

## Background and Research on Variable Waste Utility Models

# CONSIDERATIONS FOR A VARIABLE BLACK CART UTILITY: DISCUSSION PAPER

DRAFT 4

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## Introduction

The City of Saskatoon (City) is improving residential curbside waste services with the implementation of an organics program and a utility fee for garbage and organics. The following is a review of waste utility models and practices to inform upcoming decisions about the black cart (garbage) service as it transitions from property tax funding to a variable rate utility.

Variable pricing, which is also known as Pay-As-You-Throw (PAYT), is an incentive-based collection approach whereby customers are charged based on the amount of waste discarded. Generally, customers pay more if they dispose of more garbage, and vice versa. The terms PAYT, variable cart and volume based are use interchangeably in this discussion paper. Administration has conducted thorough research on funding models and rates for waste services and this document summarizes the findings of this work and previous research completed with the Unified Waste Utility Project. This paper aims to build on the PAYT research and recommendations provided to City Council in 2018.

## Background

In [October 2018](#), to help resolve an ongoing operational funding short fall for waste services and improve waste diversion rates, Administration recommended expanding the waste utility to include variable garbage cart sizes and pricing. Residents would have a choice of cart sizes (e.g. 180 L, 240 L & 360 L) for year-round pick up which would then be charged monthly on their City of Saskatoon utility bill. Rates would be based on the size of garbage cart to give the resident control of their costs and provide an incentive for reducing or diverting more waste from the landfill. In December 2018, council voted to reverse the earlier decision to implement an integrated waste utility model and opted to maintain a property tax funding approach.

In [March 2019](#), City Council decided to phase-in the costs of the new organics collection program by dedicating an almost one percentage point property tax increase over the next four years. These preliminary increases were revised during the 2020/2021 budget process, equalling 0.87% and 0.8% of one percentage point of the property tax in 2022 and 2023 respectively.

At its June 21, 2021 meeting, the Governance and Priorities Committee resolved: That the Administration Report back as soon as possible regarding the implications for the funding and operations of waste programs, including the organics program, if funding for the organics program moved to a utility model.

In [October 2021](#), while facing substantial property tax increase and budget pressures due to the pandemic City Council approved “That the City of Saskatoon proceed with Option 2: A fixed monthly rate for the curbside organics utility with a January 2023 implementation, and a variable rate for black cart garbage utility with implementation in 2024, as outlined in the report of the General Manager, Utilities and Environment Division dated October 18, 2021”.

## Principles

To identify program options, the Administration conducted best practice research and previous public engagement. To assess options and develop a recommendation the four principles that make up the Triple Bottom Line were used with specific indicators identified relevant to this work:

1. Social Equity and Cultural Wellbeing
  - a. Equity and opportunity
  - b. Self sufficiency and living with dignity
2. Environmental Health and Integrity
  - a. Waste reduction and diversion
3. Economic Prosperity and Fiscal Responsibility
  - a. Financial accountability and transparency
  - b. Ease of implementation – reduce operational costs
  - c. Affordability for users – economic efficiency
  - d. Fairness – those who use a service pay
4. Good governance
  - a. Transparency
  - b. Engagement
  - c. Best Practice

## Waste Services

In 2021, garbage collection services were provided to approximately 73,000 single-family households; an estimated 52,600 tonnes of residential garbage were collected and there were more than 2.6 million scheduled black cart lifts (tips). Scheduled garbage collection occurred from Monday to Friday, including public holidays, except December 25 and January 1. In 2021, these collections were completed the weekends following December 25 and January 1. Weekly collections were provided from May to September, with the remainder of the year on a bi-weekly (i.e. every second week) collection schedule<sup>1</sup>.

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<sup>1</sup> [2021 Integrated Waste Management Report \(May 2022\)](#)

## Public Engagement

“Saskatoon Talks Trash: Curbside” engagement campaign ran from February 12 - March 6, 2018. In that time, over 5,000 residents participated in a variety of engagement activities. In the online survey<sup>2</sup>, supportive residents were interested in PAYT for three main reasons: the diversion incentive, opportunity for individual cost control, and higher standard of accountability for all residents. When asked about areas of improvement for the current curbside program, 176 respondents expressed interest in smaller cart options or a choice of sizes. 159 commenters specifically mentioned that they wanted to see a PAYT approach. Additional information is found in Attachment 1.

The 2021 Waste and Recycling Survey<sup>3</sup> included more than 1,000 residents and reported findings that 86% of respondents are satisfied with the frequency and capacity of the garbage collection program. Nonetheless, results suggest residents generated more waste in 2021, and more than half (52%) fill or overflow their carts when garbage collection is every second week up from 44 % in 2019 (Figure 1). Additionally, the survey indicates that larger households (3 or more people in the household) and younger respondents (in the 18-24 and 35-55 year old age categories) are more likely to overflow their cart when it’s biweekly as shown in Figure 2 and 3.

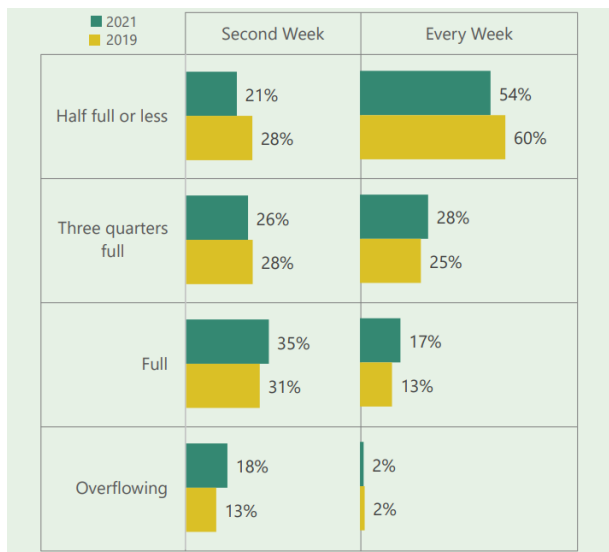


Figure 1: Level of Garbage in the Black Bin on Garbage Day

<sup>2</sup> [Saskatoon Talks Trash: Curbside Online Survey Summary 2018](#)

<sup>3</sup> [2021 Waste & Recycling Survey](#)

