

NO: R030

COUNCIL DATE: February 24, 2020

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **February 20, 2020**

FROM: **General Manager, Engineering**

FILE: **5360-01**

XC: **3900-02**

SUBJECT: **Plastic Bags and Single-Use Items Update**

RECOMMENDATION

The Engineering Department recommends that Council:

1. Receive this report for information;
2. Authorize staff to prepare and bring forward a Plastic Bag and Single-Use Item Bylaw, as outlined in this report; and
3. Authorize staff to develop a communications and education campaign on the proposed Plastic Bag and Single-Use Item Bylaw to support residents, affected businesses and other organizations in the transition away from the associated products.

INTENT

The purpose of this report is to provide Council with information on single-use item reduction strategies and to seek approval to develop a proposed Plastic Bags and Single-Use Items Bylaw.

BACKGROUND

At the May 27, 2019 Regular Council meeting, as part of Corporate Report No. R102; 2019 attached as Appendix "I", Council endorsed staff to proceed with proposed actions and commencement of a Single-Use Item ("SUI") Reduction Strategy with staff committing to report back to Council near the end of 2019. Further, at the January 13, 2020 Regular Council meeting, under the Mayor's Report, the Mayor directed staff to prepare Bylaws that would eliminate the use of plastic shopping bags in Surrey by no later than January 1, 2021.

In 2019, staff initiated a series of action items towards a SUI Reduction Strategy, including public consultation with residents and businesses to determine the level of support for introducing SUI reduction requirements. In addition, significant work was also completed in collaboration with Metro Vancouver ("MV") to develop a document that supports local governments with implementing programs and policies to reduce SUIs while also ensuring consistency across the region.

DISCUSSION

Plastic bags and SUIs are products that are typically disposed of after one use. Over the years, there has been movements towards reducing waste generated from some SUIs through recycling collection programs, extended producer responsibility programs, and disposal bans. Despite these actions, these items continue to be problematic and a global concern due to the scale of their production and consumption, low levels of recycling, and accumulation in the environment.

Governments and businesses around the world are now taking action to regulate and limit the use of these items. Many jurisdictions have established or aim to enact a range of policies and programs, education campaigns to out-right bans on single-use plastic products. These include Vancouver, Richmond, Squamish, Saanich, Courtenay, Cumberland, Ucluelet, Tofino and Salmon Arm. Outside of the Province, municipalities including Calgary, Charlottetown, Toronto, Montreal, Seattle, and San Francisco are developing SUI reduction plans. The proposed Bylaw(s) would regulate businesses by ensuring practices in Surrey are consistent with those being introduced by other municipalities in the region. This is expected to place Surrey businesses in a similar position in relation to others in the region.

As mentioned above, in 2019 the City undertook several key actions to move toward developing an approach to reducing plastic bags and SUIs. These are described in detail below and align with approaches being developed or implemented in other municipalities, both regionally and Provincially.

Single-Use Items Actions Completed in 2019

Waste Composition Study

Approximately, 1.1 billion plastic bags and SUIs are disposed of in the MV region, with an estimated 76 million sent to landfill annually from Surrey. To identify the volume and types of items used and disposed of in Surrey, a waste composition study was conducted. The purpose of the study was to provide current data on the prevalence, composition and distribution of these materials in residential and street garbage bins within the City. The results of the study provided a focal point on which items should be targeted in Surrey.

Item	SUI Composition by Volume	Estimated Number of Items Disposed Annually (million)
Plastic Checkout Bags	36%	25.6
Disposable Cups	18%	12.5
Plastic Take-Out Containers	17%	12.4
Foam Take-out Containers and Cups	10%	7.3
Plastic Straws	10%	7.0
Plastic Utensils	9%	6.5

The composition of Surrey's waste stream revealed that plastic bags are the most prevalent SUI in Surrey, with double the waste volume than the next SUI. Disposable cups and plastic take-out containers were second and third, respectively.

Public Consultation

The initiative to reduce plastic bags and SUIs is strongly supported by Surrey residents. A City-wide survey of Surrey residents was carried out to determine the level of support to reduce or restrict the use of plastic bags and SUIs. A total of 2,158 survey responses were received. The results indicate that there is 83% support to reducing or restricting the use or distribution of plastic bags and SUIs, with 71% in favour of implementing bans for these items.

Based on the survey results, the table below provides public sentiment regarding the most supported materials to target.

Item	% Support
Foam Take-out Containers and Cups	86%
Plastic Checkout Bags	83%
Plastic Straws	81%
Plastic Utensils	81%
Plastic Take-Out Containers	81%
Disposable Cups	78%

Other items identified by Surrey residents include plastic wrap, plastic bottles, and drink plugs/stir sticks; however, these received a lower level of support.

