Breaking Down Residential Composting: Digestible First Steps for Municipal Programs

A review of municipal compost programs and recommendations for the Town of Brookline, MA

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The Need for Municipal Composting

Composting programs have the potential to help municipalities reach their sustainability goals, including zero waste initiatives. Without composting programs, many cities and towns send organic waste materials to landfills or incinerators. Organic materials, when landfilled, produce methane gas as they decompose in anaerobic conditions, which support methane-producing bacteria. Methane is a greenhouse gas 28-36 times more potent than carbon dioxide[1], so the removal of organic materials from landfill waste can help municipalities reach their emissions reduction targets. Alternatively, some municipalities, including Brookline, send organic waste to a Waste-to-Energy Incinerator. While this approach may seem to be a satisfactory solution, solid waste incineration entrails its own problems. First, producing energy from solid waste incineration is highly inefficient. Because food waste is composed of about 70% water, burning it requires considerable energy[2]. Additionally, incineration is expensive, creates air pollution, and can undermine zero waste initiatives by locking municipalities into the high waste volumes needed for energy generation.

Given this context, the Town of Brookline, MA identified composting as an essential strategy to reduce waste and decrease greenhouse gas emissions as part of its Zero Waste Framework[3]. The Brookline Department of Public Works sought a review of existing composting programs, with short and long-term recommendations to inform their decision-making process in implementing and incentivizing universal town-wide composting. For this report, interviews were conducted with representatives of Massachusetts municipalities who currently run curbside composting programs. Additional information was gathered from city, state, and national government websites and an online literature review was conducted to inform recommendations.

Key Recommendations

1. Begin with a voluntary, limited pilot program with plans to expand over time
    - The pilot program should be opt-in, not mandatory
    - Limit the number of residents participating in the initial pilot and exclude large apartment buildings initially
    - Long term recommendation: Reevaluate making composting mandatory after developing the program gradually, with attention to education and outreach

2. Work with a contractor for initial program implementation
    - To implement its pilot program, the Town of Brookline should begin contracting with an existing compost service provider. Once the program has matured, Brookline can evaluate whether additional staff should be hired so this work can be done internally by the DPW

    - Request proposals from haulers with appropriate experience. Require haulers to identify the compost processing facility to be used – deciding where organic materials will be taken for processing will determine whether the waste goes through true compost processing or anaerobic digestion
    - Loop in Massachusetts state officials when selecting a composting facility to ensure that the program has the correct permits
    - Specify data sharing requirements in contractor agreements in order to track the program's success metrics

3. Budget for the upfront cost of the composting pilot program in Brookline's annual operating budget
    - Negotiate reduced rates for organic materials disposal
    - Work to reduce trash collection frequency for long-term cost reductions
    - Apply for external funding, including grants, at both the state and national level
    - Adopt cost reduction techniques to minimize the financial burden on DPW resources

4. Encourage residential composting through financial incentives
    - Use SMART or PAYT trash programs to provide a direct financial incentive for residents to reduce waste
    - Brookline should increase PAYT rates over time to embed the costs of organics collection in trash hauling and further incentivize the compost program

5. Prioritize education and outreach to increase resident satisfaction
    - Contrary to common resident anxieties, composting food waste will actually reduce issues with odors and rodents
    - Develop a volunteer-run hotline or forum for residents to contact with questions, complaints, and suggestions
    - Develop targeted outreach campaigns for multilingual households, disabled and elderly residents, college students, residents in public housing and Environmental Justice Communities of Concern (EJCOC), landlords, property managers, and residents of large apartment buildings

1. Begin with a voluntary, limited pilot program with plans to expand over time

While the Town of Bookline's long term goal may be implementing a mandatory program for all residents, we believe that starting with a limited, opt-in pilot program is the best first step. An opt-in program eliminates the need for regulation and enforcement. This approach also gives town officials the opportunity to ramp up education about the program gradually while working out any issues with implementation. Mandating compost collection preemptively could easily backfire; public response will likely be more positive with a voluntary pilot. Cities and towns with successful composting programs have built them up over a number of years, offering incentives and education to residents.

