

**Setting the Path to Zero Waste:**  
*Recommendations on the Future of Residential Curbside  
Waste Management in Newton*

**Newton Sustainable Materials Management Commission**

**November 2, 2021**

## Acknowledgements

The City of Newton Sustainable Materials Management Commission (SMMC) is an eleven-member body appointed by the Mayor with the approval of the City Council. The SMMC members are citizens of the City and are selected to provide representation by those with expertise or interest within the field of municipal solid waste disposal, including but not limited to recycling, composting, resource recovery, hazardous waste environmental engineering, solid waste collection, organics management, and energy recovery.

The purpose of the SMMC is to advise the Mayor and the City Council on all aspects of municipal solid waste collection, disposal, organics management, energy recovery, and recycling affecting the City and to monitor and make recommendations regarding the City's activities in these areas. The SMMC members are:

Sunwoo Kahng, Chair  
Marian Rambelle, Vice Chair  
Carl Valente, Secretary  
Steven Ferrey  
Meryl Kessler  
John Lewis  
Robin Maltz  
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Miles Smith  
James McGonagle, Commissioner, Department of Public Works, Ex-Officio

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# Table of Contents

<b>Executive Summary</b> .....	iii
<b>1. Background – Current Residential Waste Management in Newton</b> .....	<b>1</b>
1.1 Service	
1.2 Contracts	
1.3 Trash and Recycling Rates	
<b>2. State and Regional Trends in Trash Disposal Capacity</b> .....	<b>4</b>
2.1 Dwindling Landfill Capacity for Trash	
2.2 Increased Exporting of Waste and Increased Costs	
2.3 Impact on Waste-to-Energy Facilities	
2.4 Trash Reduction as a Solution	
2.5 Sufficient Capacity for Organics Processing	
2.6 Recycling Capacity Stalled but Rebounding	
2.7 Overall Trash Composition by Primary Material Capacity	
<b>3. Looking to Examples in Other Communities</b> .....	<b>7</b>
3.1 Variable Rate Curbside Collection System	
3.2 Curbside Organics Collection - Complement to Variable Rates or Biweekly Collection	
3.3 Case Studies	
<b>4. Setting a Path to Zero Waste in Newton</b> .....	<b>11</b>
4.1 Reasons for Establishing a Zero Waste Goal	
4.2 Comparable Zero Waste Goals	
4.3 Proposed Waste Reduction Goals for Newton	
4.4 Current Trash Reduction Measures are Not Enough	
4.5 Invest in SMMD Staffing for Success	
4.6 Pathways to Achieving Residential Waste Reduction Goals	
4.7 Newton Needs a Comprehensive Zero Waste Plan	
<b>Appendices</b>	
Explanations of Appendices.....	18
Appendix A. Historical Waste Management Costs for Newton.....	19
Appendix B. Projection of Yearly Reduction in Trash 2021-2050.....	20
Appendix C. Advancing Zero Waste in Newton - Looking to the Future.....	21
Appendix D. Summary of SMMC Variable Rate System/Curbside Composting Survey.....	23
<b>Figures</b>	
Figure 1.1 Newton Residential Curbside Trash 2002-2020 (tons/year) .....	2
Figure 1.2 Newton Residential Curbside Single Stream Recycling 1998-2020 (tons/year).....	3
Figure 2.1 Residential Trash Composition at Wheelabrator-Millbury WTE.....	6
Figure 3.1 Variable Cart Size and Annual Rates in 4 Municipalities.....	8
Figure 4.1 Proposed Newton Trash Reduction Goals.....	13
Figure 4.2 Potential Impact of Curbside Organics Collection.....	14



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## Executive Summary

### Purpose of this Report

The purpose of this Sustainable Materials Management Commission (SMMC) Report is to present our findings on the current and future trends in residential waste management, the impact they will have on Newton, and our recommendations for action. Residential curbside waste management services include trash, recycling, yard waste, and bulky item pickup through contracts negotiated by the City. These services are provided to the vast majority of Newton households. For this report, the SMMC researched and discussed the following specific issues between June 2020 and September 2021:

1. The anticipated statewide shortfall of in-state solid waste disposal capacity and its implications, particularly financial, for Newton
2. Newton's future needs regarding solid waste, waste diversion, and waste reduction in relation to evolving state and federal regulations and trends<sup>1</sup>
3. Strategies in other municipalities to reduce waste, and increase waste diversion for solid waste and recycling services

Information from this SMMC report will be incorporated into wider efforts underway by the Sustainable Materials Management Division (SMMD) of the Newton Department of Public Works (DPW). The SMMD will prepare a comprehensive and data-driven report to assess the current status of Newton's residential curbside waste collection program and develop recommendations to further reduce waste (anticipated in June 2022). Following this analysis, the SMMD expects to develop a 5-Year Sustainable Materials Management Strategy.

Our goal in producing this report is to lay the groundwork for the upcoming SMMD report and to impress upon the City the urgency for action. We must take concrete steps in the next several years if we are to dramatically reduce residential waste in Newton in future years.

### Key Findings

- Shrinking regional landfill capacity will limit solid waste disposal outlets, increase pressure on Massachusetts communities to export solid waste out-of-state, and almost certainly raise disposal costs significantly.
- The cost of Newton's latest 5-year waste collection and hauling contract (2020-2025) is markedly higher than the previous contract. Many communities across Massachusetts are experiencing rising waste hauling and disposal costs, and costs are expected to continue to increase.
- Newton's 20-year solid waste disposal contract with the Wheelabrator Waste-to-Energy (WTE) plant

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<sup>1</sup> For the purpose of this report, waste is defined to include trash, recyclables, yard waste, organics (food scraps), and bulky waste; solid waste does not include recyclables.

in Millbury will expire in 2028. We assume but are not certain whether the Millbury WTE plant will operate beyond 2028, but Newton will almost certainly face significantly higher trash disposal costs in the next contract.

- Newton’s curbside trash and recyclables tonnage has declined over time, but it has leveled off in recent years. Recycling is an important component of reducing trash and should continue to be strengthened, but it is not enough. It will be important for Newton to invest in new programs to further prevent waste generation and increase waste diversion if the City intends to control rising costs and keep its commitment to zero waste.<sup>2</sup>
- Newton’s residential waste hauling and disposal services are paid for through a general fund, funded largely through residential property taxes.<sup>3</sup> As a consequence, residents generally do not know how much these services cost and have little financial incentive to reduce waste.
- Removing organics from the trash stream would have the largest and most immediate impact on reducing trash.

## **SMMC Recommendations**

Reducing our trash, along with diverting waste through recycling and composting, will help achieve important greenhouse gas reductions; reductions in air, soil, and water contamination; and lifecycle resource conservation. To reduce Newton’s environmental impact and better buffer our city against the financial impacts from future residential waste management costs, **the SMMC recommends that the City adopt the following strategies by the end of 2023 so that our path forward is defined prior to negotiations for the next waste hauling contract in 2024:**

### **1. Set residential zero waste goals for Newton**

In order to make measurable progress towards waste reduction, we recommend that the City commit to specific waste reduction goals. Reducing trash tonnage by 25% by 2030 and 70% by 2050 compared to 2018 levels would put Newton near the waste reduction goals set by the Massachusetts Department of Environmental Protection (MassDEP).<sup>4</sup> Neighboring communities such as Boston<sup>5</sup> and Cambridge<sup>6</sup> have drafted zero waste plans with quantified waste reduction goals.

### **2. Implement a citywide curbside organics collection program**

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<sup>2</sup> *Solid Waste and Recycling Resolution Passed by Newton City Council*. (May 22, 2016). Green Newton. <https://greennewton.org/solid-waste-and-recycling-resolution-passed-by-newton-city-council/>

<sup>3</sup> Property taxes are paid into Newton’s general fund, which covers all waste management costs.

<sup>4</sup> Massachusetts Department of Environmental Protection. (October 2021). *Final Massachusetts 2030 Solid Waste Master Plan: Working Together Toward Zero Waste*. p. 8. <https://www.mass.gov/doc/final-massachusetts-2030-solid-waste-master-plan-working-together-toward-zero-waste-october-2021/download>

<sup>5</sup> City of Boston. (June 2019). *Zero Waste Boston: Recommendations of Boston’s Zero Waste Advisory Committee*. [https://www.boston.gov/sites/default/files/embed/file/2019-06/zero\\_waste\\_bos\\_recs\\_final.pdf](https://www.boston.gov/sites/default/files/embed/file/2019-06/zero_waste_bos_recs_final.pdf)

<sup>6</sup> City of Cambridge. (October 1, 2019). *City of Cambridge Zero Waste Master Plan*. <https://www.cambridgema.gov/Departments/publicworks/Initiatives/zerowastemasterplan>

Massachusetts residential trash tested at the Wheelabrator Millbury WTE contains approximately 29.2% food waste.<sup>7</sup> Diverting organic materials from the waste stream could substantially reduce trash tonnage, and organics can be composted or anaerobically digested, both of which are environmentally preferable to landfill disposal or incineration.<sup>8</sup> Expanding curbside collection to include organics would provide convenient and equitable access for all residents, increasing the likelihood that organics will be diverted from trash. The additional costs of a citywide program could be offset, partially or fully, by the savings from bi-weekly trash collection (as discussed below).

### **3. Incentivize trash reduction with a fee-based variable rate system and/or bi-weekly collection**

Moving to multiple cart sizes combined with a fee-for-service model, similar to utility billing for water, would incentivize further trash reduction. Residents would have control over how much trash they generate and thus can control their costs. Currently, residents are likely unaware of the City's cost of waste management and have little incentive to reduce trash below the 65-gallon trash cart volume. Recycling, yard waste, and organics collection would be offered with no additional fee.

