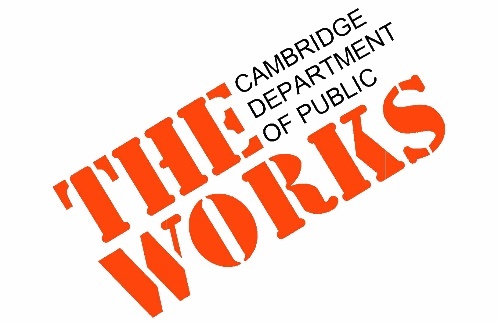
City of Cambridge

Zero Waste Master Plan

**Appendix A**

**Appendix A: Phase 1 Baseline Understanding**

**Statement of Purpose**

This Baseline Understanding report was originally completed in March 2017, and was finalized in November 2017 & June 2019. The purpose of this document is to establish the baseline waste management system in the City as a basis for progressing towards a Zero Waste Master Plan. The baseline waste management system as documented in this report, represents the waste management system and system performance as of the end of 2018.

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# Introduction

The City of Cambridge (City) is undertaking a Zero Waste Master Plan to further its environmental goals of minimizing waste generation, maximizing reuse and repurposing, and delivering a broad range of recycling options. The City provides a comprehensive suite of waste management services to both the residential and some non-residential sectors. The purpose of this document is to establish the baseline waste management system in the City upon which the recommendations for progressing towards Zero Waste will be based.

# Demographics

The City of Cambridge is the fifth largest city in the state of Massachusetts. The 2015 population is estimated to be 110,402[[1]](#footnote-1) and by 2030 is expected to be 118,625[[2]](#footnote-2). The City has a population density of 16,469 persons per square mile and 7,406 housing units per square mile[[3]](#footnote-3). The City is contained within 6.39 square miles.[[4]](#footnote-4) Cambridge is a city undergoing rapid growth; in 2010, it was reported that there were 44,032[[5]](#footnote-5) households and by 2030, it is expected there will be 49,640 households.[[6]](#footnote-6) The largest proportion of householders represents those under the age of 35, followed by those in the age bracket of 35 to 54. The under 35 demographic also represents a large proportion of those renting in multi-family units which is not unexpected given the number of higher learning institutions in the City.[[7]](#footnote-7)

Table 2‑1 presents a breakdown of the number of types of dwelling units and households (HH) receiving trash collection service by the City. Table 2‑2 presents a breakdown of the number of types of dwelling units and households receiving recycling collection service by the City. The City services approximately 68% of households (32,051 households) with trash collection and approximately 95% of households (44,678 households) with recycling collection. The remaining households not serviced by trash and recycling (approximately 5,000 households) still have access to the City’s Recycling Center, Household Hazardous Waste events, and other resources.

Table 2‑1: Number of Buildings and Households Receiving City Trash Collection Service

| # Units | Monday | | Tuesday | | Wednesday | | Thursday | | Friday | | Total | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Buildings | #HH | Buildings | #HH | Buildings | #HH | Buildings | #HH | Friday | #HH | Buildings | Households |
| 1 | 996 | 996 | 1,186 | 1,186 | 552 | 552 | 591 | 591 | 451 | 451 | 3,776 | 3,776 |
| 2 | 881 | 1,762 | 982 | 1,964 | 495 | 990 | 529 | 1,058 | 592 | 1,184 | 3,479 | 6,958 |
| 3 | 448 | 1,344 | 256 | 768 | 376 | 1,128 | 472 | 1,416 | 517 | 1,551 | 2,069 | 6,207 |
| 4 | 64 | 256 | 37 | 148 | 78 | 312 | 139 | 556 | 128 | 512 | 446 | 1,784 |
| 5 | 26 | 130 | 21 | 105 | 31 | 155 | 47 | 235 | 41 | 205 | 166 | 830 |
| 6 | 41 | 246 | 15 | 90 | 66 | 396 | 149 | 894 | 107 | 642 | 378 | 2,268 |
| 7 | 13 | 91 | 4 | 28 | 15 | 105 | 13 | 91 | 19 | 133 | 64 | 448 |
| 8-12 | 33 | 299 | 14 | 141 | 69 | 672 | 58 | 542 | 57 | 542 | 231 | 2,196 |
| **Total 1-12 Units** | **2,502** | **5,124** | **2,515** | **4,430** | **1,682** | **4,310** | **1,998** | **5,383** | **1,912** | **5,220** | **10,609** | **24,467** |
| 13-20 | 25 | 417 | 9 | 153 | 33 | 542 | 22 | 346 | 24 | 377 | 113 | 1,835 |
| 21-50 | 10 | 324 | 9 | 283 | 42 | 1,341 | 5 | 157 | 10 | 309 | 76 | 2,414 |
| 51-100 | 9 | 560 | 3 | 191 | 14 | 916 | 2 | 113 | 2 | 138 | 30 | 1,918 |
| 101+ | 3 | 581 | 1 | 153 | 1 | 175 | 0 | 0 | 3 | 508 | 8 | 1,417 |
| **Total 13+ Units** | **47** | **1,882** | **22** | **780** | **90** | **2,974** | **29** | **616** | **39** | **1,312** | **227** | **7,584** |
| **Total** | **2,549** | **7,006** | **2,537** | **5,210** | **1,772** | **7,284** | **2,027** | **5,999** | **1,951** | **6,552** | **10,836** | **32,051** |

Source: City of Cambridge

Table 2‑2: Number of Buildings and Households Receiving City Recycling Collection Service

| # Units | Monday | | Tuesday | | Wednesday | | Thursday | | Friday | | Total | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Buildings | #HH | Buildings | #HH | Buildings | #HH | Buildings | #HH | Friday | #HH | Buildings | Households |
| 1 | 997 | 997 | 1,186 | 1,186 | 552 | 552 | 591 | 591 | 451 | 451 | 3,777 | 3,777 |
| 2 | 881 | 1,762 | 982 | 1,964 | 495 | 990 | 529 | 1,058 | 593 | 1,186 | 3,480 | 6,960 |
| 3 | 448 | 1,344 | 256 | 768 | 376 | 1,128 | 473 | 1,419 | 517 | 1,551 | 2,070 | 6,210 |
| 4 | 64 | 256 | 37 | 148 | 78 | 312 | 139 | 556 | 128 | 512 | 446 | 1,784 |
| 5 | 26 | 130 | 21 | 105 | 31 | 155 | 47 | 235 | 41 | 205 | 166 | 830 |
| 6 | 42 | 252 | 15 | 90 | 68 | 408 | 150 | 900 | 112 | 672 | 387 | 2,322 |
| 7 | 13 | 91 | 4 | 28 | 15 | 105 | 13 | 91 | 21 | 147 | 66 | 462 |
| 8-12 | 44 | 414 | 14 | 141 | 75 | 730 | 61 | 566 | 65 | 620 | 259 | 2,471 |
| **Total 1-12 Units** | **2,515** | **5,246** | **2,515** | **4,430** | **1,690** | **4,380** | **2,003** | **5,416** | **1,928** | **5,344** | **10,651** | **24,816** |
| 13-20 | 47 | 685 | 10 | 172 | 49 | 756 | 34 | 495 | 51 | 691 | 191 | 2,799 |
| 21-50 | 18 | 591 | 19 | 623 | 64 | 2,049 | 13 | 429 | 20 | 645 | 134 | 4,337 |
| 51-100 | 13 | 834 | 12 | 798 | 28 | 1,898 | 6 | 374 | 8 | 606 | 67 | 4,510 |
| 101+ | 9 | 2,139 | 4 | 661 | 6 | 919 | 19 | 3,569 | 5 | 928 | 43 | 8,216 |
| **Total 13+ Units** | **87** | **4,249** | **45** | **2,254** | **147** | **5,622** | **72** | **4,867** | **84** | **2,870** | **435** | **19,862** |
| **Total** | **2,602** | **9,495** | **2,560** | **6,684** | **1,837** | **10,002** | **2,075** | **10,283** | **2,012** | **8,214** | **11,086** | **44,678** |

