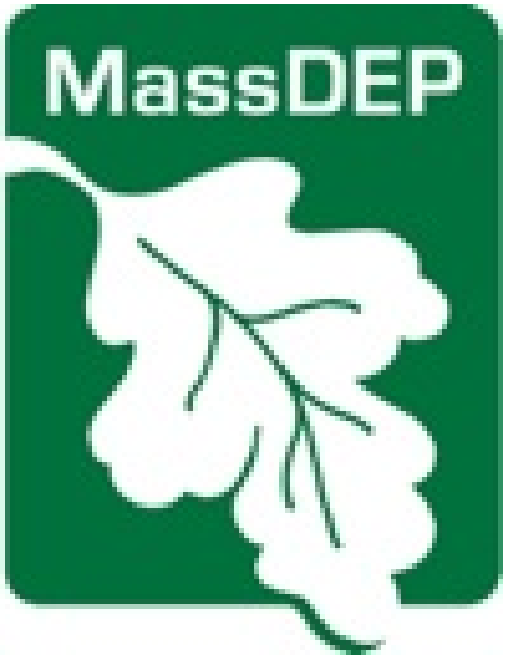
# DRAFT FOR PUBLIC COMMENT

# Massachusetts 2030 Solid Waste Master Plan

## September 2019



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## Introduction and Background

The Solid Waste Master Plan establishes the Commonwealth's policy framework for reducing and managing solid waste that is generated, reused, recycled, or disposed by Massachusetts residents and businesses. The Draft 2020-2030 Plan proposes a broad vision for and strategies for how the Commonwealth will seek to manage our waste over the next decade and beyond. The Massachusetts Department of Environmental Protection (MassDEP) has prepared this Solid Waste Master Plan (the 2020-2030 Plan) in accordance with the requirements of Massachusetts General Law Chapter 16, Section 21.

Waste and materials management in Massachusetts has changed dramatically since 2010. Changes in global recycling markets have led to tight recycling capacity, depressed prices and increased recycling costs here in the Commonwealth. These markets have been stressed further by the closure of a large glass processor in Massachusetts. Solid Waste disposal capacity in Massachusetts and throughout the Northeast has continued to shrink as more landfills close and they are not replaced by new in-state disposal capacity. This tightening of disposal capacity has weakened the resiliency of Massachusetts waste disposal infrastructure and facility outages that were routine in the past are causing frequent operational problems.

These challenges also present opportunities and drive innovation. MassDEP has developed and implemented extensive programs since 2010 that lay the foundation for moving toward a zero waste future in Massachusetts. The Commonwealth has implemented a nation-leading strategy to reduce food waste, highlighted by a commercial organics disposal ban for facilities generating a ton or more of organic material a week in 2014. Supported by a comprehensive strategy, the rescue of fresh and perishable foods grew by 60%, innovative companies and municipalities established 600,000 tons of anaerobic digestion capacity, the number of businesses with food waste collection programs grew by 70%, and annual food waste reduction grew by 180,000 tons through 2018.

Massachusetts has also built upon its comprehensive grant and assistance programs for municipalities and businesses, including the Sustainable Materials Recovery Program and Recycling Dividends Program for municipalities and the RecyclingWorks in Massachusetts program for businesses. Massachusetts has implemented two new market development programs to help drive recycling market growth in Massachusetts, including the Recycling Business Development Grant program and a memorandum of understanding with the Closed Loop Fund to drive increased investment in Massachusetts recycling businesses. MassDEP also continues to provide loans through the Recycling Loan Fund, while ramping up coordination with state economic development organizations to effectively leverage all of Massachusetts

market development programs to help support growth of local recycling, reuse, composting, and anaerobic digestion. Through these programs, MassDEP has provided a total of $40 million in grants, loans, and assistance to support recycling since 2010.

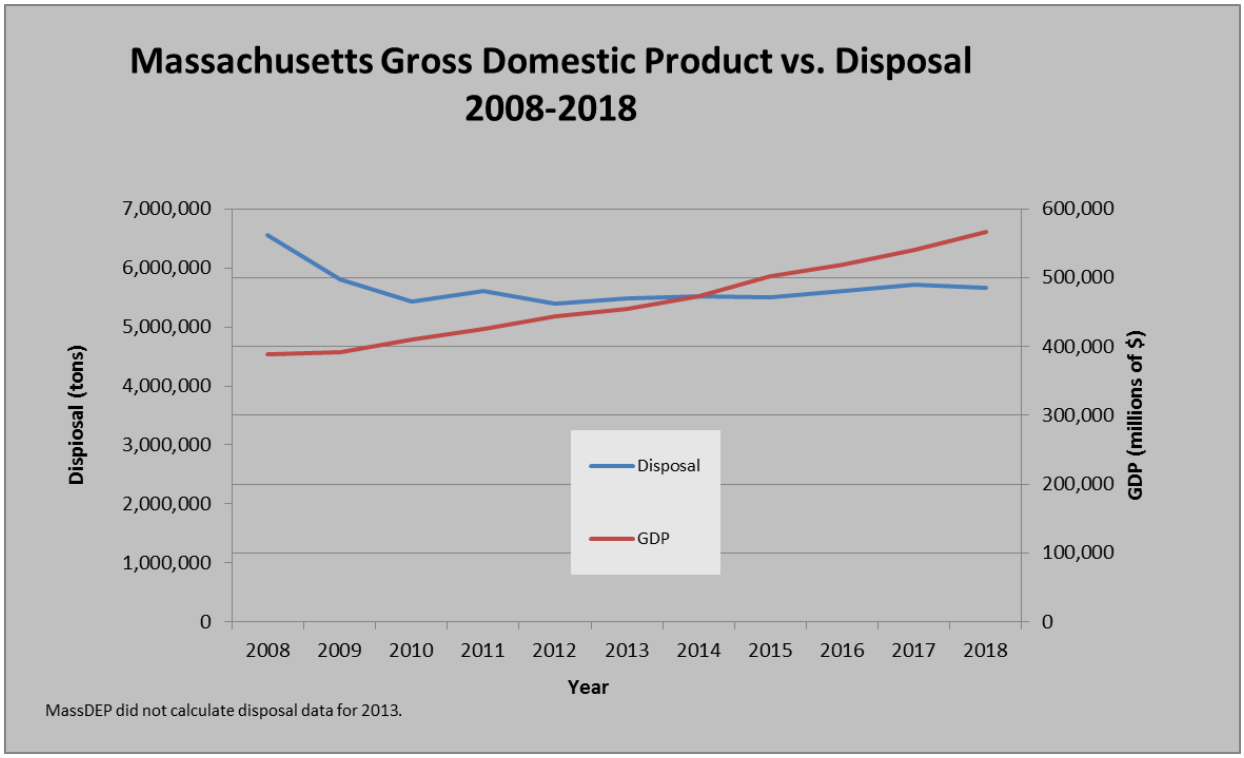
MassDEP has devoted significant effort to addressing the need to improve the quality of our recyclables and reduce contamination. In the past several years, the agency, working with municipalities and a number of recycling business partners, developed the Recycling IQ Kit and the Recycle Smart initiative to address these critical needs.

The Commonwealth is also striving to implement and grow initiatives at the top of the waste and materials management hierarchy, implementing a new reuse grant program, delivering guidance and technical assistance to foster increased source reduction of food waste, and establishing guidance and assistance to increase reuse of office furniture and building materials. In all of these areas, innovative business, non-profit, and municipal organizations and schools are helping to make progress.

MassDEP also continues to permit and oversee solid waste management, recycling, composting, anaerobic digestion and other facilities and operations to ensure that they are developed, sited, and operated in a manner that protects public health and the environment. Massachusetts has waste disposal bans that prohibit the disposal of certain recyclable and compostable materials in the trash. MassDEP has increased our waste ban inspection and compliance work over the past decade, identifying and resolving waste ban non-compliance by hundreds of businesses and institutions.

In the 2010-2020 Solid Waste Master Plan, MassDEP established a goal to reduce total disposal by 2 million tons on an annual basis, from 6,550,000 tons in 2008 to 4,550,000 tons in 2020. This would represent a 30% reduction. Through 2018, total disposal was at 5,660,000 tons, a decrease of 890,000 tons, or 14 percent. While the reduction is not on pace to meet 2020 goals, this decrease is more significant when considering that the state gross state product grew by 16% during this time period (Figure 1.1). Historically, waste generation typically tracks in line with the economy so that, without significant waste reduction and diversion, one would expect to see an increase in waste disposal by roughly 46% during this period. At the same time, Massachusetts population grew by 5% from 6,544,000 in 2008 to 6,902,000 in 2018. During this period, disposal per capita actually decreased 18%, from 2,000 pounds per capita in 2008 to 1,640 pounds per capita in 2018

In February of 2019, MassDEP published the Massachusetts Materials Management Capacity Study, which was conducted for MassDEP by MSW Consultants Inc. This study showed:



