

## Single-use Items Reduction Strategy – Evaluation Framework

This document provides additional details and explanation regarding the “Success Measures” section of the Single-Use Items Reduction Strategy (CD2024-0391 – Attachment 4).

### Highlights

The following measures will be considered collectively to evaluate reduction in waste generated from single-use items:

- The **amount of single-use items in the garbage stream and in litter**, as measured through waste composition studies.
- The **amount of contamination** from single-use items in recycling and composting streams, as measured through Material Recovery Facility (MRF) and the Calgary Composting Facility audits.
- **Levels of knowledge and participation** in waste reduction behaviours by businesses and Calgarians, as measured through survey data.
- **Number of single-use items distributed or purchased** by businesses on an annual basis, as measured through voluntary reporting.
- **Level of business support** for the strategy as well as the nature of any concerns, perception of effectiveness and needs for additional information/materials, as monitored through formal and informal engagement with businesses, Business Improvement Areas, industry associations, and business-focused advisory and working groups.

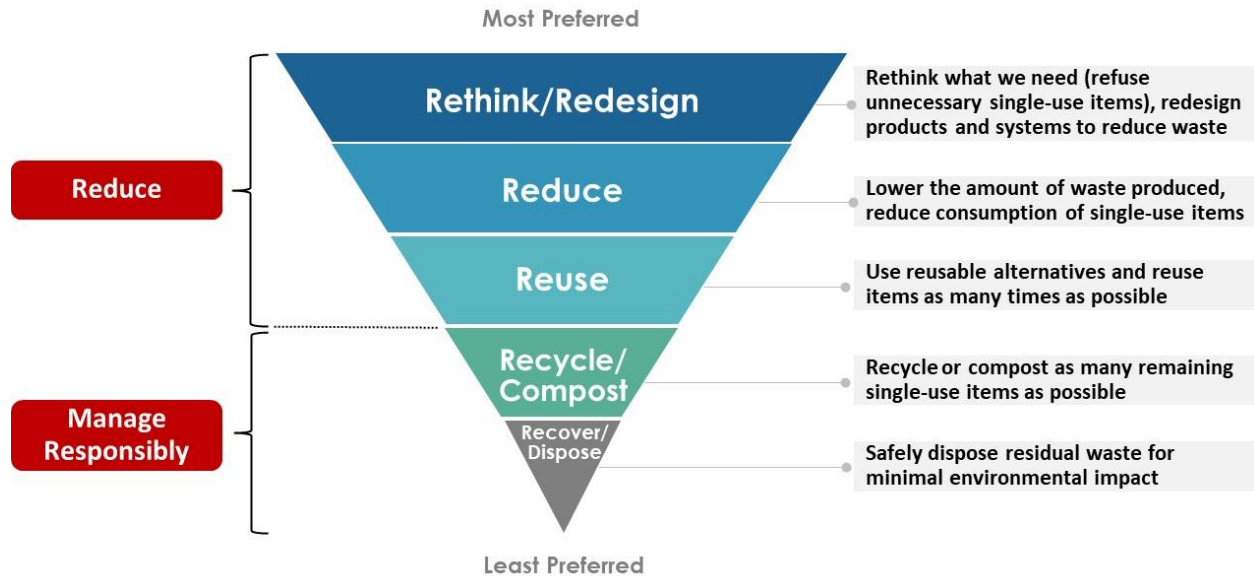
The City will also monitor waste composition studies in other Canadian municipalities with similar policies, and best practices for waste reduction both nationally and internationally.

### Background

The focus of the single-use items reduction strategy is to reduce waste from single-use items independent of composition – not simply replace the single-use plastic items that continue to be banned under the Federal regulation with single-use items made from other materials (even if they are recyclable or compostable). Eliminating the use of unnecessary single-use items and replacing needed single-use items with reusable options is the fundamental goal.

Waste & Recycling Services mission is: *To enable Calgarians to reduce and manage their waste responsibly, now and into the future.* The prioritization of rethinking our need for single-use items, preventing and reducing waste, and reuse over substitution is reflected in The City’s zero waste hierarchy.

Figure 1: The City of Calgary Zero Waste Hierarchy (applied to single-use items)



While waste diversion – recycling and composting – continues to be encouraged, waste reduction and reuse are preferred. Disposal should always be the last option.

Managing waste from single-use items contributes to landfill costs and the long-term liability associated with managing Calgary’s waste into the future. Moreover, managing single-use items also add to recycling and composting costs. They are often difficult to recycle (e.g. due to small size, material types or being soiled with food) and are a significant source of contamination in our recycling and composting streams.