Source: City of Cambridge

# State and Municipal Ordinances

Both the City of Cambridge and the State of Massachusetts have adopted a goal to reduce municipal trash by 30% by 2020, and 80% by 2050 or before (using 2008 levels as the base) as part of the pathway to Zero Waste. This section provides an overview of state and municipal legislation and ordinances relevant to this project.

## State Legislation

The State of Massachusetts has developed several guidance documents, policies and pieces of legislation regarding waste management including: hazardous waste, solid waste, construction and demolition material, disaster debris, and solid waste management facilities. Over time, the State has enacted several regulations to achieve greater diversion. Those most applicable to this study are described below.

### Waste Disposal Bans

The Massachusetts Department of Environmental Protection (MassDEP) has enacted several bans since the early 1990s on landfilling and combustion of materials that are either toxic and/or easy to recycle. Materials that are banned from disposal and/or transfer for disposal in Massachusetts include[[8]](#footnote-8):

* Asphalt Pavement, Brick & Concrete
* Cathode Ray Tubes
* Clean Gypsum Wallboard
* [Commercial Food Waste](http://www.mass.gov/eea/agencies/massdep/recycle/reduce/food-waste-ban.html)
* Ferrous & Non-Ferrous Metals
* Glass & Metal Containers
* Lead Acid Batteries
* Leaves & Yard Waste
* Recyclable Paper, Cardboard & Paperboard
* Single Resin Narrow-Necked Plastics
* Treated & Untreated Wood & Wood Waste (Banned from Landfills Only)
* White Goods (Large Appliances)
* Whole Tires (Banned from Landfills Only; Shredded Tires Acceptable)

### Commercial Organics Ban

In October 2014, a ban on the disposal of commercial organic wastes by businesses and institutions that dispose of one ton or more of these materials per week took effect. In general, this ban affects the following groups[[9]](#footnote-9):

* Residential Colleges or Universities with ≥ 730 students
* Non-residential Colleges or Universities with ≥ 2,750 students
* Secondary Schools with ≥ 4,000 students
* Hospitals with ≥ 80 beds
* Nursing Homes with ≥ 160 beds
* Restaurants with ≥ 70 or more full time employees
* Resort/Conference Properties with ≥ 475 seats
* Supermarkets with ≥ 35 full time employees.

### Bottle Bill

Massachusetts has a Bottle Deposit Law; the “Bottle Bill”, enacted in 1983 which requires a $0.05 deposit on all carbonated soft drink, beer, malt beverage and sparkling water containers sold in the state. This legislation reduces the quantities of these materials requiring management by municipalities.

## Municipal Ordinances

The following provides brief descriptions of ordinances enacted by the City which are relevant to this project.

### Refuse and Litter Ordinance

Cambridge Municipal Code Chapter 8.24, Refuse and Litter Ordinance[[10]](#footnote-10), sets out the conditions for the handling, collection and disposal of waste as well as maintenance of public and private properties.

This ordinance was amended in 1991 when City Council mandated recycling throughout the City for all sectors.

Section 8.24.070 (Mandatory Recycling) of the Cambridge Municipal Code requires all owner/occupants in Cambridge to separate all designated recyclable materials regardless of service provider. The ordinance requires commercial establishments to recycle materials that comprise at least 5% of their waste stream.

Section 8.24.110 specifies that the Commissioner of Public Works has the right to specify the times and methods of storage, collection and disposal of refuse by any private collector.

### Bring Your Own Bag Ordinance

In March 2015, City Council passed the Bring Your Own Bag (BYOB) Ordinance[[11]](#footnote-11) which prohibits the use of plastic bags with handles, and requires retail establishments to charge customers a minimum of $0.10/bag for all reusable, paper or compostable bags with handles provided at the point of sale. The intent of this ordinance is to reduce the number of single use plastic bags, and encourage the use of reusable or other bags.

### Polystyrene Ordinance

Cambridge recently adopted a Polystyrene Ordinance[[12]](#footnote-12) which took effect on October 20, 2016. The ordinance prohibits retail establishments from using single-use, disposable, polystyrene containers for prepared take-out food or beverages. The ordinance affects all food and drink establishments that prepare and serve food or drink in single-use disposable service-ware.

# Waste Materials Management Programs

The Department of Public Works (DPW) administers all waste materials management programs in the City. The Solid Waste Division is comprised of the following three divisions: Recycling, Rubbish and Street Cleaning.

The Recycling Division is responsible for the weekly curbside collection of materials that must be diverted under State law, including paper, cardboard, bottles, cans and yard waste. These materials are collected from Cambridge residents, City buildings, schools and some small non-profit organizations. Materials are also collected from various drop-off locations. The Division maintains a Recycling Center accessible to Cambridge residents, as well as businesses and non-profit agencies with 50 or fewer employees. The Division collaborates with the Rubbish Division to provide household hazardous waste events, and collection for scrap metal, appliances, and large electronics. As of 2019, the Recycling Division also manages the curbside composting program, the Small Business Recycling Pilot, and a variety of other smaller waste events. The Recycling Division has five full-time employees (a director, two program managers, and two inspectors), two part-time employees, and two interns.

The Rubbish Division provides weekly curbside collection of trash from residences, public buildings, schools and some non-profit organizations. Collection of large, bulky items from residents is also provided by this division in addition to provision of four household hazardous waste collection events held annually. This division also is responsible for oversight and enforcement of the City’s Refuse and Litter Ordinance.

The Street Cleaning Division is responsible for maintaining streets and sidewalks, as well as cleaning public area trash and recycling receptacles and removing graffiti.