Reconfiguring trash collection (and recycling) from weekly to bi-weekly cuts greenhouse gas emissions and would lower the cost of trash collection by putting fewer trash trucks on the road. Such a cost savings could help defray the costs of starting a citywide curbside organics collection program.

### **4. Strengthen support for Extended Producer Responsibility (EPR) legislation**

In 2021, Newton passed a resolution to support EPR initiatives at the state level to reduce waste at the source. These laws will incentivize manufacturers to reduce unnecessary and difficult-to-recycle packaging and make it easier for residents to reduce waste. The City should continue to actively support EPR legislation at the state level as well as support local fees or bans that support waste reduction.

### **5. Increase SMMD staffing**

Designing and implementing new programs, as well as expanding existing programs, will require more SMMD staff time. We recommend that the SMMD budget be increased in the next few years to include at least one more full-time staff position. For comparison, Cambridge operates with a staff of 5 full-time employees for 46,835 households, and Brookline has 3 full-time staff members for 24,436 households. In comparison, Newton has 2.5 full-time staff members for 31,139 total households.<sup>9</sup>

### **6. Develop a comprehensive zero waste plan for the City of Newton**

This SMMD report and the upcoming SMMD 5-Year Sustainable Materials Management Strategy address strategies for reducing residential curbside waste. Though the residential sector constitutes a large

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<sup>7</sup> SAC Environmental LLC. (April 2020). *Wheelabrator Millbury, Inc.: 2019 Waste Characterization Study Report in Support of Class II Recycling Program*. MassDEP. p. 14, Table3-1. <https://www.mass.gov/doc/class-ii-recycling-program-waste-characterization-study-april-2020-4>.

<sup>8</sup> *Food Recovery Hierarchy*. Environmental Protection Agency. <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>.

<sup>9</sup> The 31,139 figure is used here since the SMMD staff serves all households in Newton and not just those 28,500 households within the curbside waste collection program.

portion of the City's waste, it is only one component. We must reduce all waste, including from multi-family buildings, institutions, restaurants and other businesses, and construction & demolition work. The City needs a comprehensive zero waste plan that can be used as a road map for reducing waste through all sectors, and we recommend one be in place prior to negotiations for the next waste hauling contract in 2024. Boston, Cambridge, and Brookline have already put such plans in place or are in the process of developing one.

## **Conclusion**

Taking action to mitigate future waste management cost increases and environmental impacts should be a priority for Newton. The City, with a long and active history of recycling and waste reduction, is well-positioned to take these next steps:

1. Having made the commitment to work towards zero waste, the City should establish ambitious but achievable waste reduction goals so that we may measure our progress and hold ourselves accountable.
2. Having laid the base with a subscription-based curbside organics collection program and a city-sponsored drop-off program, the next step would be to implement a citywide organics curbside collection program to give broad and equitable access to residents.
3. Having introduced a cart collection system where residents are incentivized to limit their trash to 65-gallons, the next step would be to create stronger incentives to reduce trash volumes even more.
4. Having made the commitment to support EPR laws, the City should continue to be a vocal advocate to make recycling easy, reduce trash, and to have responsible parties bear their fair share of the cost.



## Background: Current Residential Waste Management in Newton

### 1.1 Service

Newton Department of Public Works (DPW) provides curbside solid waste and recycling service to approximately 28,500 residential households each week.<sup>10</sup> All single-family homes and small multi-family (two- to five-family) properties receive curbside services for trash, recyclables, and yard waste. Some households have backyard composting of organics, and others subscribe to a private service for weekly collection. Most large multi-family properties do not receive curbside services, although some large properties are grandfathered in. All Newton residents have access to the Newton Resource Recovery Center to drop off recyclables, food waste, household hazardous waste, and other items.

### 1.2 Contracts

Curbside collection and hauling services, i.e., hauling, for trash, recycling, and yard waste, are contracted with Waste Management. The current contract began on July 1, 2020 and will expire on June 30, 2025. This contract includes processing of residential curbside recyclables at the Waste Management Avon Materials Recovery Facility (MRF). Planning for the next collection services contract is anticipated to begin during summer 2023 and contract negotiations are anticipated to begin in 2024. The contract also includes dumpster collection service for trash and recycling at public buildings and management of the City's curbside cart fleet. The five-year cost of these services is expected to total approximately \$40.7 million.

Residential single stream recycling is hauled to the Waste Management Avon MRF. Newton is obligated to pay a set per ton processing fee for sorting and baling the recyclables. However, the actual cost each month is determined by a formula called the "blended value calculation" in the Waste Management contract based on a weighted average of the current commodity value and the composition of each commodity material within the stream. Depending on the value of the commodities in the recycling stream, which fluctuate based on global markets, Newton will pay a monthly per ton cost or could receive a rebate if the blended value exceeds the processing charge. The set cost for processing of recyclables collected in FY2018 was capped at \$30 per ton and due to a low value of recyclables, Newton paid \$30 per ton every month that fiscal year. Due to global shifts in supply and demand for recyclable commodities that lowered the value of the recycling stream, the processing charge rose to \$89 per ton in FY2021 and actual costs totaled \$563,927.

The processing charge escalates annually by 5%. In FY22, the processing charge is \$93.45 per ton. Interestingly, since May 2021, materials recovered from the recycling stream have steadily increased in value. This trend is due to a combination of supply chain impacts from the pandemic that have caused significant increases in raw materials costs and an increased domestic capacity for processing recovered materials. This boom in commodities value has positively impacted Newton as reflected in our monthly blended value calculation. The actual monthly price for single stream recycling reached a high of \$88/ton in July 2020. The cost dropped steadily each month reaching a low of \$15/ton in June 2021. From July through September 2021, Newton received a rebate for single stream recycling each month

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<sup>10</sup> This is the majority of the 31,139 total households in Newton.

for the first time since March 2017, cumulatively totaling more than \$36,000. While it is uncertain how long this high value of the recycling stream will last, the current outlook is that markets will stay strong until there are fewer supply chain disruptions caused by the pandemic.

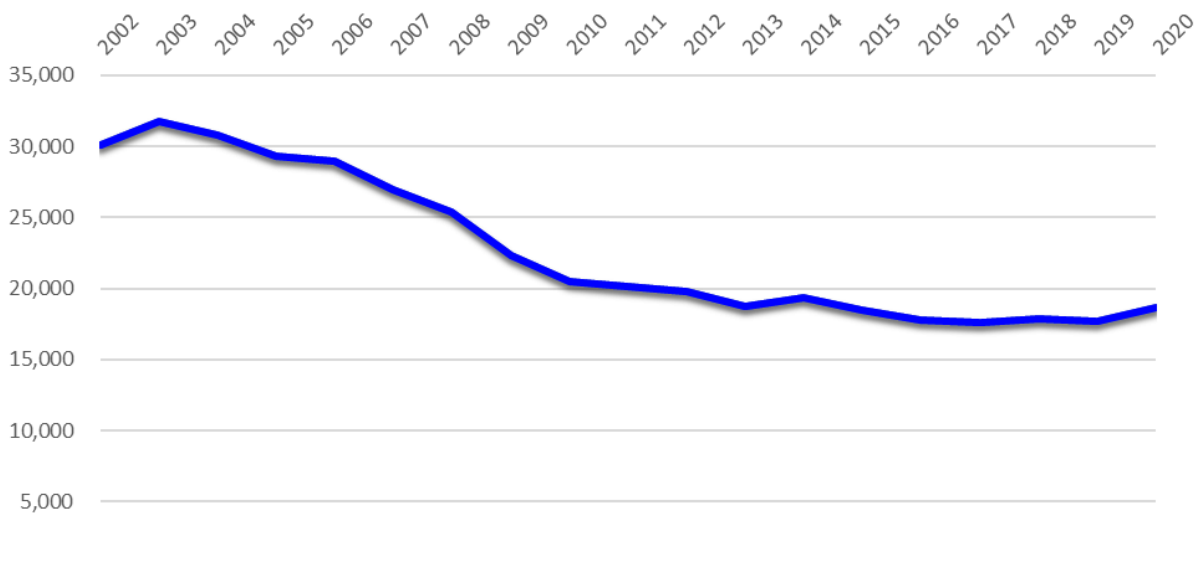
Trash disposal is contracted with the Wheelabrator WTE facility in Millbury, where it is combusted to generate electricity that is sold into the New England electric grid. Trash disposal costs, i.e., the tipping fee, was in the \$107-\$140/ton range from FY1998-FY2008. It decreased significantly with a 20-year contract that started July 1, 2008 and expires June 30, 2028. The cost of trash disposal is based on tonnage. In FY2020, the cost was \$68.97 per ton and the total disposal cost was \$1.235 million. We have been unable to identify any data, i.e., actual municipal contracts with WTE facilities, for likely trash disposal costs beyond this period. See Appendix A for graphs illustrating historical costs for trash disposal and recycling processing, and for trash and recycling hauling.

### 1.3 Trash and Recycling Rates

Newton’s trash generation fell by an average of 4.3% annually between 2003 and 2009. The rate of waste reduction experienced a sharper decline for several years after the City instituted the automated cart system and single stream recycling in 2009, but has slowed in the last decade. From 2014 to 2019, trash reduction averaged only 1.7% per year, and the City experienced a slight rise in trash generation in 2020 during the COVID-19 pandemic.

