



Strategic Plan to Advance Composting, Compost Use, and Food Scraps Diversion in Montgomery County, Maryland



April 2018

Montgomery County, Maryland
Department of Environmental Protection, Division of Solid Waste Services



April 2018

Dear Friends:

Montgomery County is an established leader in protecting and preserving our environment. We continue to improve the quality of our land, air and streams by reducing waste, reusing material and increasing recycling. Our commitment to our integrated waste management strategies increases recycling in the County and improves the overall health of our environment – for ourselves and future generations.

Our waste management goal is to reduce waste to the maximum extent possible, and while we have achieved a waste diversion rate of 61 percent, we must do more. I want to bring our waste diversion rate up to 70 percent by the end of 2020. Food waste – or food scraps – is our next frontier material that presents us with another good opportunity to significantly decrease waste, increase the amount of material we recycle, and strive toward our 70-percent goal.

The Department of Environmental Protection has developed the Strategic Plan to Advance Composting, Compost Use and Food Scraps Diversion. This plan provides the direction and strategies that will help us reduce the amount of food thrown away, and channel food to those who experience food insecurity. This plan also provides an outline of how to expand our abilities to recycle food scraps more directly at the source, as well as work to secure processing capacity at facilities, so food scraps that are not consumable can be recycled into useful compost. The solution will take a combination of numerous possibilities.

I want to thank our partners in the community – individuals, organizations, businesses, and agencies – for their assistance in the development of this plan. Their commitment, expertise and insight have been invaluable. While this plan is a strong foundation, there is more work to be done on these issues. Thank you for your continued support and participation in our efforts.

Sincerely,

Isiah Leggett
County Executive

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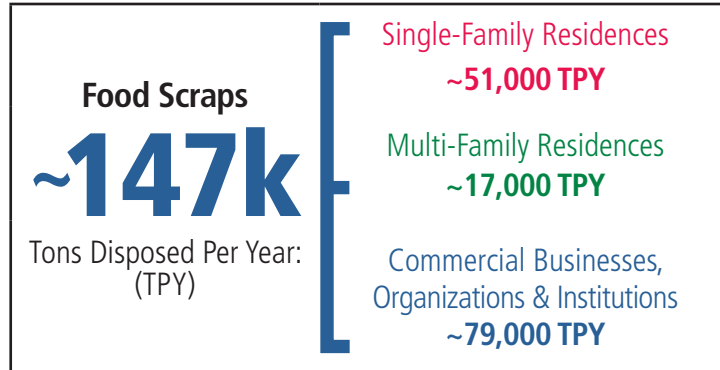
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Executive Summary

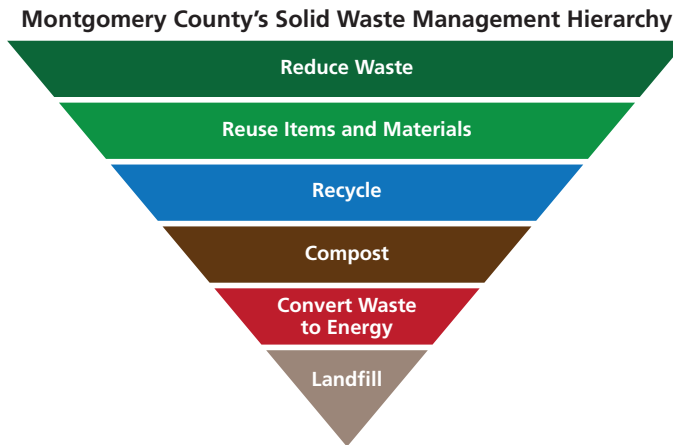
Montgomery County, Maryland has been a leader in recycling for over 30 years and continues to expand its waste reduction and recycling programs. The County continually strives towards its established goal to reduce waste and recycle 70% of all waste generated in the County by 2020. In calendar year (CY) 2015, Montgomery County's waste diversion rate was 61%, one of the highest in the United States (U.S.). As the chart below displays, food waste (referred to as food scraps) represent a significant portion of the County's solid waste disposed, and presents a significant opportunity to reduce, reuse, and recycle more.

Food Scraps in Montgomery County, Maryland



Note: As Compared to 648,000 Overall Tons of Solid Waste Disposed Per Year

Furthermore, reducing wasted food and encouraging the donation of food to those in need correspond with the top priorities of the County's Solid Waste Management Hierarchy. Reducing waste, reusing materials, and recycling are the three top tier priorities of the County's Solid Waste Management Hierarchy as seen below.



Montgomery County has a longstanding commitment to protecting the environment and saving natural resources for the future. The County's Department of Environmental Protection (DEP) operates with an integrated solid waste management system, comprised of facilities, programs and services to manage solid waste in the most environmentally preferable manner, and cost-effectively. The County has a formal goal to reduce waste and recycle 70% of the waste generated by 2020, a waste reduction policy, and regulations in effect that require recycling across all segments of the diverse community, single-family residential, multi-family residential, and businesses, including non-profit organizations and all levels of government. In addition, DEP's education efforts are comprehensive and robust, and provide technical support and recommendations in efforts to reduce, reuse, and recycle more.

Over the years, DEP has provided assistance and guidance to individual residents, multi-family properties, and businesses in their efforts to separate food scraps and recycle them. One of the limiting factors preventing more widespread recycling of food scraps has been the lack of long-term, stable food scrap composting (or processing) facilities, able to accept and process food scraps to create a new product, namely compost. Despite this, DEP has continued its efforts to expand food scrap recycling through several initiatives.

DEP implemented food scrap recycling programs in on-site cafeterias in three county facilities to gain first-hand expertise and develop best practices. DEP has also actively participated in regional coordination on market development and worked with jurisdictions and the State of Maryland to draft Maryland's first Composting Regulations, adopted in 2015.

In addition, DEP had been performing planning and evaluation activities, among other efforts, looking to secure composting processing capacity for food scraps with the goal of further expanding recycling opportunities. In the meantime, the County Council enacted Bill 28-16, which requires DEP to develop a strategic plan to reduce excess food generation, reuse food that would otherwise be wasted, and increase the amount of food and other compostable waste that is composted. Bill 28-16 requires that DEP include in the strategic plan in consultation with numerous stakeholders, legislative, policy, metrics, and cost recommendations to reduce food scraps and increase composting based upon its evaluation of numerous specific considerations.

The establishment of food scrap reduction efforts and policies laid out in the strategic plan can significantly reduce the impact food currently places on Montgomery County's solid waste stream. The implementation of a food scrap recycling program in Montgomery County can be a major component toward achievement of the 70% recycling goal, while also staying consistent with principles of sustainable resource/materials management. In addition to advancing the County's recycling rate, diverting food scraps from disposal also preserves the limited available capacity at the Resource Recovery Facility (RRF) to process other – non-recyclable – materials as the County's trash tonnage continues to increase. If the RRF capacity is reached, as could occur without the implementation of a food scrap recycling program, the County would incur costs for bypassing excess materials that could not be processed by the RRF due to capacity constraints.

The Strategic Plan provides the direction, framework, and strategies for reducing wasted food including: educating generators on how to decrease the amount of excess food generated, giving food that would otherwise be wasted to organizations that serve people in need, and composting food scraps. Optimal waste management efforts prioritize eliminating or reducing the amount of waste generated to begin with as the most preferred and effective management technique. The next highest priority is to extend the usefulness of any product or material to the maximum extent possible through reuse. The next priority is to recycle or compost the material, depending on the material type. The composting process promotes the biological decomposition of organic material, such as food scraps, into a stable, humus-like product. The "finished" compost product can be used in various agricultural and environmental applications. Compost provides a demonstrated benefit to soil by suppressing plant diseases and pests, reducing or eliminating the need for chemical fertilizers, promoting higher yields of agricultural crops, and by improving overall soil structure. Compost is also a valuable stormwater management tool to reduce runoff volume due to the soil's increased water holding capacity and increased infiltration. Non-recyclable or non-compostable material for which disposal is necessary should be converted to energy. Landfilling is the least preferred method of managing solid waste.

To participate in the development of the Strategic Plan, DEP invited stakeholders to an initial meeting in June 2017. During the meeting, DEP presented goals and objectives for the Strategic Plan, relevant background information on the status of food scrap recycling efforts and requirements of Bill 28-16, and outlined its approach, process, steps and timing, including stakeholder participation. Stakeholders were invited to volunteer and participate in one of six working groups created by DEP: Reducing Wasted Food/Channeling Food to Others; In-Home, Backyard, and Community-Scale Composting; On-Site Institutional and On-Site Business Composting; On-Farm Composting; Composting Capacity to Serve Montgomery County; and Strategies to Maximize Food Scraps Collection at the Curb. DEP drafted chapters for each of the six-major focus areas and provided them to the stakeholder working groups for their review and comment. Stakeholders were asked to provide collective comments, information, and feedback on the draft chapters by November 8, 2017. The stakeholder comments (409 sets) were then reviewed, and the Strategic Plan was written. Some stakeholder comments have not been included at this strategic planning stage, but will be addressed in a later phase of implementation planning.

Recommendations for the six focus areas relate to collaboration, policies, regulations, data, infrastructure, education, and development of implementation plans. Future implementation plans would include timelines and cost estimates for associated activities, and assess and mitigate any potential impacts. Further additional research may be needed to identify required additions or changes to existing regulations, policies, or standard practices related to food scraps. Additional research on data and metrics are needed to further assess current efforts and identify additional sources of food scraps that should be included in the development of a food scrap recycling program. Identification of options to secure food scrap processing capacity at facilities to serve generators in the County is needed.

This executive summary provides a snapshot of the findings for each area of focus, along with the major recommendations.



Reducing Wasted Food/Channeling Food to Others



Findings

While Montgomery County, Maryland may be considered one of the wealthiest counties in the U.S., according to Feeding America, the nation's largest domestic hunger-relief network, 6.3% of the County's population is considered food insecure (i.e., they don't have consistent access to quality, nutritious food). Current practices for channeling "quality, nutritious" food to those who have unmet needs should be modified through collaboration and coordination with other established groups to include donation of food that would otherwise be wasted or thrown away. Donations of food by residents, businesses, and multi-family properties in the County can be affected by food labeling, specifically expiration or "use by..." or "best by..." dates. Expanded and targeted education of donors to understand what is "acceptable" in terms of donation of foods to others can reduce the amount of food that is wasted and disposed of as trash. Through efforts to increase food donations, the County could decrease the amount of food thrown away and decrease food insecurity, which are objectives of this Plan and the Montgomery County Food Security Plan.



Recommendations

- Expand collaboration with community-based stakeholders to create awareness among residents, multi-family properties, and businesses of the importance of reducing wasted food and channeling wasted food to those who are food insecure.
- Work with the Montgomery County Department of Health and Human Services and others to provide input to the State of Maryland and other pertinent groups to further efforts to establish common terms, definitions, metrics, and practices to improve interconnectedness of food systems; encourage development of standardized food labels that are clear and consistent.
- Work with the Montgomery County Department of Health and Human Services, Montgomery County Public Schools, and other schools/educational institutions to develop policies to reduce the amount of wasted food and encourage food donation.
- Consider increased efforts to measure wasted food reduction initiatives, and consider collecting additional data on food recovery efforts by tracking food scraps generated and donated by businesses, non-profit organizations, and others, using existing reporting and other mechanisms.
- Gather and use data to measure food scraps reduction efforts and food recovery donation through reporting by food recovery and assistance organizations.
- Consider development of educational materials on food recovery and assistance programs, including guidelines on donating excess foods.
- Utilize established groups to increase food donation opportunities and to train donors on proper source-separation and storage of donated food.



Resources

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



In-Home, Backyard, and Community-Scale Composting



Findings

Montgomery County has promoted grasscycling (leaving grass clippings on the lawn after mowing), backyard and community-scale composting of yard trim materials through training, compost workshops and demonstrations, distribution of educational materials, and vermicomposting to recycle kitchen food scraps in-home. Over the long-term, the County has successfully used education and training to encourage residents to grasscycle and compost yard trim materials. At the Montgomery County Composting Facility, a maximum of 77,000 tons of materials may be processed annually, and DEP's efforts have encouraged many residents to manage their grass and leaves at the source. In fact, since 2007, DEP has also distributed over 38,000 backyard compost bins to residents to use for backyard composting. According to the County's most recent Waste Composition Study, yard trim materials accounted for less than 2% of the County's overall disposed waste stream, indicating that most yard trim is recycled through composting (via backyard/on-site, community, or composting facilities) or grasscycling. The County should evaluate the feasibility of encouraging residents to recycle food scraps through at-home, backyard, and community-scale composting programs.



Recommendations

- Continue educational efforts on all forms of in-home, backyard, and community-scale composting, including providing compost training workshops and demonstrations on best practices for backyard and community-scale composting, as well as research and evaluation of other types of compost bins that are suitable for composting food scraps.
- Conduct a coordinated inter-agency review of existing requirements and restrictions pertaining to backyard/community-scale composting, and recommend regulatory changes to County zoning and applicable County codes to clarify, and support activities to include food scraps.
- Consider implementation of regulatory changes or modifications to promote and encourage proper backyard and community-scale composting activities.
- Consider increased collaboration with community-based stakeholders and other pertinent groups (i.e., The Maryland-National Capital Park and Planning Commission - Montgomery Parks, Montgomery County Public Schools, and interested residents, multi-family properties, and businesses or organizations) to establish community-scale composting demonstration projects throughout the County.



Resources

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



On-Site Institutional and On-Site Business Composting



Findings

According to the DEP's most recent Waste Composition Study, an estimated 79,000 tons of food scraps are disposed by the non-residential sector (comprised of businesses, organizations, and government). Yard trim materials, including grass clippings and leaves, are mandated for recycling, and are currently being recycled by businesses on-site (through grasscycling or composting) or are removed off-site by lawn care service providers for composting. Only 1.6% of non-residential waste disposed as trash includes grass clippings and leaves, demonstrating there is a high level of compliance and most yard trim is being properly managed in the non-residential sector.

DEP has identified a few businesses that have some type of on-site composting program in place where their food scraps or other organic materials generated on-site at the place of business are also composted on-site. To increase composting of food scraps, expanding on-site composting at businesses/commercial properties is one solution that could minimize the amount of food scraps disposed in the solid waste stream.



Recommendations

- Continue efforts to expand educational activities to encourage businesses that may wish to set up on-site food scrap recycling programs.
- Identify institutions and businesses that generate significant quantities of food scraps and assess potential for on-site composting activities; provide educational materials and trainings; provide follow-up assistance to address issues/concerns; and evaluate.
- Continue to work with businesses, institutions, and business groups (such as the Chambers of Commerce, business associations, government agency representatives, and others) to encourage businesses to set up and maintain on-site food scrap composting programs.
- Encourage businesses and institutions to report data on the amount of food scraps composted on-site to measure on-site composting efforts.
- Explore incentives such as grants for businesses and institutions to purchase necessary supplies and equipment to facilitate the collection and on-site composting of food scraps.



Resources

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



On-Farm Composting



Findings

The U.S. Department of Agriculture's 2012 AgCensus Report estimated there are 540 farms (average size 118 acres) in Montgomery County, of which 42% are farmed as a primary occupation. In 1980, Montgomery County created the Agricultural Reserve, which includes 93,000 acres of land and is zoned to encourage agricultural uses. The agricultural community has routinely composted organic material, such as manure, on-site to reduce the amount of waste, and typically, these materials are generated on-site, as a by-product of their farm operation. The finished composted material is then used by the farm to rejuvenate its soils. Currently, DEP is aware that limited amounts of food scraps and other organic materials from off-site sources are being composted on-site at some farms. To increase composting of food scraps, expanding on-farm composting is one solution that could minimize the amount of food scraps disposed in the solid waste stream.



Recommendations

- Work with Maryland Department of the Environment, Maryland Department of Agriculture, the Montgomery County Office of Agriculture, Soil Conservation District, Cooperative Extension Service, and others to meet with the agricultural community to discuss on-farm composting of food scraps.
- Convene a multi-agency group to review and update County zoning and other applicable County codes, if necessary, to promote increased opportunities for on-farm composting of food scraps and other organic materials.
- Conduct research to assess expansion of on-farm composting activities, including identifying farmers interested in on-farm composting.
- Develop technical assistance to generators and farmers to facilitate on-farm composting of food scraps, including information on State and local regulations applicable to on-farm composting of food scraps, as well as educational materials, which may include design standards, guidelines, and best practices.
- Consider policies, legislation, and regulations that promote and encourage the use of finished compost in the region.
- Explore incentives such as grants for farmers to purchase necessary supplies and equipment to facilitate the collection and on-farm composting of food scraps.



Resources

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



Composting Capacity to Serve Montgomery County



Findings

The commercial sector generates over half of all waste generated in the County and disposes of approximately 79,000 tons of food scraps annually. Therefore, encouraging businesses to set up food scrap composting programs for their workplaces provides the County the opportunity to divert a significant amount of waste from the overall waste stream. According to data from CY2015 Annual Business Waste Reduction and Recycling Reports, 30 businesses reported they source-separated food scraps for recycling, sent to processing facilities through collection by recycling collection companies. Numerous businesses have expressed to DEP an interest in separating their food scraps for recycling. DEP developed food scrap recycling collection programs for pre-consumer food scraps generated in cafeterias in three County facilities: the Executive Office Building, the Council Office Building, and the Public Safety Headquarters Building. DEP used these programs to develop educational materials and training, and recommended best practices when implementing food scrap recycling programs. However, a limiting factor in businesses setting up food scrap recycling collection programs has been the lack of long-term, stable food scrap composting processing facilities to serve the region.

More recently, there has been an increasing availability of processing facilities in the regional market to accept and process food scraps for recycling. DEP should build upon its existing efforts to County businesses, and provide financial incentives to expand the current number of businesses that source separate food scraps, contract for food scrap recycling collection service, and encourage development and expansion of processing facilities to increase capacity for additional tonnages of food scraps for recycling.



Recommendations

- Continue to identify businesses/multi-family properties that generate significant quantities of food scraps; provide education and training; and provide resource lists of food scrap composting processing facilities and recycling collection service providers that offer food scrap recycling collection services.
- Continue to promote use of the Prince George's County Western Branch Composting Facility for recycling of commercially-generated food scraps and other acceptable organic materials.
- Continue to research opportunities to secure additional capacity for food scraps and other organic material generated in the County that can be processed at regional composting facilities, and other facilities that utilize other technologies such as anaerobic digestion.
- DEP should continue to work with composting and/or anaerobic digestion facilities, and should pursue and attain agreement(s) to secure stable processing capabilities for additional tonnages of food scraps generated in the County, through the issuance of Request for Proposals (RFPs).



Composting Capacity to Serve Montgomery County



Recommendations (continued)

- DEP should structure agreements to secure stable processing capacity, and to offset processing costs to incentivize and induce increased recycling of food scraps.
- DEP should establish Executive Regulations to support the expansion of food scrap processing capacity:
 - A regulation to establish differential tip fees to motivate generators to source-separate food scraps and other organics, and encourage collectors to provide recycling collection services for these materials.
 - A regulation to establish rules to ensure the County pays its contract processor(s) only for food scraps and other organic materials that are generated within the County.
- Work with licensed collectors/haulers that collect food scraps and other organic materials from businesses, organizations, and government facilities, to provide information, education, and trainings.
- Continue and expand work with business owners/managers, Chambers of Commerce, business associations, representatives of government agencies, and others to raise awareness of food scrap recycling programs and increase participation.
- Consider various metrics to obtain data regarding the amount of food scraps available to better estimate processing capacity needs and document the amount of food scraps and other organics collected for recycling.
- DEP should implement any necessary minor modifications to the Transfer Station Annex Building to accommodate receipt and transfer of food scraps for recycling.
- Longer-term, DEP should explore feasibility of using in-County capacity, including County-owned property(ies) for processing source-separated food scraps and other acceptable organic materials.



Resources

In FY19, \$432,000 funds a new, dedicated position in DEP to manage the Commercial Food Scraps Recycling Program, and provides for minor modifications that may be necessary to the Transfer Station Annex Building to accommodate receipt and transfer of food scraps for recycling. The new Program Manager will work to secure capacity to process and recycle food scraps (and potentially other acceptable organics), and also develop incentives to increase recycling of food scraps in the commercial sector. These incentives may include establishment of differential tip fees at County solid waste acceptance facilities to motivate generators to source-separate food scraps and potentially other organics, and encourage collectors to provide recycling collection services for these materials.

Additional resources, including staffing, operating, and capital costs, may be needed in the future to support these recommendations, dependent on the specific details determined in further development of an implementation plan.



Strategies to Maximize Food Scraps Collection at the Curb



Findings

As part of its weekly curbside recycling collection provided to all approximately 217,000 single-family households in the County, DEP collects yard trim. These materials are transported to the County's Shady Grove Processing Facility and Transfer Station, where the grass clippings and leaves are loaded and transported to the Montgomery County Composting Facility. In CY2015, approximately 66,000 tons of material was processed at the County's Composting Facility; 77,000 tons may be processed annually. The finished product is a soil amendment called Leafgro®, which is bagged, distributed to retailers and sold; the product is also sold in bulk. According to the County's most recent Waste Composition Study, it is estimated that approximately 51,000 tons of food scraps are disposed by the single-family sector annually. Diverting food scraps and other acceptable organic materials for recycling would help the County towards achievement of the goal to recycle 70% by 2020. DEP should consider the feasibility of conducting a pilot program to provide single-family residential curbside recycling collection of food scraps and other organic material leveraging existing collection services, and available capacity at its facilities for operational and cost efficiencies.



