

**Utilities & Environmental Protection Report to  
SPC on Utilities and Corporate Services  
2019 March 20**

**ISC: UNRESTRICTED  
UCS2019-0364**

**Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

**EXECUTIVE SUMMARY**

On 2018 June 13, Waste & Recycling Services (WRS) recommended a Pay-As-You-Throw (PAYT) program with three black cart sizes and tag-a-bag. Based on this recommendation, The Standing Policy Committee on Utilities and Corporate Services (SPC on UCS) directed WRS to return with a financial model for the recommended PAYT program, including an option for tag-a-bag only. This report details findings from the financial model analysis of the recommended options.

PAYT is a solid waste management program that provides residents with the ability to pay according to the amount of waste put out for collection. Typical PAYT programs include a choice of cart size and a requirement to pay for excess waste set outside the filled cart. Excess waste is typically identified for collection using tags or stickers and is commonly referred to as “tag-a-bag”.

PAYT can improve program fairness and provide customers with choice for cart size and service level. It introduces a financial incentive to fully use waste diversion programs and reduce the amount of garbage put out for collection, which can also result in more efficient programs. PAYT may also require more investments, increasing the overall cost of the program, and create a more complex program for customers. Increased contamination of diversion programs as a result of customers focusing on reducing garbage is also a risk.

WRS developed a financial model to evaluate the costs of two PAYT program options for residential garbage:

1. Maintaining the current black cart program with the addition of tag-a-bag for excess garbage outside the black cart; and
2. Providing three black cart sizes plus the addition of tag-a-bag.

The analysis of the financial model estimated that introducing a tag-a-bag program will cost approximately \$300,000 in the first year and \$200,000 annually in subsequent years. This includes the cost of collecting and disposing of the excess garbage, which is currently embedded in the Black Cart Program charge. Based on the financial model, these costs should be recovered through the sale of tag-a-bag stickers.

For the option with three cart sizes and tag-a-bag, the costs are approximately \$11 million to \$13.5 million in the first year, which includes the capital to purchase additional cart sizes. Annual costs for subsequent years will range from \$1.5 million to \$2.5 million. The analysis also indicated that introducing any new cart sizes will result in increased program costs, including cart purchase, storage and delivery costs, and billing system changes. These costs would eventually have to be recovered through black cart charges and cart exchange fees.

WRS has estimated the revised charges for the 2020 black cart program through the financial model. If tag-a-bag is introduced, both PAYT program options would result in a \$0.10 reduction in the monthly household charge for the standard sized cart. The reduction in charge is possible due to costs associated with collecting excess garbage outside of carts, which would be funded by the tag-a-bag program.

In addition to variable carts as an option for PAYT, WRS also considered the option of using Radio Frequency Identification (RFID) technology. The use of RFID technology to track how often residents put out their cart for collection is emerging as another option for a PAYT program. WRS will develop a plan to pilot the use of RFID technology for a PAYT program.

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#### **ADMINISTRATION RECOMMENDATION:**

That the Standing Policy Committee on Utilities & Corporate Services recommend that Council direct Administration to:

1. Implement a tag-a-bag program for residential garbage collected outside of the black cart starting no later than Q2 2020, with a price of \$3.00 per tag in 2020;
2. Bring bylaw amendments, if required, as part of the budget adjustment process in November 2019 to update the Black Cart Program charge in 2020 to adjust for excess garbage costs being recovered through tag-a-bag revenue; and
3. Develop a plan for piloting RFID technology for PAYT and report back to SPC on UCS no later than Q4 2019.

#### **RECOMMENDATION OF THE SPC ON UTILITIES AND CORPORATE SERVICES, DATED 2019 MARCH 20:**

That the Administration Recommendations contained in Report UCS2019-0364 be adopted.

#### Oppositions to Recommendations 1 and 2:

Against: Councillor Farkas and Councillor Magliocca

#### **PREVIOUS COUNCIL DIRECTION / POLICY**

On 2018 June 13, the SPC on UCS received the Pay-As-You-Throw Program for Residential Black Cart Collection report (UCS2018-0656). Administration recommended a PAYT program with three black cart sizes and tag-a-bag. SPC on UCS referred the report back to Administration to return with a financial model for the recommended PAYT program, including an option for tag-a-bag only.

On 2018 May 28, Council approved the Waste & Recycling Services Outlook for 2018 to 2025 (UCS2018-0153). A key trend identified in this report was increasing customer expectations. One of the initiatives identified to respond to this trend was providing options for residential customers through a variable pricing program. The use of pricing tools to incentivize diversion was also identified as a step towards our target of 70 per cent waste diversion by 2025.

#### **BACKGROUND**

PAYT is a program where residents pay according to the amount of waste they put out. Typical PAYT programs include a choice of cart size, and a requirement to pay for excess waste set out for collection. The excess garbage bags set out for collection are identified using tags or stickers, which is commonly referred to as a “tag-a-bag” program. PAYT programs can improve fairness, provide customers with choice for cart size, and introduce a financial incentive to fully use waste diversion programs and reduce the amount of garbage put out for collection. PAYT programs can improve collection efficiency when the price is set high enough to encourage residents to reduce the amount of excess garbage they place outside of the cart. PAYT may also require more investments, increasing the overall cost of the program, and create a more complex program for

### **Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

customers. Increased contamination of diversion programs as a result of customers focusing on reducing garbage is also a risk.