**Trash Tonnage** – Trash tonnage in Newton in FY2002 was 29,266 tons, peaking in FY2004 at 31,759 tons. Since that time, it has decreased to 17,635 tons in FY2019 as recyclable collection improved. There was a small uptick to 18,173 tons in FY2020 attributable to COVID-19 pandemic factors leading to many residents working from home rather than at an office. (Figure 1.1).

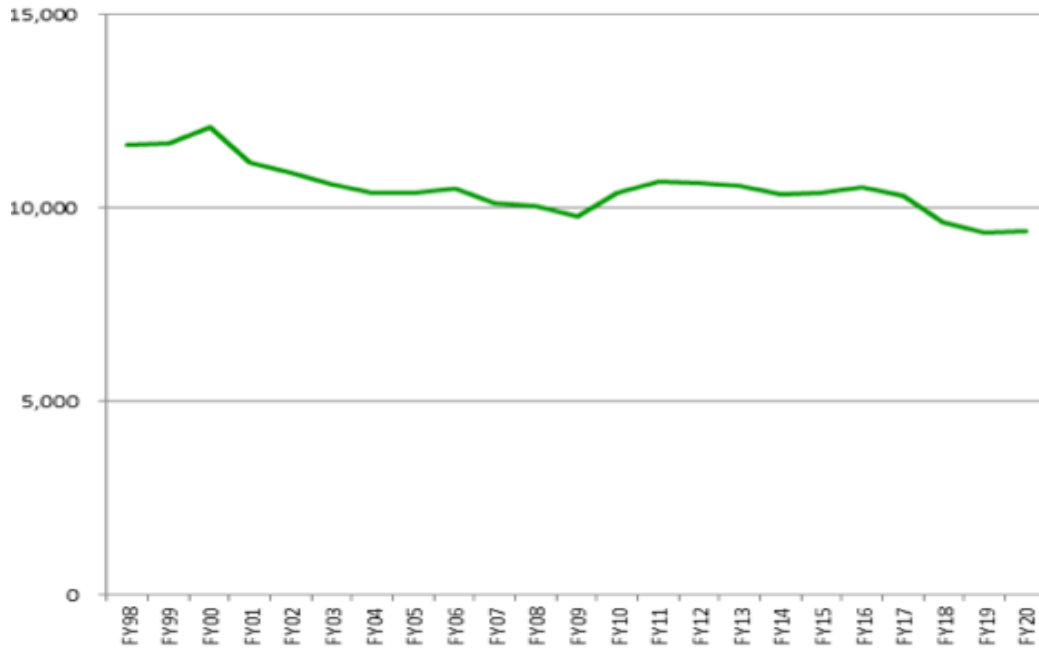
**Figure 1.1 Newton Residential Curbside Trash 2002-2020 (tons/year)**



**Recycling Tonnage** – The collection tonnage has remained fairly steady between 9,200 and 10,800 tons over the past few years. However, there has been a well-documented trend of “light-weighting” of

materials, e.g., plastic water bottles have been made with 35% less plastic since 2009, and noticeable changes in material streams due to changes in technology, e.g., many fewer newspapers and magazines in paper form are being consumed due to online availability. Therefore, it is likely that Newton has increased the volume of recycling although the weight has not increased. (Figure 1.2).

**Figure 1.2 Newton Residential Curbside Single Stream Recycling 1998-2020 (tons/year)**





# 2

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## State and Regional Trends in Trash Disposal Capacity

### 2.1 Dwindling Landfill Capacity for Trash

MassDEP data suggests that there may be sharply decreasing municipal solid waste (MSW) landfill capacity in Massachusetts by 2030. A growing number of ash and MSW landfill permits are getting close to their expiration dates.<sup>11</sup> If they are not extended, 95% of the State's current MSW landfill capacity will no longer be available, and there is projected to be only 60,000 tons of MSW landfill capacity in Massachusetts by 2027.<sup>12</sup> In-state ash landfills, which accept Waste-to-Energy (WTE) ash, face an even dimmer future, with permits for the five remaining facilities scheduled to expire in the next six years.

### 2.2 Increased Exporting of Waste and Increased Costs

Massachusetts currently exports 25% of its trash to New Hampshire, New York, and Ohio, and smaller amounts to other states via rail. Rail transfer stations have excess capacity and can accommodate a near doubling of Massachusetts trash exports. The implications for Newton will be increasing costs of transporting and disposing of trash if the Wheelabrator-Millbury WTE facility and Shrewsbury ash landfill (or comparable in-state facilities) are no longer available. Rail transfer capacity is expected to be a key factor in future trash disposal. A potential of 2.7 million tons per year, or 40% of all Massachusetts disposal tonnage currently generated, and for which there may not be future in-state capacity, could be transported by rail via transfer facilities. A significant unknown is how the laws and regulations in other states receiving Massachusetts trash may change and further increase transportation costs. Trash transportation, whether by rail or truck, also results in an additional carbon footprint, which is inconsistent with both Massachusetts and Newton policies and climate action goals. The potential reliance on rail transfer to out-of-state facilities also raises questions as to what redundancy must be built in.

### 2.3 Impact on Waste-to-Energy Facilities

WTE facilities, such as Wheelabrator-Millbury used by Newton, are operating at or near capacity. Though there are no additional WTE facilities in the planning stages or in the foreseeable future, MassDEP assumes WTE capacity in Massachusetts will remain sufficient for the foreseeable future.<sup>13</sup> While Newton is likely to feel little impact from decreasing regional MSW landfill capacity because our trash is incinerated at a WTE facility, there could eventually be an impact from decreasing ash landfill capacity, as fly ash and bottom ash must be disposed of in ash-only landfills. The MassDEP permit for the Shrewsbury ash landfill

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<sup>11</sup> Massachusetts Department of Environmental Protection. (February 11, 2019). *Massachusetts Materials Management Capacity Study*. p. 2-2, Table 2-2. <https://www.mass.gov/doc/massachusetts-materials-management-capacity-study-february-2019/download>.

<sup>12</sup> *Massachusetts Materials Management Capacity Study*. p.2-3, Figure 2-1.

<sup>13</sup> *Massachusetts Materials Management Capacity Study*. p.2-2; Massachusetts Department of Environmental Protection. (January 2020). *Active Landfills*. <https://www.mass.gov/doc/list-of-active-landfills-in-massachusetts-january-2020/download>

will expire in 2028.<sup>14</sup> There is no indication that in-state ash landfill capacity will increase, creating another long-term factor in the future pricing of WTE disposal if Newton’s ash will need to be shipped out-of-state.

## 2.4 Trash Reduction as a Solution

Between now and 2030 (the end date of the current MassDEP Final 2030 Solid Waste Master Plan), the State will generate 5.5-5.7 million tons of trash annually if there is no further reduction in trash disposal tonnage and/or diversion through recycling, organics, producer-required take-back, or EPR.<sup>15</sup> Given current trends and State laws and regulations, it is anticipated that 2.2-2.3 million tons of trash will need to be exported to other states. However, if Massachusetts meets its 2030 trash reduction goals, then only 4.0 million tons of trash will be generated and very little trash will need to be exported to other states to meet our in-state needs. The fact that trash disposal decreased by 13% while the State’s Gross Domestic Product (GDP) rose 16% from 2008-2017 is an encouraging trend.

## 2.5 Sufficient Capacity for Organics Processing

In contrast to trash disposal capacity, there appears to be sufficient capacity to process food waste, in Massachusetts through both anaerobic digestion and composting. Eight anaerobic digestion facilities are currently permitted to process 275,000 tons per year and this is expected to increase to 600,000 tons. As of 2019, however, only 92,555 tons of organics were processed annually at these facilities. Four large compost facilities are permitted and receive 130,000 tons of organics per year.<sup>16</sup> There are two challenges with organics disposal:

- While food waste makes up a substantial portion of overall trash (approximately 29.2% by weight), residential food waste collection services are relatively limited and typically on a subscription basis for households, imposing additional costs for residents.
- There are currently limited local facilities for processing food waste. Accessing more distant facilities may require higher transportation costs as organics volumes increase.

## 2.6 Recycling Capacity Stalled but Rebounding

The primary issue with municipal recycling programs (plastic/metal/glass containers, paper & cardboard) is the lack of domestic and North American markets to purchase and recycle these materials, coupled with the tightening of international recycling commodities markets. China had been purchasing 40% of the world’s recycling, but in 2018, the China National Sword policy placed import restrictions on recyclables that effectively banned imports of scrap plastics and paper. An increased demand for higher quality recyclables has also raised costs to collect and sort single stream recycling. This pushed the

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<sup>14</sup> Massachusetts Department of Environmental Protection. (February 11, 2019). *Massachusetts Materials Management Capacity Study*. p. 2-2, Table 2-2. <https://www.mass.gov/doc/massachusetts-materials-management-capacity-study-february-2019/download>.

<sup>15</sup> Massachusetts Department of Environmental Protection. (October 2021). *Final Massachusetts 2030 Solid Waste Master Plan: Working Together Toward Zero Waste*. <https://www.mass.gov/doc/final-massachusetts-2030-solid-waste-master-plan-working-together-toward-zero-waste-october-2021/download>.

<sup>16</sup> *Massachusetts Materials Management Capacity Study*. p. 2-7.

recent cost of recycling processing close to or higher than the cost of trash disposal, whereas in the past municipalities had relied on the value of the recycling stream as a modest revenue generator. As other overseas buyers were sought and domestic markets opened up, these costs have leveled out but the commodity value of recyclables is still recovering.<sup>17</sup> The recent shortage of raw materials stemming from COVID-19 related supply chain disruptions has driven up the market value of recyclables, to the benefit of municipalities that receive rebates for their collected materials. It is uncertain how long this high value of the recycling stream will last, but it is likely that markets will stay strong at least until supply chain disruptions caused by the pandemic are resolved.