The pilot program should be capped at a limited number of residents, based on the town's size and budgeting constraints. This recommendation aligns with the practices of other cities and towns in Massachusetts. An initial pilot program inviting 3000 households in Brookline to participate would be of a similar scale to other pilot programs in Massachusetts, encompassing 12% of Brookline households[4].

Municipality	Pilot Program Details	Current State of Program
Town of Hamilton	74 households in 2009; expanded pilot program of 600 households in 2010[5] (23.9% of households in the town[4]).	Available to all households in 2012; mandatory beginning February 1, 2022.
City of Cambridge	600 households in 2014; expanded to 5000 households in 2015[6] (11.6% of households[4]). Pilot was only accessible to buildings with 12 units or less.	Accessible to all residents, with approximately 50% participation currently.[6]
City of Boston	Began three-year pilot on August 1, 2022 with a cap at 10,000 subscribers[7] (approximately 4% of Boston households[4]). Limited to buildings under 7 units.	The city intends to expand the size of the program gradually, adding 10,000 additional subscribers each year.[7]
City of Watertown	Began three-year pilot program July 2022, capping its initial service at 2000 households[8] (12.4% of households[4]). Limited to buildings under 4 units.	Participation is currently limited by the program budget. The city has a waitlist for additional interested households.[8]

Table 1. Program details for Massachusetts municipalities with curbside pick-up programs

It may be useful for Brookline to further limit the scope of its initial pilot program to single family homes and buildings with few units. The Cambridge pilot was only accessible to buildings with 12 units or less[6]. Boston has limited its pilot to buildings under 7 units.[7] In Watertown, only buildings with fewer than 4 units are eligible.[8] These initial limitations on building size are adopted because serving apartments is logistically complicated and communal bins often have more contamination. Over time and with resident education, the program should be expanded to include larger apartment buildings.

Once the town's composting program matured, Brookline can then reevaluate the implementation of a mandatory program. Mike Orr, the Recycling Director at Cambridge Department of Public Works, recommends waiting until the municipality reaches at least two-thirds participation in a voluntary program (approximately 66%) before proposing mandatory composting.[6] Pushing a mandatory program any earlier could receive significant political backlash. The Town of Hamilton, Massachusetts serves as a good example of this approach. In Hamilton, the Board of Selectman implemented a ban on organics in residential trash in 2021, nine years after making voluntary curbside composting available to all residents. The language in the organics ban reasons that "removing organics from the waste cycle is one simple action that Hamilton residents can take to mitigate the increased carbon emissions caused by burning it with our trash" while also specifically noting that it is possible to implement this ban now "in recognition that all the components to carry out town-wide residential curbside composting have been in place for a number of years".[9] James Gist, the chief financial officer at Brick Ends Farm, where Hamilton's compost is sorted, worried that mandating compost "could get really dirty really quick", referring to the concern that some people may just fill their compost bins with more trash. "I don't think the Town of Hamilton will have that problem," he said, "but I think you try to scale this and you might see a few more issues."[10]

San Francisco, the model city for successful composting in the US, also spent many years building up their composting program - initially started in 1996 - before implementing a mandatory recycling and composting ordinance for residents and businesses in 2009. Robert Reed, director at Recology, San Francisco's refuse hauler and partner in developing the city's waste collection and processing, noted that the city's successful compost program was achieved over many years with numerous steps. "We tested different ways to collect compostable material. We undertook a strong and consistent outreach campaign. We gave presentations at community meetings," said Reed.[11] This commitment to education and outreach while gradually increasing the scale of its program will be necessary for Brookline to successfully reach its long-term goal of citywide, mandatory compost.

2. Work with a contractor

To implement its pilot program, the Town of Brookline should begin contracting with an existing compost service provider. All of the municipalities interviewed for this report began their programs by utilizing contract services and recommended this approach. The composting service providers utilized by the municipalities interviewed are shown in the table below. The RecyclingWorks website (funded by the Massachusetts Department of Environmental Protection) provides a searchable list of compost haulers in Massachusetts to find potential contractors: https://recyclingworksma.com/recyclers/.

