

# Moving Beyond Solid Waste to Sustainable Materials Management

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City of Newton Sustainable Materials Management Framework Report

January 5, 2017



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## Executive Summary

The purpose of this report is to describe the current sustainable materials management practices, policies, and operations within the City of Newton; develop recommendations for program improvement; and propose long term goals.

While Newton has consistently been an environmental leader among communities in Massachusetts by offering a comprehensive range of waste and recycling services, there are numerous practices that could be improved to reduce waste generation, increase reuse, and increase material recovery. The City commits to environmental sustainability as part of its Outcomes-Based Budget and includes increasing recycling initiatives as one strategy for achievement. In addition to the environmental benefits, there is often a financial benefit to generating less waste and recovering more material. As stated in the Massachusetts 2010-2020 Solid Waste Master Plan, the culture shift away from solid waste management toward sustainable materials management means more focus on:

- Reducing the generation of waste
- Promoting more efficient use of materials throughout their lifecycle
- Increasing recovery, reuse, and recycling of materials that have served their useful purpose
- Reducing the amount of waste requiring disposal
- Reducing the toxicity of the waste requiring disposal
- Improving the environmental performance of materials management facilities

The introduction of this report describes the waste management hierarchy and provides details and background on various methods of managing waste materials. A summary of the Massachusetts 2010-2020 Solid Waste Master Plan is included and referred to in the later sections of the report. Since the Massachusetts 2010-2020 Solid Waste Master Plan is intended to be a “Path to Zero Waste” for Massachusetts and an explanation of zero waste follows. A historical review of materials management practices in Newton provides context for current practices. A vision for Newton’s materials management practices and proposed steps toward zero waste complete the introduction section.

Chapter Two describes Newton’s current materials management practices and policies for managing residential and municipal waste streams. The description of residential services includes curbside practices and details about the Newton Resource Recovery Center, as well as a discussion on how Newton compares to other cities of similar size in the region. The management of wastes from city buildings, city operations, and city public spaces that follows does not include management of waste from public schools other than the collection service that is included in the City’s recycling and waste hauling contract with Waste Management.

Recommendations for improvement are laid out in Chapter 3 and include recommendations for waste reduction, cost reduction, and increased recovery for residential services, municipal buildings and operations, and public spaces.

### **Recommendations to improve residential services include:**

- Assessing the bulky waste collection policy to reduce the possibility of abuse and decrease the amount of waste generated through this service.
- Improving infrastructure to manage household organic wastes by encouraging backyard composting, promoting food waste prevention, investigating anaerobic digestion, and investigating promotion of use of in-sink food waste disposers.
- Offering a permanent reuse “swap shop” at the Newton Resource Recovery Center.

- Increasing the efficiency and cost-effectiveness of managing the City's curbside carts.
- Restructuring the household hazardous waste collection program to improve efficiency and worker safety.
- Perform a fiscal analysis to determine the costs and benefits of the City providing service to multi-family properties.
- Increasing recovery of household food waste by exploring curbside collection options.
- Development and implementation a long term education and outreach plan to improve communication between the City and residents.
- Development and promotion of a city-wide recovery and waste reduction goal to increase citizen engagement.
- Rewarding good recycling behaviors with tags on curbside carts or with a focus on public space recycling.

**Recommendations to improve practices and policies within City buildings include:**

- Evaluate, update, and implement a waste prevention policy and program that was previously developed through a MassDEP grant.
- Assessing the waste collection service needs of City buildings to reduce the amount of pickups and reduce costs.
- Begin tracking time and money spent managing illegal dumping; discourage illegal dumping by locking municipal dumpsters and installing security cameras.
- Mandating recycling and responsible materials management as a job duty for all City staff.
- Determine contamination of municipal dumpsters to guide internal educational messaging.
- Find missed recovery opportunities and change practices to continuously increase recovery of materials and reduce waste generation.

**Recommendations to improve public space materials management include:**

- Explore development of a formal carry-in/carry-out policy for public spaces that do not have city-managed collection receptacles.
- Improve education and outreach to reduce contamination in public space recycling and increase proper recycling.
- Mandate recycling for all permitted events held on City property by requiring a recycling plan in the permit application process.

**Recommendations to improve sustainable materials management practices in City operations include:**

- Improve materials management in project planning by including preferred materials management preferences in bids and internal project development.
- Improve street sweepings management by separating contaminated sweepings from side street sweepings.
- Increase sorting and seek recovery outlets for project wastes (i.e., stumps, concrete, wood).

The contents of this report are intended to guide short and long term program planning. Long term planning for sustainable materials management in Newton should incorporate these aforementioned recommendations. Goal setting and identifying priority materials for Newton will also guide long term planning. A long term plan will be developed in 2017.

## 1 Introduction

The purpose of this report is to describe the current sustainable materials management practices, policies, and operations within the City of Newton; develop recommendations for program improvement; and propose long term goals.

While Newton has consistently been an environmental leader among communities in Massachusetts by offering a comprehensive range of waste and recycling services, there are numerous practices that could be improved to reduce waste generation, increase reuse, and increase material recovery. The City commits to environmental sustainability as part of its Outcomes-Based Budget and includes increasing recycling initiatives as one strategy for achievement.<sup>1</sup> In addition to the environmental benefits, there is often a financial benefit to generating less waste and recovering more material.

Recommended policy changes and methods to improve waste and recycling operational efficiency are detailed in this report. The City is dedicated to influencing positive change by setting a good example for residents through improved materials management in all City facilities. Newton, along with most of the Northeast, is at a pivotal moment due to dwindling capacity in existing waste outlets that will soon lead to increased costs. The culture in the City must begin to shift away from thinking that waste has no use. Instead we must move toward a comprehensive and integrated approach that manages materials throughout their lifecycles and encourages stakeholders to take their share of responsibility through smartly designed incentives. A communication plan for education and outreach efforts is included in this report to help guide this culture shift. As stated in the Massachusetts 2010-2020 Solid Waste Master Plan, the culture shift away from solid waste management toward sustainable materials management means more focus on:

- Reducing the generation of waste
- Promoting more efficient use of materials throughout their lifecycle
- Increasing recovery, reuse, and recycling of materials that have served their useful purpose
- Reducing the amount of waste requiring disposal
- Reducing the toxicity of the waste requiring disposal
- Improving the environmental performance of materials management facilities

As consumers, businesses and government officials we can no longer afford traditional methods of managing wastes. Solid waste management currently requires significant expenditures by taxpayers and businesses. Disposal of valuable materials is a waste of resources and lost economic opportunity. Diverting material from the waste stream by reducing generation and increasing reuse, recycling, and composting, saves everyone money, captures valuable resources, protects our environment, and contributes to the economy. By 2030, annual landfill capacity in Massachusetts is anticipated to decline by as much as 85%.<sup>2</sup> As landfill capacity is reduced, pressure and demand are increased at waste-to-energy facilities, which will cause price increases that are expected to impact Newton during the next pricing negotiation. By reducing waste and increasing recycling and composting, there is a reduction for the overall need for disposal capacity.

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<sup>1</sup> [http://www.newtonma.gov/gov/executive/metrics/environmental\\_sustainability.asp](http://www.newtonma.gov/gov/executive/metrics/environmental_sustainability.asp)

<sup>2</sup> <http://ebcne.org/news/presentation-added-ebc-solid-waste-management-conference-talking-trash-the-looming-solid-waste-disposal-capacity-crisis/>

In addition to saving landfill space, waste reduction conserves natural resources, saves energy, prevents pollution, and reduces greenhouse gas emissions. In 2009, Massachusetts is estimated<sup>3</sup> to have:

- Reduced greenhouse gas emissions by nearly 1.8 million tons of carbon equivalent per year;
- Saved 70 trillion BTUs of energy, equivalent to the annual energy consumption of more than 12 million barrels of oil or nearly 600 million gallons of gasoline; and
- Avoided the use of 1.1 million tons of iron ore, coal, limestone and other natural resources.

The greenhouse gas benefits of achieving Massachusetts 2010-2020 Solid Waste Master Plan goals through source reduction, recycling, and composting could exceed four million tons of CO<sub>2</sub> equivalent on an annual basis. Recycling creates environmental and energy conservation benefits, primarily by avoiding the extraction of virgin resources and reducing the environmental impacts of extracting these resources. Capturing these valuable materials provides these critical benefits for our environment and our economy in Massachusetts, but also nationally and internationally.

These lifecycle benefits dwarf the greenhouse gas emissions associated with transporting recycled materials to facilities that will use them, as well as the greenhouse gas emissions of the recycling processes. For example, the greenhouse gas benefits of recycling aluminum instead of disposing it are so large that you would need to transport aluminum about 116,000 miles by truck before the GHG emissions from this transportation would equal the GHG emissions avoided by recycling that aluminum. This relationship holds true for other recyclables as well: cardboard would need to be trucked for 27,000 miles to offset the lifecycle greenhouse gas benefits from recycling it.

The robust recycling industry that has developed since the 1980s demonstrates that materials previously considered to be waste have considerable value, in both monetary and natural resource terms. As referenced in the Massachusetts 2010-2020 Solid Waste Master Plan, the 2009 U.S. Recycling Information Study found that in Massachusetts recycling, reuse, and manufacturing based on recycled feedstocks directly support more than 2,000 businesses with an estimated 14,000 jobs, maintain a payroll of nearly \$500 million, and bring in annual revenues of \$3.2 billion. There is much more that can be done to divert material from disposal and toward an active and productive extended life in the economy. In doing so, there will be a reduction in greenhouse gas emissions and natural resources and energy will be conserved while at the same time spurring the expansion of businesses and jobs and reducing disposal costs for waste generators and the municipality. In summary, recovering more material as opposed to disposing of it is an environmental, economic development, and cost reduction opportunity.<sup>4</sup>

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<sup>3</sup> <http://www.mass.gov/eea/docs/dep/recycle/priorities/swmp13f.pdf>

<sup>4</sup> <http://www.mass.gov/eea/agencies/massdep/recycle/reports/solid-waste-master-plan.html>

## 1.1 Background

### 1.1.1 Factors That Impact Sustainable Materials Management<sup>5,6</sup>

#### 1.1.1.1 Non-Hazardous Materials and Waste Management Hierarchy

The U.S. EPA developed the non-hazardous materials and waste management hierarchy in recognition that no single waste management approach is suitable for managing all materials and waste streams in all circumstances. The hierarchy (Figure 1) ranks the various management strategies from most to least environmentally preferred. The hierarchy places emphasis on reducing, reusing, and recycling as key to sustainable materials management.

#### 1.1.1.2 Source Reduction and Reuse

Source reduction, also known as waste prevention, means reducing the amount of waste that is generated. Reuse means to use a material again or more than once. These are the two most environmentally preferred strategies for sustainable materials management.

They can take many different forms, including reusing or donating useable items, buying goods in bulk and buying secondhand to reduce packaging, redesigning products, and reducing toxicity. Purchasing products that incorporate these features supports source reduction. In many cases, reuse needs infrastructure in place to redirect items that still have value for their original intended purpose (e.g. clothing, furniture, etc.) from those who no longer need them to individuals and organizations that can use them. Source reduction and reuse save natural resources, conserve energy, reduce pollution, reduce the toxicity of the waste stream, and cut costs for consumers and businesses.

Source reduction is also important in manufacturing. Lightweighting of packaging, reuse, and remanufacturing are all becoming more popular business trends. Two policy strategies that have been used to encourage or require source reduction for the manufacturing sector include product stewardship and extended producer responsibility. As defined by the Product Stewardship Institute, product stewardship occurs when manufacturers minimize negative environmental, health, safety, and social impacts of a product and its packaging throughout all lifecycle stages, while also maximizing economic benefits. Extended producer responsibility (EPR) is a mandatory type of product stewardship that includes, at a minimum, the requirement that the manufacturer's responsibility for its product extends to post-consumer management of that product and its packaging. There are nearly 400 EPR laws in place around the world, including 92 in the U.S, that regulate various material types



**Figure 1.** The Waste Management Hierarchy illustrates waste management strategies in order of most preferred to least preferred.