## 2.7 Overall Trash Composition by Primary Material Capacity

When considering future trash disposal alternatives and costs, it is helpful to understand the composition of the trash stream. MassDEP publishes a survey of the composition of the trash received at each of the state’s eight WTE facilities every three years. Below are the 2019 results of the MassDEP Waste Characterization Study for the Wheelabrator-Millbury WTE where Newton’s trash is hauled.

**Figure 2.1 Residential Trash Composition at Wheelabrator-Millbury WTE<sup>18</sup>**

Paper	17.0%
Plastics	12.1%
Metals	2.4%
Glass	2.2%
Organic Material	38.0% (29.2% food waste)
Construction & Demolition	10.4%
Household Hazardous Waste	5.3%
Electronics	0.2%
Other (textiles, bulky materials)	12.6%

This data may help Newton policymakers in identifying opportunities for diverting materials that may have a higher value from the trash stream, e.g., recycling and composting instead of incineration to generate electricity.<sup>19</sup>

<sup>17</sup> Minter, A. (May 22, 2021). Recycling Isn’t Dead. It’s Booming. *Bloomberg News*.

<https://www.bloomberg.com/opinion/articles/2021-05-22/recycling-isn-t-dead-it-s-booming>

<sup>18</sup> SAC Environmental LLC. (April 2020). *Wheelabrator Millbury, Inc.: 2019 Waste Characterization Study Report in Support of Class II Recycling Program*. MassDEP. p. 14-17. <https://www.mass.gov/doc/class-ii-recycling-program-waste-characterization-study-april-2020-4>.

<sup>19</sup> *The City of Newton 2018 Organics Collection Pilot Study Summary Report* (May 16, 2019) indicates liquids cannot easily be counted in a waste characterization study and may not be included in the organics estimate.





# 3

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## Looking to Examples in Other Communities

The SMMC surveyed 10 Massachusetts communities and 29 other communities around the country for examples of innovative waste reduction programs, identified program elements that incentivize waste reduction, and evaluated their suitability for Newton. Aside from initiatives to raise recycling rates, two of the most often cited methods of reducing residential curbside trash are a variable rate system and an organics collection program. In the variable rate systems, residents pay fees for trash disposal that correspond with cart sizes. Lower capacity carts are offered at lower rates, providing a financial incentive for residents to reduce trash and lower their disposal costs. An organics collection program would remove food scraps and plant matter from the trash stream and could facilitate shifting to bi-weekly trash pickup. With plenty of models from which to draw, an organics collection program and a variable rate system implemented together may offer the best options for the City's next step in achieving further residential waste reduction.<sup>20</sup>

### 3.1 Variable Rate Curbside Collection System

In Massachusetts, 155 out of 351 communities have adopted a version of the variable rate system, also known as Pay-As-You-Throw (PAYT) and Save-Money-And-Reduce-Trash (SMART). Newton has a partial PAYT system in which exceeding the 65-gallons per household requires renting a second cart or overflow bags. Variable rate curbside collection systems were widely utilized in the 26 municipalities we surveyed. In these systems, residents select from a range of cart sizes and are charged a corresponding fee, usually through a monthly utility bill, or utilize special bags purchased through the municipality. Recycling, yard waste, and composting (where offered) is provided at no additional expense to residents. According to MassDEP calculations from 2020, the average amount of solid waste generated per household in PAYT/SMART municipalities in Massachusetts was 29% less than in municipalities without PAYT/SMART programs.<sup>21</sup>

*Bi-Weekly Trash Collection* – A variant of a variable rate system, some communities are opting to collect trash every other week, cutting greenhouse gas emissions and lowering the cost of trash collection by putting fewer trash trucks on the road. Such a cost savings could help defray the costs of starting a citywide curbside organics collection program. Recycling can be collected weekly or bi-weekly with the same benefits of reduced costs and greenhouse gas emissions. Separating out organics (including meat and dairy products, and possibly diaper and pet waste) into a separate cart collected weekly could help reduce smells from the trash.<sup>22</sup> Portland, OR; Vancouver, WA; Renton, WA; Longmont, CO; and Toronto, ON are examples of communities that have successfully implemented a bi-weekly collection program.

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<sup>20</sup> Pollans, L., Krones, J., & Ben-Joseph, E. (July 2017). Patterns in Municipal Food Scrap Programming in Mid-sized U.S. Cities. *Resources, Conservation & Recycling*. pp. 312-313.

<sup>21</sup> Massachusetts Department of Environmental Protection. (September 2021). *MassDEP Fact Sheet: PAY-AS-YOU-THROW (PAYT) / SAVE-MONEY-AND- REDUCE-TRASH (SMART)*. <https://www.mass.gov/doc/paytsmart-in-massachusetts-fast-facts/download>.

<sup>22</sup> Toronto, which uses an anaerobic digestion system to process their organics, accepts diaper and pet waste in its curbside organics carts. *Making The Move To Alternate Week Trash Collection*. (August 15, 2012). Biocycle. <https://www.biocycle.net/making-the-move-to-alternate-week-trash-collection/>

In implementing a variable rate system, there are key elements to make the program successful in reducing waste:

- Residents are made aware of the cost of their trash collection and disposal via municipal utility bills. Revenues from utility bills for waste services could cover most or all of Newton’s total costs – administration, collection, hauling, and disposal / tipping fees.
- Multiple cart sizes are offered to accommodate individual household needs. Residents would pay correspondingly less for smaller carts. In addition, the rate differential between cart sizes has been shown to affect the program’s efficacy. The greater the differential, the greater the percentage of households adopting smaller carts.<sup>23</sup>
- Excess trash must be paid for, generally through overflow bags purchased at local stores.
- Residents are required to pay for all offered services, whether one price for a “suite” of curbside services (trash, recycling, yard waste, and organics) or a charge for trash collection with other services (recycling, yard waste, and organics) offered at no cost.

### **3.2 Curbside Organics Collection - Complement to Variable Rates or Biweekly Collection**

States like California and Vermont as well as municipalities around the country have recently acknowledged the important role that organic waste diversion can play in reducing trash and in environmental sustainability by passing mandates for diverting organics from commercial and residential waste streams. Massachusetts has a disposal ban on commercial organics only for facilities that generate one-half ton or more per week. The Town of Hamilton, MA recently passed a composting mandate where residents must place food scraps into permitted carts that are collected curbside or show proof of home composting. Cambridge, MA has also implemented a residential curbside organics collection program. Relatively newly implemented, the residential organics collection programs we surveyed are still developing strategies for successful implementation. The following observations stood out:

- Curbside organics collection is provided by the municipality as part of a bundled “suite” together with trash, recycling, and yard waste for one charge to residents.
- Repeated educational efforts raise resident participation and reduce contamination, i.e., unacceptable items.
- Some municipalities and states have elected to adopt a composting mandate, which strengthens the adoption of curbside organics collection programs.
- A citywide curbside organics program would entail costs but could offer cost efficiencies compared to the current subscription service in which only 7.5% of households participate.

### **3.3 Case Studies**

Some examples of innovative community programs to reduce trash are described below. Details of the 39 communities we reviewed can be found in the [SMMC Variable Rate System/Curbside Composting Survey](#)<sup>24</sup>

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<sup>23</sup> Burns & McDonnell. (November 2017). *Minneapolis Zero Waste Plan, November 2017.*

<https://www.minneapolismn.gov/media/-www-content-assets/documents/SWR---Mpls-Zero-Waste-Plan.pdf>

<sup>24</sup><https://docs.google.com/spreadsheets/d/1H3b67TQgZIJmo7w3lo6iTqxCEv9VTKQVmokxmPE94RE/edit?usp=sharing>

**Figure 3.1 Variable Cart Size and Annual Rates in 4 Municipalities**

					Price Differential Smallest to Largest
	20 Gal.	30-35 Gal.	60-65 Gal.	90-95 Gal.	
Brookline, MA	--	\$230	\$310	\$392	\$162
Napa, CA	\$320	\$401	\$615	\$947	\$627
Renton, WA	\$171	\$282	\$495	\$731	\$559
St. Louis Park, MN	\$177	\$241	\$344	\$527	\$350

**Brookline, MA** – Brookline (pop. 59,000; 26,000 total households; 13,000 households with curbside pickup) began offering multiple trash cart sizes in 2017. Fees are set by cart size (see Figure 3.1), and there is no additional cost for recycling carts, regardless of size. Trash is used to generate electricity at a WTE and cart fees are designed to cover about 75% of Brookline’s waste costs. When the variable trash cart sizes were initially introduced, many residents misjudged the size they would need, imposing administrative costs to switch sizes. As a result, Brookline charges \$40 to switch carts. Residents receive separate utility bills for their trash cart fee.

**Napa, CA** – Napa (pop. 77,000) offers a weekly bundled service that includes trash, recycling, and composting collection (yard waste and organics). About 50% of households use 35-gallon carts, 24% use 65 gallon carts, and 22% use 20 gallon carts. Overage is handled through a special request and pick up of up to a 95 gallon bag for \$6. Up to two 95 gallon recycling carts and composting carts are available at no additional cost. In 2020, Napa had a 66.80% diversion rate (recyclables + yard waste + organics / total waste) for its residential program.<sup>25</sup> The city of Napa has invested in building a new composting facility and will incrementally raise prices over the next 4 years to fund it. Costs related to waste management are expected to be covered through waste collection charges paid by residents.