Metro Vancouver Toolkit

Throughout 2019, the City collaborated and undertook significant work with MV and other member municipalities to develop a SUI toolkit, attached as Appendix “II”. The development of the toolkit was an important step in an effort to support and promote regional harmonization with reducing and restricting plastic bags and SUIs. Independent strategies are problematic for retailers and industries operating across many different locations with different requirements, and create confusion for the public.

The toolkit is a guiding document that provides information, resources and options that can be used to implement SUI reduction programs and policies. The MV toolkit and key actions completed by staff in 2019 were used as a platform to develop Surrey’s approach to reducing and restricting plastic bags and SUIs as described in this report.

In addition, MV has also taken an advocacy role for member jurisdictions, encouraging the Province to implement a Province-wide plastic bag and SUIs reduction strategy to allow for inter-municipal harmonization and consistency for consumers, producers, and businesses with operations throughout the Province.

Plastic Bag and Single-Use Items Proposed Approach

Based on the waste composition study and public consultation, plastic checkout bags are the highest single-use waste product in Surrey, and have the second highest level of support (83%) from the public to restrict usage.

As such, staff have developed a recommended approach to initially focus on reducing plastic checkout bags disposable cups and plastic take-out containers. This approach closely aligns with other municipalities undertaking the same initiatives ensuring inter-municipal harmonization and consistency for the public, consumers, producers and businesses with operations throughout the Province.

Plastic Bags

Plastic checkout bags are convenient, but they are a major source of waste, pollution and litter on City streets. These bags account for 25.6 million items per year disposed of in Surrey, which is the highest of all types of items. Their use can be reduced or avoided completely.

While plastic bags are technically recyclable, there are no viable convenient recycling programs in place. Residents must drop-off plastic bags at depots, creating significant barriers to recycling, and these items are not readily recycled in the commercial and institutional sectors. In addition, plastic bags labelled as compostable or biodegradable are not accepted by organics processing facilities.

It is proposed that businesses be prohibited from providing and distributing plastic checkout bags to customers, including those bags labelled compostable or biodegradable, as these are not readily accepted by composting processing facilities. Research indicates that through bans on plastic shopping bags, there is an overall decrease in plastic consumption and increase in reusable options. While voluntary approaches such as bag fees or by-request only may encourage reduction in bags, they are not as effective as bans. In addition, feedback results from the resident survey also indicate that approximately 70% prefer and support outright bans on plastic bags. Furthermore, the City also received a petition from 1,613 residents expressing support for a ban on plastic bags.

The proposed prohibition would not apply to other types of small bags, such as those used to package fruit, bulk foods, produce, frozen foods, meat, fish, small hardware items (such as nails and bolts), clothes after professional laundering or dry cleaning, linens, bedding, tires, or other similar large items that cannot easily fit in a paper bag or reusable bag. The purpose of the exemptions for these items include hygiene, protection and containment of perishable items, and protection of loose material.

In addition, with regards to plastic checkout bags, it is recommended that fees for paper and reusable bags be incorporated into the proposed Bylaw to ensure that substitution for plastics bags is avoided and trade-offs are minimized. Banning plastic checkout bags without regulating paper and reusable checkout bags may result in unintended consequences where consumers simply substitute plastic with paper bags and reusable bags if available. Literature research indicates paper bags have higher greenhouse gas emissions due to material extraction, production and transportation.

The fees for paper or reusable bag purchase could be consistent across the region with a phase-in period imposed to provide time for businesses and residents to adjust to the new requirements, while also reducing the financial burden at one time.

Further provisions could be incorporated into the proposed Bylaw, such as paper bags being at least 40% recycled content, and that businesses report on an annual basis the number of paper and reusable checkout bags it distributed during the year which would allow the City to determine the effectiveness of the proposed Bylaw.

Take-out Containers and Cups

It is recommended that the City take action on foam cups, plates and take out containers. Similar to plastic bags, residents must drop-off single-use foam items at depots, and they are not readily recycled in the commercial and institutional sectors. The resident survey confirmed that there is also 78-86% support from residents to ban these products. Additionally, there are other feasible alternatives to using single-use foam items.

It is proposed businesses be prohibited from providing and distributing plastic and polystyrene foam take-out containers and cups for the purpose of serving or transporting prepared food, including but not limited to: plates, cups, bowls, trays, cartons, and hinged or lidded containers. Exemptions to these provisions for facilities such as hospitals and community care facilities could be incorporated into a proposed Bylaw. Similarly, the proposed Bylaw could be applied to events and festivals in the City.

Plastic Straws and Utensils

Plastic straws and utensils are hard to recycle, are not included in residential recycling programs, and are rarely included in commercial programs. There are alternative options to using plastic straws, such as paper. Many restaurants and fast food outlets are taking voluntary actions to reduce straws by eliminating straws, transitioning to reusable options or providing disposable straws by request.