<sup>5</sup>

<http://charmack.org/mecklenburg/county/luesa/solidwaste/managementplan/documents/bestpracticesrecyclingstudy.pdf>

<sup>6</sup> <https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy>



including consumer electronics, packaging, batteries, pharmaceuticals, mercury-containing items, paint, and mattresses. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the manufacturer and away from the public sector; and (2) providing incentives to manufacturers to incorporate environmental considerations into the design of their products and packaging.

### 1.1.1.3 Recycling and Composting

Basic information about the nature of recycling is necessary to understand both the choices that communities make and the opportunities available for recycling. In the free enterprise economic system of the United States, there is demand for consumer goods, so manufacturers make products and then sell them through a system of wholesale and retail outlets. These products are purchased by consumers and in time the packaging for the goods and the goods themselves are no longer useful or desired and they are disposed.

Recycling is the reverse of this process where discarded materials must be recovered from the waste stream, sorted, accumulated in high volumes, processed into a raw usable material, and eventually transported to a manufacturer to become a new product or packaging material. Recycling is driven by private sector demand for the recovered materials, as well as consumer demand for products and packaging made from recycled content. The demand for the recovered materials and process of brokering recovered materials that have value is referred to by the term “markets.”

Composting is a managed process to decompose organic wastes into a soil amendment. Composting is often considered recycling and included in recycling rates. Commercial composting facilities manage high volumes of organic wastes including yard waste and food waste. Moisture, oxygen, and time are also managed to produce compost. Compost, the end product of the composting process, is rich in nutrients and used as a fertilizer.

Recycling and composting prevent the emission of greenhouse gases and water pollutants, save energy, supply raw materials to industry, create jobs, stimulate the development of more sustainable technology, conserve resources for future generations, and reduce the demand for new landfills and combustors.

The infrastructure that makes recycling possible is only economically feasible to develop if there is a market demand for the materials a community or business wants to recycle. This means that the recovered material must be capable of being processed into a form that is competitive and transported in an economically competitive manner to raw materials. Consequently, local government recycling programs (or their service providers) focus their efforts on recovering materials for which market demand exists. Haulers and processors are needed to transport, sort and prepare these recovered materials in a sufficiently high quality to be sold on the private market.

In today’s global economy, recycling markets and market demand for many materials are also driven by the international marketplace. Commodity value will fluctuate according to proximity between the manufacturer and end user and transportation distance affects the cost of collecting and transporting materials.

The value of recovered materials is impacted by inexpensive raw material imports as has occurred in the past with steel and aluminum. Since plastics are made from oil, when oil prices are high, the demand for crude oil to make plastics decreases and demand for recycled plastics increases. Glass is made from lime, soda ash and sand, which are abundant and inexpensive raw materials. Consequently, the price that a glass factory is willing to pay

for recycled cullet is low. Combine that fact with the heavy weight (thus increased cost) to transport glass and it is easy to understand why it has become common for the need to pay for glass to be recycled.

#### 1.1.1.4 Energy Recovery

Energy recovery from waste is the conversion of non-recyclable waste materials into useable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolyzation, anaerobic digestion, and landfill gas (LFG) recovery. This process is often called waste-to-energy (WTE). Converting non-recyclable waste materials into electricity and heat reduces carbon emissions by offsetting the need for energy from fossil sources and reduces methane generation from landfills.

At an MSW incineration facility, MSW is unloaded from collection trucks and placed in a trash storage bunker. An overhead crane grabs the waste and then lifts it into a combustion chamber to be burned. The heat released from burning converts water to steam in a boiler system. The steam drives a turbine generator that produces electricity. After energy is recovered, approximately ten percent of the waste volume remains as ash.

The remaining ash is collected and taken to a landfill where a high-efficiency baghouse filtering system captures particulates. As the gas stream travels through these filters, more than 99 percent of particulate matter is removed. Captured fly ash particles fall into hoppers (funnel-shaped receptacles) and are transported by an enclosed conveyor system to the ash discharger. They are then wetted to prevent dust and mixed with the bottom ash from the grate. The facility transports the ash residue to an enclosed building where it is loaded into covered, leak-proof trucks and taken to a landfill designed to protect against groundwater contamination. Ash residue from the furnace can be processed for removal of recyclable scrap metals.

#### 1.1.1.5 Treatment and Disposal

Prior to disposal, treatment can help reduce the volume and toxicity of waste. Treatments can be physical (e.g., shredding), chemical (e.g., incineration), and biological (e.g., anaerobic digester). Landfills are the most common form of waste disposal in the United States and are an important component of an integrated waste management system. Modern landfills are well-engineered facilities located, designed, operated, and monitored to ensure compliance with state and federal regulations. Landfills that accept municipal solid waste are primarily regulated by state, tribal, and local governments. EPA, however, established national standards that these landfills must meet in order to stay open. The federal landfill regulations eliminated the open dumps (disposal facilities that do not meet federal and state criteria) of the past. Today's landfills must meet stringent design, operation, and closure requirements. Methane gas, a byproduct of decomposing waste, can be collected and used as fuel to generate electricity. Capped landfills have often been put to use as recreational space depending on their location, but more recently solar farms have been a very efficient use of these areas.

#### 1.1.1.6 Disposal Fees

The fees associated with disposing of waste influence decisions on sustainable materials management. In the Northeast, trash disposal fees are much higher than in other parts of the country, thus municipalities and businesses have an increased economic incentive to reduce their waste and recycle as much as possible. Many communities have determined that the residential sector has an increased incentive to recycle when there is a pay-as-you-throw system or rate-payer based system in place. A pay-as-you-throw system charges a fee for trash collection and includes recycling collection at no cost or at a reduced cost compared to trash.

### 1.1.1.7 Public Policy

Federal, state and local policies can also influence sustainable materials management. These policies include: landfill bans, mandates, incentives, and disincentives, subsidies, deposit laws, advance disposal fees, packaging policies, producer responsibility laws, low-interest loans, grants and tax breaks.

Internal policies can also be useful, especially if initiated by an institution that is a large consumer of goods. For example, by requiring the use of recycled content paper by federal agencies, the federal government was able to influence recycled content standards, quality of recycled content paper and demand for these products.

State policies that benefit recycling have generally consisted of recycling goals, recycling requirements, recycling grants, tax incentives, beverage container deposit laws, disposal fee surcharges and disposal restrictions (bans). The state of Massachusetts has banned disposal of many materials including plastic beverage bottles, large household appliances known as “white goods,” yard waste, paper, cathode ray tubes, metal, and commercial organic material. In addition, Massachusetts has a beverage container deposit law as well as recycling goals and requirements for its local governments.

### 1.1.1.8 Characterizing Waste Streams

Waste reduction programs across the country are generally organized into residential waste, commercial waste, and construction/demolition waste. The reason for this is that these waste sources are different in character and strategies must address their differences as well as where the waste materials are being generated.

Residential waste is fairly homogenous across the country. A resident in a hotter climate may consume more “cold” beverages than someone in a cold climate, but generally all consumers shop at the same chain stores, consume the same products and generate similar wastes. There are some predictable differences between home owners and multi-family residents. A home owner will consume more home improvement products and generate yard waste for example. All residential households generate food waste. Most programs in larger cities address residential household hazardous waste as well as electronics, tires and white goods as these goods are often either banned or problematic in disposal.

Commercial waste streams tend to be the largest portion of solid waste in cities and towns. They are also the most diverse in character. Different business types generate different waste streams. Restaurants generate food waste and large quantities food packaging materials (primarily cardboard). Office buildings generate mostly paper. Retail stores generate mostly cardboard. Manufacturing waste consists of transport packaging waste and process waste. While transport packaging waste is predictable (wooden pallets/crates, plastic stretch wrap, corrugated cardboard), process waste depends on the type of product being manufactured. Process waste that is landfilled can include dewatered non-hazardous sludge or foundry sand. In this report, commercial waste is sometimes referred to as ICI referring to the institutional, commercial and industrial waste stream. Institutional consists of hospitals, universities, prisons and other similar large waste generators. Commercial includes restaurants, retail and office buildings. Industrial refers to the manufacturing facilities mentioned above.

Construction and demolition waste consists mainly of concrete, metal, treated and untreated wood, roofing materials, drywall, dirt, sand and gravel. There is a difference between construction wastes and demolition wastes in terms of recyclability. Painted drywall is not recyclable, so this material is lost in demolition. It is also difficult to differentiate between treated and untreated wood when the wood is aged, so this is also a material that is rarely recycled in demolition projects.

### 1.1.1.9 Infrastructure and Facilities

Materials management requires infrastructure. Infrastructure includes collection infrastructure (e.g., carts, collectors/haulers), processing infrastructure and end-use or disposal infrastructure. Prior to the advent of recycling, infrastructure generally consisted of garbage collectors and disposal facilities. Now there are recycling processing facilities which sort, package and transport recyclables to market.

In order to recycle yard waste, a commercial composting facility is required. If the goal is to recycle food waste, a more sophisticated commercial composting facility is required to address odors and avoid problems with pests.

### 1.1.2 The Massachusetts 2010-2020 Solid Waste Master Plan

The plan sets two goals for the state to achieve by 2020, 1) Reduce solid waste disposal by 30 percent (from 6.55 million tons to 4.55 million tons), and 2) continue to divert toxic substances from the waste stream. The goal established for the state to reach by 2050 is an 80 percent reduction in waste disposal and the virtual elimination of all products containing toxic chemicals from being sent to disposal facilities. Three objectives form a framework for strategies to achieve the goals. The objectives and respective strategies are as follows:

- 1) Objective 1: Reduce Waste and Maximize Recycling
  - a. Increase business and institutional recycling and composting
  - b. Increase residential recycling and composting
  - c. Strengthen incentives through producer responsibility
  - d. Stimulate greater reuse of materials and products
  - e. Deploy diversion strategies for organics and construction /demolition streams
  - f. Build local and regional recycling markets
  - g. Commonwealth leading by example
  - h. Statewide education campaigns
  - i. Eliminate barriers to siting anaerobic digestion, recycling and composting facilities
  - j. Keep toxics out of the waste stream
- 2) Objective 2: Improve the Environmental Performance of Solid Waste Facilities
  - a. Modify the moratorium on municipal waste combustion to encourage innovative and alternative technologies (e.g., gasification or pyrolysis)
  - b. Improve solid waste facility waste ban and recycling performance
  - c. Reduce emissions of municipal waste combustors
  - d. Landfill oversight to ensure both active and closed landfills comply with environmental requirements
- 3) Objective 3: Develop Integrated Solid Waste Management Systems
  - a. Foster integrated facility partnerships between municipalities and businesses
  - b. Encourage innovative pilot programs
  - c. Highlight successful systems

The MASWMP was designed to put the state on a path to reach zero waste. Recommendations for Newton contained within this report align with Objective 1 (Reduce Waste and Maximize Recycling) in the MASWMP.

### 1.1.3 What is Zero Waste?

The only peer-reviewed accepted definition of zero waste comes from the Zero Waste International Alliance (ZWIA). According to ZWIA:

“Zero Waste is a goal that is ethical, economical, efficient, and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.

Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.”

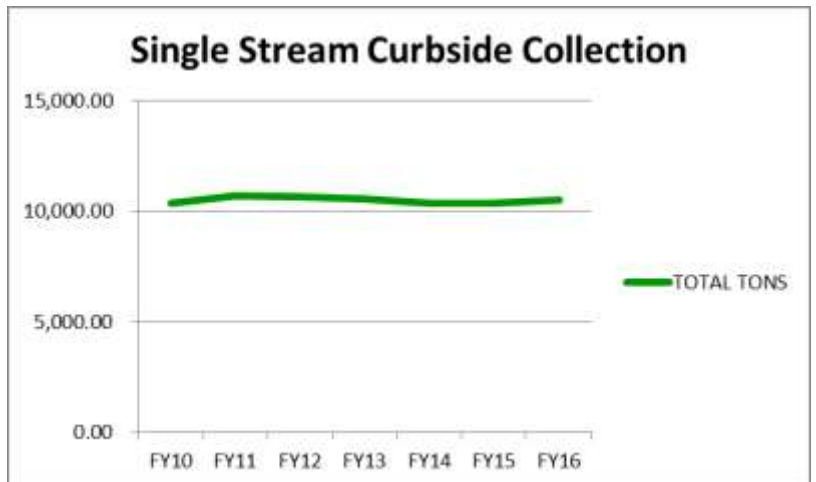
This definition has been adopted by the National Recycling Coalition and is used by many communities and businesses. As stated by the National Recycling Coalition in 2016, the key measure of performance toward ZWIA’s Zero Waste definition is diverting 90% of all discarded materials from landfills, incinerators and the environment. Although 90% does not equate to zero discards, the goal is viewed as the most reasonable, yet ambitious, goal that communities and the materials management industry should be aiming for.

