

Massachusetts
2030 Solid Waste Master Plan:
Working Together Toward Zero Waste
October 2021



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Introduction and Background

The Solid Waste Master Plan (SWMP) 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 2030 Solid Waste Master Plan (2030 Plan) proposes a broad vision and strategies for how the Commonwealth will manage waste over the next decade and beyond. The Massachusetts Department of Environmental Protection (MassDEP) has prepared the 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 in the Commonwealth. The closure of a large glass processor in Massachusetts has further stressed these markets. Solid waste disposal capacity in Massachusetts and throughout the Northeast has continued to shrink as more landfills close and are not replaced by new in-state/regional 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 challenges.

These challenges also present opportunities and can 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 implemented a nation-leading strategy to reduce food waste, highlighted by a commercial organics disposal ban for facilities generating one ton or more of organic material per week in 2014. Supported by a comprehensive strategy, fresh and perishable food rescue efforts increased by 60 percent, innovative companies and municipalities established 600,000 tons of anaerobic digestion capacity, the number of businesses with food waste collection programs more than doubled, and annual food waste reduction grew by 210,000 tons from 2014 to 2019.

Massachusetts has also built on 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 a new market development program, the [Recycling Business Development Grant](#) (RBDG) program, to help drive recycling market growth in the Commonwealth and increased investment in Massachusetts recycling businesses. MassDEP also continues to provide loans through the [Recycling Loan Fund \(RLF\)](#), 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 improving the quality of our recyclables and reducing 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.

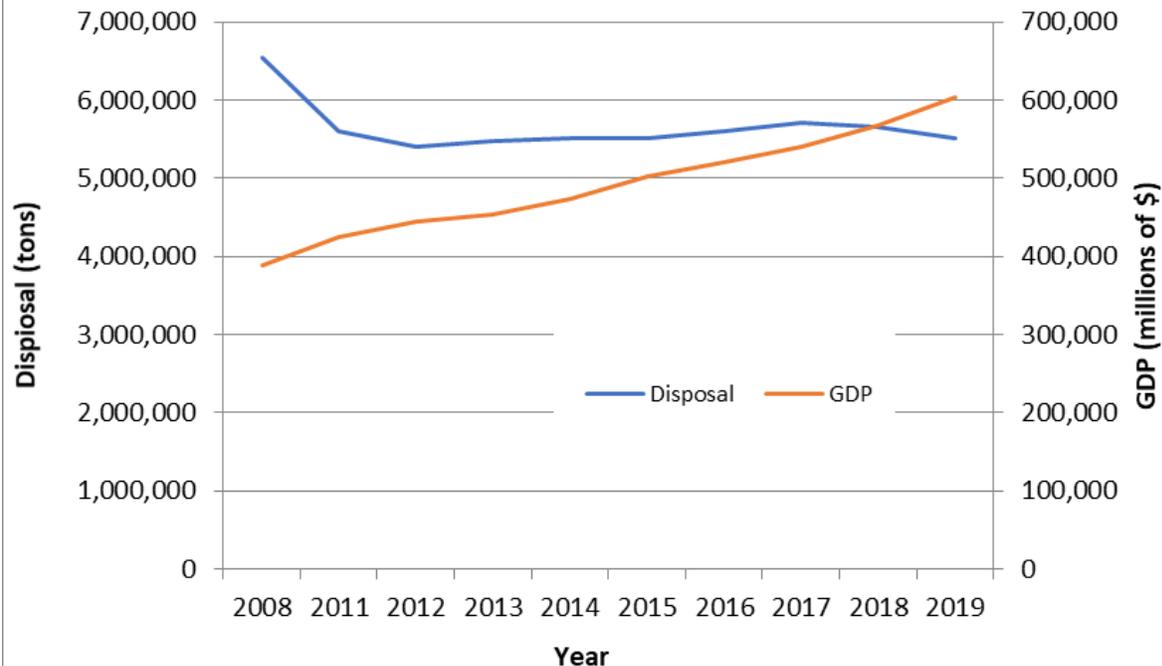
The Commonwealth is also striving to implement and grow initiatives at the top of the waste and materials management hierarchy, implementing a new reuse grant program, delivering financial and technical assistance to foster increased source reduction of food waste; reuse of office furniture and building materials; and encouraging municipal reuse efforts such as swap shops and lending libraries. In all these areas, innovative business, non-profit, and municipal organizations as well as schools are helping achieve 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 bans that prohibit the disposal of certain recyclable and compostable materials in the trash. MassDEP has increased waste ban inspections and compliance 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 annually, from 6,550,000 tons in 2008 to 4,550,000 tons in 2020. This would represent a 30 percent reduction. Through 2019, total disposal was at 5,510,000 tons, a decrease of 1,040,000 tons, or 16 percent. This current trajectory will not achieve the 2020 goal. However, 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 strive towards a zero waste future in Massachusetts.