Municipality	**Compost Service Provider**
Hamilton, MA	Casella Waste Systems, Inc.
Manchester-By-The-Sea, MA	Black Earth Compost, LLC
Watertown, MA	Black Earth Compost, LLC
Boston, MA	Garbage to Garden Save That Stuff, Inc. ** The City of Boston works with two service providers*
Cambridge, MA	N/A **The City of Cambridge operates its program internally, but initially contracted with Save That Stuff, Inc.*

Table 2. Contracting services utilized by Massachusetts municipalities with curbside pick-up programs

At this time, Cambridge is the only municipality in Massachusetts to operate its own in-house curbside composting program. Like the other cities and towns interviewed, the Cambridge program began as a pilot program using a contractor for weekly pickups. This decision was made primarily for logistical reasons, to achieve the collection efficiencies needed.[12] Once the citywide program matured, Cambridge reevaluated whether DPW crews could be utilized. Four years after the initial pilot, in 2018, Cambridge brought the pickup services in-house. Limited hiring and new equipment was needed for this shift; in the end, one existing truck was shifted from trash pickup to compost pickup and one new truck was purchased. Only one new employee was hired and several were shifted from trash pickup to the composting program.[6] If the Town of Brookline is similarly inclined to use DPW crews for compost collection, we recommend a similar, iterative approach. Brookline should begin by contracting with an existing service provider and reevaluate the effectiveness of bringing collection services in-house once the program has had time to develop. Such an evaluation will require additional analysis to determine the exact number of additional hires needed for an in-house program.

Several considerations and practices should inform Brookine's search for a collection service. First, the town should request proposals from haulers with appropriate experience. These haulers should be required to identify the compost processing facility to be used. Deciding where organic materials will be taken for processing will determine whether the waste goes through true compost processing or anaerobic digestion. True compost processing will likely lead to greater resident satisfaction and could supply residents with rich soil for local yards and gardens. Alternatively, organic materials can be taken to a facility for anaerobic digestion. While anaerobic digestion will reduce greenhouse gas emissions from organic material, it does not provide soil to residents. We recommend that Brookline loop in state officials when selecting a composting facility to make sure they have the correct permits. Additionally, Brookline should include agreements about data sharing in their contractor requirements[7]. The town must be specific about the data needed from contracting companies in order to track the program's success metrics.

3. Budget for the upfront cost of the composting pilot program in Brookline's annual operating budget

The initial implementation of a composting program will be a cost to the town of Brookline. Over time, however, it is possible that composting could reduce waste collection expenses as residential trash needs will be reduced by successful waste diversion. As trash is successfully diverted to other waste streams, the town may save money on tipping fees, and may even be able to reduce the frequency of trash collection as has been done in some municipalities with robust recycling and composting programs. The Zero Waste Initiatives identified in the Town of Brookline's Zero Waste Framework call for expanding organics collection in the short term (2024-2027) and considering the reduction of trash collection days or implementing every other week collection in the medium term (2028-2030) as trash volumes decrease[3], which would benefit both the environment and the budget.

A number of municipalities have found long-term success in reducing costs associated with adding curbside composting collection. Part of this success can be attributed to negotiating reduced disposal rates for organic materials. The town of Hamilton, MA, for example, implemented a composting program for both environmental and financial reasons. Shawn Farrell, who chairs the Board of Selectmen, said "We could see it as a way to be fiscally responsible and lower our trash burden".[10] The town negotiated a $40-per-ton disposal rate from Brick Ends Farm, a composting site, which was significantly lower than the city's trash rate of $70-per-ton. The Board of Selectmen for Manchester-By-The-Sea (which began offering town-wide curbside composting in April 2014) reported a savings of $13,000 in trash and processing fees in 2019 due to composting. It costs the town more than $65 per ton to dispose of trash, and only $45 per ton for composting.[13] However, these potential savings are unlikely to fully cover the cost of implementing town-wide curbside composting.