With the rollout of the Green Cart Program for residential composting in 2017, Calgary implemented a full suite of residential diversion programs, enabling Calgary households to minimize the amount of garbage they put out for collection and disposal. All households currently pay the same monthly Black Cart Program charge regardless of the amount of garbage they produce. Approximately four per cent of households set out excess garbage and the cost of this service is currently paid for by all households with black cart collection. Introducing PAYT would improve fairness in the Black Cart Program.

### **INVESTIGATION: ALTERNATIVES AND ANALYSIS**

#### ***Financial model***

WRS reviewed several options for PAYT programs, and assessed two options with a detailed financial model: a tag-a-bag program; and a program with three black cart sizes and tag-a-bag (Attachment 1).

This analysis found that introducing a tag-a-bag program will cost approximately \$300,000 in the first year and \$200,000 annually in subsequent years. The tag-a-bag program costs include:

- customer education and communication
- printing tags or stickers
- managing a distribution network

Based on the financial model estimates, the tag-a-bag program costs are anticipated to be recovered through the sale of tags and it is recommended that this be reflected in a reduction of the monthly black cart charges by \$0.10 in 2020. The reduction in charge would be possible due to costs associated with collecting excess garbage outside of carts, which would be funded by the tag-a-bag program.

For the option with three cart sizes (120 L, 240 L and 360 L), where smaller (120 L) and larger (360 L) cart size options are provided in addition to the tag-a-bag program, the costs are approximately \$11 million to \$13.5 million in the first year. Approximately \$10 million of the cost in the first year is the capital required to purchase additional cart sizes. In subsequent years, approximately \$1.5 million to \$2.5 million will be required annually for ongoing tag-a-bag program costs, cart replacement and exchanges, and for managing increased blue cart contamination.

One of the risks identified is that households may choose the smaller black cart option based on cost even if it is not the right size for their household, resulting in additional contamination, cart exchanges and an increase in program costs. To manage this risk, a small financial incentive or no financial incentive will be provided at the onset of the program, so that customers who select a smaller cart size do so based on the size that is appropriate for their needs. After the program is fully established, a larger financial incentive can be provided to customers with smaller carts.

The estimated residential charges for a PAYT program in 2020 are shown in Table 1. Ranges for the small and large cart charges depend on the proportion of households that switch to different cart sizes, which would be examined in more detail prior to program rollout. The charges will also depend on the pricing strategies used to encourage households to choose the appropriate cart size for their needs while promoting waste reduction, and the use of cart exchange fees. It is

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UCS2019-0364**

**Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

recommended that the charge for the standard black cart be reduced by \$0.10 in 2020, to reflect the costs associated with managing excess garbage being funded from the tag-a-bag program. There will be pressure on the rates for all cart sizes in future years to recover the costs of introducing new cart sizes.

Small	Standard	Large	Tag-a-Bag
\$6.00 - \$6.85	\$6.85*	\$10.00 - \$13.00	\$3.00 per bag

**Table 1: 2020 Estimated Monthly Household Charges for Three Cart Sizes and Tag-a-Bag**

*\*The current Council approved charge for Black Cart Program in 2020 is \$6.95.*

Both PAYT options would support waste diversion, and improve the transparency and fairness of charges for garbage collection and disposal. The tag-a-bag program on its own is the lower cost option. It is also likely to achieve greater collection efficiency, since households are less likely to put out excess garbage due to costs associated with the service. In instances where households regularly put out excess garbage, WRS would work with them to determine if an additional cart is required.

The benefit to the three black cart sizes and tag-a-bag option is that customers could choose the black cart size that best meets their needs. Offering a choice of additional cart sizes will require managing a large inventory of standard carts, as it is anticipated that over 100,000 standard carts would be returned. Current black carts in circulation still have roughly 10 years of useful life remaining. If these carts are returned for a different cart size, additional costs will be incurred to store the returned carts. These carts would ideally be reused, but may reach the end of their useful life while in storage. Introducing new cart sizes when the existing carts are reaching the end of their useful life could significantly reduce associated costs.

Cities that introduce multiple cart-sizes at the same time as automated collection can offset some of the capital costs for carts with efficiency savings that are realized through automated collection. Calgary has already achieved program savings due to automation, and these savings are reflected in the current black cart program charges.

***RFID technology for PAYT***

The use of radio-frequency identification (RFID) technology to track how often residents put out their cart for collection is emerging as another option for a PAYT program. The RFID chips currently in Calgary's black carts could be used to track how often a cart is emptied. With this technology, there is the potential to have monthly billing based on how often the customer puts their black cart out for collection. This is referred to as variable set-out.