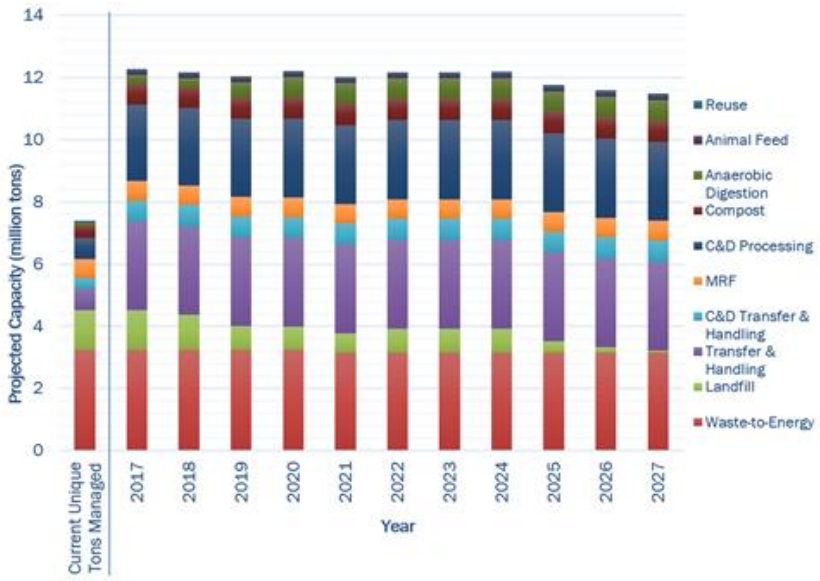

- limited and decreasing solid waste management capacity, consistent with MassDEP's own disposal capacity projections. Municipal solid waste combustion capacity is essentially fully utilized on an annual basis and, as these facilities age, they may experience increased down time and maintenance needs.
- At the same time, landfill capacity for municipal solid waste and construction and demolition debris is projected to decline to virtually zero by the end of the next decade.
- While Massachusetts has fairly extensive waste transfer capacity, most of these facilities do not effectively increase overall capacity, as most are not able to deliver waste beyond Massachusetts and our neighboring states, where disposal capacity is also limited. Some facilities are investing in capacity to transfer waste out of the region by rail, though those facilities can face logistical challenges in terms of arranging rail shipments and ensuring an adequate supply of the right type of railcars. This tight system capacity is less resilient, which means that disruptions such as a temporary facility closure, poor weather, or even peak volumes can lead to haulers having difficulty finding adequate disposal outlets.

Massachusetts also has very tight capacity at materials recovery facilities, as these facilities are practically operating at 100% of their capacity right now. A number of facilities are making capital investments that are expected to increase their efficiency as well as their overall capacity. As our collective efforts to reduce contamination continue to grow, this will

effectively increase recycling capacity, as every ton of contamination that is removed from the recycling stream allows for another ton of recyclables to be accepted at our MRFs.

Massachusetts' capacity picture is brighter for other waste reduction and diversion capacity. Between anaerobic digestion and composting, Massachusetts has several hundred thousand tons of available capacity for food materials. Massachusetts has excess processing capacity for construction and demolition debris materials that can divert more material from disposal. Massachusetts also has a growing infrastructure for donation and reuse, particularly for food materials, building materials, textiles, and office furniture and equipment. At the same time, Massachusetts recycling infrastructure is growing for mattresses, which are a bulky and difficult to manage material in our waste stream (Figure 1.2).

**Figure 1.2 Projected In-State Solid Waste Capacity (2017-2027)**




Source: https://www.mass.gov/files/documents/2019/02/19/capstudy.pdf

## Waste Reduction in Massachusetts by the Numbers

- **Food waste reduction** increased by 180,000 tons from an estimated 100,000 tons in 2008 up to 280,000 tons in 2018.
- **Food rescue** increased **60 percent** from 2008-2018.
- MassDEP awarded **$24 million in grants** to **308 municipalities** and regional groups since 2010.
- MassDEP conducted **1,000 waste ban inspections**, inspected more than **30,000 loads of trash**, issued over **800 notices of non-compliance**, and delivered more than **30 higher level enforcement actions with penalties** since 2013.
- **The Recycling Loan Fund** awarded **39 loans** for more than **$10 million** since 2010.
- **The Recycling Business Development Grant program** awarded **26 grants** for more than **$3 million** to support Massachusetts waste reduction infrastructure since its inception in 2016.
- **RecyclingWorks in Massachusetts** delivered **6,200 technical assistance services**, held **180 events** with nearly **5,000 attendees**, and established a web site that has received more than **350,000 visits**.
- **153** municipalities (nearly 30 percent of the state's population) have implemented **Pay as You Throw** programs.
- Massachusetts state agencies purchased nearly **$300 million** in **environmentally preferable products and services** in 2016.
- More than **200 organizations** joined MassDEP as **Recycle Smart partners** to help reduce recycling contamination.
- More than **60 municipal grantees** have recycled more than **70,000 mattresses** through MassDEP's **Mattress Recycling Incentive Program**, diverting almost 2,000 tons from the solid waste stream since 2016.
- Municipalities representing 52% of the state's population have prohibited the distribution of single use plastic bags

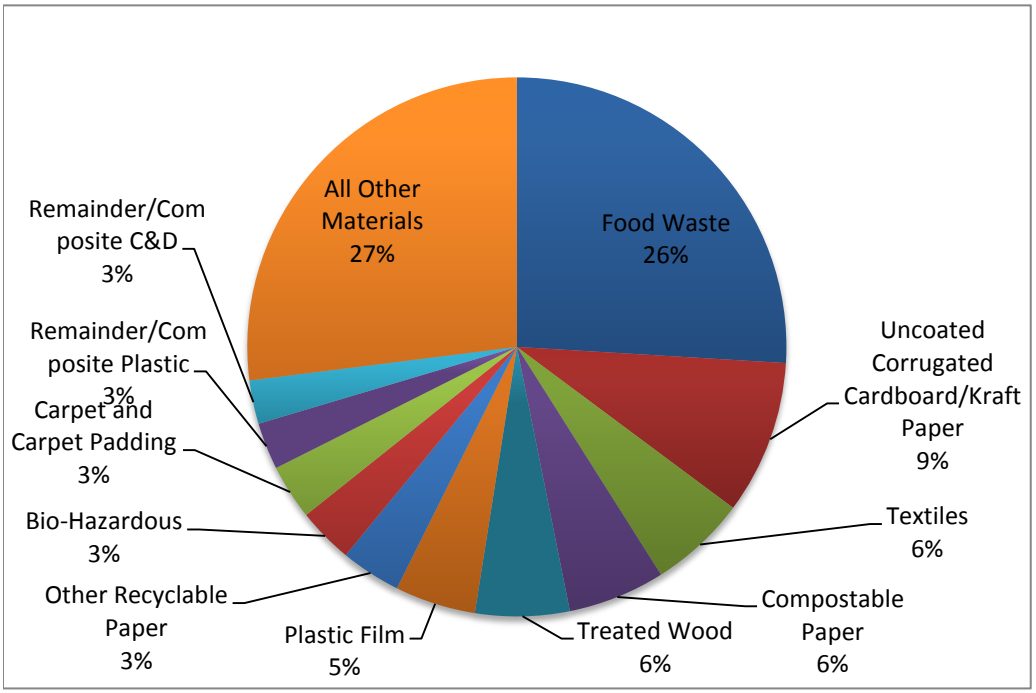
## 2010-2020 Goals and Policy Framework

In the 2010-2020 Solid Waste Master Plan, MassDEP established two primary waste reduction goals:

1. To reduce overall disposal from 6,550,000 tons in 2008 to 4,550,000 tons by 2020, a 30% reduction.
2. To reduce overall disposal to 1,310,000 tons by 2050, an 80% reduction.

Through 2018, Massachusetts total disposal had dropped to 5,660,000 tons, a reduction of 890,000 tons, or 14 %. This current trajectory will not achieve the 2020 goal. The programmatic work that has been done over the past several years will help lay the foundation for future waste reduction progress. There are significant environmental and economic arguments for why we should continue to set aggressive waste reduction goals and to strive towards a zero waste future in Massachusetts.

**Figure 2.1 Top 10 Materials in the Trash (2016)**




Source: https://www.mass.gov/doc/summary-of-waste-combustor-class-ii-recycling-program-waste-characterization-studies-includes/download

From an environmental standpoint, waste reduction provides well established and important benefits, particularly as we strive to reduce more waste through source reduction and reuse. Reducing our waste, along with recycling, composting, and anaerobic digestion will also help achieve important greenhouse gas reductions, energy savings and resource conservation impacts when viewed from a lifecycle perspective.

At the same time, solid waste disposal options and capacity in Massachusetts and throughout the Northeast are increasingly limited. As these options continue to decrease, we will have a more difficult time shipping trash for disposal and solid waste management costs will likely continue to rise. Reducing the amount of waste for disposal not only reduces our environmental impacts, but also helps us to achieve a more robust, diverse, and cost effective materials management system. Over time, these efforts can reduce materials management costs for businesses, municipalities, and Massachusetts residents. Diverting material to donation, reuse, recycling, composting, anaerobic digestion and other diversion outlets can help create jobs and economic activity that helps to grow the Massachusetts economy. A 2016 study conducted for MassDEP by ICF International estimated that the implementation of Massachusetts' food waste ban and supporting strategies helped to support 900 jobs, added $77 million to the gross state product and generated $175 million in annual economic activity. Donation and reuse opportunities can also create important social benefits by helping to get valuable items to those in need. This argument is especially compelling for food, as we dispose of more than 1 million tons of food material in the trash annually, while 10.3 percent of Massachusetts' population is food insecure[1].

## Moving Forward: Goals and Policies for 2020-2030

### 2030 Goals

1. MassDEP's proposed waste reduction goal for 2030 is to reduce disposal by 1.7 million tons annually from a 2018 baseline of 5.7 million tons to 4.0 million tons by 2030, a 30% reduction. This goal would place us on track to achieve our 2050 goal listed below.
2. Reduce the toxicity of the waste stream by improving the availability of household hazardous waste collection programs and implementing producer responsibility approaches for targeted materials.