## Trash Collection

The City provides weekly collection of trash to residential areas, public buildings, schools and some non-profit organizations. The City provides weekly trash collection service with municipal crews (Department of Public Works) to approximately 68% of the households in the City; all single family homes and approximately two thirds of all multi-family buildings, an estimated 32,050 households. The City also collects trash from all schools and City buildings, as well as from some Cambridge Housing Authority (CHA) buildings and the Cambridge Rindge and Latin School (CRLS).

As of April 2018, the City collects trash and litter using its own workforce using the following resources:

* Six (6) three (3) person rubbish trucks (rear packers) collecting household trash from Monday to Friday
* Two (2) two (2) person trucks (rear packers) managing litter in various squares and parks from Monday to Friday
* Evening and overnight crews assist with litter collection during “off-hours” times as required.

The City does not provide trash collection to the commercial sector who must contract directly with private service providers. All haulers licensed to operate in Cambridge are required to offer recycling collection.

The Refuse and Litter Ordinance limits household trash to 150 pounds per week, 150 gallons per household in no more than three barrels, up to 50 gallons each. For example, a multi-family building with 6 units can have up to eighteen 50-gallon barrels and up to 900 pounds of trash per week set out for collection. The City provides some collection of trash from dumpsters from select locations with regular collection vehicles.

## Large Item Collection

The City provides large item collection to residents receiving City service. Some large items are collected at the curb; others are collected on a scheduled basis and require an Appliance/Large Item disposal permit for each item being collected. The cost of each disposal permit is $25 or $20 for senior citizens (ages 62+). Items of a commercial or industrial nature are not eligible for collection by the City. Residents are allowed to put one piece of furniture out per week on trash day. Collection staff on-route call in items that have been set out and that do not require a permit (and therefore not scheduled) for collection by a supervisor.

The City had a partnership with the MA Coalition for the Homeless who collect furniture items in good condition at no charge two times per month (on the last Friday and the first Monday of every month, except holidays) with additional collections provided during peak move-in/out times around June 1 and September 1. Residents would contact this organization directly to have furniture collected. Unfortunately, the nonprofit couldn’t continue offering this service after 2016.

One City pickup truck is dedicated to the daily collection of small TVs/monitors, microwaves, stereos and box fans. There is a dedicated City crew for the weekly scheduled collection of white goods and other metals on Wednesdays and large TVs/monitors on Thursdays.

Items such as appliances or metal are brought to the DPW yard. Following extraction of refrigerants by a contractor, appliances are placed into a dumpster along with scrap metal for removal by a contractor. Furniture and other items not requiring a permit are collected by regular packer trucks and hauled for trash disposal.

An Appliance/ Large item Permit is required for:

* Air Conditioners\*[[13]](#footnote-13)
* Clothes Washers & Dryers
* Copiers & Printers (More than 40 lbs)
* Dehumidifiers\*
* Dishwashers
* Exercise Equipment (small) & Bicycles (free, call ahead to schedule pick-up)
* Larger Exercise Equipment (motorized)
* Lawnmowers (free, call ahead to schedule pick-up, must remove gas)
* Metal Filing Cabinets & Desks (free, no permit required, call ahead to schedule pick-up)
* Radiators (free, no permit required, call ahead to schedule pick-up)
* Refrigerators\* & Freezers\* (must remove doors, non-commercial)
* Snow Blowers (free, call ahead to schedule pick-up, must remove gas)
* Stoves
* TVs & Computer Monitors (Over 20" diagonal screen length)
* Trash Compactors
* Water Coolers & Heaters

No Permit is required for:

* Carpet or lumber (residential only, up to 3 tied bundles, 3' x 3' x 1')
* [Electronics](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics)(microwaves, stereos, box fans, small printer or fax machine)
* [Furniture](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/furnitureandhouseholdgoods)(couches, mattresses, box springs, tables)
* Toilet or Sink (one per household on collection day)
* Small TVs & computer monitors (20” or less diagonal screen length), including hard drive, keyboard, mouse and small printer or fax machine.

## Recycling Collection

The City manages a residential recycling collection program that has been in effect for more than twenty years. Currently, the curbside recycling program is single stream. Recycling is mandatory for all sectors in the City. Recycling is provided to approximately 95% of the households in the City or 44,600 households.

The City has a 5-year contract with a private service provider for curbside recycling collection and delivery of recyclables to another private service provider (Casella Recycling, expiring 10/24/20) for processing. Recyclables are delivered to Casella’s Material Recycling Facility (MRF) located at 24 Bunker Hill Industrial Park in Charlestown.

Recycling is collected using the same schedule and routes as the City’s trash program and typically require five (5) recycling packer trucks (rear load packers) operating throughout the City on a daily basis. One additional Supervisor rear load packer is used to service narrow streets, collect missed material and/or deliver new or replacement carts.

### Residential Recycling

The City provides most residences with 65 or 95 gallon recycling carts on wheels for weekly collection of single stream recycling. Residents may also convert any 32-gallon trash barrel for recycling, labeled with City stickers, or continue using blue bins. There are no limits on the amount of recycling placed out for collection.

|  |  |
| --- | --- |
| **Accepted Items**  *Containers*   * Aerosol Cans * Aluminum Cans, Trays & Foil * Glass Bottles & Jars * Metal Cans * Large Plastics * Stiff Plastic Containers * Spiral Cans   *Papers*   * Books * Cardboard Boxes * Frozen Food Boxes * Paperboard * Phone Books & Junk Mail * Pizza Boxes * Newspapers & Inserts * Magazines & Catalogs * Paper Bags * Shredded Paper * White & Colored Paper * Wrapping Paper | **Items NOT Accepted**   * [Trash](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/Trash/trashrequirements) * [Plastic bags](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Plastics) * [Styrofoam](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Packaging) * [Food waste](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/compostingquestions) * Ceramics, dishes or glassware * Clothes hangers * [Electronics](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics) or [appliances](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/largeitems) * [Household Hazardous Waste](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection) * [Light bulbs](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/florescentlights) * Milk Cartons & Juice Boxes * [Paint containers](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/Paint) * Paper towels or napkins * Photographs or blueprints * [Pots, pans or scrap metal](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Metal) * Plastic utensils * VCR or cassette tapes * Windows, plate glass or mirrors * [Yard waste](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/yardwaste) |

As of 2019, the acceptable list for recycling is under revision per changes in the recycling markets.

### Commercial Recycling

Since 1991, the City’s [Mandatory Recycling Ordinance](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/ordinancesandregulations)has required all buildings recycle any recyclable material that comprises at least 5% of their waste stream. Businesses can arrange for [curbside pickup](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/aboutrecycling/Businesses/greenyouroffice)with any hauler licensed in Cambridge. All haulers licensed to operate in Cambridge are required to offer recycling collection. Small businesses with 50 employees or less may use the City’s [Recycling Center](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/aboutrecycling/dpwrecyclingcenter)during regular operating hours. As of early 2019, the City operates a Small Business Recycling Pilot for 123 businesses to receive twice per week curbside recycling collection at no cost to the business.   
  