Plastic utensils are hard to recycle, and there are limited alternatives on the market. Additional review is required to determine appropriate and effective reduction approaches for plastic utensils.

At this time, the City's proposed Bylaw would not include plastic straws and utensils until further research is completed.

Communication and Education Campaign

All policy or regulation changes that affect a wide array of stakeholders require a thorough communications plan and campaign. This will ensure that businesses and residents are well-informed of the mandatory bans, will assist with transitioning from SUIs to other alternatives

Accordingly, as part of the next steps, staff are seeking to develop an awareness and education campaign which will include:

- A harmonized, inter-municipal approach;
- A series of technical workshops with business sector stakeholders. The purpose of these workshops would be to ask questions on SUIs, how the requirements might impact businesses, and which solutions and alternatives are available to businesses to smoothly transition away from SUIs;

- Developing a resource toolkit to support businesses within Surrey as they work towards replacing SUIs at their business with reusable alternatives;
- Direct mail-outs to impacted Surrey businesses advising them of the proposed Bylaw and requirements; and
- Leveraging social media to encourage behaviour change amongst residents.

Staff will apprise and forward the communication and awareness campaign plan to Council once developed. The plan will include key actions, timelines and steps required to implement and educate businesses and residents about the new mandatory bans on plastic checkout bags, foam cups and containers and plastic straws.

Developments by Other Levels of Government

While there are various initiatives being undertaken by different levels of government, it remains unknown how various regulations and policies will unfold, what actions will be included and the timelines to implement these initiatives. In the event of any Provincial or Federal programs are developed concurrently and that may affect the City's plans or actions, staff will apprise Council including recommendations on next steps.

Timelines

The proposed next steps are provided in the table below:

Next Step	Anticipated Timeline
Staff to prepare proposed Plastic Bag and SUI Bylaw	March 2020
Proposed Bylaw 1 st , 2 nd , and 3 rd Reading	April 2020
Communication and Education Campaign	April to October 2020
Anticipated Bylaw Approval (4 th Reading)	Fall 2020
Anticipated Bylaw Implementation	January 2021

SUSTAINABILITY CONSIDERATIONS

Taking action on SUIs supports the objectives of the City's Sustainability Charter 2.0. In particular, this initiative supports the Sustainability Charter 2.0 theme of Infrastructure. Specifically, it supports the following Desired Outcomes ("DO") and Strategic Directions ("SD"):

- Materials and Waste DO19: Residents and businesses are conscious of their consumer choices and reuse existing materials first;
- Materials and Waste DO20: Materials and resources are used efficiently, sourced locally where feasible, and repurposed or recycled at the end of their life cycle;
- Materials and Waste DO21: The City is moving toward a zero-waste target, in line with regional waste diversion goals;
- Materials and Waste SD13: Work with local businesses and organizations to maximize the recovery and reuse of local materials and waste products as part of the circular economy; and
- Materials and Waste SD14: Provide tools and educational resources that support residents and businesses to reduce consumption.

CONCLUSION

The Engineering Department recommends that Council authorize staff to bring forward a corporate report with a proposed Plastic Bag and Single-Use Item Bylaw(s) as described in this report and that staff commence development of a communications and education campaign to support residents, affected businesses and other organizations in the transition away from the associated products.

Scott Neuman, P.Eng.
General Manager, Engineering

HJ/cc

Appendix "I" - Corporate Report No. 102; 2019
Appendix "II" - Metro Vancouver Single-Use Toolkit

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CORPORATE REPORT

NO: R102

COUNCIL DATE: May 27, 2019

REGULAR COUNCIL

TO: Mayor & Council

DATE: May 23, 2019

FROM: Acting General Manager, Engineering

FILE: 0450-01

SUBJECT: Update on Single-Use Plastic and Other Items

RECOMMENDATION

The Engineering Department recommends that Council:

1. Receive this report for information; and
2. Endorse the proposed actions as outlined in this report to commence the development of a Single-Use Item Reduction Strategy for Surrey.

INTENT

The purpose of this report is to provide Council with an overview on the Metro Vancouver ("MV") Regional Single-Use Item Reduction Approach and actions that the City will initiate in 2019 to determine options on how best to proceed with developing a single-use item strategy in Surrey.

BACKGROUND

Single-use items are products and packaging that are disposed of after one use. These include take out containers, disposable cups, utensils, plastic straws, plastic bags and plastic water bottles. These items are produced in significant amounts, and the increase in use of them is driven by several factors, including convenience, transportation of goods, food safety, cost savings and durability. It is estimated that over 1.1 billion single-use items are disposed in the MV region each year, which is equivalent to 440 items per person.