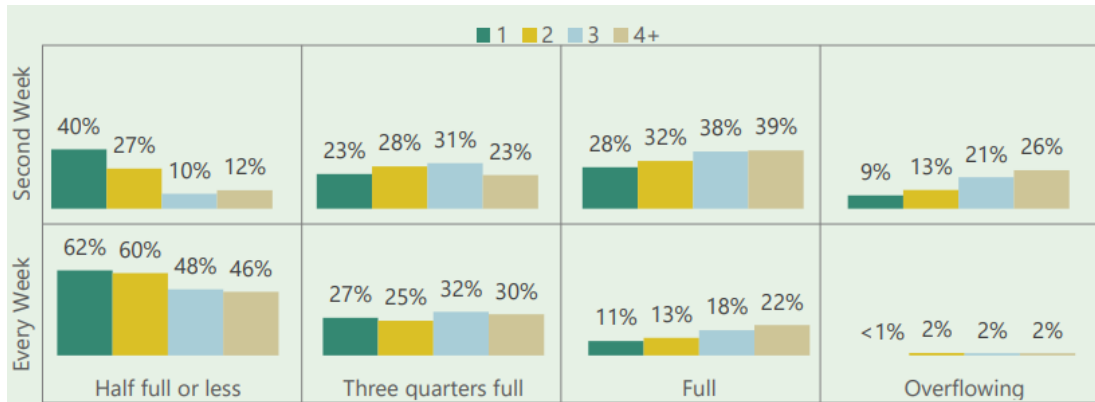


Figure 2: Level of Garbage in Black Bin on Garbage Day by Number of People in Household (2021 Results)

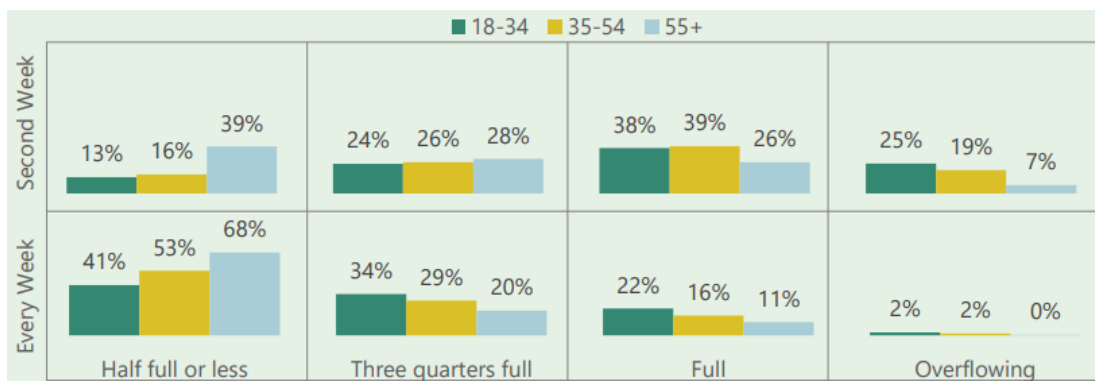


Figure 3: Level of Garbage in Black Bin on Garbage Day by Age (2021 results)

When asked about the funding Curbside Organics approximately 20% prefer property taxes, 20% prefer utility bill while the rest are either not sure or defer to the judgment of the City. Of those who prefer “part of property taxes” funding, approximately half explain that this method is more convenient/easier, part of public services or homeowner’s responsibility. Half of those who chose “Line item on utility bills” funding do so because they can see/track costs with this method.

The 2021 Performance, Priorities and Preferences Civic Survey<sup>4</sup> indicates satisfaction with waste management services (garbage collection, recycling collection and landfill services). All waste management services saw increases compared to 2018. The results were from 500 telephone and 801 online-panel surveys conducted with residents of Saskatoon who were 18 years of age and older.

<sup>4</sup> [Citizen Satisfaction & Performance Survey 2021](#) and [Civic Services Survey: Performance, Priorities and Preferences 2021](#)

## Waste Characterization

The 2019 City of Saskatoon Waste Characterization Study<sup>5</sup> reported curbside garbage samples contained 65% divertible material (57% food waste/yard waste/compostable paper, and 8% recyclable material). Removal of organic waste from the garbage with the introduction of the Curbside Organics Program will decrease the total tonnage of materials in this stream.

The average full container equivalents per set out (i.e. when a cart is set out, how full it is) per week for recycling, garbage, and organics are 0.75, 0.67, and 0.77. Finally, participation rates for recycling, garbage, and organics are 66.92%, 79.10%, and 7.24%, respectively

The overall capture rate for recyclable material was 66%, which includes all materials accepted in the curbside recycling program in the City of Saskatoon at the time of the study. These values can be considered a benchmark as capture rate improvement can be considered one of the improvements with PAYT.

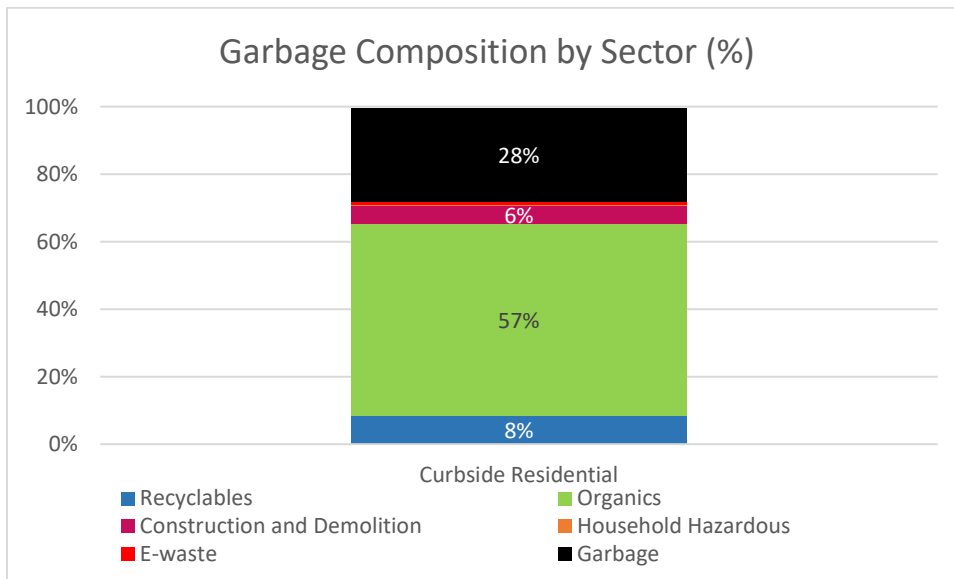


Figure 4: Single Family Residential Garbage Composition

<sup>5</sup> [2019 City of Saskatoon Waste Characterization Study](#)

# Research

## Jurisdiction Scan

Municipalities across Canada have a variety of funding models for garbage and organics collections, through property taxes, utility bills, and fixed and variable rates. There are also many jurisdictions that receive provincial funding for recycling programs through extended producer responsibility (EPR) models. The table below highlights information on funding models for waste collection services. Attachment 2 provides further details into the fees and programs offered for the municipalities listed.