[1] https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/food_insecurity_household/state/MA

## 2050 Goals

1. MassDEP's proposed waste reduction goal for 2050 is to reduce disposal by about 5.1 million tons by 2050, from a 2018 baseline of 5.7 million tons to 570,000 tons by 2050, a 90% reduction.
2. Continue to reduce the toxicity of the waste stream by reducing and phasing out use of hazardous products.

## Envisioning a Zero Waste Future for Massachusetts

MassDEP recognizes that a zero waste future requires wholesale change in how we produce, distribute, sell and use products and services as a society. This would require Massachusetts to move in the decades ahead toward policies encouraging and requiring any reusable, recyclable or compostable material to be diverted from disposal at an extremely high rate while eliminating the use of products or packaging that are not reusable, recyclable, or compostable. These types of changes will require significant policy actions and significant cultural and societal change. The building blocks for a zero waste future are in our hands today.

## Setting Priorities

In order to reach our waste reduction goals most effectively and efficiently, MassDEP has conducted analysis to identify priority materials, which can be viewed as priorities for several different reasons, including:

1. Significant additional diversion potential on a tonnage basis,
2. Opportunities to reduce waste by phasing out use of single use products and disposable packaging,
3. Potential for increased reuse and donation, and
4. Existing underutilized capacity, or opportunities for local market development potential.

MassDEP has conducted analysis of Massachusetts waste characterization data that estimates additional diversion potential by material category. This analysis in included in Appendix B.

Priorities from each of the above four perspectives are summarized here:

## Summary of Top Diversion/Reduction Priorities

**1. Divert materials with significant potential.**

| Material | Diversion potential (tons) |
|---|---|
| **Food material** | 570,000 |
| **Cardboard** | 220,000 |
| **Untreated wood** | 135,000 |
| **Textiles** | 130,000 |
| **Bulky materials** | 130,000 |

**2. Reduce or phase out materials that are difficult to recycle.**

- Target single use packaging
- Encourage better packaging and purchasing habits to reduce waste

**3. Increase reuse and donation opportunities.**

- Food donation to food banks and food rescue operations
- Building materials
- Office furniture and equipment
- Textiles

**4. Develop local markets for recycling/reuse/management.**

- Food material
- Mattresses
- Glass
- Textiles

## Major New and Expanded Initiatives

In the sections that follow, MassDEP has described our proposed goals and strategies by program area. In addition, MassDEP expects to develop and periodically update separate Action Plans for key program areas of focus. Major proposed new or expanded program and policy initiatives proposed in the 2020-2030 Plan are:

Legislative Strategies

- Work with the Legislature and other stakeholders to :
    - Develop an effective approach to reduce the use of single use packaging.
    - Advance extended producer responsibility (EPR) systems for paint, mattresses, and electronics.
    - Develop a recycling service requirement for waste haulers that would ensure a level playing field and comprehensive recycling access for all residents and businesses.

MassDEP Regulatory and Assistance Strategies

- Develop a comprehensive approach and promulgate regulations to lower the current 1 ton per week threshold for Massachusetts' commercial food waste disposal ban to ½ ton per week by 2022.
- Work closely with municipal officials providing additional technical and financial support to successfully build comprehensive waste management programs including prioritizing assistance for development of new Pay-As-You-Throw programs.
- Promulgate regulations to ban the disposal of mattresses and textiles to drive increased mattress recycling and reuse and recycling of textiles.
- Increase the amount and frequency of waste ban inspections on haulers and generators of waste.
- Establish minimum performance standards for construction and demolition processing facilities to increase recycling of materials banned from disposal and improve compliance with waste disposal bans.
- Allow permitting of up to 350,000 tons of additional annual management capacity in the form of innovative waste to energy or other integrated waste management technologies and allow replacement of existing waste to energy capacity with more advanced technologies that reduce emissions and increase separation of recyclable materials.

## Source Reduction and Reuse

*Goals:*

- Develop and implement expanded strategies to reduce waste at the source.
- Develop and implement policies and programs that extend the lifespan of products through reuse, repair and remanufacturing.

**Figure 3.1 Libraries of Things at Peabody Institute Library, Danvers**


*Priority materials*: Durable goods including appliances, electronics and furniture, single use packaging and food service products, wasted food, building materials, transportation and distribution packaging

<u>Strategies</u>

Create a Strategic Reduce and Reuse Action Plan that will:

- Assess the best opportunities to increase materials reuse and extend product lifespans.
- Identify barriers and capacity needs among priority industries, including workforce development needs and technical gaps.
- Provide data on the state of reuse activity, economic benefit, materials diversion, and attitudes/behaviors around reuse.
- Create a network of source reduction and reuse industry stakeholders and hold an open dialogue to advance reuse, repair and extension of product lifetimes.

*Residential*

- Provide micro grants to municipalities, NGOs and businesses to stimulate growth of reuse/repair/share operations.
- Incentivize municipal investments in reuse/repair/share programs.
- Provide trainings and share best practices to institutionalize reuse/repair/share programs.
- Develop communications plan to help residents adopt best practices for reducing waste, increasing reuse and repair, and extending product lifespans.

*Commercial and Institutional*

- Provide grants for market development to drive better utilization of reused materials in value added applications

### Reuse Stores in Massachusetts

Reuse stores are home improvement and donation centers that sell gently used furniture, appliances, home goods, building materials and more. The main reuse stores in Massachusetts include:

- Habitat for Humanity ReStores
- Eco-Building Bargains
- Boston Building Resources

- Foster increased use of dishwashers and beverage dispensers to switch from disposable to reusable food service ware in school, institutional and corporate cafeterias.
- Support & promote initiatives to test reusable shipping containers or materials and promote successes.
- Address reuse, repair, and product durability in state contracts, such as for refurbished furniture vendors.
- Use tracking and data to increase efficiency and reduce waste in business operations, such as food service, packaging and distribution, and contracting incentive systems like resource management contracting.

*Information*

- Create an online calculator to quantify the environmental, social and economic benefits of choosing reuse/repair/share over purchase and disposal to help Massachusetts residents, businesses and municipalities better understand the benefits of reuse options.
- Develop an online tool/map to help connect Massachusetts residents with reuse/repair/share resources across the state.
- Document environmental, social and economic benefits of reuse of furniture, fixtures, and equipment in commercial and institutional renovation projects.

*Policy*

- Develop an approach to reduce the use of single use packaging.
- Develop model state or local policies that advance source reduction, reuse, and repair such as deconstruction and reuse in building codes, conversion to water coolers from single use water bottles in government buildings.

**Figure 4.1 Habitat for Humanity Restore, Ashland**

*MassDEP provided a grant to help with capital costs of opening the Ashland store. There are now 16 ReStore locations across Massachusetts.*

## Organics Waste Reduction

*Goal:* Reduce the disposal of food and other organic materials by an additional 500,000 tons annually by 2030, based off of a 2018 baseline of 280,000 tons of food waste reduction.

Strategies

Work with stakeholders to implement an Action Plan targeting different sectors, including large commercial and institutional generators, medium business and institutional generators, and small businesses and residents.

For large generators:

- Develop initiative/systems to track and reduce food waste generation at the source.
- Drive increased food waste reduction through continued waste ban inspections and enforcement, sending formal information requests to businesses that generate food scraps, technical assistance through RecyclingWorks in Massachusetts, and education and outreach.

For medium generators:

- Develop a comprehensive strategy to support reducing the threshold for the commercial organics waste disposal ban to ½ ton per week by 2022.
- Implement grant and loan programs to foster increased investments in collection systems, local and regional composting capacity and intermediate processing facilities.
- Provide expanded business assistance through RecyclingWorks in Massachusetts.

For small businesses and residents:

- Develop a multi-pronged approach to reduce food waste from small sources including:
    - Raise awareness about how to reduce food waste
    - Support increased adoption of on-site/home composting
    - Foster further development of community and drop-off composting programs
    - Develop efficient models for curbside food waste collection

### Organics Collection Economic Impacts and Industry Trends (2010-2016)

- Employment across the industry **increased 150% from 2010 to 2016** and supports over 900 jobs.
- The sector was projected to **grow to support 1,370 jobs** by 2017.
- The food waste reduction industry generated **$174 million in economic activity** in 2016.
- Companies engaged in food waste reduction had **planned capital investments of $50 million.**

Source: https://www.mass.gov/files/documents/2016/12/pu/orgecon-pres.pdf

# Residential Waste Reduction

*Goals:*

- Increase quality of and reduce contamination in residential recycling streams.
- Reduce disposal of residential waste through source reduction, reuse, recycling, and composting.

*Target Materials*: Mixed residential recyclables, organics, textiles, mattresses, bulky materials

Strategies

MassDEP will continue to work closely with municipal officials, the recycling and solid waste industries, and other stakeholders to identify and implement strategies to improve management of residential waste streams and reduce disposal of these materials. MassDEP will focus on four categories of program and policy actions to progress towards these goals:

- Incentives & grants
  - Award municipal grants for equipment, pilot projects and regional initiatives through the Sustainable Materials Recovery Program
  - Provide incentive grants to encourage adoption of key waste reduction program initiatives through the Recycling Dividends Program
  - Promote and provide financial and technical assistance to municipalities to implement Pay-As-You-Throw programs.
- Technical Assistance
  - Deliver technical assistance through regional Municipal Assistance Coordinators
  - Support programs to collect and safely manage hazardous household products.
  - Manage state contracts to support municipal programs, including hazardous products collection and management, collection carts, and PAYT bags.