Over the years, there has been progress towards reducing waste generated from some single-use items. Currently, some of these items can be recycled by Surrey residents through the Recycle-BC program. Disposable coffee cups can be recycled through the curbside residential collection service, and plastic bags and expanded polystyrene fast food packaging can be recycled at local depots. In addition, recycling of single-use items is also encouraged by the Encorp Deposit Return Stewardship program, and MV's disposal bans also support diversion of these items from landfills.

Despite the above efforts, the use of single-use items results in increased energy and resource consumption, scattered litter, illegal dumping, increased costs to collect from public spaces, and increased landfill waste. Additionally, these items are not all recyclable or compostable. Of even greater significance is that single-use items can end up in waterways, contaminating the water and adversely impacting fish and marine life.

DISCUSSION

There has been increasing momentum globally and locally toward further reducing or eliminating single-use items. Various levels of government at the Federal, Provincial, regional and municipal levels are undertaking initiatives focused on managing single-use items. Specifically, in Canada, there is a mix of regulatory authority over the use of single-use items and the waste created by them. Each level of government has a role to play in the future management of single-use item waste.

The implementation of progressive actions at various levels focused on reducing, eliminating or standardizing single-use items will significantly help with managing waste, decreasing reliance on virgin resources and advancing greener and more sustainable alternatives. Some of the work that is currently being undertaken at various levels includes:

- The Government of Canada has recently introduced steps to reduce plastic waste in its own operations, which include new commitments to divert at least 75% of plastic waste by 2030, eliminate the unnecessary use of single-use plastics, and leverage procurement practices to focus on sustainable plastic products;
- Canada has been an important proponent of the G7 Ocean Plastics Charter, which means more international support and a growing momentum for action on plastic pollution globally;
- The Canadian Council of Ministers of the Environment approved development for a Zero Plastic Waste Strategy in November 2018, which outlines areas where changes are needed across the plastic lifecycle, from design to collection, clean-up and value recovery, and underscores the economic and business opportunities resulting from long-lasting and durable plastics. This is slated to be ready for consideration in 2019, and staff will provide input and feedback on the proposed plan.
- The MV Regional District, in collaboration with member municipalities, is developing an approach towards single-use item reduction (discussed further below);
- Union of BC Municipalities (“UBCM”) Resolution (Provincial Program) in September 2018 passed the resolution that the Province of British Columbia develop a Provincial Single-Use Item Reduction Strategy, as part of a Provincial Zero Waste Strategy (discussed further below); and
- The City of Vancouver is consulting on and plans to implement several single-use item reduction policies including:
 - Bylaws to reduce the number of plastic bags, paper bags, and disposable cups distributed;
 - A “by-request-only” bylaw for disposable utensils;
 - Straw distribution restrictions; and
 - An expanded polystyrene take-out cup and container ban;

Metro Vancouver Single-Use Item Reduction Strategy

A key priority of the Integrated Solid Waste and Resource Management Plan (“ISWRMP”) is waste reduction. Reducing the use of single-use items, such as coffee cups and grocery bags, is an important opportunity to achieve the waste reduction goals of the ISWRMP. In October 2017, the MV Board directed staff to identify options and determine actions to reduce single-use items that are best done at a Regional level (Appendix “I”). Subsequently, the MV Board approved initiating consultation on a regional single-use item reduction strategy in February 2018 (Appendix “II”).

MV has indicated that they have limited regulatory authority in relation to single-use items, and their approach is to develop a single-use item tool kit that member jurisdictions can use as a framework to implement a strategy that is customized to their community. The tool kit will provide municipalities with resources and best practices towards development of a single-use strategy and will promote regional harmonization. Below is a high-level overview of the proposed MV potential actions that have currently been identified to include in the tool kit.

- Identifying priority single-use items, including plastic and paper shopping bags, polystyrene foam cups and take-out containers, disposable hot and cold drink cups, and disposable straws and utensils;
- Developing educational and promotional materials for businesses and residents;
- Exploring options to increase use of reusable items;
- Identifying options to implement fees, discounts or deposits on single-use items;
- Implementing a disposal ban for single-use items at regional facilities;
- Reviewing requirements for use of recyclable and/or compostable materials for single-use items;
- Exploring options to restrict sale of specific single-use items;
- Analyzing and expanding existing data on the use, recycling and disposal of single-use items; and
- Reviewing regulatory options available to restrict or ban certain items.

A workshop with member municipality staff was held in May 2019 to review potential policy and regulatory approaches that can be taken with the various single-use items. The approaches considered at the workshop to reduce single-use items included a mandatory fee, bans, a requirement of reusable items, a requirement of recyclable/compostable items, and by request only from customers.