Table 1: Funding Models in Canadian Municipalities

City	Services	Property Tax			Utility Charge				Comments
		Mill Rate per Property Value	Flat Rate Fee	Charges for Extra	Included in Garbage Fee	Flat Rate Fee Per Household	Variable Cart Fee	Charges for Extra	
Vancouver	Garbage						✓	✓	Full cost recovery through the utility billing. Recycle BC provides and pays for recycling collection
	Recycling Organics				✓		✓		
Burnaby	Garbage						✓	✓	Full cost recovery. Recycle BC provides and pays for recycling collection. No charge for organics, included in garbage fees.
	Recycling Organics				✓			✓	
Surrey	Garbage		✓	✓					Flat rate charged through property taxes
	Recycling Organics		✓		✓				
Red Deer	Garbage						✓		Flat rate fee charges based on cart size for waste
	Recycling Organics				✓			✓	
Calgary	Garbage					✓		✓	Fully funded through the utility.
	Recycling Organics					✓		✓	
Edmonton	Garbage						✓		Flat rate fee for garbage, recycling and organics. Variable cart for garbage.
	Recycling Organics				✓				
Lethbridge	Garbage						✓	✓	Single fee for garbage and recycling based on garbage cart size. No organics program currently.
	Recycling Organics				✓			✓	
North Battleford	Garbage					✓			No organics program currently.
	Recycling Organics					✓			
Warman	Garbage					✓			Subscription based seasonal organics program
	Recycling Organics					✓			
Regina	Garbage	✓						✓	Property tax funded garbage, flat rate fee for garbage recycling. No variable pricing. Pilot organics program, full roll-out in 2023.
	Recycling Organics					✓			
Winnipeg	Garbage	✓		✓					Manitoba Product Stewardship Corp funds 80% of residential recycling costs, other funding from landfill tipping fees and recyclable sales.
	Recycling Organics	✓							
Toronto	Garbage						✓		Stewardship Ontario provides partial funding for curbside recycling programs,



	Recycling								remainder funded my municipal property taxes.
	Organics							✓	
<b>Ottawa</b>	Garbage	✓							Stewardship Ontario provides partial funding for curbside recycling programs, remainder funded my municipal property taxes.
	Recycling	✓							
	Organics			✓					
<b>Region of Peel</b>	Garbage	✓							Stewardship Ontario provides partial funding for curbside recycling programs, remainder funded my municipal property taxes.
	Recycling	✓							
	Organics			✓					
<b>Beaconsfield</b>	Garbage	✓				✓	✓		Pay as you throw based on the size and frequency of collection.
	Recycling								
	Organics								

## Literature Review: Economic Incentive Tools and PAYT Principles

Recent reports on public policy and economics in Canada identify per-unit based user fees as a best practice for funding waste services. The Canada Ecofiscal Report: Cutting the Waste (2018), which makes five recommendations for improving waste management in Canada, recommends that municipalities should implement PAYT programs and charge households directly for waste disposal. The report explains, “PAYT programs can generate several benefits:

- First, less waste disposal in response to higher prices can allow municipalities to defer future landfill costs. Savings can be significant in communities that have limited landfill capacity or that ship waste to neighbouring communities.
- Second, PAYT programs can reduce operating collection costs if residents put out less garbage at the curb (though these savings may be offset by higher collection and processing costs for diverted materials).
- Third, the revenues generated from PAYT programs reduce or eliminate the need to cross-subsidize disposal services through property taxes or other revenue sources.
- Finally, at a broader scale, increased waste diversion can create environmental benefits if greater resource recovery leads to decreased use of virgin materials.”

Tassonyi and Kitchen (2021)<sup>6</sup>, in an assessment of fairness of municipal user fee policy, state that per-unit user fees are preferred to taxes on efficiency grounds for both collection and disposal of solid waste because users can be identified and per-unit costs calculated. They add that, “a charge that includes the full marginal social costs of collection and disposal is critical if one is to provide an incentive for discouraging waste and resource overuse.” This idea is similar to the behaviour of turning off a water tap or light switch save resources and, ultimately, money on a utility bill.

<sup>6</sup> [Almos Tassonyi and Harry Kitchen. “Addressing the Fairness of Municipal User Fee Policy” in IMFG Papers on Municipal Finance and Governance No. 54, July 2021.](#)

The implementation of PAYT programs is increasing as communities recognize the impact PAYT can have on diversion. Literature from Ontario’s Continuous Improvement Fund states, “PAYT is considered one of the most effective policies for maximizing diversion of single-family waste as it communicates a clear message to householders that more waste equals more direct expense”. The results of a study of Ontario municipalities over a nine-year period concluded “a significant relationship between user-pay schemes and increased diversion, and also indicate that the policies may be more effective in urban communities than in rural ones.”<sup>7</sup> Skumatz Economic Research Associates, Inc (SERA) research similarly notes PAYT is one of the most effective and cost-effective programs available, resulting in a total reduction of 17 percentage points from the residential generation stream. In the paper by C.D. Howe Institute, experience has show that “when partial or full unit pricing mechanisms are introduced into municipalities, the amount of residential waste to be disposed falls by anywhere from 8 percent to 38 percent, and the amount recycled increases by anywhere from 6 percent in mature systems to as much as 40 percent in newer programs” as outlined in Table 2.

Table 2: Effects of Bag Limits and Unit Pricing on Material Recycled and Waste Disposed in Six Canadian Municipalities<sup>8</sup>

	Change in Amount of Residential Waste Disposed	Change in Amount of Residential Waste Recycled	Base Year Before Bag Limits and Unit Pricing Introduced	Comparison Year After Bag Limits and/or Unit Pricing
	Percent	Percent		
Peterborough, Ontario	-21	+49	1993	2000
Markham, Ontario	-8	+6	1997	2000
Georgina, Ontario	-38	+46	1996	1999
Barrie, Ontario	-16	+22	1996	1999
Orillia, Ontario	-23	+31	1996	1999
St. Albert, Alberta	-38	+51	1995	2000
Peel, Ontario	-4	+12	2002	2003

Source: RIS (2001).

Partial and full user fee models for residential garbage collection are considered successful instruments to encourage waste reduction. Though there is a level of complexity beyond utility models in comparing diversion and unit-pricing in these Cities, including what additional waste diversion and education programs have been implemented. The below figure identifies residential waste diversion rates in Ottawa, Toronto, Halton Region and Metro Vancouver. The arrows indicate the year each municipality implemented user pay/PAYT.