**Pay As You Throw (PAYT) Fast Facts**

- 153 Massachusetts municipalities, representing nearly 30% of the state's population have PAYT programs in place.
- Municipalities with PAYT have average per household trash generation rates that are up to 40% lower than non-PAYT communities.
- If all of Massachusetts municipalities adopted PAYT, that would reduce trash disposal by more than 400,000 tons annually.

- Training, Education and Outreach
  - Increase adoption of the Recycling IQ Kit at the local level to implement hands on "boots on the ground" local initiatives to reduce contamination in residential recyclables.
  - Implement broader adoption and increase program partners for the Recycle Smart MA program to raise awareness about what materials should and should not be placed in recycling bins.

    - Continue to work with recycling facilities, haulers, and municipalities to ensure that materials collected can be handled through our recycling infrastructure.
- Policies and Regulations
    - Propose new waste bans on textiles and mattresses with grant and assistance programs to support and drive this infrastructure.
    - Support the development of producer responsibility approaches for materials that are difficult and expensive to manage in local programs, including paint, electronics and carpet.
    - Support the development of a hauler recycling requirements that ensure a level playing field and consistent access to recycling, especially for residents not served by municipal programs.

## Snapshot of the City of Lynn Recycling IQ Kit Case Study

- **The Problem:** With a population of 94,063, Lynn had high levels of contaminated recycling. The top contaminants in recycling were plastic bags, food, and liquids.
- **Recycling IQ Kit:** MassDEP awarded Lynn the Recycling IQ Kit grant in 2017, which provided $15,000 of funding and 40 hours of technical assistance to implement the program. The City used $25,000 in Recycling Dividend Program funds to cover the remainder of the costs.
- **Taking Action:** Lynn implemented 8 weeks of curbside feedback to 5,000 households (18.5% of households served), focusing on the areas with the worst contamination. City staff checked carts and attached "oops tags" to recycling carts with the most problematic items with instructions to "correct this and we collect next time." City-wide outreach included mailers, newspaper and social media ads, billboards, banners, sandwich boards, and store signs. The route supervisor communicated regularly with the hauler to let them know which carts were tagged and left unemptied at the curb.
- **Results:** The overall rejection rate (tagging rate) decreased 71.5% from the first week (31.6%) to the last week of the program (9.8%). It took two Oops tags or less to bring 87% of HHs into compliance in the most non-compliant area.

## Commercial Waste Reduction

*Goal:* 1 of every 4 loads of trash that MassDEP observes at solid waste facilities contain significant amounts of materials that are banned from disposal. Through inspections, compliance, enforcement, and assistance, reduce percentage of waste ban failed loads from 26% in 2018 to 10% by 2030[2].

*Priority Materials*: Food material, cardboard, furniture and other bulky materials, mattresses.

Strategies

Improve waste ban compliance and enforcement

- Increase amount and frequency of MassDEP waste ban inspections.
- Create and distribute outreach materials to raise awareness about waste bans.
- Continue to utilize third party inspection data to inform inspections and outreach.
- Increase use of direct business information requests to gather more information on waste ban compliance status.
- Implement new waste bans for food material (reduced threshold of 1 ton per week), mattresses, and textiles.

Work with the business community to develop improved strategies to reduce waste and increase diversion from disposal.

- Support waste ban compliance through RecyclingWorks in Massachusetts technical assistance. Increase assistance for targeted sectors and materials, such as businesses subject to newly developed waste bans.
- Support initiatives that go beyond waste ban compliance including source reduction and recycling and reduction of materials that are not banned from disposal.
- Use financial and technical assistance to support other plan sections on source reduction, reuse, and reducing food waste.
- Develop guidance and tools to improve business waste, recycling, and organics contracting practices.
- Continue to assist schools and deliver recycling and composting education to schools through the Green Team program.

### Business Recycling Assistance

- **RecyclingWorks in Massachusetts** delivered **6,200 technical assistance services**, held **180 events** with nearly **5,000 attendees**, and established a web site that has received more than **350,000 visits**.
- Recycling Works compliance tips https://recyclingworksma.com/waste-bans-and-compliance/
- Recycling Works food waste generation estimation https://recyclingworksma.com/food-waste-estimation-guide
- Recycling Works guidance for contracting hauling services https://recyclingworksma.com/hauler-contracting-bmp/

[2] Goal may need to be adjusted to account for addition of new waste ban materials between now and 2030.

## Construction and Demolition Materials Waste Reduction

*Goal:* Reduce disposal of construction and demolition materials by 260,000 tons by 2030, more than double current C&D recycling tonnage.

Priority materials: wood, cardboard, gypsum, carpet

### Recycling Business Development Grants

- Since 2017, MassDEP has awarded $750,000 in grants to six facilities to purchase and install equipment to recover more wood for recycling.
- This equipment is projected to increase wood recycling by 34,000 tons per year.
- The photo (left) shows clean, separated wood at Stoughton Recycling, a project partially funded by the RBDG grant.

Strategies

Continue to work with stakeholders on the development and implementation of an Action Plan to increase C&D diversion

Promote waste re-use, reduction, and separation at the job site.

- Continue Source Separation Pilot Project Initiative to generate case studies for posting on RecyclingWorks website.
- Continue to provide C&D Technical Assistance through RecyclingWorks for commercial and institutional generators.
- Encourage use of C&D Materials Re-use stores (e.g. EcoBuilding Bargains, ReStores by Habitat for Humanity, etc.)
- Promote source separated diversion programs such as ceiling tiles and other alternative collection systems
- Encourage conformance to USGBC/LEED Green Building Standards.

Improve collection and C&D facility performance.

- Establish Minimum Performance Standards (MPS) for C&D Processing Facilities.
- Provide financial investment to improve process efficiency and effectiveness (e.g. RLF, RBDG).
- Evaluate flexibility in the permit modification process for capital investments tied to increased reuse and recycling.

Develop end markets.

- Expand existing/new wood markets.
- Develop common C&D materials product specifications (improve reliability for end-markets).
- Identify outlets for C&D fines.

Optimize regulatory/policy incentives.

- Improve implementation and enforcement of existing/new C&D waste bans.
- Promote interagency cooperation to advance C&D waste reduction.
- Work with municipalities and other stakeholders to explore models and pilots for local ordinances to require C&D recycling management and diversion, and deconstruction as part of local building permits.

## Market Development

*Goal:* Foster in-state market development for reusable, recyclable and compostable materials.

*Target Materials*: Food material, furniture and other bulky materials, glass, textiles. Also increase ability of recycling facilities and systems to sort materials to enable higher value market outlets.

Strategies

Work with stakeholders to develop a comprehensive market development plan:

- Plan should support activities across multiple levels of the hierarchy, including reuse, recycling, composting, processing, and other diversion options.
- Identify materials that are the best candidates for in-state market development.

Provide targeted business development assistance

- Support key market development sectors through targeted grants and loans, including Recycling Business Development Grants and the Recycling Loan Fund.
- Leverage other state business development resources, including partnering with the Massachusetts Office of Business Development, MassDevelopment, and other state grant and loan programs.
- Leverage additional financing through Memorandum of Understanding with the Closed Loop Fund.
- Consider additional waste bans to drive infrastructure growth in targeted sectors, including mattresses, textiles, and reduced ban threshold for commercial organic material, including food material.
- Utilize state purchasing power to foster and improve markets for recovered materials.

### Environmentally Preferable Purchasing (EPP) by the Numbers (FY2016)

- Over **$290 million** spent through the statewide EPP contract.
- **$23 million** in cost savings from energy efficient office equipment and water efficient products.
- Over **53,000** tons of recycling diverted from disposal.
- More than **15,000** state employees reached each month through the OSD newsletter.

### Glass Market Development

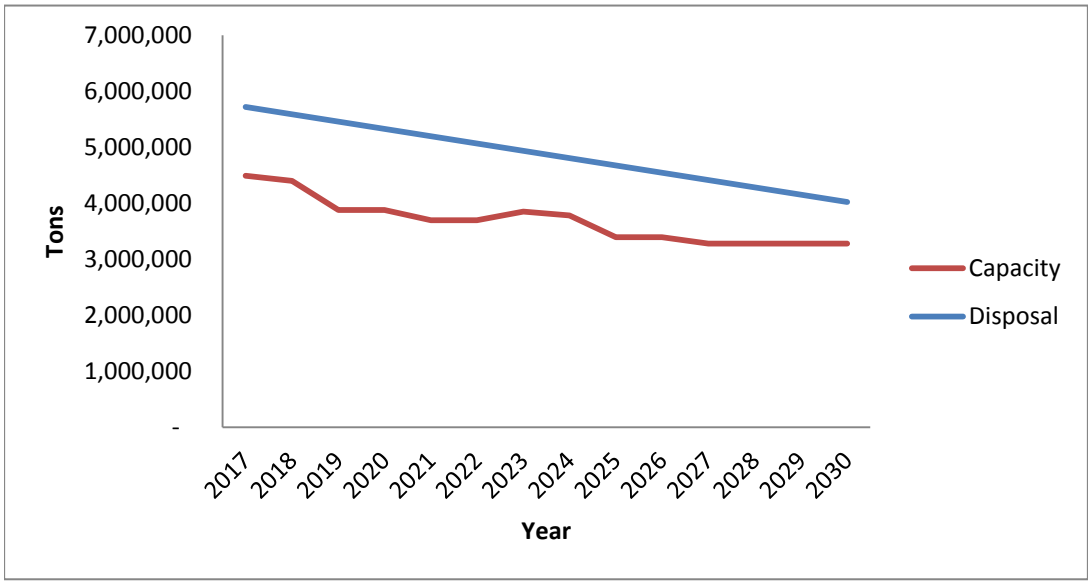
MassDEP provided grants to the towns of Groton and Dennis (pictured below) to open regional glass grinding operations. Source separated glass bottles and jars are accepted from neighboring municipalities for grinding into processed glass aggregate for use in construction and drainage projects. In addition, MassDEP provided a grant to JM Equipment to establish a glass crushing operation in Freetown.