Single-use items also have climate and environmental impacts. Life cycle environmental impacts of single-use items (from raw material acquisition through manufacture, distribution, product use and disposal) include the use of valuable natural resources, greenhouse gas emissions, air pollutant emissions, water use, habitat damage, and water pollution. Many single-use items are used only once – or not at all (e.g. napkins, utensils), before being disposed of. Preventing waste in the first place is the ideal and most preferred option.



One of the program pathways outlined in Calgary’s Climate Strategy is waste reduction, which aims to reduce the number of new products used and discarded in Calgary. Reducing waste, including waste from single-use items, reduces greenhouse gas emissions from The City’s landfills and composting facility. Emissions from these facilities form part of The City’s greenhouse gas inventory and are regularly reported through The City’s climate program.

Reducing our use of single-use items not only helps reduce greenhouse gas emissions from landfilling and processing waste, it also reduces the upstream emissions from making these items, including emissions associated with resource extraction, manufacturing, and transportation.



## Strategy Components and Evaluation Framework

The *Single-Use Items Reduction Strategy* prioritizes single-use items that can be easily **avoided** or **replaced** with reusable items.

As part of the strategy, a bylaw was developed to reduce waste from shopping bags and foodware accessories, while voluntary measures encourage reduction of single-use cups and takeout containers. The table below provides a summary of The City’s approach.

Single-use Item	Bylaws
 Shopping Bags	Mandatory minimum fee on paper shopping bags and new reusable shopping bags
 Foodware accessories (utensils, straws, stir sticks, pre-packaged condiments and napkins)	Customer request required for single-use accessories made from any material

Single-use Item	Voluntary Measures
 Food serviceware	Voluntary reduction for single-use food serviceware made from any material
 Cups	Voluntary reduction for single-use cups made from any material

The City recognizes that behaviour change takes time and the strategy challenges our norms of convenience. Shifting Calgarians’ focus to waste reduction (from diversion and disposal) is a long-term endeavour. Notable changes are not expected until one and a half or two years following full implementation of the strategy.

The Single-Use Items Charter Bylaw is a foundational component of the strategy. While other tools such as education, outreach and capacity building can shift behaviours, best practices and learnings from other jurisdictions show that purely voluntary measures have limited impact, and the effectiveness of public education is varied.

Waste & Recycling Services maintains a regular measurement program that includes waste composition studies, and monitoring contamination rates at the contracted Material Recovery Facility and The City’s Calgary Composting Facility. These metrics will be used to evaluate the strategy. Other measures in the evaluation framework may be delayed or reconsidered if the bylaw were to be repealed and not replaced.

The framework to evaluate reduction in waste generated from single-use items will be monitored using the measures outlined below. There is no single target or metric that can determine if the strategy is a success – rather positive or negative trends on these indicators, considered collectively, will form the basis for reporting.

1. **Waste composition studies:** Waste composition studies are globally recognized as best practice to characterize the amounts of different types of materials in a waste stream. They involve sampling, counting, weighing and categorizing materials. Past studies in Calgary have sampled for single-use items in the residential and commercial garbage streams, and in public space waste bins. The next waste composition studies are planned for 2024-2025 and will sample the residential, commercial and corporate waste streams. These studies will go ahead regardless of the bylaw status, though the approach and specificity with which single-use items are measured may be modified if the bylaw is repealed. A decrease in the amount of single-use items in the garbage stream will be a positive indicator.
2. **Material Recovery Facility (MRF) and the Calgary Composting Facility data:** Various audits are regularly conducted at both facilities and will continue regardless of the bylaw status. Decreased contamination from single-use items will be a positive indicator.
3. **Survey research:** Waste & Recycling Services will continue to gather input from Calgarians and businesses on an ongoing basis, however, the timing and frequency of further research specific to single-use items will be accelerated if the bylaw remains in place. Increased levels of knowledge and participation in waste reduction behaviours will be positive indicators.
4. **Voluntary reporting by businesses:** Number of single-use items distributed or purchased on an annual basis. A downwards trend in the use of single-use items would be a positive indicator, however, a voluntary reporting program will not be pursued if the bylaw is repealed.
5. **Business engagement:** Regular touchpoints with businesses via informal surveys and discussions. Waste & Recycling Services will continue to engage with businesses to support development of services and policy, however, engagement specific to single-use items will be reduced if the bylaw is repealed.

In addition to evaluating The City's Single-Use Items Reduction strategy, we also monitor waste composition studies in other Canadian municipalities with similar policies, and best practices for waste reduction both nationally and internationally.