<sup>7</sup> [Christina Chiasson. The price of garbage: an analysis of the effect of user-pay programs on waste diversion in Ontario municipalities \(April 2018\)](#)

<sup>8</sup> [C.D. Howe Institute. Taking Out the Trash: How to Allocate Costs Fairly \(July 2005\)](#)

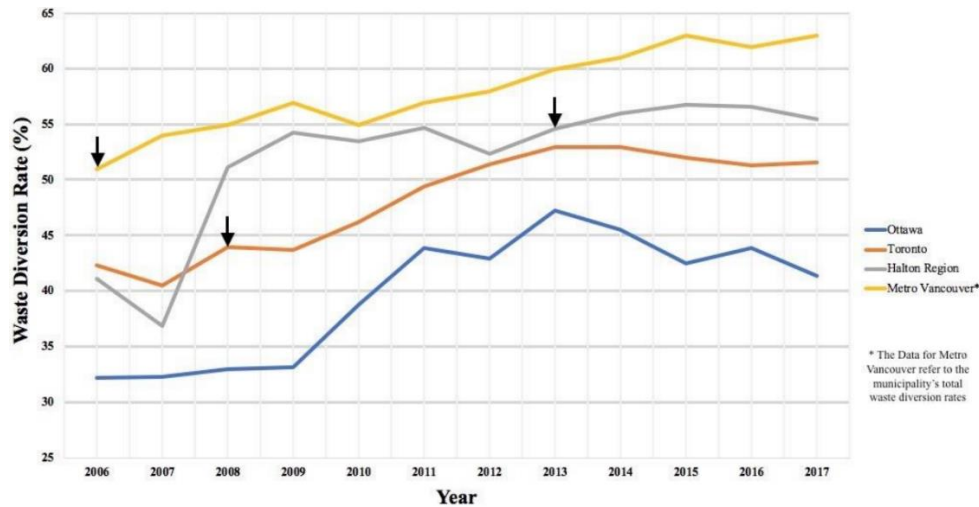
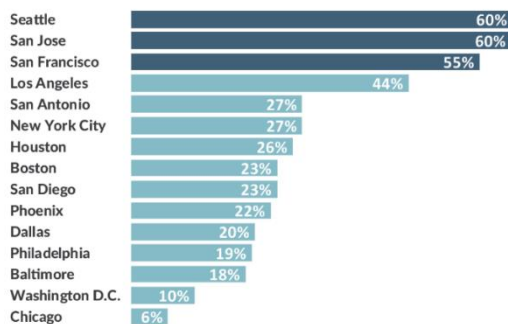


Figure 5: User Pay Systems Influencing Waste Diversion Rates<sup>9</sup>

Volume based residential fees with differential costs help Cities meet diversion goals as well as encouraging lower production of non-recyclable waste. Citizen Budget Commission<sup>10</sup>, in a study of U.S. municipalities with variable charges found average garbage levels fell 17 percent after implementation, with garbage production down 6 percent and the remainder due to increased diversion. Among large and dense U.S. cities, ones with the highest residential diversion rates – San Francisco, San Jose, and Seattle – use a monthly fee structure that varies based on how many carts or bags the household sets out for pick-up. In 2013 the residential diversion rate was 55 percent in San Francisco and 60 percent in San Jose and Seattle; the next highest rate in the review was 44 percent in Los Angeles as shown below.



Notes: Cities with variable monthly garbage fees are shaded dark blue. Diversion rates for New York City, San Francisco, and Baltimore are based on fiscal year 2012 data. New York City's reported diversion rate includes certain construction materials, such as fill, reused by the City. In fiscal year 2013 the City's curbside and containerized diversion rate was 15 percent.

Source: Waste & Recycling News, Municipal Recycling Survey, 2013; City of San Diego Environmental Services Department, "Zero Waste Stakeholders Meeting, Session One" (presentation, July 2014), [www.sandiego.gov/environmental-services/pdf/recycling/ZWpresentation1.pdf](http://www.sandiego.gov/environmental-services/pdf/recycling/ZWpresentation1.pdf); and City of Phoenix, City Manager's Performance Measurement Dashboard, Fiscal Year 2013-2014 (June 2014), [www.phoenix.gov/citymanagersite/Documents/13-14%20Year%20End%20Dashboard.pdf](http://www.phoenix.gov/citymanagersite/Documents/13-14%20Year%20End%20Dashboard.pdf).

Figure 6: Residential Diversion Rates in Selected Large and Dense U.S. Cities 2013

<sup>9</sup> [Waste Watch Ottawa Diverting more Curbside Waste in Ottawa with a User Pay System \(June 2019\)](#)

<sup>10</sup> [Citizen Budget Commission. A Better Way to Pay for Solid Waste Management \(February 2015\)](#)

## Discussion

### Saskatoon Waste Reduction and Diversion Plan

Economic incentives to support reduction and diversion are an important action identified in the Solid Waste Reduction and Diversion Plan for the City of Saskatoon.<sup>11</sup> Over the longer term, user fees and per-unit charges lead to a more efficient, fairly priced and funded residential solid waste management system. The City's shift to a utility funding model for waste establishes a transparent link between waste disposal and the cost of waste services. Providing variable rates, linked to cart size, creates a financial incentive to change waste disposal behaviours.

As shown in the figure below, economic incentives are an important consideration to reach the City's 70% waste diversion target.