Recommendations

- DEP should develop information and materials on best practices, provide education to single-family residents about separation and recycling of food scraps, and utilize its education and technical assistance offerings to assess the level of interest residents have to voluntarily participate in any potential residential curbside collection pilot or program.
- DEP should consider implementation of a curbside food scraps recycling collection pilot for single-family households, to examine numerous aspects (i.e., education to the broader community and to participating residents, containerization, collection, processing, finished product, monitoring, and collecting data and feedback for evaluation).
- DEP should pursue any necessary agreements and Maryland Department of the Environment permit amendments to update existing processes at the Montgomery County Composting Facility to incorporate food scraps and other acceptable organic materials (such as soiled paper and compostable food service ware products).
- DEP should determine any adjustments to its receiving procedure at the Montgomery County Shady Grove Processing Facility and Transfer Station, and identify any equipment at the Montgomery County Composting Facility that may be necessary in the future to properly compost food scraps and other organic materials, and mitigate potential odor and runoff issues.



Resources

In FY19, \$132,000 funds DEP staff to provide education and technical assistance to residents of single-family homes to increase awareness and understanding about food scraps separation and recycling. Staff will develop best practices, and use these to create educational materials, and conduct meetings and presentations to residents. Staff will also assess the level of interest residents have to participate in a voluntary residential curbside recycling collection pilot which may be planned in the future.

Additional resources, including staffing, operating, and capital costs, that are needed in the future to support these recommendations are dependent on the specific details determined in further development of an implementation plan.

Introduction

Montgomery County, Maryland strives to minimize the amount of waste generated and disposed as trash in the County, through various waste reduction, reuse, and recycling programs and initiatives. The County has a goal to reduce waste and recycle 70% of all waste generated in the County by 2020. In Calendar Year 2015, a total of 1,116,511 tons of waste were generated in the County. Of this amount, 625,407 tons of materials were recycled. Along with the County's 5% source reduction credit awarded by Maryland Department of the Environment (MDE) for documented waste reduction efforts, the County's waste diversion rate was 61%.¹ The 70% waste diversion and recycling goal, established through Executive Regulation (ER) 7-12, was predicated on the premise that certain materials are mandated for recycling, and that additional materials would be recycled once anticipated markets developed, such as the recycling of food scraps and other organic material (food-soiled paper and compostable food service ware).

The non-residential, or commercial sector, generates the greatest percentage of the waste that is generated in the County. Approximately 51% of the waste generated in CY2015 was generated by the commercial sector, which includes businesses, not-for-profit organizations, institutions, and Federal, State and local government offices. In 2015, there were an estimated 33,000 businesses and organizations in the County with an estimated employment of 528,000 people.²

The single-family residential sector generated approximately 40% of the waste stream, while the multi-family sector generated an estimated 9% of the waste stream. It is important to note that the Department of Environmental Protection (DEP) provides weekly recycling collection services to all single-family households in the County (approximately 217,000), and weekly refuse collection service to approximately 93,000 single-family households (mostly in the down-County area). Residents living in municipalities, such as the cities of Gaithersburg, Rockville and Takoma Park, receive curbside collection services through their municipalities, and not from the County. All multi-family properties (apartments and condominiums with 7 or more dwelling units), and all businesses, organizations and institutions, contract recycling and refuse collection service with private collectors, or they may self-haul or back-haul their materials to acceptance facilities.

According to the County's most recent Waste Composition Study, food scraps represent a significant percentage of the County's overall disposed solid waste stream.³ An estimated 147,000 tons of food scraps are disposed annually in the County. Of this amount, it is estimated that the commercial sector disposes of 79,000 tons of food scraps each year, followed by 51,000 tons disposed annually by single-family households and 17,000 tons disposed by multi-family residents each year.

The commercial sector, therefore, provides the greatest opportunity to divert these materials from the waste stream and recycle them instead, contributing to increases in the County's recycling achievement.



Backyard composting using the bin that DEP provides to interested residents.



Educational poster on food scraps recycling.

- 1 Montgomery County, MD (2015) Recycling Rate and Tons Disposed by Calendar Year. Department of Environmental Protection, Division of Solid Waste Services. <http://www.montgomerycountymd.gov/sws/programs/recycling-rate.html>
- 2 Maryland Department of Commerce (2017) Brief Economic Facts: Montgomery County, Maryland. https://static1.squarespace.com/static/5873c778e6f2e14a3529e892/t/58d13b956b8f5bad3a97fa0e/1490107300088/Montgomery+County+Brief+Economic+Facts_2016.pdf
- 3 SCS Engineers (2013) Montgomery County Waste Composition Study - Summary of Results. Presented to Division of Solid Waste Services, Department of Environmental Protection, Montgomery County, MD. <http://www.montgomerycountymd.gov/sws/resources/files/studies/waste-composition-study-130726.pdf>

A review of business listings from the 2016 Dun & Bradstreet (D&B) Business Database shows that there are more than 1,300 businesses in the County that have the potential to generate larger quantities of food scraps that could be recycled.

Through the years, DEP has provided technical assistance and education to businesses that generate significant amounts of food scraps in their efforts to reduce, reuse, and recycle this material. To increase efforts to recycle food scraps, the County has implemented several commercial food scrap recycling demonstration projects, focused on recycling of pre-consumer food scraps. DEP has also successfully promoted backyard and on-site composting of yard trim materials, such as grass clippings, leaves, brush and garden trimmings, as well as grasscycling (leaving grass clippings on the lawn after mowing). In addition, DEP has provided education to residents on vermicomposting, for those who are interested in recycling food scraps using worm bins.

However, there has been limited food scrap recycling processing capacity in the State and region, which has contributed to the slow expansion of food scrap recycling programs in the County. Just recently, a number of processing facilities in Maryland have been permitted by the State through MDE to accept food scraps for composting processing. There are also several facilities that are in the planning/design/construction phase, that should have the ability to process food scraps generated in the County. In addition, other food scrap processing technologies are expanding in the country, such as anaerobic digestion (AD) which is being pursued by some operators in the region.

DEP has been monitoring the expansion of these opportunities as it continues its efforts in planning for food scrap recycling in the County.

During this time, the Montgomery County Council enacted, and the County Executive signed Bill 28-16⁴ on November 28, 2016, requiring DEP to develop a Strategic Plan to Advance Composting, Compost Use, and Food Scraps Diversion. The purpose of the Strategic Plan is to identify: County policies and initiatives to reduce waste and support composting; models and best practices used by other jurisdictions; metrics for assessing and increasing food scraps diversion, composting and compost use; goals and associated timelines for achieving certain levels of food scraps diversion; challenges to meeting these goals and solutions for overcoming such challenges; potential sites for composting operations; environmental and public health benefits of composting and food scraps diversion; and cost estimates and potential economic and environmental benefits of implementing the Strategic Plan.

This Strategic Plan provides the direction, framework, and strategies to reduce wasted food, channel excess food to others to meet needs, increase recycling of food scraps through a variety of means, and encourage use of finished compost product. Pursuit of food scrap reduction and recycling efforts as described in the Strategic Plan will also reduce the amount of food scraps processed at County disposal facilities and preserve limited disposal capacity. This Strategic Plan includes a background, assessment of current efforts, and challenges associated with maximizing participation in six specific focus areas: reducing wasted food and channeling food to others; in-home, backyard and community-scale composting; on-site institutional and on-site business composting; on-farm composting; composting capacity to serve Montgomery County; and strategies to maximize collection of food scraps at the curb. In addition, the Strategic Plan includes recommendations in each focus area to address policy, legislation, regulations, education, metrics, and resources.



Stakeholders attend June 2017 meeting during which DEP describes details to develop the Strategic Plan to Advance Composting, Compost Use, and Food Scraps Diversion.



November 2017 meeting during which each of the six Working Groups share information on their efforts to support development of the Strategic Plan.

4 County Council for Montgomery County, MD (2016) Bill No. 28-16, enacted 15 Nov 2016.
https://www.montgomerycountymd.gov/council/resources/files/lms/bill/2016/Signed/pdf/3120_1030_Signed_10052017.pdf



Reducing Wasted Food/Channeling Food to Others

BACKGROUND

The highest priority of Montgomery County's solid waste management hierarchy is to prevent waste or reduce the amount of waste generated in the County. DEP works with generators (businesses, non-profit organizations, Federal, State, and local government agencies, multi-family properties, as well as residents) to reduce waste at the source, wherever waste is generated. Technical assistance, education and training are provided to encourage generators to develop and implement on-site waste reduction efforts. The next highest priority of the hierarchy is to reuse materials or items to the greatest extent possible, whether by the initial generator, or if the items, goods, or materials exceed the needs of the initial generator, by others who will benefit from receiving and using the excess items, goods or materials to address their existing, unmet needs.

According to data from Montgomery County's 2012-2013 Waste Composition Study, it is estimated that approximately 147,000 tons of food scraps are disposed of in Montgomery County annually, which may consist of excess or unwanted food that is still consumable; food scraps generated during food preparation at home, as well as in restaurants, delis, cafeterias, hotels, hospitals and other businesses or facilities; food that is thought to be "expired" or past its "best by," "sell by" or "best if used by" dates; and food that does not fulfill a specific need.

Reducing the amount of food disposed of has many benefits. Not generating excess food scraps in the first place reduces the amount of waste that needs to be managed, potentially resulting in reduced costs in terms of collecting food scraps for composting or disposal. Food scraps generated in excess of generators' needs but that are consumable (i.e., prepared foods, baked goods, fresh produce, canned or boxed foods, etc.) can be diverted from the solid waste stream and, more desirably, provided to residents who are in need of nutritious food that they otherwise may not be able to access. This channeling of food to others with unmet needs ensures that the highest and best use of this food occurs. Diverting food from the County's waste disposal stream reduces the amount of waste that must be processed at County solid waste processing facilities, reducing the capacity needed for solid waste processing infrastructure to dispose of the material.



Food collected for donation.

At the same time, there are areas in the County where residents experience difficulties in accessing nutritious foods, for a variety of reasons. To focus attention on food insecurity in the County, the Montgomery County Council announced the launch of the Montgomery County Food Council in 2011. The Food Council is a privately run, privately funded non-profit organization, whose mission is to build a more sustainable community food system for Montgomery County.

Building on the efforts of the Food Council, the County Council enacted Bill 19-16, on July 12, 2016 (signed by the County Executive on July 19, 2016), which required the County Executive to develop a 5-year strategic plan to achieve food security in Montgomery County.⁵ The plan, *A Food Secure Montgomery*, released in January 2017, provides short and long-term recommendations for the County and partner organizations to ensure that food is available to those in need.

5 County Council for Montgomery County, MD (2016) Bill No. 19-16, enacted 12 Jul 2016.
https://www.montgomerycountymd.gov/council/resources/files/lims/bill/2016/Signed/pdf/1907_1020_Signed_04212017.pdf

The report estimates that approximately 7% of the County's population (approximately 78,000 residents) can be considered "food insecure"⁶ – meaning they do not consistently have:

- Sufficient quantity of food available of an appropriate nature and quality.
- Access to acquire food needed for a nutritionally adequate diet.
- Availability of food uninhibited by health or hygiene problems (safe drinking water, sanitation, or medical services, etc.)

In addition, the report states that nearly 14% of children in the County (approximately 33,000 children) are estimated to be food insecure. Therefore, groups such as the Food Council are working to ensure these individuals receive the assistance they need to access nutritious foods.

This issue is not unique to Montgomery County, but also exists throughout the State of Maryland, as well as throughout the U.S. In Maryland, MDE estimates that more than 850,000 tons of food is wasted annually in the State.⁷ To raise awareness of this issue, MDE convened the first Maryland Food Recovery Summit on November 30, 2016. This event brought together nearly 200 stakeholders to share information and discuss needs and strategies to reduce wasted food in the State. The stakeholders included a diverse mix of generators, users of food, government agencies, non-profit organizations, and elected officials. Several themes were identified during the summit:

- Community food rescue programs and food scrap recycling efforts currently exist in the State, as well as nationally.
- Building infrastructure for food scraps composting programs is needed.
- Available data and research on policies and programs should be used to develop effective strategies.
- Follow the food recovery hierarchy to develop food recovery efforts (prevent waste; channel edible surplus foods to feed people; and divert non-edible foods to anaerobic digestion or food composting programs).
- Economic issues are central to motivating change and maintaining success.
- The need for partnerships and collaboration are crucial for the success of food recovery programs.



Community Food Rescue brochure.

A summary report of the Food Recovery Summit written by MDE⁷ included a list of challenges and possible solutions to increasing food recovery (either through increasing infrastructure for food scraps composting programs or through promoting source reduction and donation of food to those in need), and some of these challenges and solutions have been incorporated into this Strategic Plan.

Assessment of Current Efforts

For many years, Montgomery County and its partners, including Federal, State, and local government agencies, businesses, non-profit organizations, faith-based groups, multi-family properties, and residents, have worked to reduce the amount of wasted food generated and direct consumable food to those in need.

6 Montgomery County Food Council (2017) A Food Secure Montgomery: What we know and what we can do. A 5-Year Strategic Plan. http://www.montgomerycountymd.gov/exec/Resources/Files/pdf/MoCo_Food-Security-Plan_2017.pdf

7 Maryland Department of the Environment (2017) Maryland Food Recovery Summit Summary and Action Items (February 2017). <http://mde.maryland.gov/programs/LAND/RecyclingandOperationsprogram/Documents/Maryland%20Food%20Recovery%20Summit%20-%20Summary.pdf>

Several businesses and organizations in Montgomery County actively maintain efforts to donate quality food to community programs that feed those facing food insecurity. In fact, some businesses have formal policies or guidelines in place that govern their food donation practices. According to information and data provided to DEP by businesses via their Annual Business Recycling and Waste Reduction Report, four businesses and one multi-family senior living community reported information pertaining to their food donation programs in Calendar Year 2015. While it is likely that there are many other food donation programs in place, these four businesses and one multi-family property voluntarily reported donating an estimated 149 tons of consumable food to organizations that feed those in need. The food was either distributed to local programs or consolidated with food from other stores in the region and distributed as part of nationwide distribution efforts.



Businesses can report on food donated to community food donation programs through the DEP Annual Business Waste Reduction and Recycling Report.

There are numerous organizations in the County that are dedicated to eliminating hunger by promoting food recovery and facilitating the collection and transportation of consumable food from the point of generation to where the food can be used to feed residents in need.

These organizations include, but are not limited to the:

- Montgomery County Food Recovery Working Group
- Montgomery County Food Council
- Manna Food Center
- Community Food Rescue
- Nourish Now
- Bethesda Cares
- Additional faith-based and other non-profit organizations, including food pantries and soup kitchens

These organizations have implemented programs to encourage food donation and facilitate the movement of food from generators or “donors” (i.e., businesses, organizations, government agencies, etc.) to users – whether it be individuals, community kitchens, or food banks.

Their efforts focus on ensuring that safe, culturally appropriate, healthy food is available to those in need, including moving consumable food from generators to users. This occurs when commercial/institutional kitchens, farms, restaurants, grocery stores, and other generators identify excess food to donate. Organizations such as Community Food Rescue connect these generators directly to users. Other organizations such as Manna Food Center and Nourish Now obtain both donations of food and other resources that can be directed to those in need.

CHALLENGES

DEP has identified numerous challenges that directly or indirectly affect efforts to reduce wasted food and recover usable consumable food to provide it to residents who experience food insecurity. These challenges include:

- **Lack of Participation.** Businesses, multi-family properties (such as senior living communities), and residents may not be actively focused on efforts that promote reduction of wasted food.
- **Standardization of Labeling.** Food labeling and food safety issues are important factors which impact the ability to increase efforts to reduce wasted food and channel food to others. There is a lack of clarity and consistency among food labeling and food safety requirements, issues that are best addressed first and foremost at the national level.

- **Lack of Education.** There is a general lack of education and awareness of “best if used by” dates or other terminology typically stamped on food products. Since there is no established standard when it comes to labeling foods and beverages with such information, the consumer is often left to determine when the food item is no longer fresh or consumable, which results in increased amounts of perfectly good consumable food either disposed of in the trash, placed down a garbage disposal, or composted if food scrap composting programs are in place.

Once excess foods are generated, there are additional challenges that exist in terms of donating consumable food to others:

- **Food Donation Logistics.** Separating and storing consumable food for donation to others requires adequate on-site storage space to store foods awaiting pick-up. A lack of space on-site to store food donations, especially for small businesses, may limit participation. In addition, certain perishable foods awaiting collection may require refrigeration, which may not be readily available. Also, businesses may lack education, training and resources to: identify and cultivate long-term working relationships with community food networks; develop on-site guidelines and procedures for the safe and proper handling of excess foods; and coordinate transportation of consumable foods.

Other challenges include:

- **Lack of Management Support and Turnover.** Participation in food recovery donation programs is dependent upon the support of the owner and/or management. Due to the general high turnover rate of businesses, including management and employees, it is difficult to keep everyone consistently informed and effectively trained on handling food for donation. New management or new ownership may not have the background or motivation to continue such programs.
- **Legal and Liability Concerns.** Some business owners are not clear on the legal aspects of donating wasted food and have a perception that it is against the law. There is also a general concern regarding liability of donating food to others. As a general practice, some businesses do not allow for the removal of excess prepared food off-site to be provided to others, because there is a perceived fear that a person who consumes the donated food may become ill, and the business would be held liable.
- **Perishable and Non-Perishable Food Donations.** A lack of education and training on proper procedures for ensuring temperature control can result in spoilage when donating perishable foods. Most donors think of donating non-perishable food items, (i.e., canned foods, cereals, pastas, containerized beverages, etc.) However, there is also a significant need for fresh food items such as prepared meals, soups, baked goods, meats, and produce that businesses such as restaurants, grocery stores and supermarkets generate. Fresh food items must be properly handled on-site, transported in a timely manner, and served to others before the food goes bad. A major challenge of getting fresh foods from the point of generation to organizations that distribute the food to those in need is how generators package and keep the items from spoiling while awaiting collection, which requires employee education and training at the business/property.
- **Additional Resources to Facilitate Donations of Food.** Food donors (generators of consumable food) must be able to identify the areas in the County where the need for food is greatest, coordinate transportation of the food to a local food bank or pantry in a timely manner, track the amount/types of food being donated for reporting and tax requirements, and identify the key partnerships with other food donation groups that are involved in this process. These efforts may go beyond the staffing resources of small businesses, such as local restaurants or small community grocery stores.
- **Awareness of Regulations.** Several regulations exist at the Federal, State and County levels that address the donation of food to others. However, a lack of education or awareness of these regulations limits the participation of some, especially businesses, in actively donating consumable food to others. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.

RECOMMENDATIONS

To minimize the amount of wasted food generated in the County and increase the donations of excess perishable and non-perishable food items from generators to County residents who are experiencing food insecurity, several recommendations that address regulations, education, metrics, and resources are provided below. It should be noted, that collaboration and coordination among numerous County departments, agencies, non-profit organizations, faith-based groups, and other community partners, will be needed to pursue recommendations, and consider potential for further implementation planning.

- Expand collaboration with community-based stakeholders to create awareness among residents, multi-family properties, and businesses of the importance of reducing wasted food and channeling wasted food to those who are food insecure.
- Work with the Montgomery County Department of Health and Human Services and others to provide input to the State of Maryland and other pertinent groups to further efforts to establish common terms, definitions, metrics, and practices to improve interconnectedness of food systems and encourage development of standardized food labels that are clear and consistent.
- Work with the Montgomery County Department of Health and Human Services, Montgomery County Public Schools, and other schools/educational institutions to develop policies to reduce the amount of wasted food and encourage food donation.
- Continue coordination and work with the Maryland Department of the Environment on food recovery and related issues across the State to ensure consistency with County programs and initiatives.
- Encourage collaboration between community partners and the County's State delegation to review existing State laws and provide recommendations, if needed, to facilitate the development of food donation programs, such as modifications to liability protection to individuals and State tax credits to businesses that donate food.
- Consider increased efforts to measure wasted food reduction initiatives and consider collecting additional data on food recovery efforts by tracking food scraps generated and donated by businesses, non-profit organizations, and others, using existing reporting methods and other mechanisms.
- Gather and use data to measure food scraps reduction efforts and food recovery donation through reporting by food recovery and assistance organizations.
- Consider development of educational materials on food recovery and assistance programs, including guidelines on donating excess foods, for residents, multi-family properties, and businesses.
- Utilize established groups to increase food donation opportunities and to train donors on proper source-separation and storage of donated food.
- Continue to provide and develop additional educational information on waste reduction to all sectors to encourage the reduction of wasted food.

RESOURCES

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



In-Home, Backyard, and Community-Scale Composting

BACKGROUND

Montgomery County has consistently promoted on-site, backyard and community-scale composting of yard trim materials such as grass clippings, leaves, garden trimmings and brush. In addition, the County has also promoted vermicomposting (composting food scraps using specialized worms in an enclosed system) to a lesser extent, for residents and businesses interested in recycling kitchen food scraps.

In 1983, the County opened the Montgomery County Composting Facility, which initially composted leaves collected through the County's leaf vacuuming program. Between 1989 and 1994, the facility expanded its operations to include grass clippings. Since the early 1990's, DEP has provided weekly curbside recycling collection of yard trim materials from single-family households. Yard trim materials that are collected through the County's residential curbside recycling collection program, as well as those materials collected by private collectors, landscape contractors, and lawn care service providers from individuals, businesses, and multi-family properties, are first transported to the Montgomery County Shady Grove Processing Facility and Transfer Station in Derwood. Brush is ground and chipped into mulch at the Transfer Station and made available for residents to pick-up for their use. Grass and leaves are transported to the Montgomery County Composting Facility, where the material is composted. The end product, produced through the composting process, is a high-quality soil amendment, which is marketed and sold under the name Leafgro®.



Successful backyard composting at the Aspen Hill home of a County resident.

There is an existing upper limit of the amount of material that can be processed at the County's Composting Facility; the facility may process no more than 77,000 tons of materials annually.

Over the long-term, the County has successfully used education and training to encourage residents to grasscycle (not raking or bagging grass clippings, but instead leaving grass clippings on the lawn where they fall when the grass is cut) as well as backyard compost their grass and leaves, thus needing to process less than the maximum 77,000 tons of material each year. According to the County's most recent Waste Composition Study, yard trim materials account for less than 2% of the County's overall disposed waste stream annually, indicating that most yard trim generated is appropriately recycled, backyard or on-site composted, or grasscycled.