#### 1.1.4 Brief History of Newton’s Waste Management Practices

##### 1.1.4.1 Recycling in Newton<sup>7</sup>

Newton has a rich history of recycling. In 1971, Newton was the first municipality in Massachusetts to start collecting newspaper for recycling at a drop-off site. Between 1972 and 1984, curbside collection of newspaper, metal cans, and glass were provided. Curbside collection resumed and expanded in 1990 to include newspaper, glass jars and bottles, plastics #1 and #2, aluminum and metal cans and seasonal yard waste collection. The Newton Resource Recovery Center was also opened that same year.

From 1990 to 2000, the recycling program in Newton expanded further to include more materials. In 2001, a grant from the MassDEP was awarded to Newton to develop a waste prevention policy and program, however the policy and program were not implemented, but much of the information and strategies included in the report are still relevant. Education and outreach efforts between 2004 and 2009 increased recycling participation and expansion of the City’s collection infrastructure. In 2009, Newton adopted a residential curbside cart program and changed to single stream recycling service. Since 2009, Newton has continued to add materials that can be recovered at the Resource Recovery Center.



**Figure 2.** Newton single stream recycling collected from FY10 through FY16. The cart system was implemented in FY09 (FY10 was the first full year with the cart system).

<sup>7</sup> <http://www.newtonma.gov/gov/dpw/recycling/about/history.asp>

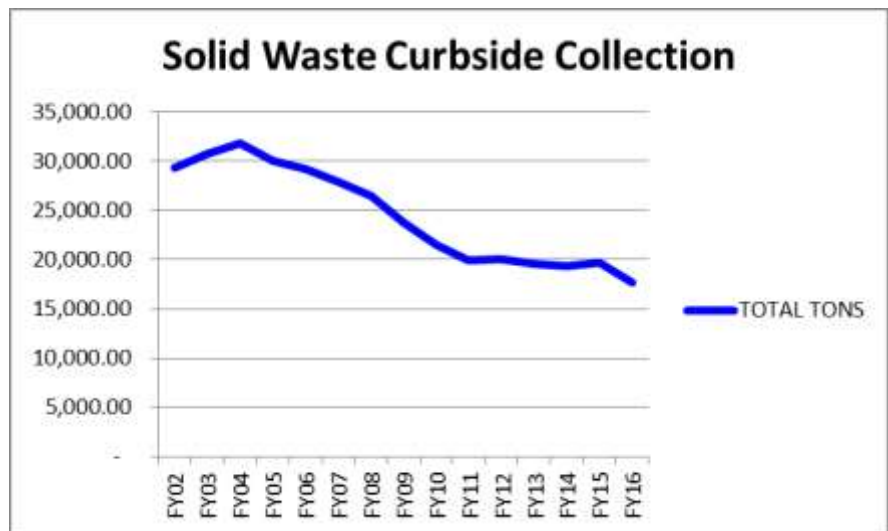
Tonnage of the single stream recycling collected with the cart system has been electronically tracked since FY10 (Figure 2). The collection tonnage has appeared to remain steady, however, there has also been a well-documented trend of lightweighting of materials (e.g., plastic water bottles have been made with 35% less plastic since 2009) and noticeable changes in material streams (e.g., many fewer newspapers and magazines are being consumed due to online content availability). Therefore, it is conceivable that Newton has increased the volume of recycling while weight has not increased.

#### 1.1.4.2 Trash Disposal in Newton

Newton once had a solid waste incinerator. The ash generated from the incinerator was contained in a landfill located at what is now the Newton Resource Recovery Center. The ash landfill started operations around 1955 and was closed and capped in 1998. Solid waste collected in Newton is now transported out of the city.

Tonnage of Newton’s solid waste has been electronically tracked since FY02 (Figure 3). Since that time, the peak of Newton’s solid waste disposal was reached in FY04 at 31,759 tons.

For Newton to meet the 30% waste reduction goal set in the Massachusetts 2010-2020 Solid Waste Master Plan for its curbside collection, solid waste tonnage would need to decrease from 23,739 tons to 16,617 tons. As of FY16, Newton had generated 17,630 tons of waste in curbside collection.



**Figure 3.** Newton solid waste collected FY02 through FY16. The cart system was implemented in FY09 (FY10 was the first full year with the cart system).

#### 1.1.5 Solid Waste Commission

In Chapter 7, Article V, of Newton Ordinances, the Solid Waste Commission is detailed. This commission serves to advise the Mayor and City Council on all aspects of municipal solid waste collection, disposal and recycling affecting the city and to monitor and make recommendations regarding the city’s activities relating to solid waste collection, disposal and recycling. The commission was established September 6, 1988. The Commission was reactivated in September 2016 and will be employed to evaluate and aid in implementation of some of the recommendations included in this report.

### 1.2 Vision and Goal Development

#### 1.2.1 Sustainable Materials Management Vision

According to the United States Environmental Protection Agency, “sustainable materials management is a systemic approach to using and reusing materials more productively over their entire lifecycles. It represents a change in how our society thinks about the use of natural resources and environmental protection.

By examining how materials are used throughout their lifecycle, a sustainable materials management approach seeks to:

- Use materials in the most productive way with an emphasis on using less.
- Reduce toxic chemicals and environmental impacts throughout the material lifecycle.

Assure we have sufficient resources to meet today’s needs and those of the future.” (EPA, 2016)

The vision statement in the Massachusetts 2010-2020 Solid Waste Master Plan (MASWMP) reads: “This Solid Waste Master Plan outlines the Patrick Administration’s vision of the future of solid waste reduction and management in the Commonwealth. We look to a future of full recycling bins, empty trash cans, active reuse markets, new green jobs, innovations in recycling technologies, reduced creation and disposal of toxic pollution, and flourishing small businesses.”

Newton should develop a vision statement to aid in goal development. *Example vision statement for Newton:* All residents and employees of the City of Newton are aware of the environmental and financial burden caused by the generation of excess solid waste and therefore strive to prevent the generation of waste. When materials no longer serve a purpose a reuse outlet is sought out. Recovery of materials that have market value or are toxic is a high priority for everyone in the community. Disposal for energy recovery (which is currently the disposal method that the majority of material goes to) is the least desirable management method and only used if all other options have been exhausted.

## 1.2.2 Proposed Steps Toward Zero Waste

### 1.2.2.1 Rethink Baseline Metrics

To date, Newton has measured its recycling program performance using a recycling rate determined with this equation:

$$\frac{\text{Tons of recyclables collected}}{\text{Tons of trash collected} + \text{Tons of recyclables collected}} \times 100\%$$

The recycling rate does not include yard waste diverted from the waste stream. There are limitations with measuring program performance solely based on the recycling rate that is formulated using the above equation. First, this metric does not inform the City of what next steps to take. Second, this metric does not track other aspects of program performance or program goals. Other metrics could include overall waste generation/diversion, cost effectiveness, toxics reduction (diversion of household hazardous waste), diversion of organic materials (yard waste and food waste), resident satisfaction, resident participation, and material reuse and source reduction. Third, the recycling rate as a percentage does not indicate how much recyclable material is not being recovered.

New metrics have been evolving in the sustainable materials management field to work around the aforementioned limitations of measuring program performance using a recycling rate. By calculating and communicating the number of pounds of solid waste and recyclable material collected per household served per year, a more meaningful baseline of program performance can be determined. These two numbers can be compared to other communities and national data to determine comparative performance.

The equations to determine these metrics are as follows:

$$\frac{\text{Household solid waste tons collected per year}}{\text{Total households served for solid waste collection}} \times \frac{2000 \text{ pounds}}{1 \text{ Ton}} = \frac{\text{Pounds of solid waste collected}}{\text{Household served}}$$
$$\frac{\text{Household recyclable materials tons collected per year}}{\text{Total households served for solid waste collection}} \times \frac{2000 \text{ pounds}}{1 \text{ Ton}} = \frac{\text{Pounds of recyclables collected}}{\text{Household served}}$$

Another metric to be considered is the “percent recoverables remaining,” which can be determined to aid in measuring how much better a recycling program could be doing and what steps it can take to improve by identifying target materials. This metric relies on a simplified waste composition study of the solid waste stream to determine the amount of recyclable material that was not recovered. For example, in 2008, Stop Waste (the waste management authority in Alameda County, CA) determined that 60% of the waste stream was made up of recoverable materials (recyclable material and organics). They then set a goal to have less than 10% recoverable material in the waste stream. Further review of waste composition studies from other communities around the country determined that 30% was the best performance to date. Stop Waste now uses regular waste characterizations to determine next steps to improve the performance of their collection program.

### 1.2.2.2 Setting Goals

Newton has an existing set of goals posted on the Environmental Affairs Division webpage. These goals include:

- To collect and dispose of wastes to meet or exceed regulatory requirements,
- To promote integrated solid waste management through appropriate use of recycling and resource recovery,
- To provide citizens with high quality and cost effective service in a timely, courteous, and reliable manner,
- To provide comprehensive environmental planning,
- To serve as a technical resource on environmental issues,
- To make the most of our diverse human resources through teamwork, training, individual development, and personal communication.

While these are admirable goals, they are not specific, do not have a deadline, and several are not measurable. By rethinking baseline metrics, new goals can be set. For example, if it is determined that Newton residents generate 1500 pounds of solid waste annually, and 50% recoverables remaining, a reasonable goal to set for one year could be 1400 pounds of solid waste per household and 40% recoverables remaining. Alternatively, a goal could be set to increase the pounds per household of recyclable material collected, as long as proper education was being conducted to prevent contamination in the recycling stream.

It is also important to include goals that focus on program cost effectiveness, toxics reduction (diversion of household hazardous waste), diversion of organic materials (yard waste and food waste), resident satisfaction, resident participation, and material reuse and source reduction. For example, weight of household hazardous waste materials could be measured for calendar year 2016 and a goal to increase that number by 10% for 2017 could be established.

### 1.2.2.3 Identify Priority Materials

Priority materials identified in the Massachusetts Solid Waste Master Plan (MSWMP) targeted for their diversion potential include paper, organics, and wood. Methods to increase diversion of these priority materials include increasing business/institutional recycling and composting, increasing residential recycling and composting, statewide educational campaigns, eliminating barriers to siting recycling and composting facilities, and piloting



innovative approaches that can divert one hundred percent of waste materials from disposal to help achieve the goal of zero waste at a local and regional level.

In Newton, priority materials for the city could be determined based on the MSWMP or data from the most recent state waste characterization study. Alternatively, a waste characterization study could be done on a small scale to determine local priority materials for Newton to target. This type of effort is not unprecedented: a city-wide educational campaign was initiated in 2005 to recycle more paper.

#### 1.2.2.4 Develop a Long Term Plan

After identifying baseline metrics and priority materials, a long term plan must be developed to prioritize necessary actions to be implemented on the path to zero waste. This plan should be developed in 2017 with stakeholder input and include recommendations found in this report.

#### 1.2.2.4 Prioritize Education and Outreach

The most successful waste reduction, diversion, and recovery programs have a strong emphasis on public education and engagement. Education campaigns that have been implemented in schools are effective in educating children as well as their adult family members. There are a number of programs that exist to offer solid waste, recycling, and environmental education, including the MassDEP Green Team, which offers resources and organizational tools for schools to enhance overall environmental sustainability.

## 2 Current Materials Management Practices and Policies

### 2.1 Residential Waste Services

Newton DPW provides solid waste and recycling service to approximately 28,500 households each week. All single family homes and small multi-family properties (typically 2-4 units) receive curbside services. Most large multi-family properties do not receive curbside services. All Newton residents have access to the Newton Resource Recovery Center.

