



Residential Organics Collection Feasibility Report

January 28, 2015

Submitted by
Rick Meyers, Resource Recovery Program Manager

Introduction

Common Council file 140611 directed the Department of Public Works to evaluate the feasibility, costs and benefits of implementing a citywide household compost collection program for food scraps and yard waste. The file also directed the evaluation to include an analysis of implementing a backyard composting program. Through this report, the Department submits the findings of its evaluation to the Common Council.

Background on Current Yard Waste Services Provided by DPW

Household collection of organics is currently limited to leaves and brush. DPW operates a seasonal fall leaf collection program in October and November whereby residents rake leaves to the street for bulk collection by city crews utilizing pushers, sweepers, and rear-load packers with ramps. Leaves typically account for half the total yard waste composted or otherwise diverted from landfills by DPW each year. DPW also operates a seasonal brush collection service with pickups available by request from April through November each year. Like leaves, brush is collected in bulk form utilizing dedicated equipment. Small piles may be hand raked into a packer while larger piles may be loaded by a skid steer into a packer. DPW does not collect other yard wastes, such as grass trimmings. Instead, the department promotes “letting clippings lay” to nourish lawns and also offers its two Self Help Centers for residents who wish to drop off the materials for composting through the City’s yard waste contractor. Residents can drop off yard materials of any kind year round at these two sites. Beyond these service offerings, DPW promotes as sustainable, cost-effective solutions both backyard composting to manage food scraps and yard materials as well as kitchen sink disposal units for handling food waste. DPW has organized and offered compost bin one-day truck sales annually each spring since 2012, working directly with a manufacturer to provide bins to the community at wholesale pricing.

Source Separated Organics (SSO) Collection Programs

Source Separated Organics (SSO) programs target recovery of yard waste and food scraps through a separate collection system complimenting recycling and garbage services. Yard waste recovery programs are fairly common, as many states have banned yard waste from landfills for decades (banned in Wisconsin since 1993). Food scraps, on the other hand, represent a fairly new frontier for municipal recovery programs. Less than 3% of the total U.S. population lives in communities where food scrap programs are available for a portion of population (Freeman & Skumatz, Food Scraps Programs in the United States, July 2011). Full SSO programs are most often found in areas where landfill rates are high and/or state or local policy mandates high landfill diversion rates. More than 80% of all food scrap programs nationally are located in just the three states of Washington, Minnesota, and California (Freeman & Skumatz, Food Scraps Programs in the United States, July 2011). US EPA Region 5 funded the Econservation Institute to research and report on food scraps programs, and over 180 such programs were identified as operating in the U.S. (Freeman & Skumatz, Best Management Practices in Food Scrap Programs, 2011). The resulting work led to the most comprehensive information and report on food scraps management in the U.S. to date. The report and a related journal article are cited throughout this DPW report.

Below are typical elements of food scrap programs in the U.S. (Freeman & Skumatz, Food Scraps Programs in the United States, July 2011):

- Yard waste and food scraps commingled
- Include soiled paper, meat, and dairy
- Weekly collection, operating year round, in large wheeled carts
- Voluntary participation, and charge additional fee
- Offered in conjunction with Pay-As-You Throw (variable rate pricing structure for garbage services)
- Average organics collected per participating household: 25-30 lbs/hh/week; (food waste component only 7-9 lbs of this total)
- Average participation rate: 35-40% of those eligible for service
- Average rate charged to residents: \$7.70 per month (median of \$7.50/mo.)
- Average landfill tip fee for communities with food scrap programs: \$82/ton
- Average cost to tip organics: \$54/ton

Processing of SSO

SSO programs including food scraps in the U.S. almost always involve co-collecting yard materials with food waste. The material is typically composted aerobically in open windrows. Less common in North America is the use of anaerobic digestion (AD) facilities which typically require separate collection of yard waste from food scraps. With proper screening technology in place, AD can tolerate a broader stream of household organic waste than composting can. For example, diapers and food scraps placed in plastic bags are accepted in Toronto's SSO program that utilizes AD facilities. After gas is captured through AD, the residual solids usually require composting for further stabilization of the organics. AD involves higher capital and operating costs than composting, and AD typically excludes yard materials, necessitating separate recovery methods for yard materials from other organics. In Milwaukee, both the Milwaukee Metropolitan Sewerage District and Pottawatomini Hotel & Casino operate AD systems that present theoretical processing opportunities. However, neither would accept yard waste and currently neither are equipped to receive household organics in solid form.