The 16 percent decrease in waste disposal is significant considering the state gross domestic product grew by 55 percent during this time period (Figure 1). Historically, waste generation typically tracks the economy so that, without significant waste reduction and diversion, an increase in waste disposal by roughly 55 percent would have been expected during this period. At the same time, the Massachusetts population grew by 5 percent from 6,544,000 in 2008 to 6,893,000 in 2019, yet during this period disposal per capita decreased by 20 percent, from 2,000 pounds per capita in 2008 to 1,600 pounds per capita in 2019.

Figure 1. Massachusetts Gross Domestic Product vs. Disposal (2008-2019)



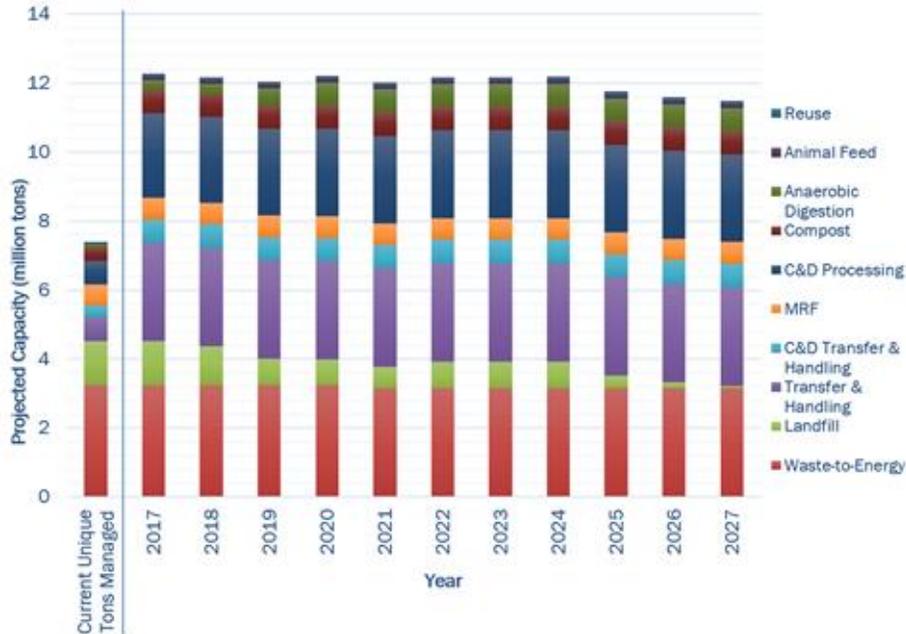
MassDEP did not calculate disposal data for 2013.

In February 2019, MassDEP published the [Massachusetts Materials Management Capacity Study](#), which was conducted for MassDEP by MSW Consultants, Inc. (Figure 2) This study showed:

- Limited and decreasing solid waste management capacity, consistent with MassDEP’s own disposal capacity projections.
- Municipal solid waste combustion capacity is being fully utilized on an annual basis and, as these facilities age, they may experience increased down time and maintenance needs.
- Landfill capacity for municipal solid waste and construction and demolition debris (C&D) is projected to decline to virtually zero by the end of the next decade.
- Massachusetts has extensive waste transfer capacity; however, most waste transfer facilities do not increase overall waste management capacity because they 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 face logistical challenges 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 high peak volumes can lead to haulers having difficulty finding adequate disposal outlets.

Figure 2. Projected In-State Solid Waste Capacity (2017-2027)



