

Attachment 1 – Yard Waste Collection Container Pilot Results

Refer to Figure 1 below that shows examples of set out of yard waste in varying types and sizes of rigid open containers. To help address ergonomic issues and find a potential solution to reduce the risk for employee injuries, Solid Waste Management Services staff conducted a Yard Waste Collection Container Pilot (the Pilot), from the fall of 2018 to the fall of 2019, to observe resident participation and set out behaviour, and pilot the automated collection of yard waste from standardized City of Toronto-issued bins in select areas. Participant feedback was also gathered to help inform staff recommendations on changes to the yard waste collection program.

Figure 1: Set out of Yard Waste in Varying Types and Sizes of Non-compliant Rigid Open Containers



Task 1: Monitoring Participation, Contamination and Use of Additional Kraft Paper Bags

City staff conducted field inspections to monitor participation, measure contamination levels, and to record the use of additional kraft paper bags in peak and off-peak yard waste seasons. Field inspections occurred over a 13-week and 14-week period for Districts 3 and 4, respectively.

Findings from Task 1 are as follows:

- Participation rates were 93 per cent and 99 per cent in Districts 3 and 4, respectively, with an overall average participation rate of 96 per cent. Participation is defined as the set out of bins compared to the number of households inspected.
- In total, 11,624 inspections were conducted, of which 335 bins were found to contain contaminants, representing a 2.9 per cent contamination rate. The kraft paper bags were not inspected for contamination, however, it can be expected they contained a degree of contamination.
- In addition to the bin, a total of 2,756 and 3,492 kraft paper bags were used in District 3 and 4, respectively. Based on these observations, on average, each household set out an additional 10 kraft paper bags and 2 kraft paper bags in District 3 and 4, respectively, over the entire season for yard waste with a weighted average of 5.5 kraft paper bags per household.

Table 1: Operational Observations and Pilot Results

Area	Participating Households	Bin Size	Number of City Issued Bins Inspected	Kraft Paper Bags			
				Peak Season*	Off-Season	Total	Kraft Paper Bags**
District 3	407	120 litres (medium bin)	4,722	1,836	920	2,756	10
District 4	558	240 litres (large bin)	6,902	417	319	736	2
Totals	965	-	11,624	2,253	1,239	3,492	5.5***

*Peak season is defined as April, late October to early December

**Average annual number of kraft paper bags per household used in addition to City issued containers

***Weighted average

Although the households in District 4 that received the larger sized City-issued bin set out fewer kraft paper bags than the households in District that received the smaller sizes bins, overall findings found that a single City-issued bin does not meet yard waste capacity needs. In both Districts, all participating households still required the use of kraft paper bags to set out overflow materials. This means that most households will likely require multiple City-issued standardized bins to meet yard waste capacity needs.

Task 2: Automated Collection of Yard Waste

This task observed the operational impact, efficiencies and health and safety aspects of automated collection of yard waste from the standardized City-issued bins. This trial was conducted for a two-week period in District 4 and was jointly performed with the City's ergonomist consultant, monitoring the collection activities.

Staff found that the top loading, fully automated trucks currently used by the City to collect garbage, blue bin recycling and Green bin organics were not suitable for the Pilot as the hopper in which the materials are dumped in is at the top of the truck and too high for staff to throw the kraft paper bags. For the purpose of the Pilot, a specialized fully-automated side loading truck (currently not yet available in the marketplace), was used with a low hopper sill that allowed for the automated collection of bins and manual loading of kraft paper bags. Refer to Figure 2 below that shows manual loading of kraft paper bags into an automated collection vehicle.

Figure 2: Collection of kraft paper bag



Findings from Task 2 are as follows:

- The bin lifter equipment impeded the collection operator's ability to safely access to the hopper when attempting to manually collect kraft paper bags of yard waste as it was further away and blocked by the lifter equipment
- The ergonomic review and analysis identified that the impeded access would create an ergonomic risk as it would not be possible for a collector to maintain proper posture while manually loading the kraft paper bags into the hopper.

These findings indicate that operationally it would not be efficient to collect with a fully automated side loading vehicle and an additional vehicle would be required to collect yard waste set out in kraft bags or an open rigid container.

Task 3: Resident Feedback

Residents were mailed a survey to solicit their feedback on their preference of the City-issued bin over other collection containers and on the degree to which the City-issued standardized bins met their yard waste capacity needs. In total the City received 369 responses representing a 38 per cent response rate.

Findings from Task 3 are as follows:

Question	Responses
Did you use the City-issued bin?	Combined weighted average of 95 per cent indicated yes
Did you like the City-issued bin over kraft paper bags or other containers?	Combined weighted average of 87 per cent indicated yes <ul style="list-style-type: none">• 80 per cent in District 3 with medium bin indicated yes• 95 percent in District 4 with large bin indicated yes
During peak yard waste season, did you require additional capacity than what was provided by the City-issued bin?	Combined weighted average of 79 per cent indicated yes <ul style="list-style-type: none">• 93 per cent in District 3 with medium bin indicated yes• 64 per cent in District 4 with large bin indicated yes
During off-peak yard waste season, did you require additional capacity than what was provided by the City-issued bin?	Combined weighted average of 29 per cent indicated yes <ul style="list-style-type: none">• 39 per cent in District 3 with medium bin indicated yes• 18 per cent in District 4 with large bin indicated yes

Pilot participants also provided general comments and noted that use of City-issued standardized bins for yard waste is a good idea. However, participants also commented that the bin did not meet their capacity needs and they had concerns with bin storage. Overall, Task 3 findings indicate that one rigid open container is insufficient in meeting capacity needs and most households will likely require the use of additional kraft paper bags for yard waste.