While yard waste composting facilities are common, additional regulatory and permitting requirements necessary for composters to accept substantial quantities of food waste result in only a small percentage of compost sites accepting food waste as well. In recent years, the Wisconsin DNR has worked to ease some of the regulatory barriers to accommodate greater recovery of food scraps through composting, although it generally has not resulted in more processing of residential SSO material. Milwaukee's currently contracted yard waste composter, Waste Management, does not offer composting of residential organics. Waste Management composts food scraps for a limited number of commercial customers, and only accepts pre-consumer vegetative scraps (no proteins). Purple Cow Organics and The Farm's Composting are other composters with operations in the greater Milwaukee area that accept pre-consumer food scraps from commercial customers. Both are able to accept limited quantities of SSO under their permits, making them potential candidates to receive Milwaukee residential SSO material under a small scale or pilot program. Neither, however, could accommodate a citywide program at this time.

Collection of SSO

For the City of Milwaukee DPW to provide a residential curbside collection service for food scraps and yard wastes, it would require a third collection cart to complement existing carts dedicated to garbage and recycling services. Due to the putrid nature of food scraps, collection would need to occur weekly. To make weekly SSO collection more cost effective, one approach is to reduce trash service to every other week upon implementing a food scraps program, although weekly trash service currently remains the standard practice. Portland, Oregon is the only large city in the U.S. that has made such a move, with organics collected weekly while recyclables and trash are collected on alternate weeks. More common is to allow residents, as part of a Pay-As-You-Throw billing system, to downsize their weekly trash collection capacity for a reduced trash fee to help offset cost of their organics service.

Cost of Food Scrap Programs

To implement SSO curbside collection service, DPW would need to invest in collection carts, potentially small kitchen collectors, and new collection vehicles. The extent and cost of these items as well as additional labor would depend on size of the program. Denver, Colorado, a city of comparable population size to Milwaukee, estimated the cost of sustaining one route (about 2,250 households) to be around \$170,000 per year (Freeman, Moving a Mountain, January 2015). Denver estimated the total capital, operations, and maintenance cost of providing service citywide to be \$15-\$17 million annually and determined a per household cost of \$9.75 per month, which is the rate they are now charging to subscribers (Freeman, Moving a Mountain, January 2015). Using national average cost data, Milwaukee may expect its full program costs to be about \$7.70 per household per month, which would equate to over \$17 million per year for a citywide program if offered to all single-family through 4-unit housing. For perspective, adding \$7.70 per month would raise the Solid Waste Fee from the current \$194.40 per year to \$286.80 per year, representing a 47.5% increase for those subscribing to the organics program. This would hinder program subscriptions; however, the economic barrier could be addressed through a restructuring of solid waste fees to create a larger incentive for recycling and organics program participation through variable rate pricing.

Impacts/Benefits

If Milwaukee were to offer a citywide SSO program, we can again look to national data to project results. Curbside organics programs including yard waste and food scraps divert an average of 25-30 pounds per participating household per week, with food scraps accounting for 7-9 pounds of that total (Freeman & Skumatz, Best Management Practices in Food Scrap Programs, 2011). With DPW's current yard waste programs, it is uncertain how much new yard waste diversion would occur through a containerized SSO program versus how much existing diversion would simply shift to the SSO program. Certainly there would be some increase as we know that the added convenience, particularly for yard materials other than leaves and brush, would result in less yard waste hidden in garbage carts. Conservatively, we might estimate each participating household to achieve 10-15 total pounds per week of new diversion of food scraps and yard material. (Madison, Wisconsin's pilot program has averaged 14 lbs/HH/week.) Average

participation across all communities is 35-45% of eligible households; however, communities with separate fees for the organics service can have subscription rates as low as 10% or less (Freeman & Skumatz, Best Management Practices in Food Scrap Programs, 2011). If all 1-4 unit households serviced with garbage and recycling by DPW were eligible to participate in a SSO program and 20% subscribed, we might expect 38,000 participating households to divert an additional 10,000 to 15,000 tons per year of organics from the landfill. Recovering 15,000 more tons would increase Milwaukee's residential landfill diversion rate from the current 24% up to around 30%. This would help reduce our reliance on landfills and conserve land and natural resources while sustaining jobs involved in re-circulating organic materials through our economy. It would also assist in reducing production of gases contributing to climate change. The net reduction from composting 15,000 tons of food waste versus disposing at a landfill with gas recovery is around 8,700 Metric Tons of Carbon Dioxide Equivalent, according to a calculation using the EPA's Waste Reduction Model.

Backyard Composting

Aside from source reduction – preventing food waste to begin with – backyard composting is generally recognized as the most cost effective and sustainable way to manage food scraps. Vegetative food scraps and yard waste can be managed onsite without the need for costly municipal collection services or treatment systems. Backyard composting also produces finished compost for the household that can be used to nourish gardens and lawns.