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

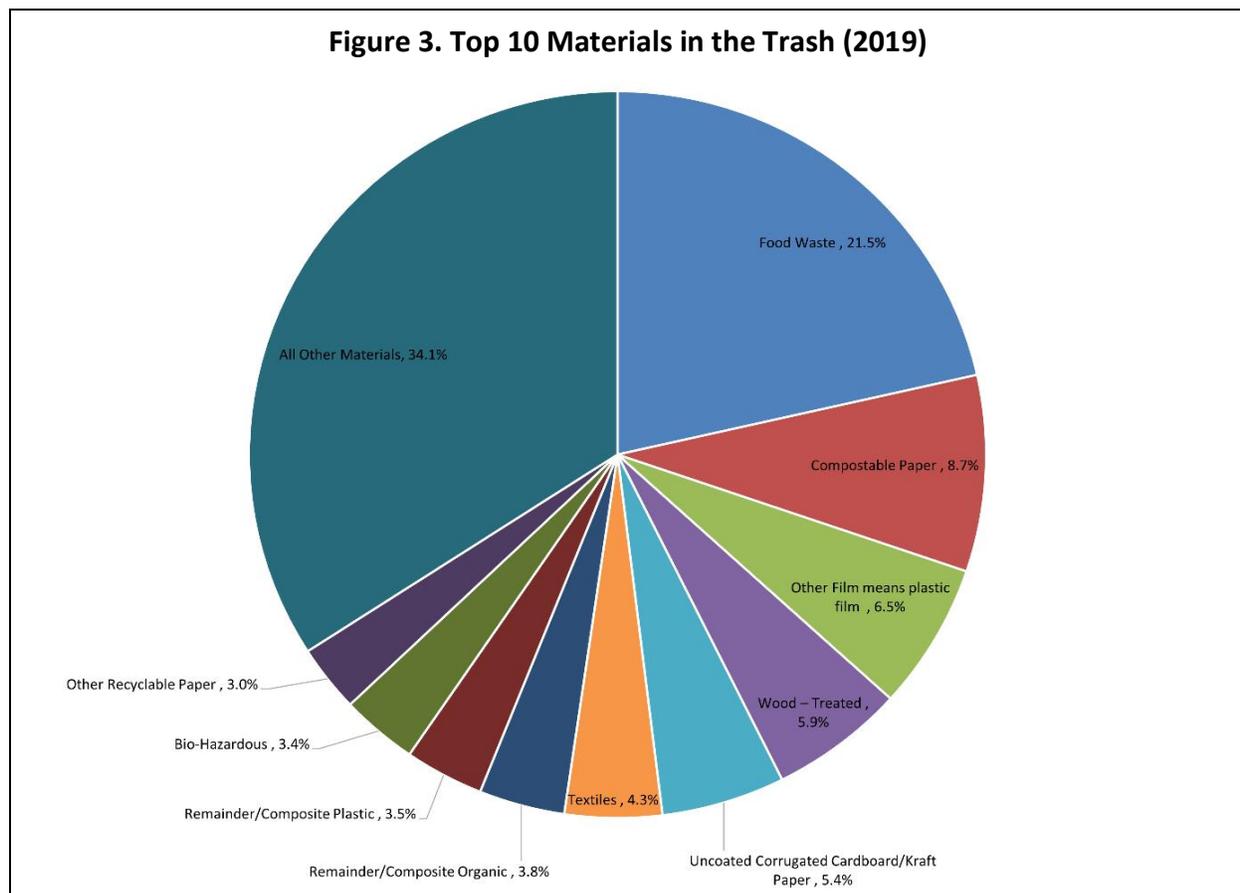
- Massachusetts also has very limited capacity at materials recovery facilities (MRFs), as these facilities are operating at nearly 100 percent of their capacity. Several facilities are making capital investments that are expected to increase their efficiency as well as their overall capacity. The Commonwealth’s continuing efforts to reduce contamination of recyclables will help increase recycling capacity because every ton of contamination 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 C&D 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’ mattress recycling infrastructure is growing and capable of processing this bulky and difficult to manage material in our waste stream.

Waste Reduction in Massachusetts by the Numbers

- **Food waste reduction** increased by 210,000 tons from an estimated 100,000 tons in 2008 up to 310,000 tons in 2018.
- **Food rescue** increased more than **60 percent** from 2008-2019.
- 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 took more than 30 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 9,800 technical assistance services, held 230 events with 6,700 attendees, and established a web site that has received more than 580,000 visits.
- **153 municipalities** (nearly 30 percent of the state's population) have implemented **Pay-as-You-Throw (PAYT)** programs.
- Massachusetts state agencies and other eligible entities purchased nearly **\$400 million** in **environmentally preferable products and services** in FY2020.
- 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 percent of the state's population have prohibited the distribution of single use plastic bags.

From an environmental and economic standpoint, waste reduction provides important benefits, particularly as we reduce more waste through source reduction and reuse.