Reduced costs can also be achieved through a reduction in frequency of trash pickups. Bi-weekly trash collection could encourage compost and recycling as well as reduce the cost of waste collection overall. Up until the COVID-19 pandemic, which increased household trash as more individuals isolated at home, Hamilton was able to successfully reduce trash and recycling pick-ups to every other week.[10] Unfortunately, the town is back to weekly collections, but the previous success of bi-weekly collection speaks to the long-term feasibility of this approach. Portland, Oregon, where a robust city-wide composting program has been in place since 2011, now only collects trash every other week, with

weekly organics and recycling pickups.[14] This schedule was made possible, in part, by intentional sizing of carts to incentivize composting and recycling. Portland residents currently receive a 60 gallon curbside compost cart free, with trash cart options of 20, 35, 60 or 90 gallons determining waste fees.[14] Most cities distribute smaller compost carts to residents - in Massachusetts, Hamilton and Watertown use 13 gallon curbside carts, Boston's are 12 gallon, and Cambridge provides 12 gallon carts for buildings with 1-3 households or a 35 gallon cart for residences comprising 4 or more households. While Brookline will likely want to use the 12 or 13 gallon compost carts initially, in the long term, Brookline should consider shifting to larger compost carts and smaller trash carts in order to maximize waste reduction and support their goal of reducing trash collection frequency.

Regardless of long term success and potential to reduce collection costs, the Town of Brookline should anticipate budgeting for the cost of the composting program in the near future. To finance this project, we have several recommendations.

There are a number of options for grants and external funding that Brookline should apply to at the state and national level to help get a municipal curbside composting program started. At the Massachusetts state level, the MassDEP Sustainable Materials Recovery Program (SMRP) provides multiple grants to assist municipalities in funding improvements to waste diversion, such as composting.[15] Links are included in the references for further information.

- Wheeled Organics Carts grant for municipally financed collection of food waste[16]: This grant is specifically provided by the state to fund curbside compost carts.
- Recycling Dividends Program[17]: Brookline currently participates, but will be eligible for increased yearly funding upon implementing town-wide composting
- 80 hours of technical assistance from a MassDEP Municipal Assistance Coordinator for a waste reduction project[18]: We recommend Brookline explore this option to support DPW staff in implementing town-wide composting.

At the national level, grants are more competitive and require more up-front time to apply, but could result in substantial funding to support the creation of a town-wide composting program in Brookline. If DPW staffing and resource constraints allow, we recommend the town of Brookline apply for the following two national grants.

- USDA Composting and Food Waste Reduction program: a "cooperative agreements to assist local and municipal governments with projects that develop and test strategies for planning and implementing municipal compost plans and food waste reduction plans"[19]
- EPA Solid Waste Infrastructure for Recycling grant program includes grants for the "Development of and/or upgrades to curbside collection programs or drop-off stations for organics" run by municipalities[20]

Ultimately, the majority of a composting program's costs will fall to municipal budgeting. We recommend getting the support of Brookline's town meeting representatives and Select Board members for the composting program's larger goals. By highlighting the role the composting program will play in the town's larger climate action and waste reduction goals, the program is more likely to receive funding through the DPW. There are also techniques used by other cities to successfully reduce the overall cost of a composting program. For example, pails to collect compostable materials in the kitchen should be given only to households that request them. Because these pails can be a large cost to the program

and their effectiveness is debatable[21], we recommend using coupons that residents can redeem for a free container, rather than supplying pails to all households. This approach will likely reduce the misuse or disposal of pails, and eliminate unneeded cost. Additional methods to reduce program costs include partnering with other communities or organizations for outreach, and using Pay-As-You-Throw (PAYT) trash rates as described below.

4. Encourage residential composting through financial incentives

One strategy to reduce program costs to municipalities and encourage residential composting is through financial incentives for residents. In most US cities and towns, residential fees for curbside trash collection are consistent regardless of how much waste is produced. Implementing Save Money and Reduce Trash (SMART) or Pay-As-You-Throw (PAYT) systems, where residents are charged less for producing less trash, can provide a direct financial incentive for residents to begin composting and thereby reduce their waste. This strategy has proven effective in multiple studies. “A survey of the 50 largest municipalities in Massachusetts with curbside trash collection found that those that implemented SMART or PAYT systems reduced the amount of trash generated by 33 to 44 percent in the first year.”[22] Additionally, a study of 180 composting programs across the US found that “PAYT or variable trash rates often go together with successful organics programs”[21] finding that they are a “very useful tool by serving as a constant reminder and economic incentive to the rate payer.”[21]