## Waste Composition Studies

*Multi-sector waste composition study:* Since 1999, Waste & Recycling services has conducted waste composition studies approximately every five years to characterize the waste in the residential and commercial garbage streams. The studies allow us to measure the amount and characterize the types of divertible materials in the garbage; and, help measure the performance of waste reduction, diversion and education programs.

The last multi-sector (single-family, multi-family, businesses) study was conducted in 2019 and was intentionally designed to provide a baseline measure for tracking a number of single-use items. Analysis found that that 3.5 million plastic shopping bags, 6.4 million plastic utensils and 2.4 million disposable cups are discarded each week in Calgary's garbage stream.

The next waste composition study is scheduled to begin in Q4 2024. It will be conducted quarterly over the course of a year and will include single-family households as well as

commercial loads (mainly comprised of multi-family and Industrial, Commercial and Institutional waste) tipped at City landfills.

In addition to the percentage of various materials making up the waste, the analysis will also provide counts of single-use items. Single-use items that were not measured individually in previous waste composition studies will be added. New material categories will include: paper shopping bags, reusable shopping bags, wood utensils, compostable straws and takeout containers (fibre-based, aluminum, plastic, compostable plastic). These data will serve as a baseline for the new items. While significant changes are not expected in the short-term, the new items as well as previously measured items, will be tracked over four quarters giving an early indication of the impact of the strategy.

In 2019, a sample from the annual Pathways and River Cleanup was also analyzed as was the composition of Green cart waste in 2020. Future samples could include litter collected from a range of public spaces. In addition to reporting on the strategy, the information may also indicate the need for additional education or initiatives (e.g. if there is increased contamination in the Green cart or increased litter of single-use items).

In 2024, Waste & Recycling Services is moving from waste composition studies conducted approximately every five years to an ongoing waste composition program with specific sectors, materials and waste streams assessed annually. This allows for flexibility and the timely collection of data to support the development and evaluation of waste reduction and diversion initiatives.

*Waste in public spaces waste composition study:* A waste in public spaces composition study was conducted in 2017. Waste in public garbage bins on roadways, in parks, and at bus stops and LRT platforms was characterized and estimates of the weight and volume of garbage, recyclable materials and compostable materials was generated. Specific materials counted included: paper coffee and fountain pop cups, plastic drink cups, plastic shopping bags, and plastic food containers. Single-use items accounted for a notable volume of waste. This study provides a baseline that can be tracked in the future, and additional material categories can be added.

*Corporate waste:* Waste & Recycling Services is in the process of developing a Corporate Waste Strategy. Key components of the strategy will include reduction in the number of single-use items in the garbage, recycling and composting streams; reduction in overall waste generation; and, reducing the amount of divertible materials in the garbage stream. The current state assessment will include a waste composition study in select City buildings and facilities in 2024. The results will provide a baseline for future measures and give The City an opportunity to demonstrate it is leading by example.

### **Data from The City's Material Recovery Facility (MRF) and the Calgary Composting Facility**

Data collected at the Material Recovery Facility (MRF) and the Calgary Composting Facility provides useful measurement and insight into the impacts of single-use items on our recycling and composting programs.

### **Material Recovery Facility (MRF)**

At our contracted Material Recovery Facility (MRF) various audits are completed throughout the process to understand the composition of the materials arriving from City recycling programs, how those materials are impacting the sorting process and the quality of the final products produced. Single-use items impact the contamination rate, costs to The City, and the quality and marketability of outbound materials.

Audits at the Material Recovery Facility (MRF) include:

- **Inbound composition/contamination audits** – These audits are conducted for the purposes of determining the inbound composition of recyclables received from City programs. They are used to establish the inbound contamination rate which is used to calculate the processing rate that The City will be charged for the sorting of recyclables. The data collected from the inbound audits provides The City with detailed information regarding what Calgarians are putting in their carts, emerging trends in packaging and where there might be confusion. The data can be used to assess the strategy as well as inform City communications and outreach efforts.
- **Outbound material quality audits** – Determine quality and composition parameters of each sorted commodity (i.e. mixed paper, cardboard, glass, etc.) such as contamination, prohibitives, and outthrows.
- **Residue audits** – Determine what materials remain at the end of the sorting process which includes unsorted acceptable material, unsorted recoverable materials and contamination.

**Image 1:** Contamination of glass material from single-use utensils and other small plastics that cannot be sorted



The introduction of Extended Producer Responsibility in April 2025 will shift the physical and financial responsibility of collecting, sorting, processing and recycling blue cart materials to producers and away from local governments and taxpayers. Once the transition occurs, The City may not have the same level of access to data from the Material Recovery Facility.