All materials subject to Massachusetts Waste Bans are considered designated recyclables in addition to the list below. The City reserves the right to add or remove recyclable materials as defined in the [rules and regulations](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/aboutrecycling/Businesses/rulesandregulations)of the Cambridge Municipal Code at any time.

The following materials are designated as recyclable materials:

|  |  |
| --- | --- |
| * Batteries (lead-acid) * Cardboard * Cathode ray tubes (TVs and computer monitors) * Construction waste (asphalt, brick & concrete) * Paper | * Glass, plastic & metal containers * Leaf & yard waste * Scrap metal * Tires (whole) * White goods * Wood |

### Multi-family Recycling

The City’s [Mandatory Recycling Ordinance](https://www.municode.com/library/ma/cambridge/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.24RELI_8.24.070MARE) includes multi-family buildings. The City provides free recycling 95 Gallon carts and weekly curbside collection service of recycling to all multi-family buildings. Carts are allocated to multi-family buildings based on one recycling cart for every three units. Carts must be placed at the curb for collection; there are a few instances where carts may be placed out in an alley for collection. The City offers limited service for recycling dumpsters.

### Public Area Bin Recycling

The City has a contract with a private operator who collects recycling materials from City streets, squares and parks throughout the year. Material is brought to the MRF by the private operator.

## Recycling Center

The City operates a recycling center located at 147 Hampshire Street in the rear of the DPW yard. It is open to Cambridge residents, small businesses and non-profit organizations in Cambridge with 50 employees or less on Tuesdays and Thursdays from 4 pm to 7:30 pm and Saturdays from 9 am to 4 pm. Use of the Center is free of charge.

The recycling center is run by City staff. Material dropped off at the recycling center by residents and small businesses is transferred to small dumpsters in the yard and, depending on the material, hauled from the center by different vendors.

The following list provides an overview of the materials accepted at the recycling center. While residents can bring any material in the accepted items list, those items marked with an asterisk are the only materials accepted from small businesses/non-profits.

**Accepted Items**

|  |  |
| --- | --- |
| * [Batteries](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/Batteries)(non-alkaline only) * Binders (good condition, for reuse) * [Books](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/paperandcardboard/Books)(residents are welcome to take up to 10 books per visit) * [Bottles & Cans](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Commingles)\* * Cardboard Boxes\* * [CDs, DVDs, Video Games (in original packaging)](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics) * Cell Phones * [Electronics](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics) and Cords (no [computer monitors or TVs](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics/computersandtvs)) * Flags * [Fluorescent Bulbs](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/florescentlights)\* * [Food Scraps](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/compostingquestions/organicsdropofffaq) (residents only) | * [Metal Items](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Metal)\* (no sealed containers or large appliances) * [Paper](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/aboutrecycling/curbsiderecyclingbasics)\* * Plastic Bags\* * Plastics, Large Items\* (laundry baskets, crates, toys, etc.) * Small Appliances (any small appliance with a cord or battery-operated device that one person can lift) * String Lights * Styrofoam Packing Peanuts (no block Styrofoam, no cellulose peanuts) * Thermometers * Thermostats * Toner & Ink Cartridges |

**Items NOT Accepted**

|  |  |
| --- | --- |
| * Air Conditioners, Dehumidifiers or Water Coolers ([Large Items/Appliance permit needed](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/largeitems)) * [Car Batteries](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Automotive/carbatteries) (bring to junk yard, auto shops, [Household Hazardous Waste Day](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection)) * [Chemicals](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection) * [Computer Monitors or TVs](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics/computersandtvs) * Construction Debris | * Floppy Disks, VHS or Cassette Tapes * [Furniture](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/furnitureandhouseholdgoods/furnitureandhouseholditems) * [Hazardous Waste](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection) * [Paint](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection) * [Smoke Detectors](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics/smokedetectors) * [Trash](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/Trash/trashrequirements) * [Yard Waste](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/yardwaste)or Wood * Water Filters * Window Glass |

## Yard Waste Collection

The City offers a yard waste collection program from the first week in April through to mid-December. Yard waste is mainly collected from single family homes and small multi-family dwellings, as larger multi-family dwellings and commercial entities typically have a landscaping service to manage their yard waste.

The program is managed by the recycling contractor and typically involves one rear load packer operating throughout the City using the same routes and schedules as the solid waste operation. Yard waste is delivered to an outdoor composting facility located in Woburn.

**Accepted Materials**

|  |  |
| --- | --- |
| * Leaves | * Shrub Prunings & Twigs (no more than 1 inch in diameter and 3 feet in length |
| * Grass | * Pumpkins |
| * Plants | * Thick Limbs (3 tied bundles per week, no more than 3 feet in length and diameter) |

**Unaccepted Materials**

|  |  |
| --- | --- |
| * Trash | * Soil, Dirt, Sand Rocks or Tree Stumps (call a private hauler) |
| * Food |  |

## Organics Collection

The City has been providing curbside organics collection since 2014. It has expanded in 2015 and 2018. The following provides details on collection, transfer and processing of organics.

### Residential Organics Collection

The City completed a feasibility study for a pilot curbside food scraps collection program for residents in 2012; and in 2015, completed the first year of the pilot collection program. Starting in 2014 with 554 households, the program expanded in the Fall of 2015 to include all eligible residences on the Monday collection routes in North Cambridge. The expanded program serviced approximately 5,200 households, in 2,500 small (1-12 units) multi-family buildings with City Trash collection. In April 2018, the City expanded this program to all buildings with 12 or fewer units. In the future, the program will be expanded to buildings with 13+ units with City trash collection and potentially to buildings with 13+ units thereafter for which the City currently provides recycling collection service. This initiative is further detailed in Appendix B.

The City provides a kitchen container and a curbside collection container (12 or 21 gallon lockable carts) to residents, and weekly collection of material at the curb. Until April 2018, the City contracted with a private service provider for collection, transfer and processing of organics. The private service provider was responsible for contracting out processing of organics. One rear load packer was utilized to collect organics as well as one 1-ton satellite dump truck which is used to provide extra collection capacity as required. After April 2018, the City took curbside collection of organics in-house with two 25-yard packers collecting food scraps daily from residential, school, and drop-off locations.

### Organics Collection from Schools and Other Locations

The City provides 65 or 68 gallon carts for organics collection at participating schools, drop-off centers (Community Centers), the Recycling Center, and participating non-profit organizations. Generally, collection is weekly or on-call as needed; however, some locations require twice weekly collection due to higher volumes collected. Prior to April 2018, the City contracted with a private service provider for collection, transfer and processing of organics from these locations. However, the City took over the collection and transfer of compostable material (food scraps and compostable trays) from schools by City collection staff. Material from schools were composted at Rocky Hill until January 2017. After January 2017, all food waste and compostables the City collected were sent to Waste Management CORe.