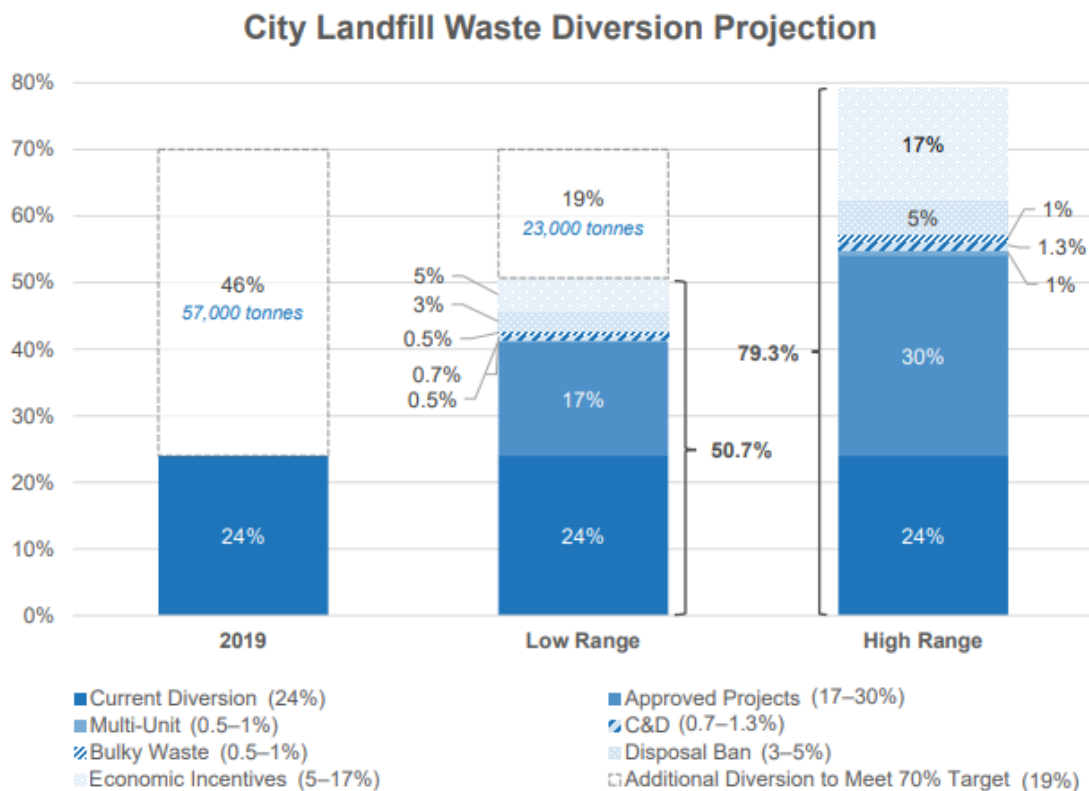


Figure 7: City Landfill Waste Diversion Projection

<sup>11</sup> [Solid Waste Reduction & Diversion Plan for the City of Saskatoon \(January 2021\)](#)

## Saskatoon Studies – Previous Administrative Reporting and SERA

After comprehensive research and public consultation in 2018, Administration developed a recommendation for an expanded solid waste utility in Saskatoon that included variable rates based on cart size for garbage<sup>12</sup>. The findings are documented in the Decision Making Process for Organics Collections, Waste Pay As You Throw Utility, and Recycling Program Report<sup>13</sup>.

In addition to this decision-making process, the City engaged a consultant, SERA<sup>14</sup> to conduct a study which incorporated data from Pay as You Throw programs from over 10,000 communities across North America. SERA's study recommended a minimum price rate differential of 55-60% between small carts and the largest cart would be sufficient to incentivize higher switchover rates, with a differential of 65-70% recommended for Saskatoon to maximize diversion. SERA has also found that dollar differentials lower than \$5 do not seem to affect cart size choices as much as differentials over \$5. Also of note, incentives above 80% rate differential are not expected to result in material additional increases in waste diversion.

SERA recommended the following PAYT System.

- **“Implement a 180/240/360 litre (48/64/96 gallon) cart-based PAYT system.** This system works well with the existing collection system, is easy to bill, avoids the need for large new cart inventories, and has been well-proven in thousands of communities in Canada and the US. The three cart sizes provide options and incentives for households to reduce. Cart-based systems are cheaper than bags. This system is cost-effective and is fundamental to encouraging households to use the new programs and reduce landfilling.
- **Implement a strong policy-based PAYT rate with 65%-75% rate increase for double the service.** Although a few costs are well-allocated to a tax or per-household fee, the vast majority should be allocated to the combined garbage / recycling / organics charge. Separate charges have led people to call and say they don't want / don't use services like organics, and embedded fees allow larger differentials between cart rate, which provide clearer diversion signals to households. This recommendation allows room for the incentive to be increased as diversion rates stagnate in the future.”

When preparing rate options for City Council, Administration will need to balance cost recovery and resident's ability to adjust to/afford additional costs with rates that further encourage diversion. With previous reporting, Administration has recommended that diversion be the focus because the long-term benefits to households outweigh the shorter-term cost savings, while helping to achieve diversion targets sooner<sup>15</sup>. Garbage utility rates will adequately fund the cost of garbage collections and landfilling

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<sup>12</sup> [Pay as You Throw Recommendation 2018](#)

<sup>13</sup> [Decision Making Process for Organics Collections, Waste Pay As You Throw Utility , and Recycling Program \(May 2018\)](#)

<sup>14</sup> [City of Saskatoon: Research and Recommendations on PAYT Subscription Level Shifts, Incentive Design and Organics Program Options \(December 2018, Schumatz Economic Research Associates, Inc.\)](#)

<sup>15</sup> [Unified Waste Utility Rate Setting Philosophy Council Report \(September 2018\)](#)

and any debt repayments for the development and implementation of the utility but should be designed to encourage waste reduction and diversion.

## Waste Behaviors

Set-out data from AMCS Platform indicates that during the winter and garbage collection every second week, 70% of residents set their carts out for collection about half of the time or less with only 30% of the residents reporting using the full collection service. In the summer months and weekly collection, this moves to 40% of residents setting out garbage every time and 60% are using half the amount of service or less indicating the majority of residents are oversubscribed in cart size or service.

When asked on a weekly average how full they fill their cart, in winter months 52% responded they fill their cart all the way (18% said overflowing), in the summer months 17% of respondents identify they fill their cart all the way (2% said overflowing)<sup>16</sup>. Organics makes up 57% of the garbage cart composition for curbside residential. Suggesting that somewhere around 75% of the customers could decrease their garbage cart size or collection frequency especially if they were using recycling and organics services.

## Variable Black Cart Service Level Options

The following service levels were considered in 2018, and a discussion on the fit of each model as part of Saskatoon's curbside waste services is provided below:

- Variable Cart Sizes
- Pay per Tip
- Fixed Rate
- Other Programs (Pay per weight, Bagging)

### Variable Cart Sizes

Variable cart size is a rate-based program where residents pay fees for the garbage services they receive based on the size of their garbage cart. The volume-based rate structure is designed to encourage residents to divert as much as possible away from landfill. Residents with the largest garbage carts pay the most and those with the smallest pay the least. This is the most common variable-pricing design for utilities in Canada where automated waste collection is in place. Examples include Burnaby, Toronto, Vancouver, Lethbridge, and Winnipeg.

Administration has previously recommended<sup>17</sup> introducing variable cart sizes and pricing, paid through a utility model. Residents would have a choice of cart size (e.g. 180 L, 240 L & 360 L) for year round bi-weekly pick up which would be charged monthly on the City of Saskatoon utility bill. This option is feasible to meet the October 2021 Council resolution.

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<sup>16</sup> [2021 Waste & Recycling Survey](#)

<sup>17</sup> [Waste Management Levels of Service – Curbside Organics and Pay as You Throw Waste Utility, SPS on EUCS \(September 2018\)](#)



Two main inputs need to be determined to set the utility rates for garbage. First is the number of carts available for residents to choose from. Second is the cost differential between cart sizes to incentivise diversion. Research suggests with a differential of 65-70% for truly incentivizing waste diversion.

Administration looked at offering two or three cart sizes for customers to select from. A three-cart option allows for the best cost differentials to incentivise waste diversion. The two-cart option works with existing garbage trucks but does not provide a deep incentive to change waste behaviour. A small retrofit to garbage trucks would be required for the three-cart option.