PAYT programs are already being successfully implemented in Massachusetts. For example, Hamilton, the only town in Massachusetts currently with mandatory residential composting, had a modified PAYT system in place before they began an initial pilot composting program in 2009. In a 2010 survey of the 600 households participating in the expanded pilot, half of respondents indicated that they never put out more than half a 30-gallon can of trash a week.[5] Hamilton households today are given one 35-gallon trash bin for free weekly pickup, and must purchase special trash bags from the town for any excess waste.[23] Similarly, Ipswich adopted a limit of one free 35-gallon bag or barrel of trash in 2010, and residents can purchase overthrow bags for $2 each if they have more trash than the one barrel.[24] The town promotes composting to residents as being cheaper than paying for one overthrow bag per week. (Ipswich residents can sign up individually for a reduced rate with Black Earth to collect their compost; there is currently no town-wide composting program, although they hope to expand to one in the future[25]). Additionally, this overthrow bag charge can be used by the town to help finance a curbside composting program if deposited in an enterprise fund, as is done in both Hamilton and Ipswich.[25]

It is advantageous that Brookline has an existing hybrid PAYT trash system, with a 3 tiered rate based on the size of residents’ chosen trash bin; residents can pay for overflow bags if they have more trash than their waste cart can hold in any given week.[26] As Brookline moves forward with its composting program, it may be beneficial to increase these PAYT rates to embed the costs of organics collection and further incentivize the compost program. One long term strategy would be to add a fourth option for a smaller trash cart. This would have the dual benefit of increasing DPW funds to help offset the cost of composting covered by the town. Compost carts should be included in the annual refuse fee at no extra charge, as is currently done for recycling carts in Brookline. Education and outreach to residents could promote moving down a trash cart size by separating out compost, thus saving the residents money.

Current trash fee structure in Brookline[26]		Sample fee structure to incentivize composting	
N/A		20 gallons	$230/year
35 gallons	$230/year	35 gallons	$310/year
65 gallons	$310/year	65 gallons	$392/year
95 gallons	$392/year	95 gallons	$475/year

5. Prioritize education and outreach to increase resident satisfaction

Two major concerns for residents are often the “yuck” factor of compost and the fear that it will attract rats and other pests. Consistent, repeated education will be key to remind residents that the same food scraps they are now putting in the compost bin were previously going into their trash bin. No new material is being added, it is simply being separated. In fact, composting bins are specifically designed with thicker plastic and locking lids to limit odors and prevent animals from getting in. This can actually reduce the presence of rats that were attracted to food scraps in the trash bins. Mike Orr, with the city of Cambridge, shared that rodent problems were initially a concern for some residents, but that the city’s composting program has actually helped to reduce rodents and odors.[6] Like many programs, the Cambridge composting bins use locking lids that minimize odors and keep animals like racoons from accessing food waste. By contrast, 40-50% of Cambridge residents’ trash bins have holes, many created by rodents, leaving the bins practically open[6]. One strategy that cities have found helpful is to include photos of “clean” carts full of organics (not messy/dirty ones or cartoon stock images) with education materials.[21]

Inevitably, there will be some residents who are uncertain or even agitated about a town-wide residential composting program. During both the initial rollout and expansion of the pilot program, a forum where residents can ask questions, make suggestions, or simply vent will be helpful in smoothing the path. In Hamilton, the volunteer Recycling Committee ran a hotline for people to call as they expanded from a pilot program of eager residents to include the entire town[5]; members felt that this was one of the keys to getting people on board as they expanded composting. They have since moved from the phone hotline to a Facebook group, where anyone in town can ask for help or make suggestions about composting.[27] If there are willing volunteers in the community, having both a hotline to call and some form of online space for questions allows for addressing resident’s concerns without adding additional burden to DPW staff. Some contractors may offer this service, although the extent to which the contractor fielding calls is knowledgeable about composting or the particulars of the town’s system will vary.[27] Therefore, even if the contractor has a customer support hotline, it may be beneficial for the town to run their own in addition, especially if there is an active group of residents looking to promote composting (as there seems to be in Brookline). Additionally, volunteer energy should be used for ongoing outreach to residents (via mailings, social media, or other means) with suggestions for specific issues as they arise. For example, when the Hamilton pilot program had fly infestations during a heat wave, “the recycling committee emailed all participants with its solution of freezing all food waste that contained meat” until the weekly pick-up.[5]