## Solid Waste Facility Oversight and Capacity Management

*Goal:* Safely and sustainably manage in-state disposal facilities and address waste management capacity challenges and shortfalls.

Figure 10.1 shows projected disposal by year, if Massachusetts is successful in achieving it's 2030 waste reduction goal, compared to the projected available in-state disposal capacity by year. This projected capacity figure assumes that all current municipal waste combustion facilities continue to operate at their current capacity through 2030. Even if we achieve our 2030 waste reduction goal, Massachusetts will still have an in-state disposal capacity gap of approximately 700,000 tons in 2030.

**Figure 10.1 Projected Disposal vs. Disposal Capacity in Massachusetts (2017-2030)**




Source: https://www.mass.gov/files/documents/2018/12/11/17swdata.pdf

Strategies

Address solid waste capacity need:

- Continue to consider applications received for permitting of solid waste facilities consistent with statute, regulation and this Master Plan Update.
- Massachusetts has a projected capacity shortfall of 700,000 tons by 2030, even assuming we meet our 2030 waste reduction goal. Massachusetts will retain capacity for municipal waste combustion within the existing 3.5 million tons of annual capacity. The need for this capacity will be reassessed every five years. Any replacement capacity would be required to meet tighter

emissions standards and increased efficiency standards. Also retain the allowance for the permitting of up to 350,000 tons per year of additional capacity through innovative non-combustion technologies such as gasification and pyrolysis. This will help to ensure adequate management capacity while improving the environmental performance of our waste management infrastructure.

- Discuss development and permitting of integrated solid waste management facilities to improve management capacity. This could include co-siting integrated operations.
- Work with stakeholders to explore other solutions to address short and medium term disposal capacity need.

Oversee active solid waste, recycling and composting facilities

- Conduct on-going permitting, inspections and enforcement of all active facilities
    - Review and permitting of facility modifications
    - Conduct operation & maintenance inspections and waste ban inspections of active facilities
    - Respond to complaints
    - Issue enforcement when appropriate
- Review third party inspection reports.
- Review all monitoring and testing results required in facility permits.
- Address emerging contaminants and chemicals of concern in solid waste facility oversight.
- Assess management alternatives within the solid waste management system for other non-MSW materials including ash, sludges, and contaminated soils.
- Develop regulation changes to provide clarification and improve implementation of existing solid waste regulations.

Oversee inactive/closed solid waste facilities

- Permit and oversee closure activities at landfill facilities.
- Discuss and develop policy for post-30 year monitoring and financial assurance requirements at landfills.
- Continue to review monitoring reports for inactive/closed facilities on an ongoing basis.

## Solar & Wind Energy at Landfills

The Department of Environmental Protection (MassDEP) issues post-closure use permits for solar and wind installations on closed and capped landfills. To date, the agency has approved nearly 100 projects rated at more than 200 megawatts. Two-thirds of these projects have been completed and are generating nearly 150 megawatts of renewable energy.

# Appendix A: Master Plan Action Items by Program Area

| Master Plan Action Items | Program Area | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Source Reduction | Reuse | Organics | Residential | Commercial | C&D | Market Development | Solid Waste Management |
| Single Use Packaging Reduction | x | | | x | x | | | |
| Source Reduction and Reuse Strategic Plan | | x | | x | x | x | | |
| Online Reuse Benefits Calculator | | x | | x | x | x | | |
| Reuse Micro Grants | | x | | x | x | x | | |
| Model State and Local Policies | | X | | X | X | X | | |
| State Contract for Refurbished Furniture Vendors | x | x | | | x | | | |
| Sustainable Materials Recovery Program (SMRP) | x | x | x | x | | | | |
| Reuse and Repair Programs and Events | x | x | | x | | | | |
| Mattress Recycling Incentive | | | | x | | | | |
| PAYT Program Funds | x | x | x | x | | | | |
| Waste Reduction Enforcement Coordinators | | x | x | x | | | | |
| Recycling/Organics Equipment | | x | x | x | | | | |
| School Recycling Assistance | | x | x | x | x | | | |
| Waste Reduction and Organics Capacity Projects | x | x | x | x | | | x | |
| Recycling Dividends Program | x | x | x | x | x | | | |
| Municipal Technical Assistance Coordinators | x | x | x | x | | | | |
| Recycling IQ Kit | | | | x | | | | |
| Recycle Smart | | | | x | x | | | |
| Green Team | x | x | x | | | | | |
| Hazardous Products Collection | x | | | x | | | | |
| Mercury Act | x | | | x | x | | | |
| Material Separation Plan | x | x | | x | | | | x |
| Extended Producer Responsibility for Paint, Mattresses, Electronics | x | | | x | | | | |
| Beyond the Bin Directory | x | x | x | x | | x | | |
| Hauler Recycling Service Requirement | | | | X | X | | | |
| Waste Bans | | | x | x | x | x | x | x |
| Inspections & Enforcement | | | x | | x | x | | |
| Outreach & Compliance Assistance | | | x | x | x | x | | |
| Additional Waste Ban Materials | | | x | x | x | | x | |
| Small Generator Food Waste Reduction Strategies | x | x | x | x | x | | | |
| RecyclingWorks in Massachusetts | x | x | x | | x | x | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Food Waste Tracking Systems | x | x | x | | x | | | |
| WasteWise | x | x | x | | x | x | | |
| C&D Technical Assistance Pilot | x | x | | | x | x | | |
| Resource Management Contracting | x | x | | | x | | | |
| Waste Reduction Procurement Strategies | x | x | | | x | | | x |
| Furniture and Office Equipment Reuse | x | x | | | x | | | |
| Recycling Business Development Grants | | | x | | | x | x | |
| Recycling Loan Fund | | | x | | | x | x | |
| C&D | x | x | | | | x | x | |
| Minimum Performance Standards | | | | | | x | x | x |
| Waste Ban Enforcement | | | | | | x | x | x |
| Improved Data and Reporting | | | | | | x | | x |
| Prioritizing Materials, Opportunities | | x | | | | x | x | |
| Inter-agency Coordination | | | | | | x | | x |
| Deconstruction in Building Permits | | x | | | | x | | |
| Ongoing Disposal Facility Oversight | | | | | | | | x |
| Site Assignment Suitability Reports | | | | | | | | x |
| Maintain MWC moratorium – allow replacement capacity | | | | | | | | x |
| Integrated Solid Waste Management Facilities | | | | | | | | x |
| Third Party Inspection Reports | | | | | | | | x |
| Monitoring and Testing Results | | | | | | | | x |
| Closed Landfill Oversight | | | | | | | | x |

# Appendix B - 2030 Goal Analysis Spreadsheet

| Detailed Material Categories | Waste Ban Material | 2018 Disposal | 2030 Disposal (90% Goal) | 2030 Reduction (90% Goal) |
|---|---|---|---|---|
| **Paper** | | 971,577 | 589,008 | 382,569 |
| Uncoated Corrugated Cardboard/Kraft Paper | Yes | 424,682 | 216,795 | 207,887 |
| Waxed Cardboard | No | 12,019 | 8,413 | 3,606 |
| High Grade Office Paper | Yes | 23,687 | 11,844 | 11,844 |
| Magazines/Catalogs | Yes | 36,615 | 18,307 | 18,307 |
| Newsprint | Yes | 31,215 | 15,608 | 15,608 |
| Other Recyclable Paper | Yes | 157,842 | 110,489 | 47,353 |
| Compostable Paper | No | 254,759 | 178,331 | 76,428 |
| Remainder/Composite Paper | No | 30,758 | 29,220 | 1,538 |
| **Plastic** | | 608,315 | 520,102 | 88,213 |
| PET Beverage Containers (non-MA deposit containers) | Yes | 28,992 | 20,294 | 8,697 |
| PET Containers other than Beverage Containers (which originally contained non-hazardous material) | Yes | 7,962 | 5,573 | 2,389 |
| Plastic MA Deposit Beverage Containers | Yes | 5,378 | 3,765 | 1,613 |
| HDPE Bottles, colored and natural, (which originally contained non-hazardous material) | Yes | 19,262 | 13,483 | 5,778 |
| Plastic Tubs and lids (HDPE, PP, etc) | Yes | 15,974 | 11,182 | 4,792 |
| Plastic Containers #3-#7 (which originally contained non-hazardous material) | Yes* | 22,126 | 22,126 | - |
| Expanded Polystyrene Food Grade | No | 15,665 | 14,099 | 1,567 |
| Expanded Polystyrene Non-food Grade | No | 8,045 | 7,241 | 805 |
| Bulk Rigid Plastic Items | No | 70,850 | 49,595 | 21,255 |
| Film (non-bag clean commercial and industrial packaging film) | No | 20,851 | 18,766 | 2,085 |
| Grocery and other Merchandise Bags | No | 21,852 | 15,296 | 6,556 |
| Other Film means plastic film | No | 211,711 | 190,540 | 21,171 |
| Remainder/Composite Plastic | No | 159,647 | 148,143 | 11,505 |
| **Metal** | | 165,565 | 143,965 | 21,600 |
| Aluminum Beverage Containers (non-MA deposit containers) | Yes | 1,412 | 988 | 424 |
| Aluminum MA Deposit Beverage Containers | Yes | 5,893 | 4,125 | 1,768 |
| Tin/Steel Containers | Yes | 25,784 | 18,049 | 7,735 |
| Other Aluminum | Yes | 14,268 | 12,841 | 1,427 |
| Other Ferrous and non-ferrous | Yes | 35,625 | 32,062 | 3,562 |
| White Goods | Yes | 10,220 | 7,154 | 3,066 |
| Remainder/Composite Metal | No | 72,364 | 68,746 | 3,618 |
| **Glass** | | 70,502 | 57,098 | 13,404 |
| Glass Beverage Containers (non-MA deposit containers) | Yes | 24,004 | 16,803 | 7,201 |
| Other Glass Packaging Containers (non-MA deposit containers) | Yes | 15,227 | 13,705 | 1,523 |