#### 2.1.2 Curbside Services

##### 2.1.2.1 Municipal Solid Waste

Municipal solid waste is collected weekly from Newton residents that have been issued a 64-gallon blue cart. Waste Management collects the waste and transports it to the Wheelabrator waste to energy facility in Millbury, Massachusetts. Newton is part of the Central Massachusetts Resource Recovery Committee, which consists of 53 communities that worked together to negotiate competitive pricing for waste disposal. The rate for solid waste disposal was \$66/ton in FY17. In FY16, there was 17,630 tons of municipal solid waste collected from Newton residential and municipal properties.

The use of the 64-gallon blue cart caps the amount of municipal solid waste that will be collected from each household. Overflow bags are available for purchase at numerous retail stores in Newton for \$2.25 each. These 33-gallon, orange bags are the only acceptable method for waste in excess of the 64-gallon cart to be set out at the curb. The financial disincentive of the overflow bags is a mechanism for Newton residents to generate less trash. An extra blue trash cart is available to residents for \$200/year.

When an item is too large to fit in the blue cart, residents can request a bulk item pickup by calling City Hall, using the Newton website, or using the Newton 311 mobile app. There is a limit of five bulk items per week per household. Anything that is recyclable, such as rigid plastic and metal items, is not accepted for bulk pickup.

#### 2.1.2.2 Recycling

Residential recycling is collected weekly from Newton residents that have been issued a 64-gallon green cart. All residents that have been issued a blue cart should also have a green cart. All materials are mixed together in a single stream and should be placed loose in the green cart (i.e., not bagged). Accepted single stream recyclables include cardboard, paper, metal cans, plastic containers and bottles, and glass jars and bottles. Waste Management collects single stream recycling and transports it to the Waste Management Avon Materials Recovery Facility where materials are mechanically and manually sorted into individual commodity types.

The rate for processing of recyclable material is variable each month. The monthly rate is determined by a blended value calculation in which the current value of each commodity stream and each material composition percentage within the recyclable stream is considered. The cost per ton to run the materials recovery facility in FY17 is \$92.37, according to the WM contract, but the value of the recyclables cuts that cost. In FY16, there were 10,515 tons of recyclable materials collected from residential and municipal properties the city services. The total cost was \$294,801, which averages to a monthly cost of \$24,567 or an average of \$28.03 per ton. There is a \$30 cap on the processing cost.

For certain recyclable items that are not accepted at the material recovery facility the City offers curbside pickup for a fee. Items eligible for this collection include appliances, other large metal items, and home electronics. The pickup fee is \$25. Newton DPW performs this collection and transports items to the Newton Resource Recovery Center where they are appropriately sorted and managed.

#### 2.1.2.3 Yard Waste

Yard waste is collected weekly from residents 39 weeks per year, typically from late March through the first week of December. Residents must place yard waste in paper yard waste bags or in a barrel. Yard waste is collected at the curb by Waste Management at a rate of \$77,625 per month and taken to the Newton Resource Recovery Center where DPW staff grind the yard waste and arrange it into windrows. Yard waste is then hauled by Hidden Acres, a commercial composting operation located in Medway, Massachusetts at a rate of \$7.75/yd<sup>3</sup> in FY17. In FY16, the rate for this service was \$7.50/yd<sup>3</sup>. Just over 14,144 cubic yards were hauled, at a cost of \$106,087.

Two weeks in January are also designated for Christmas tree collection, a service included in the WM contract.

#### 2.1.2.4 Management of Household Organic Waste

Household organic waste is not currently managed with curbside collection. Residents are encouraged to conduct backyard composting of kitchen food scraps and yard waste. The DPW purchases two different styles of backyard composters along with kitchen scrap collection buckets and sells them at cost to residents. Newton residents are able to purchase these items from City Hall and pick them up at the Newton Resource Recovery Center.

## 2.1.3 Serving Multi-Family Properties

### 2.1.3.1 Municipal Solid Waste

According to the Newton Recycling and Trash Ordinance, “the department of public works, or its contractor, shall remove and process or dispose of all refuse, recyclable materials and garbage from residential premises, except those residential premises which are required pursuant to special permit or other zoning requirements to make their own private arrangements therefore, which are properly placed in accordance with the requirements of this chapter.” The City is working to determine how many apartment and condo developments have a special permit that obligates them to make their own private arrangements for trash and recycling.

The DPW provides service to 38 apartment and condominium developments (including publicly owned housing units). These properties are provided with dumpsters serviced by Waste Management (Appendix A). The dumpster volume and number of collections per week varies depending on space limitations and the number of housing units.

### 2.1.3.2 Single Stream Recycling

All of the 38 multi-family properties that the City services also receive recycling collection. Two of these properties have a recycling dumpster and the other 36 properties have green residential recycling carts, presumably due to space limitations. Both the dumpsters and carts are serviced by Waste Management (Appendix A).

## 2.1.4 Newton Resource Recovery Center

### 2.1.4.1 Recycling

Collection of single stream recyclables (paper, metal cans, plastic containers and bottles, and glass jars and bottles) is available to residents at no cost via four 10-yard dumpsters. Cardboard is collected separately in a compactor due to the large volume received at the site. Bulky rigid plastics, which may include children’s toys, cracked storage totes, and broken lawn chairs, are collected in a 30-yard roll-off container. All of these containers are serviced by Waste Management. The cost of renting and servicing the single stream dumpsters was \$10,498 in FY16. The cardboard and roll-off containers cost \$240 per pickup, with an addition \$20/ton processing fee for the rigid plastics.

Scrap metal is collected in a 20-yard roll-off container that is serviced by Anestis Metals Corp., which is located in Lawrence, Massachusetts. In accordance with federal and state regulations, refrigerators, freezers, air conditioners, and dehumidifiers have refrigerant purged before being put in the roll-off container. Interstate Refrigerant Recovery, Inc. is Newton’s vendor for this service and the cost is \$8/unit.

Expanded polystyrene (EPS; i.e., Styrofoam) is collected for recycling. Expanded polystyrene foam cups, to-go containers, and trays are not accepted. Only white block Styrofoam is accepted by the current vendor – Gold Circuit E-Cycling based in Springfield, Massachusetts. The cost of recycling EPS in FY 16 was \$6,400.

Household electronics, such as computers, printers, cords, DVD players, and video game consoles are accepted for recycling. Televisions and monitors are accepted for a fee payable at City Hall - \$25 for the first TV and \$18 each after that. The vendor, Universal Recycling Technologies, picks up electronics on an as-needed basis. The cost of responsible electronics recycling is estimated to be \$23,500 in FY17. Electronics recycling will be available to residents at no cost (with the exception of TVs and monitors) in January 2017 at the Newton Resource

Recovery Center. Working with a former vendor, the cost of recycling electronics in until February 2016 was charged to the resident.

Cell phones are collected and sent to a non-profit organization Cell Phones for Soldiers in Alpharetta, Georgia. Printer and toner cartridges are accepted for recycling. Some cartridges are sent to Funding Factory and the City receives a rebate for them. Cartridges not eligible for a rebate are taken to Staples.

Used motor oil is required by state regulations to be separated from the trash collected in a 350-gallon tank. Used anti-freeze, which is also required to be separated from the trash, is collected in 55-gallon plastic drums. These materials are collected by Western Oil, Inc. in Lincoln, Rhode Island. Collection of used oil and antifreeze totaled \$724 in FY16.

Propane tanks and canisters are required by state regulations to be separated from the trash. Tanks and canisters are stored onsite and collected for recycling by Might Flame in Clyde, New York. In FY16, the cost of recycling propane tanks was \$463. Helium tanks are also recovered, punctured by DPW and included in scrap metal.

Although they are not recycled, medical sharps, needles and lancets are required by state regulations to be separated from the trash. Sharps are collected in three metal drop-boxes. Residents are instructed to store medical sharps in a hard plastic container (e.g., an empty laundry detergent bottle) to avoid any accidental needle sticks. The residential storage containers are dropped into the drop box or, if too large, are stored in a locked shed in a universal waste storage box. Medical sharps are collected from the site by B&D Associates, Inc. based in Concord, New Hampshire. The cost of this service to Newton in FY16 was \$4,523.

#### 2.1.4.2 Universal Waste Recovery

Universal wastes are hazardous substances that are very common. The federal Universal Waste Rule became effective on October 17, 1997. In Massachusetts, hazardous batteries, mercury-containing devices and lamps, and hazardous waste pesticides are considered universal wastes.

Mercury-containing devices, such as mercury thermostats and thermometers, are required by state regulations to be separated from the trash. These materials are stored in 5-gallon buckets provided by Wheelabrator's mercury recovery program and housed in a shed donated by the same program. This program is offered by Wheelabrator at no cost to the city in an effort to keep mercury-containing devices out of the waste-to-energy facility.

Light bulbs and lamps, including CFL, LED, and fluorescent tubes, are required by state regulations to be separated from the trash. These items are sorted into appropriate categories and stored in cardboard boxes or fiber drums and collected by Veolia Environmental Services in West Bridgewater, Massachusetts. The City pays for the collection and processing of bulbs and lamps, however, invoices are most often reimbursed through the Wheelabrator mercury recovery program.

Non-alkaline batteries are required by state regulations to be separated from the trash. "Non-alkaline" includes rechargeable, lithium and lithium ion, nickel-metal hydride, lead acid, button cell, and nickel cadmium batteries. Alkaline batteries are not considered hazardous and are not economically feasible to recycle, thus residents are

encouraged to toss these batteries in the trash. Button cell batteries are sent with the mercury-containing devices in the Wheelabrator mercury recovery buckets. All other batteries collected are shipped to Call2Recycle, based in Atlanta, Georgia. Most batteries that go to Call2Recycle provide a rebate to the City, however lithium primary and alkaline batteries incur a processing cost. The cost of managing batteries in FY16 was \$0, since no shipment of batteries to Call2Recycle was sent.

#### 2.1.4.3 Reuse

Household goods in useable condition, such as dishes, are acceptable at the Goodwill donation trailer. Goodwill provides an attendant who screens and sorts items.

Textiles are collected by Goodwill, Salvation Army, and the Red Cross. Each of these outlets will sort through the material to sell what is reusable. Remaining textiles, such as a towel with a hole, are recycled by these organizations.

Books in good condition are collected by the Book Reuse Shed, which is managed by volunteers. This shed acts as a free library for the Newton community. Books that are not deemed to be in good condition are donated to More Than Words, a non-profit organization based in Waltham, Massachusetts. More Than Words will resell some books at their Waltham or Boston store locations; books that cannot be resold are sold wholesale for \$1/pound.

Newton operates a latex paint reuse program. Resident drop-off is limited to four 1-gallon paint cans, which must be less than 3 years old and more than half full, per year. Anyone is able to take as much paint as they want at no cost.

#### 2.1.4.4 Household Hazardous Waste

In 2016, DPW held 18 household hazardous waste (HHW) days. HHW includes adhesives, cleaners, solvents, fuels, sealants, pool chemicals, oil-based paints and stains, filled aerosol cans, pesticides, insecticides, and automobile fluids. The collection of HHW is held as a collection event due to sorting and storage requirements for the material that is collected. The Newton Resource Recovery Center has 6 storage sheds to properly store HHW that is dropped off from residents. HHW is sorted into standard hazardous waste categories – flammable, acid, base, corrosive, toxic, pesticide, and unknown. Collection events are operated by DPW staff. After the final collection event, a hazardous waste vendor is used to collect and manage the material – most of which is disposed of at a hazardous waste combustor. Disposal cost for HHW collected in calendar year 2015 was \$8,446.

### 2.1.5 Best Practices

Best practices for managing municipal solid waste and recycling are frequently changing since the economics of recycling and disposal of solid waste are dependent on numerous market variables. A 2011 survey conducted by Mecklenburg County, North Carolina compared 24 mature local government recycling and waste diversion programs to identify program elements that offer successful diversion of solid waste from disposal. This study compiled the following best practices that were found to be shared by local governments with high recycling/diversion rates.