### **Calgary Composting Facility**

Similar audits are performed at the Calgary Composting Facility. Single-use items – particularly plastic bags and compostable plastics – impact the contamination rate and the quality of the finished compost.

Audits at the Calgary Composting Facility include:

- **Inbound composition/contamination audits** - These audits are conducted for the purposes of determining the inbound composition of the green cart materials received at the facility. The data collected from the inbound audits provides The City with detailed information regarding what Calgarians are putting in their green carts, how they are preparing materials (i.e. plastic vs compostable liner bags), emerging trends and where there might be confusion. The data is can be used to assess the strategy as well asinform City communications and outreach efforts.
- **Finished compost quality audits** – Every batch of finished compost is tested through the Compost Quality Alliance (CQA) program. Compost CQA testing refers to the analysis of compost quality used to assure buyers of the product's quality and suitability for specific applications. Test parameters include: maturity and stability; nutrient content; particle size; moisture content; pathogens; organic matter content; heavy metals, and; foreign matter. The foreign matter assessment is of particular value as it identifies the presence of non-compostable materials i.e. plastics, including compostable plastics.
- **Residue audits** – visual residue audits are performed to assess what is being screened out of the finished compost. Residue audits help in The City to understand the effectiveness of the composting process and how inbound contamination is impacting that process.

**Image 2:** Finished compost testing, single-use foodware accessories



### **Survey research**

*Business research:* In October 2023, a telephone survey was conducted with 497 businesses in Calgary to track awareness and reported compliance with the waste bylaw, and gather baseline

data on current practices around food waste and single-use items reduction. The survey included an oversample of businesses in the Food Services and Retail sectors.

Three months prior to the Single-Use Items Charter bylaw coming into force, 84% of restaurants and 78% of retail businesses surveyed said they were aware of the bylaw. Measures that will be tracked in future surveys include the percentage of businesses that: ask customers if they need a shopping bag before providing one; charge a fee for paper shopping bags; no longer provide bags at all; ask customers if they need foodware accessories before providing them; use reusable cups, plates and utensils for dine-in; accept customer provided cups; accept customer provided takeout containers; offer a reusable take-out container program; and, participate in other single-use items reduction efforts.

In addition to tracking these measures, future surveys will also assess support for specific components of the current strategy, as well as support for other potential waste reduction initiatives.

Waste & Recycling Services typically conducts a survey with businesses every three to five years. Should the bylaw remain in place, a survey will be conducted in late 2025 or early 2026 to gauge the effectiveness of the strategy.

*Customer research:* In December 2021, an online survey was conducted with a representative sample of more than 1,000 adult Calgarians. Topics included knowledge and behaviours related to single-use items, and barriers to reducing single-use items. While self-reported measures may not provide an accurate assessment of actual behaviours, they are useful for tracking changes over time – increased knowledge levels, increased participation in reduction behaviours, and a decrease in perceived barriers would suggest the strategy is having a positive impact.

Specific metrics that will be tracked include the percentage of Calgarians who say they: are very knowledgeable about ways they can reduce their reliance on single-use items; take their own bag to the grocery store; take their own bag to other stores (retail, malls, markets); take a reusable mug when buying beverages outside their home; refuse single-use items if they don't need them; make a conscious effort to reduce their use of single-use items; and do a very good job when it comes to waste diversion.

In addition to tracking these measures, future surveys will also assess support for specific components of the current strategy, as well as support for other potential waste reduction initiatives.

Should the bylaw remain in place, a similar survey will be conducted in late 2025 or early 2026 to gauge the effectiveness of the strategy.

### **Voluntary reporting**

One of the most effective means of assessing the impact of the strategy would be to collect data from businesses on the number of single-use items purchased or distributed on an annual basis (for each specific item), as well as any cost savings from using fewer single-use items and/or switching to reusable options. While it is not practical to establish this as a requirement, should the bylaw remain in place, The City will develop a system for voluntary reporting and encourage business license holders to participate.





## **Business engagement**

The City will engage business licence holders on an ongoing basis to gauge any concerns, the need for additional information/materials, and assess the effectiveness of the strategy as well as support for the strategy. This will include surveys or engagement via the Engage platform, and input from City of Calgary Business Improvement Areas and industry associations. An initial touchbase is planned for late 2024 or early 2025.

We will also leverage the Industrial, Commercial and Institutional (ICI) working group which has long been a mechanism to communicate with and get input from businesses – many conduct their own waste composition studies and are willing to share information.