Collection Frequency Options and Analysis

The level of service of bi-weekly, year-round collection of green carts and black carts was established through a Council resolution at the regular business meeting of City Council on October 22, 2018. This level of service was recommended by the Administration as the lowest cost and most optimal service level for Saskatoon. The analysis considered a combination of weekly and biweekly services in summer and winter. It did not include options for collection frequency less than bi-weekly.

The October 2018 reporting included financial analysis in Attachment 1- Additional Information on Service Level Options and additional information including advantages and disadvantages to bi-weekly, year-round collections for both green carts and black carts compared to options with more frequent collections in Attachment 2 - Additional Information on Program Design Options. Administration assumed a medium cart (240L) for the analysis; however, the decision to use 360L as the standard cart size, with eligible townhouses receiving a 240L cart was not made until April 25, 2022.

Year-round, bi-weekly green cart organics and black cart garbage collection has been scheduled so that residents alternate between setting out each cart on the same day of the week, which is a convenient schedule. This approach also optimizes existing City trucks, staff, and collection routes and schedules.

It is assumed that residents will generate approximately the same amount of organic waste that they currently do. Whether that waste goes into the black cart or the green cart, there is a cost associated to disposing of that waste (collections and landfilling or composting).

How efficiently automated waste collection occurs is dependent on the number of carts set out, the distance of the route, how full the carts are, and the density of the material in the cart. The cost of performing these collections depend on the amount of time collections take, fuel consumption, and truck use (kilometers driven).

If there is a high set out rate it will increase the time which it takes for the route to get collected due to the truck starting, stopping, and tipping each cart. How quickly a route can be completed depends on how many carts are set out.

Collections trucks also need to tip their waste at the organics processing facility when they are full, or when they reach the maximum weight which they can haul. If there is a lot of waste in each cart, then the truck will reach it's limit quickly and need to make a trip to go dump that material. Trips to dump material vary in time depending on the location of the collections that day. Typically, a truck will tip its collected waste twice per day. However, if a route has a low set out rate and little waste in those carts, the truck may only need to go to the dump its waste once, which greatly reduces the time and distance driven.

The number of resources required to meet the level of service throughout the first year of the green cart program has been highly variable. In spring and fall when yard waste is at its peak and the set-out rate is at its highest, additional trucks have been required to make all the collections. In winter when the set-out rate has been at its lowest and there has been primarily food waste in the carts, less operators have been required to make those collections.

Under the current level of service, each day of the week there are approximately 8,000 green carts that are scheduled for collection. On average, eight operators are scheduled to complete these collections and each operator has roughly 1,000 carts on their route scheduled to be collected. Operators will assist each other in completing routes depending on how the work goes. However, during peak season up to 10 operators are required to perform the green cart collections. During the slower season typically 6 operators have been required to perform this work.

Option 1 - Status Quo collection frequency

Description

This option sees the continuation of the current level of service: year-round, bi-weekly collection of residential green carts.