DEP estimates that approximately 51,000 tons of food scraps are disposed annually in the County by single-family residents. Therefore, there is the potential to increase recycling achievement through efforts to promote composting of food scraps and other types of organic materials (such as soiled paper and compostable food service products). Composting food scraps through in-home, backyard, and community-scale composting programs is an option for the County to consider in its efforts to increase food scrap recycling efforts.

While composting yard trim has been encouraged for many decades, the County has discouraged residents and community gardeners from incorporating food scraps into backyard compost bins or in community-scale composting programs. Concerns regarding pests and odor due to improper management of composting food scraps, as well as existing State and County regulations and requirements that have restricted or prohibited the composting of food scraps, either in backyard compost bins, or through community-scale composting programs, have limited the potential growth of these programs.

The addition of food scraps can enhance the composting process as food scraps contribute a significant amount of nitrogen to compost systems, which is an integral part of the composting process. Successful composting requires a proper ratio of carbon-rich feedstocks to nitrogen-rich feedstocks, as well as oxygen and water. Food scraps provide the necessary amount of nitrogen-rich materials for successful composting operations, so long as proper management techniques are followed. This is especially important during the winter months (after the growing season has ended) when the availability of nitrogen-rich materials such as grass clippings is limited.

Attention must be paid to backyard and community-scale composting efforts, through careful and consistent actions, as well as constant monitoring to ensure that odors, pests, or other issues that may arise are dealt with immediately and corrective action taken so that potentially negative impacts are mitigated.

It may be possible to introduce food scraps into backyard and community-scale composting operations with proper education/training, containment and management techniques, and proper placement of compost bins in terms of appropriate set-backs and in areas that are less densely developed. This provides an opportunity to recycle food scraps and other organic material, in smaller-scale and decentralized locations. While removing food scraps from the solid waste stream reduces the burden on County solid waste management facilities, it can also be used to create a nutrient-rich product to further enhance plant growth and improve soils, serving as a useful material to more effectively manage stormwater runoff.

Assessment of Current Efforts

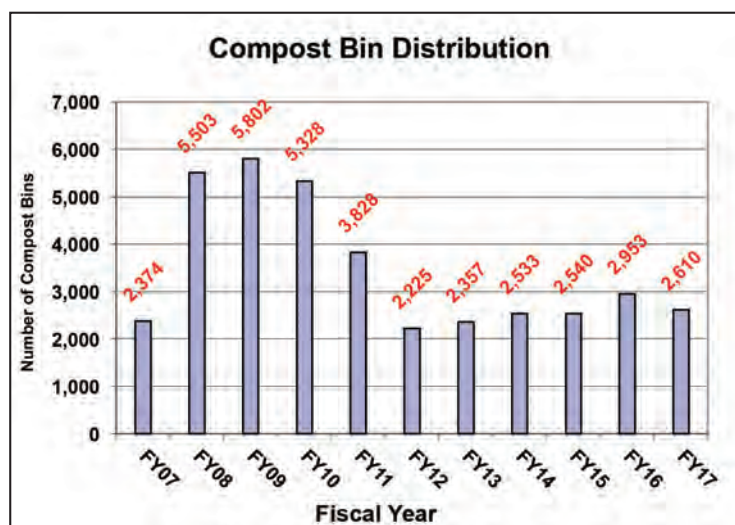
Backyard/On-Site Composting:

DEP provides backyard compost bins to residents, provides technical assistance, and conducts workshops, including training, guidance, and educational materials to encourage the on-site or backyard composting of yard trim. During the 1990's, the County also provided educational materials on vermicomposting, training workshops on setting up and maintaining worm bins, and distribution of worms to residents.

In Fiscal Year (FY) 2007, DEP developed a Strategic Plan to increase its efforts to promote and encourage backyard composting and grasscycling of yard trim materials. Since FY07 (through FY17), DEP has distributed a total 38,053 compost bins to County residents at various community events, such as the Montgomery County Agricultural Fair and Grow It Eat It⁸ events coordinated by the Cooperative Extension Services' Master Gardener Program. Compost bins are also distributed during backyard composting workshops and are available for residents to pick-up from the County at 21 locations and County government facilities located throughout the County.



DEP staff and Recycling Volunteer Program Master Composter provide information and tips on grasscycling and backyard composting at Dawson's Market.



Number of backyard compost bins for yard trim distributed to Montgomery County residents annually since FY2007.

8 University of Maryland Extension, Montgomery County Master Gardener Program, Grow It Eat It Campaign
<https://extension.umd.edu/mg/locations/grow-it-eat-it-0>

DEP has also developed and conducts a comprehensive education and awareness campaign to encourage residents, multi-family property owners, business and commercial property owners and managers to manage yard trim on-site through grasscycling and backyard or on-site composting. These efforts include:

- Educational Brochures (Backyard/On-Site Composting and Grasscycling)
- Informational Mailers (Composting and Grasscycling)
- Refrigerator Magnets (Composting and Grasscycling)
- Informational Doorhanger (Composting and Grasscycling)
- Referral to information on Vermicomposting

In addition, information is provided to businesses owners, managers, commercial property owners and employees during Waste Reduction and Recycling Seminars for Businesses, and to multi-family property owners, managers, and on-site staff during Multi-Family Waste Reduction and Recycling Seminars.

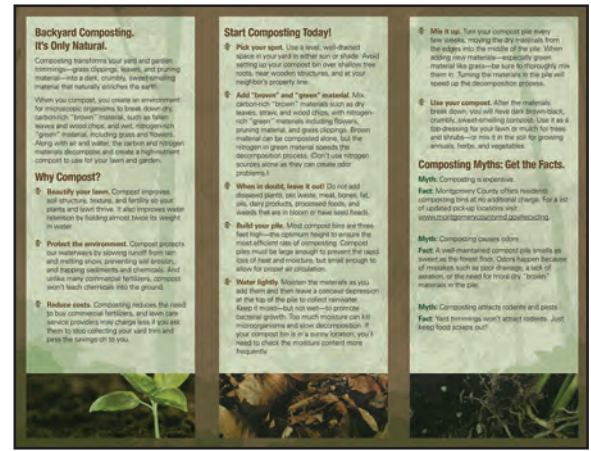
DEP has also periodically conducted broad-based educational campaigns to educate a wider audience of residents during the fall leaf season and prior to the start of the spring mowing season. These efforts have included the use of print publications, radio announcements, and local cable television programming and PSA announcements.

Community-Scale Composting/Community Gardens:

The Maryland-National Capital Park and Planning Commission (M-NCPPC) Montgomery Parks Department manages community garden plots throughout the County. Some community garden organizers have implemented on-site composting of yard trim materials, and use the compost bins provided by DEP. There have been specific community garden plot managers who have attempted to include food scraps and garden trimmings in their on-site compost bin in their community garden. Although no data has been collected, DEP has been made aware of challenges experienced with the addition of food scraps in community garden composting projects. Some of the specific concerns expressed to DEP include: a lack of ownership among the individual plot gardeners to accept responsibility for the proper management of the compost piles or compost bins; limited convenient on-site access to water to keep materials in a compost bin or pile moist; and other logistical challenges. However, these issues can be addressed with education on proper management techniques. Promoting community-scale composting projects in community gardens is important, as the gardeners can use the finished compost in their individual garden plots.

To date, the County has not undertaken initiatives to expand community-scale yard trim composting programs to include food scraps or other organic material, such as soiled paper or compostable food service products.

Community-scale composting of food scraps has been going on across the country for decades. As noted by Growing Local Fertility: Guide to Community Composting, a guidance document from the Institute for Local Self-Reliance and the Highfields Center for Composting, “community composting involves a relatively small-scale system in which material is converted into compost within a local community. Many but not all community composting programs are non-profit mission driven enterprises. The distinguishing feature of community composting is keeping the process and product as local as possible while engaging the community through participation and education.”



Brochure on backyard composting distributed by DEP.



Example of community-scale composting program.



Residents growing vegetables and creating compost at a community garden at Halpine Hamlet Apartments (a multi-family residential property) in Rockville.

A few jurisdictions in the Washington, D.C. metropolitan area have begun community-scale food scrap composting projects. As examples, the D.C.'s Department of Parks and Recreation Community Compost Cooperative Network and Baltimore's Real Food Farm, are innovative, small-scale and volunteer-driven urban agricultural enterprises engaged in growing fresh produce, while also composting yard trim and food scraps on-site in community gardens. Recently, the D.C. Department of Public Works conducted a feasibility study on developing composting infrastructure and will continue its community composting initiative while pursuing additional infrastructure capacity.

CHALLENGES

The inclusion of food scraps in on-site, backyard and community-scale composting projects can result in potential environmental and health safety issues, if not properly managed.

- **Management of Food Scraps in Compost Bins.** Improper management of food scraps in a compost bin or compost pile may result in environmental concerns, nuisance odors, runoff issues, as well as attract vermin and pests. In the past, although no formal data has been collected, housing inspectors from the County's Department of Housing and Community Affairs (DHCA) periodically investigated reports of piles of trash that included food scraps. Residents have also contacted other County agencies including the Department of Health and Human Services (DHHS), and the Department of Permitting Services (DPS), as well as DEP to request that staff investigate and/or address complaints about issues with improperly contained food scraps placed in compost bins or piles.
- **Use of Existing County-Provided Compost Bins.** Over 38,000 backyard compost bins have been distributed by DEP to County residents since FY07. However, these compost bins are appropriate for the composting of yard trim materials and are not designed to include food scraps for composting. These compost bins are completely open at the top and bottom, and are designed with hundreds of small holes around the perimeter of the bin to maximize air flow within the compost bin, to make for more efficient aeration and composting. Therefore, these specific types of backyard composting bins provided by the County are not sufficient for composting food scraps as pests (insects, rodents, etc.) can be attracted to the food scraps placed into the bins.
- **Siting (Location) of Compost Bins.** Due to concerns about the proximity of compost bin placement to neighboring properties, DEP recommends residents place compost bins at least one foot away from their neighbor's property line. At present, there is no specific requirement in the County's codes or regulations that address this recommendation. DEP, DHCA, DHHS, and DPS inspectors have received complaints from adjacent property owners regarding placement of compost bins on a neighboring property.
- **Limited Availability of Community-Scale Composting Sites.** Designation of a person responsible for managing the compost bin/pile in a community garden; assurance that the finished compost is used (and therefore moved); and decisions about who can use the finished material, have been limiting factors in expanding community-scale composting programs.
- **On-Site Space Limitations.** Community gardens may have limited space on-site for active compost piles, storage space to store feedstocks, space to cure compost, and space to store finished compost prior to use or distribution.
- **Lack of Education.** People responsible for composting programs must be knowledgeable about the composting process and manage the process using standard practices to avoid any safety, environmental, and public health issues.
- **Regulatory Limitations.** Current Montgomery County regulations and policies do not specifically encourage the on-site composting of food scraps in backyard compost bins or in community gardens. Portions of Montgomery County Code (Chapter 48) restrict the backyard composting of food scraps. Chapter 48 allows for the use of compost piles to dispose of food scraps, as long as each compost pile is completely rodent-proofed. There are also existing County zoning and land use codes, and other County codes pertaining to air quality, water quality, fire safety, housing and building maintenance standards, and rat control, that impact the ability to expand backyard and community scale composting. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.

RECOMMENDATIONS

- Continue educational efforts on all forms of in-home, backyard, and community-scale composting efforts, including providing educational materials, backyard compost bins designed for yard trim, compost training workshops, and demonstrations on best practices for in-home, backyard and community-scale composting.
- Conduct research and evaluate other types of compost bins that are suitable for composting food scraps.
- Conduct a coordinated inter-agency review of existing requirements and restrictions pertaining to backyard/community-scale composting and recommend regulatory changes to County zoning and applicable County codes to clarify, and support backyard and community-sale composting activities to include food scraps.
- Consider implementation of regulatory changes or modifications to promote and encourage proper backyard and community-scale composting activities.
- Conduct education and training following any changes to the County's zoning code or other applicable County codes, including development of best practices to encourage proper backyard and community-scale composting activities. Update existing resources as necessary to reflect any changes.
- Consider increased collaboration with community-based stakeholders and other pertinent groups (i.e., The Maryland-National Capital Park and Planning Commission - Montgomery Parks, Montgomery County Public Schools, Cooperative Extension Service Master Gardeners, and interested residents, multi-family properties, and businesses or organizations) to establish community-scale composting demonstration projects throughout the County.
- Continue to track and monitor the distribution of compost bins provided to residents, as well as to community groups.



DEP compost bin distribution and grasscycling and composting educational event.



Training led by DEP Recycling Volunteer Master Composter on backyard composting.

RESOURCES

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



On-Site Institutional and On-Site Business Composting

BACKGROUND

It is estimated that there were an estimated 33,000 businesses (defined to include non-profit organizations, and Federal, State and local government facilities) in Montgomery County in 2015, that employed an estimated 528,000 people.⁹ Per Montgomery County Executive Regulation (ER) 1-15, all businesses are required to recycle mixed paper and cardboard, commingled materials (bottles, cans and containers), scrap metal, yard trim, and Christmas trees. Food scraps and other acceptable recyclable organic materials, including compostable packaging, and soiled paper products, are not currently mandated for recycling. According to DEP's most recent Waste Composition Study, businesses are estimated to dispose of 79,000 tons of food scraps annually.

Yard trim, such as grass clippings and leaves, are currently being recycled by businesses on-site through grasscycling and/or composting on the property, or are removed off-site for composting by the organization's landscape contractor or lawn care service provider, who serves as a collector of these materials. It is estimated that only 1.6% of the non-residential waste stream included yard trim materials, demonstrating there is a high level of compliance and most yard trim is being properly managed through a combination of on-site grasscycling and on-site or off-site composting efforts.

The County does not provide refuse and/or recycling collection services to businesses, organizations, or government facilities of any type. Rather, businesses must contract for refuse and recycling collection services with private refuse/recycling collection companies or self-haul materials to recycling and solid waste acceptance facilities. Some businesses, such as supermarkets and large retailers, back-haul their recyclable materials to a central distribution center, where materials from individual store locations are consolidated before being sent to recycling markets. Smaller-scale businesses that generate limited amounts of solid waste may self-haul their trash and recyclable materials to local solid waste and recycling facilities, in lieu of contracting collection service with a refuse/recycling collection company.

The County has identified a few businesses that have implemented some form of on-site composting program, where organic materials generated on-site at the place of business are also managed and composted on-site at that property. There are many more businesses and institutions that have implemented food scrap recycling collection service where food scraps generated on-site are separated at the point of generation, collected by a food scraps recycling collection company and transported off-site to commercial composting facilities for processing.



Presentation on food scrap composting given to attendees at DEP's Business Waste Reduction and Recycling Seminar.

Assessment of Current Efforts

Through its ongoing work with businesses, organizations, and government facilities, DEP is currently aware of four businesses that manage their food scraps at the source, and compost food scraps on-site.

According to Annual Business Waste Reduction and Recycling Report data, the following businesses composted a combined total of 30 tons of food scraps on-site in CY2015:

⁹ Maryland Department of Commerce (2017) Brief Economic Facts: Montgomery County, Maryland.
https://static1.squarespace.com/static/5873c778e6f2e14a3529e892/t/58d13b956b8f5bad3a97fa0e/1490107300088/Montgomery+County+Brief+Economic+Facts_2016.pdf

- Green Acres School, Bethesda
- The Humane Society of the United States, Gaithersburg
- Sandy Spring Friends School, Sandy Spring
- Seven Locks Jewish Community (Congregation Har Shalom), Potomac

DEP provides on-site technical assistance, education and training to businesses and institutions, including County departments and agencies, to develop programs to further increase efforts to reduce waste and increase recycling achievement.

In late 2001 and early 2002, DEP met with the Montgomery County Department of Correction and Rehabilitation (DOCR) to research the feasibility of an in-vessel composting system to process food scraps on-site at the Montgomery County Correctional Facility (MCCF) in Boyds. At the time, Art Wallenstein, then Director of DOCR, wanted the Department to recycle 90% of their waste generated. He asked DEP for assistance to determine whether a 90% recycling rate was achievable.

DEP conducted mini-waste sort audits of waste generated from the Montgomery County Detention Center at Seven Locks in Rockville. The results of the mini-waste sorts showed that a 90% recycling rate was achievable; however, to accomplish this goal, food scraps had to be diverted from the waste stream and recycled or composted.

DEP and DOCR staff performed research, spoke with staff of, and later visited the James River Correctional Facility outside of Richmond, Virginia, to observe first-hand their on-site composting program. The facility uses an in-vessel composting system for food scraps generated on-site. A combination of staff and inmates manage and operate the on-site composting program at James River.

Several challenges prevented the start-up of an on-site composting program at the MCCF. First, the cost of an in-vessel system that met the needs of the new correctional facility was more than \$100,000. Second, an arrangement with the community surrounding the MCCF restricted inmate access to certain areas, namely within an established safety perimeter. The most feasible location for setting up an in-vessel composting system was located beyond (outside of) this safety perimeter. Third, the end use of the finished compost product was a consideration. It was determined that the finished compost could not be transported off-site, primarily due to security/public safety concerns and logistics. Furthermore, the compost that would have been generated was a far greater quantity than what could have been used on-site. Therefore, with the above considerations, DOCR made the decision not to implement an on-site food scraps composting project at that time.

Since the 1990's, DEP has provided tailored and individualized assistance to numerous businesses, including grocery stores, restaurants, and others that generate significant amounts of food scraps to set up food scrap recycling programs. Through these programs, businesses have separated their food scraps from other waste and recyclable materials, and have contracted with collectors, or have self-hauled, food scraps to composting facilities for recycling.



Congregants of a local synagogue set up a compost bin on their property.



DEP food scrap recycling brochure for businesses and institutions.



The manager and employees of the cafeteria in the County's Executive Office Building in Rockville receive education and training on the do's and don'ts of separating food scraps for recycling collection.

To develop best practices, and gain first-hand expertise, DEP developed demonstration food scrap recycling collection programs for pre-consumer food scraps for cafeterias in three County facilities: the Executive Office Building and the Council Office Building in Rockville, and the Public Safety Headquarters Building in Gaithersburg. Through these demonstration projects, DEP developed educational materials and best practices on implementing food scrap recycling programs, which are used to provide technical assistance, training and education to businesses/institutions that develop programs to separate their food scraps for recycling.

CHALLENGES

There are limitations impacting the development of on-site food scrap recycling programs, where food scraps generated are managed and composted on the property. On-site space constraints, capital and operating costs, on-site management of composting, and end use of the finished product, are issues that must be considered in the context of the Strategic Plan.

- **Availability of Feedstocks and Sizing of Programs.** Assessing the amount of food scraps generated on-site by businesses and institutions to determine the type and size/capacity of on-site composting operations is critical.
- **On-Site Space Limitations.** Businesses and institutions need adequate space for all aspects of the composting process, including: on-site storage area for feedstock prior to composting; on-site area for active composting; on-site area for curing compost; and storage area for all composting-related equipment. Businesses on small properties, or those located in the Central Business Districts (CBDs) may not have adequate space to implement on-site composting programs (i.e., physical site limitations for in-vessel composting systems).
- **Use of End Product.** Businesses and institutions that are considering on-site composting programs must ensure there is an action plan to use and/or distribute the finished compost product after the curing process. Factors to be considered include: quantity of finished compost; amount of time when finished compost will be available; and whether compost will be used on-site and/or distributed/sold to others. If finished compost is distributed to others, how it will be removed off-site needs to be determined. For compost that is sold or distributed within the State of Maryland, the generator will also need to apply for a registration to the Maryland Department of Agriculture (MDA) and have the finished product tested.
- **Regulatory Limitations.** Current Montgomery County zoning codes and other applicable County codes, regulations and policies do not specifically encourage the on-site composting of food scraps. Portions of Montgomery County Code (Chapter 48) restrict the on-site composting of food scraps. County code allows for the use of compost piles to dispose of food scraps, as long as the compost pile is completely rodent-proofed. There are also existing County zoning codes and other County codes regarding air quality, water quality, fire safety, housing and building maintenance standards, and rat control, that may impact the ability to expand on-site composting at businesses and institutions. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.
- **Design Standards, Guidelines and Best Practices.** Issues concerning siting, placement on-site, screening, setbacks, and more, must be reviewed, evaluated and any necessary requirements must be considered for development of design standards, guidelines and best management practices.



Information for businesses on implementing food scrap recycling programs provided in Business Recycling Handbook.

- **Operation Costs.** Businesses and institutions will need to cover the costs of composting their food scraps on-site. Costs associated with setting up a composting program vary based on the type of composting system utilized and businesses must consider these features within their budgetary constraints and operating cost. Various composting processes/technologies for consideration are explained in detail under the Review of Food Scrap Processing Technologies section.
- **Lack of Education.** A lack of employee awareness and training can result in improper handling of food scraps and other organic materials in composting programs.
- **Certification of Composting Operations.** Compost facility operators must be certified by MDA. A determination needs to be made whether this applies to on-site composting.
- **Composting Facility Permit Requirements.** The composting program must also comply with MDE Composting Facility Permit Requirements, as well as other State, and local requirements. Employees need to be aware of the conditions of any permit related to on-site composting. If an MDE Composting Facility Permit is not required due to sizing or other exemption, proper steps must still be taken to follow best practices.

RECOMMENDATIONS

- Continue efforts to expand educational activities to encourage businesses that may wish to set up on-site food scrap recycling programs. Provide educational materials and technical assistance pertaining to implementing on-site composting programs for businesses and institutions, including best practices.
- Identify institutions and businesses that generate significant quantities of food scraps and assess potential for on-site composting activities; provide educational materials and trainings; provide follow-up assistance to address issues/concerns; and evaluate.
- Continue to work with businesses, institutions, and business groups (such as the Chambers of Commerce, business associations, government agency representatives, and others) to encourage businesses to set up and maintain on-site food scrap composting programs.
- Conduct a coordinated inter-agency review of existing requirements and restrictions pertaining to on-site composting programs and recommend regulatory changes to County zoning and applicable County codes to clarify, and support activities to include food scraps.
- Conduct research on available on-site composting technologies for businesses and institutions to consider when planning on-site composting programs, such as availability of in-vessel composting technologies.
- Provide follow-up assistance to businesses and institutions with on-site composting programs to address any issues or concerns.
- Conduct evaluation of on-site composting programs to assess programs effectiveness.
- Encourage businesses and institutions to report data on the amount of food scraps composted on-site to measure on-site composting efforts.
- Explore incentives such as grants for businesses and institutions to purchase necessary supplies and equipment to facilitate the collection and on-site composting of food scraps.