#### 2.1.5.1 Curbside Service

For city residential curbside service, best practices include a mandatory recycling program that includes organics, a variable rate system where trash charges are based on the size of the subscribed container and

recycling and composting collection are free, a food waste collection program (usually allowed to be combined with yard waste) and a ban on disposal of recyclable and compostable items in the trash container. Furthermore, trash is rejected if recyclable or compostable materials are found in trash or a fine is levied.

Comparatively, Newton has an established mandatory curbside recycling program, however it does not include organics. There is a limit for trash disposal of 64-gallons and additional overflow bags available for a fee at local retail locations. This is not a fully variable rate system and Newton does not charge a separate fee for solid waste disposal. Newton does not have a food waste collection program. There are numerous state laws in Massachusetts banning the disposal of recyclable materials and the revamped recycling/trash compliance policy that took effect October 1 does reject trash cart pickups and levy fines if there are multiple violations where recyclable material is visible in the trash cart.

#### 2.1.5.2 Serving Multi-Family Properties

Best practices for serving multi-family properties include recycling service required with recycling either free with trash service or at an extra charge, a mandatory recycling requirement and offering food waste collection.

Newton provides some, but not all, multi-family properties with trash and recycling service. No food waste collection is offered and the mandatory recycling requirement in the City's ordinance is not currently enforced at multi-family properties.

#### 2.1.5.3 Commercial Sector Waste

For managing waste from commercial facilities, best practices include mandatory recycling, mandatory collection of organic waste for food generating businesses, collection at no cost, a ban on expanded polystyrene foam containers for restaurants that in turn requires that food service containers must be recyclable or compostable and requiring businesses to submit a recycling plan.

Commercial sector waste practices in Newton must adhere to applicable federal, state, and local regulations. At the time of this report there is no enforcement or monitoring of commercial sector waste practices. There is no definitive language in the City's ordinance to mandate commercial recycling.

#### 2.1.5.4 Managing Construction & Demolition Waste

Best practices for managing construction and demolition waste include a mandatory recycling quota, an economic incentive to reach the recycling quota (e.g., a fee is required to get a building permit and the fee is returned if the recycling quota is met), disposal bans, materials must be taken to a certified facility that meets designated recycling requirements, a materials management plan must be submitted with a permit application and final reporting on materials recycled upon project completion.

Most of the construction and demolition waste generated within Newton is presumably from the commercial sector. It is unknown how much, if any, recycling of construction and demolition material occurs from waste generated in Newton.

#### 2.1.5.5 Source Reduction and Reuse

Best practices to encourage waste reduction and reuse include green purchasing policies or requirements and operation or fostering the development of a permanent community "swap shop," where residents can donate items for reuse and take used items to use at no cost.

The Newton Resource Recovery Center provides some donation options for usable goods. There is limited encouragement of waste reduction and reuse. The City has a green purchasing policy in place, however it is not enforced.

### 2.1.6 How Newton Compares

The tables below examine Newton’s residential materials management services in calendar year 2015 (CY15) to six of its neighboring communities. Watertown is not included because they did not report to MassDEP in 2015.

Newton is the only community among its neighbors to provide carts to residents, which establishes a limit on trash service (Table 1). This practice has been demonstrated to significantly cut costs and reduce the amount of trash generated. Newton provides the highest number of weeks of curbside yard waste collection, but doesn’t offer any type of food waste collection. In CY15, Newton had the second highest recycling rate among its neighbors based on weight (Table 2).

Newton provides more year round materials collections than any of its neighbors (Table 3), which allows residents greater access to properly dispose of a wide variety of materials. Needham, Wellesley, and Weston all have a permanent swap shop in place to provide more opportunities for reuse of household items.

**Table 1.** CY15 Comparison of basic solid waste and recycling services among neighboring communities.

Municipality Name	Newton	Boston	Brookline	Waltham	Needham	Wellesley	Weston
Total Households	30900	284731	25900	23000	9983	8983	3600
Households Served (trash)	28500	284731	13604	16093	9983	8983	1767
Households Served (recycling)	28500	284000	13604	23000	9983	8983	1767
Trash Service Type	Curbside	Curbside	Curbside	Curbside	Drop-off	Drop-off	Drop-off
Carts for Trash	Yes						
Trash Cart size	64						
Fee for bulky waste?	No	No	No	No	Yes	No	No
Recycling Service Type	Both	Curbside	Curbside	Curbside	Drop-off	Drop-off	Drop-off
Recycling Collection Frequency	Weekly	Weekly	Weekly	Weekly			
Single Stream	Yes	Yes	Yes	Yes	Yes		
Carts for Recycling	Yes	Yes	Yes				
Recycling Cart Size	64	64					
# Curbside Yard Waste Collection Weeks	41	17	40	34			
Compost Bin Program	Yes		Yes	Yes	Yes	Yes	
Food Waste Collection	None	Drop-off	None	None	Drop-off	None	None

**Table 2.** CY15 Comparison of tonnage collected and subsequent weight-based recycling rates.

Municipality Name	Newton	Boston	Brookline	Waltham	Needham	Wellesley	Weston
Recyclables (tons)	10344	35103	5159	3449	260	5332	0
Trash (tons)	18452	188071	9634	19355	9281	6250	1731
Recycling Rate	56%	19%	54%	18%	3%	85%	0%

**Table 3. CY15 Comparison of permanent recycling center materials collected and services offered.**

Municipality Name	Newton	Boston	Brookline	Waltham	Needham	Wellesley	Weston
Auto batteries	Year Round	Between 3 & 10	Once a Week	Between 3 & 10	Year Round	Year Round	1 or 2
Auto tires	Year Round	Between 3 & 10	Once a Week	0	Year Round	Year Round	0
TVs and Computers	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round
Other electronics	Year Round	Year Round	Year Round	0	Year Round	Year Round	Year Round
Used oil	Year Round	Between 3 & 10	Once a Week	Between 3 & 10	Year Round	Year Round	1 or 2
Household batteries	Year Round	Year Round	Year Round	Between 3 & 10	Year Round	Year Round	Year Round
Propane tanks	Year Round	Between 3 & 10	Once a Week	Between 3 & 10	Year Round	Year Round	Year Round
Anti-freeze	Year Round	Between 3 & 10	Once a Week	Between 3 & 10	Year Round	Year Round	1 or 2
Used oil filters	Year Round	Between 3 & 10	Once a Week	Between 3 & 10	Year Round	0	1 or 2
Latex/Oil based paint	More than 10	Between 3 & 10	Year Round	Between 3 & 10	1 or 2	Once a Week	1 or 2
Fluorescents/CFLs	Year Round	Between 3 & 10	Year Round	Between 3 & 10	Year Round	Year Round	Year Round
Button batteries	Year Round	Between 3 & 10	Year Round	Year Round	Year Round	Year Round	Year Round
Thermostats	Year Round	Between 3 & 10	Year Round	Year Round	Year Round	Year Round	Year Round
Thermometers	Year Round	Between 3 & 10	Year Round	Year Round	Year Round	Year Round	Year Round
Other mercury devices	Year Round	Between 3 & 10	Year Round	Year Round	Year Round	Year Round	Year Round
Expanded Polystyrene	Year Round	0	1 or 2	0	0	0	Year Round
Medical Sharps	Year Round	0	Year Round	Year Round	Year Round	0	Year Round
Textiles	Year Round	Between 3 & 10	Year Round	0	Year Round	Year Round	Year Round
Bulky Rigid Plastic	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round
Books/Media	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round	Year Round
Comprehensive HHW Collection Events	18	5	36	0	1	1	1
Permanent Swap-Shop					Yes	Yes	Yes

## 2.2 Managing City Waste Materials

### 2.2.1 City Buildings

#### 2.2.1.1 Municipal Solid Waste

Waste Management provides solid waste dumpster service to 9 city facilities and 23 public schools. Service for these dumpsters occurs one to five times per week. In addition, Waste Management provides curbside cart service for ten city parks and smaller facilities. An additional six city parks use curbside service during the summer.

#### 2.2.1.2 Single Stream Recycling

Five city facilities and 23 public schools have single stream recycling dumpster service from Waste Management. Ten city parks and other facilities receive curbside single stream cart service year round. Six city parks have cart service during the summer.

#### 2.2.1.3 Surplus Equipment and Auction

Surplus equipment is sold online at [www.publicsurplus.com](http://www.publicsurplus.com).

#### 2.2.1.4 Printer Cartridges and Cell Phone Collection

Two recycling collections are available at Newton City Hall. Printer cartridges are collected for recycling in the basement near the Information Technology office. All Information Technology staff and other staff who change out printer cartridges are encouraged to take empty printer cartridges to this location. Used cell phones can be collected from staff in the Information Technology Director's office.



## 2.2.2 Wastes from City Public Spaces

### 2.2.2.1 Big Belly Collection System

In Spring 2016, Newton implemented the Big Belly program to enhance public space waste/recycling collection. This program is managed by the Parks & Recreation Department. When this program was implemented, the number of city-managed waste/recycling receptacles was reduced from approximately 490 to 348 Big Bellies at 174 sites. Material collected from these receptacles is transported to the Newton Resource Recovery Center. Solid waste is disposed of in the trash compactors on the municipal side of the site. Single stream recycling is placed in the single stream recycling dumpsters on the residential side of the site.

### 2.2.2.2 Dog Waste Collection

Twenty-six dog waste collection receptacles were installed in Summer 2016 in certain public spaces where dog waste disposal had become an issue. Although these receptacles have signs posted to collect “dog waste only,” they have a large capacity and a large opening that results in general waste disposal. Management of these receptacles is provided by Doody Calls for \$10 per pickup.

## 2.2.2 Wastes from City Operations

Scrap metal is collected in a roll-off container at the Elliot Street DPW yard.

The public works department produces excavate from various operations. This excavate is crushed and used as fill in many projects, which is a beneficial reuse that saves on disposal and transportation costs.

Street sweepings are not allowed to be disposed of in a waste-to-energy facility. Instead, this material is disposed of at a landfill. The disposal of sweepings is the responsibility of the contractor hired to remove these materials. In FY17, the street sweepings are being managed by W.L. French Excavating Corporation and taken to the Crapo Hill landfill in New Bedford, Massachusetts.

Woody debris is generated by the Urban Forestry Division. This division prunes and removes City-owned trees and removes tree debris following storm events. Some of this work is also contracted out to a private vendor. In 2016, an estimated 4,000 cubic yards of wood chips were generated from wood and brush that was chipped. Occasionally woodchips are used at conservation properties. Logs and brush that were not chipped were transported to Mulch By the Yard in Stoughton, MA. Approximately 14,200 cubic yards (roughly 1,800 tons) of this material was generated in 2016.

In FY16, Newton removed 736.3 tons of soil contaminated with #2 fuel oil from the site of the former Fire Station #3 (337 tons) and the current Bowen School site (399.3 tons).

## 2.2.3 Best Practices

Best management practices for managing institutional waste are similar to those of residential waste with the best practices being based on the waste management hierarchy. Some differences include monitoring procurement with a focus on end-of-life management, the need for staff training, and additional state and federal regulations that apply.

## 3 Recommendations for Improvement

### 3.1 Residential Waste Services

#### 3.1.1 Waste Reduction

##### 3.1.1.1 Bulky Waste Pickups

Bulky waste pickups should be analyzed and recommendations should be developed to reduce the quantity of waste produced by residents. Based on the daily bulk list, there are numerous households that have multiple items most weeks. In many cases, these repeat bulk requests come from rental properties and it is likely that property owners are bringing in bulky waste from neighboring cities to dispose of items here. Reducing the number of bulk items allowed, reducing the number of pickups, placing a fee structure on bulky items, or incentivizing or requiring reuse to be the first outlet would all be methods of reducing the amount of bulky waste Newton residents produce. Some materials collected with the bulky pickups may have recycling outlets available, including mattresses and wood.

The Newton Environmental Affairs Division applied for the MassDEP In-Kind Technical Assistance Program in August 2016 to analyze the current bulky waste collection practice, offer recommendations for improvement, and devise a strategy to implement those recommendations. MassDEP granted the In-Kind Technical Assistance to Newton in September 2016. The project is underway and will be completed by June 30, 2017.