| | | | | |
|---|---|---|---|---|
| Glass MA Deposit Beverage Containers | Yes | 12,464 | 8,725 | 3,739 |
| Remainder/Composite Glass | No | 18,806 | 17,865 | 940 |
| **Organic Materials** | | 1,367,014 | 760,507 | 606,507 |
| Food Waste | Yes* | 1,134,673 | 567,336 | 567,336 |
| Branches and Stumps | Yes** | 5,505 | 4,954 | 550 |
| Prunings, Trimings, Leaves and Grass | Yes | 109,550 | 76,621 | 32,930 |
| Manures | No | 3,470 | 3,470 | - |
| Remainder/Composite Organic | No | 113,816 | 108,125 | 5,691 |
| **Construction and Demolition (in MSW and C&D streams)** | | 897,317 | 640,315 | 257,002 |
| Asphalt Pavement, Brick, and Concrete | Yes | 3,176 | 1,588 | 1,588 |
| Aggregates, Stone, Rock | No | 19,160 | 9,580 | 9,580 |
| Wood – Treated | Yes | 287,773 | 267,281 | 20,492 |
| Wood – Untreated | Yes | 229,710 | 96,318 | 133,392 |
| Asphalt Roofing | No | 69,667 | 26,494 | 43,174 |
| Drywall/Gypsum Board | Yes* | 44,758 | 40,739 | 4,019 |
| Carpet and Carpet Padding | No | 168,336 | 127,495 | 40,841 |
| Remainder/Composite Construction and Demolition | No | 74,737 | 70,822 | 3,916 |
| **Household Hazardous Waste** | | 170,665 | 168,167 | 2,498 |
| Ballasts, CFLs, and Other Fluorescents | Yes*** | 313 | 281 | 31 |
| Batteries – Lead Acid | Yes | 635 | 572 | 64 |
| Batteries – Other | No | 1,936 | 1,743 | 194 |
| Paint | No | 3,340 | 3,006 | 334 |
| Bio-Hazardous | No | 145,684 | 145,684 | - |
| Vehicle and Equipment Fluids | No | 5,017 | 4,515 | 502 |
| Empty Metal, Glass, and Plastic Containers (that originally contained toxic materials) | No | 6,221 | 5,599 | 622 |
| Pesticides and Fertilizers | No | - | - | - |
| Other Hazardous or Household Hazardous Waste | No | 7,519 | 6,767 | 752 |
| **Electronics** | | 46,543 | 41,889 | 4,654 |
| Computer-related Electronics | No | 9,002 | 8,102 | 900 |
| Other “brown goods” | No | 30,685 | 27,616 | 3,068 |
| Televisions and Computer Monitors | Yes* | 6,856 | 6,170 | 686 |
| **Other Materials** | | 720,584 | 455,656 | 264,928 |
| Tires and other rubber | Yes** | 30,947 | 27,852 | 3,095 |
| Textiles | No | 255,047 | 127,524 | 127,524 |
| Bulky Materials | No | 386,558 | 255,591 | 130,967 |
| Mattresses | No | 3,118 | 2,183 | 935 |
| Restaurant Fats, Oils and Grease | No | 3,226 | 2,903 | 323 |
| Other Miscellaneous | No | 41,688 | 39,603 | 2,084 |
| **Total** | | 5,018,082 | 3,376,707 | 1,641,376 |
| | | | | 33% |
| **Notes** | | | | |

Column 2 - Baseline disposal based on 2016 waste characterization data and 2018 statewide disposal data. This tonnage only includes MSW and C&D disposal and excludes other non-MSW disposal of approximately 600,000 tons.

Columns 3 and 4 show one possible scenario of disposal and reduction for 2030 that would be on course with a 90% reduction in disposal tons by 2050. Note that there are many combinations of reductions by material category that could achieve this same target.

The box to the right represents % remaining/reduction assumptions applied by material category for each of these two scenarios.

All values listed in annual tons.

| | 90% Goal Remaining | 90% Goal Reduction |
|---|---|---|
| high | 50% | 50% |
| med-high | 70% | 30% |
| med-low | 90% | 10% |
| low | 95% | 5% |
| zero | 100% | 0% |

* partial waste ban item

** banned from combustion

*** hazardous

# Appendix C – DRAFT 2018 Solid Waste Data Update

## Goals and Methodology Summary

MassDEP's current waste reduction goal in the 2020 Solid Waste Master Plan is to reduce disposal on an annual basis from 6,550,000 tons in 2008 to 4,550,000 tons by 2020. In the *Draft 2030 Solid Waste Master Plan*, MassDEP has proposed goals to reduce waste disposal from 5,660,000 tons in 2018 to 4,020,000 tons by 2030, a reduction of 1,640,000 tons on an annual basis. Table 1 summarizes the methodology for the disposal reduction calculation in future years.

**Table 1 Methodology Summary**

| Waste Reduction Rates | | Equation |
|---|---|---|
| Disposal Tonnage | = | In State Disposal (Landfill & Municipal Waste Combustor) + Export for Disposal – Import for Disposal |
| Disposal Tonnage Reduction | = | 2018 Disposal Tons – Current Year Disposal Tons |
| % Disposal Reduction | = | $\frac{\text{2018 Disposal Tons – Current Year Disposal Tons}}{\text{2018 Disposal Tons}}$ |

## Progress in Meeting Current Disposal Reduction Milestone

Total disposal in 2018 was 5,660,000 tons, a decrease of 890,000 tons, or 14 percent, from 2008.

## Solid Waste Management Overview

Table 2 highlights how solid waste disposal changed from 2017 to 2018, measured in tonnage and percent change. From 2017 to 2018, total disposal decreased by 1 percent. Of the total waste that required disposal, 4.5 million tons were disposed in-state, of which 1.3 million tons were land filled and 3.2 million tons were combusted. Massachusetts exported 1.8 million tons for disposal and imported 630,000 tons, and thus was a net exporter of about 1,190,000 tons of waste requiring disposal. See Table 5 for a more detailed picture of disposal import and export data by state.

**Table 2 Solid Waste Tonnage and Percent Change Summary: 2017 - 2018**

| | 2017 | 2018 | Tons Change | % Change |
|---|---|---|---|---|
| **Disposal** (Incl. Net Exports) | **5,720,000** | **5,660,000** | **(60,000)** | **-1.0%** |
| In-State Disposal | **4,490,000** | **4,470,000** | **(20,000)** | **-0.4%** |
| Landfill | **1,310,000** | **1,270,000** | **(40,000)** | **-3.1%** |
| MSW | 1,140,000 | 1,190,000 | **50,000** | **4.4%** |
| C&D | 70,000 | - | **(70,000)** | **-100.0%** |
| Other | 110,000 | 70,000 | **(40,000)** | **-36.4%** |
| Combustion | **3,180,000** | **3,200,000** | **20,000** | **0.6%** |
| MSW | 3,140,000 | 3,180,000 | **40,000** | **1.3%** |
| Non-MSW | 30,000 | 20,000 | **(10,000)** | **-33.3%** |
| Net Exports | **1,230,000** | **1,190,000** | **(40,000)** | **-3.3%** |
| Exports | 1,790,000 | 1,820,000 | **30,000** | **1.7%** |
| MSW | 820,000 | 750,000 | **(70,000)** | **-8.5%** |
| Non-MSW | 970,000 | 1,070,000 | **100,000** | **10.3%** |
| Imports | 570,000 | 630,000 | **60,000** | **10.5%** |
| MSW | 540,000 | 610,000 | **70,000** | **13.0%** |
| Non-MSW | 20,000 | 20,000 | **0** | **0.0%** |

Note: % Change is calculated based on the rounded amounts in this table.
Percentages may not add exactly to 100% due to rounding.

Table 3 presents solid waste disposal data from 2010-2018, excluding 2013, when MassDEP did not publish statewide solid waste data. Tables 3 and 4 also show the Master Plan baseline year of 2008 for comparison purposes. Table 4 shows how MSW and non-MSW disposal changed from 2008 through 2018. Total MSW disposal decreased by 40,000 tons from 2017-2018, and total non-MSW disposal increased by 20,000 tons.

