

# **Yard Waste and Organics Collection: Alternative Management Strategies for Local Governments**

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## **INTRODUCTION**

The organic fraction of the MSW waste stream, which includes food scraps, yard waste, wood waste, and mixed paper, represents about 40 to 60 percent by weight [1]. Multi-family residential units do not generate yard waste and wood packaging so organic wastes are significantly lower, 15 to 20 by weight, still not an insignificant amount if the community has a high diversion goal.

According to the U.S. EPA, Americans generated nearly 35 million tons of food waste in 2010, with 97 percent of it disposed at landfills [1]. As such, many communities in recent years have been evaluating options to handle organics beyond the traditional approach in just supplying information on municipal web sites about the benefits of backyard composting. Further, many state and provincial governments have begun promulgating policies and regulations that target the recycling of organics prompting local solid waste agencies to develop advanced municipal curbside collection programs.

A key question for the local solid waste agency to answer is what types of organic wastes will be targeted for collection and processing [11]. For example, some programs accept food wastes, but do not collect meat or fish wastes due to significant odor and processing issues. The plastic lining in some disposal cups, as well as in coated paperboard products, can pose a contaminant problem for composters. For example, the plastic lining in some disposal cups, as well as in coated paperboard products, can pose a contaminant problem for composters. Also, other programs restrict the collection of pet wastes and diapers due to contamination concerns. The paragraphs below briefly discuss some of facets of these organics recycling initiatives.

### **Drop Off Programs**

Historically, many rural and smaller communities where residents already self-haul refuse, yard waste drop-off can be cost-effective way to recover a significant amount of organics. Residents who can conveniently haul their yard clippings and other organic wastes to a nearby drop box will participate at levels similar to curbside collection systems. Also, mobile drop-off centers can help serve a number of adjacent communities, especially if these centers offer reduced or free tipping fees for source-separated organics. Food waste collection at drop-off centers has oftentimes proven a bit more complicated than recycling because the materials cannot sit around as long as stacks of newspapers, but a convenient network of community locations can overcome the barriers to frequent drop-offs by residents.

## **Bulk Collection**

Another simple collection system for organics is for residents to rake their yard clippings, leaves, and brush into piles on the edge of the curb. Trucks with vacuum equipment can then remove the piles and haul them away. If vacuum equipment is unavailable, the piles must be placed in the street so loaders or sweepers can get access to the piles to remove them. Most local governments have dump trucks and loaders and consider this option a less expensive implement a yard waste collection program.

This system would only accommodate yard waste since food wastes handled this way would create too much odor and vector attraction. Piles of yard waste in the street could cause traffic problems as well as plugging municipal storm drains. Wet yard wastes piled in this manner could also produce unpleasant odors.

This method of collection could easily be implemented because it does not require anymore effort on behalf of the participants than what is normally expended taking care of their yards. But, the various negative issues introduced with this method would require careful consideration by decision makers before implementing.

## **Curbside Collection Programs**

According to a 2013 survey in the United States [12], there are more than 214 source-separated organics collection programs in operation and the effort is gaining traction in recent years. That number is up from only 20 programs in 2005. While each of these programs has its own method for food waste collection, several major trends are apparent in both the residential and multi-family sectors.

### **Residential**

A key challenge to residential collection is assisting residents in getting over the “ick factor” of composting organics. Many misconceptions exist regarding storage of organics in households, including the space requirements, public health risks, odor and rodent problems. Surveys conducted by several municipalities have noted typical comments such as lack of space, odor problems, and lack of time as the top concerns regarding implementation of a household organics collection program. For example, a 2008 study in King County, WA [13] showed that much of public opinion regarding separation of household organics is based on perception rather than reality, and that the “ick factor” dispels when citizens begin recycling household organics.