##### 3.1.1.2 Managing Household Organic Wastes

Increased emphasis on backyard composting is a step Newton could take to reduce the amount of food waste entering the municipal waste stream. By selling compost bins at a discount (\$25 or less), promoting backyard organics management online and in press, and offering a composting outreach program at least once per year it has been established by MassDEP that organics diversion increases. In addition to the decrease in food waste in the municipal stream, implementing these practices would lead to additional MassDEP grant funding through the Recycling Dividends Program in 2017.

*Food Too Good To Waste* is a highly developed food waste reduction campaign that has been developed by EPA. The campaign promotes multiple strategies for all consumers to reduce food waste and offers tools including online tutorials, a food storage guide, an education toolkit, and guidance on hosting a food waste reduction challenge.

Some communities, such as Nantucket, have enhanced their materials management infrastructure with an anaerobic digester. While citing such a facility is difficult, investigating the economic feasibility of building an anaerobic digester in Newton may be worthwhile pursuit. Regional opportunities to partner with neighboring communities may also exist. An initial investigation to determine a potential location, a cost/benefit analysis, and barriers is recommended.

Some communities have studied the management of most food waste using domestic in-sink food waste disposers (i.e., a garbage disposal). From 2012 to 2014 a study was conducted in Boston which combined the use of an in-sink food waste disposer with education and outreach on how to use it.<sup>8</sup> Waste composition audits found a 36% average reduction per week in food disposed in the trash. Since the Massachusetts Water

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<sup>8</sup> <http://blog.insinkerator.com/wp-content/uploads/2016/10/BostonReport.pdf>

Resources Authority Deer Island Sewage Treatment Plant is equipped with an anaerobic digester to digest sludge following primary and secondary treatment, the plant did not encounter any problems receiving the food scraps as a liquid slurry with wastewater.

### 3.1.1.3 Open a Permanent Swap Shop

Many municipalities in the Greater Boston Area have established permanent reuse areas for common household items, generally known as swap shops, at their drop off sites. The day-to-day tasks of such sites are managed by volunteers, but the infrastructure is overseen by DPW staff. Newton does have space to set up a small permanent swap shop at the Newton Resource Recovery Center, but would need to plan traffic flow and develop policies for general management and scavenging (i.e., residents who take items to sell for a profit) to maintain an orderly operation. Newton also has the volunteer capacity to operate a swap shop. Physical needs to get the operation up and running would include a semi-permanent structure (i.e., a steel-framed tent), tables and shelving. A grant is available from MassDEP to offset the startup costs.

## 3.1.2 Cost Reduction

### 3.1.2.2 Cart Management

In FY16, the City spent over \$112,000 on new carts and parts. Trash and recycling carts are property that the City owns. Carts are replaced when the body is cracked. Repairs are able to be performed on wheels and lids. There is no tracking of cart damage done by the City. Cart damage is only addressed when a resident reports the damage through Customer Service and requests a repair.

Currently, the City receives cart repair services as part of the WM contract. Cart deliveries, swaps, and removals are performed by the Newton DPW Highway Division. Cart deliveries occur when a resident requests an additional cart or moves into a newly constructed residence. Cart swaps are requested by residents switching between the 64-gallon cart and the 35-gallon cart. Cart removals happen when a home is not being lived in (e.g., during a renovation) or when an extra cart is no longer needed by a resident.

More attention and resources are needed to reduce replacement and repair costs. It appears that a higher than expected number of carts need to be replaced each year. Therefore, contracting a service provider to manage cart repairs, deliveries, swaps, removals, inventory, communication with residents, and administrative tracking is currently being considered.

### 3.1.2.3 Household Hazardous Waste Collection

Currently, Newton provides approximately 18 household hazardous waste (HHW) collection events per year. This number of collection events is high compared to other communities. The needs of residents for a convenient method of appropriately managing their household hazardous waste must be balanced with the costs incurred by the City (i.e., staff resources and disposal costs) in managing these events.

In addition, proper training of staff for these events has not been maintained since the program was initiated in 2010, which has led to environmental management and safety concerns. A Fall 2016 independent environmental health and safety audit of the Newton Resource Recovery Center performed by Tighe & Bond found numerous issues of non-compliance with storage of hazardous waste, in particular, labelling of containers and proper storage containers/shelving. Policies, proper training, and proper storage equipment will be put in place by DPW prior to the first collection event in 2017 to ensure that this operation is in compliance.

A reduced number of HHW collection days may be needed to improve program efficiency, but this reduction must be balanced with providing residents an adequate outlet for this waste stream. One option is an outside service provider that can run collection events, but it is an expensive service that can cost \$8,000 - \$10,000 per event. The cost of properly training DPW staff, bringing all the processes and storage into compliance, and the overall disposal cost will be evaluated and compared to the cost of an outside service provider managing these events. Increasing the convenience of the times of these collection events and increasing communication to residents about when HHW events occur is also of the utmost importance to improve program efficiency.

### 3.1.3 Increase Recovery

#### 3.1.3.1 City Service to Apartments and Condos

Apartment complexes and condos have inconsistent service from the City. The inconsistency stems from a lack of specificity in the City's Waste and Recycling Ordinance with regard to which households the City will provide waste services. In FY17, the City will spend \$152,055 to provide waste and recycling services to 36 apartment/condo buildings. It was estimated in 2015 that 103 apartment and condo complexes are not serviced by the City, and this number is likely higher due to developments that have been built since 2015. Data collection to definitively determine the number of properties that have a special permit (granting them City collection service) must be completed before a comprehensive fiscal analysis can be performed to determine the costs and benefits to the City to change the existing policy.

#### 3.1.3.2 Recover Household Food Waste

Some municipalities have established curbside collection programs for household organics. Most recently in the Greater Boston Area, the City of Cambridge started a curbside organics collection pilot program. For Newton residents, a curbside organics collection system could also be piloted. An alternative collection method that could also be piloted is collection of food waste with curbside yard waste collection.

#### 3.1.3.2 Develop and Implement a Long Term Education & Outreach Plan

Contained in this report is a short term education and outreach plan. A long term education and outreach plan will be a key component of a long term sustainable materials management plan. A multi-year campaign using similar materials will generate resident awareness and develop a brand identity for the Newton recycling program. This strategy was used in Newton between 2000-2015.

#### 3.1.3.3 Promote a City-Wide Recovery and/or Waste Reduction Goal

The general messages of "recycle" or "recycle more" are common and can sometimes increase resident participation. However, it is difficult to determine how much of an increase in participation has occurred if there is not a specific and measureable goal. Newton has a current recycling goal of 45% set by DPW, but it is unlikely that most residents are aware of this goal. Publicizing a specific target encourages participation and increases emotional investment in achieving a common goal.

By changing metrics used to measure success away from tonnage collected and instead toward pounds of trash and recycling generated per household served (as mentioned in 1.2.2.1), a more tangible, practical goal for residents will be established.

#### 3.1.3.4 Incentivize Good Recycling Habits

Creative outreach methods can incentivize, encourage, and develop a good recycling ethic. Campaigns such as "Get Caught Recycling Right" and "Good Job" tags are positive feedback strategies. In a "Get Caught Recycling Right" campaign, a handful of recycling stewards have a reward to hand out when they see residents properly

recycling in public spaces or at the Resource Recovery Center. “Good Job” tags can be used curbside to provide feedback to residents that don’t have any contamination in their recycling cart and trash that fits in the cart.

## **3.2 City Waste – Institutional Stream**

### **3.2.1 Waste Reduction**

#### **3.2.1.1 Implement a Waste Prevention Policy and Program**

In 2001, Newton used MassDEP grant funding to develop a waste prevention policy and program. There is no evidence that this policy and program was ever implemented. The recommendations contained in the final report are practical and as valid today as they were in 2001. The program includes waste prevention in all City facilities, implementing an environmentally preferable procurement program, and a plan for vehicle and maintenance operations.

### **3.2.2 Cost Reduction**

#### **3.2.2.1 Assessing City Waste Collection Service Needs**

An assessment is needed to better understand the need for dumpster space at all properties to which the City provides dumpster service. It is likely that at many of these properties a smaller dumpster could be used or fewer pickups are needed. Outreach to multi-family housing could also increase recycling collection and decrease trash collection.

School dumpsters should be included in this assessment to increase recycling pickups and reduce trash pickups. A calendar should be devised by the Environmental Affairs Division to vary the number of pickups for the school buildings to fit the waste management needs – summer/winter break needs fewer pickups, first and last 3 weeks need more frequent pickups.

#### **3.2.2.2 Deter Illegal Dumping**

Illegal dumping has been reported at numerous City facilities. The scope of the illegal dumping problem in Newton is not known. To better understand costs and time spent managing illegal dumping, a reporting system could be devised either using the WebQA platform or placing responsibility of tracking on a City staff person. Recommended steps to deter illegal dumping include keeping all municipal dumpsters locked and installing security cameras.

### **3.2.3 Increase Recovery**

#### **3.2.3.1 Include Recycling as a Job Duty**

In order to increase recovery among all City departments, recycling must be a part of the workplace culture. A plan to increase recycling by existing employees should be developed and include training for custodial staff, as well as training and education for all department staff. Tools to develop and execute such a plan are available from the Recycle@Work program of Keep America Beautiful, a national non-profit organization.

For new hires to the City, a short training session that covers the waste/recycling program, Newton’s Buy Recycled Policy, and any circumstances that may pertain to specific job duties which increase recycling could be implemented as part of orientation.

### 3.2.3.2 Quantify Contamination

Perform quarterly audits of dumpsters and carts at specified city-serviced locations to identify and quantify recycling contaminants. This task would be included in the waste prevention program referenced in section 3.2.1.1 of this report. Information gleaned from these audits would be used to guide procurement practices and educational messaging on materials management.

### 3.2.3.3 Determine Missed Recovery Opportunities

Using information from quarterly audits, determine what recoverable waste materials are being generated at specific locations. Use this information to change practices to increase recovery of valuable or harmful materials.

## 3.3 City Waste from Public Spaces

### 3.3.1 Waste Reduction

#### 3.3.1.1 Carry-In/Carry-Out Policy

The reduction in public space recycling/trash service that occurred with the implementation of the Big Belly program resulted in some public spaces left with a carry-in/carry-out policy for publicly generated waste. It is recommended that educational materials, such as signs, be placed in City parks to encourage residents to consider removing foods/beverages from packaging at home before coming to the park to reduce waste. This signage could also include an explanation of why the carry-in carry-out policy is in place.

### 3.3.2 Increase Recovery

#### 3.3.2.1. Big Belly Collection Receptacles

The Big Belly collection receptacles offer advanced sensor technology to determine when the units are full. This allows the Parks & Recreation Department the ability to increase collection operations efficiency. Although receptacles are labeled, there is a high amount of contamination.

To better understand what materials are most frequently causing contamination, a waste characterization of the most heavily used Big Belly units is recommended. Results of the waste characterization can determine the level of contamination and guide educational messaging. An increase in education through signage to reduce contamination would be the next step. Additionally, public outreach by volunteers at the locations of the most highly used Big Belly receptacles is also likely to reduce contamination.

#### 3.3.2.2 Require a Recycling Plan for City Park Permits

At the time a resident is applying for a usage permit for a City park, it is recommended that they be required to provide a recycling plan. This requirement would force the resident/organization to think about waste and recycling collection at their event and put a plan together. The plan would need to be deemed practical and the resident/organization could agree to be responsible for not leaving any litter behind. A littering fine should be issued as a consequence of litter being found at the event site following the event.

## 3.4 City Waste from Operations

### 3.4.1 Waste Reduction

#### 3.4.1.1 Improve Materials Management in Project Planning

While some waste is unavoidable in City operations, thoughtful planning on the front end of a project will result in less materials management needed on the back end of the project. Planning suggestions include requiring

contractors to include materials management tasks and costs in their bids for construction projects, seeking reuse outlets for unwanted furniture from schools and offices as opposed to disposing of those materials, and finding beneficial reuse of materials that result from demolition or replacement of infrastructure.