The City will need to purchase additional garbage carts to expand its existing stock. The table below shows estimates from SERA for:

- Subscription level results from the Saskatoon Residential Set Out Survey
- Subscription level results from communities with mandatory organics, including food, with no mini carts, and with PAYT incentives
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*Table 3: Results for Subscription Levels in Saskatoon*

	<i>Saskatoon Survey</i>	<i>Community Group 1A2 (55%)</i>
180 L (48 Gal)	34%	48%
240 L(64 Gal)	40%	14%
360 L (96 Gal)	26%	38%
Transition from 360 L	74%	62%
Households transition*	53,946	45,198

\*Assuming 74,000 curbside customers by 2024

Saskatoon currently uses 360 litre black carts for its residential curbside garbage collection. Basic new carts can run approximately \$75-\$100 CAD and will be a substantial investment for the new utility. Recent procurement of green carts was approximately \$80 per cart including freight. The above table indicates that 62-74% of residents may opt for a smaller cart size for a cost of approximately \$3.9M. A funding source would need to be identified for purchasing carts i.e. a loan charging against the future utility.

Logistics (storage, collection, and delivery) resulting from cart changes will also need to be considered. Cart swap fees can be used to discourage seasonal cart size changes and recover costs. Additional staff resources would be required to administer billing, carts management and cover the costs of communications. It is anticipated that residents would not be charged a fee for selecting a smaller cart size, however to minimize the potential for multiple cart size changes and to keep the administrative and operating costs low, it is recommended that cost recovery be applied to any household requesting a larger waste cart. Cart swap fees can be used to discourage seasonal cart size changes and recover costs.

### Three Variable Cart Options (i.e. 180/240/360 litre)

A three cart size model provides greater selection and incentives for households to reduce waste. Residents would have the choice to right size their garbage cart to fit their household needs which was identified as a benefit in public engagement.

Operationally, this option would require modifications to existing side loader garbage trucks (mechanical pincher arms) to accommodate the smaller cart size. Current side loader garbage trucks have mechanical arms sized for collections for communal commercial customers (1,130 L container) which are on the same route as curbside residential customers (360 L). There are approximately 200 commercial customers using the 1,130 L container. Accommodating a smaller cart size would mean commercial routes would need to be separated from curbside and two or more trucks dedicated to the commercial route. The remainder of the garbage truck's mechanical arms would need to be retrofitted with an after-market mechanical arm to accommodate the smaller cart size. There are approximately 30 side loader garbage trucks in the fleet, 9-10 in operation for garbage in the winter (bi-weekly), 18 in the summer season (weekly collection). Cost for the new mechanical arms, including installation can run at approximately \$4,000 per truck, totalling approximately \$120,000 in retrofits. Cart management logistics, in terms of inventory and staff, will need to be improved with additional cart size options.

### Two Variable Cart Options (i.e. 240/360 litre):

Introducing a single smaller cart size (i.e. 240 L) option to the current cart size (360 L) provides less opportunity to implement rate differentials that incentivise waste diversion. Operationally, a 240L cart would work with existing side loader garbage truck equipment (mechanical pincher arms) as well as potentially decrease the logistical requirements of cart management. Two cart size options would allow some selection by customers but may require further expansion of the program in the future. If the program was modified at a future date to add another cart size, the City would need to modify the billing system and plan for additional procurement and deployment of carts.

### Pay Per Tip

Pay per tip means households are only charged when they put out their garbage cart. This model is not well established (currently operational in two municipalities in North America) and is not technically feasible for billing accuracy with the City's current cart inventory and fleet. Pay per tip is also not currently compatible with the City's utility billing software.

Barriers to a pay per tip approach include operational constraints (much higher RFID verification and audit trail procedures required), and complex routing (inefficiency of trucks that must be designed to collect at every location but may encounter less than 50% of the carts on any given collection day). Reliability in tracking collections, and therefore missed or inaccurate billing, for each household if residents are not diligent about returning their cart to their property on non-collection days (an issue specific to back-lane collections and culd-de-sacs).

The City began utilizing RFID technology in 2014 for inventory management, collection verification and routing. Maintaining an active inventory of carts assigned to service addresses has proven challenging, and currently our cart deployment is estimated as being approximately 70% accurate. Software and



hardware issues, RFID tag reliability, operational procedures, and data management have all been noted as areas of concern. The City's existing cart inventory includes RFID tags, management of the inventory at locations would need to be improved to ensure the correct properties are being tipped. RFIDs would be required for billing purposes and would require a much higher degree of care than current standards. 99.9% confidence in RFID allocation to customer sites would need to be achieved.

There are concerns that back lane or rear lane are also very difficult for RFID programs because there is a high incidence of left out carts and higher incidence of carts being moved from one service address to another. Cul-de-sacs and other clustered collection points also pose challenges accuracy of service locations. Construction activities throughout the summer months also cause carts to be moved from one home to another. This poses a concern in the ability for this information to be used to for accurately billing customers in a per tip model.

In addition, this option would require more complicated billing system than other alternatives. Implementation of this type of would likely not be able to meet our 2024 timelines with the current use of the Customer Information System (CIS) for billing and AMCS Platform for reading cart tips. Billing system requirements for a pay per tip system are more complicated than those required than variable cart options. Configuration and development of an on-demand integration between AMCS Platform and CIS would be required to read tips. However, the rate structure and data requirements would be similar to billing for services like residential water and energy usage.

The accuracy of current RFID inventory, billing accuracy and risk with back lane collection are considerable barriers with the implementation for pay per tip at this time. There is potential with future maturity of the utility program and move to front street collection to implement such a model. As current models stagnate the City can look to additional economic incentive tools to support reduction and diversion.

#### A fixed rate program

Administration also analyzed the introduction of a fixed rate whereby waste management costs are made more visible to residents through their utility bill, and revenues are more stable and predictable. Fixed rate programs provide a transparent funding model for solid waste services. The largest deterrent to implement a fixed rate system is in regard to diversion potential, it has no additional incentive for waste diversion in comparison with other options. This option is advantageous in its simplicity for current operations and residents. It would still be considered as an improvement from a program that uses the property tax funding for overall transparency and fairness.

In this alternative, the City simply transitions the current cost of service from a resident's tax bill to their utility bill. Residents' would pay a monthly service fee based on biweekly service during the year using their existing (360 litre) cart.

Alternative variable PAYT options (i.e. variable schedule, variable tips, hybrid)

Administration studied the implications of introducing pricing variability based on:

- Maintaining an established garbage collection schedule and allowing residents to choose when to place their cart out, charging only for the tips made.
- Allowing residents to choose their collection frequency annually, and developing garbage collection schedules based on these choices.
- Hybrid combinations including variable cart sizes and variable collection frequencies.

Barriers to the variable schedule approach include a number of complications regarding schedule (verifying collection days), operational constraints (complicated routing) and the complexity involved for residents (who may not be able to predict their future waste collection needs especially with the transition to a new waste stream). There are significant bylaw enforcement and fraud (free tips) risks. A second service employee in the truck (navigator) may be needed to address compliance and help with changing routes (as residents change their frequency selections).