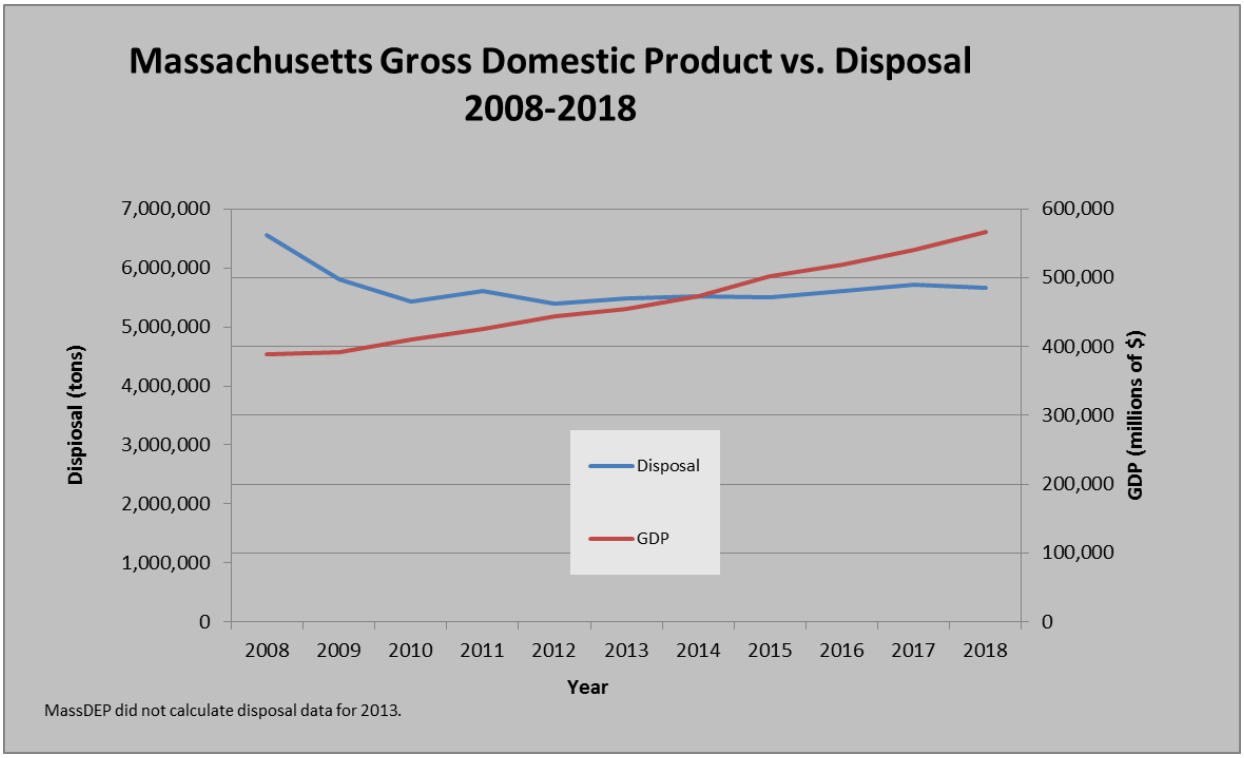
**Table 3 Solid Waste Disposal 2010-2018** (all data in tons)

| | 2008 | 2010 | 2011 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|
| **Disposal** | **6,550,000** | **5,430,000** | **5,610,000** | **5,400,000** | **5,520,000** | **5,510,000** | **5,610,000** | **5,720,000** | **5,660,000** |
| **Landfill** | **1,740,000** | **1,560,000** | **1,650,000** | **1,700,000** | **1,560,000** | **1,380,000** | 1,330,000 | 1,310,000 | 1,270,000 |
| MSW | 1,560,000 | 1,280,000 | 1,390,000 | 1,380,000 | 1,380,000 | 1,260,000 | 1,170,000 | 1,140,000 | 1,190,000 |
| C&D | 130,000 | 120,000 | 70,000 | 100,000 | 50,000 | 50,000 | 70,000 | 70,000 | 0 |
| Other | 50,000 | 170,000 | 190,000 | 220,000 | 130,000 | 70,000 | 90,000 | 110,000 | 70,000 |
| **Combustion** | **3,230,000** | **3,180,000** | **3,260,000** | **3,210,000** | **3,270,000** | **3,250,000** | **3,190,000** | **3,180,000** | **3,200,000** |
| MSW | 3,210,000 | 3,170,000 | 3,250,000 | 3,210,000 | 3,260,000 | 3,250,000 | 3,170,000 | 3,140,000 | 3,180,000 |
| Non-MSW | 10,000 | 10,000 | 10,000 | 0 | 0 | 10,000 | 20,000 | 30,000 | 20,000 |
| **Net Exports** | **1,580,000** | **690,000** | **700,000** | **490,000** | **690,000** | **880,000** | **1,090,000** | **1,230,000** | **1,190,000** |
| Exports | 1,850,000 | 1,270,000 | 1,340,000 | 1,050,000 | 1,190,000 | 1,380,000 | 1,560,000 | 1,790,000 | 1,820,000 |
| MSW | 840,000 | 690,000 | 630,000 | 510,000 | 460,000 | 620,000 | 680,000 | 820,000 | 750,000 |
| Non-MSW | 1,010,000 | 580,000 | 710,000 | 540,000 | 730,000 | 760,000 | 880,000 | 970,000 | 1,070,000 |
| Imports | 270,000 | 580,000 | 640,000 | 560,000 | 490,000 | 500,000 | 460,000 | 570,000 | 630,000 |
| MSW | 240,000 | 440,000 | 390,000 | 420,000 | 460,000 | 460,000 | 420,000 | 540,000 | 610,000 |
| Non-MSW | 30,000 | 140,000 | 240,000 | 150,000 | 40,000 | 50,000 | 40,000 | 20,000 | 20,000 |

**Table 4 MSW and NON MSW Disposal 2008-2018**

| | 2008 | 2010 | 2011 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | % change vs 2008 | % change vs 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Disposal (Tons) | 6,540,000 | 5,440,000 | 5,620,000 | 5,390,000 | 5,510,000 | 5,510,000 | 5,620,000 | 5,720,000 | 5,650,000 | -0.14 | -0.01 |
| MSW | 5,370,000 | 4,700,000 | 4,880,000 | 4,680,000 | 4,640,000 | 4,670,000 | 4,600,000 | 4,560,000 | 4,510,000 | -0.16 | -0.01 |
| Non-MSW | 1,170,000 | 740,000 | 740,000 | 710,000 | 870,000 | 840,000 | 1,020,000 | 1,160,000 | 1,140,000 | -0.03 | -0.02 |

## Comparing Disposal Trends to State Economic Trends




The chart above gives a visual representation of Massachusetts waste disposal totals from 2008-2018 in the context of the state's Gross Domestic Product (GDP) over the same time frame, measured in millions of current dollars.

While GDP has grown by 46 percent from 2008-2018, disposal decreased by 14 percent during that same period. From 2017 to 2018, GDP increased by 5 percent and disposal decreased by 1 percent. Note that the 2013 disposal data in this chart is estimated based on averaging 2012 and 2014 disposal.

| | 2008 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | % change vs. 2008 | % change vs. 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GDP (millions of dollars) | 388,583 | 409,763 | 425,593 | 444,330 | 454,346 | 473,454 | 502,678 | 519,741 | 540,949 | 567,255 | 46% | 5% |
| Total Disposal (tons) | 6,550,000 | 5,430,000 | 5,610,000 | 5,400,000 | 5,480,000 | 5,520,000 | 5,510,000 | 5,610,000 | 5,720,000 | 5,660,000 | -14% | -1% |

## Disposal Import/Export Data for 2017-2018

Table 5 shows MSW and C&D data exported and imported for disposal by state. The export and import data for Massachusetts was collected from annual facility reports (AFR) submitted to MassDEP and from direct correspondence with other states. In some instances, the export data provided in the AFR differed from that reported from other states. In order to calculate the most inclusive estimate of export, the higher number from the two sources was used. For example, if

an AFR reported that Massachusetts sent Connecticut 10,000 tons of MSW, and Connecticut reported receiving 29,000 tons of MSW from Massachusetts, 29,000 tons of export was used.

**Table 5 Disposal Import/Export Data by State (tons): 2017-2018**

**MSW Exported**

| State | 2017 | 2018 |
|---|---|---|
| CT | 37,638 | 1,857 |
| ME | 46,800 | 40,762 |
| NH | 398,872 | 388,499 |
| NY | 148,271 | 164,743 |
| OH | 189,201 | 140,229 |
| RI | - | - |
| VA | | 15,966 |
| VT | 3,219 | - |
| **TOTAL** | **824,001** | **752,056** |

**C&D Exported**

| State | 2017 | 2018 |
|---|---|---|
| CT | 13,443 | 0 |
| ME | 8,864 | 20,647 |
| NH | 891 | 108,147 |
| NY | 184,746 | 77,037 |
| OH | 360,744 | 556,091 |
| RI | 1,579 | 11,474 |
| **TOTAL** | **570,267** | **773,396** |

**MSW Imported**

| State | 2017 | 2018 |
|---|---|---|
| CT | 85,134 | 93,516 |
| ME | 6,830 | 52 |
| NH | 220,429 | 290,444 |
| NY | 18,802 | 33,970 |
| RI | 210,642 | 191,336 |
| VT | 1,466 | 2,012 |
| **TOTAL** | **543,303** | **611,330** |

**C&D Imported**

| State | 2017 | 2018 |
|---|---|---|
| CT | 195 | 596 |
| ME | 75 | 79 |
| NH | 9,391 | 6,219 |
| NY | 1 | 1 |
| RI | 4,783 | 643 |
| VT | 5 | 0 |
| **TOTAL** | **14,450** | **7,538** |

## Management of Ash from Municipal Waste Combustors

Table 6 shows the Massachusetts landfills accepting municipal waste combustion (MWC) ash and their anticipated lifespan according to current permit conditions. Table 6A shows the amount of ash generated by individual MWCs and where it was disposed, as well as the amount of metal recovered from each.

