

Additional Cost Comparison Information

Purpose

To provide a high-level summary of the factors that influence the cost of solid waste collection for the single family residential sector, and to provide, as much as possible, a comparison of the City of Saskatoon's total costs (collections plus disposal/processing) to those in other municipalities. An additional objective was to present the utility rates paid by single family households in other Canadian municipalities, for both organics and waste (garbage) programs.

Summary

Numerous factors, described throughout, hinder an 'apples-to-apples' comparison of solid waste collection and disposal/processing costs between municipalities. Nevertheless, single family (curbside) collection costs for waste, recycling, and organics are examined. Landfill tipping fees, along with processing costs per tonne for recycling and organics are presented. The findings revealed that total (collection plus disposal/processing) costs are very likely to differ between waste, recycling, and organic material streams. Utility fees for both organics and waste (garbage) are also presented, from other Canadian municipalities. Finally, additional conclusions are included at the end of this document.

Research

Collection Costs

The cost per household to collect waste, recycling, and organics from the curbside of single family homes is influenced by a number of factors. The following is not an exhaustive list, but represents some of the significant factors for consideration:

- **Collection equipment and methodology.** Automated, semi-automated, and manual collection methods exist, each with different capital, operating, and maintenance costs for equipment. This also impacts the crew size required to deliver the service. For single family service, the City of Saskatoon (City) primarily utilizes automated collection trucks (side-loaders), with semi-automated trucks (rear-loaders) utilized in a handful of congested back lanes. Container capital and maintenance costs, if applicable, are also influenced by the type of collection method. By comparison, some municipalities utilize bags instead of carts.
- **Collection location.** Front street and back lane collections are offered by the City. This impacts collection efficiency, and in some cases, the type and size of equipment required to provide service. Increased health and safety incidents and lane maintenance costs are associated with the back lane collection. In select locations, the City provides a higher level of service to mobility challenged residents, whereby carts are relocated from the property by City staff, collected, and then returned to the property. In the City's experience, back lane collections are more costly than front street collections.

- **Collection frequency.** The quantity of collections equipment and personnel, and therefore the costs, are positively correlated with the frequency of collections. Collection costs increase with increasing collection frequencies.
- **Set-out and participation rates.** The set-out rate is the percentage of households that set their cart at the curb for collection on any given collection day. The participation rate is similar to the set-out rate, but measured over a period of time. Lower participation rates, for example, may reduce collection costs by reducing the number of “tips” on a given route over a period of time.
- **Diversion programs.** In the case of waste collections, the availability of curbside recycling and organics programs may reduce the quantity of waste collected on collection day. Lower collection tonnages may reduce collection costs.
- **Location and logistics of drop-off facility.** The closer the drop-off (i.e. unloading) location to the collection location (i.e. the lower the travel distance), the more efficient collection operations become. Landfills, transfer stations, Material Recovery Facilities (MRFs), and Organics processing facilities also have their own unique factors which influence how quickly a truck can unload, and how much time they spend before returning to collection operations.
- **Special services.** Unique service levels may be offered which increase the overall collection costs. The City is aware of other municipalities who provide the collection of additional waste bags at the curb, in addition to automated collection of carts. Other municipalities also offer collection of bulky items. The aforementioned collection of carts directly from personal property is also considered a special service.
- **Economic Variables.** Prices for labour, capital, and fuel are examples. These can vary between municipalities.
- **Other.** Customer service provisions, climate, housing density (urban vs. rural), topography, road characteristics, seasonal waste generation rates (particularly organics), and location of fleet storage and maintenance facilities are additional examples of factors which may affect collection costs.

There are differences in how collection services within each municipality are funded. Property tax, utility fees, or a combination of both may be used to fund these programs. The true, total, cost to deliver collections services for other municipalities is generally not readily available; much less in a format that can be compared to the City of Saskatoon’s services. Relying on information published on municipal websites may be misleading.

The City is a member of the National Solid Waste Benchmarking Initiative (NSWBI), and has access to collection cost data for other Canadian municipalities who are also members. However, due to the aforementioned factors, it is often challenging to make a true ‘apples-to-apples’ comparison of collection costs per single family household across municipalities. With that in mind, Table 1 represents 2016 actual costs to deliver these services. At the time this report was written, the 2017 actual costs had not been compiled by NSWBI.