In addition, a common theme that emerged from the workshop was that a harmonized approach, either via Extended Producer Responsibility Program (“EPR”) or an alternative Provincial single-use item program would be beneficial. A harmonized approach will reduce potential challenges for various stakeholders and provide for an efficient and consistent approach. Advancing a Provincial program was identified as a key measure to include as both a regional and municipal action.

A broader consultation with other stakeholders, such as businesses, industry and the public, will be held by MV in June 2019 to gather further input and feedback. The feedback and input gathered at the municipal and other stakeholder workshops will be taken into consideration to help develop the single-use item tool kit. The MV draft toolkit is scheduled to be completed by July 2019, with the toolkit being presented to the MV Board for their consideration later in 2019.

Union of BC Municipalities Resolution (Provincial Program)

On September 13, 2018, the UBCM passed the resolution that the Province of British Columbia develop a Provincial Single-Use Item Reduction Strategy as part of a Provincial Zero Waste Strategy, which would include, but not necessarily be limited to, plastic and paper shopping bags, polystyrene foam cups and polystyrene foam containers, other hot and cold drink cups and take-out containers, straws and utensils, but would exclude all single-use items needed for medical use or for people with disabilities.

A successful strategy involves a wide array of stakeholders, including residents, businesses, retailers and industry. On this basis, it is beneficial to have a Provincial strategy which will ensure an equitable, transparent, sustainable and consistent approach throughout the region. Independent strategies or restrictions are problematic for retailers and industries operating across many different locations with different requirements and create confusion for the public.

To support the UBCM resolution, the MV Board in February 2019 endorsed the recommendation to write to the Province expressing support on developing a Provincial Single-Use Item Reduction Strategy (Appendix "III"). A Provincial approach would ensure inter-municipal harmonization and consistency for the public, consumers, producers and businesses with operations throughout the Province.

Next Steps

Staff will continue to be actively engaged in the development of the MV Regional single-use item tool kit. The research conducted and tool kit developed will significantly help the City to develop a single-use strategy. In addition, it will also assist with supporting the development of an integrated, consistent and transparent approach across the MV region.

Furthermore, it is recommended that staff continue to work with the region on supporting a harmonized approach at the Provincial level, whether via implementation of an EPR program or an alternative Provincial single-use item program, which will ensure a consistent and coordinated approach with single-use item reduction among communities. This will significantly benefit residents, consumers, businesses, industry and other stakeholders with transitioning towards reducing or eliminating single-use items.

In parallel, there are certain actions that the City can start to undertake while the regional tool kit is being developed and while other developments emerge at the Provincial level. These specific actions are noted below. The development of an efficient and effective strategy requires significant time, consultation with various agencies, data analysis, regulatory review, community involvement and engagement. The information gathered through these actions, along with the MV single-use tool kit, will assist the City in determining options on how best to proceed with developing a single-use item strategy for Surrey.

Surrey Early Actions on Single-Use Strategy Plan

1. Initiate a preliminary community consultation and engagement of residents and businesses to:
 - Provide information on single-use items;
 - Seek input from stakeholders to better understand the challenges and concerns;
 - Identify type of single-use items to target specific to Surrey;
 - Identify how we can work with businesses to implement the strategy;
 - Review unintended consequences with reducing single-use items, such as impacts to businesses, accessibility to alternative products, persons with disabilities, health concerns, affordability, regulatory changes, public health authority requirement, recyclability/composability of alternative items, etc.;
 - Develop timelines required to implement single-use strategy; and
 - Develop and introduce an education campaign on single-use item reduction.
2. Complete, in 2019, a single-use item waste composition study to gain an understanding of the volume and type of single-use items generated and landfilled in Surrey; and
3. Conduct, in 2019, an extensive review of regulatory and legislative authority, including ability to make amendments that will help support the reduction and increase of single-use items.

SUSTAINABILITY CONSIDERATIONS

A single-use item reduction strategy supports the objectives of the City's Sustainability Charter 2.0. In particular, it supports the Sustainability Charter 2.0 theme of Infrastructure. Specifically, a single-use item reduction strategy supports the following Desired Outcomes ("DO") and Strategic Directions ("SD"):

- Materials and Waste DO19: Residents and businesses are conscious of their consumer choices and reuse existing materials first;
- Materials and Waste DO20: Materials and resources are used efficiently, sourced locally where feasible, and repurposed or recycled at the end of their life cycle;
- Materials and Waste DO21: The City is moving toward a zero-waste target, in line with regional waste diversion goals;
- Materials and Waste SD13: Work with local businesses and organizations to maximize the recovery and reuse of local materials and waste products as part of the circular economy; and
- Materials and Waste SD14: Provide tools and educational resources that support residents and businesses to reduce consumption.