**St. Louis Park, MN** – St. Louis Park (pop. 49,000), an inner ring suburb of Minneapolis, has weekly or biweekly curbside trash and recycling collection, and weekly organics collection for single family homes. The fee for the curbside service is based on the size of the trash cart with no additional fees for organics, recycling, or yard waste. Recycling has a very high participation rate, estimated at 96-99%. The organics collection program is offered to all households served by the curbside trash collection program, and currently 38% of the 12,300 households participate. St. Louis Park has been collecting organics since fall 2013 and has seen a steady rise in waste tonnage diverted through curbside collection. In 2014, the amount of trash diverted due to curbside organics collection was 3.3%, while in 2020 it was 8.4%.<sup>26</sup> If the 2020 rate were extrapolated to all households, the rate of diversion due to organics would be 22%.

<sup>25</sup> Although not directly comparable, Newton had a 2019 diversion rate of 38.5% (excluding yard waste).

<sup>26</sup> Data from email communication with Kala Fisher, St. Louis Park Solid Waste Manager. (May 14, 2021).

**Renton, WA** – Renton (pop. 101,000) offers biweekly collection of trash and recycling, and weekly collection of organics. Residents are supplied with one cart for recycling and one for organics collection, but may place additional containers out on collection day without extra charge. Residential rates are based on trash cart size (20- to 96-gallon) and are billed quarterly through the waste hauling vendor. Seniors and disabled customers are offered a 50% discount. The trash and recycling trucks collect from half of the city in alternating weeks.

# 4

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## Setting a Path to Zero Waste in Newton

### 4.1 Reasons for Establishing a Zero Waste Goal

In considering any further actions to reduce residential waste, it would be extremely helpful to establish waste reduction goals for the City. Concrete, quantifiable goals would help define the path forward and aid the City in making measurable progress.

- Waste reduction goals would serve as ‘goalposts’ for the City’s anticipated 5-year sustainable materials management strategy and beyond to decrease trash tonnage and costs.
- Waste reduction would lessen the impact of anticipated trash disposal cost increases (as in-state disposal capacity shrinks) after the City’s current trash disposal contract ends in 2028.
- The City Council unanimously passed a resolution on May 16, 2016<sup>27</sup> that requested the development of a long-range plan to improve the City’s recycling rate and reduce trash tonnage, including setting ambitious, yet attainable goals that are at least consistent with the State’s 10-year Solid Waste Master Plan. The plan should include but not be limited to considering the strategy of a “zero waste” goal.
- Newton’s [Five-Year Climate Action Plan \(2020-2025\)](#), adopted by the City Council on November 15, 2019, includes reducing greenhouse gas emissions associated with disposal of materials by evaluating strategies to improve waste reduction and diversion among residents, businesses, and municipal operations.

### 4.2 Comparable Zero Waste Goals

In formulating waste reduction goals for Newton, the SMMC looked to the following:

**Massachusetts:** The MassDEP’s [Final 2030 Solid Waste Master Plan: Working Together Toward Zero Waste](#) (October 2021) established trash reduction goals for the state of 30% by 2030 and 90% by 2050 from 2018 levels. The previous plan, the [2010-2020 Solid Waste Master Plan: A Pathway to Zero Waste](#) (SWMP), had overall waste reduction goals of 30% by 2020 compared to 2008 levels and 80% by 2050 compared to 2008 levels, which aligns with the Massachusetts Global Warming Solutions Act (GWSA, Chapter 298 of the Acts of 2008).

Unfortunately, the State’s goals set in the 2010-2020 plan were not met. According to the State’s [2019 Solid Waste Data Update](#), total disposal in 2019 was 16% less than in 2008, well short of the 30% reduction goal for 2020. The 2010-2020 plan was slightly more front-loaded, while the proposed final 2030 plan is back-loaded, given that its reduction percentage for 2050 is higher.

**Boston:** The [Zero Waste Boston Report \(June 2019\)](#) recommendations include reducing trash by 55% by 2035 (from 2017 levels), to be accomplished by increasing Boston’s recycling rate from 25% in 2017 to

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<sup>27</sup> [Solid Waste and Recycling Resolution Passed by Newton City Council](https://greennewton.org/solid-waste-and-recycling-resolution-passed-by-newton-city-council/). (May 22, 2016). Green Newton. <https://greennewton.org/solid-waste-and-recycling-resolution-passed-by-newton-city-council/>

80% by 2035. Zero Waste Boston defines ‘recycling’ in this context as reused, recycled or composted materials.

**Brookline:** Brookline published a draft [Zero Waste Framework](#) in August 2021 for discussion that proposes reducing the trash generation per capita by at least 15% by 2030 compared to 2015, reducing the trash disposed to landfill and incineration by at least 50% by 2030 compared to 2015, and increase the diversion rate away from landfill and incineration to at least 70% by 2030. The Framework identifies potential new and expanded solid waste management programs needed to reduce waste and increase recycling and composting to achieve zero waste, such as EPR, expansion of the curbside organics subscription program to all residents, mandating of commercial organics collection, bi-weekly curbside trash collection, and the expansion of reuse, rental, and repair programs.

**Cambridge:** The [Cambridge Final Zero Waste Master Plan \(October 2019\)](#) set trash reduction goals of 30% by 2020 and 80% by 2050 from 2008 levels (modeled on MassDEP’s 2020 SWMP baseline level), and Cambridge announced that the 2020 goal was achieved one year early, with a reduction of 32% in 2019.

### 4.3 Proposed Waste Reduction Goals for Newton

After considering the strategies and goals outlined in the above documents and considering the specific circumstances unique to Newton, we recommend the City establish residential trash reduction goals, based on the 2018 trash tonnage, of:

**25% reduction by 2030**  
and  
**70% reduction by 2050.** <sup>28</sup>

These goals assume an average reduction of 408<sup>29</sup> additional tons per year in overall residential waste based on 2018 levels, similar to the goals set by Cambridge, MA and somewhat less but not far from the very ambitious Massachusetts trash reduction goals. This means a household in Newton that generated 24 pounds of trash weekly in 2018 should reduce their weekly trash output to 18 pounds per week by 2030, and to 7 pounds per week by 2050. We believe these goals are ambitious but achievable through a combination of new waste reduction initiatives and strengthening of existing programs. The resulting trash quantities are listed in Figure 4.1.

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<sup>28</sup> As shown in the columns to the left in Appendix B, the linear reduction results in a 23% decline by 2030, but the SMMC rounded this amount to 25% for simplicity. If 2008 were the base year, the 2050 goal would be 80%.

<sup>29</sup> Unlike the goals in the State’s proposed final 2030 plan, which back-loads trash reduction by assuming higher reductions in the latter 20 years (2030-2050) compared to the first 12 years (2018-2030), the proposed SMMC goals assume a consistent reduction of about 408 additional tons per year between 2021 and 2050.

**Figure 4.1. Newton Trash Reduction Goals**

Year	Trash per Year (Tons)	Reduction
2018	17,514	0%
2025	15,474	12%
2030	13,434	25% <sup>30</sup>
2050	5,274	70%

#### **4.4 Current Trash Reduction Measures are Not Enough**

From 2002-2019, Newton experienced an average of 3% annual decline in trash generation, but over the last five years from 2015-2019, this rate has slowed to an average of 1.7%. (The City experienced a slight uptick in FY2020 during the COVID-19 pandemic.) If the City maintains the existing waste diversion programs and continues to achieve the more conservative 1.7% annual reduction rate, the City will not reach either the 2030 or 2050 waste reduction goals. Even the more optimistic 3% annual reduction rate will not allow us to achieve the 2050 goal. Newton will need to reduce waste at an annual rate of almost 4% in order to get to 25% in 2030 and 70% by 2050.

The City will need to make bold commitments in order to achieve these goals. In the past, Newton has taken big steps to reduce waste and residents have responded positively. Newton met the goal of the State's *2010-2020 Solid Waste Master Plan* by reducing trash between 2008 and 2019 by 33%, mainly due to the adoption of 65 gallon trash and single stream recycling carts in 2009 (with the first full year being 2010). More recently, with the implementation of the bulky waste fees in February 2020, the City dramatically reduced the number of collection requests by residents from 805 in February 2019 to 173 in February 2020.

#### **4.5 Invest in SMMD Staffing for Success**

The implementation of new waste reduction programs as well as the expansion of existing programs will require more SMMD staff time and effort. Currently, the SMMD operates with two full-time staff members, and a half-time administrative position is in the process of being reinstated. We recommend additional staff be hired, as needed, to implement and expand programs, collect and analyze data, and monitor enforcement in the future. Both neighboring Cambridge and Brookline have made greater investments in staff and are making progress in developing waste reduction goals and implementing strategies. Newton will need more staff if we, too, are to succeed in achieving a zero waste goal.

We also encourage the City to engage outside consultants to help draft a comprehensive zero waste plan encompassing residential, commercial, and institutional waste. We recommend that a zero waste plan be in place by the start of the next waste hauling contract negotiations in 2024. Given the limited SMMD staff and resources, outside consultants or specialists would expedite the development process.

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<sup>30</sup> This figure is rounded up from 23%.

## 4.6 Pathways to Achieving the Residential Waste Reduction Goals

The SMMC has recommended several options in this report to reduce the residential waste stream and lower costs. The SMMD staff will develop the technical details of the various options with costs, benefits, and compatibility with our current system in their report to be released in June 2022. It is beyond the scope of this report to provide detailed strategies to reduce residential waste. Furthermore, this report does not address opportunities to reduce municipal (offices and schools) and commercial waste.<sup>31</sup> The SMMC will work with the SMMD and city officials to identify the resources needed to undertake the implementation steps.