The city of Toronto, Canada, which runs a successful municipal composting program, attributes its success in part to the fact that “the city government commissioned targeted advertising to apartment dwellers, a specialized hotline for questions and a task force whose goal is to help multi-unit residences meet their waste diversion targets. The city also extended PAYT pricing to multi-family residences, which provides a financial incentive for building owners to both adopt and encourage composting amongst their tenants.”[22] Targeted outreach should be made by the town of Brookline to specific groups to encourage participation by residents beyond those already eager to begin curbside composting. The US Census Bureau estimates that 33% of Brookline residents age 5 and older speak a language other than English at home in 2020, with 27.8% of the population over age 5 speaking English “less than very well”.[4] Multilingual outreach and education on the existence of a new composting program as well as what and how to compost will thus be essential. Other groups that may benefit from more personalized outreach include disabled and elderly residents, college students, residents in public housing and Environmental Justice Communities of Concern (EJCOC), landlords, property managers, and residents of large apartment buildings. While some of these groups may not be included in Brookline’s initial pilot program, working with them in advance should make the adoption of composting smoother.

Outreach and education can take many forms. Informational mailings (in multiple languages) could be sent to all residences, or a section on the composting initiative could be added to the trash/recycling mailings that are already distributed. DPW staff or community volunteers can table at events such as farmers markets and local fairs and festivals. Flyers, alongside a compost cart to draw attention, could be displayed at libraries, town hall, and other municipal buildings. Brookline’s Zero Waste Framework outlines a “Lead by Example” initiative, in which they intend to expand the compost collection pilot project from some to all elementary schools and the high school to “provide a model for Brookline families and support expansion of organics collection communitywide”.[3] Student energy should be leveraged to educate both their own families and the wider community, perhaps through student-driven outreach projects such as videos or inviting members of the green teams to help with tabling at events.

Conclusion

In this report, we have offered short and long-term recommendations which we believe will help the Town of Brookline successfully navigate the creation of a composting program. As described above, we recommend that Brookline begin with a pilot program that is voluntary, limited in scope, and contracted out to an established composting service. The cost of this initial program will fall largely on the municipality, but cost-cutting techniques and external funding can reduce this financial burden. Over time, the program will develop and mature. Brookline may eventually decide to bring hauling services in-house under the town’s DPW and/or explore mandatory composting. These are exciting future possibilities that reflect Brookline’s commitment to reduce waste and decrease greenhouse gas emissions. However, the largest takeaway from our interviews and online research has been the importance of gradual growth; Brookline must work in incremental steps towards the town’s final goals, consistently prioritizing education and outreach to maximize resident satisfaction and support.