CONCLUSION

The use of single-use items results in increased energy and resource consumption, scattered litter, and increased landfill waste. Additionally, these items are not all recyclable or compostable and end up in waterways, contaminating the water and adversely impacting fish and marine life. There has been increasing momentum and various levels of government at the Federal, Provincial, regional and municipal levels are undertaking initiatives focused on managing single-use items.

A key priority of the ISWRMP is waste reduction. MV has indicated that they have limited regulatory authority in relation to single-use items, and their approach will be developing a single-use item tool kit that member jurisdictions can use as a framework to implement a strategy. In parallel, the City will start to undertake specific actions as outlined in this report, which can be used as input to the MV tool kit and will assist in determining options on how best to proceed with developing a single-use item strategy for Surrey. In addition, it is recommended that staff continue to work with the region on supporting a harmonized approach at the Provincial level, whether via implementation of an EPR program or an alternative provincial single-use item program.

Staff will prepare a report to Council later in 2019 with updates on the plan and how to proceed with the development of a single-use item reduction strategy in Surrey.



Jaime Boan, P.Eng.
Acting General Manager, Engineering

HJ/cc

Appendix "I" – Single-Use Item Reduction Strategy Update

Appendix "II" – Regional Single-Use Item Reduction Strategy Research and Consultation

Appendix "III" – Single-Use Item Reduction Approach



Single-Use Item REDUCTION TOOLKIT





Introduction

Action on single-use item reduction is important to a wide range of stakeholders in Metro Vancouver, for environmental, health and sustainability reasons. Solutions to current challenges require collaboration and innovation from all sectors and initiatives are already underway across civil society, industry and the public sector. The purpose of this toolkit is to provide information and resources that support local governments implementing programs and policies to reduce single-use item use.

This document highlights leading single-use reduction initiatives and provides information on a range of policy options for local governments in Metro Vancouver to consider in the development of their own approaches. The toolkit focuses on priority single-use items identified by the Metro Vancouver Board including, bags, cups, takeout containers, straws and utensils. Additional resources including a jurisdictional scan and an annotated bibliography of leading research are available on our website. The information in this toolkit is to be used as a guiding document and can be modified to fit the requirements of each local government.

This toolkit is a living document and may be updated periodically.

The toolkit is not a legal document and should not be considered a substitute for governing legislation and regulation.

Single-Use Items Disposed

In 2018, 1.1 billion single-use items were disposed in the Metro Vancouver region¹. Of that, a third were utensils, a quarter bags and a quarter cups. That is equivalent to 440 items per person per year. Approximately 57% of the items are plastic, 22% are plastic-lined paper the the remaining are paper or wood. While these figures are surprisingly high, single-use items are small and light so they only account for 2.4% of garbage in the region.

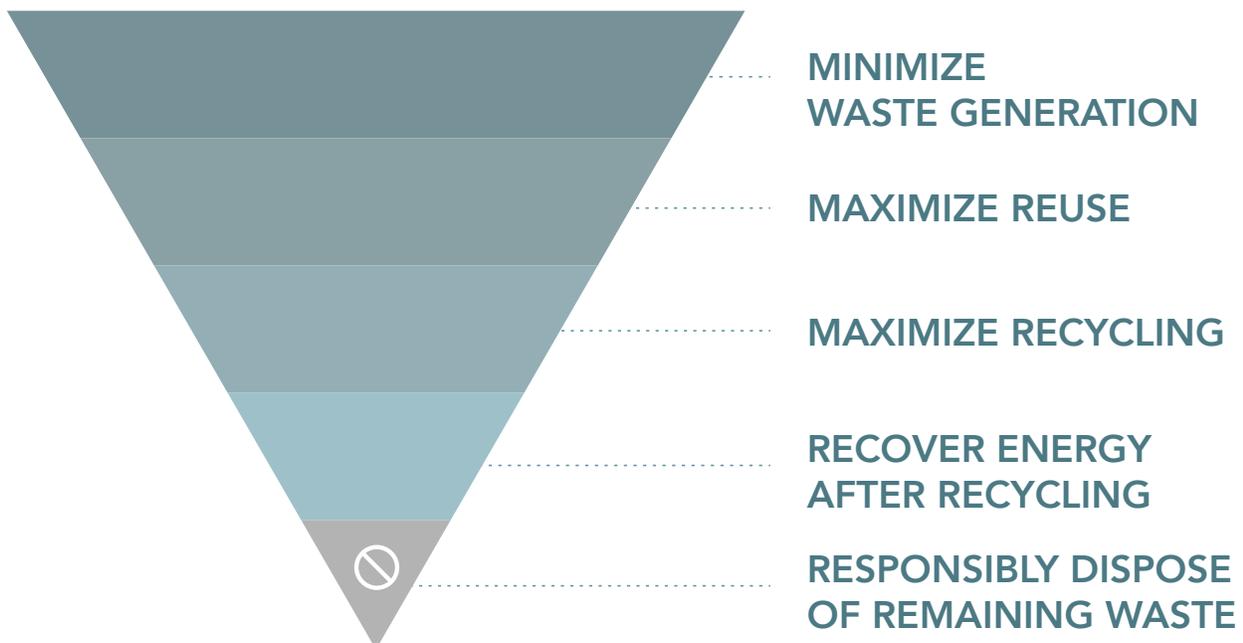
SINGLE-USE ITEM TYPE	ITEM DISPOSED (MILLIONS)	% BY WEIGHT OF OVERALL COMPOSITION
Retail Bags	256	0.9%
Disposable Cups	262	0.6%
Takeout Containers	179	0.7%
Straws	102	<0.1%
Utensils	331	0.1%
TOTAL	1.1 Billion	2.4%