Financial Implications

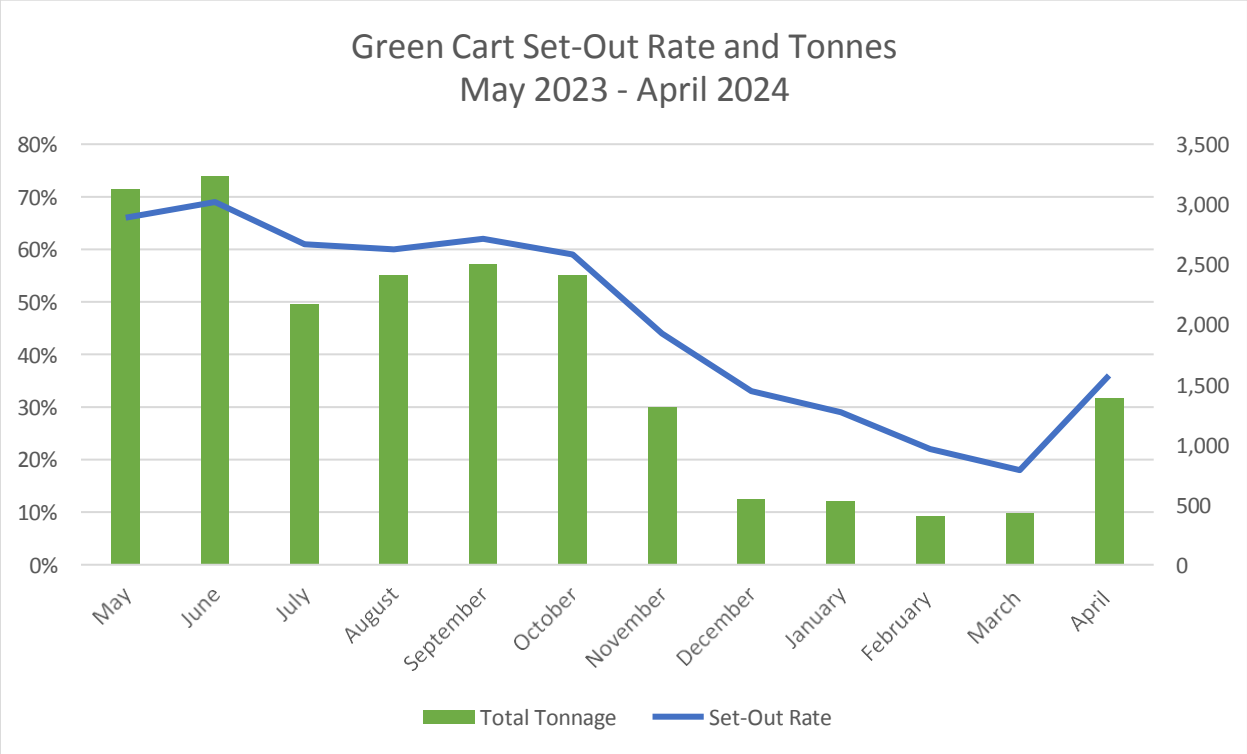
Providing curbside organics collection services while also providing curbside collection of garbage results in a unique opportunity to optimize staffing levels and fleet size. When these two schedules are coordinated to occur during opposite weeks, they can be collected using the same fleet and staff. This approach is more efficient than segregating the collections fleet into two. This also allows the programs to balance each other out. For example, in spring and fall when yard waste is at its peak and the set-out rate is at its highest, additional trucks have been utilized from garbage collections to make all the collections. In winter when the set-out rate has been at its lowest and there has been primarily food waste in the carts, less operators have been required to make those collections. This provides flexibility in how the collections occur and reduces risk of needing overtime to perform collections or having routes not completed.

There are no financial implications of remaining status quo on the collection frequency level of service. While it is difficult to determine the true cost of green cart collections due to the annual budgeting process and the fact that the program has been operating for 8 months of the 2023 budget year and only 4 months of the 2024 budget year, the cost of performing only the collections of the green cart are showing to be less than budgeted for the first year of the program.

Environmental Implications

With the current collection frequency, continuous improvement of waste diversion outcomes is projected through increased participation rates and capture rates. Based on assessments of comparable jurisdictions and estimates of organics waste generated that was carried out in 2018 during the program design phase, the projected improvements for the first 8 years of the Green Cart program operations included:

- Increase in participation rate of 2.9% per year
- Increase in capture rate of 0.7% per year for food waste
- Increase in the capture rate of 1.4% per year for yard waste



Social Implications

Ability to participate in and fully utilize the diversion offered by the Green Cart program with the current collection frequency is measured through the Waste and Recycling Survey. Only one survey was completed in the Fall of 2023, and it is important to note that data collection was completed in October 2023, before residents had their carts for a winter. It indicated that 70% of residents were somewhat or very satisfied with the collection frequency. The main collection frequency barriers identified in the survey included:

- Grossness including smell or odours – 25%
- Not picked up often enough in hotter seasons – 21%
- Pests (rodents, insects) – 18%
- Not enough cart space – 13%
- Picked up too often in the cooler and colder seasons – 12%

The weight of a materials in a cart can impact the ability of some residents to be able to physically set out their carts. The Waste Characterization Study audits provide an indication of the average weights of carts by neighbourhoods where the audits are being conducted.

Weight (kg/household)	Fall Audit	Winter Audit	Spring Audit
Average	15.62	4.6	TBD
Lowest Neighbourhood Average	7.44	0.59	TBD
Highest Neighbourhood Average	23.60	10.14	TBD

Legal Implications
There are no legal implications of this option as it is currently what is being provided.

Advantages
- User friendly.
- Winter collection frequency is common in other jurisdictions.
- Coordination with Other Curbside Collection Programs.
- Mitigates freezing issues for winter collections.
- Consistent collection of the green cart also has been known to increase participation in disposing of organic material appropriately.

Disadvantages
- Low set out rate observed during winter months.
- Low tonnages collected during winter months.
- Sentiment that money is being wasted with the current level of service.