Works Cited

1. US EPA, OAR. *Basic Information about Landfill Gas*. 15 Apr. 2016, https://www.epa.gov/lmop/basic-information-about-landfill-gas.
2. *C40 Knowledge Community*. https://www.c40knowledgehub.org/s/article/Why-solid-waste-incineration-is-not-the-answer-to-your-city-s-waste-problem. Accessed 6 Dec. 2022.
3. Town of Brookline, MA. Zero Waste Framework. Department of Public Works. January 2022. https://www.brooklinema.gov/DocumentCenter/View/32461/Zero-Waste-Framework-Final
4. *Explore Census Data*. https://data.census.gov/. Accessed 6 Nov. 2022.
5. Tracy Frisch. Residential Food Waste Collection Rolls Out. BioCycle December 2011, Vol. 52, No. 12. https://www.biocycle.net/residential-food-waste-collection-rolls-out/
6. M. Orr, personal communication, October 17, 2022.
7. T. Savarese, personal communication, November 2, 2022.
8. A. Pforzheimer, personal communication, October 28, 2022.
9. Town of Hamilton, Board of Selectmen, Organics Ban. https://www.hamiltonma.gov/wp-content/uploads/2018/08/Organics-Ban-final-12.21.20.pdf
10. Staff, Janelle Nanos Globe, et al. "Hamilton Becomes First Mass. Town to Mandate Composting - The Boston Globe." *BostonGlobe.Com*, https://www.bostonglobe.com/2021/02/21/business/hamilton-becomes-first-mass-town-mandate-composting/. Accessed 6 Nov. 2022.
11. Yerina Mugica, Andrea Spacht and Alice Henly. Natural Resources Defense Council (NRDC), San Francisco Composting, November 2017, https://web.archive.org/web/20190321195801/https://www.nrdc.org/sites/default/files/food-matters-san-francisco-composting-cs.pdf
12. *Curbside Organics Collection From Residents: Phase 2 Report*. City of Cambridge Department of Public Works, 2015, https://www.cambridgema.gov/-/media/Files/publicworksdepartment/recyclingandrubbish/PDFs_Keep/2015cambridgecurbsideorganicsexecutivesummary.pdf.
13. *Sustainability Committee | Manchester-by-the-Sea, MA*. http://manchester.ma.us/672/Sustainability-Committee. Accessed 6 Dec. 2022.
14. *Garbage Service for Houses and Smallplexes | Portland.Gov.* https://www.portland.gov/bps/garbage-recycling/home-recycling/garbage-service-basics. Accessed 6 Dec. 2022.
15. *Apply for a Sustainable Materials Recovery Program (SMRP) Municipal Grant | Mass.Gov*. https://www.mass.gov/how-to/apply-for-a-sustainable-materials-recovery-program-smrp-municipal-grant. Accessed 6 Dec. 2022.

16. Massachusetts Department of Environmental Protection. Sustainable Materials Recovery Program. Wheeled Organics Carts. https://www.mass.gov/doc/details-wheeled-organics-carts/download

17. Massachusetts Department of Environmental Protection. Sustainable Materials Recovery Program. Recycling Dividends Program. https://www.mass.gov/doc/details-recycling-dividends-program/download

18. *Apply for SMRP Municipal Technical Assistance | Mass.Gov*. https://www.mass.gov/how-to/apply-for-smrp-municipal-technical-assistance. Accessed 6 Dec. 2022.

19. *Composting and Food Waste Reduction (CFWR) Cooperative Agreements*. https://www.usda.gov/topics/urban/coop-agreements. Accessed 6 Dec. 2022.

20. US EPA, OLEM. *Grants for Political Subdivisions*. 25 Oct. 2022, https://www.epa.gov/rcra/grants-political-subdivisions.

21. Juri Freeman and Lisa Skumatz. Econservation Institute. Best Management Practices in Food Scraps Programs. http://web.archive.org/web/20170126143436/http://www.foodscrapsrecovery.com/EPA_FoodWasteReport_EI_Region5_v11_Final.pdf

22. Bradford, Abigail, et al. *Composting in America: A Path to Eliminate Waste, Revitalize Soil and Tackle Global Warming*. Frontier Group & U.S. PIRG Education Fund, 2019, https://publicinterestnetwork.org/wp-content/uploads/2019/06/USP-Composting-in-America-FINAL-1.pdf.

23. "Trash Information." *Town of Hamilton, MA*, https://www.hamiltonma.gov/government/department-public-works/trash-organics-recycling-yard-waste-disposal-information/trash-information/. Accessed 6 Dec. 2022.

24. Town of Ipswich, Massachusetts. Trash Policy Directive. https://www.ipswichma.gov/DocumentCenter/View/510/Trash-Policy-Revisions-----May-2018-PDF

25. M. Connelly, personal communication, October 20, 2022.

26. *Trash / Hybrid Pay-as-You-Throw (HPAYT) | Brookline, MA - Official Website*. https://www.brooklinema.gov/1364/Trash-Hybrid-Pay-as-You-Throw-HPAYT. Accessed 6 Dec. 2022.

27. G. Clark, personal communication, October 21, 2022.