Current experience also suggests that a municipality must have a strong outreach effort to educate the general public on household waste management practices and illustrate the link between recycling food scraps and lowering refuse collection costs. Information must be easy to understand and the composting process must be as simple and quick for residents as possible. Innovative outreach efforts include: composting workshops, illustrated posters of compostable materials, and images of food waste or recyclables displayed on the sides of collection trucks [].

## Single- Family

Currently, single-family, residential collection of organics is just in its infancy in the United States. Those communities who are “early adopters” have been faced with a series of implementation decisions such as the type of containers, which will encourage a greater participation, and the frequency of collection. Currently, a major trend in residential collection of organics in the United States is providing a variety of kitchen container to help store organics as a means to assist in the daily collection of food scraps and to increase overall participation, as well as some type of external container that will be for curbside pickup.

Collection of household organics is relatively simple and is performed either by the municipality or a waste collection service subcontracted by the municipality. Household organics are placed in a “third cart” and collected weekly or bi-weekly at the curb. The organics carts range in size from 18 gallons to 65 gallons, depending on whether the municipality allows co-mingling of yard waste in the carts. Some municipalities that implement the third cart system are able to realize waste collection cost savings by reducing the amount of refuse collections (moving to biweekly or monthly collections). Table 4 provides a comparison of collection containers currently used in the United States for organics.

**Table 1. Comparison of Interior and Exterior Collection Containers**

Container	Advantages	Disadvantages
Bucket (1-5 Gallon)	<ul style="list-style-type: none"><li>• Easily transportable by the user</li><li>• Can be placed on the kitchen countertop</li><li>• Size prevents overloading</li><li>• Differentiable from refuse container</li></ul>	<ul style="list-style-type: none"><li>• Difficult to commingle bulky materials such as plants, cardboard, or paper</li><li>• Not often used for post-consumer food scraps</li><li>• Not used as collection container for hauler</li></ul>
"Slim Jim"	<ul style="list-style-type: none"><li>• Size consistent with many liners</li><li>• Available with rollers</li><li>• Size prevents overloading</li><li>• Height allows for food to be scraped off for food prep table</li><li>• Differentiable from refuse container</li></ul>	<ul style="list-style-type: none"><li>• Difficult to commingle bulky materials such as plants, cardboard, or paper</li><li>• Not used as collection container for hauler</li><li>• Would require lifting into a collection container</li></ul>
Refuse Container	<ul style="list-style-type: none"><li>• Size allows commingling of bulky organics</li><li>• Low cost option</li><li>• Available with rollers</li></ul>	<ul style="list-style-type: none"><li>• Potential confusion with refuse container increases potential for contamination</li><li>• Greater level of signage and employee communication is needed</li></ul>
Carts (32-64 gallon)	<ul style="list-style-type: none"><li>• Can be used for interior and exterior collection</li><li>• Size allows commingling of bulky organics</li><li>• Rollers to ease transport to outdoor area</li></ul>	<ul style="list-style-type: none"><li>• Carts taller than food prep tables</li><li>• Carts can be too large for use by some generators</li><li>• Food scraps can exceed weight limits for automated</li></ul>

	<ul style="list-style-type: none"> <li>Also good for small generators</li> </ul>	<ul style="list-style-type: none"> <li>arms or tipper if customers not properly trained</li> <li>Larger liners are needed for carts</li> </ul>
Dumpsters (1-4 CY)	<ul style="list-style-type: none"> <li>Can include bulky organics</li> <li>Once/week collection feasible</li> <li>Consistent with typical refuse containers for commercial</li> <li>Plastic containers available</li> </ul>	<ul style="list-style-type: none"> <li>Employees may be required to lift material overhead</li> <li>Some customers may not have space for additional container</li> <li>Must remove from site for cleaning</li> </ul>

Source: Reference [14].

A majority of communities that offer organics collection have expanded upon an active yard waste collection program by adding such things as food scrap and soiled paper products. This enables “piggybacking” on existing routes and containers, as well as automated collection vehicles or split body collection trucks. Further, by co-collecting yard wastes and food waste together can help mitigate odor and moisture issues [15].