## HHW Collection

The City contracts with a private service provider to operate four Household Hazardous Waste (HHW) events annually, which are open to Cambridge residents. Generally, each year four events are held on Saturdays from 9 am to 1 pm in April, June, September and October. Events are held at locations throughout the City (typically City-owned parking lots). One City staff person attends the events to support the contractor’s staff. Residents can also dispose of HHW at privately run facilities for a small fee at other times during the year. The following is a list of acceptable and non-acceptable items collected at the City-run events as of April 2019.

|  |  |
| --- | --- |
| **Accepted Items**   * [Batteries: Vehicle & Non-Alkaline](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/Batteries) * Car Fluids: Antifreeze, Brake, Engine Degreaser, & Transmission * Car Tires (maximum four per household) * Chemicals: Cleaners, Glues, Removers, Photography & Swimming Pool * [Fluorescent Light Bulbs](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/florescentlights) * Mercury Items: Thermometers & Thermostats * Paints: Oil-Based & Latex * Poisons: Insecticides, Pesticides & Weed Killers * [Prescription Medicines](https://www.cambridgema.gov/cpd/communityresources/prescriptiondrugdropbox) (also accepted year-round at Police Dept. 125 Sixth St) * Propane Cylinders (20 lbs. or less only) * Waste Fuels: Antifreeze, Gasoline, Kerosene, Sterno & Motor Oil (motor oil also accepted year-round at DPW) | **Items NOT Accepted**   * Alkaline Batteries * Ammunition, Fireworks & Explosives * Asbestos (requires proper disposal) * [Bleach or Ammonia](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/Bleach) * Commercial/Industrial Waste * Construction Debris * [Empty Aerosol Cans](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Commingles) * [Fire Extinguishers](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/hazardouswastecollection/fireextinguishers) * Compressed Gas Cylinders * Infectious or Biological Waste * Radioactive Waste * [Smoke Detectors](https://www.cambridgema.gov/theworks/ourservices/recyclingandtrash/curbsidecollections/getridofitright/Electronics/smokedetectors) * Syringes |

# Waste Management Contracts

The following sections provide an overview of the various contracts the City holds with private service providers for waste management.

### Recycling Collection and Processing

The City has a contract with FW Russell and Sons Disposal Inc. and Langton & Douglas Contracting, Inc. for weekly single stream recycling collection. The City has a 5-year contract which commenced on November 1, 2015 and ends on October 31, 2020. The contract requires the service provider to collect single stream recycling on a weekly basis from all eligible households and deliver the material to a Material Recovery Facility (MRF) located in Charlestown. This contract also covers yard waste collection for 37 weeks per year.

The City has a contract with Casella Recycling LLC for processing and marketing of recyclables delivered to their Material Recycling Facility (MRF) located at 24 Bunker Hill Industrial Park, Charlestown, MA. The contract period runs from October 25, 2015 through October 25, 2020. The City’s agreement includes provisions for a monthly calculation of revenue or charges to Casella determined by the average commodity revenue (ACR). The ACR is calculated by dividing the prior month’s net revenue for Casella for each commodity (including residue tons at current market rates) divided by the total tons of commodities shipped (including residue and unaccounted for tons) over the same month. The ACR threshold of $78.50 per ton is subtracted from the excess ACR to determine who gets paid. The City gets paid for 50% of the revenue share of the excess ACR. In times of unfavorable markets, the City must pay Casella dollar for dollar below the ACR threshold. This arrangement excludes pre-sorted recyclables such as cardboard and mixed paper for which the City has an alternative revenue sharing agreement. Residue is not to exceed 7% by weight. The agreement allows for twice yearly audits of Cambridge loads by Casella to identify more significant contaminants which could be targeted through public education campaigns and driver training.

Casella also processes cardboard, commingles, paper and plastic film collected at the Recycling Center.

### Yard Waste Collection, Hauling and Processing

The contract for yard waste collection is part of the recycling collection contract. The City has a contract with FW Russell and Sons Disposal Inc. and Langton & Douglas Contracting, Inc. for collection, marketing and composting of yard waste on a seasonal basis. The City has a 5-year contract which commenced on November 1, 2015 and ends on October 31, 2020. The service provider is required to collect yard waste on a seasonal basis, deliver material to a composting facility (Landscape Express) located at 218 New Boston Street in Woburn and market the final compost. The City’s contractor has an agreement with Landscape Express to process yard waste and market the final compost.

### Organics Collection, Hauling and Processing

The City contracted with Save that Stuff Inc. from August 2015 until April 2018 for weekly organics collection, hauling and processing.

Save that Stuff was responsible for weekly collection of residential curbside organics (food scraps from the pilot area), hauling and processing. Up until the end of January 2017, material was processed at Rocky Hill Farm located at 34 Butterfield Road, Saugus, MA. After February 2017, material will be processed at Waste Management CORe situated at Save that Stuff’s facility located at 200 Terminal Street in Boston. Organics are processed into a slurry which is transferred to the Greater Lawrence Sanitary District wastewater treatment plant located at 240 Charles Street in North Andover, MA where it is anaerobically digested. The methane produced will be converted to electricity and heat to be used for the plant’s power needs.

The City entered into a separate contract with Save that Stuff for organics collection from City buildings, schools, the Recycling Center and other drop-off locations, and delivery to a registered composting facility. The contract began on August 25, 2014 and ended on February 15, 2017 when the City brought the collection in-house. This entire collection route was collected and sent to Rocky Hill Farm for processing until April 2018, when the City switched to Waste Management CORe.

### Christmas Tree Collection and Disposal

Christmas trees are collected by City forces and taken to C.J. Mabardy’s facility. From there, they are transported to a wood chipping facility in Winchendon, MA.

### HHW Collection and Processing

The City has a contract with Clean Harbors, Norwell, MA to operate four household HHW events annually. Material is transferred to their facility located at 42 Longwater Drive in Norwell, MA.

The City also has a contract with Environmental Integrity for hauling fluorescent bulbs and mercury-containing items collected by the City to a processing facility located in Holyoke, MA.

### Large Items Collection and Disposal

Large items are collected by City forces and either processed at the DPW yard (e.g. appliances) or taken to the transfer station owned by Republic Services for disposal (e.g. furniture). Scrap metal is hauled from the DPW yard by Scrap-It and taken to their facility located at 2 Dexter Street, Everett, MA.

### Electronics Collection and Disposal

Small electronics (e.g. small TVs/monitors, microwaves, stereos) are collected by City forces from the curb using a pickup truck. Larger electronics (e.g. large TVs/monitors, copiers, printers) are collected by a dedicated City crew on a scheduled collection basis. Some electronics are accepted at the Recycling Center. Electronics are placed in containers, collected by Universal Recycling Technologies and hauled to their facility at 61 Industrial Park Drive in Dover, NH.