### Pathway 1: Implement Curbside Organics Collection

Upon considering a number of potential actions, we focused on organics diversion for a number of reasons:

- The City already has a nascent subscription organics diversion partnership program with Black Earth Compost that 7.5% of households are participating in and can be expanded. The cost is \$59.99 for six months, plus a one-time start-up fee of \$34 for a 13-gallon container.
- As food waste comprises about 29.2%<sup>32</sup> (by weight) of the trash stream, removing food waste from the trash stream would have the largest and most immediate impact on reducing trash.
- Information gained from the existing organics subscription program and the *City of Newton 2018 Organics Collection Pilot Study* could facilitate the design and rollout of a citywide program for immediate and sizable impact.

**Figure 4.2 Potential Impact of Curbside Organics Collection**

Percent (and number) of households participating by 2030	50% (14,250)	<b>66%</b> <b>(18,712)</b>	100% (28,500)
Percent (and tons) of trash reduced by 2030	19% (3,335)	<b>25%</b> <b>(4,379)</b> <i>achieves 2030 goal</i>	38% (6,669)

*\*The calculations assume 28,500 households in Newton served through curbside collection, organics collection averaging 9lbs. per household-week, and a 2018 baseline of 17,514 tons of trash.*

Based on an average organics value of 9 pounds per household per week,<sup>33</sup> Newton could reach the

<sup>31</sup> See Appendix C for a listing of broader waste reduction measures that Newton can implement in the future.

<sup>32</sup> SAC Environmental LLC. (April 2020). *Wheelabrator Millbury, Inc.: 2019 Waste Characterization Study Report in Support of Class II Recycling Program*. MassDEP. p. 17. <https://www.mass.gov/doc/class-ii-recycling-program-waste-characterization-study-april-2020-4>.

<sup>33</sup> There are numerous estimates of the percentage of organics in Newton's residential trash. Based on the 29.2% waste characterization value and the 2018 trash volume of 17,514 tons, Newton could expect to collect about 6.9



proposed 25% trash reduction goal for 2030 through organics diversion alone if 66% of the 28,500 households participated in a curbside organics program. If 100% of households participated, the City would divert 6,669 tons annually, getting us more than halfway to the 2050 reduction goal of 70% .

## **Pathway 2: Incentivize Trash Reduction with a Fee-Based Variable Cart System or Bi-Weekly Collection**

In a fee-based variable rate system residents are made aware of the cost of their trash collection and disposal through out-of-pocket fees. Because Newton already uses a cart system, a variable size cart system with variable fees makes sense. Brookline implemented this type of system in 2017, in which residents choose their cart size and pay the associated annual fee. Smaller cart sizes pay less. Residents have control over how much trash they generate and thus can control their costs. Excess trash that doesn't fit in the cart must be paid for, generally through overflow bags purchased at local stores, similar to Newton's current system.

With almost all Newton residents now adapted to a 65 gallon limit on trash,<sup>34</sup> we believe that a shift to decrease the limit through smaller carts or a variety of cart sizes, along with financial incentives to downsize, is the logical next step in reducing residential waste. Aided by a robust city educational campaign, a fee-based variable cart sized system could provide an incentive for residents to participate in a curbside organics collection program (Pathway 1), reduce trash output, as well as be more aggressive in their recycling, reuse, and reduction practices to divert materials from trash.

Adopting a biweekly trash collection schedule would cut greenhouse gas emissions and lower the cost of trash collection by putting fewer trash trucks on the road. Recycling, collected on alternate weeks with a larger cart, would further cut greenhouse gas emissions and costs. These cost savings could help offset the costs of a citywide curbside organics collection program. Separating out organics (including meat and dairy products, and possibly diaper and pet waste) into a separate cart collected weekly could minimize odors from the trash. (See Section 3.1 for examples of communities using biweekly collection.)

## **Pathway 3: Adopt a Utility Style Billing for Residential Waste Services**

Newton pays for its waste management services through the City's general fund. With little awareness of the cost of waste management in the City and the cost of managing the waste they generate, residents likely have little financial incentive to reduce their trash. Associating household trash generated with a cost, and showing that households can control their costs is important incentivizing residents to reduce trash.

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pounds / household per week. Black Earth Compost has reported values of 9.0 - 11 pounds / household per week for their Newton subscribers. Lastly, the *City of Newton 2018 SMMD Curbside Organics Pilot Study* reported collecting about 12 pounds / household per week in March-June 2018. For the purpose of this report, we assume an average value of 9 pounds / household per week. We do not have data on the number of individuals who compost on their own or on other companies that collect organics.

<sup>34</sup> In 2021, only 400 households subscribed for 421 extra trash carts and the average number of orange overflow bags ordered by stores annually between 2016 through June 2021 was 12,800. The SMMD data collection currently underway for the SMMD Residential Curbside Collection Analysis (expected June 2022) will give us a more detailed picture of the quantity of trash generated by households.

Newton homeowners pay for their water usage through quarterly water bills. Usage above a basic amount is charged at a higher rate to discourage high water consumption. Less water consumed results in a lower cost. This utility style fee-for-service model can be adapted to residential waste management. Combined with variable cart sizes and corresponding prices, residents would pay ‘per use,’ incentivizing trash reduction. The City should maintain transparency about the shift in funding from the general fund to individual households through robust education. The City could determine whether to set the waste management charges to cover all or a portion of its costs.

### ***Transitioning to a Fee-for-Service System - Natick, MA***

Prior to starting a PAYT program 18 years ago, the town of Natick first implemented an annual flat utility fee per household to pay for the rising cost of curbside collection services. After a year, the town pledged to remove the fee for a unit-based system that enabled residents to control their own trash costs.<sup>35</sup> The program fixed a municipal budget shortfall, reduced the amount of trash by 40%, lowered disposal costs, and increased recycling by 20%.<sup>36</sup>

#### **Pathway 4: Strengthen Support for Extended Producer Responsibility Legislation**

Passing EPR laws is one of the strongest ways to help defray the cost of disposing of or recycling items that cities and towns in Massachusetts currently bear. These laws will incentivize manufacturers to reduce unnecessary and difficult-to-recycle packaging and improve the recyclability of materials, making it easier for residents to reduce waste. Newton’s recent resolution in support of EPR initiatives is a positive first step, and the City should continue to actively support EPR and other product stewardship legislation as they arise, including fees and bans on single use items. Examples of state EPR legislation are the recently introduced expanded bottle bill, and paint and mattress recycling bills.

In addition, Newton should continue to support local fees and bans that promote waste reduction. The City has been successful in encouraging the use of reusable shopping bags through the ban of single use plastic bags and a fee on paper bags. Newton’s polystyrene ordinance eliminates the use of the non-recyclable material in food establishments as well as packing peanuts and plastic stirrers. New ordinances could expand on these successes to include more single use items. The passage of legislation such as recycling and composting mandates would likely raise resident participation rates.

#### **4.7 Newton Needs a Comprehensive Zero Waste Plan**

This SMMC report recommends waste reduction strategies in residential curbside collection. Though

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<sup>35</sup> *Strategies To Incentivize Waste Diversion*. (October 11, 2018). BioCycle. <https://www.biocycle.net/strategies-incentivize-waste-diversion/>

<sup>36</sup> For information on the 155 Massachusetts communities who have implemented a form of fee-for-service waste management system, see: Massachusetts Department of Environmental Protection. (January 2004). *Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs*. <https://www.mass.gov/doc/massdep-pay-as-you-throw-implementation-guide/download>.

residential waste is a large portion of the City's trash, Newton must also address waste generation from large multi-family buildings, institutions, restaurants and other commercial businesses, and construction & demolition work if we are to make an impact. Appendix C lists measures that could be adopted by the City. Having a comprehensive zero waste plan would provide a holistic road map that would ensure programs and legislation are made effective and efficient. Having a zero waste plan in place would be beneficial prior to negotiations for the next waste hauling contract in 2024. Boston, Cambridge, and Brookline have already put such plans in place or are in the process of developing one. (See Section 4.2.)

## Explanation of Appendices

### **Appendix A. Historical Waste Management Costs for Newton**

Two graphs give an overview of the costs for waste management over several decades. Graph 1 illustrates the costs associated with trash disposal at the Wheelabrator Millbury WTE facility and for recycling processing at the Waste Management MURF in Avon. The dip in FY2009 reflects the beneficial terms in the new 20-year Wheelabrator WTE contract. Graph 2 shows Newton's trash and recycling hauling costs. Costs for FY2021-2025 are fixed costs established in the current waste hauling contract and not projected costs.

### **Appendix B. Projection of Yearly Reduction in Trash 2021-2050**

The table projects a sample path to the recommended reduction goals of 25% by 2030 and 70% by 2050 using a steady reduction each year through organics diversion, increased recycling, and source reduction. The table is meant to illustrate that the goals, though ambitious, are achievable.