Reducing our waste, along with diverting it with recycling, composting, and anaerobic digestion, will achieve important greenhouse gas emissions reductions and result in energy savings and resource conservation impacts 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 an increasingly 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 achieve a more robust, diverse, and cost-effective materials management system. Figure 3 shows the top materials in Massachusetts' trash by weight, which represent the greatest potential opportunities to reduce our trash disposal.



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 implementation of Massachusetts' commercial 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 opportunity is especially compelling for food, as we dispose of more than 1 million tons of food material each year, while roughly 10 percent of Massachusetts' population is food insecure¹.

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

Goals and Policies for 2020-2030

2030 Goals

1. MassDEP's 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 percent reduction in tons disposed. 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.

2050 Goals

1. MassDEP's 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 percent reduction in tons disposed.
2. Continue to reduce the toxicity of the waste stream by reducing and phasing out use of hazardous products.

Reducing Greenhouse Gas Emissions

Waste reduction can lead to significant greenhouse gas emission reductions, particularly when viewed from a lifecycle perspective. Based on the EPA Waste Reduction Model (WARM), if Massachusetts achieves the 2030 waste reduction goals, it could prevent over 1,700,000 metric tons of carbon dioxide (CO₂) equivalent from entering the atmosphere. This reduction is equivalent to removing annual emissions from over 370,000 passenger vehicles or conserving nearly 200 million gallons of gasoline.

MassDEP will continue to align the 2030 Plan with the Baker-Polito Administration's 2030 Clean Energy & Climate Plan and 2050 Decarbonization Roadmap, as well as the greenhouse gas emissions reductions requirements in the recently enacted "An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy." This includes achieving a reduction of 300,000 metric tons of CO₂ equivalent emissions annually from municipal waste combustors by reducing disposal of plastics at these facilities. Reducing and phasing out the use of single-use plastic products and packaging will help contribute to this goal.

Envisioning a Zero Waste Future for Massachusetts

MassDEP recognizes that a zero waste future requires systemic changes in how we produce, distribute, sell, and use products and services as a society. This would require Massachusetts to

move toward policies encouraging and requiring any reusable, recyclable or compostable material to be diverted from disposal at a very 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 effectively and efficiently, MassDEP has conducted analyses to identify priority materials based on the following criteria:

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.

Summary of Top Diversion/Reduction Priorities

1. Divert materials with significant potential.

<u>Material</u>	<u>Diversion potential (tons per year)</u>
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

MassDEP has analyzed Massachusetts waste characterization data to estimate additional diversion potential by material category. See Figure 3 for a summary of the top materials disposed in our trash today. A full analysis including additional diversion and reduction potential for all material categories is included in Appendix B.

Ongoing Engagement on Plan Implementation and Measuring Progress

In the sections that follow, MassDEP describes goals and strategies by program area. In addition, MassDEP expects to work closely with stakeholders to develop and periodically update separate Action Plans for key program areas, including source reduction and reuse, organics waste reduction, C&D waste reduction, and market development.

In gathering input on this plan, MassDEP heard from many stakeholders on the need for continued engagement as we move forward. A number of environmental justice, advocacy and community organizations identified the need for regular interaction on issues related to their communities. Changes to solid waste management and recycling markets have also underscored the need for regular engagement among communities, businesses and citizens. Several of the initiatives described in more detail below include workgroups to provide input to MassDEP's ongoing implementation of the Solid Waste Master Plan and related initiatives, measures to determine success, and to identify new areas of collaboration moving forward. MassDEP will engage environmental justice populations and other overburdened communities in its efforts to develop and implement a Solid Waste Master Plan that recognizes the importance of environmental justice and equity when addressing the issue of managing our waste.

MassDEP has included a number of initiatives in the 2030 Plan to strengthen our engagement with and support of environmental justice communities. These include:

- Increasing engagement with environmental justice populations in all phases of MassDEP's regulatory process from development to implementation.
- Continuing to provide program information and outreach materials in multiple languages to ensure equitable access for all people.
- Implementing recycling grant evaluation criteria that prioritize environmental justice communities and ensuring that MassDEP connects with environmental justice communities in its grant program outreach.
- Promoting small scale composting assistance to enable composting at community gardens in environmental justice areas.
- Working with municipal partners to promote MassDEP's Illegal Disposal Surveillance Program in communities with environmental justice populations to reduce illegal dumping in those communities.
- Promoting and encouraging the use of electric and hybrid trash and recycling collection vehicles in environmental justice communities. MassDEP will work with communities to encourage the use of low- or zero emission collection vehicles in community contracts

with trash and recycling vendors. MassDEP has funded low emission collection vehicles with Diesel Emission Reduction Act, Supplemental Environmental Project, and Volkswagen mitigation funds and would seek to expand these investments with funds from the Transportation Climate Initiative Program (TCI-P) auction proceeds, once implemented.