### Trash Collection and Disposal

Trash collection is provided by City forces. Trash is hauled to a transfer station located at 68 Norfolk Ave, Roxbury, MA owned and operated by Republic Services (formerly Allied Waste Systems Inc).

Currently, the City has a contract with Republic Services transfer station in Roxbury, MA which started in July 2018 and expires on June 30, 2023 for trash disposal. Trash is either sent to a landfill (e.g. Turnkey Landfill in Rochester, New Hampshire) or to a waste-to-energy facility (WTE) (e.g. Wheelabrator in Saugus MA, Covanta SEMASS in West Wareham MA or Covanta in Haverhill MA) depending on market conditions. Typically, approximately 50% of trash is disposed of at a waste-to-energy facility and 50% is landfilled; however, this can vary from year to year.

Previously, the City had a contract with Waste Management Inc., for trash disposal. From FY08 to FY13, trash was disposed of at WTE facilities (Wheelabrator in Saugus, North Andover, and Milbury MA) or landfill (Turnkey in Rochester, NH and Fitchburg, MA). Both of these landfill sites have active methane to energy facilities.

Table 5‑1 presents the destination of trash from FY08 to FY18, and reflects the two contracts with different service providers.

Table 5‑1: Destination of Trash (FY08-FY18)

| Period | Total Tonnage | % WTE | Tonnage to WTE | % Landfill | Tonnage to Landfill |
| --- | --- | --- | --- | --- | --- |
| FY18 | 15,370 | 50% | 7,685 | 50% | 7,685 |
| FY17 | 15,538 | 50% | 7,769 | 50% | 7,769 |
| FY16 | 16,097 | 60% | 9,736 | 40% | 6,491 |
| FY15 | 16,089 | 60% | 9,653 | 40% | 6,434 |
| FY14 | 16,226 | 60% | 9,658 | 40% | 6,438 |
| FY13 | 16,725 | 86.4% | 14,450 | 13.6% | 2,275 |
| FY12 | 17,030 | 84.2% | 14,339 | 15.8% | 2,691 |
| FY11 | 17,407 | 88.8% | 15,457 | 11.2% | 1,950 |
| FY10 | 18,515 | 65.4% | 12,109 | 34.6% | 6,406 |
| FY09 | 19,772 | 80.7% | 15,956 | 19.3% | 3,816 |
| FY08 | 20,425 | 24.6% | 5,025 | 75.4% | 15,400 |

Source: City of Cambridge -Tonnage Destination Report – FY08-FY13 (E. Katz), Outbound Breakdown Analysis (M. Orr), Trash Tonnage (M. Orr)

### Miscellaneous Debris Collection and Disposal

The City has a contract with W.L. French Excavating Corporation for the collection of miscellaneous debris, including playground structures, regular street sweeping debris, leaf season street sweeping debris and staging area cleanup.

The green debris managed by W.L. French Excavating is disposed of at Clear Summit Earth Materials in Lancaster, MA.

The street sweepings managed by W.L. French Excavating are disposed of at the Crapo Hill landfill located in New Bedford, MA.

In the past, the City contracted with C.J. Mabardy for the receipt of waste dropped off by DPW vehicles at the C.J. Mabardy Transfer Station, which included miscellaneous debris and playground structures, wood stumps, street sweeping debris, dirt, materials generated by routine street work (e.g. rubble, gravel, asphalt). Street sweepings managed by C.J. Mabardy had been disposed of at a landfill located in Southbridge, MA.

### Catch Basin Waste Collection and Disposal

The City has a contract with Rapid Flow for solid waste collection and disposal from catch basins. Catch basin waste is disposed of at Turnkey Landfill located in Rochester, NH.

# Waste Materials Managed

The following sections present a breakdown of the tons of waste materials managed by the City by fiscal year and by calendar year.

## Overall City-Managed Waste

Table 6-1 present the overall tons of waste materials managed by the City in the major categories of Organics, Recycling, and Trash[[14]](#footnote-14) by fiscal and calendar year. Further breakdowns of each major category are provided in subsequent tables.

Table 6‑1: Overall City-Managed Waste (2012-2018) (tons)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Waste Stream | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Organics[[15]](#footnote-15) | 1,982 | 2,251 | 2,092 | 2,395 | 2,518 | 2,726 | 3,460 |
| Recycling | 9,594 | 9,707 | 9,678 | 9,581 | 9,546 | 9,532 | 9,405 |
| Trash | 16,895 | 16,491 | 16,137 | 16,166 | 15,723 | 15,492 | 14,895 |
| **Total** | **28,471** | **28,449** | **27,907** | **28,142** | **27,787** | **27,750** | **27,760** |

Source: City of Cambridge, Organics, Recycling (2012-2016 Recycling Database), Trash (2012-2013, Tonnage file from M. Orr, 2014-2016, Rubbish and Allied Files)

## City-Managed Trash

Table 6-3 presents the tons of trash managed. This represents trash collected from parks and litter bins, Cambridge Housing Authority (CHA), Cambridge Rindge & Latin School (CRLS), curbside by City forces (includes trash from dumpsters collected at parks, municipal buildings, schools, non-profits and some residential facilities).

Table 6‑3: City-Managed Trash (2012-2018) (tons)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Source | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Parks, Litter | 961 | 841 | 774 | 814 | 703 | 691 | 740 |
| CHA | 574 | 472 | 354 | 391 | 366 | 440\*\* | 447\*\* |
| CRLS | 106 | 105 | 73 | 108 | 104 | 110\*\* | 100\*\* |
| Curbside | 15,254 | 15,073 | 14,936 | 14,853 | 14,419 | 14,251 | 13,608 |
| **Total** | **16,895** | **16,491** | **16,137** | **16,166** | **15,723** | **15,492** | **14,895** |

Source: City of Cambridge, 2012-2013 Tonnage file from M. Orr (Parks, Litter, CHA, CRLS and Curbside), 2014-2016 Rubbish Files (tons of trash for Parks and Litter), 2014-2016 Allied Trash (tons of trash from CHA, CRLS,), Curbside tons from M.Orr (Tonnage files). \*\*= estimate.

The tons of trash presented in the previous table include the tons of trash collected from dumpsters at residential and non-residential locations (included in Curbside tons). These include City parks, municipal facilities/departments, schools, non-profits, and some residential buildings. Service is provided with varying frequency depending on the volume of material generated and can vary from once a week to five times a week.

## City-Managed Organics

Table 6‑1 present the tons of organics managed by the City. The category of food scraps represents the material dropped off at recycling/community centers and collected curbside from various schools and organizations as well from the curbside organics collection pilot areas.