Pay per weight alternatives would charge residents on the amount of waste that was found within their container during their biweekly tip of a 360 litre cart. Administration has not recommend pursuing a strategy of weight-based measurement as it is not in compliance with federal Weights and Measures Regulations.

Bagging options could look at bag-tag programs used for additional waste capacity similar to other municipalities (Calgary, Toronto). Bags in carts are difficult to enforce, cost more to residents, and are difficult administratively. Introducing a bag program makes extra work for the city<sup>18</sup>. As collections are already automated, it would be anticipated there would be significant operational impacts. This option would re-introduce manual collection, a practice abandoned in Saskatoon in the mid-1980's to reduce the potential for worker injuries and lost staff time. Collection staff would likely require an additional staff to navigate the routes and leave the truck to move the bags into the cart before tipping into the hopper. Bagging also requires rear loader trucks to collect bags; depending on the scale of bag collection, it would range from additional vehicles to replacement of existing collections fleet. Typically, Administration hasn't reviewed these options due to the higher safety concerns and union implications associated with leaving the vehicle. In addition, this type of program can add confusion with the introduction to service levels of the organics programs.

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<sup>18</sup> Bag programs are more “responsive” for a week-to-week incentive to reduce and divert waste. Operationally and on a payback basis, they are expensive.

## Attachment 1

### Engagement Data

The “Saskatoon Talks Trash: Curbside” engagement campaign ran from February 12 - March 6, 2018. In that time, over 5,000 residents participated in a variety of engagement activities. Engagement results informed the program recommendations brought forward in the Changes to Waste Management in Saskatoon report<sup>19</sup>. Support for the pay-as-you-throw (PAYT) waste utility was mixed, with many concerns identified. Many other themes were identified through engagement, which can inform both the design and implementation of future programs, services, and changes.

The report found: “A small majority (approximately 60%) of residents who participated in engagement activities demonstrated support for a PAYT approach. A vocal minority (about 30%) expressed strong opposition, while a third group were uncertain or had further questions.”

Supportive residents were interested in PAYT for three main reasons: the diversion incentive, opportunity for individual cost control, and higher standard of accountability for all residents. Many participants expressed interest in choosing their cart size. Residents (both supportive and opposed) were very concerned about the potential for PAYT to cause illegal dumping in their carts and in the alleys, ditches, and surrounding areas. The second highest concern was that a utility would be “double-dipping” or a “tax grab”, on top of property taxes. Other frequently cited concerns included: affordability, fairness (larger families, medical waste, secondary suites, and tenants), variable waste volumes, contamination risk, and preference for waste to remain on the mill rate.

A large number of residents expressed a preference for moving to bi-weekly garbage collection all year, once the organics program is introduced.”

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<sup>19</sup> [Changes to Waste Management in Saskatoon - Engagement Results Council Report \(June 2018\)](#)

## Attachment 2

### Utility Charges for Waste Services in Canadian Municipalities in 2022

Table 4: Canadian cities with waste utility programs demographics

City	Province	Population <sup>20</sup>
Vancouver	British Columbia	662,248
Burnaby	British Columbia	249,125
Surrey	British Columbia	568,322
Red Deer	Alberta	100,844
Calgary	Alberta	1,481,806
Edmonton	Alberta	1,010,899
Lethbridge	Alberta	98,406
North Battleford	Saskatchewan	19,375
Warman	Saskatchewan	12,419
Saskatoon	Saskatchewan	317,480
Regina	Saskatchewan	249,217
Winnipeg	Manitoba	834,678
Toronto	Ontario	6,202,225
Ottawa	Ontario	1,017,449
Beaconsfield	Quebec	19,277

#### Vancouver, BC

Garbage and organic fees together range from \$20.75 to \$37.08 with no charge for recycling (Recycle BC provides and pays for recycling collection). Fees are based on the size of a customer's garbage cart. Green cart collection for food and yard waste has an additional charge which is also based on the size of the cart.

Monthly Utility Fees	X-Small (75L)	Small (120L)	Medium (180L)	Large (240L)	Extra-large (360L)
Garbage (biweekly)	\$8.33	\$9.58	\$11.17	\$12.83	\$16.08
Organics (weekly)	NA	\$12.42	\$14.50	\$16.67	\$21.00

<https://vancouver.ca/home-property-development/garbage-bins-and-green-bins.aspx>

<https://vancouver.ca/home-property-development/flat-rates.aspx>

<sup>20</sup> Statistics Canada 2021. Census Profile 2021 Census.

## Burnaby, BC

Operates under a mix of utility and tax funding. Solid Waste revenues accounted for 35% of expenses in 2020. Garbage fees together range from \$3.75 to \$32.92 with no charge for recycling (Recycle BC provides and pays for recycling collection). Fees are based on the size of a customer's garbage cart. Green cart collection for food and yard waste is provided at no extra charge.

Monthly Utility Fees	120L	180L	240L	360L
Garbage (biweekly)	\$3.75	\$9.17	\$11.67	\$32.92

<https://www.burnaby.ca/services-and-payments/utility-fees-and-charges/residential-utility-fees>

## Surrey, BC

An annual Waste Management Fee of \$315.90/year (\$26.33/month) is a flat rate charged through property taxes for a standard level of service which includes biweekly garbage, biweekly recycling, and weekly organics. Customers can request extra carts or upgrade to a 360L cart for additional fees.

	Base Fee (included in Property Taxes)	Additional Cart (120L)	Additional Waste (180L/240L)	Additional Waste (360L)	Replacement (upgrade) to a 360L cart
Monthly Fee	\$26.33	\$13.12	\$26.33	\$39.45	\$13.12

<https://www.surrey.ca/services-payments/utility-billing-services/understanding-utility-rates-calculations>

<https://www.surrey.ca/services-payments/waste-collection/collection-carts-bags-stickers>

## Red Deer, AB

Waste fees range from \$19.00 to \$23.05 per month, charged to each single-family household for weekly garbage, recycling, and organics (including both food and yard waste) collection. The amount charged is determined by the size of black cart. Residents may request a different blue or black cart size with a \$50.25 cart exchange fee charged when residents request a cart size change. Residents are allowed up to 3-100L bags of garbage, additional bags are \$1.00 each. Residents can request a second blue box for recycling at no charge and unlimited bags of yard waste.

Monthly Utility Fees	Small (120L)	Medium (240L)	Large (360L)
Garbage (weekly)	\$19.00	\$23.05	\$29.10

<http://www.reddeer.ca/city-services/utility-billing-service-centre/customer-care/understanding-utility-rates/>

## Calgary, AB

The total monthly utility charge for garbage, recycling, and organics collection is \$24.30 for garbage, organics and recycling. City of Calgary had a phase plan to transition to the utility, the property tax subsidy is removed from these fees. Flat fees are charged for weekly organics collection (\$8.65/month per household); biweekly recycling (\$8.80/month per household) and waste collections (\$6.85/month). Food waste, yard waste, and pet waste is accepted in green carts. Bag tags are available for extra garbage.