RESOURCES

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



On-Farm Composting

BACKGROUND

The agricultural community has long composted organic material, such as manure, to reduce the amount of waste generated on-site that must be taken off-site and processed elsewhere, as well as return valuable nutrients back to the soil. The organic matter composted on-site at most farms is typically materials that are generated directly on that site, as a by-product of farm operations. The finished composted material is then used by the farm to rejuvenate its soils. To a much lesser extent, a few farms are known to compost organic materials from off-site sources.

The definition of “farm” as it relates to Maryland’s Composting Facility Permit Regulations, means “the site of a business or activity operated for the primary purpose of tilling, cropping, keeping, pasturing, or producing an agricultural product other than compost, including livestock, poultry, plants, trees, sod, food, feed, or fiber, by in-ground, out-of-ground, container, or other culture.” According to the United States Department of Agriculture’s 2012 AgCensus Report¹⁰, it is estimated that there are 540 farms located in Montgomery County, of which 42% are farmed as a primary occupation. The average size of these farms is 118 acres. In 1980, Montgomery County created the Agricultural Reserve, which includes 93,000 acres of land. This area has been zoned to encourage agricultural uses.

To increase composting of food scraps in the County, on-farm composting of food scraps should be considered as a potential option to minimize the amount of food scraps disposed in the solid waste stream.

Assessment of Current Efforts

Currently, DEP is aware that limited amounts of food scraps and other organic materials are being composted on-site at some farms located within the County. For example, Red Wiggler Community Farm in Germantown, is composting food scraps from various sources on-site. Customers can bring in their food scraps when they pick up their Community Supported Agriculture (CSA) food allotments. The food scraps are then composted on-farm and the finished compost is tilled into the soil to grow new crops. DEP is also aware that some other farms in the County accept limited quantities of food scraps from small-scale solid waste collectors, and small businesses that generate food scraps.

Presently, there is extremely limited processing capacity in the region to compost food scraps and other organic material, such as soiled paper and compostable food service ware. Additional capacity can be made available if on-farm composting of organic materials is encouraged, and some tonnages of material are processed on-farms. However, DEP has heard from the agricultural community that there are barriers that limit their participation in fully setting up on-farm composting programs.

Since the 1990’s, there have been several instances in Maryland, where facilities at which food scrap composting operations were approved to operate, operated in earnest, and then were halted due to some regulatory or regulatory-related issue. To reduce the possibility of recurrence of this situation, DEP, as well as staff of other jurisdictions, held a number of discussions with MDE on the matter.



Collection of organic materials for on-farm composting.

10 USDA - Census of Agriculture (2012) 2012 Census Publications. <https://www.agcensus.usda.gov/Publications/2012/>

Working together for almost two years on this issue resulted in the State of Maryland's 2015 Composting Facility Permit Regulation, which includes best management practices that farmers can follow that would address the above concerns. MDE sponsored an informational meeting for the agricultural community on December 3, 2015, to share the goals of the new State regulations on composting. DEP staff participated in this meeting and provided a presentation on the County's solid waste and recycling program.

CHALLENGES

There are numerous challenges that currently limit efforts to further increase the amount of food scraps and other organic materials composted on farms.

- **Neighbor Concerns.** Concerns of neighboring property owners and a perceived negative impact on their property values as a result of odors or other nuisance issues could result from improper management of on-farm composting.
- **Environmental Concerns.** Environmental concerns include contamination of feedstock, excess nutrient runoff into waterways, etc.
- **Composting Costs.** Costs of on-farm composting are dependent on the type of composting system that will be used by the farm; farmers may lack the financial resources to invest in the necessary equipment.
- **Contamination of Feedstocks.** Contamination of food scraps is a significant concern for farmers that accept food from off-site sources for composting. If the materials are contaminated, the farm will need to handle and properly dispose of the contamination as solid waste, at increased cost.
- **Certification.** Compost facility operators must be certified by MDA. A determination needs to be made whether this applies to on-farm composting.
- **Regulatory Limitations.** Current Montgomery County zoning codes and other applicable County codes, regulations, and policies do not specifically encourage the on-site composting of food scraps on-farms, especially if the composting activities are not a direct result of on-farm operations. In addition, existing County zoning requirements limit the amount of on-farm composting activities to the Agricultural Reserve and indicate that composting is permitted only as an accessory use in these areas. Portions of Montgomery County Code (Chapter 48) restrict the backyard composting of food scraps. County code allows for the use of compost piles to dispose of food scraps, as long as the compost pile is completely rodent-proofed. There are also existing County zoning codes and other County codes regarding air quality, water quality, fire safety, housing and building maintenance standards, and rat control, that may impact the ability to expand on-farm composting. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.
- **Permitting Requirements.** Permitting on-farm composting programs (above exemption thresholds) must comply with MDE Composting Facility Permit Requirements, as well as other State, and local requirements. If the farm is exempt from applying for an MDE Composting Facility Permit, proper steps must still be taken to follow best practices.



Training and education are key to on-farm composting success.

- **Inconsistencies with Nutrient Management Requirements (administered by MDA).** These plans specify how much fertilizer, manure, or other nutrient sources, such as compost, can be safely applied to crops to meet yields, but prevent excess nutrients from impacting State waterways. These plans are required for all agricultural land used to produce plants, food, feed, fiber, animals or other agricultural products. DEP has heard that these nutrient management plans limit the amount of compost farmers can use on their farms. As a result, farmers would need the ability to market and distribute their compost to others.
- **Increased Marketing and Distribution of Finished Compost.** All compost distributed within the State of Maryland must be registered through MDA. This registration must be renewed annually. Other neighboring States, such as Virginia, West Virginia, Pennsylvania, and D.C. may have their own such registration or testing process that differs from Maryland. This may make it more difficult to market finished compost, due to the geographic proximity of Montgomery County to these neighboring jurisdictions.

RECOMMENDATIONS

- Work with Maryland Department of the Environment, Maryland Department of Agriculture, the Montgomery County Office of Agriculture, Soil Conservation District, Cooperative Extension Service, and others to meet with the agricultural community to discuss on-farm composting of food scraps.
- Convene a multi-agency group to review and update County zoning and other applicable County codes, if necessary, to promote increased opportunities for on-farm composting of food scraps and other organic materials.
- Conduct research to assess expansion of on-farm composting activities, including identifying farmers interested in on-farm composting.
- Develop technical assistance to generators and farmers to facilitate on-farm composting of food scraps, including information on State and local regulations applicable to on-farm composting of food scraps, as well as educational materials, which may include design standards, guidelines, and best practices.
- Consider developing educational materials and trainings to address contamination issues (i.e., assistance provided to generators of food scraps to keep contamination out of food scraps collected for recycling, and to farms and their employees on methods to manage contamination of food scraps).
- Consider policies, legislation, and regulations that promote and encourage the use of finished compost in the region.
- Encourage farms to report data, using existing reporting mechanisms or identify new reporting methods, on the amount of food scraps and other organic materials that are composted on the farm; and whether materials are generated only on-site, or materials are transported to the farm from other locations or businesses.
- Explore incentives such as grants for farmers to purchase necessary supplies and equipment to facilitate the collection and on-farm composting of food scraps.

RESOURCES

Resources which may include staffing, operating, and/or capital funds that are needed to support these recommendations are dependent on the specific details that should be determined in the development of an implementation plan.



Composting Capacity to Serve Montgomery County

BACKGROUND

All businesses and multi-family properties (as well as single-family residents) are required to recycle yard trim materials (grass clippings, leaves and garden trimmings) but are not currently mandated to recycle food scraps and other organic materials such as food-soiled paper or compostable food service products. The decision to mandate specific materials for recycling is dependent upon the amount of the material that is generated, and whether strong, stable, long-term market conditions exist within the region to support recycling of the tonnages generated.

To reach the County's goal to reduce waste and recycle 70% of waste generated by 2020, it is important to maximize the amount of materials recycled by businesses, including food scraps. Currently, it is estimated that only 1.6% of the non-residential waste stream included grass clippings, leaves, and prunings, demonstrating there is a high level of compliance with the mandate, and most yard trim is being properly managed. However, it is estimated that businesses dispose approximately 79,000 tons of food scraps annually, while multi-family properties dispose 17,000 tons of food scraps each year.

A review of CY2015 Annual Business Waste Reduction and Recycling Reports submitted by 594 businesses, identified 30 businesses that reported source-separating food scraps for recycling collection services by private recycling collection companies. According to CY2015 business recycling tonnage and facility processing data reviewed by DEP, approximately 3,522 tons of food scraps were diverted from the solid waste stream and composted in CY2015.¹¹

Through its ongoing work with multi-family properties to provide technical assistance, training, education and support to further increase efforts to reduce waste and increase recycling achievement at multi-family properties, DEP is aware of several multi-family properties and senior living communities that have implemented programs to separate food scraps for recycling. These properties contract with a service provider who collects the food scraps and transports the materials to a composting processing facility. An estimated 8 tons of food scraps were recycled from multi-family properties according to a review of CY2015 multi-family recycling tonnage and facility processing data reviewed by DEP.¹¹

DEP has developed several programs and initiatives to increase food scrap recycling programs, including efforts to encourage development of processing capacity for composting food scraps and other organic materials.



Aerial photo of the Montgomery County Composting Facility.



Leafgro® bagging operations at the County's Composting Facility.

11 Montgomery County, MD (2015) Waste Recycling by Material Type: Achievement and Opportunity (CY15 Actuals).
Department of Environmental Protection, Division of Solid Waste Services.

Some examples of these efforts included:

- **Food Scraps Recycling Collection in County Buildings.** To develop best practices and gain first-hand expertise, DEP developed and implemented a model food scrap recycling collection program for pre-consumer food scraps in the cafeterias at three County government buildings: the Executive Office Building and the Council Office Building in Rockville, and the Public Safety Headquarters Building in Gaithersburg. Pre-consumer food scraps are separated from the waste stream by cafeteria employees. The food scraps are placed in collection containers during food prep for breakfast, lunch and any catering events. Towards the end of day, any leftover prepared food is placed in carryout containers and sold at a discounted rate; remaining food is then placed into the central food scrap recycling collection containers. The food scraps are collected by a private recycling collection company and are transported to the Prince George's County Composting Facility in Upper Marlboro, Maryland for composting. Through these demonstration projects, DEP has developed educational materials and best practices on implementing food scrap recycling programs, which have been used to provide technical assistance, training and education to businesses/institutions that develop programs to separate food scraps and recycle them.
- **Regional Food Scraps Solicitation.** On behalf of Montgomery County, and pursuant to an action item in the County's Comprehensive Solid Waste Management 10 Year Plan (2012-2023)¹², the Northeast Maryland Waste Disposal Authority (the Authority) issued a procurement in 2016 to secure food scraps processing capacity for the County. The Request for Proposals (RFP) was issued on September 8, 2016 and included the following:
 - A County commitment to pay the private sector on a put-or-pay basis for 30,000 tons per year of combined single-family residential curbside and commercial food scraps and organic materials.
 - A requirement that proposers' facilities be sized to be able to accept up to 50% more than that put-or-pay commitment tonnage, and be able to handle an additional 36,000 tons per year of material in the form of leaves and grass clippings in the event the County decided that food scraps and other organic materials be collected curbside from single-family households together with yard trim.
 - A requirement that the proposers must use their own land; the County did not make available any County-owned land for the purpose of allowing development of a new processing facility.The procurement yielded proposals that the County deemed to be too costly and not in the best interests of the County, and was discontinued on June 8, 2017.
- **Participation in Regional Efforts to Increase Composting Processing Capacity for Food Scraps and Other Organic Materials.** DEP, along with other jurisdictions and stakeholders, worked with MDE to draft Maryland's first Composting Facility Regulations, which were enacted on July 1, 2015. The purpose of the regulation was to define composting, acceptable materials, facility sizes, operation standards, etc., giving clear guidance to public and private enterprises interested in composting organic materials, including food scraps. DEP has also actively participated on the Food Scrap Recycling Task Force, hosted by the Metropolitan Washington Council of Governments (COG) to discuss efforts to increase markets for compost and development of food scrap recycling efforts in the MD-VA-DC metro area.



Cafeteria employee at the Executive Office Building in Rockville separates pre-consumer food scraps for recycling collection.

12 Montgomery County, MD (2015) Comprehensive Solid Waste Management 10 Year Plan 2012-2023 (March 2015). Department of Environmental Protection, Division of Solid Waste Services. <https://www.montgomerycountymd.gov/SWS/Resources/Files/swp/complete-plan.pdf>

Assessment of Current Efforts

In the past 20 years, the solid waste industry has seen an increase in the number of composting processing facilities and the types of technology used to process food scraps and other organics including food-soiled paper and compostable food service ware packaging. This growth is emerging and evident in the region, albeit not as robust or stable as in other parts of the country. There are four dominant types of technologies used in the U.S. for processing food scraps and other organic materials: open windrows, aerated static piles, in-vessel composting, and anaerobic digestion. These technologies are discussed in detail under the Review of Food Scrap Processing Technologies section.

Food scraps generated by the commercial and multi-family sectors that cannot be composted on-site will need to be processed at composting processing facilities that are permitted to accept food scraps for processing. Montgomery County's Composting Facility is limited by community agreement to receiving no more than 77,000 tons per year of incoming materials. Adding food scraps and other organic materials generated from the commercial and multi-family sectors would exceed that limit. Therefore, DEP should explore securing food scrap recycling processing capacity that is becoming available in the region. There has been an increase in the number of composting processing facilities that are permitted by MDE to accept food scraps and other organic materials in the State. Additional processing facilities are also being planned, or are in construction phase, both in Maryland and in the region that should be able to accommodate the tonnage of materials from businesses, organizations, institutions, government facilities, and multi-family properties in the County.

DEP has identified several facilities in the region with potential for receiving and processing source source-separated food scraps and other organic materials from the County's commercial and multi-family sectors. It should be noted that none of these facilities are located within Montgomery County; hence transportation costs may be high. Note that the information below was current as of Fall 2017.

- Prince George's County's Western Branch Composting Facility, Upper Marlboro, Maryland
Both Western Branch and the Montgomery County Composting Facility are operated by the Maryland Environmental Service (MES). MES has been operating a pilot-scale, aerated pile system using the GORE® cover system to process food scraps at Western Branch since October 2013. In FY17, Prince George's County expanded its pilot food scraps composting operation and was expected to compost 6,750 tons of food scraps during FY17. Prince George's County has indicated interest in providing future expansion capacity for food scraps and other organic materials generated by the commercial sector in Montgomery County at its Western Branch facility. Currently, a significant amount of food scraps that are currently separated for recycling by the commercial sector in Montgomery County is being processed at Western Branch, including the pre-consumer food scraps collected from DEP's commercial food scrap recycling demonstration projects.
- Comus Materials, LLC, Woodsboro, Maryland
Located in neighboring Frederick County, Maryland, Comus Materials, LLC, privately owns and operates on a free market basis, a composting facility that is permitted by the State of Maryland to receive 33,000 tons of feedstock, including food scraps. The potential available capacity of this facility is not yet known.
- Maryland Food Center Authority (MFCA), Jessup, Maryland
The Maryland Food Center Authority (MFCA) has indicated its desire to develop a food scraps recycling facility for the benefit of its members. MFCA reports that it generates approximately 6,000 tons per year of food scraps at its center located in Jessup, Maryland, and that it aims to enter into a public-private partnership to not only meet that capacity need, but which could potentially accommodate additional sources of food scraps. The vision that MFCA has is that it will provide a five-acre property that it owns for the site and will assist in the permitting process, for development of an anaerobic digestion system on a public-private partnership basis. In late April 2017, MFCA signed a 180-day memorandum of understanding (MOU) with BTS Biogas USA to examine the feasibility of a specific public-private partnership. BTS Biogas USA holds rights to anaerobic digestion technologies well-established in commercial practice in Europe, and hopes to propose an arrangement suitable to MFCA within the next several months. DEP has held discussions with MFCA, and interests appear somewhat aligned. The MFCA project holds technical potential for processing of food scraps and organics generated by the commercial sector in Montgomery County.

- Freestate Farms, LLC, Manassas, Virginia

The Prince William County, Virginia, Board of Supervisors has authorized an agreement with Freestate Farms, LLC to operate Prince William County's existing Balls Ford Road Composting Facility, and to develop and operate at that site a new integrated facility for advanced aerated composting, anaerobic digestion, and baseload renewable energy. Once fully constructed, the new facility will be able to process over 165,000 tons per year of food scraps, yard trim, and wood waste products to produce commercial-scale volumes of compost, mulch, and organic soil amendment products. In addition, the facility will also generate one megawatt of baseload renewable electricity (enough for approximately 750-1,000 typical homes).

Construction of the new facility was expected to begin in late 2017, and the first phase of the new facility—the advanced aerated composting system which will process over 85,000 tons of materials per year (including up to 30,000 tons of food scraps)—should come fully online in late 2018. The second phase of the project—the anaerobic digestion system, which will process over 80,000 tons per year of food scraps into organic soil amendment products and generate baseload renewable energy—should come online in early 2019.

- McGill Environmental Systems, Waverly, Virginia

McGill Environmental Systems is an existing composting facility, which seeks good quality sources of food scraps. Conversations between DEP and McGill indicate their desire to negotiate with Montgomery County for a portion of its existing capacity, suggesting tipping fees for materials delivered to its site. The facility is somewhat distant, however, imposing high transportation costs. DEP is aware of some commercial sector generated food scraps that are processed at McGill Environmental Systems.

- Potential Use of County-Owned Land for Food Scrap Recycling Processing

The development of additional food scrap recycling processing capacity should include a review of existing sites within Montgomery County, including County-owned properties or facilities, that DEP should consider researching to determine the feasibility of developing site(s) to include processing of food scraps and other organic materials from businesses, organizations and multi-family properties. For example, the County-owned Gude Landfill property on Gude Drive in Rockville is one potential site that could be reviewed for the development of food scraps recycling processing capacity.

CHALLENGES

Challenges to increasing food scraps recycling in the commercial and multi-family sectors include:

- **Lack of Food Scrap Recycling Processing Capacity in Montgomery County.** There are no large-scale food scrap recycling processing facilities located in Montgomery County. Therefore, all businesses and multi-family properties that source separate food scraps and other organic materials must use recycling collection companies to transport their food scraps and other organic materials or self-haul to other facilities in the region. The Montgomery County Composting Facility is limited to processing no more than 77,000 tons per year of materials for processing; remaining facility capacity would provide only enough capacity for food scraps generated from the single-family sector.
- **Limited Regional Facilities that Accept Food Scraps for Composting.** A significant challenge has been the instability of composting facilities in the region to remain operational and able to consistently accept food scraps for processing over the long-term. Since the 1990's, several composting facilities in the State have opened their gates, accepted food scraps, and then either had to cease operations, or had to cease acceptance of food scraps to remain in operation. This has caused generators of food scraps that have source separated food scraps for recycling, along with their collectors, to scramble to find other alternative facilities that could accept their food scraps for recycling. There were instances in which food scrap recycling programs were ceased by generators due to a lack of available processing facilities.



Example of contamination in a load of food scraps.

The current limited food scrap recycling processing facility capacity to serve the region is an obstacle and presents a challenge to significantly increasing the number of businesses, organizations, and government facilities that establish recycling programs to source separate their food scraps for recycling.

- **Contamination of Source-Separated Food Scraps.** A major source of contamination in food scrap recycling programs are various types of food packaging materials that are not compostable, or not compostable within the processing capabilities of the composting processing facility. The facility operator determines the acceptable feedstocks, based upon the type of processing technology used to process food scraps, as well as the size of the facility.
- **Regulatory Limitations.** Current Montgomery County zoning codes and other applicable County codes, regulations and policies do not specifically encourage composting of food scraps. There are also existing County zoning codes and other County codes regarding air quality, water quality, fire safety, housing and building maintenance standards, and rat control, that may impact the ability to expand food scrap processing capacity in the County. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.

RECOMMENDATIONS

- Continue to identify businesses/multi-family properties that generate significant quantities of food scraps; provide education and training; and provide resource lists of food scrap composting processing facilities and recycling collection service providers that offer food scrap recycling collection services.
- Consider the development of a broad-based education campaign to encourage businesses, organizations, institutions, and government facilities (at all levels) to encourage the commercial sector to source separate food scraps and other organic materials for recycling collection.
- Continue to promote use of the Prince George's County Western Branch Composting Facility for recycling of commercially-generated food scraps and other acceptable organic materials.
- Continue to research opportunities to secure additional capacity for food scraps and other organic material generated in the County that can be processed at regional composting facilities, and other facilities that utilize other technologies such as anaerobic digestion.
- DEP should continue to work with composting and/or anaerobic digestion facilities and should pursue and attain agreement(s) to secure stable processing capabilities for additional tonnages of food scraps generated in the County, through the issuance of Request for Proposals (RFPs).
- DEP should structure agreements to secure stable processing capacity, and to offset processing costs to incentivize and induce increased recycling of food scraps.
- DEP should consider establishing Executive Regulations to support the expansion of food scrap processing capacity:
 - A regulation to establish differential tip fees to motivate generators to source-separate food scraps and other organics and encourage collectors to provide recycling collection services for these materials.
 - A regulation to establish rules to ensure the County pays its contract processor(s) only for food scraps and other organic materials that are generated within the County.
- Work with licensed collectors/haulers that collect food scraps and other organic materials from businesses, organizations, and government facilities, to provide information, education, and trainings.
- Continue and expand work with business owners/managers, Chambers of Commerce, business associations, representatives of government agencies, and others to raise awareness of food scrap recycling programs and increase participation.
- Consider various metrics to obtain data regarding the amount of food scraps available to better estimate processing capacity needs and document the amount of food scraps and other organics collected for recycling.
- DEP should consider any necessary minor modifications to the Transfer Station Annex Building to accommodate receipt and transfer of food scraps for recycling.