Table 6‑1: City-Managed Organics (2012-2018) (tons)

| Material Category | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Christmas Trees | 44 | 40 | 27 | 45 | 45 | 45 | 45 |
| Food Scraps | 107 | 123 | 191 | 311 | 532 | 527 | 1,246 |
| Yard Waste | 1,831 | 2,089 | 1,873 | 2,039 | 1,986 | 2,154 | 2,169 |
| **Total** | **1,982** | **2,251** | **2,092** | **2,395** | **2,563** | **2,726** | **3,460** |

Source: City of Cambridge, Recycling Database

## City-Managed Recyclables

Table 6‑2 present the tons of recyclables managed by the City collected in various ways including:

* Curbside – includes materials collected at the curb such as, appliances, electronics, HHW, paper, scrap metal, single stream recycling, and, Styrofoam[[16]](#footnote-16) from residential properties, non-profit organizations, City locations, other organizations such as senior centers and other locations.
* Drop-off – includes materials such as cardboard, commingled recycling, electronics, HHW, paper, plastic film and scrap metal dropped off at the Recycling Center, or collected at shred events, Hazardous Waste Days, Special Collection Event from the Electrical Department (fluorescent tubes), and some materials collected at the curb (electronics, TVs, monitors, miscellaneous HHW) and brought to the DPW yard.
* Public Area Bins includes single stream materials collected in bins from public areas such as City squares and parks.

Table 6‑2: City-Managed Recycling (2012-2018) (tons)

| Source | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Curbside | 9,360 | 9,439 | 9,416 | 9,317 | 9,314 | 9,163 | 9,054 |
| Drop-Off | 198 | 229 | 214 | 210 | 171 | 201 | 185 |
| Public Area Bins | 36 | 39 | 48 | 54 | 62 | 60 | 65 |
| **Total** | **9,594** | **9,707** | **9,678** | **9,581** | **9,546** | **9,424** | **9,304** |

Source: City of Cambridge, Recycling Database

Table 6‑3 present a breakdown of the materials managed by the City from various sources.

Table 6‑3: Breakdown of City-Managed Recycling (2012-2018) (tons)

| **Material Category** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Curbside** | **9,360** | **9,439** | **9,416** | **9,317** | **9,314** | **9,163** | **9,054** |
| Appliances & Scrap Metal | 53 | 43 | 27 | 17 | 42 | 50 | 39 |
| Electronics | 91 | 67 | 66 | 61 | 64 | 37 | 50 |
| HHW | 0 | 14 | 0 | 1 | 0 | 0 | 0 |
| Single Stream | 9,209 | 9,308 | 9,315 | 9,232 | 9,204 | 9,076 | 8,965 |
| Styrofoam | 6 | 6 | 6 | 6 | 4 | 0 | 0 |
| **Drop-Off** | **198** | **229** | **214** | **210** | **171** | **201** | **185** |
| Cardboard | 56 | 57 | 58 | 59 | 42 | 50 | 41 |
| Single Stream | 15 | 13 | 11 | 14 | 10 | 17 | 21 |
| Electronics | 21 | 29 | 37 | 32 | 25 | 36 | 36 |
| HHW | 22 | 51 | 25 | 21 | 4 | 25 | 9 |
| Paper | 43 | 33 | 33 | 27 | 20 | 21 | 12 |
| Plastic Film | 4 | 5 | 5 | 5 | 2 | 2 | 2 |
| Scrap Metal | 38 | 41 | 45 | 51 | 67 | 50 | 64 |
| **Public Area Bins** | **36** | **39** | **48** | **54** | **62** | **60** | **65** |
| **Grand Total** | **9,594** | **9,707** | **9,678** | **9,581** | **9,546** | **9,424** | **9,304** |

Source: City of Cambridge, Recycling Database

## Miscellaneous Debris

The following table present the tons of street sweepings, and green debris disposed of by current and former contractors, such as Mabardy, French and Rapid Flow.

Table 6‑4: Tons of Miscellaneous Debris Managed (2012-2017)

| Material Category | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| --- | --- | --- | --- | --- | --- | --- |
| Street Sweepings | 1,066 | 1,477 | 1,290 | 791 | 1,399 | 1,139 |
| Green Debris | 346 | 456 | 187 | 307 | 332 | 1,298 |

Source: City of Cambridge (M. Orr)

## Catch Basin Waste

The following table present the tons of catch basin waste disposed of by W.L. French Excavating.

Table 6‑5: Tons of Catch Basin Waste Managed (2012 – 2017)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Material Category | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Catch Basin Waste | 614 | 412 | 491 | 705 | 278 | 303 |

Source: City of Cambridge (M. Orr)

# Waste Composition

This section evaluates the results of a 2016 waste audit. The audit is comparing diversion and diversion potential results for households participating in the curbside organics program (i.e. households located in the pilot area of the Monday route) and households that are not participating in the curbside organics program (i.e. households that were not eligible to participate in curbside organics). This composition analysis is for residential units on the City’s trash collection route. Further examination of buildings with private trash service should be conducted in the next few years. It is anticipated that the waste composition below is very similar to residential buildings with private trash collection.

## Waste Audit

In December 2016, the City conducted a waste audit of trash and recycling from 111 households that participate in the organics pilot and from 116 households that do not participate in the organics pilot. It should be noted that this audit was high level for the purposes of estimating waste composition and generation. Detailed sorts of trash and recycling were not conducted and curbside organics bins were not audited; it was assumed that the majority of material in the green bins would consist of food scraps.

**Table 7‑1** presents the results of the waste audit for participating and non-participating households. This table presents the percent composition and estimated pounds generated per household weekly for trash and recycling based on the waste audit data. Composition and generation rates for curbside organics have been estimated based on tons collected, and assuming curbside organics are comprised primarily of food scraps.

Table 7‑1: Waste Audit Results (2016 audit)

|  | **Participating Households** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Trash | | Recycling | | | Curbside Organics | |
| Material | % Composition | lbs/ hhld/ wk | % Composition | lbs/ hhld/ wk | % Capture Rate | % Composition \* | lbs/ hhld/ wk |
| Paper/ Cardboard | 10 | 1.25 | 63 | 8.11 | 87 |  |  |
| Containers/ Plastics | 6 | 0.73 | 31 | 3.95 | 84 |  |  |
| Food Scraps | 29 | 3.80 |  |  |  | 100 | 2.52 |
| Organics (non-food paper) | 12 | 1.59 |  |  |  |  |  |
| Diapers/ Pet Waste | 9 | 1.13 |  |  |  |  |  |
| Textiles | 4 | 0.50 | 0.1 | 0.01 |  |  |  |
| Electronics | 3 | 0.44 |  |  |  |  |  |
| Other Materials | 21 | 2.78 | 5 | 0.68 |  |  |  |
| Scrap Metal | 2 | 0.26 | 0.4 | 0.05 |  |  |  |
| Liquids | 4 | 0.49 |  |  |  |  |  |
| Total | 100 | 12.97 | 100 | 12.79 |  | 100 | 2.52 |

\*Note that curbside organics were not audited, it was assumed that they consisted primarily of food scraps.