Furthermore, bid requests could include requirements or indicate preference for sustainable materials management in submitted proposals. For example, a vendor that submits a proposal to demolish an old school and build a new one can include finding reuse outlets for any equipment left in the school before demolition.

### **3.4.2 Cost Reduction**

#### **3.4.2.1 Street Sweepings Management**

Separation of street sweepings into two categories can save the City on management costs. Sweepings that come from side streets contain less litter and automobile fluids, so they are often accepted at a municipal solid waste landfill and are less costly to dispose. Street sweepings that come from main thoroughfares often contain more litter and oil, thus these sweepings need to go to a hazardous waste landfill, which is costly.

### **3.4.3 Increase Recovery**

#### **3.4.3.1 Recover Inert Materials**

Many inert materials can be beneficially reused and some construction materials can be recycled. Thorough quarterly audits performed as part of the waste prevention program (see section 3.2.1.1) can determine what inert materials are currently being disposed of. This could include stumps, concrete, asphalt, gravel, and wood boards/pallets. After the materials are identified, a recovery outlet can be sought and separate collection or management can be implemented.

## **4 Education & Outreach**

Much research has been done on what education and outreach approaches are effective to encourage recycling and behavior change. Numerous resources, including toolkits and templates, have been compiled by numerous organizations (e.g., Recycling Partnership, Keep America Beautiful, Waste Management, MassDEP, etc.) and are available at no cost.

Additionally, Newton has \$10,000 allocated for education in the Waste Management contract. These funds were not expended in FY16 and have been approved by Waste Management to be rolled into FY17. Grant funding is available from MassDEP through the Recycling Dividends Program (RDP). In FY17, Newton was awarded \$31,500 through the RDP program. The RDP grant funds can be spent on education efforts, site improvements, and there is a \$750 allotment for conference attendance and professional memberships.

### **4.1 Print Materials**

#### **4.1.1 Comprehensive Program Guide**

A sustainable materials management program guide will be updated from existing material in late 2016 to be distributed by mail to all Newton residents in early 2017. This guide will contain information on all solid waste, recycling, yard waste, household hazardous waste, and reuse policies and outlets available to Newton residents. Information such as the collection event dates for household hazardous waste, collection dates for yard waste, and changes in collection due to holidays will also be included.

### **4.1.2 Recycling Program Flyer**

A recycling program flyer, which also promotes material reuse, was updated in October 2016. This flyer is currently provided to residents at the Newton Resource Recovery Center and distributed via mail to residents that are found to be non-compliant with curbside recycling requirements.

### **4.1.3 Recycling Signage**

A sign plan has been developed for the Resource Recovery Center and new signage is anticipated to be put in place by February of 2017.

Educational signage improvements are needed in all City buildings and parks.

## **4.2 Social Media**

### **4.2.1 Facebook**

Newton has a recycling Facebook page established, however it has been defunct since March of 2015. The investment of staff time in maintaining the page and the value of the page to the entire Newton community should be evaluated before restarting activity on the page.

### **4.2.2 Twitter**

Newton also has a Twitter feed established that has also been defunct since March of 2015. This social media outlet is useful for getting information out quickly. The investment of staff time in maintaining the page and the value of the page to the entire Newton community should be evaluated before restarting activity on the account.

### **4.2.3 Instagram**

Increasingly, municipalities are using Instagram to relay information using photos. The investment of staff time in maintaining the page and the value of the page to the entire Newton community should be evaluated before creating and managing an account.

## **4.3 Other Media Outlets**

### **4.3.1 NewTV**

Local TV stations are generally a good way to reach residents that are highly engaged in the community. Though that may be a small population, because these folks are engaged, it is likely that information relayed using a single appearance or potentially a recurring segment would be relayed by word of mouth to many community organizations and individuals.

## **4.4 Community Outreach**

### **4.4.1 Recycling Ambassadors**

There has proven to be strong interest in improving recycling among a small group of passionate Newton residents and students. It would be ideal to train these individuals as volunteers to promote the Newton sustainable materials management program. These Recycling Ambassadors could attend community events to engage with the other residents in conversation and answer questions.

In addition, these volunteers or Newton Environmental Affairs staff could attend meetings of local community groups to present on the Newton sustainable materials management program and answer questions from engaged citizens.



#### **4.4.2 Door Knocking**

While door-to-door education is not a sustainable practice on a long-term basis due to staffing/volunteer needs, targeted areas could be determined where this method of outreach may be particularly effective. In other communities multi-family properties have been targeted for door to door outreach with measurable success.

### **4.5 Technology Services**

#### **4.5.1 City Website – Environmental Affairs Pages**

The Environmental Affairs pages on the City’s website contain a substantial amount of information, so much so that the City has received feedback that the right information is hard to find. The Environmental Affairs portion of the website needs to be mapped and simplified.

Data from IT on website traffic should be gathered and analyzed to better understand how the Environmental Affairs page is currently used (or not used). Information on click-throughs for links would also be useful.

#### **4.5.2 Newton’s 311 (WebQA) Service**

To provide better customer service to residents, Newton uses a 311 service (Web QA). Environmental Affairs Division requests that can be submitted by Newton residents include bulk item pickup, cart repair, and reporting missed curbside collection.

To improve the reach of this service, a direct mail campaign could be targeted to addresses that have never used the 311 system (Web QA).

#### **4.5.3 Recycle Right Newton**

This software platform, powered by ReCollect, was implemented in November 2016. This service includes a mobile application available for free on iTunes and Google Play. The primary function of this service is a reminder service to notify residents of their curbside collection day. The calendar can send them an email reminder or even call them at a time they can customize. This reminder function is particularly useful during holiday weeks that cause a delay in collection. Additionally the calendar can easily relay to residents when HHW collection events are happening.

Additional features that Newton has subscribed to with Recycle Right Newton include a waste wizard to provide details on proper outlet for materials and collect data on backend for what materials cause most confusion and a sorting game for residents to play and learn what proper outlets are for various materials. Data is relayed on the backend to inform City staff which materials cause most confusion so that educational messaging can be tailored to meet resident needs. The sorting game can be featured at community outreach events to engage residents.

### **4.6 Education Planning**

The Education and Outreach Plan for 2017 is included in Appendix B.

#### **4.6.1 Channels**

External channels are intended to reach Newton residents. Internal channels are intended to reach City of Newton staff. The channels included in the education plan are common communication methods used by municipalities across the country.

#### **4.6.2 Target Audiences**

The target audiences include housing type (single, multi-family), generation (Baby Boomers, Gen Xers, Millennials, Children), and community role (local non-profit organizations, educators). These target audiences were determined following a marketing strategy specifically developed for municipalities to reach various parts of their community.

#### **4.6.3 Key Messages**

Eight key messages were defined by City staff to focus communications directed at target audiences. These messages include how to use and access services offered in Newton, information regarding the collection schedule, how to properly manage materials, what materials are not accepted and contamination issues that can arise, increasing recycling is easy and important, waste reduction, sharing community successes, and changes and updates to services. Some communication channels will intentionally only include two of the eight messages to communicate only pinpoint information.

### **5 Looking Forward – Ideas for the Future**

#### **5.1 Technology**

- Use of cameras on collection trucks to enforce curbside compliance and foster consistent service to all residents.
- Engage further with the collection service provider to potentially increase route efficiency and decrease vehicle emissions.
- Explore and better understand the use of a weighing mechanism in automated collection arm on trucks.
- Use GIS to track recycling participation, contamination, and increase curbside compliance.

#### **5.2 Newton Leads 2040 Initiative**

- Develop long term goals to reduce waste to prevent increased costs and increase the City's overall sustainability.
- Incorporate demographic forecasting for Newton into sustainable materials management planning.

# Appendix A. Container (Dumpster) and Cart Service

## CONTAINER SERVICE

MFR=multi-family recycling  
MRT=multi-family trash  
MR=municipal recycling  
MT=municipal trash  
SR=school recycling  
ST=school trash

QTY=quantity of containers  
CY=cubic yard capacity per container  
FREQ=frequency of collection  
FY17 Rate/PU=rate per pickup

Type	Location	Address	QTY	CY	FREQ	FY17 Rate/PU	Rate/Mo	Annual
MFR	NCDF HOUSING	27 HAMLET ST	2	2	1	\$20.79	\$180.04	\$2,160.50
MFR	ST JAMES UNITS	22 SAINT JAMES ST REAR	1	4	1	\$20.79	\$90.02	\$1,080.25
MFT	THURSTON ROAD	60 THURSTON RD	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	HAMILTON HSG	545 GROVE ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	PARKER HOUSE	21 PARKER ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	COMM AVE APTS	2300 COMMONWEALTH AVE	3	10	1	\$55.62	\$722.50	\$8,670.05
MFT	COMM AVE APTS	2350 COMMONWEALTH AVE	3	10	1	\$55.62	\$722.50	\$8,670.05
MFT	CURTIS ARMS APT	136 NORTH ST	2	10	2	\$55.62	\$963.34	\$11,560.06
MFT	NEW HYDE HSG	82 LINCOLN ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	TAGLIENTI APTS	410 LANGLEY RD	1	6	1	\$37.08	\$160.56	\$1,926.68
MFT	TAGLIENTI APTS	33 PAUL ST	2	10	1	\$55.62	\$481.67	\$5,780.03
MFT	ZIGARELLI APTS	392 LANGLEY RD	2	6	1	\$37.08	\$321.11	\$3,853.35
MFT	BLITHEDALE ST	27 BLITHEDALE ST	1	6	1	\$37.08	\$160.56	\$1,926.68
MFT	HOUSING MANN HS	21-35 WALKER ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	IMPERIAL CONDOS	280 BOYLSTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	HOUSING MANN HS	16 BROOKSIDE AVE	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	PEABODY CONDOS	30 OBER RD	1	8	1	\$49.44	\$214.08	\$2,568.90
MFT	CENTENNARY VILL	234 CENTRAL ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	199 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	SACO ST APTS	SWEET ST	1	10	2	\$55.62	\$481.67	\$5,780.03
MFT	NCDF HOUSING	27 HAMLET ST	3	10	1	\$55.62	\$722.50	\$8,670.05
MFT	SAWMILL BROOK	655 SAW MILL BROOK PKWY	1	8	1	\$49.44	\$214.08	\$2,568.90
MFT	ST JAMES UNITS	22 SAINT JAMES ST REAR	1	6	1	\$37.08	\$160.56	\$1,926.68
MFT	ADAM ST APTS	175 ADAMS ST	1	8	1	\$49.44	\$214.08	\$2,568.90
MFT	COTTAGE CT APTS	12 COTTAGE CT	1	6	1	\$37.08	\$160.56	\$1,926.68
MFT	MT IDA APTS	543 CENTRE ST	1	6	1	\$37.08	\$160.56	\$1,926.68
MFT	PARK ST APTS	40-46 PARK ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	FARWELL ST APTS	55 FARWELL ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	NONANTUM VILLGE	237 WATERTOWN ST	2	10	1	\$55.62	\$481.67	\$5,780.03
MFT	JFK HOUSING	83 KENNEDY CIR	2	10	1	\$55.62	\$481.67	\$5,780.03
MFT	CAPASSO APT	151 CONCORD ST	1	10	1	\$55.62	\$240.83	\$2,890.02