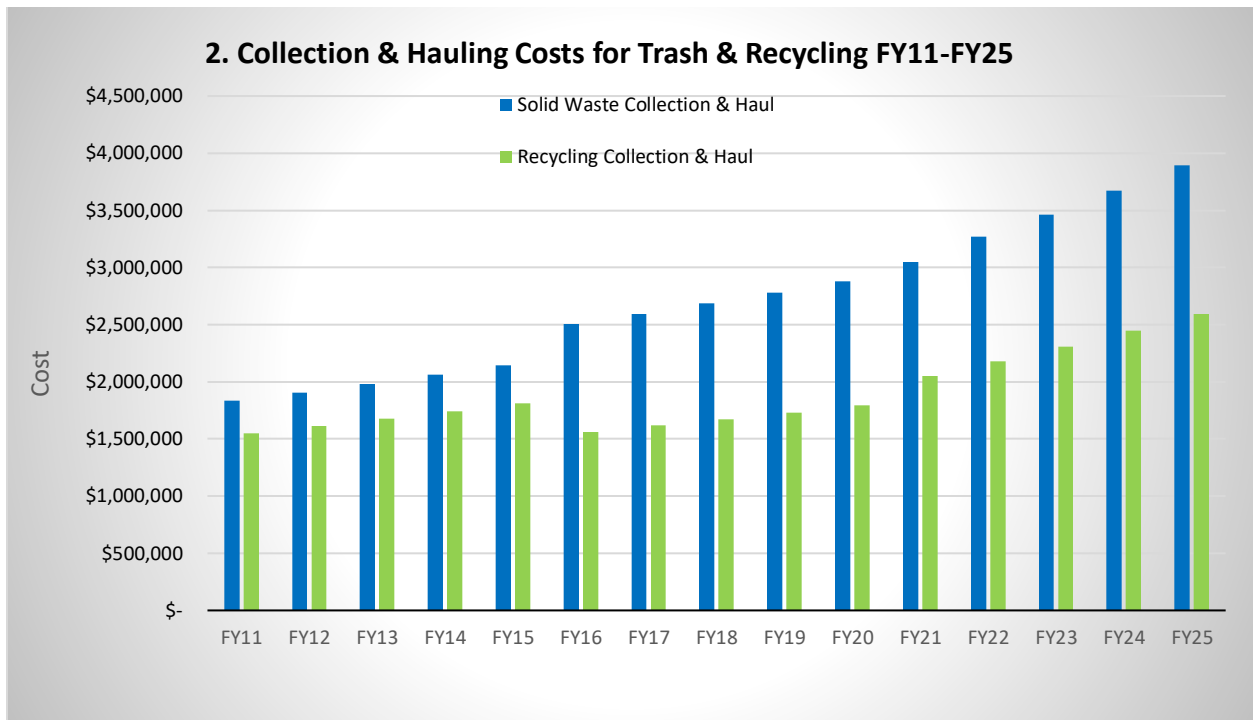
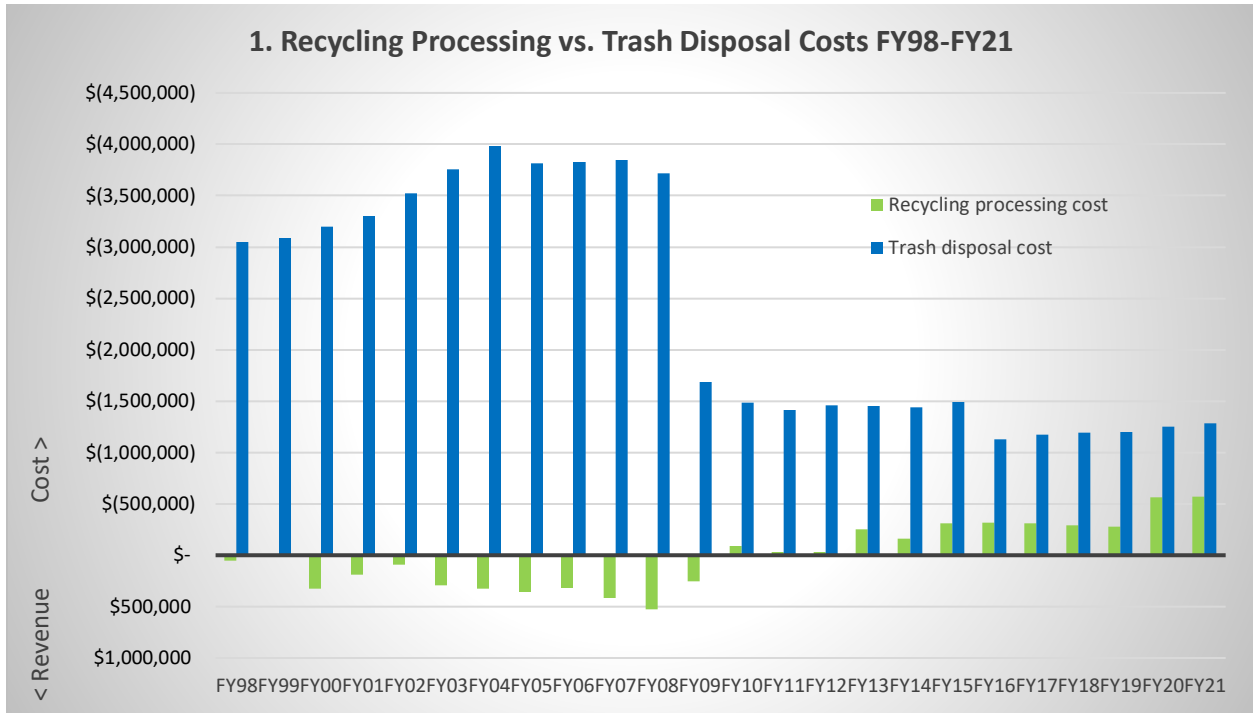
### **Appendix C. Advancing Zero Waste in Newton - Looking to the Future**

This chart illustrates the progress that Newton has made across residential, commercial, institutional, and municipal sectors and the work that still needs to be done. The residential waste reduction recommendations (in bold) are a part of a comprehensive set of 'next steps' that could be put in place to achieve zero waste in Newton. A zero waste plan for Newton could flesh out these 'next steps' in detail and with greater coherence.

### **Appendix D: Summary of SMMC Variable Rate System/Curbside Composting Survey**

This table summarizes the information on communities in Massachusetts and around the country that employ variable cart systems, utility billing, and curbside organics collection. Access the original survey (<https://docs.google.com/spreadsheets/d/1H3b67TQgZIJmo7w3lo6iTqxCEv9VTKQVmokxmPE94RE/edit#gid=0>).

## Appendix A. Historical Waste Management Costs for Newton



“Solid Waste” in the Graph 2 legend is synonymous with trash.

## Appendix B. Projection of Yearly Reduction in Trash 2021-2050

Fiscal Year	Trash Reduction Goals				Projected Reduction Rates of Trash Reduction Programs								Total Combined Reduction in Tons (A+B+C)	Total Percent Reduction
	Trash Tonnage Goal (2018 Baseline) [1]	Static Reduction Per Year in Tons	Total Annual Reduction Needed to Achieve 70% Reduction (2018 Baseline)	Percent Reduction Achieved (2018 Baseline)	Percent of Organics Diverted from Trash (Targeting 7.0% diverted tons per year) [2]	Organics Diversion in Tons(A) [3]	Percent of Additional Recycling, Textile, and Other Materials Diverted from Trash (Targeting an increase of 1.0% per year)	Additional Recycling, Textile, and Other Diversion in Tons (B)	Percent of Source Reduction Through Reuse, Reduce, and EPR (Targeting an increase of 0.6% per year)	Source Reduction Through Reuse, Reduce, and EPR in Tons (C)				
2018 (actual)	17514													
2019 (actual)	17635													
2020 (actual)	18173													
2021	17106	408	408		3.5%	611	0%	0	0.0%	0	611	3%		
2022	16698	408	816		3.7%	654	1%	175	0.6%	105	934	5%		
2023	16290	408	1224		4.0%	700	2%	350	1.2%	210	1260	7%		
2024	15882	408	1632		4.3%	749	3%	525	1.8%	315	1590	9%		
2025	15474	408	2040	12%	4.6%	801	4%	701	2.4%	420	1922	11%		
2026	15066	408	2448		4.9%	857	5%	876	3.0%	525	2259	13%		
2027	14658	408	2856		5.2%	917	6%	1051	3.6%	631	2599	15%		
2028	14250	408	3264		5.6%	982	7%	1226	4.2%	736	2943	17%		
2029	13842	408	3672		6.0%	1050	8%	1401	4.8%	841	3292	19%		
<b>2030</b>	<b>13434</b>	<b>408</b>	<b>4080</b>	<b>23%</b>	<b>6.4%</b>	<b>1124</b>	<b>9%</b>	<b>1576</b>	<b>5.4%</b>	<b>946</b>	<b>3646</b>	<b>21%</b>		
2031	13026	408	4488		6.9%	1203	10%	1751	6.0%	1051	4005	23%		
2032	12618	408	4896		7.3%	1287	11%	1927	6.6%	1156	4369	25%		
2033	12210	408	5304		7.9%	1377	12%	2102	7.2%	1261	4740	27%		
2034	11802	408	5712		8.4%	1473	13%	2277	7.8%	1366	5116	29%		
2035	11394	408	6120	35%	9.0%	1576	14%	2452	8.4%	1471	5499	31%		
2036	10986	408	6528		9.6%	1687	15%	2627	9.0%	1576	5890	34%		
2037	10578	408	6936		10.3%	1805	16%	2802	9.6%	1681	6288	36%		
2038	10170	408	7344		11.0%	1931	17%	2977	10.2%	1786	6695	38%		
2039	9762	408	7752		11.8%	2066	18%	3153	10.8%	1892	7110	41%		
2040	9354	408	8160	47%	12.6%	2211	19%	3328	11.4%	1997	7535	43%		
2041	8946	408	8568		13.5%	2366	20%	3503	12.0%	2102	7970	46%		
2042	8538	408	8976		14.5%	2531	21%	3678	12.6%	2207	8416	48%		
2043	8130	408	9384		15.5%	2708	22%	3853	13.2%	2312	8873	51%		
2044	7722	408	9792		16.5%	2898	23%	4028	13.8%	2417	9343	53%		
2045	7314	408	10200	58%	17.7%	3101	24%	4203	14.4%	2522	9826	56%		
2046	6906	408	10608		18.9%	3318	25%	4379	15.0%	2627	10324	59%		
2047	6498	408	11016		20.3%	3550	26%	4554	15.6%	2732	10836	62%		
2048	6090	408	11424		21.7%	3799	27%	4729	16.2%	2837	11365	65%		
2049	5682	408	11832		23.2%	4065	28%	4904	16.8%	2942	11911	68%		
<b>2050</b>	<b>5274</b>	<b>408</b>	<b>12240</b>	<b>70%</b>	<b>24.8%</b>	<b>4349</b>	<b>29%</b>	<b>5079</b>	<b>17.4%</b>	<b>3047</b>	<b>12476</b>	<b>71%</b>		

[1] All calculations are based on a baseline of 2018 trash tonnage.