| **Non-Participating Households** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Trash | | Recycling | | | |
| Material | % Composition | lbs/ hhld/ wk | % Composition | lbs/ hhld/ wk | % Capture Rate | |
| Paper/ Cardboard | 11 | 2.23 | 50 | 6.168 | 73 | |
| Containers/ Plastics | 7 | 1.54 | 37 | 4.55 | 75 | |
| Food Scraps | 33 | 6.9 |  |  |  | |
| Organics (non-food paper) | 8 | 1.72 |  |  |  | |
| Diapers/ Pet Waste | 11 | 2.29 |  |  |  | |
| Textiles | 4 | 0.92 |  |  |  | |
| Electronics (WEEE) | 2 | 0.46 |  |  |  | |
| Other Materials | 19 | 3.89 | 11 | 1.38 |  | |
| Scrap Metal | 1 | 0.27 |  |  |  | |
| Liquids | 3 | 0.64 | 1 | 0.15 |  | |
| Total | 100 | 20.86 | 100 | 12.24 |  | |

An estimate of the waste generation rates for participating and non-participating households was developed based on the information obtained through the waste audit. In general, it appears that participating households generate less waste overall. Caution should be used when interpreting these results as the difference may be attributed to those households who initially self-selected to participate in the organics pilot program and who may be more proactive about waste reduction compared to the average resident.

Table 7‑2: Waste Generation – Participating and Non-participating Households (lbs/hhld/week)

|  |  |  |
| --- | --- | --- |
| **Waste Generation lbs/hhld/week** | **Participating Households**  (lbs/hhld/week) | **Non- participating Households**  (lbs/hhld/week) |
| Trash | 12.97 | 20.86 |
| Recycling | 12.79 | 12.24 |
| Curbside Organics | 2.52 |  |
| **Total** | **28.29** | **33.10** |

## Comparison of Participating and Non-participating Households

The following figures present a comparison between the participating and non-participating households for trash and recyclables set out for collection. **Figure 7‑1** presents the composition of the trash set out for collection by participating households audited. It is interesting to note that almost one-third of the trash set out by participating households still consists of food scraps. This reflects that based on the audit results, it appears that the curbside organics program is capturing in the order of 40% of the food scraps generated, with 60% remaining in the trash.

Figure 7‑1: Trash - Participating Households - Percent Composition

Table 7‑2 presents the composition of the trash set out for collection by non-participating households audited.

Figure 7‑2: Trash – Non-Participating Households - Percent Composition

**Figure 7‑3** presents a comparison of the estimated generation rates of materials found in the trash stream. In general, non-participating households generate greater quantities of all material streams compared to participating households.

Figure 7‑3: Quantities of Materials Placed in the Trash

**Figure 7‑4** presents the composition of the recycling stream for participating households. Figure 7-5 presents the composition of recycling stream for non-participating households. In general, participating households recycle a greater percentage of paper/cardboard and containers/plastics compared to non-participating households, based on the material capture rates as indicated in Table 7‑1.

Figure 7‑4: Recycling – Participating Households - Percent Composition

Figure 7‑5: Recycling – Non-Participating Households - Percent Composition

Figure 7‑6presents a comparison of the quantities of materials found in the recycling stream. In general, participating households set out greater quantities of paper/cardboard but less containers/plastics however they also generated less containers/plastics. Non-participating households place greater quantities of other materials out for recycling that are not accepted in the City’s recycling program such as durable plastic products, carpeting, wood, ceramics etc.

Figure 7‑6: Quantities of Materials Set Out for Recycling



Although the waste audit did not include detailed material sort categories and did not delineate if materials included within the broader material categories were accepted in the City’s recycling program, a very rough estimate of capture rates can be made. Capture rates refer to the quantity of recyclable materials captured in the recycling bin as a percentage of total materials placed in the recycling bin and in the trash.

Assuming that all materials considered in the categories of paper/cardboard or containers/plastics are accepted in the City’s recycling program, the following capture rates were estimated:

* Participating households had a capture rate of 87% for paper/cardboard and 84% for containers/plastics.
* Non-participating households had a capture rate of 73% for paper/cardboard and 75% for containers/plastics.

It appears that there may be opportunities to educate non-participating households about placement of recyclable materials in the correct container.

# Next Steps

The next steps in the project are to develop the baseline collection model using the information in this document and to develop alternative collection efficiency models for recycling, trash and curbside organics. The information contained in this document will also be used to estimate the baseline for Greenhouse Gas (GHG) emissions associated with the current system.

1. U. S. Census Bureau, QuickFacts, Cambridge City, Massachusetts [↑](#footnote-ref-1)
2. Metro Boston 2030 Population and Housing Demand Projections, Municipal Report, Stronger Region Scenario: Population for Cambridge. [↑](#footnote-ref-2)
3. Cambridge Development Department (Facts and Maps) [↑](#footnote-ref-3)
4. U. S. Census Bureau, QuickFacts, Cambridge City, Massachusetts [↑](#footnote-ref-4)
5. Cambridge Development Department (Facts and Maps) and U. S. Census Bureau, Census 2010 [↑](#footnote-ref-5)
6. Metro Boston 2030 Population and Housing Demand Projections, Municipal Report, Stronger Region Scenario: Housing for Cambridge. [↑](#footnote-ref-6)
7. Metro Boston 2030 Population and Housing Demand Projections, Municipal Report, Stronger Region Scenario: Housing for Cambridge. [↑](#footnote-ref-7)
8. The Official Website of the Executive Office of Energy and Environmental Affairs, Massachusetts Waste Disposal Bans [↑](#footnote-ref-8)
9. MassDEP – Guidance for Businesses, Institutions and Haulers [↑](#footnote-ref-9)
10. [Chapter 8.24 - Refuse and Litter](https://www.municode.com/library/ma/cambridge/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.24RELI) [↑](#footnote-ref-10)
11. [Ordinance Number 1366](https://www.cambridgema.gov/~/media/Files/publicworksdepartment/recyclingandrubbish/byobordinance2016/BYOB%20Ordinance.pdf?la=en) [↑](#footnote-ref-11)
12. [Ordinance Number 1374](https://www.cambridgema.gov/~/media/Files/publicworksdepartment/recyclingandrubbish/polystyreneordinance2016/Polystyrene%20Ordinance.pdf?la=en) [↑](#footnote-ref-12)
13. Refrigerants are removed from air conditioners, dehumidifiers, freezers, and refrigerators in order to meet the Clean Air Act. All appliances are then sent to a local scrap metal recycling facility. [↑](#footnote-ref-13)
14. Note that the trash tons reported includes other materials such as street sweepings as reported by Allied/Republic and is not solely curbside trash. [↑](#footnote-ref-14)
15. Includes both food waste and yard waste [↑](#footnote-ref-15)
16. In previous years, City collected Styrofoam trays used in schools. Following the ban on Polystyrene, schools have switched to compostable trays. [↑](#footnote-ref-16)