Major New and Expanded Initiatives

Major new or expanded program and policy initiatives proposed in the 2030 Plan are:

Legislative Strategies

- Work with the Legislature and its Zero Waste Caucus and stakeholders to:
 - Develop an effective approach to reduce the use of single use packaging.
 - Advance extended producer responsibility (EPR) systems for paint, mattresses, electronics and other products and packaging. Continue to administer and enhance existing EPR programs (Bottle Deposit Law, Mercury Products, etc.).
 - 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 for implementation of regulations to lower the current one ton per week threshold for Massachusetts' commercial food waste disposal ban to one-half ton per week by 2022.
- Work closely with municipal officials to provide 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 by 2022 to drive increased mattress recycling, and reuse and recycling of textiles.
- Increase the amount and frequency of waste ban inspections to monitor waste ban compliance by waste haulers and generators and to take enforcement action on waste ban violations.
- Establish a minimum performance standard (MPS) for C&D processing facilities to increase recycling of materials banned from disposal and improve compliance with waste disposal bans.
- Continue to allow permitting of up to 350,000 tons of additional annual management capacity in the form of innovative disposal technologies or other integrated waste management solutions and allow replacement of existing combustion capacity with more advanced technologies that reduce emissions and increase separation of recyclable materials.
- In the SWMP program review to be conducted in 2025, make a concerted effort to improve the performance of existing combustion capacity and explore the potential to establish a declining cap on carbon dioxide emissions on the municipal waste

combustors. This would be similar to that of other electricity generation facilities and consistent with the objectives of the Global Warming Solutions Act and the 2030 Clean Energy and Climate Plan.

- In all of MassDEP's regulation and program development and implementation, enhance engagement with environmental justice populations in recognition that these people and communities have historically borne a disproportionate environmental burden, including impacts from solid waste disposal activities. In addition, environmental justice communities also may benefit from the positive economic and environmental efforts to reduce, reuse and recycle.
- Support innovation in waste reduction and recycling through work with leading academic and research institutions and enhanced grant opportunities.

First Year Plan Priorities

In addition to ongoing implementation of core permitting, inspection, enforcement, grant, outreach, and assistance programs, MassDEP has established several priorities to implement in the first year of the 2030 Plan. MassDEP believes that these short-term priorities will contribute to significant progress in reducing the disposal of targeted priority materials.

- ***Legislative coordination*** – Work with the Legislature's Zero Waste Caucus and other interested legislators to inform the development of a solid waste and waste reduction legislative agenda.
- ***Source Reduction & Reuse (R&R) Workgroup and Action Plan*** – MassDEP will establish a Source Reduction and Reuse (R&R) Workgroup to engage stakeholders in the development of a comprehensive R&R Action Plan. MassDEP will hold regular meetings and work to ensure broad and inclusive stakeholder and public engagement in this effort. MassDEP plans to issue an initial R&R Action Plan in 2021 and will update this plan as needed.
- ***Expanded waste bans*** – MassDEP is finalizing regulations to reduce the threshold for the commercial organics/food waste disposal ban from one ton to one-half ton per week. These regulations also include waste disposal bans on mattresses and textiles
- ***C&D minimum performance standard (MPS)*** – MassDEP has issued a MPS for waste ban compliance by C&D processing facilities and transfer stations. This began in 2020 and will ensure a level playing field across the industry, supporting companies that have made equipment and staffing investments to maximize recycling.
- ***Renew and increase waste ban inspections*** – Due to health concerns during the COVID emergency, MassDEP temporarily suspended waste ban inspections. MassDEP has resumed these inspections and will increase these inspections as well as leverage other ways to achieve waste ban compliance, including increased use of solid waste facility

and third-party data and use of formal information requests. MassDEP's goal is to conduct at least 200 inspections annually.