[2] Increasing the tons of organics diversion by 6.8% per year is equivalent to having 428 additional households each year adopting curbside or organics collection, or 1.5% of households yearly.

[3] 611.33 tons is the actual amount collected in 2020 in from the 2137 subscribers in Newton as reported by Black Earth. We chose to use that figure as the baseline.

## Appendix C. Advancing Zero Waste in Newton – Looking to the Future

	<b>Current Practices</b>	<b>Next Steps</b>
<p><b>Reduce and Reuse</b></p>	<ul style="list-style-type: none"> <li>• Implement residential curbside cart collection system with 64-gallon limit for trash and recycling with payment mechanism for excess trash</li> <li>• Passed ordinances to eliminate single use items including plastic bags and polystyrene.</li> <li>• Divert reusable goods through programs like the Swap Shop, Book Shed, and Paint Reuse Shed.</li> <li>• Support programs that encourage repair and reuse such as Repair Clinics and the Library of Things.</li> <li>• Implemented fees for disposing of bulky waste items</li> <li>• Offer no-cost curbside textiles collection service</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Devise and implement policies and infrastructure to further reduce residential curbside trash generation</b></li> <li>• Emphasize the importance of waste reduction through education and outreach</li> <li>• Expand reusable goods diversion programs</li> <li>• Devise and implement policy to encourage or require ‘deconstruction’ techniques in construction, demolition and deconstruction for recovery of materials for reuse</li> </ul>
<p><b>Organics Diversion</b></p>	<ul style="list-style-type: none"> <li>• Implemented city-funded residential yard waste collection 37 weeks per year</li> <li>• Implemented city-endorsed and resident-funded curbside organics collection service</li> <li>• Installed one free organics drop-off location</li> <li>• Sell discounted home composting bins</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Implement city-funded residential curbside organics collection program</b></li> <li>• Expand organics drop-off collection program</li> <li>• Enforce commercial organics waste ban</li> <li>• <b>Implement organics collection in all Newton Public schools and municipal buildings</b></li> </ul>

<p><b>Recycling</b></p>	<ul style="list-style-type: none"> <li>• Adopt MassDEP Recycle Smart single stream acceptable materials guidelines</li> <li>• Offer drop-off collection of over 20 hard-to-recycle materials at the Resource Recovery Center</li> <li>• Educate residents to recycle correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Pass private hauler regulations and mandatory recycling ordinance to increase commercial recycling</li> <li>• Enforce state waste bans</li> <li>• Incentivize construction, demolition and deconstruction (CDD) recycling</li> <li>• Expand infrastructure for recycling hard-to-recycle materials</li> </ul>
<p><b>Toxics Reduction</b></p>	<ul style="list-style-type: none"> <li>• Offer 18 household hazardous waste collection events annually</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance education efforts to reduce use of toxic household products</li> </ul>
<p><b>Zero Waste Policy</b></p>	<ul style="list-style-type: none"> <li>• Pass a Zero Waste Resolution recognizing that reducing waste in the City is a priority</li> <li>• Pass a Resolution in support to extended producer responsibility (EPR) laws and expansion of the bottle bill</li> <li>• Advocate for EPR laws to alleviate municipal burden of hard-to-manage materials</li> </ul>	<ul style="list-style-type: none"> <li>• Set zero waste goals, determine tracking metrics, and provide regular public updates on progress</li> <li>• Fund SMMD staff to ensure successful development and implementation of policies and programs</li> <li>• Update city ordinances and practices to determine who receives city waste services</li> <li>• Conduct citywide education campaigns to build a culture of zero waste</li> <li>• Expand the City’s environmentally preferable purchasing practices, fund new ideas and approaches</li> <li>• Require companies and large residential developments to submit zero waste plans</li> <li>• Require zero waste at public events that require a permit</li> </ul>



## Appendix D: Summary of SMMC Variable Rate System/Curbside Composting Survey (Spring/Summer 2021)

For more detail see:

<https://docs.google.com/spreadsheets/d/1H3b67TQqZIJmo7w3lo6iTxCEv9VTKQVmokxmPE94RE/edit?usp=sharing>

Community	Residents Charged for Trash Collection	Carts for Trash	Curbside Food Collection	Explanation of MSW Collection	Fee for Collection, If Applicable	Explanation of Compost Program
<b><u>Brockton MA</u></b>	X	X		Weekly 35 gallon trash collection; biweekly collection of recyclables (96 gallon)	\$70/quarter, utility bill	NA
<b><u>Brookline MA</u></b>	X	X	X	Offers different size trash carts for variable pricing; recycling cart provided at no cost. Did not see big increase in recycling but had an 8% drop in trash. Maybe diverted to clothing and Black Earth / compost drop off.	Prior to 2017 cost was \$200/year. Now varies by cart size. Aims to cover 75% of cost of program. Currently does not cover that amount.	Supports Black Earth subscription program similar to Newton.
<b><u>Cambridge MA</u></b>			X	Paid through General Fund	NA	Voluntary city program of composting. Currently approx. 40% participation. In 1st year, decreased trash by 8%.
<b><u>Chicopee MA</u></b>	X	X		After local landfill closed in 2017 town decreased trash carts to 35 gal. Weekly recycling and biweekly recycling pickup. 90-95% of residents don't need overflow bags. Trash tonnage declined by approximately 25%.	NA	NA

<b><u>Hamilton MA</u></b>			X	About 10 years ago switched to 35 gallon trash cart every 2 weeks. Now with COVID every week.	NA	Mandatory composting started Feb 2021. If compost bin not put out trash not picked up. Special exception if backyard compost.
<b>Community</b>	<b>Residents Charged for Trash Collection</b>	<b>Carts for Trash</b>	<b>Curbside Food Collection</b>	<b>Explanation of MSW Collection</b>	<b>Fee for Collection, If Applicable</b>	<b>Explanation of Compost Program</b>
<b><u>Malden MA</u></b>	X	X		City used bags that residents purchased in private cans until 2021. Additional trash can be put in additional bags or another cart can be purchased. Recycle can provided as well.	Purchase bags or pay \$75/year for a tag for a 35 gal can.	NA
<b><u>Natick MA</u></b>	X		X		Bags purchased by residents at local stores are used.	Black Earth voluntary subscription service.
<b><u>Taunton MA</u></b>	X			Bags purchased and 95 gallon recycling cart collected every 2 weeks. Started in 2004.	Bags purchased by residents at local stores are used.	NA
<b><u>Worcester MA</u></b>	X		X	Started a PAYT system in 1993 using bags.	Pays for about 50% of cost. Only 3 price increases in 27 years. Want to keep the program affordable.	Voluntary programs available. Considering doing a city pilot program.
<b><u>Clovis CA</u></b>	X	X	X			
<b><u>Davis CA</u></b>	X	X	X	Recycling cart split with one side for paper and cardboard and the other for all else.	Variable Rate Pricing depending on cart size	

<b><u>Lake Forest CA</u></b>	X	X	X			
<b><u>Livermore CA</u></b>	X	X	X			
<b><u>Mission Viejo CA</u></b>	X	X	X			
<b><u>Napa CA</u></b>	X	X	X			
<b><u>Redwood City CA</u></b>	X	X	X	86% of residents get 35 gallon trash carts.		
<b>Community</b>	<b>Residents Charged for Trash Collection</b>	<b>Carts for Trash</b>	<b>Curbside Food Collection</b>	<b>Explanation of MSW Collection</b>	<b>Fee for Collection, If Applicable</b>	<b>Explanation of Compost Program</b>
<b><u>Santa Clara County CA</u></b>	X	X	X	Mixed waste processing captures organic waste and misplaced recyclables from garbage carts.	Variable Rate Pricing depending on cart size	
<b><u>Costa Mesa CA</u></b>	X	X	X	Trash Waste and Recycling co-mingled and sorted at MRF	Flat Fee for all MSW	
<b><u>W. Covina CA</u></b>	X	X	X			
<b><u>Boulder CO</u></b>	X	X	X	City requires that compost and recycling be bundled together with trash.	Private Haulers	
<b><u>Edina MN</u></b>	X	X	X	Residents contract with private hauler for trash but city collects recyclables and compost for a fee.		\$16.50/quarter for weekly collection. Not mandated to use but must. Recyclables collection is \$11.10/quarter for biweekly pickup.
<b><u>St. Louis Park MN</u></b>	X	X	X		Variable Rate pricing depending on cart size	Hennepin County is mandating that towns over a certain size offer composting service as part of trash package.