¹ 2018 Single-Use Item Waste Composition Study

Why Single-Use Item Reduction?

- Single-use items cost taxpayers millions of dollars per year to collect from public waste bins and to clean up as litter in parks, streets and greenspaces;³
- Reducing single-use items helps protect oceans from marine litter. Food wrappers, plastic bags, plastic cup lids, straws and stirrers, and foam takeout containers are all listed as part of the top 10 collected items by the Oceans Conservancy organization;⁴ and
- Single-use items take a significant amount of resources to produce and consume valuable space in our landfills, for items that are only used once.

This toolkit emphasizes reduction and reuse over recycling and disposal. This approach is most effective at preventing litter, protecting our oceans, reducing street collection costs and reducing resources needed to produce single-use items.



³ City of Vancouver Single-Use Item Reduction Consultation Paper

⁴ Ocean Conservancy Coastal Cleanup 2017 Report

Existing Regulatory Framework

Work on single-use item and plastics reduction is happening within all orders of government, from regulation and policy, to reduction programs in communities across the country. Coordination and cooperation is critical. Metro Vancouver is working with its member jurisdictions and partners in

government and industry to advance common goals. Also, the National Zero Waste Council, an initiative of Metro Vancouver, includes a Plastics Advisory Panel. This panel plays an advisory role to regulatory approaches to plastics that are being advanced nationally.⁵

Current Initiatives

GOVERNMENT OF CANADA	PROVINCE OF BRITISH COLUMBIA	BC MUNICIPALITIES
<ul style="list-style-type: none"> Plans to ban harmful single-use plastics by 2021 	<ul style="list-style-type: none"> Residential single-use packaig including bags, cups and takeout containers included in EPR under the Recycling Regulation Clean BC Plastics Action Plan 	<ul style="list-style-type: none"> Several B.C. local governments have or are in the process of introducing policies to reduce problematic single-use items.

5 National Zero Waste Council Plastics Advisory Panel Regulatory Approaches for Priority Plastics Wastes

Recycling and Collection Systems for Single-Use Items:

The best option is always to choose reusable alternatives.⁶ For single-use items that cannot be avoided, it's best to select items that are readily accepted in existing recycling infrastructure. Within each item category this toolkit provides an overview of which items are typically accepted within existing recycling and collection systems. This is often a confusing area for businesses to navigate. Many businesses find it frustrating if they invest in new products, only to learn there are currently no options for managing them apart from garbage.

While it is sometimes difficult for local governments to recommend specific products to business, it is possible to provide some guidance and best practices:

- ✓ Durable reusable materials are preferable.
- ✓ Businesses that don't have dishwashing capability, can look into third party services providers of washed reusable food service ware.
- ✓ Businesses looking at new products should confirm they are accepted in typical office recycling programs; on-street recycling bins; and residential recycling programs as this is where items often end up.
- ✓ Check with your recycling and green bin service provider, make sure whatever items you select can be composted or recycled.
- ✓ Provide clear signage on your recycling bins to help customers sort their waste.
- ✓ Provide clear instructions on branded materials so customers know what to do with the items when they are done.
- ✓ Clear rigid PET, HDPE and PP are often high value recyclable materials. Whereas black plastics are often hard to recycle. Work with your supplier and local recyclers to make sure your food service ware is widely accepted for recycling.
- ✓ Support recycling markets by specifying recycled content.
- ✓ Fibre-based products are commonly accepted in green bins. However, some have plastic liners, synthetic waxes or intentionally added per- and poly- flouoraokyl substances (PFASs) which are not safe for composting. Work with your supplier and local composters to find products that don't have these problematic coatings.
- ✓ Wood utensils are commonly accepted in green bin programs.

⁶ Oregon DEQ Reusable Food Service Ware

Single-Use Item Policy and Regulatory Options

The toolkit focuses on providing information on retail bags, cups, takeout containers, straws and utensils. For each item, it explores by-request, mandatory fees, bans and requiring reusable food service ware.