- ***Municipal recycling contracting guidance*** – MassDEP will develop guidance for municipalities on best practices for cost-effectively contracting for recycling collection and processing services.
- ***State Agency Recycling Market Development Council*** – The Baker-Polito Administration will establish a State Agency Recycling Market Development Council. This Council, which will be chaired by the Executive Office of Energy and Environmental Affairs, will bring together Secretariats including Administration and Finance, Education, Housing and Economic Development, and Transportation. This group will focus on increasing the use of recycled materials in state building, construction, and renovation projects and increasing state purchasing of recycled content products. Focus materials are expected to include asphalt shingles, glass, compost, office furniture, and tires.
- ***Enhanced Investment to Advance Waste Reduction Innovation and Business Development*** - MassDEP will advance research and development for new waste reduction and recycling technologies and strategies and expand its grant programs to foster development and expansion of recycling markets. As part of this effort, MassDEP will create a new grant program to invest in innovation, committing \$1 million in initial funding.
- ***Market Development Work Group and Action Plan*** – MassDEP will establish a recycling market development work group to engage a broad and diverse set of stakeholders in developing a comprehensive recycling market development Action Plan. This Plan will prioritize potential investments that address specific material market deficiencies and, where possible, advance opportunities in and needs of environmental justice populations.
- ***Annual disposal and solid waste capacity updates*** – MassDEP will continue to prepare and publish annual disposal and solid waste capacity updates, beginning with the 2020 update by fall 2021. These annual updates will report on progress towards Massachusetts waste disposal reduction goals.

2025 Program and Policy Assessment

MassDEP will work through the Solid Waste Advisory Committee to prepare a mid-course program and policy assessment by 2025. This assessment will report on progress on implementing the programs and policies identified in the 2030 Plan and update the status of the C&D, Organics, Reduction & Reuse, and Market Development Action Plans. As part of the 2025 program and policy assessment, MassDEP will consider whether additional measures are needed to advance the goals of the action plans, and the 2030 Plan as a whole.

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.

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

Strategies

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.

Figure 4. Libraries of Things at Peabody Institute Library, Danvers



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
- EcoBuilding Bargains
- Boston Building Resources

Residential

- Provide [micro grants](#) to municipalities, nongovernmental organizations, 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 and implement a communications plan to educate residents on how to adopt best practices for reducing waste, increasing reuse and repair, and extending product lifespans.

Commercial and institutional

- Provide market development assistance and grants to improve utilization of reused materials in value-added applications.
- Foster increased use of dishwashers and beverage dispensers to switch from disposable to reusable food service ware in school, institutional and corporate cafeterias.
- Support and promote initiatives to test reusable shipping containers or materials and share 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 or map to help connect Massachusetts residents with reuse/repair/share resources across the state.

Figure 5. Habitat for Humanity Restore in Ashland, MA



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

- 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 state or local policy models that advance source reduction, reuse, and repair such as deconstruction and reuse in building codes or conversion to refillable water stations from single use water bottles in government buildings.

Organics Waste Reduction

Goal

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

Strategies

Work with stakeholders to implement the [Action Plan](#) targeting different sectors, including large commercial and institutional generators, medium business and institutional generators, and small businesses and residents.

For large generators (> 1 ton per week)

- Develop initiatives and 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 (½-1 ton per week)

- Develop a comprehensive strategy to support reducing the threshold for the commercial organics waste disposal ban to one-half 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 (< ½ ton per week)

- Develop a multi-pronged approach to reduce food waste from small sources including:
 - Raising awareness about how to reduce food waste.

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

- Employment across the industry **increased 150 percent 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 \$50 million in capital investments**.

Source:

<https://www.mass.gov/files/documents/2016/12/201612201612/pu/orgecon-pres.pdf>

- Supporting increased adoption of on-site home composting.
- Fostering further development of community and drop-off composting programs
- Developing efficient models for curbside food waste collection.
- Promoting small scale composting at community gardens in urban areas and prioritize this activity in communities with Environmental Justice populations. This could include grants for start-up equipment and technical assistance to encourage participation.
- Conducting a stakeholder process by 2025 to assess whether to ban all organic waste from disposal by 2030.

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, and 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 programs and policy actions to progress towards these goals:

Incentives and 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.

Training, education, and outreach

- Increase adoption of the [Recycling IQ Kit](#) at the local level to implement hands-on, 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 the existing recycling infrastructure.

Policies and regulations

- Implement 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 requirement that ensures a level playing field and consistent access to recycling, especially for residents not served by municipal programs.

Pay As You Throw (PAYT) Fast Facts

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

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 percent 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 over 70 percent from the first week (31.6 percent) to the last week of the program (9.8 percent). It took two “oops tags” or less to bring 87 percent of households into compliance in the most non-compliant area.