Lastly, the types of materials collected and ability to accept liner materials to help increase the “cleanliness” of the container (Table 5) depend largely in part on the ability of the composting facility to accept and process these materials. For example, meat, bones, and dairy scraps usually attract animals and also tend to generate odors and attract flies. While keeping these materials out of an organics collection program may cut back on odor and pest problems, many communities have found it extremely complicated for residents to keep food discards separate. This has usually required a significant investment in public education.

**Table 2. Comparison of Liners**

Types of Liners	Advantages	Disadvantages
No Liner	<ul style="list-style-type: none"> <li>Cost effective</li> <li>Low contamination with conventional plastic bags</li> </ul>	<ul style="list-style-type: none"> <li>More frequent cleaning of container</li> <li>Difficult to transfer material into collection container</li> </ul>
Plastic Bag	<ul style="list-style-type: none"> <li>Cleanliness of container</li> <li>No change in purchasing practices from refuse</li> </ul>	<ul style="list-style-type: none"> <li>Ergonomic issues</li> <li>Can increase time to unload materials</li> </ul>
Compostable Bag	<ul style="list-style-type: none"> <li>Cleanliness of container</li> <li>Minimizes nuisances</li> </ul>	<ul style="list-style-type: none"> <li>Requires purchasing changes</li> <li>Higher cost</li> <li>Can be less sturdy</li> </ul>
Kraft Paper Bag	<ul style="list-style-type: none"> <li>Cleanliness of container</li> <li>Paper bags are easily compostable</li> </ul>	<ul style="list-style-type: none"> <li>Limits material storage time</li> <li>Purchasing changes</li> <li>Higher costs</li> <li>“Workaround” solution</li> </ul>

Source: Reference [14].

## **Multi-Family**

Traditionally, solid waste professionals group multi-family residences into two different groups [15]:

- Buildings with four to six residential units.
- Buildings or apartment complexes with six or more residential units.

Those in the first group can usually be serviced by traditional containers (cans) and vehicles, which are used for single-family residences. For the sake of discussion, high-rise buildings refer to multi-family units that typically rely on traditional roll-offs or compactor units for organics collection. To save space, architects most often use areas within the space of building near load-out areas for placement of these units. Normally, regular refuse is fed by gravity through a chute on each floor that is then conveyed to a wheeled container, which is taken periodically to a central roll-off or compactor in the load-out area of the building.

Apartments with six or less units generally have several multi-story buildings with onsite parking. Each building has a central, screened disposal container where refuse and organics can be dumped. These containers are then normally serviced by a front-loader vehicle.

Communities that have implemented organics collection for high-rise units have provided residents with kitchen containers to collect their food waste separate from their normal housed refuse. This means that the residents must transport their organics to a central collection facility, which is oftentimes has proven inconvenient for their residents.

Surveys of these programs have pointed out the following collection issues [15]:

- Resident inconvenience – For the most part, residents in these high-rise buildings are familiar with trash chutes to dispose of their refuse. Therefore, requiring these individuals to source separate their food wastes and compostable organics in a separate container and bypass the trash chute in favor of carrying these materials to a basement area would be considered inconvenient to many high-rise dwellers.
- Limited space for the collection container – Having building maintenance to provide a separate collection container for source-separated organics is difficult given the limited storage space.
- Limited space for the building container - Storage space in the high-rise building is oftentimes at a premium. Most often, these areas are designed for a single roll-out container.
- Building custodial space workload – Separate containers for organics collection will require custodians to transport these materials for the central building load-out. These containers will also require regulation sanitation to reduce odors and prevent vectors such as insects and rodents. All of these tasks will require extra manpower needs.



- The “Uck Factor” – Food waste and other organics can result in unpleasant odors especially if plastic liners are needed.
- Costs - The extra labor needs and separate collection service will result in extra sanitation service costs by building management.