- Longer-term, DEP should explore feasibility of using in-County capacity, including County-owned property(ies) for processing source-separated food scraps and other acceptable organic materials.
- Continue to encourage the reporting of food scraps collected through reporting mechanisms already in place to obtain data on the amount of food scraps recycled, and if necessary, identify other reporting opportunities to gather this information.

RESOURCES

In FY19, \$432,000 funds a new, dedicated position in DEP to manage the Commercial Food Scraps Recycling Program, and provides for minor modifications that may be necessary to the Transfer Station Annex Building to accommodate receipt and transfer of food scraps for recycling. The new Program Manager will work to secure capacity to process and recycle food scraps (and potentially other acceptable organics), and also develop incentives to increase recycling of food scraps in the commercial sector. These incentives may include establishment of differential tip fees at County solid waste acceptance facilities to motivate generators to source-separate food scraps and potentially other organics, and encourage collectors to provide recycling collection services for these materials.

Additional resources, including staffing, operating, and capital costs, may be needed in the future to support these recommendations, dependent on the specific details determined in further development of an implementation plan.



Strategies to Maximize Food Scraps Collection at the Curb

BACKGROUND

DEP provides weekly curbside recycling collection services to over 217,000 single-family households in the non-municipal areas of the County. As part of this service, residents receive year-round weekly recycling collection of yard trim materials such as grass clippings, leaves, garden trimmings, as well as Christmas trees. DEP does not provide residents with curbside recycling collection containers to set-out yard trim for recycling collection. Residents are informed to place yard trim at the curb for recycling collection service in one of three ways:

- In any type of reusable containers of their choosing they obtain, with a County-provided yard trim recycling decal affixed to the container.
- In paper lawn bags, available at most grocery stores, nurseries, and home improvement stores.
- Bundled with twine (for branches and twigs).

The yard trim is transported to Montgomery County’s Shady Grove Processing Facility and Transfer Station, where the grass clippings and leaves are loaded and transported to the Montgomery County Composting Facility. In CY2015, approximately 66,000 tons of yard trim were processed at the Composting Facility. The finished product is a soil amendment marketed under the name Leafgro®, which is bagged, distributed to retailers, and sold; the product is also sold in bulk. The Composting Facility may not process more than 77,000 tons of materials annually. Currently, yard trim materials are processed at the facility.

While the County provides weekly curbside recycling collection of yard trim, DEP first encourages residents to manage their yard trim materials on-site through grasscycling, and/or backyard or on-site composting. This effort, to manage yard trim materials directly at the source, reduces the amount of yard trim that requires collection, transportation and processing by the County. Since the early 1990’s, DEP has provided backyard compost bins, as well as a variety of educational and instructional materials, guidance, training, and community workshops to teach residents about grasscycling and on-site or backyard composting. These efforts have included broad-based educational campaigns, designed to increase awareness of grasscycling and composting.

However, the County discourages residents from placing food scraps, of any type, in backyard compost bins for several reasons:

- Improperly managed food scraps in a compost bin or compost pile can result in nuisance odor and leachate (runoff) issues (both of which are environmental concerns) and can attract vermin which can be a human health and safety hazard.
- The backyard compost bins provided by the County are not designed to include food scraps for composting. The addition of food scraps in these compost bins may attract pests and rodents, and can be the source of odors, and contribute to runoff.

It is estimated that 51,000 tons of food scraps are disposed in the trash by the single-family sector annually. Diverting food scraps and other acceptable organic materials for recycling from the single-family sector would help the County towards achievement of the County’s goal to reduce waste and recycle 70% by 2020. To increase recycling of food scraps generated by single-family residents, the County should consider a curbside food scraps recycling collection pilot.



Example of educational food scraps recycling container label developed by DEP.

Assessment of Current Efforts

Across the U.S., the number of households that receive curbside recycling collection of source-separated food scraps is growing. As a result, there is increased emphasis for communities to incorporate food scraps diversion into their integrated solid waste management systems. For single-family households in a number of jurisdictions across the U.S., this is being accomplished by the inclusion of food scraps into existing yard trim recycling collection services, and subsequent composting of materials at composting facilities.

According to a recent study completed in 2016 by the Applied Research Foundation of the Solid Waste Association of North America (SWANA) and published in a report entitled “Food Waste Diversion Programs and Their Impacts on MSW Systems,”¹³ food scraps diversion rates from selected communities were as low as 1 to 2 pounds per household per week for some established programs (such as those in Portland, Oregon, and King County, Washington) and as high as 8 pounds per household per week in the City of Seattle, Washington, where food scraps recycling is mandatory.

Locally, several communities, such as Takoma Park and University Park, Maryland provide curbside food scraps recycling collection services for their residents. Howard County has established a food scraps composting program, initially as a pilot program, using a covered aerated static pile at the County’s Alpha Ridge Landfill. Howard County Recycling Coordinator Gemma Evans and Operations Division Chief Jeff Dannis stated that the Howard County program has moved beyond pilot status, but that any future expansion to serve more households will be done in measured phases.¹⁴ Food scraps collected from Takoma Park and University Park are transported to Prince George’s County’s Western Branch Composting Facility for processing, also using a covered aerated static pile windrow system. A detailed review of these programs is described under the Review of Other Food Scrap Recycling Programs section.

To increase the amount of food scraps and other organic materials collected for recycling from single-family households, DEP should consider efforts to develop a pilot project to test, assess and determine long-term strategies to provide residents with the opportunity to recycle source-separated food scraps and other organic materials at the curb. The County already provides residents with year-round recycling collection service for yard trim materials and Christmas trees; therefore, the County should consider the inclusion of food scraps and other organic materials into the existing yard trim recycling collection program. The information gathered from the pilot could be used to evaluate whether single-family residents that receive County-provided recycling collection services will separate food scraps for recycling and place these materials into a separate curbside collection container for recycling collection by the County.

This is a similar process undertaken by other municipalities across the U.S. A pilot project can be used to assess the amount of materials set-out for collection, participation rates, effectiveness of educational efforts, and the most appropriate size of container that residents prefer to use for separating and recycling food scraps. However, the implementation of a pilot project will need to take into consideration several existing challenges.

CHALLENGES

Specific challenges involved with the development of a pilot program to collect and process source-separated food scraps from single-family households include:

- **Processing Requirements.** Currently, the Montgomery County Composting Facility processes yard trim materials for composting; processing changes would be necessary to incorporate food scraps and other organic materials for composting.
- **Incorporating Food Scraps with Yard Trim.** The volume of food scraps that can be processed is limited by the amount of leaves available and the ability to achieve a proper carbon-to-nitrogen (C:N ratio) mixture. Leaves and food scraps must be mixed in appropriate proportions to create the proper carbon-to-nitrogen ratio. In addition, a bulking agent to increase the stability of the pile and increase the porosity of the pile to allow greater flow of air through the material during the decomposition process is necessary.

13 Solid Waste Association of North America (SWANA) (2016) Food Waste Diversion Programs and Their Impacts on MSW Systems (April 2016). Applied Research Foundation

14 Evans, Gemma and Dannis, Jeff, Howard County, MD. Personal communication, March 19, 2018.

- **Odor and Stormwater/Runoff Concerns.** Potential environmental issues associated with composting have resulted in other facilities in the State and region being required to cease operations, or cease accepting food scraps as a feedstock in their composting programs. Typically, this resulted from odor and stormwater/runoff issues. Maryland’s Composting Regulations attempt to mitigate these issues.
 - Odor – typically an issue during the receiving/pre-processing steps and during the active composting phase of the process.
 - Stormwater/Contact Water Runoff – water that comes in contact with active compost, as well as leachate generated during the composting process must be contained to prevent it from entering waterways; control systems, such as impoundments, treatment systems, or direct connections to sanitary sewer lines, may be needed to meet regulatory requirements.
- **Regulatory Limitations.** Current Montgomery County zoning codes and other applicable County codes, regulations and policies do not specifically encourage the composting of food scraps. There are also existing County zoning codes and other County codes regarding air quality, water quality, fire safety, housing and building maintenance standards, and rat control, that may impact the ability to expand residential food scraps recycling collection in the County. A summary of these regulations is described under the Review of Existing Regulations, Legislation, Requirements, Codes, and Policies section.

RECOMMENDATIONS

- DEP should develop information and materials on best practices, provide education to single-family residents about separation and recycling of food scraps, and utilize its education and technical assistance offerings to assess the level of interest residents have to voluntarily participate in any potential residential curbside collection pilot or program.
- Develop and test educational materials to assess resident interest in participating in a food scraps recycling pilot program.
- DEP should consider implementation of a curbside food scraps recycling collection pilot for single-family households, to examine numerous aspects (i.e., education to the broader community and to participating residents, containerization, collection, processing, finished product, monitoring, and collecting data and feedback for evaluation).
- DEP should pursue any necessary agreements and Maryland Department of the Environment permit amendments to update existing processes at the Montgomery County Composting Facility to incorporate food scraps and other acceptable organic materials (such as soiled paper and compostable food service ware products).
- DEP should determine any adjustments to its receiving procedure at the Montgomery County Shady Grove Processing Facility and Transfer Station, and identify any equipment at the Montgomery County Composting Facility that may be necessary in the future to properly compost food scraps and other organic materials, and mitigate odor and runoff issues.
- Consider methods to maximize the recruitment of single-family households to participate in a food scraps recycling collection pilot.
- Consider various methods for obtaining resident feedback and questions regarding a pilot program.

RESOURCES

In FY19, \$132,000 funds DEP staff to provide education and technical assistance to residents of single-family homes to increase awareness and understanding about food scraps separation and recycling. Staff will develop best practices, and use these to create educational materials, and conduct meetings and presentations to residents. Staff will also assess the level of interest residents have to participate in a voluntary residential curbside recycling collection pilot which may be planned in the future.

Additional resources, including staffing, operating, and capital costs, that are needed in the future to support these recommendations are dependent on the specific details determined in further development of an implementation plan.



Review of Existing Regulations, Legislation, Requirements, Codes, and Policies

There are numerous Federal, State, and County regulations, legislation, requirements, codes, and policies that regulate, restrict or affect the donation of wasted food, and the composting of food scraps and other organic materials in Montgomery County. The following is a summary of the known existing regulations, as identified by DEP, that regulate donations of wasted foods, composting of food scraps and other organic materials, and the distribution/sale of finished compost or soil amendments. DEP conducted comprehensive and extensive research to produce this information.

The chart below summarizes the various regulations that may potentially impact the focus areas defined in this Strategic Plan. Additional research is necessary before implementation planning to assess the impact on specific recommendations as described in the Strategic Plan, as well as identifying any other Federal, State, or County policy, regulation, or legislation that may be applicable.

**Existing Regulations, Legislation, Requirements, Codes, and Policies
Applicable to the Six Focus Areas**

	Reducing Wasted Food/ Channeling Food to Others	In-Home, Backyard & Community-Scale Composting	On-Site Institutional/On-Site Business Composting	On-Farm Composting	Composting Capacity to Serve Montgomery County	Strategies to Maximize Food Scraps Collection at the Curb
Federal Laws						
Bill Emerson Good Samaritan Food Donation Act Public Law 104-210	•					
National Pollution Discharge Elimination System (NPDES)		•	•	•	•	•
Maryland State Laws						
MD Code Ann. Cts. & Jud. Proc. §5-634 Provides liability protections to those who donate food to a nonprofit organization	•					
MD Code Ann. Health – Gen. §21-322 Provides liability protections to those who donate food to a nonprofit organization	•					
MD Code Ann. Environ. §9-1701 The Maryland Recycling Act		•	•	•	•	•
MD Code Ann. Education §4-132 Food Recovery Programs for Schools	•					
MD Code Tax – Gen. §10-741 Tax Credit for Eligible Food Donations	•					
COMAR Section 10.15.06.10 Production, Processing, Transportation, Storage and Distribution of Grade A Milk	•					

	Reducing Wasted Food/ Channeling Food to Others	In-Home, Backyard & Community-Scale Composting	On-Site Institutional/On-Site Business Composting	On-Farm Composting	Composting Capacity to Serve Montgomery County	Strategies to Maximize Food Scraps Collection at the Curb
COMAR Section 15.18.04.02 Maryland Department of Agriculture Compost Product Registration		•	•	•	•	•
COMAR Section 15.18.04.04 Maryland Department of Agriculture Compost Facility Operator Requirements		•	•	•	•	•
COMAR Section 15.18.04.05 Maryland Department of Agriculture Compost Classification		•	•	•	•	•
COMAR Section 15.20.04.03 Maryland Department of Agriculture Nutrient Management Certification and Licensing Certification and License Requirement				•		
COMAR Section 26.04.11.04 Composting Facilities – General Restrictions and Specifically Prohibited Acts		•	•	•	•	•
COMAR Section 26.04.11.05 Composting Facilities – Permits for Facilities Not Located on a Farm		•	•		•	•
COMAR Section 26.04.11.06 Composting Facilities – Permits for Facilities Located on a Farm				•		
COMAR Section 26.11.02 Air Quality: Permits, Approvals, and Registration		•	•	•	•	•
COMAR Section 26.11.06 Air Quality: General Emission Standards, Prohibitions, and Restrictions		•	•	•	•	•
Montgomery County, Maryland, Laws, Regulations, and Policies						
Montgomery County Executive Regulation 1-15 Residential and Commercial Recycling	•	•	•	•	•	•
Montgomery County Council Resolution No. 17-300 Supports Montgomery County Food Council	•					
Montgomery County Code Chapter 3, Air Quality Control Section 3-9 Ambient Air Quality Requirements for Odors		•	•	•	•	•
Montgomery County Code Chapter 19, Water Quality Control Section 19-50 Prohibition of Water Pollution		•	•	•	•	•
Montgomery County Code Chapter 22, Fire Safety Section 22-62 Storage and Handling of Combustible Fibres		•	•	•	•	•

	Reducing Wasted Food/ Channeling Food to Others	In-Home, Backyard & Community-Scale Composting	On-Site Institutional/On-Site Business Composting	On-Farm Composting	Composting Capacity to Serve Montgomery County	Strategies to Maximize Food Scraps Collection at the Curb
Montgomery County Code Chapter 22, Fire Safety Section 22-80 Combustible Waste and Refuse	•	•	•	•	•	•
Montgomery County Code Chapter 24, Health and Sanitation Section 24-8C Strategic Plan to Achieve Food Security in Montgomery County	•					
Montgomery County Code Chapter 26, Housing and Building Maintenance Standards Section 26-9(a)(8) Storage of Rubbish and Garbage in Approved Containers		•	•	•	•	•
Montgomery County Code Chapter 39, Rat Control Section 39-1 Definitions	•	•	•	•	•	•
Montgomery County Code Chapter 39, Rat Control Section 39-4 Rat Infestations Prohibited	•	•	•	•	•	•
Montgomery County Code Chapter 48, Solid Waste Section 48-5 Permit to Collect or Dispose of Solid Wastes			•	•	•	•
Montgomery County Code Chapter 48, Solid Waste Section 48-9 Waste Accumulation on a Property		•	•	•	•	•
Montgomery County Code Chapter 48, Solid Waste Section 48-10 Disposal of Garbage on Private Property		•	•	•	•	•
Montgomery County Code Chapter 48, Solid Waste Section 48-17 Disposal by Use of Compost Piles		•	•	•	•	•
Montgomery County Code Chapter 48. Solid Waste Section 48-24 Storage and Removal		•	•	•	•	•
Montgomery County Code Chapter 48, Solid Waste Sections 48-52 through 48-58 Disposable Food Service Products & Packaging Material	•	•	•	•	•	•
Montgomery County Code, Chapter 59, Zoning Ordinance Article 59-3 Uses and Use Standards Division 3.2 Agricultural Uses Section 3.2.3 Community Garden		•				
Montgomery County Code Chapter 59, Zoning Ordinance Article 59-3 Uses and Use Standards Division 3.2 Agricultural Uses Section 3.2.6 Farming				•		
County Agreements						•

Note: Above information may not be all inclusive. Further review should be performed to determine if additional requirements may apply.



Reducing Wasted Food/Channeling Food To Others

There are several Federal, State and County laws and policies governing food recovery and food donation to those in need. These include:

Federal Laws

- The Bill Emerson Good Samaritan Food Donation Act (Public Law 104–210): limits the civil or criminal liability arising from the “nature, age, packaging, or condition of apparently wholesome food or an apparently fit grocery product” that is donated to a non-profit organization or received by such a non-profit organization as a donation for ultimate distribution to individuals with unmet needs. This law provides a level of protection to food donors.

Maryland State Laws

- Current Maryland law reinforces the Emerson Act, providing liability protections to those who donate food to a nonprofit organization (See Md. Code Ann. Cts. & Jud. Proc. §5-634 and Md. Code Ann. Health – Gen. §21-322).
- MD Code Ann. Education §4-132 Food Recovery Programs for Schools authorizes county boards of education to develop and implement food recovery programs for schools and to seek recognition for such programs through any food recovery certification program.
- MD Code Tax – Gen. §10-741 Tax Credit for Eligible Food Donations allows certain qualified farms a credit, up to a certain amount, against the State income tax equal to a certain percentage of the value of certain food donations, clarifying the value of such food.
- COMAR Section 10.15.06.10 requires Grade A fluid milk products to include a “Sell-By” date including the month and the day of the month. The milk may not be sold, delivered, or offered for sale after the “Sell-By” date; a person may not sell, deliver, or offer Grade A fluid milk for sale after 30 days from the date of processing. There are no restrictions on the donation of milk.

Montgomery County, Maryland Laws and Regulations

- Montgomery County Council Resolution No. 17-300 supports the establishment of the Montgomery County Food Council.
- Montgomery County Code Chapter 24, Health and Sanitation: Section 24-8C requires the County Executive to develop a 5-year strategic plan to achieve food security in Montgomery County.
- Montgomery County Code Chapter 48, Solid Waste: Sections 52 through 58 prohibit the use of expanded polystyrene food service packaging and requires the use of recyclable or compostable food service ware.



In-Home, Backyard, and Community-Scale Composting

There are several Federal, State and County laws and policies that address the management of organic materials for in-home, backyard, and community scale composting. These include:

Federal Laws

- The National Pollution Discharge Elimination System (NPDES) contains limits on what can be discharged from any point source, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people’s health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Maryland State Laws

- Annotated Code of Maryland 9-1701 (The Maryland Recycling Act) prohibits the disposal of yard trim at disposal facilities.
- COMAR Section 26.04.11.05 permits backyard composting of food scraps without a Maryland Composting Facility Permit as long the compost pile is located on a residential property and composts organic materials generated on the residential site. In addition, the finished compost must be used on the residential site for personal, household, or family purposes.

- Larger composting programs, more associated with community-scale composting (such as community gardens) are also exempt from the Maryland Composting Facility Permit requirements, as long as the composting does not use more than 5,000 square feet of area in support of composting operations (or smaller area as required by local law), and complies with the following pile height requirements: not to exceed 9 feet for raw feedstock storage areas, and not to exceed 12 feet for active composting piles, or piles of materials in the curing stage, or finished compost piles.
- In addition, the General Requirements for composting facilities, identified in COMAR Section 26.04.11.04, state that:
 - A person shall not engage in composting in a manner which will likely:
 - (1) Create a nuisance;
 - (2) Be conducive to insect and rodent infestation or the harborage of animals;
 - (3) Cause nuisance odors or other air pollution in violation of COMAR Section 26.11.06 or involve construction of a source of air pollution subject to a permit to construct or operation of a source of air pollution subject to a permit to operate unless permitted under COMAR Section 26.11.02;
 - (4) Cause a discharge of pollutants derived from organic materials or solid waste to waters of this State unless otherwise permitted by the Department [Maryland Department of the Environment];
 - (5) Harm the environment; or
 - (6) Create other hazards to the public health, safety, or comfort as may be determined by the Department [Maryland Department of the Environment].
- COMAR 15.18.04.02 requires that compost that is sold or distributed in the State of Maryland, must be registered with the Maryland Department of Agriculture (MDA). This requirement may apply to community-scale composting programs if the finished compost is intended to be sold or distributed in Maryland, as opposed to use by the registered users of each garden plot on-site.

Montgomery County, Maryland Laws and Regulations

Current County codes and regulations do not specifically encourage the on-site composting of food scraps in backyard compost bins or in community gardens. Portions of Montgomery County Code actually restrict backyard composting of food scraps.

- Montgomery County Code Chapter 48, Solid Waste
 - Section 48-1. Definition of garbage: includes all organic waste materials resulting from the preparation, cooking, handling or storage of food. Therefore, food scraps are included in the definition of garbage.
 - Section 48-17. Disposal by use of compost piles: The use of compost piles for the disposal of garbage is permitted only when the pile is completely rodent-proofed. Compost piles consisting entirely of leaves and dirt do not require rodent-proofing.
 - The code allows for the use of compost piles to dispose of garbage, as long as the compost pile is completely rodent-proofed. The County's solid waste code does not define or mention the use of compost bins.
 - Section 48-24. Storage and Removal
 - (c) Container standards. All containers for the storage of solid waste, except bins for the storage of bulky rubbish, shall be vermin-proof and waterproof, of noncorrodible metal or similar material, and shall be equipped with tight-fitting lids at all times. Containers recessed into the ground shall be permitted only if they are of such construction that they do not permit the entrance of waste material or water seepage into the nonremovable parts.
 - (d)(6) The presence of solid waste in place other than inside proper containers of disposal devices, the presence of sour odors and the presence of insects, rodents or other vermin, or evidence of their presence shall constitute improper maintenance or lack of maintenance and the need for more frequent removal.
 - (e)(2) The existence of objectionable odors at the nearest adjoining premises shall be evidence of insufficient removal frequency.