Option 2 – Reduce winter Green Cart collection frequency to once every 4 weeks
Description
This option sees the Green Cart collection frequency reduced from bi-weekly to once every 4 weeks during winter months.

A) Define winter as the months where the set-out rate is less than 50% of the peak set- out rates – December 1 to March 31 (4 months).

B) Define winter as the months where the previous subscription green cart did not operate – November 1 to March 31 (5 months).

C) Define winter as the months where the previous subscription green cart did not operate – November 1 to April 30 (6 months).

Financial Implications
Under this level of service, it is assumed that a similar quantity of organic waste would be disposed of in the green carts as is currently being disposed of. It is also assumed that the set-out rate would increase from its current winter rate because residents would be more consistently setting their cart out every four weeks. This means that each route would take more time to complete and thus the expense of performing these collections would not be cut in half, despite the level of service being cut in half.

It is important to note that the total number of trucks required in a city or contracted fleet would remain the same to provide bi-weekly collections in the summer months.

It is estimated that we could reduce the number of collections operators by 4 over the winter months at this level of service. This would provide a savings of approximately $25,500 per month.

Fuel and equipment savings are estimated to be $11,250 per month.

This equates to an estimated savings of $40,500 per month.

The following table shows the estimated savings when compared to the 2024 green cart utility rates.

Number of months with collection every 4 weeks	Estimated Savings	Estimated Annual Cost per cart	Estimated Average Monthly Cost per cart
Status Quo	$ -	$ 87.45	$ 7.29
4	$ 162,000	$ 85.41	$ 7.12
5	$ 202,500	$ 84.87	$ 7.07
6	$ 243,000	$ 84.33	$ 7.03

There may also be higher administrative resources required to hire, train, and layoff seasonal staff as compared to maintaining a consistent complement of permanent staff.

In May of 2019, Administration presented additional information about the option of collecting organics once every four weeks in the winter. The information indicated that 5 months of reduced service would save approximately $230,000. The more recent estimates take into account the fact that we are familiar with the set-out rates and quantities, or waste collected in the green carts in the winter and that less resources (expenses) are required to perform the current level of service and therefore there are less savings available by reducing the level of service.

This option would require that four operators be moved from full-time to seasonal employees. Leading up to the level of service change, Administration would assess the current staffing levels and work closely with the union to ensure that the appropriate actions are taken to achieve the desired staff levels. It should be noted that because this program has been operating for only one year and has not fully operated over an entire budget year, it is difficult to truly determine the true cost of providing the service. Considering the utility fee rates are already set for the green cart program in 2025, it is recommending that the utility fee remain set for 2025 at $7.78 and any savings be returned to the utility stabilization reserve.

Environmental Implications

There is expected to be reduced fuel consumption with this level of service. There may be more organic material landfilled due to less residents not using their green cart due to the frequency of collections. This would lead to increased methane creation in the

landfill. However, the actual environmental impact is not known as this is not a common service level in other larger jurisdictions. As well, there are few studies on the impact of collection frequency on diversion rates and most address collection frequency for recyclables which do not have the same "ick" factor as organics on resident behaviour.

Social Implications

Many of the barriers to program participation noted with the current collection frequency from the Fall survey such as grossness and odours are unlikely to be an issue during the coldest winter months with reduced collection frequency. However, during the shoulder seasons or during unexpected warm temperatures in the winter months, if collection frequency is reduced it could cause materials to thaw and could result in odour issues as well as increased likelihood of material freezing to the cart.

The weight of materials in a cart can impact the ability of some residents to be able to physically set out their carts. With less frequent collections, it is expected that the average weight of a green cart during collections will increase. No jurisdictions were found that offer this level of service, making it difficult to predict the accessibility implications.

Administration was not able to find studies or guidelines on when a cart's weight becomes more challenging to move from an accessibility perspective. The multi-unit organics pilot, which is primarily food waste, has preliminary data showing that a 360L cart 1/3 full weighs 56kg (40kg food waste, 16kg cart) and feedback has been collected from participating properties that the carts become difficult to move when they are more than 1/2 full of food waste. It is reasonable to expect that snow and ice conditions may exacerbate the challenges of rolling-out heavier carts.

Legal Implications

Due to the budget and billing process, there is no ability to change the utility fee rate when the level of service changes during the year. The daily utility fee would be based on the annual cost of providing the complete service divided by the days of the year.