<https://www.calgary.ca/waste/residential/rates.html>

## Edmonton, AB

The City of Edmonton charges a combined utility fee per household for garbage, organics and recycling collection based on the size of the garbage cart. Single-unit homes are provided with a garbage cart, and an organics cart (food scraps). Yard waste is collected twice in Spring and twice in Fall in clear or double-ply bags. Recycling is collected in blue bags all year round on a weekly basis. A second or any subsequent cart size exchanges by an account holder for the same service address is subject to an \$18.50 service charge. In 2021, Edmonton rolled out organics and garbage carts to over 250,000 single unit homes as part of the transition to automated cart-based collection and implementation of an organics program.

Monthly Utility Fees	Small (120L)	Large (240L)	Excess (360L)	Communal
Garbage and Organics (bi-weekly garbage, weekly summer organics)	\$43.32	\$48.32	\$58.32	\$30.69

[https://www.edmonton.ca/programs\\_services/garbage\\_waste/rates-fees.aspx](https://www.edmonton.ca/programs_services/garbage_waste/rates-fees.aspx)

<https://pub-edmonton.escribemeetings.com/filestream.ashx?DocumentId=126828>

## Lethbridge, AB

Residents pay a variable fee of \$10.23 or \$11.94 depending on the size of their garbage cart; the fee covers the cost of garbage cart. Standard monthly Waste & Recycling Services bill is broken down into four components: Cart (Collection) Fee, Recycling Fee, Landfill Fee, Waste Program Fee. Recycling is a fee of \$9.00 per month. Lethbridge is piloting a curbside organics program with Spring 2023 implementation. The cost of a replacement cart is \$100.00.

Monthly Utility Fees	Reduced Size (240L)	Standard Size (360L)	Additional Cart	Waste Reduction Fee	Landfill Fee
Garbage (weekly garbage)	\$10.23	\$11.94	\$8.75	\$3.60	\$1.52

<http://www.lethbridge.ca/living-here/Waste-Recycling/Pages/Waste-Collection-Rates.aspx>

## North Battleford, SK

A \$10.00/month per household flat fee is charged for biweekly garbage collection, and \$6.60 for biweekly recycling collection. There are no collections for organics. Each household receives one 360 L garbage cart, and one 360 L recycling cart.

[https://www.cityofnb.ca/mrws/filedriver/Monthly\\_Bill\\_Final.pdf](https://www.cityofnb.ca/mrws/filedriver/Monthly_Bill_Final.pdf)

## Warman, SK

The City of Warman offers curbside garbage and recycling collection at a monthly cost of \$14.55. The City also offers an optional subscription program for curbside organics service provided by Loraas Organics. The program runs from May 1<sup>st</sup> through October 31<sup>st</sup>. A \$10.00/month (\$60.00 annually) per unit flat fee is charged for organics collection. Charges will be applied to the City of Warman Utility bill.

<https://www.warman.ca/526/Curbside-Organics>

## Regina, SK

Garbage is charged through property taxes and recycling is funded through a flat utility fee of \$7.75/month per household. Recyclables are collected bi-weekly in a 360L cart. Garbage is collected weekly in a 240L or 360L cart size (no variable pricing).

With the continuation of biweekly garbage collection, residents who require an additional garbage cart may request one from the City and pay an annual fee for the additional cart which will be billed on their utility bill. The annual fee will be either: \$156.95/year for a 360L cart or \$116.80/year for a 240L cart. The City of Regina is exploring a variable rate model for garbage.

Monthly Utility Fees	Additional Cart (240L)	Additional Cart (360L)
Garbage ((bi-weekly winter, weekly summer)	\$9.60	\$11.00

<https://www.regina.ca/home-property/water/utility-account/rates/index.html>



## Winnipeg, MB

The majority of waste collection, recycling, and yard waste collection is funded through property taxes. Customers pay an additional waste diversion fee of \$67.31/year for new waste diversion programs. Standard cart size of 240L is available to single-family households. They can upgrade to a larger, or additional cart, for an additional fee. A cart delivery fee of \$25.00 is applied or resident can pick up the cart at no additional cost.

	<b>Additional Cart (240L)</b>	<b>Additional Cart (360L)</b>	<b>Replacement (upgrade) (360L cart)</b>
<b>Monthly Fee</b>	\$8.75	\$11.00	\$3.25

<https://myutility.winnipeg.ca/UtilityPortal/UtilityBilling/rates>

## Ottawa

Residential garbage collection costs are recovered through a flat-fee set annually based on a full cost recovery model. The rate for curbside collection services is \$118 per residential household per year (\$9.83 per month). The City of Ottawa is currently reviewing its waste costs and potential to move to a PAYT program due to increasing landfill life concerns.

<https://ottawa.ca/en/garbage-and-recycling/garbage>

## Toronto, ON

Utility fees are based on the size of a customer's garbage cart. Services include collection of garbage, recycling, food and yard waste, and household hazardous waste. For a number of years, many Solid Waste Management Services single-family ratepayers received a rebate or credit on each utility bill, funded from the property tax base. In 2019, Council approved a three year plan to phase out the rest of the single-family garbage cart rebates. Customers can also purchase extra bag tags for \$5.11/bag.

<b>Monthly Utility Fees</b>	<b>Small (69L)</b>	<b>Medium (132L)</b>	<b>Large (246L)</b>	<b>Extra-large (360L)</b>
Garbage, Recycling, Organics	\$23.20	\$28.16	\$38.24	\$44.36

<https://www.toronto.ca/services-payments/recycling-organics-garbage/houses/garbage-bin-sizes-fees/>

## Beaconsfield, QB

The smart collection is based on pay as you throw principles and is established according to the size and frequency of collection.

The fixed tariff covers the overall fixed cost of all collection services for waste and recyclable materials. This tariff includes the cost of one garbage cart collection per month (12). It is established based on the size of cart chosen. The variable tariff is calculated based on the number of additional garbage cart collections made during the year.



The cost of each collection is established based on the size of cart chosen. The weight of the cart is not applicable.

<b>Single-Family</b>	<b>Small (120L)</b>	<b>Medium (240L)</b>	<b>Large (360L)</b>
Annual Fixed Portion	\$150	\$155	\$160
Variable Portion (\$/bin pick-up)	\$0.40	\$0.80	\$1.20

<https://www.beaconsfield.ca/en/environmental/80-composting-recycling-and-waste/989-waste-reduction>

<https://www.beaconsfield.ca/en/incentive-tariff-approach-1>