the amount of greens being dropped off, since the weight of the browns is approximately 375 lbs

per cubic yard of yard waste. This is in contrast to the 463 lbs that is equivalent to a cubic yard of food waste.

In finding the GHG equivalent footprint that is being alleviated by this compost project, there was an assumption made that, in making this calculation, only half of the browns would be used. This is because in Lancaster county, there is separate yard waste pickup, which is taken to a plant in Reading, PA to be turned into mulch.

- a) This GHG equivalent was calculated using ReFed’s impact calculator which given a certain weight of compost can calculate the amount of GHG eq that was being alleviated.
- b) This same calculator was used in order to calculate the water footprint that was alleviated through this project.
  - i) This calculation was approximately 19.8 million gallons of water.

Calculating the cost savings to the city of Lancaster:

In order to calculate the cost savings to the city of Lancaster, the same equation was used as above to calculate the GHG eq that was alleviated. This information can be seen in the table below.

Approximate savings to the city of Lancaster	tipping fee	tonnage	total per month	total annually
Food waste	80	3.17925	254.34	3052.08
yard waste	35	5.15	180.25	2163
			Total savings for the city of Lancaster	
				5215.08