Commercial Waste Reduction

Goal

- One of every four loads of trash that MassDEP observes at solid waste facilities contains significant amounts of materials that are banned from disposal. Through inspections, compliance, enforcement, and assistance, MassDEP aims to reduce the percentage of waste ban failed loads from 25 percent in 2018 to 10 percent by 2030².
- Reduce the disposal of other targeted materials from businesses and institutions that are not banned from disposal such as furniture and office equipment.

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

Strategies

Improve waste ban compliance and enforcement.

- Increase the amount and frequency of MassDEP waste ban inspections. Complete 200 waste ban inspections including 10,000 loads of trash annually.
- 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 from 1 ton to ½ ton per week), mattresses, and textiles.

Business Recycling Assistance

- RecyclingWorks in Massachusetts delivered 9,800 technical assistance services, held 230 events with nearly 6700 attendees, and established a web site that has received more than -580,000 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.

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 of materials that are not banned from disposal.
- Use financial and technical assistance to support other plan sections on source reduction, reuse, and recovering 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.

Construction and Demolition (C&D) Materials Waste Reduction

Goal

Reduce disposal of C&D materials by 260,000 tons by 2030, more than double current C&D recycling tonnage.

Priority materials: wood, cardboard, gypsum, carpet.

Strategies

Continue to work with stakeholders on the development and implementation of an [Action Plan](#) to increase C&D diversion

Promote waste reuse, reduction, and separation at the job site.

- Continue the 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 material reuse 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 standard for waste ban compliance by C&D processing facilities and transfer stations.
- 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.

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 an RBDG grant.

Develop end markets.

- Expand existing wood markets and foster new market alternatives.
- 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 and new C&D waste bans.
- Promote interagency cooperation in state projects 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 waste management 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:

- Establish a State Agency Recycling Market Development Council to increase purchases of recycled products and use of recycled materials in state agency building, construction, and renovation projects. Focus areas will include glass, asphalt shingles, compost, office furniture, and tires.
- Support key market development sectors through targeted grants and loans, including the [RBDG](#) and [RLF](#).

Environmentally Preferable Purchasing

(EPP) by the Numbers (FY2020)

- Over **\$392million** spent through the statewide EPP contract.
- **\$23 million** in cost savings from energy efficient office equipment and water efficient products.
- Over **55,710** tons of recycling diverted from disposal.
- More than **15,000** state employees reached each month through the Operational Services Division 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.



- Leverage other state economic development resources, including partnering with the [Massachusetts Office of Business Development](#), [MassDevelopment](#), and other state grant and loan programs.
- Support innovation in the area of recycling through work with leading academic institutions and enhanced grant opportunities.
- Leverage additional financing and funding from other organizations, including the [Closed Loop Fund](#), US EPA and others.
- Implement additional waste bans to drive infrastructure growth in targeted sectors including mattresses, textiles, and food material from businesses.