Municipality	Cost (\$)/household/scheduled service*	
	Waste	Recycling
All municipalities	Average = \$1.68 Median = \$1.70 Stdev = \$0.56	Average = \$1.27 Median = \$1.36 Stdev = \$0.59
Saskatoon	\$1.96	\$1.36

Table 1: 2016 costs to deliver collection services (NSWBI).
(* 6 communities reported data for waste, 5 for recycling.)

Due to the fact that the service levels for organics collection were markedly different, comparable information from NSWBI could not be obtained. Some communities were operating pilot projects wherein only a portion of the City received collections. In addition, yard waste and food waste were either co-mingled, collected independent of one other, or only one stream was collected.

Based on a discussion with another municipality, they revealed that they are experiencing similar curbside collection rates (collected carts/day/truck) with waste and organics. They have also shared that their collection rate for curbside recycling is nearly 1.4 times higher. Again, this information needs to be taken into context based on the information previously presented.

Conversations with a number of municipalities and reviews of forums within the solid waste professional community have revealed the challenges with drawing precise comparisons for collection costs. It is therefore imperative that a municipality carefully evaluates each of the aforementioned factors when analysing collection costs.

Disposal & Processing Costs

Rather than providing a detailed comparison of the cost breakdown for each municipality, the tipping fee can be referenced for the cost paid by customers at landfills. The landfill tipping fee charged to customers is often set based on the following factors:

- Operating costs;
- Capital & closure costs;
- Post closure care costs;
- Replacement costs;
- Subsidies for other programs; and
- Other considerations which may include incentivizing diversion, etc.

At \$105.00/tonne, the City's landfill tipping fee is slightly above the 2018 national average of \$99.85/tonne. It is important to note that some communities apply a variable fee structure based on the size/weight of the load.

The NSWBI reports on the processing cost per tonne for both recycling and organics. 2016 actual processing costs/tonne are listed in Table 2. At the time this report was written, the 2017 actual costs had not been compiled by NSWBI.

Cost (\$)/tonne*	
Recycling	Organics (Composting)
Average = \$139.50	Average = \$58.83
Median = \$139.50	Median = \$61.00
Stdev = \$37.21	Stdev = \$23.41

Table 2: 2016 processing costs (NSWBI).
(* 4 communities reported data for recycling, 6 for organics.)

The fee paid by the City of Saskatoon for recycling processing is not an outlier, and has historically fallen within the range presented in the data from other municipalities. The City's current cost to process organics at the compost depots is at the lower end of the data presented.

A report entitled Organics Program Update was received as information at the August 2018 meeting of the City's Standing Policy Committee on Environment, Utilities and Corporate Services. This report provided extensive background information on "organics program design considerations and an update on the development of organics processing capacity." Without restating the background information within that report, operational costs per tonne for organics processing were cited to range from \$45 to \$150. Note: this was based on information reported to the City in 2014. Many variables influence the cost of organics processing, which include, but are not limited to, processing technology, regulatory requirements, along with volume and type of materials processed.

Single Family Household Utility Fees

In anticipation of the proposed city-wide single family organics program and an expanded waste utility for Saskatoon, preliminary research was performed to determine costs incurred by residents in Canadian municipalities with an organics program and a utility fee model. The information in Table 3 was obtained through civic information sites as well as correspondence with other municipal contacts. Utility fees depend on the following factors:

- Cart Size
- Processing and collection cost factors
- Diversion incentives (Pay-As-You-Throw)

Fee (\$) per Household/Month*		
Organics	Waste (Garbage)	Combined**
Average = \$12.40	Average = \$9.82	Average = \$21.54
Median = \$11.11	Median = \$8.79	Median = \$26.08
Stdev = \$3.28	Stdev = \$3.61	Stdev = \$4.69

Table 3: Single family household utility fees from other Canadian municipalities (2018).
(* 5 communities provided data for organics, 5 for waste, and 8 for 'combined' organics + waste.)
(** Some communities did not separate organics and waste utility fees – only a lump sum was provided.)