MFT	CAPASSO APT	125 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	89 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	145 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	155 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	163 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	181 LEXINGTON ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	CAPASSO APT	180 CHURCH ST	1	10	1	\$55.62	\$240.83	\$2,890.02
MFT	WOODLAND PARK	264 GROVE ST	7	10	1	\$55.62	\$1,685.84	\$20,230.11
MFT	CHATHAM TOWNHSE	2247 COMMONWEALTH AVE	1	10	1	\$55.62	\$240.83	\$2,890.02
MR	RUMFORD AV YARD	115 RUMFORD AVE	5	10	1	\$43.25	\$936.36	\$11,236.35
MR	CITY HALL	1000 COMMONWEALTH AVE	1	10	2	\$43.25	\$374.55	\$4,494.54
MR	NEWTON POLICE HEADQTRS	1321 WASHINGTON ST	1	8	1	\$38.32	\$165.93	\$1,991.11
MR	MAIN LIBRARY	330 HOMER ST	1	10	1	\$43.25	\$187.27	\$2,247.27
MR	PUBLIC WORKS	52 ELLIOT ST	2	10	1	\$43.25	\$374.55	\$4,494.54
MR	CRAFTS ST YARD	90 CRAFTS ST	1	8	1	\$38.32	\$165.93	\$1,991.11
MT	CITY HALL	1000 COMMONWEALTH AVE	1	10	3	\$55.62	\$722.50	\$8,670.05
MT	POLICE HEADQTRS	1321 WASHINGTON ST	1	8	3	\$49.44	\$642.23	\$7,706.71
MT	FIRE STATION 7	144 ELLIOT ST	1	2	1	\$15.33	\$66.38	\$796.55
MT	PUBLIC WORKS	52 ELLIOT ST	1	10	2	\$55.62	\$481.67	\$5,780.03
MT	CRYSTAL LAKE	83 NORWOOD AVE	1	10	1	\$55.62	\$240.83	\$2,890.02
MT	POLICE STATION	25 CHESTNUT ST	1	8	1	\$49.44	\$214.08	\$2,568.90
MT	CITY OF NEWTON	101 WALKER ST	1	2	1	\$15.33	\$66.38	\$796.55
MT	LIBRARY	330 HOMER ST	1	2	5	\$15.33	\$331.89	\$3,982.73
MT	CRAFTS ST YARD	90 CRAFTS ST	1	8	1	\$49.44	\$214.08	\$2,568.90
SR	NORTH HIGH SCH	457 WALNUT ST	2	10	1	\$43.25	\$374.55	\$4,494.54
SR	NORTH HIGH SCH	457 WALNUT ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	NORTH HIGH SCH	457 WALNUT ST	1	2	called in as needed	\$15.33	-	-
SR	SOUTH HIGH SCH	140 BRANDEIS RD	2	10	1	\$41.79	\$361.90	\$4,342.82
SR	OAKHILL HIGHSCH	130 WHEELER RD	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	WILLIAMS SCHOOL	141 GROVE ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	EDUCATION CTR	100 WALNUT ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	COUNTRYSIDE SCH	191 DEDHAM ST	1	8	2	\$38.32	\$331.85	\$3,982.21
SR	HARACE MANN SCH	687 WATERTOWN ST	1	10	2	\$43.25	\$374.55	\$4,494.54
SR	CHAS BROWN JR	125 MEADOWBROOK RD	1	8	2	\$38.32	\$331.85	\$3,982.21
SR	BOWEN SCHOOL	280 CYPRESS ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	FA DAY JR HIGH	21 MINOT PL	1	8	2	\$38.32	\$331.85	\$3,982.21
SR	BURR SCHOOL	171 PINE ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	CABOT SCHOOL	229 CABOT ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	FRANKLYN SCHOOL	125 DERBY ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	LINCOLN ELLIOT	191 PEARL ST	1	8	2	\$38.32	\$331.85	\$3,982.21
SR	MASON RICE SCH	144 PLEASANT ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	MEM SPAULDING	250 BROOKLINE ST	1	10	1	\$43.25	\$187.27	\$2,247.27

SR	PIERCE SCHOOL	170 TEMPLE ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	UNDERWOOD SCH	101 VERNON ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	WARD SCHOOL	10 DOLPHIN RD	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	CARR SCHOOL	225 NEVADA ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	BIGELO MIDDLE	42 VERNON ST	1	8	1	\$38.32	\$165.93	\$1,991.11
SR	ANGIER SCHOOL	1697 BEACON ST	1	10	1	\$43.25	\$187.27	\$2,247.27
SR	AQUINAS SCHOOL	15 WALNUT PARK	1	8	1	\$38.32	\$165.93	\$1,991.11
ST	NORTH HIGH SCH	457 WALNUT ST	2	10	5	\$55.62	\$2,408.35	\$28,900.15
ST	SOUTH HIGH SCH	140 BRANDEIS RD	2	10	5	\$55.62	\$2,408.35	\$28,900.15
ST	SOUTH HIGH SCH	140 BRANDEIS RD	1	2	1	\$15.33	\$66.38	\$796.55
ST	OAKHILL HIGHSCH	130 WHEELER RD	1	8	5	\$49.44	\$1,070.38	\$12,844.51
ST	WILLIAMS SCHOOL	141 GROVE ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	EDUCATION CTR	100 WALNUT ST	1	8	3	\$49.44	\$642.23	\$7,706.71
ST	COUNTRYSIDE SCH	191 DEDHAM ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	HARACE MANN SCH	687 WATERTOWN ST	1	10	2	\$55.62	\$481.67	\$5,780.03
ST	CHAS BROWN JR	125 MEADOWBROOK RD	1	8	5	\$49.44	\$1,070.38	\$12,844.51
ST	BOWEN SCHOOL	280 CYPRESS ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	FA DAY JR HIGH	21 MINOT PL	1	8	5	\$49.44	\$1,070.38	\$12,844.51
ST	BURR SCHOOL	171 PINE ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	CABOT SCHOOL	229 CABOT ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	FRANKLYN SCHOOL	125 DERBY ST	1	8	3	\$49.44	\$642.23	\$7,706.71
ST	LINCOLN ELLIOT	191 PEARL ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	MASON RICE SCH	144 PLEASANT ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	MEM SPAULDING	250 BROOKLINE ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	PIERCE SCHOOL	170 TEMPLE ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	UNDERWOOD SCH	101 VERNON ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	WARD SCHOOL	10 DOLPHIN RD	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	CARR SCHOOL	225 NEVADA ST	1	8	2	\$49.44	\$428.15	\$5,137.80
ST	BIGELO MIDDLE	42 VERNON ST	1	8	5	\$49.44	\$1,070.38	\$12,844.51
ST	ANGIER SCHOOL	1697 BEACON ST	1	10	2	\$55.62	\$481.67	\$5,780.03
ST	AQUINAS SCHOOL	15 WALNUT PARK	1	8	1	\$49.44	\$214.08	\$2,568.90
<b>FY17 Container Service Annual Total Cost</b>							<b>\$428,691.82</b>	

## RECYCLING CARTS

LOCATION	ADDRESS	CART COUNT
FIRE STATION 1	241 CHURCH ST	8
NONANTUM VILLGE	239 WATERTOWN ST	2
JFK HOUSING	83 KENNEDY CR	2
HORACE MANN HSG	680 WATERTOWN ST	2
CAPASSO APT	151 CONCORD ST	4
CAPASSO APT	89 LEXINGTON ST	4
CAPASSO APT	125 LEXINGTON ST	4
CAPASSO APT	155 LEXINGTON ST	4

CAPASSO APT	159 LEXINGTON ST	4
CAPASSO APT	163 LEXINGTON ST	4
CAPASSO APT	181 LEXINGTON ST	4
WOODLAND PARK	264 GROVE ST	2
CHATHAM TOWNHSE	2247 COMMONWEALTH AVE	4
COMM AVE APTS	2300 COMMONWEALTH AVE	4
COMM AVE APTS	2350 COMMONWEALTH AVE	4
CRYSTAL LAKE	15 NORWOOD AVE	2
TAGLIENTI APTS	410 LANGLEY RD	2
TAGLIENTI APTS	33 PAUL ST	4
ZIGARELLI APTS	392 LANGLEY RD	10
IMPERIAL CONDOS	280 BOYLSTON ST	15
PEABODY CONDOS	30 OBER RD	2
SAWMILL BROOK	655 SAWMILL BROOK PKWY	2
ST JAMES UNITS	22 ST JAMES ST REAR	4
ADAM ST APTS	175 ADAMS ST	2
MT IDA APTS	290 CENTRE ST	2
PARK ST APTS	40-46 PARK ST	2
FARWELL ST APTS	55 FARWELL ST	2
CURTIS ARMS APT	136 NORTH ST	4
CARR SCHOOL	225 NEVADA ST	2
BIGELO MIDDLE	42 VERNON ST	2
LIBRARY BLDG	144 BRIDGE ST	2

**Appendix B. 2017 Newton Sustainable Materials Management Education and Outreach Plan**

		Target Audience								Key Messages								Funding Source	Budget	Timeframe
		Single family residents	Multi family residents	Baby Boomers	Gen Xers	Millennials	Children	Local non-profit organizations	Educators	How to use/access services	Collection schedules	How to properly manage materials	Materials not accepted & contamination issues	Recycling more is easy & important	Preventing waste generation	Sharing community successes	Service changes and updates			
External Channels	Program Guide mailer	x	x	x	x	x	x	x	x	•	•	•	•	•	•	•	•	WM Education Funds	\$ 19,000.00	February 2017
	Recycle Right Newton	x	x	x	x	x	x	x	x	•	•	•	•	•	•	•	•	MassDEP Grant Funds	\$ 16,000.00	Ongoing
	Bill Inserts - Recycle Right Newton App	x		x	x					•	•							MassDEP Grant Funds	\$ 2,500.00	Spring 2017
	Bill Inserts - HHW/yard waste collection	x		x	x					•	•	•	•					MassDEP Grant Funds	\$ 2,500.00	Spring 2017
	Bill Inserts - plastic bag contamination	x		x	x								•	•	•			MassDEP Grant Funds	\$ 2,500.00	Spring 2017
	Bill Inserts - encourage recycling	x		x	x									•	•	•		MassDEP Grant Funds	\$ 2,500.00	Fall 2017
	Targeted post card mailers to "not outs"	x								•				•			•	Sanitation budget	\$ 2,500.00	June 2017
	Bus shelter posters	x	x						x					•			•	WM Education Funds	\$ 1,000.00	Summer 2017
	Posters in public buildings			x	x							•	•	•			•	MassDEP Grant Funds	\$ 500.00	Fall 2017
	City Website - Env Affairs pages	x	x	x	x	x		x	x	•	•	•	•	•	•	•	•	staff time	-	Full update by June 30, 2017
	Brochure handouts - Recycling Program			x	x	x		x	x	•	•	•	•	•	•			staff time	-	ongoing
	Brochure handouts - Sharps Mgmt			x	x	x		x	x	•	•	•	•	•	•			staff time	-	ongoing
	Green Bin E-Newsletter			x	x	x		x	x	•		•	•	•	•	•	•	staff time	-	starting in March 2017, then quarterly
	Sandwich board signs - HHW			x	x	x					•						•	staff time	-	May 2017
	Sandwich board signs - yard waste			x	x	x					•						•	staff time	-	late November 2017
	Library display cases			x	x	x	x					•	•	•				staff time	-	July 3 - July 31
	Facebook			x	x	x		x	x	•	•	•	•	•	•	•	•	staff time	-	starting February 2017, then ongoing
	Instagram				x	x				•		•	•	•	•	•	•	staff time	-	starting February 2017, then ongoing
	NewTV			x	x					•		•	•	•		•	•	staff time	-	intermittent
	Community group outreach	x	x	x	x					•	•	•	•	•	•	•	•	staff time	-	1 presentation per month
Newton Tab	x	x	x	x	x		x	x	•				•	•	•	•	staff time	-	intermittent as opportunities are available	
311 messages			x	x	x				•	•	•	•			•	•	staff time	-	ongoing	
City Council newsletters			x	x					•	•			•	•	•	•	staff time	-	TBD	
Community events	x	x	x	x		x	x	x	•	•	•	•	•	•	•	•	staff time	-	intermittent	
School presentations/classroom visits				x	x	x		x			•	•	•			•	staff time	-	TBD	
Tours of Rumford/MRF/Wheelabrator	x	x	x	x	x	x	x	x			•	•	•	•		•	staff time	-	intermittent as requested	
Internal Channels	Intranet - info on waste policies for staff	All City personnel								•		•	•	•	•	•	•	staff time	-	Posted by July 2017
	Team training sessions	All City personnel								•		•	•	•	•	•	•	staff time	-	Beginning May 2017
	Email announcements to all staff	All City personnel								•		•	•	•	•	•	•	staff time	-	monthly
	Email to department heads	All City personnel								•		•	•	•	•	•	•	staff time	-	intermittent as needed
	New hire orientation	All City personnel								•		•	•	•	•	•	•	staff time	-	Beginning July 2017