Solid Waste Facility Oversight and Capacity Management

Goal

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

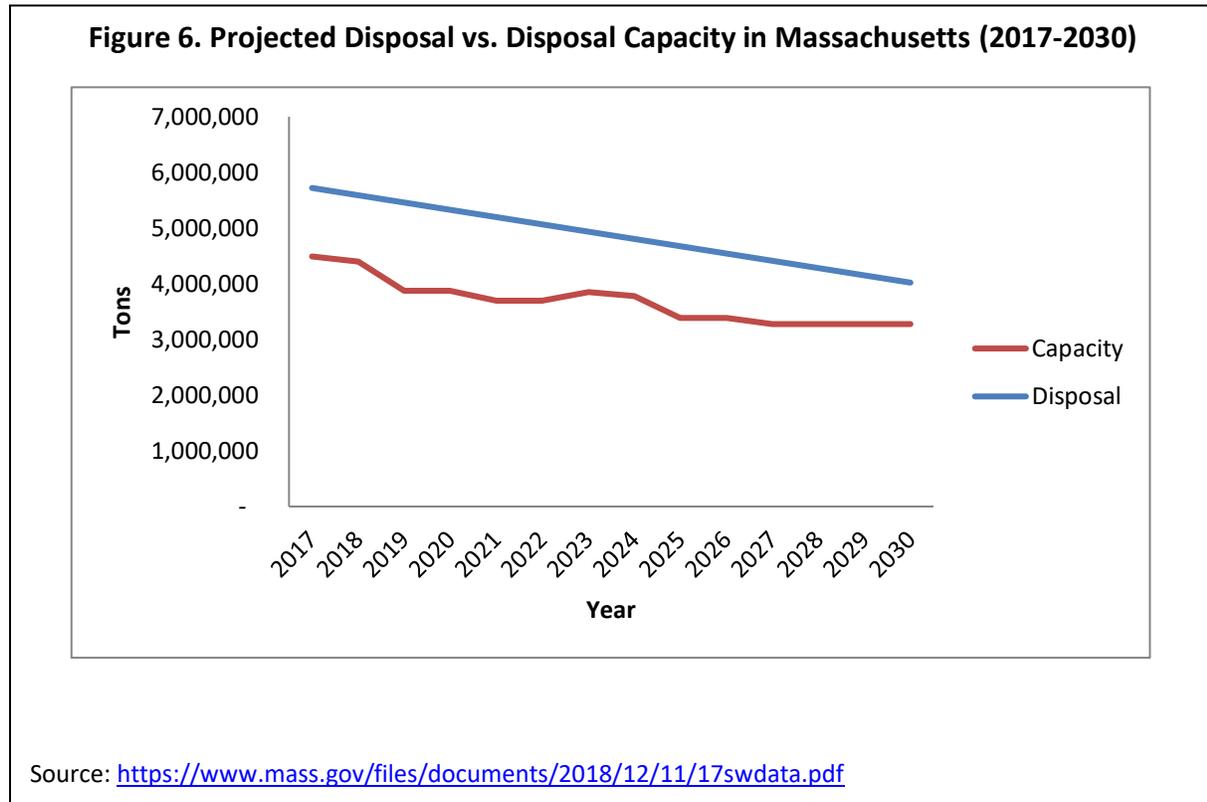


Figure 6 shows projected waste disposal by year, if Massachusetts is successful in achieving its 2030 waste reduction goal, compared to the projected available in-state disposal capacity by year. This figure assumes that all current municipal waste combustion facilities continue to operate at their current 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.

Strategies

Address solid waste capacity needs.

- Continue to consider applications received for permitting of existing and new solid waste facilities consistent with statute, regulation, and the 2030 Plan.
- Make a concerted effort to improve the performance of existing combustion capacity and, in the 2025 program review, explore the potential to establish a declining cap on

carbon dioxide emissions from municipal waste combustors. This would be similar to that of other electricity generation facilities and consistent with the objectives of the Global Warming Solutions Act and the 2030 Clean Energy and Climate Plan. In addition, MassDEP is evaluating opportunities to further reduce nitrogen oxides (NO_x) emissions from municipal waste combustors through the Ozone Transport Commission (OTC).³ On June 15, 2021, the OTC adopted “Resolution of the Ozone Transport Commission on Developing a Recommendation for Emissions Reductions from Municipal Waste Combustors,” in which the members of OTC commit to working together to develop regional and national recommendations on more stringent NO_x emissions reductions for municipal waste combustors.

- Retain capacity for municipal waste combustion within the existing 3.5 million tons of currently permitted annual capacity and reassess the need for this capacity every five years. Any replacement capacity would be required to meet tighter emissions and efficiency standards and increase separation of recyclable materials. Also retain the opportunity for permitting up to 350,000 tons per year of additional capacity through innovative technologies such as gasification, pyrolysis, and other integrated waste management solutions. 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 needs.

Oversee active solid waste, recycling and composting facilities.

- Conduct ongoing permitting, inspections and enforcement of all active facilities.
 - Review and permit facility modifications.
 - Conduct operation and maintenance inspections and waste ban inspections of active facilities.
 - Respond to complaints.
 - Issue enforcement when appropriate.
- Review third party inspection reports.

³ The Ozone Transport Commission is a multi-state organization created by the Clean Air Act to advise the U.S. Environmental Protection Agency on ozone transport pollution issues and to develop and implement regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions. See www.otcair.org for addition information on the OTC.

- 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.
- Working with municipal partners, promote MassDEP's Illegal Disposal Surveillance Program in communities with Environmental Justice populations. This program is focused on reducing illegal dumping, through the use of cameras.
- Promote use of electric and hybrid trash and recycling collection vehicles, particularly in communities with Environmental Justice populations.

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 and Wind Energy at Landfills

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.



Bellingham Landfill

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					
Recycling/Organics Equipment		x	x	x					

Waste Reduction Enforcement Coordinators		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	

State Agency Recycling Market Development Council			x	x	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, Trimmings, 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	445,234	275,350
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	16,000	11,200	4,800
Restaurant Fats, Oils and Grease	No	3,226	2,903	323
Other Miscellaneous	No	28,806	20,164	8,642
Total		5,018,082	3,376,707	1,641,376

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

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