| **Table 6: Ash Landfills Anticipated Capacity** | |
|---|---|
| **Landfill** | **Projected Closure Year** |
| Bondi Island* | 2023 |
| Carver Marion Wareham | *2020* |
| Ward Hill Neck | 2021 |
| Peabody | 2025 |
| Wheelabrator Saugus | 2022 |
| Wheelabrator Shrewsbury | 2028 |
| *Permit application in-house that would provide an additional 7-8 years. | |

| Table 6A: Municipal Waste Combustor Ash Management (2018) | | | | |
|---|---|---|---|---|
| **Combustion Facility** | **Ash Disposed (tons)** | **Disposal Facilities** | **Pre-Combustion Metal Recovery (tons)** | **Post-Combustion Metal Recovery (tons)** |
| Haverhill | 147,127 | Ward Hill, Haverhill | 100 | 13,943 |
| Millbury | 117,687 | Shrewsbury | 75 | 9,070 |
| North Andover | 101,247 | Shrewsbury | - | 7,226 |
| Pittsfield | 4,821 | Bondi's Island, Springfield | - | 2,068 |
| Saugus | 122,762 | Saugus, Shrewsbury | - | 6,204 |
| SEMASS | 185,875 | Bourne, Carver/Marion/Wareham | 26,786 | 10,935 |
| Springfield | 37,901 | Bondi's Island, Springfield | 98 | 5,371 |
| **Totals** | **717,420** | | **27,059** | **54,817** |

## Rail Transfer Capacity

Table 7 illustrates the growing trend of increased rail disposal capacity in Massachusetts, included the current permit status, tons accepted, and types of waste accepted.

| Table 7: Summary of Rail Transfer Facilities | | | | | | |
|---|---|---|---|---|---|---|
| **Facility Name** | **Region** | **Town** | **Current Status** | **Tons/Day** | **Tons/Year** | **Waste** |
| Champion City Recovery | SERO | Brockton | Operating | 1,000 | 286,000 | C&D |
| Devens Recycling Center | CERO | Devens | Operating | 1,500 | 390,000 | MSW, C&D |
| Lenox Valley Waste Transfer Facility | WERO | Lenoxdale | Operating | 198 | 53,262 | MSW, C&D |
| New England Waste Disposal | SERO | Taunton | Operating | 940 | 244,400 | MSW, C&D |
| Tri-County Recycling | WERO | Ware | Operating | 750 | 195,000 | C&D |
| Trojan Recycling | SERO | Brockton | Operating | 500 | 140,400 | MSW, C&D |
| Upper Cape Regional Transfer Station | SERO | Falmouth | Operating | 286 | 74,360 | MSW, C&D |
| Western Recycling | WERO | Wilbraham | Operating | 645 | 167,700 | MSW, C&D |
| Yarmouth-Barnstable Regional Rail Transfer Station | SERO | Yarmouth | Operating | 530 | 137,800 | MSW |
| TLA Holbrook | SERO | Holbrook | Permit under review | 1,000 | 260,000 | MSW |
| Casella | WERO | Holyoke | Permitted | 1,250 | 382,500 | MSW, C&D |
| Howard Transfer Station | NERO | Roxbury | Permitted | - | - | - |
| Parallel Products of New England | SERO | New Bedford | Seeking approval | 1,500 | 390,000 | MSW, C&D |
| Wood Recycling, Inc. | NERO | Peabody | Permitted | - | - | - |
| Covanta SEMASS | SERO | Wareham | Seeking approval | | | MSW |
| United Materials Management of Leominster | CERO | Leominster | Seeking approval | 1,000 | 300,000 | MSW, C&D |
| McNamara Transfer Station | WERO | Springfield | Under construction | 699 | 181,740 | MSW, C&D |
| **Totals** | | | | **10,099** | **2,721,422** | |

**Waste Management Capacity Projections**

The disposal capacity projections in Table 8 reflect either actual permitted capacity, approved capacity contingent on receiving permits, or capacity based on facility contract commitments. However, some landfills may take in less than their permitted tonnage in a particular year. In these cases, capacity for a particular landfill may last beyond the date shown in these projections. In other cases, a landfill may choose to accept a different material than MSW, such as municipal waste combustion ash, so that a portion of this permitted capacity may not be available for MSW. MassDEP attempts to take these factors into account by projecting only the percent of potential landfill capacity that is actually used for MSW and C&D disposal. The combustion capacity is shown as level based on permit limits, although this actual amount managed will always be somewhat lower than these limits.

**Table 8: Projected Disposal Capacity 2018-2030 (Tons Per Year)**

| Municipality | Permitted Capacity | End of current permitted capacity | Lifetime of LF | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Active Landfills** | | | | | | | | | | | | | | | |
| Bourne | 30,000 | 2021 | **2024** | 30,000 | 30,000 | 30,000 | 219,000 | 219,000 | 219,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carver | 101,125 | 2020 | **2020** | 101,125 | 101,125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dartmouth | 115,000 | 2024 | **2026** | 115,000 | 115,000 | 115,000 | 115,000 | 115,000 | 115,000 | 115,000 | 115,000 | 0 | 0 | 0 | 0 |
| Middleborough | 60,000 | 2020 | **2031** | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| Nantucket | 26,000 | 2029 | **2029** | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 0 |
| Taunton | 120,120 | 2019 | **2020** | 120,120 | 120,120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Westminster | 390,000 | 2024 | **2024** | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Municipal Waste Combustors** | | | | | | | | | | | | | | | |
| Agawam | 131,400 | | | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 | 131,400 |
| Haverhill | 602,250 | | | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 | 602,250 |
| Millbury | 529,575 | | | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 | 529,575 |
| North Andover | 460,500 | | | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 |
| Pittsfield | 84,000 | | | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 | 84,000 |
| Rochester | 1,250,000 | | | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| Saugus | 460,500 | | | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 | 460,500 |
| | *4,360,470* | *3,518,225* | | | | | | | | | | | | | |
| **TOTAL PERMITTTED COMBUSTION CAPACITY** | *3,518,225* | | | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* | *3,518,225* |
| **ADJUSTED TOTAL COMBUSTION CAPACITY*** | | | | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* | *3,190,000* |
| **TOTAL PERMITTED CAPACITY** | | | | **4,360,470** | **4,024,225** | **3,964,225** | **3,934,225** | **3,934,225** | **3,934,225** | **3,544,225** | **3,544,225** | **3,544,225** | **3,544,225** | **3,544,225** | **3,518,225** |
| **TOTAL POTENTIAL CAPACITY** | | | | **4,032,245** | **4,032,245** | **3,811,000** | **4,000,000** | **4,000,000** | **4,000,000** | **3,391,000** | **3,391,000** | **3,276,000** | **3,276,000** | **3,276,000** | **3,250,000** |
| **KEY:** | | | | | | | | | | | | | | | |
| Permitted Capacity | Number without shading | | | | | | | | | | | | | | |
| Potential Additional Cap | Number with shading | | | | | | | | | | | | | | |
| **ESTIMATED TOTAL POTENTIAL AVAILABLE CAPACITY** | | | | **4,032,245** | **4,032,245** | **3,811,000** | **4,000,000** | **4,000,000** | **4,000,000** | **3,391,000** | **3,391,000** | **3,276,000** | **3,276,000** | **3,276,000** | **3,250,000** |
| **100% of potential for LFs and 91 % of potential for combustion** | | | | | | | | | | | | | | | |
| **Actual combustion varies per year, has never reached capacity** | | | | | | | | | | | | | | | |
| Total Potential Landfill Capacity | | | | 842,245 | 842,245 | 621,000 | 810,000 | 810,000 | 810,000 | 201,000 | 201,000 | 86,000 | 86,000 | 86,000 | 60,000 |

| Table 9: Waste Management Capacity Projections: 2019-2030 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** |
| | | | | | | | | | | | | | |
| **Total Disposal (baseline)** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** | **5,660,000** |
| **Total Disposal (reduced)** | **5,660,000** | **5,501,520** | **5,347,477** | **5,197,748** | **5,052,211** | **4,910,749** | **4,773,248** | **4,639,597** | **4,509,689** | **4,383,417** | **4,260,682** | **4,141,383** | **4,025,424** |
| **Combustion Capacity** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** | **3,190,000** |
| **Potential LF Capacity** | **1,270,000** | **842,245** | **842,245** | **621,000** | **810,000** | **810,000** | **810,000** | **201,000** | **201,000** | **86,000** | **86,000** | **86,000** | **60,000** |
| **In-state Disposal Capacity** | **4,460,000** | **4,032,245** | **4,032,245** | **3,811,000** | **4,000,000** | **4,000,000** | **4,000,000** | **3,391,000** | **3,391,000** | **3,276,000** | **3,276,000** | **3,276,000** | **3,250,000** |
| **Net Disposal Export (baseline disposal)** | **1,190,000** | **1,627,755** | **1,627,755** | **1,849,000** | **1,660,000** | **1,660,000** | **1,660,000** | **2,269,000** | **2,269,000** | **2,384,000** | **2,384,000** | **2,384,000** | **2,410,000** |
| **Net Disposal Export (reduced disposal)** | **1,190,000** | **1,469,275** | **1,315,232** | **1,386,748** | **1,052,211** | **910,749** | **773,248** | **1,248,597** | **1,118,689** | **1,107,417** | **984,682** | **865,383** | **775,424** |
| | | | | | | | | | | | | | |
| **Assumptions for Annual Percent Change:** | | | | | | | | | | | | | |
| **Baseline Disposal Tonnage** | 0.0% | | | | | | | | | | | | |
| **Decreased Disposal Tonnage/year** | 2.8% | | | | | | | | | | | | |
| 2018 data shows actual figures. | | | | | | | | | | | | | |