DPW has held compost bin truck sales annually since 2012 in partnership with compost bin manufacturers. The sale has taken place each spring on a Saturday and offers compost bins, kitchen collectors, compost turners, and rain barrels for sale to the public at whole-sale prices. A total of 2,743 compost bins were sold over the first 3 years, and another sale is in the planning stages for 2015. These sales involve staff time, but DPW has not subsidized the cost of compost bins to date, which have been \$45 per unit in recent years. If DPW were to offer \$10 or \$15 rebates for compost bins sold to Milwaukee residents, for example, it could provide more incentive for residents to try composting, although it's uncertain that the price point of a compost bin is an actual tipping point barrier for people who would otherwise choose to compost. It may be more effective to spend money on a broader public promotion campaign educating on the benefits of backyard composting. Additionally promotion could be done through partnering with community groups and collaborating more closely with those working to improve urban access to fresh produce through urban gardening. Healthy food and healthy soils go hand in hand, so promotion of composting aligns well with initiatives to improve access to nutritious and fresh foods.

The potential for backyard composting implementation is somewhat limited in urban areas with dense housing and relatively small yards. However, wherever it can be implemented, it can effectively reduce food waste to landfill from participating households. In Milwaukee's study referenced in the next section, new backyard composters achieved an average food waste reduction of about 4 pounds per week compared to what they put in the trash prior to using a backyard compost bin. If 10% of Milwaukee's 1-4 unit households composted and achieved similar results, it could divert an additional 2,000 tons per year from the landfill.

Alternatives to DPW SSO Collection Program & Backyard Composting

Food Waste Disposers

During the summer of 2013, DPW launched a study and demonstration project in partnership with InSinkErator to reduce the amount of food waste sent to landfills by residents. The program involved about 175 households that were recruited in collaboration with Southside Organizing Committee to participate in one of two subgroups: one utilizing in-sink disposal units and the other utilizing backyard compost bins. Through this study, the efficacy of both of these strategies for reducing food waste in the city's residential waste stream was examined. Both backyard composting and food waste disposers resulted in food waste reductions of about 25%.

Used in homes and apartments, in-sink food waste disposers are a well-established tool for diverting food scraps from disposal, and they utilize existing public infrastructure to convey materials. Disposers convert food scraps into a liquid slurry for transport via existing sewers to Milwaukee Metropolitan Sewerage District (MMSD) facilities. At those facilities, water is cleaned for discharge, organic solids are processed through anaerobic digestion to produce useful biogas, and the remaining digested solids are made into Milorganite, MMSD's branded soil amendment product.

In our study project, participant surveys revealed a high level of satisfaction with the disposers and reported a variety of benefits including reduced odors and trash, easier and faster kitchen clean up, and reduced flies and pests. While food waste disposers are popular with those who use them and they cost effectively convey food scraps, which are mostly water, to MMSD's anaerobic digesters, barriers to their wider adoption and use is the cost to the household to purchase and install them as well as lack of familiarity for those who have never used them. DPW, in partnership with MMSD, promotes food waste disposers as an option to manage food scraps.

Neighborhood/Community Compost sites

DPW promotes community compost sites as another option for managing food scraps, particularly for those that want to compost but live in apartments or for whom it is otherwise impractical to backyard compost. Community compost sites are open for the drop-off of organic materials by the public. KompostKids.org provides a list of such sites in Milwaukee as well as a set of guidelines on how to use the community compost sites, including a list of accepted items.

Private Service Providers

There currently exist a couple of small businesses that provide residential, fee-based collection service for SSO in the Milwaukee area. Residents who do not have the space or desire to compost on their own have the option of a convenient household collection service through these companies. Compost Express offers collection in 5-gallon buckets while Elyve Organics offers collection in containers ranging from 5 to 55-gallons. Growing Power does not pick up from residents, but does allow drop-off of materials. (Another company, Compost Crusaders, currently only provides commercial collection services.)

Conclusions

After recovering recyclables and yard waste from Municipal Solid Waste (MSW), food waste is the largest component of remaining discards at 21% (US Environmental Protection Agency, 2014). Clearly, food scraps recovery programs present an opportunity to target a significant fraction of the waste stream. Food waste prevention education, including resources on food donation opportunities, should be considered as part of any strategy to reduce food waste. Food scrap programs represent a relatively new frontier in MSW management in the U.S. While programs are growing in prevalence, a very small percentage of the population currently has access to such collection programs. One of the primary barriers to increased food scrap recovery is lack of processing facilities accepting food scraps. Processing capacity in the Milwaukee region currently is inadequate to receive material directly from a SSO residential program, although a couple of compost sites could potentially accept limited quantities in a small scale program.

The cost of providing food scraps and yard waste recovery through a SSO curbside collection service averages \$7.70 per household based on national survey data (Freeman & Skumatz, Best Management Practices in Food Scrap Programs, 2011). The economics of a SSO curbside collection program for Milwaukee may not be favorable presently, but landfill disposal costs are likely to continue to trend upward over time. It is prudent to consistently evaluate the potential of operating a SSO collection program, beyond which there is also a variety of ways Milwaukee can promote reducing food waste for a more sustainable future.

Works Cited

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