- Section 48-5 requires any disposal of solid waste to be done only under a permit.
- Section 48-9 does not permit accumulation of solid waste to remain on a property.
- Section 48-10 prohibits the disposal of any garbage on private property unless allowed by the County.
- Sections 48-53 and 48-54 prohibit the use and sale of expanded polystyrene food service ware and require food service establishments to use recyclable or compostable food service ware.
- Montgomery County Code Chapter 3, Air Quality Control
 - Section 3-9. Ambient air quality requirements for odors.
 - (a) A person must not cause or allow the emission into the atmosphere of any gas, vapor, or particulate matter beyond the person's property line or unit if a resulting odor creates air pollution.

Air pollution is defined as the presence in the atmosphere of any substances or combination of substances whose character, quantities or duration make those substances likely to pose a health hazard to humans, plants, or animals, or unreasonably interfere with the use and enjoyment of property. The substances may be emitted as odors, solids, vapors, liquids, or gases from any single source or in combination with other sources.
- Montgomery County Code Chapter 19, Water Quality Control
 - Section 19-50. Prohibition of water pollution.
 - (a) A person must not discharge, or cause to flow from a storage system or other container, any pollutant into waters of the State in the County except in concentrations or quantities explicitly authorized by an approved NPDES discharge permit or by a plan for compliance, or that are consistent with the utilization of approved best management practices.
 - (c) A person must not improperly store, handle, or apply any pollutant in a manner that will cause its exposure to rainfall or runoff and discharge as point source or nonpoint source pollution into waters of the State in the County except in concentrations or quantities explicitly authorized by an approved NPDES discharge permit or by a plan for compliance, or as results from approved best management practices.
- Montgomery County Code Chapter 22, Fire Safety
 - Section 22-80. Storage of combustible waste: Combustible waste and refuse shall be stored in:
 - (1) Approved containers which are constructed of noncombustible materials equipped with a tight-fitting cover; or
 - (2) An approved bin constructed of noncombustible materials having a self-closing cover that will operate automatically in case of fire inside the bin.
- Montgomery County Code Chapter 26, Housing and Building Maintenance Standards
 - Section 26-9(a)(8). All rubbish and garbage must be stored and maintained in approved containers as required by Chapter 48. Rubbish and garbage must not remain outside of approved storage containers, or containment areas approved for bulk objects, for more than 24 hours.
 - (A) The owner must provide a sufficient number of containers for storage of rubbish and garbage to prevent overflow and must maintain the containers as required by Chapter 48.
 - (B) Each occupant of a dwelling, dwelling unit, or individual living unit must dispose of all rubbish and garbage in a clean and sanitary manner by placing it in appropriate containers as required by Chapter 48.

- Montgomery County Code Chapter 39, Rat Control
 - Section 39-4. Rat infestations prohibited; notice of violation; extermination by director; appeal from order of director.

It shall be unlawful for any owner to allow their property to be infested with rats or to be in such condition as to contribute to existing or potential rat infestations.

Conditions which may contribute to existing or potential rat infestations under Section 39-4:

 - Section 39-1. Definitions.

Harborage: Any condition which provides shelter or protection for rats, thus favoring their multiplication and continued existence on any premises. Harborage can be structural, incidental, or temporary.

Infestation: The presence of one or more rats that have established residence in any given area. Observation of live rats, active rat burrows, rat droppings or rat runways or tracks shall be considered prima facie evidence of rat infestation.

Rat feeding: Any condition which provides food for rats, including but not limited to stored food, garbage, pet food, wild bird feed, vegetable gardens, and fruit trees.
- Montgomery County Code Chapter 59, Montgomery County Zoning Ordinance
 - Article 59-3. Uses and Use Standards, Division 3.2. Agricultural Uses, Section 3.2.3. Community Garden, defines community gardens (in part) to include cultivation of fruits, vegetables, flowers, ornamental plants, and beekeeping.



On-Site Institutional and On-Site Business Composting

There are several Federal, State and County laws and policies that address the management of organic materials for on-site institutional and on-site business composting. These include:

Federal Laws

- The NPDES contains limits on what can be discharged from any point source, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Maryland State Laws

- MDE Compost Facility Permit

A Composting Facility Permit is not required for a Tier 1 facility (composts only Type 1 materials – yard waste) or a Tier 2 facility (composts only Type 1 (yard waste) and Type 2 materials, including food scraps, soiled paper, and compostable food service ware products) if the facility uses no more than 5,000 square feet of area “in support of composting” activities and meets maximum pile height restrictions (9 feet for feedstock piles and 12 feet for all other piles).

If the area where active composting activities exceeds 5,000 square feet, the business or institution will need to apply to MDE for a General or Individual Composting Facility Permit.
- Maryland Department of Agriculture (MDA) Compost product registration or operator certification requirements
 - COMAR 15.18.04.02 - Requires that any compost sold or distributed in the State of Maryland must be registered with MDA. The registration must be renewed annually.
 - COMAR 15.18.04.04 - Requires that composting facility operators must be certified by MDA.
- Maryland Department of the Environment (MDE) for Air Permits
 - COMAR 26.11.12.02 - Air permits, from MDE, may be required for certain equipment used in the composting process, such as tub grinders, etc.

Montgomery County, Maryland Laws and Regulations

- Montgomery County Code Chapter 48, Solid Waste

The business or institution must comply with all requirements set forth in Montgomery County Code Chapter 48.

- Montgomery County Code Chapter 59, Zoning and Land Use

On-site composting must be permitted on-site at the business/commercial property/institution.

- Other Relevant Chapters of Montgomery County Code

Requirements set forth in Montgomery County Code pertaining to Air Quality (Chapter 3), Water Quality (Chapter 19), Fire Safety (Chapter 22), Housing and Building Maintenance Standards (Chapter 26), and Rat Control (Chapter 39) must be complied with.



On-Farm Composting

There are several Federal, State, and County laws and policies that address the management of organic materials for on-farm composting. These include:

Federal Laws

- The NPDES contains limits on what can be discharged from any point source, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Maryland State Laws

- MDE Compost Facility Permit

MDE's Composting Facility Permit regulations provides several exemptions, pertaining to on-farm composting. These exemptions are as follows:

- **Exempt Up to Any Size:** The farm composts feedstocks that are only generated on-site on the farm, or from another site that is controlled by the same operator, and uses the finished compost on-site, or at a site controlled by the same operator.
- **40,000 ft² Exemption:** On-farm composting that uses no more than 40,000 ft² of area "in support of composting operations," if the on-site composting facility meets the following requirements: 1) complies with general restrictions in COMAR 26.01.11.04; 2) constructed and operated in accordance with a Nutrient Management Plan, if required, that addresses the composting activity; and 3) composts only one or more of the following materials: organic materials generated on-site or at another site controlled by the same operator, animal manure and bedding materials regardless of the site of generation, and Type 1 feedstocks (yard trim only), regardless of place of generation.
- The definition of areas "in support of composting" applies to the following:
 - Feedstock receiving and preparation area
 - Active composting area
 - Curing area
 - Finished compost storage area
 - Composting equipment storage areas
 - Areas used for storage of solid waste (i.e., items screened out of finished compost)
- **5,000 ft² Exemption:** On-farm composting operations that use no more than 5,000 ft² of area "in support of composting" and must comply with the following pile height requirements:
 - Piles of raw feedstock cannot exceed 9 feet
 - Piles for active composting, curing, or finished compost piles cannot exceed 12 feet
 - If local law limits height of piles, the local requirements will apply

There are no restrictions on feedstocks or the distribution of finished compost for exempt farms.

- **Emergency Animal Mortality Composting:** animal mortalities resulting from a non-routine die-off; must be managed in accordance with approval from MDA, in consultation with MDE

Beyond the “on-farm” exemptions listed above, a farm would need to apply for a Composting Facility Permit to MDE. If a farm chooses to compost food scraps, a Type 2 material as defined by the Compost Facility Regulations, that are not generated on-site or at another site controlled by the same operator, the only exemption applicable to a farm would be the 5,000 ft² exemption. Farms would need to apply to MDE for a General or Individual Composting Facility Permit for anything above 5,000 ft².

- Maryland Department of Agriculture (MDA) Compost product registration or operator certification requirements
 - COMAR 15.18.04.02 - Requires that any compost sold or distributed in the State of Maryland must be registered with MDA. If compost is from normal farm operations, is not for sale or distribution, and is for use only on the owner’s farm or leased farm as part of an agronomic, horticultural, or silvicultural operation, then the farmer would not need to register the compost with MDA. Otherwise, any compost sold or distributed within the State will need to be registered. This registration must also be renewed annually.
 - COMAR 15.18.04.04 - Requires that composting facility operators must be certified by MDA.
- Maryland Department of the Environment (MDE) for Air Permits
 - COMAR 26.11.12.02 - Air permits, from MDE, may be required for certain equipment used in the composting process, such as tub grinders, etc.

Montgomery County, Maryland Laws and Regulations

- Montgomery County Code Chapter 48, Solid Waste

The farm must comply with all requirements set forth in Montgomery County Code Chapter 48.

- Montgomery County Code Chapter 59, Zoning and Land Use

- Chapter 59 Section 3.2.6 Farming

Montgomery County’s Zoning Code, Chapter 59, includes composting as an accessory use. As such, the Zoning Code allows for the production and manufacturing of compost where up to 20% of the materials can come from off-site sources. This limits the amount of feedstock generated off-site that can be composted at any one farm.

- Other Relevant Chapters of Montgomery County Code

Requirements set forth in Montgomery County Code pertaining to Air Quality (Chapter 3), Water Quality (Chapter 19), Fire Safety (Chapter 22), Housing and Building Maintenance Standards (Chapter 26), and Rat Control (Chapter 39) must be complied with.



Composting Capacity to Serve Montgomery County

There are several Federal, State and County laws and policies that address the management of organic materials for composting facilities located in Montgomery County. These include:

Federal Laws

- The NPDES contains limits on what can be discharged from any point source, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people’s health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Maryland State Laws

- Current regulations potentially applicable to composting processing facilities that accepts food scraps as well as anaerobic digestion facilities.

- Maryland Department of the Environment (MDE) Composting Facility Permit Requirements, as well as other Federal, State and local requirements
- Maryland Department of Agriculture (MDA) Compost product registration or operator certification requirements
 - COMAR 15.18.04.02 - Requires that any compost sold or distributed in the State of Maryland must be registered with MDA. The registration must be renewed annually.
 - COMAR 15.18.04.04 - Requires that composting facility operators must be certified by MDA. A determination needs to be made to confirm whether this would apply to on-site composters.
- Maryland Department of the Environment (MDE) for Air Permits
 - COMAR 26.11.12.02 - Air permits, from MDE, may be required for certain equipment used in the composting process, such as tub grinders, etc.

Montgomery County, Maryland Laws and Regulations (for facilities located in Montgomery County)

Requirements set forth in Montgomery County Code pertaining to Air Quality (Chapter 3), Water Quality (Chapter 19), Fire Safety (Chapter 22), Housing and Building Maintenance Standards (Chapter 26), Rat Control (Chapter 39), Solid Waste (Chapter 48), and Zoning and Land Use (Chapter 59) must be complied with.



Strategies to Maximize Food Scraps Collection at the Curb

Federal Laws

- The NPDES contains limits on what can be discharged from any point source, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

Maryland State Laws

- Maryland Department of the Environment (MDE) Composting Facility Permit Requirements, as well as other Federal, State, and local requirements.
- Maryland Department of Agriculture (MDA) Compost product registration or operator certification requirements
 - COMAR 15.18.04.02 - Requires that any compost sold or distributed in the State of Maryland must be registered with MDA. The registration must be renewed annually.
 - COMAR 15.18.04.04 - Requires that composting facility operators must be certified by MDA. A determination needs to be made to confirm whether this would apply to on-site composters.
- Maryland Department of the Environment (MDE) for Air Permits
 - COMAR 26.11.12.02 - Air permits, from MDE, may be required for certain equipment used in the composting process, such as tub grinders, etc.

Montgomery County, Maryland Laws and Regulations (for facilities located in Montgomery County)

Requirements set forth in Montgomery County Code pertaining to Air Quality (Chapter 3), Water Quality (Chapter 19), Fire Safety (Chapter 22), Housing and Building Maintenance Standards (Chapter 26), Rat Control (Chapter 39), Solid Waste (Chapter 48), and Zoning and Land Use (Chapter 59) must be complied with.

- All applicable community agreements.



Review of Food Scrap Processing Technologies

There are a wide variety of technologies used to recycle food scraps and other organic materials (i.e., soiled paper, compostable food service ware, grass clippings, leaves, etc.) that occur under either aerobic (oxygen-dependent) or anaerobic (lack of oxygen) conditions. These processes can be categorized into the following groups:

- **Open Windrow Composting:** a controlled aerobic decomposition process that occurs when organic materials are formed into long rows (windrows) and oxygen is introduced by periodically turning the windrows.
- **Aerated Static Pile (ASP):** a controlled aerobic decomposition process that occurs when organic materials are formed in piles or windrows and oxygen is introduced by forcing air through the piles/windrows. The piles or windrows may be covered with an engineered membrane.
- **In-Vessel Aerobic Composting:** a controlled aerobic decomposition process that uses a combination of rotating drums, silos or tunnels to mix and aerate the materials. After processing, the composted organic materials must be cured prior to use or distribution.
- **Anaerobic Digestion:** a process in which organic materials are exposed to microorganisms in an oxygen-depleted environment using a combination of air-tight vessels to capture gases for conversion to energy. The process creates digestate that can be further composted for use or distribution.

Generally, there is a progression of increased costs and operating complexity from open windrows, to aerated static piles, to in-vessel composting systems, to anaerobic digesters. As the cost and complexity increase, so do the capabilities and benefits of the technologies. These capabilities and benefits include: 1) the ability to process more organic material with higher concentrations of food scraps; 2) the need for smaller areas of land to process organic materials; 3) an increased ability to control odors; and 4) the ability to handle a diverse mix of organic materials.

Minimal or passive composting systems (open windrows) typically need more land area and will take more time for the composting process to occur. Covered aerated static piles and in-vessel composting systems can process food scraps and other organic materials more quickly while using less land. While it is important to be aware of odor concerns using any of these processing technologies, a well-managed and maintained system should not create problematic, persistent odors.

Below are detailed descriptions of the various types of processing technologies used to process food scraps and other organic materials.

OPEN WINDROW

With an open windrow composting system, the organic materials are formed into long narrow piles called windrows which are periodically turned, based on the temperature of the materials in the windrow, as well as the amount of time the materials have been in the windrows. Turning the materials serves to mix and break up the material which increases the airflow within the windrow and adds oxygen to the piles. As the organic materials are composted, the microorganisms consuming the organic material use up oxygen and release carbon dioxide. Therefore, it is critical to incorporate oxygen back into the windrow as the composting process continues. In addition, when the materials are turned, excess moisture that is generated during the decomposition process is released.

Typically, windrows are turned every 3 to 4 weeks using a front-end loader.

However, some composting facilities, such as the Montgomery County Composting Facility, use windrow turning machines, instead of front-end loaders for aerating and turning the materials. Front-end loaders may be used to initially form the windrows, but a windrow turner is used to turn and aerate the materials, resulting in more thorough and efficient blending and aeration.



Windrow turner in operation at the Montgomery County Composting Facility.

In open windrows, aeration occurs in one of two ways: by convection, when warm air rises through the materials and exits the windrow thereby drawing fresh air in behind; and, by direct exposure, when piles are mechanically turned, clumps are broken apart and materials are fluffed, thus improving circulation and air flow within the pile. Since the piles are repeatedly agitated, the mix of organic materials can be adjusted in response to changing conditions or odors. Turning the windrows also ensures the organic materials are evenly mixed and exposed to high temperatures in the pile's core. If odors emerge after turning, windrows can be covered with a 3 to 6-inch layer of finished compost.

If food scraps are added to open windrows, several factors should be considered to minimize odors, pests, and pathogens. Windrows that contain food scraps may need more frequent turning initially than those with only grass clippings and leaves. Maintaining pile temperatures at more than 131°F for a certain period of time, is also necessary to kill any pathogens in the food scraps.

AERATED STATIC PILE

Aerated Static Pile (ASP) composting uses increased technology to process organic materials, which typically includes food scraps. In ASP composting programs, the organic materials are formed into long windrows, but the amount of oxygen in the windrows is maintained by blowing in or pulling air through the windrow using a blower and aeration pipes. Water may be added to maintain the moisture content of the pile.

With the forced aeration method, air is supplied to the organic materials via perforated pipes that are embedded in or under each windrow. A blower moves the air, either by suction, to pull air through the pile and into the perforated pipe ("negative pressure"), or by forcing air from inside the perforated pipe outward through the pile ("positive pressure"). The blower can operate continuously or intermittently, on a timer or thermostat. Since negative pressure collects air through the pile into the pipe, odors can be filtered through a biofilter (air pumped through a layer of wood chips or finished compost) before being discharged. With positive pressure, covering the pile with an adequate layer of finished compost usually suffices as an odor-controlling biofilter.

Since aerated static piles are not turned during the composting process, the mixture of organic materials and the formation of the windrows are important to ensure even air distribution for effective composting. Organic materials are mixed and then placed on a base of porous materials (i.e., wood chips), in which the pipes are located. The initial pile height can be up to 8 feet, provided the porosity of the organic materials is sufficient to allow air to move between the particles. If the material is particularly wet, it may be necessary to use a bulking agent or carbon-rich material (i.e., wood chips) to increase the porosity of the mixture. Covering the windrow with a 3- to 6-inch layer of finished compost helps maintain moisture on the pile surface, discourage pests, insulate against heat loss, and prevent odors from escaping the pile.

COVERED AERATED STATIC PILE

The organic materials are formed into windrows placed over perforated pipes with air forced through the windrows, as explained above under Aerated Static Piles. In a covered aerated static pile system, the windrow is then covered with an engineered membrane that is placed over the entire length of the windrow. One example is a GORE® Cover which is currently used by the Prince George's County Western Branch Composting Facility. The use of engineered covers prevents rainfall from coming into contact with the organic materials and allows the release of carbon dioxide from the pile. Other benefits of using a cover include the condensation that forms on the inside of the cover helps maintain moisture and the cover also controls odors.



Example of covered aerated static pile composting using an engineered covering.

Surface water runoff and excessive moisture due to precipitation are typically less of an issue for covered ASP systems than open windrows or uncovered ASP systems. When rainfall comes into contact with active compost, State and local regulations typically require that containment systems be in place to collect the contact water and stormwater, in addition to the leachate generated from the windrows. Larger water-containment systems will increase the capital and operating costs of composting facilities. The use of a cover can also speed up the composting process.

Hybrid systems of covered ASP systems and open windrows may be used for cost efficiencies. A covered ASP system can be used for the first four weeks of processing food scraps and other organic materials, when the potential for odors is the highest. Subsequently, the materials can then be processed in open windrows for the curing stage.

IN-VESSEL COMPOSTING

In-vessel composting consists of different proprietary systems that usually involve mechanical agitation and forced aeration and may be enclosed in a building or in a containerized environment. These are capital-intensive systems but result in the greatest level of processing and odor control, as well as the shortest duration of time needed for the composting process. These systems are generally used for composting sludge and/or food scraps, other than simply yard trim materials.

In-vessel compost systems are equipped with a rotating drum or other equipment to control the flow of incoming materials and ensure the size of the materials are more uniform in nature. A variety of processing screens and other devices are used to remove contaminants and prepare a marketable product. These systems are typically equipped with an air collection system and biofilters to remove odor from exhausted air. Curing of the composted material is necessary after the initial composting stage. Increased permitting effort and higher capital costs are generally needed for in-vessel systems.

In-vessel compost technology on a small to medium scale can also be used for managing food scraps in areas with limited space (i.e., on-site at businesses and institutions). Certain vendors have designed in-vessel systems specifically for on-site composting of food scraps. These vessels are fully-enclosed and may include power mixing, aeration, and biofiltration of process air. The Earth Tub® is one example of a small, in-vessel compost system (3 cubic-yard capacity), which is used by some businesses and schools.

Odor control is one of the main advantages of in-vessel composting technology. However, if the mix of organic materials is not the proper ratio of carbon-to-nitrogen (C:N ratio), or if the system is not maintained, odors can escape from the unit.



The Earth Tub, one example of an in-vessel or closed vessel composting system.

ANAEROBIC DIGESTION

Anaerobic digestion (AD) involves the decomposition of organic waste in an oxygen-deficient environment, which results in the production of methane-rich biogas and digestate. Digestate is a liquid or solid material that remains after digestion, which can then be composted, disposed of, or managed through waste water treatment systems. The biogas is typically used in a boiler to produce thermal energy or in an engine to produce electricity.

AD processing systems are generally classified as either high solids (dry) or low solids (wet).

- High solids/dry systems are used for food scraps and yard trim materials. Dry systems generally use tunnels, which are gas-tight, concrete, garage-like chambers and are loaded using front-end loaders.
- Low solids/wet systems are used to process for manure, sludges, and liquid industrial waste. Wet systems generally use vessels, which are mixed and are fed using pumps.



Example of an anaerobic digester that processes food scraps and other organic materials deemed acceptable by the operator.

Five to 10 commercial-scale AD systems began operating in the U.S. over the past 5 years. DEP is aware of plans to develop and build an AD system for food scraps at Freestate Farms, LLC in Manassas, VA, and discussions to develop an AD system at the Maryland Food Center Authority's center in Jessup, MD.

There are a wide variety of processing technologies used to process food scraps and organic materials. They are summarized in the table below.