For comparison, Table 4 consolidates the cost estimates for the City’s proposed program, presented in this attachment’s main report. Refer to the report for additional details.

Estimated Cost (\$) per Household/Month		
Organics*	Waste (Garbage)*	Combined**
\$7.08-\$10.15	\$6.10-\$7.40	\$15.93-20.35

Table 4: Consolidated cost estimates for the proposed program, per household in the City of Saskatoon, from Table 1 in the main report.

(* Organics and waste costs do not include the \$2.75-2.80/month admin. cost, nor the \$2.00/month recovery park capital cost.)

(** The combined cost does include the \$2.75-2.80/month admin. cost, but does not include the \$2.00/month recovery park capital cost.)

Eighteen municipalities were contacted in total; however, only eight were able to provide data in a comparable format. It is worth noting that some municipalities fund the organics service through property tax; however, the costs obtained in those instances could not be compared to the data here, due to different units of measure or a lack of cost breakdown. In addition, some municipalities who charge for this service through a utility were unable or unwilling to provide the breakdown for the organics service (i.e. their costs included other services).

Request for Information Results

The City conducted a request for information from industry for organics collection and processing. There were 11 responses to the RFI; of that only two provided information on collections. As noted above it is difficult to get accurate comparisons from an RFI as many assumptions would be made on different service levels as there are many different service levels in other communities that the proponents would be basing assumptions on.

The results for organics processing ranged from \$45 per tonne to \$140 per tonne. The costs for collections ranged from approximately \$4 per household to \$6.50 per household. However, it should be noted some of these respondents expected the City to provide the capital funding for facilities, other proponents would not collect from back lanes. Other respondents did not provide any pricing information and others required foot print at the Saskatoon Regional Waste Management Facility. Some respondents required the City to provide and manage carts.

The three largest concerns with making a decision from this data is that (1) it is non-binding, (2) the proponents have requested the information be kept confidential making it non-competitive, and (3) all prices are based on more volume than the City expects to produce in the first year of the organics program resulting in unit prices that are lower in the RFI than would be expected when a binding procurement is released. The Administration recommends using Table 3 and Table 4 of this attachment as a better comparison for residential costs than the RFI responses.

Conclusions

The following conclusions can be derived from this research:

- Collection costs are influenced by numerous factors which may vary from one municipality to another. Accurate comparisons between municipalities, therefore, become very difficult.
- Both the lack of available comparable data, along with the many factors influencing cost, inhibit a concrete conclusion; however, benchmarking data suggests that curbside collection costs for waste are higher than that for recycling.
- Comparable curbside collection costs for organics could not be ascertained from benchmarking data, for reasons described within the document.
- The City's landfill tipping fee (\$105/tonne) is slightly above the 2018 national average of nearly \$100/tonne.
- Benchmarking data from Canadian municipalities revealed that recycling processing costs were nearly \$140/tonne, on average, in 2016. The fee paid by the City of Saskatoon for recycling processing falls within the range presented in the data.
- Organics processing costs were previously reported by Administration to fall between \$45-\$150/tonne (2014 values), depending on a variety of factors including processing technology as well as volume and types of organics processed. The City presently processes organics at the compost depots at the lower end of that range.
- The proposed waste and organics program utility cost (refer to this attachment's main report) for Saskatoon residents falls within the range of data obtained from other municipalities.
- Total (collection plus disposal/processing) costs are very likely to differ between waste, recycling, and organic streams.
- Without significantly more research and modeling, it is not possible to perform an 'apples-to-apples' comparison, between municipalities, of collection and disposal/processing costs for each waste stream (waste, recycling, and organics).

Additional References

- Bohm, R.A., Folz, D.H., Kinnaman, T.C., Podolsky, M.J. 2010. The Costs of Municipal Waste and Recycling Programs. *Resources, Conservation and Recycling* 54: 864-871.
- National Solid Waste Benchmarking Initiative. 2017. Data from 2010-2016. 220pp.
- National Solid Waste Benchmarking Initiative. 2018. Data from 2010-2017, Draft 091818. 208pp.
- Solid Waste Association of North America, Applied Research Foundation. 2008. *The Benchmarking of Residential Solid Waste Collection Services: FY2008 Report*. 47pp.