

Collecting Food Scraps and Soiled Paper

The great majority of programs are collecting three streams (recycling/organics/rubbish), instead of two (recycling/garbage). Only a handful of the existing residential organics programs collect SSO in two streams (wet/dry). There are myriad variations for how to collect three streams, and much depends upon local parameters.

Options for collecting three streams

The material is collected in a combination of separate fleets, one or both of which divide the vehicle into two compartment to collect two streams separately on the same truck body in order to avoid the need for three fleets of trucks.

These split-bodied, or co-collection, trucks are usually compacting vehicles with a dividing wall separating the box into two lengthwise compartments, with a wall front to back. Typically both compartments are compacted to increase the time on-route before filling up, but oftentimes the compaction ratio for recyclables is lowered in order to minimize glass breakage.

Note that use of split-bodied trucks, in turn, has necessitated collecting all recyclables in one compartment, and therefore processing recyclables at a materials recovery facility (MRF)



Photo Credit: Center for a Competitive Waste Industry

Split body collection vehicle

capable of single stream processing. In single stream MRFs, all the recyclables come out of the same compartment commingled. The separation of containers from paper, previously done by the participant in the home, has to be done centrally instead. The collection savings from avoiding a third fleet are greater than the additional processing costs from combining recycled containers and paper into one stream.

TABLE 2 shows the different configurations that are being used in different locations in order to achieve separate collection of organics.

| Different Collection Strategies for Separate Collection of Source Separated Organics | | | | |
|--|--|---|--------------------------------|----------------------|
| Material Streams | | | | Collection Frequency |
| I | Wet (Food, soiled paper and other wet contamination) | ↔ | *Dry (Recyclables and rubbish) | Weekly |
| II | Rubbish | ↔ | Recyclables ↔ Organics** | Weekly |
| III | Rubbish | | | Biweekly |
| | | ↔ | Recyclables ↔ Organics** | Weekly |
| IV | Rubbish | ↔ | Recyclables | Biweekly |
| | | | ↔ | Organics** |
| V | Rubbish | ↔ | Recyclables ↔ Organics** | Biweekly |

TABLE 2

* “↔” indicates the two streams share the same split bodied truck in collection.

** Collection of the yard trimmings component of organic discards also varies. Some collect grass as well as leaves and include that in the green cart. Others do not collect grass curbside, requiring either mulching lawnmowers or drop off, and collect leaves and brush only in season on a less frequent schedule on another truck.

Thus, for example, San Francisco collects all three streams weekly, with recyclables and organics on different compartments of the same truck; Toronto alternates rubbish and recyclables on the same truck in which SSOs are collected weekly, and Halifax collects each stream biweekly, with recyclables and organics sharing the same vehicle.

Key Factors

Five key issues, arising from the case studies in this report, must be considered to determine optimal collection arrangements for a specific locality: the size of the streams; the frequency of rubbish collection; grasscycling; and flexible compartment dividers.

Size of the streams

In conducting a site-specific study it's important to project the size of the different streams and how much variation there is around the mean based upon how much material will wind up in each stream once the program is in place, diversion is increased and rubbish is decreased. Variables include whether grass clippings are collected or eliminated; what potential exists for backyard composting; whether diapers and pet waste are accepted. Also, consideration should be given to determine which combination of variables makes it possible to eliminate the typical mid-day trip off-route to unload the vehicle when it tops off. Fifteen to twenty percent of routing requirements ride on that question, and this is always a significant cost-driver in system design.

Less frequent rubbish collection

When organics and recyclables are collected, little material is left for the trash truck to collect, and even less that will be putrescible. There is no reason, then, to continue collecting the small volume of inert material remaining each week. If the related processing issues can be managed for pet wastes and diaper discards, one way to both minimize overall costs and maximize organics diversion is to collect rubbish less frequently, either bi-weekly or monthly.

- The cost of trash collection is dramatically reduced because the garbage truck routes are cut nearly in half or by four. This effect is so influential on costs that the expanded program could conceivably pay for itself, notwithstanding the fact the organics may require expensive processing.
- Capture rates can be tripled because residents have a new incentive to put their putrescibles in the designated container: to avoid having their rotting discards hang around the house that much longer.

There may be conflicting factors to consider, however:

- Bi-weekly rubbish collection will not be possible unless pet waste and diapers are included in organics collection. Health Departments will need to be aware of the separate organics collection and support the effort.
- Since a digester may be needed to process the organics, and a single-stream MRF will be needed to process the recyclables, the opportunity is only available for larger communities (or smaller ones acting jointly) who have the necessary resources and are strongly committed to residential organics separation.
- There may significant savings to also shifting to less-frequent collection for recyclables as well as for rubbish. It will no longer, be necessary to maintain a single compartment compacting vehicle for the rubbish collection and another split body truck for recyclables and organics. In this example, every truck is a split body unit, which collects organics on one side each week, but on the other side, alternates weekly between rubbish and recyclables, both of which are collected

biweekly. By reducing the types of trucks needed to serve a community from two to one, which will all be split-body trucks, there are significant savings in the need for fewer spare trucks and more efficient maintenance.