### **Collection Approaches**

Historically, there have been three different types of collection approaches used to collect organic wastes from multi-family residences. These are discussed in the paragraphs below.

#### **Source Separation**

In this approach, residents of these multi-family buildings are given a separate container, usually for their kitchen, to separate and store organic wastes (food waste and compostable paper products). As noted above, the resident uses this container to transport and dispose of these materials into a separate organics building container.

One the largest organics collection programs for high-rise buildings to date is conducted by the City of Toronto, Canada (See Chapter 9). The City’s Green Bin Program allows participants to place organics (fruit and vegetable scraps, paper towels, coffee grounds, diapers, person hygiene products, and pet wastes) in small kitchen bins and then into plastic bags for separate weekly collection along with recyclables. The City has reduced the frequency of waste collection to twice per month. To allow plastic bags, a hydropulper at the City’s anaerobic digester is used to separate the plastic bags from the resulting slurry for composting.

The City estimates that its multifamily residents generate an average of 165 pounds per residential unit per year. Building owners are responsible for providing a container size equal to eight cubic yards for every 1,000 units. At the end of 2011, 650 buildings representing 120,000 single units have participated in the City’s organics program.

#### **Wet/Dry**

Under this type of collection approach, residents are requested to separate their solid wastes into two different streams: a “dry stream” consisting of recyclables and other wastes; and a “wet stream”, which consists of food wastes, coffee grounds, and food-soiled paper and paper products.

#### **Mixed Waste**

This collection approach requires that the residence collect all of their wastes in a single container, typically as they do now. Here the mixed wastes are delivered to a mixed waste MRF where these materials are separated into recoverable recyclables and organics.

## **Commercial Generators**

Commercial food waste generators can economically profit from diverting their unwanted food to beneficial uses. Many organics collection programs in the United States have focused on these potential generators of organics as the “low hanging fruit” to help ramp up their landfill diversion rates and to begin development of a comprehensive organics recycling program. Potential commercial generators of organic wastes include the following [16] :

- Colleges and universities
- Convention centers
- Farming and agriculture
- Food and beverage product manufacturing
- Grocery stores
- Hospitals
- Hotels
- Office buildings and corporate campuses
- Prisons
- Restaurants
- Schools and school districts
- Sports arenas and stadiums

While these commercial organics collection programs are still in their infancy in the United States, current experience suggests the following steps to help implement a viable program [17,18]:

- Identify what businesses are generating food discards, and target these businesses based on type and size.
- Identify businesses that use food discards (such as composters, vermicomposters, animal feeders, animal feed manufacturers, tallow companies). Finding a composting facility that is permitted to take all types of food will result in greater flexibility and higher diversion. If composting facilities can only take vegetative materials, these materials are still worth targeting.
- Try to make matches and distribute information on users to generators so they can make their own matches.
- Place the highest use value on edible food redistribution. When developing a program, work with and support local food donation organizations to incorporate edible food recovery.
- Work with haulers to develop a collection strategy and financial incentives for participating businesses.

- Put time into working with businesses. Provide monitoring and follow-up. Remind businesses that they reap many benefits from participating, including financial and public relations.
- Conduct outreach and find different ways to promote the program. A brochure can help inform businesses about the program. Health departments and chambers of commerce can help deliver messages to businesses.
- Be flexible. As with any new program, be willing to fine-tune the program to meet the needs of cities and customers. Find out if the level of service is right (such as pickup frequency). If not, make adjustments.
- Use front-end loader trucks to collect food discards. Front-end loader trucks are better equipped to handle heavy containers than rear loader trucks.
- Consider providing biodegradable and compostable bags for customers to line their containers as needed. Bags will keep containers cleaner and prevent food scraps such as dough from sticking to containers, but they will also add to costs.
- Devote a staff person or employ a consultant to work with generators to set up composting systems at generators' sites.
- Offer seed money to cover part of the cost of equipment for on-site diversion.
- Promote business customer recognition programs via local business associations.

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