Summary of Food Scrap Processing Technologies

Issue	Aerobic Process				Anaerobic Digestion
	Open Windrows	Aerated Static Piles (ASP)		In-Vessel	
		Membrane Cover	Compost-Only Cover		
Land Area Requirements [1]	15 to 20 acres	6 to 8 acres	6 to 8 acres	3 to 6 acres (Does not include land for curing)	3 to 6 acres (Does not include land for curing)
Feedstocks [2]	Yard trim and food scraps plus bulking agent. Amount of food scraps limited by the mixture of materials to achieve control parameters.	Yard trim and food scraps plus bulking agent. Amount of food scraps limited by the mixture of materials to achieve control parameters.	Yard trim and food scraps plus bulking agent. Amount of food scraps limited by the mixture of materials to achieve control parameters.	Yard trim and food scraps.	Dry systems process food scraps and yard trim.
Typical Labor Requirements [3]	Site manager, heavy equipment operators, and clerk (3-5).	Site manager, heavy equipment operators, and clerk (3-5).	Site manager, heavy equipment operators, and clerk (3-5).	Site manager, heavy equipment operators, and clerk (3-5).	Site manager, heavy equipment operators, and clerk (3-5).
Amount of Food Scraps	Up to 30% by volume or up to 50% by weight of organic materials	Up to 30% by volume or up to 50% by weight of organic materials	Up to 30% by volume or up to 50% by weight of organic materials	Up to 30% by volume or up to 50% by weight of organic materials	>50% of organic materials by weight
Costs (Capital and Operating)	Lowest capital costs, medium operating costs	Medium capital costs, low to medium operating costs	Low to medium capital costs, medium operating costs	Medium to high capital costs, high operating costs	Highest capital costs, high operating costs
Processing Time	16 to 20 weeks	8 to 10 weeks	8 to 10 weeks	6 to 8 weeks	4 weeks
Curing Time	2 to 4 weeks	4 to 6 weeks	4 to 6 weeks	4 to 6 weeks	Digestate to compost or land application
End Product	Compost	Compost	Compost	Compost	Biogas can be combusted, upgraded to natural gas or used to generate electricity Digestate (solids and liquids) Solid digestate can be composted

Issue	Aerobic Process				Anaerobic Digestion
	Open Windrows	Aerated Static Piles (ASP)		In-Vessel	
		Membrane Cover	Compost-Only Cover		
By-Products	Contact water, air emissions, screening overs	Contact water, air emissions, screening overs	Contact water, air emissions, screening overs	Contact water, air emissions, screening overs	No By-Product
Odor Control	None	Membrane provides odor control	Compost cover acts as a biofilter	Biofilter	Self-contained
Birds, Insects, and Vermin	Proper maintenance and prompt processing of food scraps	Proper maintenance and prompt processing of food scraps	Proper maintenance and prompt processing of food scraps	Proper maintenance and prompt processing of food scraps	Proper maintenance and prompt processing of food scraps
Technology	Low complexity	Moderate complexity	Moderate complexity	High complexity	High complexity

[1] The estimates for land assumes a facility that processes 40,000 tons of organic materials per year. This does not include buffer zones that may be required by State or local regulations or public input. Land estimates for in-vessel aerobic composting and anaerobic digestion do not include curing requirements to create finished compost or other soil amendments. The curing process type (i.e., aerobic decomposition or pelletizing) will determine the amount of land needed. In addition, set-back requirements may also impact the amount of land required.

[2] A 2-to-1 ratio of bulking (carbon-rich) material (i.e., paper, sawdust, wood chips) to food scraps is reported in the literature for aerobic composting.

[3] Additional staff or consultants may be needed to manage end use product and market the product for all technologies.



Review of Other Food Scrap Recycling Programs

The following information is based on research of food scrap recycling collection and/or processing pilots and programs. DEP conducted research on programs both locally and nationally. It should be noted that this is not an exhaustive listing.

LOCAL FOOD SCRAP RECYCLING EFFORTS

Prince George's County, Maryland (Food Scrap Recycling Processing Capacity)

According to data from a Waste Characterization Study conducted by Prince George's County in 2015, approximately 81,300 tons of organic materials are disposed of at the County's landfill annually which includes:

- 44,700 tons of food scraps
- 19,800 tons of soiled paper (napkins, tissues, and paper towels)
- 16,800 tons of yard trim (grass, leaves, and brush)

The County has been composting yard trim at the Prince George's County Western Branch Composting Facility, located in Upper Marlboro, Maryland for about 25 years. Under an intergovernmental agreement with the County, the Maryland Environmental Service (MES) operates the Western Branch Composting Facility. The end-product produced is marketed as Leafgro® and sold in bulk.

In May 2013, the County implemented a pilot program to compost food scraps with yard trim at the Western Branch Composting Facility. Using the GORE® Cover technology, MES tested various ratios of food scraps mixed with yard trim to determine the amount of food scraps that should be mixed with yard trim. The food scraps are mixed with yard trim and then ground to three inches or less in size. The mix is placed over perforated pipes on a concrete pad and covered with a GORE® Cover. The materials are monitored daily using a computerized system. The composting process using this technology takes approximately ten weeks from forming the windrows to the usable finished product (eight weeks of active composting with two weeks of curing) instead of the eight-months it would take to compost yard trim materials using the open windrow system.¹⁵ Once finished, the compost is screened and marketed as "Leafgro® Gold." Leafgro® Gold contains higher amounts of nitrogen than Leafgro®.¹⁶

The County received a \$12,000 grant from the U.S. Environmental Protection Agency which covered about 8% of the startup costs. Since the initial pilot in 2013, the County increased the GORE® Cover System from a three heap pilot project, to a four heap continuous process in 2014. The composting of food scraps and yard trim mixed together in the GORE® Cover System has been so successful, another expansion to an eight heap system is in process.¹⁷

Up to 125 tons per week of source-separated food scraps from both residential and commercial sources are processed at Western Branch along with soiled or waxed corrugated cardboard and some paper products. The pilot project included food scraps delivered from the University of Maryland, residential food scraps collected curbside from the Town of University Park and the City of Takoma Park, and several commercial haulers/collectors with specialized food scrap recycling collection routes (Apple Valley, Progressive Waste Solutions,

15 Maryland Environmental Service (MES) (2013) Prince George's County & MES Cut Ribbon on New Food Scrap Composting Project at Western Branch Yard Waste Composting Facility. MES Wave, the Official Blog of Maryland Environmental Service, October 25, 2013. <http://www.menv.com/blog/prince-georges-county-mes-cut-ribbon-on-new-food-scrap-composting-project-at-western-branch-yard-waste-composting-facility/>

16 Goldstein, Nora (2015) Food Scraps Composting At County Yard Trimmings Site. *BioCycle* (May 2015), 56(4): 21 <https://www.biocycle.net/2015/05/13/food-scraps-composting-at-county-yard-trimmings-site/>

17 Prince George's County, MD, Department of the Environment (undated) Yard Waste Composting Facility. <https://www.princegeorgescountymd.gov/583/Yard-Waste-Composting-Facility>

Bates, and Compost Crew). Note: the pre-consumer food scraps collected from Montgomery County's food scrap recycling demonstration programs for the cafeterias in the County's Executive Office Building, Council Office Building and Public Safety Headquarters Building are collected, transported to, and being processed at the Western Branch Composting Facility.

Town of University Park, Maryland (Residential Food Scraps Recycling Collection)

The Town of University Park's curbside food scraps recycling collection program began in 2011 and has expanded to serve nearly 20%, or approximately 200, of the Town's 900 single-family households. The Town provides residents with a kitchen pail, compostable bags, and a five-gallon bucket for food scraps. Food scraps are collected weekly by municipal employees using dump-body trucks, and delivered to the Prince George's County Western Branch Composting Facility.

The acceptable food scraps that residents can recycle include:¹⁸

- All fruit and vegetable scraps – including rinds and cores
- Bread, cookies, crackers, pasta
- Grains, cooked or uncooked – rice, oats, barley, wheat, etc.
- Coffee grounds, tea bags (no staples), filters
- Herbs and spices
- Egg shells (crushed well)
- Nuts and nutshells

Unacceptable food scraps include:

- Meat, poultry, or fish, including bones, fat, gristle, skin, etc.
- Dairy products, including cheese, butter, yogurt, sour cream, etc.
- Grease, oil, or sauce of any kind
- Pizza boxes, egg cartons, napkins, paper towels, or tissues

The initial program was funded through a \$15,000 Federal energy grant. Equipment and labor expenses for operating the program are paid for by the Town's Public Works Department. According to Mickey Beall, Public Works Director for the Town of University Park, interest in the program continues to grow, and the program has diverted about 88 tons of food scraps in the last four years.¹⁹

City of Takoma Park, Maryland (Residential Food Scraps Recycling Collection)

The City of Takoma Park started a residential pilot program for food scraps recycling collection in 2013, offered to 365 households in two collection areas. In 2014, food scrap recycling collection service became available to all 3,200 households in the city; about 1,300 households are currently signed up to participate. There is no added fee for residents to participate, which is provided by the City's Public Works Department. Single-family households receive a 5-gallon bucket and sample roll of compostable bags. Set-out rates are averaging 11 lbs. of food scraps per household per week. Residents are permitted to place only food scraps in the 5-gallon container. Yard trim materials are kept separate and are collected by City trucks and are composted at a City yard trim processing site. The food scraps are now collected by City crews and are transported to the Prince George's County Western Branch Composting facility.²⁰

18 Town of University Park, MD (2013) Town of University Park Food Scrap Composting Program (Food Scrap Compost Guide 5-24-13). <https://www.upmd.org/DocumentCenter/View/95>

19 Beall, Mickey, Town of University Park, MD. Personal communication, February 22, 2016.

20 Yepsen, Rhodes (2015) BioCycle Nationwide Survey: Residential Food Waste Collection in the U.S. *BioCycle*, 56(1): 53 <https://www.biocycle.net/2015/01/15/residential-food-waste-collection-in-the-u-s-2/>

Initially, food scrap recycling collections services were provided under contract by The Compost Crew. In 2016, the City reported that food scraps accounted for approximately 3% of the 6,957 tons of municipal solid waste collected by the City from single-family homes, small multi-family buildings, and public facilities and spaces.²¹

Howard County, Maryland (Food Scrap Recycling Processing Capacity and Residential Curbside Collection)

Howard County began its program to compost food scraps and yard trim at the County's Alpha Ridge Landfill, using an Engineered Compost Systems (ECS) aeration system and covers. While the initial work was being completed on this food scraps processing system at the Alpha Ridge Landfill, the County began a pilot to test residential organics recycling collection for both yard trim and food scraps on two residential routes. The County later added an additional route, for a total of three residential routes. Materials collected are delivered to the composting site at the Alpha Ridge Landfill where front-end loaders dump the food scraps and yard trim materials into a grinder to be shredded. The materials are then formed into piles, under which perforated pipes are used to draw air through the materials and then through a biofilter to remove odors. The materials are covered with an ECS cover. It takes approximately three months for the entire process to take place.²²

Currently, the County considers its program to be beyond pilot status, but still only provides food scrap recycling collection service for residents on the three collection routes, with approximately 15,000 households, eligible to opt-in to the program. Approximately 5,900 households have signed up to receive curbside food scraps recycling collection service. All food scraps and yard trim materials are collected weekly with residents choosing a 12-, 35- or 65-gallon cart. The services are paid through an enterprise fund (i.e., a line item on property tax bills). The County has reported that increased composting capacity will be needed (either at Alpha Ridge, or another local processor)²³ before they increase collection service to more households.

Residents are able to recycle the following acceptable materials:

- Fruit and vegetable scraps (fresh or cooked)
- Grass, leaves, yard trim
- Bread, pasta, rice, grains, cereal, baked goods, etc.
- Meat, fish, shellfish (including bones)
- Dairy products (cheese, butter, ice cream, etc.)
- Fats, oils, grease
- Nuts, beans, seeds (including shells/hulls)
- Egg shells
- Coffee grounds, filters, tea bags (no foil or foil-backed products)
- Paper products (paper towels, napkins, paper plates)
- Pizza boxes (remove non-food items)
- Houseplants, cut flowers (no dirt)
- Chopsticks and popsicle sticks

The following materials are unacceptable:

- Ice cream containers
- Facial tissues
- Styrofoam®
- Pet waste
- Diapers

21 City of Takoma Park (2017) Waste Management 101: A Review of Takoma Park's 2016 Efforts. Takoma Park Newsletter (1 Mar 2017). <https://takomaparkmd.gov/newsletter/waste-management-101-a-review-of-takoma-parks-2016-efforts/>

22 Wheeler, Timothy B. (2013) Food-Scrap Composting Finds a Home in Howard. Howard County Times (21 April 2013). www.baltimoresun.com/news/maryland/howard/ellicott-city/bs-gr-howard-composting-20130421-story.html

23 Yepsen, Rhodes (2015) BioCycle Nationwide Survey: Residential Food Waste Collection in the U.S. *BioCycle*, 56(1): 53 <https://www.biocycle.net/2015/01/15/residential-food-waste-collection-in-the-u-s-2/>

NATIONAL FOOD SCRAP RECYCLING EFFORTS

Alameda County, California

All Alameda County jurisdictions offer curbside food scrap recycling collection services to residents of single-family homes, and many provide services to apartments and condominiums, as well. Residential food scraps have been collected separately in Alameda County since 2002. In 2016, there were 13 municipalities that offered curbside residential food scraps collection services to a total of 298,600 residences. The food scraps are co-collected with yard trim on a weekly basis throughout the year using automated collection vehicles. The weekly collection frequency is designed to collect the food scraps before the completion of the 7-day fly breeding cycle.²⁴

Materials collected in the program include:²⁵

- All food products - includes fruit, vegetables, breads, cereal, dairy, meat (including bones), coffee grounds, filters and tea bags
- Food-soiled paper - includes paper towels, plates, napkins, pizza boxes and paper lunch bags

Plastic bags and Styrofoam®, glass, metal, liquids and pet waste are not accepted in the composting program

City of Minneapolis, Minnesota

Solid waste and recycling collection services within the City of Minneapolis are provided through a combination of City and private service providers. The City provides curbside collection services for trash, recyclables, organics, yard trim, and bulky materials to approximately 290,000 residents in 106,000 dwelling units. Food scraps and soiled paper are collected separately from yard trim. The 2017 base fee for residential recycling collection services is \$23.47 per month and includes the costs for collection and processing of all materials. The collection and disposal of trash adds between \$2 and \$5 per month depending on the size of the resident's trash cart.²⁶

Residents must opt-in to receive curbside organics recycling collection services. As of the end of August 2017, 46,132 households or 43.1% of all households that receive City-provided collection services, have signed up to participate in the City's curbside organics recycling collection services.²⁷ Acceptable organics include:

- Food scraps – includes fruits and vegetables; meat, fish and bones; bread, pasta, and baked goods; eggshells; and dairy products
- Food-soiled and non-recyclable paper – includes napkins and paper towels (not used with chemical cleaners); all paper, non-plastic lined plates and bowls, food-soiled paper, including pizza boxes, unlined take-out containers and egg cartons; and facial tissue, tissue paper, and other paper products with fibers too short to be recycled
- Other compostable items – includes coffee grounds, filters and tea bags; tissues, cotton balls and cotton swabs (with paper stems only); wood chopsticks, Popsicle® sticks and toothpicks; floral trimmings and house plants; animal and human hair and nail clippings; and small quantities of grease and oil (i.e., grease on a paper towel or leftover pasta cooked with oil)

The City has detailed examples of unacceptable items for inclusion with food scraps on its website, which includes the following:

- Yard Trim (collected separately from food scraps)
- Non-certified compostable plastic bags, products and plastic-lined paper products (i.e., hot and cold take-out cups, ice cream tubs, take-out food containers, milk cartons, etc.)

24 Solid Waste Association of North America (SWANA) (2016) Food Waste Diversion Programs and Their Impacts on MSW Systems (April 2016). Applied Research Foundation

25 Stopwaste.org (2018) "Food Scrap Composting". <http://www.stopwaste.org/recycling/residents/food-scrap-composting>

26 City of Minneapolis (2017) Zero Waste Plan (November 2017), p. 6.

<http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/wcmstp-206720.pdf>

27 City of Minneapolis (2018) Residential Organics Recycling – How to Participate. Public Works, Solid Waste and Recycling. <http://www.ci.minneapolis.mn.us/solid-waste/organics/index.htm>

- Large quantities of grease or oil
- Polystyrene foam
- Items labeled as biodegradable, oxo-degradable, earth friendly, made from plants, green, etc. are not necessarily acceptable. If an item is labeled one of these terms in addition to having the Biodegradable Products Institute (BPI) or Cedar Grove certified compostable logo, then they are acceptable.
- Wax and parchment paper (unless labeled BPI or Cedar Grove certified compostable)
- Cornstarch or 'biodegradable' packaging peanuts (unless BPI or Cedar Grove certified compostable)
- Fast food wraps and butter wraps
- Items that can go into their blue recycling cart (including paper, plastic, glass, metal and cartons)
- Pet waste, litter or bedding (State of Minnesota will not allow compost facilities to accept these items)
- Fabric that contains synthetic fibers
- Dryer lint and dryer sheets (contain synthetic fibers)
- Items that have chemicals on them (including cotton swabs used for nail polish application or removal, cleaning wipes, etc.)
- Feminine hygiene products and diapers (State of Minnesota will not allow compost facilities to accept these items)

Organics collected are brought to a commercial composting facility where they are mixed with yard trim and composted. After several turnings and a curing process – a process that takes six to nine months – the compost is screened to remove any items that didn't get composted (such as larger sticks or contaminants) and is ready for use in gardens, or in landscaping or erosion control projects.²⁸

Currently, there are limited options for organics processing. The City recognizes the need to add organics processing facility capacity and it is understood that Hennepin County intends to release a Request for Proposal (RFP) for the development of an anaerobic digestion facility in 2018 to address needed capacity.²⁹

For decades, the City has promoted residential backyard composting and grasscycling. The City has taken additional steps to increase diversion of organic materials through implementation and promotion of its curbside organics recycling program that rolled out in June 2016. Resident feedback indicates that the cost of compostable plastic bags is prohibitive to participating in the City's organics recycling program;³⁰ therefore, the City will consider strategies to increase participation in the program.

Hennepin County, Minnesota

Communities in Hennepin County, Minnesota began composting residential food scraps in 2005. In February 2014, the Hennepin County Board approved a requirement for Minneapolis to collect food scraps citywide starting in 2015 and that county staff develop an implementation schedule for the rest of the 46 municipalities in Hennepin County.³¹

Hennepin County provides funding for recycling, organics, and waste reduction education initiatives and programs for public, private, and charter schools through its School Recycling Grant program.

28 City of Minneapolis (2018) Residential Organics Recycling – Questions and Answers. Public Works, Solid Waste and Recycling. <http://minneapolismn.gov/solid-waste/organics/WCMS1P-136943>

29 City of Minneapolis (2017) Zero Waste Plan (November 2017), p. 7. <http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/wcmssp-206720.pdf>

30 City of Minneapolis (2017) Zero Waste Plan (November 2017), pp 11-12. <http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/wcmssp-206720.pdf>

31 Solid Waste Association of North America (SWANA) (2016) Food Waste Diversion Programs and Their Impacts on MSW Systems (April 2016). Applied Research Foundation

In 2017, the program awarded grants totaling \$150,700 to schools and school districts within the County. The County has published a Best Practices Guide to Organics Recycling in Schools³² that may aid in supporting development of organics programs in schools within the City.

As stated above, Hennepin County intends to release a Request for Proposal (RFP) for the development of an anaerobic digestion facility in 2018 to address needed capacity.

San Antonio, Texas

In September 2011, the City of San Antonio initiated a large-scale food scraps recycling collection pilot project for 30,000 single-family homes. During the pilot, City staff delivered kitchen bins by personally knocking on doors. Residents were receptive and generally provided positive feedback.³³ City staff developed suggestions for common concerns raised by residents:

- Odors – residents were educated to freeze strong smelling foods and set them out on the actual day of collection
- Cleanliness – residents were educated to wrap messy and wet food scraps in newspaper or use paper bags
- Rodents/Critters – residents were reminded that the organic materials were the same materials that they currently place in their trash cart
- Storage & Space Constraints – residents were offered large-size and small containers

In 2013, the program was expanded and offered, on a subscription basis, to 120,000 households (approximately 20,000 subscribed for the service) for a service cost of \$3.00 per household per month. At that time, participants were provided with either a 48- or 96-gallon cart as part of their service with food scraps and yard trim collected together on a weekly basis.

In 2017, the program was expanded to all 346,000 households and transitioned from subscription-based service to one in which the service cost is embedded into the costs of trash and recycling collection service.³⁴

Currently, monthly fees for weekly curbside collection services for trash are as follows:

- Small 48-gallon cart – \$17.69
- Medium 64-gallon cart – \$19.69
- Large 96-gallon cart – \$22.44

A green organics recycling cart is available in two sizes: large (96 gallons) and small (48 gallons). Residents may choose whichever size best fits their needs. There is no additional fee for either size cart. The cost for organics recycling collection is included in the garbage rate fee.³⁵

The curbside organics recycling program is provided to all residents for yard trim, food-soiled paper, food scraps, and other organic material. The City instructs residents to place acceptable organics in their green cart either loose or in paper bags. The material collected in the green cart is composted and made into nutrient-rich soil.