- On the other hand, going even further and moving all of the three streams to bi-weekly collection, which may be an option in colder climates, is problematic. It effectively removes the incentive for residents to separate organics to avoid having putrescibles hang around longer. For instead of rubbish being collected less frequently than organics, collection for both is now pushed off to less-than-weekly.
- Finally, if recycling collection is not made less frequent along with rubbish collection, then consideration may be given to developing a split totter that can be loaded with one lift onto the collection vehicle to reduce the time at each stop loading twice.

Grasscycling

Some cities have made a decision not to collect grass and instead encourage “grasscycling,” or leaving the grass clippings on the lawn.

As long as the clippings are not too long they begin to decompose almost immediately, with the following benefits:

- It is an easier maintenance practice.
- There are less polluting truck trips to collect and also to distribute the material to end markets.
- It is less costly than collecting and processing clippings. In temperate regions, this reduces yard collections to seasonal leaf collection and intermittent chipping for brush.
- There is no opportunity for the grass clippings to go anaerobic in bags on the route, releasing uncontrolled ammonia and possibly methane, before its destination.
- All of the nutrients are returned to the soil without losses from premature volatilization.
- The need for fertilization is reduced.

Possible conflicting considerations include:

- In semi-arid, but irrigated, climates like much of California, a third collection is already provided for yard trimmings year-round. In some communities it is not politically feasible to eliminate grass pickups due to residents' expectations for high levels of service.
- If green wastes are already being collected in a sufficiently large wheeled cart, there may be no need for an entirely new pickup. However, be aware that if food and yard trimmings are collected together, they will both have to be taken to a facility that can handle the most difficult to process of the two or more organic fractions, which will very significantly increase processing costs.

Pivoting compartment dividers

Co-collecting two discard streams in different compartments on the same vehicle has one significant downside. As presently designed, the dividing wall between the two compartments is usually fixed at the factory, while the relative proportions of each stream on a given day's route can vary. Consequently, one compartment will tend to top out before the other fills, and the truck will have to go off-route to unload with the other side partially empty. A new design is needed in which the dividing wall is fixed only at one end to a pivot so that it can adjust on-route to daily variations in the flow of materials in each stream, or one where the dividing wall moves laterally. This is especially important when one of the compartments on the same split body truck is alternatively used with different discard streams, which means the fixed wall can only be set to match the average of the first and second streams, and not the third.

Carts

With the addition of another separated discard stream, including putrescibles, care must be taken in the selection of containers and carts for the kitchen and garage that will work in conjunction with the type of collection and processing used.

A key element in designing systems to handle household food scraps is providing containers that allow residents to isolate discarded food, which can soon rot, smell and attract bugs, especially in warmer climates. If these unpleasant side effects occur, public support for the program can collapse.

Most programs provide both a small bucket with a lid for the kitchen to hold each day's leavings, and also a wheeled cart, to take the source separated organics from the house or garage to the curb on collection day. Food scraps are usually heavier than regular garbage, making it a candidate for automated collection.



Photo Credit: Center for Competitive Waste Industry

Kitchen catcher

Note that in those cases where recycling and

composting streams are collected on the same truck (see Collection below), then a split toter for recyclables on one side and organics on the other may be considered, so that both can be loaded onto the truck with one lift.

The kitchen catcher is usually about 1-2 gallons in size, with a sealable lid, that residents can use to place each day's food scraps. The wheeled cart is usually about 12 gallons, for programs that only include SSOs, and 64 gallons for programs that combine yard trimmings and food scraps. Remembering that SSO programs, unlike backyard composters, usually include meat, latches are also often added to the cart to keep out raccoons and dogs.



Photo Credit: Center for a Competitive Waste Industry

Cart for food scraps

For sanitary reasons, and to overcome the “yuck” factor, many programs also provide designated plastic bags to line one or both containers, or permit households to use any plastic bag. However, adding plastic film into the organics stream increases contamination that will need to be managed in processing. For that reason, some programs attempt to restrict plastic liners to biodegradable plastic. However, these bags tend to cost more, and also compete against the free plastic bags people receive for carrying home groceries or goods when they shop. For that reason, other programs believe that attempts to dictate biodegradable bags will not succeed. In either event, if and to the extent that significant non-biodegradable bags enters the organics stream, the processing system has to be designed to cope with that level of contamination.