Advantages

- Responds to resident demand/perceptions that the current winter collection frequency is inefficient.
- Aligns will low set out rate observed during winter months.
- Aligns with low tonnages collected during winter months.
- Modest reduction in collection costs from staff and fuel cost reductions.

Disadvantages

- May decrease accessibility of the program (heavier carts for residents to move, during winter months where snow/ice already making cart movement more difficult).
- Fuller carts likely to increase cart freezing issues (incomplete collection, carts with frozen waste in the bottom falling into the collections truck), cart capacity issues, cart damage due to freeze/thaw of fuller carts.

- More difficult for residents to remember the schedule.
- Likelihood of a lower organics capture rate as residents may not use their green cart at all in the winter because of the 4-week wait between collections.

Option 3 – Increase summer Green Cart collection frequency to weekly

Description

This option sees the Green Cart collection frequency increased during the summer months to weekly collections. Summer is defined as the months where the previous green cart subscription-based program operated – May 1 to October 31 (6 months) and where the monthly tonnes were approximately 2,000 tonnes or greater and set-out rates are approximately 60% or higher.

Financial Implications

The financial implications are based on the level of service increase to 6 months of weekly green cart collections (13 additional collections per resident). This option could be implemented by the summer of 2026.

The City has the equipment (collections trucks) and resources to provide the current level of service of bi-weekly collections for both garbage and organics. In order to deliver a level of service of weekly collections of organics in the summer months there are three options that could be considered:

- Purchase additional trucks and hire additional staff.
  - This would require approximately eight additional trucks to be purchased. The delivery time for a new truck is over a year currently. The current estimated cost of a truck is $700K.
- Hire a third-party contractor to complete the additional collections during the summer months.
  - This would cost an estimated $1.5M for the six months that the contractor would be assisting with making 32,750 collections weekly.
  - Hire additional staff and run an evening collection shift (~3:00 pm – 10:00 pm) using the same fleet to complete the collections.
  - This would require hiring 9 seasonal operators and a supervisor who would be hired for 7 months of the year to accommodate onboarding and training. This results in an additional 5.8 FTEs at a total cost of approximately $452.3K.
  - This would result in increased fuel and fleet costs of approximately $230K.
  - There would also be additional costs for ensuing that a processing facility could stay open to accept the material. The estimated costs of having a processing facility stay open late are estimated to be $123.5K.
  - This results in a total estimated increase in costs of $805.8K or an increase of $0.91 per cart per month when compared to status quo.
- There is also a possibility to increase the length of each operator's daily shift so that collections do not run as late into the evening. The operations of this would costs a similar amount as running a later shift, but there would be more initial costs in changing the entire routing system and collection calendar.

Environmental Implications

There would be increased GHG emissions from the additional trucks running which are required to meet this level of service.

The increased collection frequency may promote more green cart use and therefore divert more organics from the landfill.

Social Implications

Many of the resident participation barriers related to collection frequency are in-part addressed through increasing summer collection frequency, since more frequent collection will reduce the amount of time materials are in the cart, which results in fewer odours, slows the ability of insects to increase in numbers, and increases program capacity.

- Grossness including smell or odours – 25%
- Not picked up often enough in hotter seasons – 21%
- Pests (rodents, insects) – 18%
- Not enough cart space – 13%

Green carts would be left out in the evening for collection. This would be a noticeable social change and may create concern from residents who do not want carts out and collections to occur in the evenings.

More frequent summer collection is common in jurisdictions that offer smaller cart sizes or the choice of cart size, as it continues to provide capacity during peak seasons.

Legal Implications

The waste bylaw would need to be updated to indicate that residents can leave their carts out later for evening collection.

Advantages

- Responds to resident demand for more frequent summer collections.
- Addresses complaints or odour/pests.
- Aligns with the higher set out rate observed during summer months.
- Aligns with higher tonnages collected during summer months.
- A common service level offered by other jurisdictions.
- Increases capture rate for the program and reduce contamination of blue and black carts through increased green cart capacity.

Disadvantages

- Higher collection costs, resulting in higher utility costs for residents.
- Collecting waste later into the evening would be a considerable change to all residents and would prompt on-street parking challenges.
- There would be increased safety concerns with collections into the evenings with additional vehicles on the street and more people out.
- More difficult for residents to remember a schedule that changes (i.e., is my cart

being collected in the daytime today, or in the evening)

- Higher likelihood of carts being left out for longer due to the evening collection which results in increased illegal dumping and lost carts.
- Continually changing new programs can be confusing and tiresome to residents.
- A completely new collection schedule will be needed, since currently green cart and black cart are collected the same day of the week on alternating days. The collection schedule was just changed in January of 2024.
- There may be inefficiencies and scheduling issues as some neighborhoods may have other waste collections the following day and need to have multiple carts out at one time.