Variable set-out programs are rare in North America, but as RFID technology becomes more commonly used to track carts and customer program usage, it may be used more frequently for billing. This option was not included in the financial model, as additional investigation is needed to test the accuracy of the technology and required data transfer systems. Once the accuracy of the system has been established, further work is required to develop cost estimates to rollout and sustain this program. However, since RFID chips are embedded in Calgary's existing inventory of black carts, it may be a more affordable PAYT program for Calgary than variable cart sizes. Information on RFID technology and PAYT programs is provided in Attachment 2.

## **Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

### **Stakeholder Engagement, Research and Communication**

Customer engagement taking place in 2019 will include engagement on the topic of PAYT programs. If a PAYT program is introduced, Calgarians will require access to information about their options and responsibilities under the new program, and a communication campaign will be required to communicate the changes.

### **Strategic Alignment**

Implementing a PAYT program can provide customers with a financial incentive to reduce the amount of garbage they produce. This is accomplished by aligning the charges residents pay for garbage collection and disposal with the amount of garbage they produce, which contributes to a Healthy and Green City as well as a Well-Run City.

- Calgary is a leader in caring about the health of the environment and promotes resilient neighbourhoods where residents connect with one another and can live active, healthy lifestyles.
- Calgary has a modern and efficient municipal government that is focused on resilience and continuous improvement to make life better every day for Calgarians by learning from citizens, partners, and others.

### **Social, Environmental, Economic (External)**

#### *Social*

A PAYT program may be viewed as a fairer system, as residents are only paying for the garbage they produce. It would require a behavior change by residents to purchase tags for excess garbage and/or select a cart size that is most appropriate for their household.

#### *Environmental*

A PAYT program provides an incentive to residents to optimize the diversion of waste from their black cart. Diverting waste reduces greenhouse gas emissions, redirects natural resources back into the economy, reduces environmental liability, and increases the life of landfills.

#### *Economic (External)*

A PAYT program would improve the transparency and fairness of the residential Black Cart Program by aligning the charges a resident pays with the amount of garbage their household put out for collection.

### **Financial Capacity**

#### ***Current and Future Operating Budget:***

If approved, the PAYT program will impact WRS' operating budget for 2020 and onward. A tag-a-bag program will cost approximately \$300,000 in the first year and \$200,000 annually thereafter. This would be recovered through the sale of bag tags. If smaller and larger cart size options are provided in addition to the tag-a-bag program, program costs are approximately \$2 million to \$3.5 million the first year in operating costs, and between \$1.5 million to \$2.5 million in future years, which would be recovered through program charges.

## **Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

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### ***Current and Future Capital Budget:***

A tag-a-bag program will not affect WRS' capital budget. Implementation of a three black cart size program would require the capital purchase of additional sizes of carts. The estimated total capital cost is approximately \$10 million. Cart purchases following implementation will be included in the growth plan for all cart based residential services.

### **Risk Assessment**

Risks associated with introducing tag-a-bag for excess garbage outside the black cart include:

- Residents who generate excess garbage may view PAYT as an additional cost burden. Education on how to properly divert waste to reduce household garbage, and a potential reduction in the monthly black cart program charge may help mitigate this risk.
- Households may look for other ways to get rid of excess garbage, leading to contamination of the blue and green carts, and increasing these programs' costs. Ongoing education and enforcement will be required to manage this risk.
- Increased complaints between neighbours regarding garbage may be received once there is a price on excess. WRS will mitigate this risk by dedicating additional resources to manage customer complaints and to educate households.
- The number of tags sold may not cover the cost of running the tag-a-bag program. WRS will continue to monitor the tag-a-bag program and make adjustments, as required.

In addition to the risks identified above, the following risks are associated with implementing three black cart sizes and tag-a-bag:

- Households may choose a cart size that does not meet their needs. This would result in additional cart exchanges and overall program costs. This risk would be mitigated through a comprehensive outreach program to educate households on how to choose the right size cart for their needs. Cart exchange fees or limits may also be put in place to manage the number and costs of exchanges.
- The charge for the small cart size may not meet customer expectations for a low cost option.
- There will be increased inventory of the standard cart size as a result of exchanges. The current cart sizes still have roughly 10 years of useful life remaining. Based on the estimated number of carts that may be returned, most of the returned carts would not be used again before the end of their useful life. This would result in long-term storage costs or disposal of many carts before they have served their useful life.
- The high cost of implementing this program will result in upward pressure on rates to recover the capital costs.

### **REASON(S) FOR RECOMMENDATION(S):**

A tag-a-bag program is recommended, without additional cart sizes, as this option limits the overall cost and complexity for both customers and The City, while improving fairness for customers. Encouraging customers to put out less excess garbage will also improve collection efficiency and waste diversion.

A tag-a-bag program will allow WRS to reduce the monthly black cart program charge for households by transferring the costs for the collection and disposal of excess garbage outside

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**Financial Model: Pay-As-You-Throw for the Residential Black Cart Program**

the black cart to the tag-a-bag program. WRS is also assessing the potential for a more affordable PAYT program based on the use of RFID technology.

**ATTACHMENT(S)**

1. Attachment 1 – Financial Model for Pay-As-You-Throw Program
2. Attachment 2 – Pay-As-You-Throw and Radio Frequency Identification