The following are considered acceptable organics³⁶:

- Yard Trim – includes branches (small, no more than 4' in length), grass clippings, floral trimmings, houseplants (no pots or planters), and leaves (loose or in paper bags)

32 Hennepin County, Minnesota (2018) Recycling and Hazardous Waste: Disposal, Licenses and Assistance. <https://www.hennepin.us/~media/hennepinus/business/recycling-hazardous-waste/documents/school-organics-recycling70bestpractices.pdf?la=en>

33 Galus, Nick (2015) City of San Antonio Curbside Organics Program, Webinar Series (May 2015). Solid Waste Management Department, City of San Antonio, TX http://www.nctcog.org/envir/stewardship/Organics_Presentation_EPA_May2015.pdf

34 Solid Waste Association of North America (SWANA) (2016) Food Waste Diversion Programs and Their Impacts on MSW Systems (April 2016). Applied Research Foundation

35 City of San Antonio (2018) FY2018 Services Guide. Solid Waste Management Department, City of San Antonio, TX. <http://www.sanantonio.gov/Portals/0/Files/SWMD/ServicesGuide/Solid-Waste-Guide-FY2018-EN.pdf>

36 City of San Antonio (2018) Organics Accepted and Not Accepted Materials. Solid Waste Management Department, City of San Antonio, TX. <http://www.sanantonio.gov/swmd/Organics/Materials>

- Food Scraps – includes bread and baked goods, candy, coffee grounds (including paper filter), condiments (no containers), dairy products, eggs (cooked), eggshells, fruit (including peel, pits, and shells), grains and pasta, leftovers, nuts (including shells), oatmeal and other cereals, preserves (jams and jelly), tea bags and tea leaves, spoiled foods, and vegetables (including cobs and husks)
- Food-Soiled Paper – includes coffee filters, microwave popcorn bags, paper cups and plates (without plastic coating), paper napkins and towels (dry or wet), paper take-out boxes and cups (without plastic coating), and pizza boxes (greasy or with food residue)
- Other – includes cotton balls, dryer lint, Popsicle® sticks, shredded paper, sawdust, toothpicks and wooden chopsticks

The City has detailed examples of unacceptable organics on its website, which includes the following:

- | | |
|--|--|
| • All plastics
(including compostable and biodegradable products) | • Hazardous waste |
| • Diapers | • Motor oil |
| • Cigarette butts | • Plastic bags |
| • Dead animals | • Plastic-coated cartons (i.e., milk and ice cream cartons) |
| • Pet waste | • Plastic cutlery
(including those labeled “biodegradable” and “compostable”) |
| • Aluminum foil | • Recyclables materials |
| • Automotive grease | • Rocks |
| • Ceramics | • Scrap metal |
| • Cigarette ashes | • Soil |
| • Clothing | • Straws |
| • Cooking grease or oil | • Styrofoam® |
| • Disposable mop sheets | • Tree stumps |
| • Dryer sheets | • Wine corks |
| • Glass | • Wood (treated or large pieces) |

A green cart containing unacceptable items will not be collected and will be subject to a \$25 fine if not corrected.

Portland, Oregon

The City of Portland piloted residential food scraps recycling collection service in 2010 and went citywide to all 147,000 single-family households (up to four units) in 2011. The City reduced its trash collection to every-other-week with the rollout of the organics program. In 2013, 76,000 tons of residential organics were collected (roughly 10% of which were estimated to include food scraps) and composted at Nature’s Need and Pacific Region Compost.³⁷

The pilot program included the addition of food scraps and food-soiled paper mixed with yard trim in green 65-gallon composting carts. Residents in the pilot area were also provided with 2-gallon in-kitchen collection pails to collect and transfer food scraps to the green carts. The green composting cart collection service was changed from every-other-week to weekly collection, and weekly garbage collection was changed to every-other-week trash collection. Residents could elect to maintain weekly trash collection service, but were required to pay double the monthly rate.

Each of the pilot households received a letter from the City sent via U.S. Postal Service; a cart tag placed on the green cart delivered by the four recycling/refuse collection service providers; a toolkit including an informational recycling and garbage system guide, collection schedule, magnet, and a 2-gallon in-kitchen pail to collect food scraps in the kitchen during food prep and clean-up. On-line education was also made available, including a feedback form and e-schedule. Two newsletters were mailed to the households in the pilot area during the pilot phase. Surveys and focus group research were used to assess attitudes and behaviors, and visual field inspections were used to observe the presence of food mixed with yard trim in the green compost cart.

37 Solid Waste Association of North America (SWANA) (2016) Food Waste Diversion Programs and Their Impacts on MSW Systems (April 2016). Applied Research Foundation

Survey results indicated that 75% of the respondents indicated they participated regularly in the program and 87% were satisfied with their overall curbside collection service. Half of the food scraps generated in the pilot area were placed in the green compost cart, and garbage collected in the pilot area decreased by 30%. It was observed that approximately 60% of the garbage containers in the pilot areas on trash collection day were completely full.

The every-other week trash collection has been cited as the driver for the 80% participation rate in the food scrap recycling collection service, which has resulted in a 36% reduction in the amount of garbage being disposed of from Portland's single-family residences.

San Francisco, California

A commercial food scraps recycling program was first implemented in San Francisco in 1996. Collection service was provided by the city's sole service provider, Recology. The City and County of San Francisco provided technical assistance, funding, programming and implementation of the program. A residential pilot program was implemented in 1997 that included the current three-bin system (known as the Fantastic Three which includes containers for recyclables, composting and landfill waste). The success of these pilot programs led the City and County of San Francisco to expand their voluntary recycling program to include food scraps city-wide starting in 1999.

As of 2009, the City has mandated source-separation and participation in the City's recycling, organics, and refuse collection program for all single-family households, multi-family properties, and businesses.

Acceptable organics in the City's green compost cart include the following:

- Food Scraps – includes bread, grains and pasta, coffee grounds with paper filter, dairy, eggshells and eggs, fruit (including pits and peels), leftovers and spoiled food, meat (including bones), seafood (including shellfish), tea and tea bags, and vegetables
- Food-Soiled Paper – includes coffee filters, greasy pizza boxes, paper plates, paper bags, napkins, tissues and towels, paper take-out boxes and containers (metal handle OK), and tissues
- Plants – includes branches and brush, flowers and floral trimmings, grasses and weeds, leaves, and tree trimmings (less than 6 inches in diameter and 4 feet long)
- Other – includes cotton balls and cotton swabs, hair, fur, and feathers (non-synthetic), plastic and cutlery clearly labeled "Compostable" (green stripe or sticker to allow for easy identification), vegetable wood crates (metal wire is okay), waxed cardboard, wood – small pieces of lumber or sawdust from clean wood only (no plywood, press board, painted, stained or treated wood), wooden chop sticks, and corks

In a telephone interview, Alexa Kielty, Residential Zero Waste Assistant for the City of San Francisco, Department of the Environment, stated the City recommends the use of compostable bags, if accepted by the composting facility.³⁸ The use of compostable bags helps to maintain the cleanliness of the curbside collection carts and increases resident participation, based upon the experience of City staff. In addition, education is crucial to the success of the program. Staff recommends that education includes how residents can collect food scraps when generated in the kitchen. If in-kitchen containers are not provided, education should include how residents can store food scraps, prior to placing the food scraps in the curbside food scraps recycling collection cart. This includes information on the types of containers that residents can purchase on their own.

It is estimated that 160,000 tons of residential and commercial organics are collected annually and composted at Recology's Jepsen Prairie Organics composting facility. Collected organics are screened for non-compostable items, ground, placed in windrows (first stage is covered), then cured for the final product which is screened and marketed to local farmers.

The City of San Francisco approves the refuse and recycling collection rates that Recology charges residents for curbside refuse and recycling collection service. When the Fantastic Three program was first implemented, residents were not charged a fee for the collection of recyclable materials or organic materials (yard trim mixed with food scraps). However, after the implementation of city-wide mandatory recycling in 2009, the City made changes to their rate structure and approved charges for the curbside recycling collection service.

38 Yepsen, Rhodes (2015) BioCycle Nationwide Survey: Residential Food Waste Collection in the U.S. *BioCycle*, 56(1): 53
<https://www.biocycle.net/2015/01/15/residential-food-waste-collection-in-the-u-s-2/>

To further increase participation in the City's recycling program and to cover the costs associated with a new labor agreement, collecting and processing additional amounts of materials, higher landfill disposal costs, regulatory costs for processing compost, and new capital investments, the City approved the following changes in their service level and rate structure (effective 7/1/2017):

- Refuse collection: 32-gallon cart being replaced with a 16-gallon cart (\$6.26 per household per month)
- Yard trim and food scrap collection: 32-gallon cart remains the same (\$6.26 per household per month)
- Recyclable materials collection: 32-gallon cart being replaced with a 64-gallon cart (\$12.52 per household per month)
- Base charge per dwelling unit: \$15 per month

Glossary of Terms and Acronyms

Aerated Static Pile (ASP) System. Composting system that uses a series of perforated pipes as an air distribution system running under a compost pile and connected to a blower to allow the flow of air through the pile.

Aeration. Process of incorporating air into a compost bin or pile through turning or ventilating to allow microbial aerobic metabolism.

Anaerobic Digestion (AD). Organic materials, including food scraps, put through a natural process in which microorganisms break down the organic materials in closed containers in the absence of air or oxygen.

Backyard Composting. Small scale composting method for the decomposition of residentially generated food scraps and yard trim on-site.

Biodegradable. Materials capable of being decomposed by microorganisms or bacteria.

Biogas. A mixture of gases, including methane and carbon dioxide, which is generated by the anaerobic biological decomposition of organic materials and can be burned as a fuel.

Carbon-rich Feedstocks. Organic materials high in carbon, such as dried leaves, straw, and wood chips.

Carbon-to-nitrogen ratio (C:N ratio). The balance of these two elements in an organism is the C:N ratio. Composting organisms require a particular proportion of carbon for energy and nitrogen for protein production to successfully decompose a compost pile. C:N ratio and sources of carbon and nitrogen can affect the odor of a pile and the speed at which it may decompose.

Community-Scale Composting. Organic materials that are generated and composted within the same community or neighborhood.

Compost. Decayed organic material that can be used as a soil amendment to improve the health of soil and reduce water runoff.

Compostable Food Service Products. Products capable of undergoing biological decomposition such that after a short period of time, the product is not visually distinguishable.

Composting. The biological decomposition of organic material by microorganisms under controlled conditions to yield a humus-like product.

Composting Facility Report. Annual solid waste facility form for Composting Facilities, used to report feedstocks, in tons, utilized for composting during the year.

Central Business Districts (CBDs). Any one of the principal business areas of the County that has been designated as a central business district, such as Wheaton, Silver Spring, Bethesda, or Friendship Heights.

COMAR. Code of Maryland Regulations.

Consumable Food. Excess or unwanted food that is still consumable.

Consumer Supported Agriculture (CSA). Allows consumers to buy local, seasonal food directly from a farmer; the farmer offers a certain number of "shares" consisting of a box of vegetables or other farm products to the public. Interested consumers purchase a share (i.e., "membership" or "subscription") and receive a box.

Cooperative Extension Service. Provides farmers with information from agricultural research and encourages them to adopt improved farming methods, and provides non-formal education and learning activities to people to improve the lives of consumers and families.

Covered Aerated Static Pile System. System used to process organic material without physical manipulation during primary composting. The blended mixture is usually placed on perforated piping, providing air circulation for controlled aeration, and covered.

CY. Calendar Year.

Digestate. A mixture usually later separated into a solid and a liquid, which is rich in nutrients and can be composted or used as fertilizer and soil amendments for agricultural purposes.

Edible Food. Excess or unwanted food that is still consumable.

Farm (as relates to Maryland's Composting Facility Permit Regulations). Site of a business or activity operated for the primary purpose of tilling, cropping, keeping, pasturing, or producing an agricultural product other than compost, including livestock, poultry, plants, trees, sod, food, feed, or fiber, by inground, out-of-ground, container, or other culture.

Feedstock. A raw material that can be used directly as a fuel or used to supply an industrial process.

Finished Compost Product. Fully decomposed and cured organic material that serves as a soil amendment to improve the physical, chemical, and biological characteristics of soil.

Food Bank. Nonprofit, charitable organization that distributes food to those who have difficulty purchasing enough food to avoid hunger.

Food Insecure. Being without reliable access to a sufficient quantity of affordable, nutritious food.

Food Insecurity. Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

Food Scraps. Food that does not fulfill a specific need, or remains after food reduction, recovery, and/or donation.

Food Security. Access to safe, sufficient, nutritious food, with dignity.

FY. Fiscal Year.

General Composting Facility Permit (GCFP). Permit required to operate a composting facility; no variances in regulations are permitted.

Generator. The owner or occupant of any dwelling unit where solid waste is generated, and the owner or occupant of any other business entity or institution at, from, or by which solid waste is generated.

Grasscycling. Leaving grass clippings on the lawn to decompose where they fall when the grass is cut, which benefits the environment by reducing runoff and reducing the need for adding fertilizers.

Humus. The organic component of soil, resulting from the decomposition of organic material by bacteria and microorganisms.

Individual Composting Facility Permit. Permit required to operate a composting facility; variances from required regulations can be requested.

In-vessel Composting System. A system in which organic materials are composted in an airtight container or vessel, in which oxygen is added.

Leachate. Liquid that results when water comes in contact with a solid, and extracts either its dissolved or suspended constituents.

Maryland Department of Agriculture (MDA). State Department responsible for regulatory matters, public service, and some educational or promotional scope activities regarding agriculture's importance and impact to the economy of the state.

Maryland Department of the Environment (MDE). State Department tasked with permitting/licensing and inspections for solid waste facilities, extending financial assistance, overseeing environmental cleanups, technical assistance for compliance and pollution prevention, public education, and outreach, and responding to emergencies.

Maryland Environmental Service (MES). Self-supporting, independent State agency, created to protect the State of Maryland's natural resources, providing environmental and technical services to governmental and private sector partners and that works on projects including solid waste management, water and wastewater treatment, composting, recycling, stormwater services, renewable energy, etc.

Maryland Food Center Authority (MFCA). State organization dedicated to combining the very best in public and private efforts in planning and developing regional food industry facilities throughout the State of Maryland.

Maryland Recycling Act 9-1701 (MRA 9-1701). Act requiring that each of Maryland's jurisdictions develop and implement recycling programs and report the amount and types of materials recycled annually.

Metropolitan Washington Council of Governments (COG). An independent, nonprofit association where area leaders address regional issues affecting the District of Columbia, suburban Maryland and northern Virginia.

Montgomery County Department of Correction and Rehabilitation (DOCR). County Department that protects the public and citizens by providing a wide range of constructive, professional, correctional services for pre-trial and convicted detainees.

Montgomery County Department of Environmental Protection (DEP). County Department that enhances the quality of life in Montgomery County by protecting and improving the County's air, water and land in a sustainable way while fostering smart growth, a thriving economy and healthy communities.

Montgomery County Department of Health and Human Services (DHHS). County Department which protects the community's health; health and safety of at-risk children and vulnerable adults; and addresses basic human needs.

Montgomery County Department of Housing and Community Affairs (DHCA). County Department which plans and implements activities which prevent and correct problems that contribute to the physical decline of residential and commercial areas; maintains a marketplace which is fair to both landlords and tenants; increases the supply of new affordable housing; maintains existing housing in a safe condition and supports community programs that benefit our residents.

Montgomery County Department of Permitting Services (DPS). County Department that promotes the health, safety and welfare and economic well-being of residents, businesses and communities of Montgomery County with timely, professional, transparent and consistent review and processing of plans and permits and through inspections of structures, rights-of-way and development.

Montgomery County Food Council. A privately run, privately-funded non-profit organization with goals to build a more sustainable community food system in the County.

Montgomery County Office of Agriculture. County office to promote agriculture as a viable components of the County's economic sector, as well as to preserve farmland as a resource for future agriculture production.

Montgomery County Public Schools (MCPS). Public school district that serves Montgomery County, Maryland.

Nitrogen-rich Feedstocks. Organic materials high in nitrogen, such as grass clippings, food scraps, etc.

Non-perishable Food. Foods that are not likely to spoil, decay, or become unsafe to consume.

Nutrient Management Plan. Plans that specify how much fertilizer, compost, or manure can be safely applied to crops to maximize yields but prevent excess nutrients from entering waterways.

On-Farm Composting. Composting organic materials on a farm.

On-Site Institutional/On-Site Business Composting. Institutions, such as public and private schools, local colleges, and government facilities (Federal, State, and County), or businesses, including not-for-profit organizations, that compost their organic materials on-site, at the point where the materials are being generated.

Open Windrow Composting System. Production of compost by putting organic material in long rows to produce large volumes of compost. Large exposed surface area encourages passive aeration and drying.

Organic Materials. Carbon based compounds derived from living organisms.

Perishable Food. Foods with a limited shelf-life that need to be refrigerated or frozen to slow or halt bacteria growth.

Reuse. Using objects or materials over again, in their original form, or finding new uses for them so they are not discarded as trash.

Source Separation. The practice of separating waste where it is generated into separate components such as paper, glass, food scraps, trash, etc., and placing them in separate containers for recycling, composting, or disposal.

The Maryland-National Capital Park and Planning Commission (M-NCPPC). Bi-county agency empowered by the State of Maryland to acquire, develop, maintain, and administer a regional system of parks within Montgomery and Prince George's Counties, and provide land use planning for the physical development of Prince George's and Montgomery Counties.

Tier 1 Facility. Composting facility which accepts only Type 1 feedstocks.

Tier 2 Facility. Composting facility that accepts Type 1 and Type 2 feedstocks.

Transfer Station. Montgomery County Shady Grove Processing Facility and Transfer Station.

Type 1 Feedstock. Yard trim including brush, leaves, grass clippings, flowers, etc.

Type 2 Feedstock. a) Source separated organics from residential curbside or drop-off programs and non-residential sources, including but not limited to pre-consumer and post-consumer food scraps and non-recyclable paper; b) MDE-approved animal manure and bedding; c) MDE-approved industrially produced food processing materials, including industrial poultry and seafood residuals; d) animal mortalities; e) manufactured organic materials such as waxed-corrugated cardboard, non-coated paper, and compostable products; and f) other materials that MDE determines pose a low level of risk from hazardous substances and a higher level of risk from physical contaminants and human pathogen, compared Type 1 feedstocks.

Vermicomposting. Process which utilizes various species of specialized worms to consume food scraps and produce castings used as a soil amendment.

Waste Diversion. The process of diverting solid waste from disposal or processing facilities, through reuse, recycling, or composting.

Wasted Food. Food that is discarded or lost uneaten.

Waste Reduction. Decreasing the amount of waste generated through changes in production, packaging, and reuse.

List of Stakeholders

WORKING GROUP MEMBERS



Reducing Wasted Food/Channeling Food to Others

- **Sara Ducey**, *Chair, Montgomery County Solid Waste Advisory Committee*
- **Cheryl Kollin**, *Program Director, Community Food Rescue*
- **Jason Kuhn**, *Crossroads Café at Rio; Business & Industries Solutions, Sodexo*
- **Elizabeth Malone**, *Member Services Director, League of Women Voters Natural Resources Committee*
- **Terry McGowan**, *Director of Quality Assurance, Giant Food*
- **Brett Meyers**, *Founder & Executive Director, Nourish Now*
- **Debra Moser**, *Owner & Founder, Central Farm Markets*
- **Tom O'Donnell**, *Sustainability Partnership, U.S. EPA Region 3, Food Waste Challenge*
- **Susan Wexler**, *Outreach Coordinator, Montgomery County Food Council and Community Food Rescue*



In-Home, Backyard, and Community-Scale Composting

- **Doug Alexander**, *President, Newspaper in Education (NIE) Institute*
- **Kelly Doordan**, *Vice Chair, Montgomery County Solid Waste Advisory Committee*
- **Susan Eisendrath**, *Co-Chair, Montgomery County Food Council*
- **Susan Kornacki**, *Sustainability Program, Montgomery County Department of Environmental Protection*
- **Dan McHugh**, *Manager, Montgomery County Department of Housing and Community Affairs*
- **Michelle Nelson**, *Community Gardens Program Manager, M-NCPPC*
- **Aimee Winegar**, *Director, Community Association Services, Inc.*



On-Site Institutional and On-Site Business Composting

- **Amanda Aparicio**, *Sustainability Coordinator, Facilities Management Division, Montgomery Parks*
- **Sue Bumpous**, *Member, Montgomery County Solid Waste Advisory Committee*
- **Kim Goddu**, *Bethesda Green*
- **Lauren Goldberg**, *Ample Harvest*
- **Aaron Hill**, *Member, Montgomery County Solid Waste Advisory Committee*
- **Brenda Platt**, *Co-Director, Institute for Local Self Reliance*
- **Sladjana Prozo**, *Harvest Power*
- **Tierra Robinson**, *Waste & Resource Recovery Branch, Division of Environmental Protection, NIH*



On-Farm Composting

- **Margaret Chasson**, *Member, Agriculture Committee, League of Women Voters*
- **Jeremy Criss**, *Director, Montgomery County Office of Agricultural Services*
- **Adam Diamond**, *MD-DC Compost Council*
- **Aliza Fishbein**, *Non-Farmer Member, Montgomery County Agricultural Advisory Committee*
- **Brian Flores**, *Co-founder, Compost Crew*
- **Mark Freedman**, *Member, Montgomery County Solid Waste Advisory Committee*
- **Caroline Taylor**, *Executive Director, Montgomery Countryside Alliance*



Composting Capacity to Serve Montgomery County

- **Koby Arthur**, *Devoured Catering*
- **Sara Bixby**, *Member, Montgomery County Solid Waste Advisory Committee*
- **Bob Broom**, *Business Development, McGill Environmental Systems*
- **Heather Bruskin**, *Executive Director, Montgomery Country Food Council*
- **Justin Burch**, *Compliance and Product Development Manager, Harvest Power*
- **Craig Coker**, *Owner, Coker Organics Recycling*
- **Christine McGrew**, *Special Projects & Policy Manager, M-NCPPC*
- **Harold Wiggins**, *President, Paterson Environmental Holdings, Inc.*



Strategies to Maximize Food Scraps Collection at the Curb

- **Yirico Alexander**, *General Manager, Bates Trucking*
- **Beth Daly**, *Former President, Sugarloaf Citizens' Association*
- **Oliver Davidson**, *Member, Chevy Chase Village Energy & Environment Committee*
- **Carol Adair Jones**, *Member, Montgomery County Solid Waste Advisory Committee*
- **Linda Silversmith**, *Member, Natural Resources Committee, League of Women Voters*
- **Noreene Stehlik**, *Interested Citizen*
- **Nima Upadhyay**, *Special Projects Coordinator, City of Takoma Park*
- **Ryan Walter**, *Co-Founder, Compost Crew*

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Fariba Kassiri, *Assistant Chief Administrative Officer, Montgomery County*

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