Option 4 – Increase summer Green Cart collection frequency to weekly and decrease winter collection frequency to every 4 weeks.

Description

This option is a combination of Option 2 and Option 3 sees the Green Cart collection frequency increase in the summer months to weekly and in the winter months to once every 4 weeks.

Financial Implications

The financial implications are based on the level of service increase to 6 months of weekly green cart collections (13 additional collections per resident) and a reduction in the level of service in the winter from between 4 to 6 months.

This would have the same financial implications as outlined in Options 2 and 3 with some savings in the winter and increased expenses in the summer. The expected total cost of this option is shown on the table below, with different costs depending on how many months the winter level of service is reduced for.

Number of winter months with collection every 4 weeks	Estimated Net Cost Increase	Estimated Annual Cost per cart	Estimated Average Monthly Cost per cart
4	$ 643,800	$ 96.15	$ 8.01
5	$ 603,300	$ 95.61	$ 7.97
6	$ 562,800	$ 95.07	$ 7.92

Environmental Implications

There would be increased GHG emissions from the additional trucks running which are required to meet this level of service.

The increased collection frequency may promote more green cart use and therefore divert more organics from the landfill. The decrease in winter collections may reduce the green cart use and cause more organics to go to the landfill.

Social Implications

The social implications are the same as indicated in Options 2 and 3.

Legal Implications

The legal implications are the same as indicated in Options 2 and 3.

Advantages

- Responds to resident demand/perceptions that the current winter collection frequency is inefficient and summer collection is not frequent enough.
- Aligns with set out rate observed during winter and summer months.
- Aligns with tonnages collected during winter and summer months.
- Addresses complaints of odour/pests.
- A common service level offered by other jurisdictions.
- Increases capture rate for the program and reduces contamination of blue and black carts through increased green cart capacity.
- Two collection frequency changes a year is something residents were able to manage before 2023.

Disadvantages

- Higher collection costs, resulting in higher utility costs for residents.
- The variable schedule and reducing the collection frequency in April and November to once every four weeks could be confusing to residents and create potentially more issue with odour during shoulder seasons.
- Collecting waste later into the evening would be a considerable change to all residents and would prompt on-street parking challenges. There would be increased safety concerns with collections into the evenings with additional vehicles on the street and more people out.
- More difficult for residents to remember a schedule that changes (i.e., is my cart being collected in the daytime today, or in the evening).
- Higher likelihood of carts being left out for longer due to the evening collection which results in increased illegal dumping and lost carts.
- Continually changing new programs can be confusing and tiresome to residents.
- A completely new collection schedule will be needed, since currently green cart and black cart are collected the same day of the week on alternating days. The collection schedule was just changed in January of 2024.
- There may be inefficiencies and scheduling issues as some neighborhoods may have other waste collections the following day and need to have multiple carts out at one time.
- May decrease accessibility of the program (heavier carts for residents to move, during winter months where snow/ice already making cart movement more difficult).
- Fuller carts likely to increase cart freezing issues (incomplete collection, carts with frozen waste in the bottom falling into the collections truck), cart capacity issues, cart damage due to freeze/thaw of fuller carts.
- More difficult for residents to remember the schedule.
- Likelihood of a lower organics capture rate as residents may not use their green cart at all in the winter because of the 4-week wait between collections.

Options Considered but Not Presented

The option to eliminate winter collections entirely was considered but not included as an option because:

- Food waste is generated year-round and landfilling food waste at any time of year generates methane, a powerful greenhouse gas, and due to rapid decay, the majority of these emissions are release prior to the installation of landfill gas collection.
- The weight of the cart from residents using the cart over the winter months – causing accessibility/safety challenges for the first collection and may exceed cart weight capacity, Protecting carts from damage (freeze thaw cycle).
- Utility/Billing complexity – raises questions on do we turn the fee on/off (resulting in larger fee when it is on), are we charging in the winter when collections aren't occurring?

Options that did not have a fixed collection frequency data (i.e., flexible year-to-year based on annual weather) were considered by not included as options because:

- Difficult to communicate to residents.
- Difficult to predict actual program costs and administer, especially as climate becomes more variable with climate change – staff would need to be trained/available if snow melted earlier than average, so only fuel and perhaps fall staff savings.
- Not common in other jurisdictions