BAGS



CUPS



TAKEOUT CONTAINERS



STRAWS



UTENSILS

By-Request Only	By-Request Only	By-Request Only	By-Request Only	By-Request Only
Mandatory Fee	Mandatory Fee	Mandatory Fee	Mandatory Fee	Mandatory Fee
Ban	Ban	Ban	Ban	
	Require Reusable	Require Reusable		Require Reusable

By-Request Only (On-Demand Policies)

By-request bylaws prevent the unnecessary distribution of single-use items. Often food and beverage retailers automatically include straws, stirrers, utensils and condiments in drive-through, on-line, delivery, take-out and dine-in orders. Some customers may not need these items. Requiring them to be only handed out upon customer request reduces single-use items while keeping items available for those that need them. (See City of Portland in the jurisdiction scan.)

Mandatory Fee

Mandatory fees bylaws require businesses to charge for single-use items that they distribute to customers. Most bylaws state that the business keep the fees to avoid creating a tax. Several studies confirm that fees are more effective than discounts in motivating customers to change behavior. (See several examples of fees included as part of bag bans in jurisdiction scan.)

WHAT WE HEARD:

Businesses typically use the fees to offset costs of environmental programs, Extended Producer Responsibility fees and checkout implementation costs. Customers want to know what happens with the fees and appreciate when business are transparent as to how they spend the fees collected.

Require Reusable

Requiring reusable policies are most commonly applied to dine-in restaurants. While some dine-in restaurants no longer have on-site dishwashing capabilities, the City of Berkeley was able to pass a reusable food service ware bylaw for dining on premises due to the emergence of off-site dishwashing service providers. (See City of Berkeley in the jurisdiction scan.)

Ban on Sale or Use

Bans restrict businesses from distributing specific single-use items to customers. Bans typically result in high reduction. To reduce unintended consequences of alternatives materials such as paper bags if plastic bags are banned, many jurisdictions include additional restrictions on the sale and use of alternatives materials including:

- Mandatory fees retained by the business;
- Definition of reusable;
- Recycled content;
- Complete definitions that include plastics labeled biodegradable or compostable; and
- Exemptions to keep items available those that need them for health and safety.

(See jurisdiction scan for several examples of single-use plastics bans on bags and straws.)

Enforcement

While voluntary compliance is common for these types of policies; businesses may need support to make sure they understand what they need to do in your community. Many jurisdictions focus on education and only use enforcement as a last resort for businesses that do not comply.

Common approaches to enforcement include:

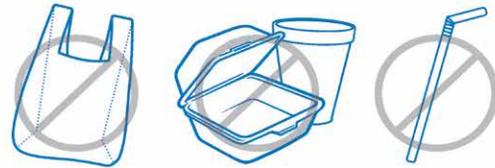
- Sending an education ambassador first to let businesses not in compliance know that there are new rules they must follow and to provide them with resources to comply.
- Official warning by bylaw officers followed by fines for businesses that do not change after being educated of new rules.

Education and enforcement is initiated in either a reactive or proactive way:

- Sending an education or enforcement officer to investigate when cities receive complaints from employees and customers that businesses are not following the new regulations.
- Proactive follow up where an education ambassador targets a manageable number of locations per week based on resource availability to actively confirm businesses are following the new regulations and provide resources to support those who are not yet in compliance. These follow ups can be on the phone, in-person or both.

Communication

All policy or regulation change should be partnered with a robust communications plan or campaign to ensure residents and businesses receive education about updated bylaws. Communications plans can include behavior change supporting collateral, web resources and advertising. There is an opportunity to consult local businesses when creating material to ensure they have the resources needed to educate their customers about the changes. There have been very successful education campaigns in jurisdictions where 'by-request' or bans have been implemented (See jurisdiction scan for examples.)



Let's be leaders!

Say no to single-use items. Let's stop unnecessary waste and reduce pollution.

Richmond's proposed Bylaw 10000 is being reviewed by the provincial government for approval and would ban:

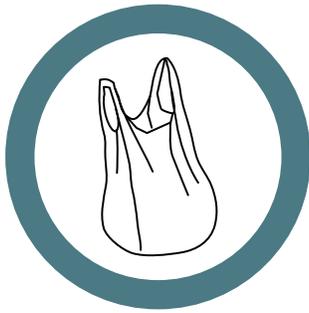
- **plastic checkout bags**, including compostable plastic and biodegradable plastic;
- **foam food service ware**, including plates, clamshell containers, bowls and cups; and
- **plastic straws**, including compostable plastic and biodegradable plastic.

Learn more about Richmond's proposed ban on single-use plastics and other items by visiting www.richmond.ca/singleuse.



For more information:
604-276-4010
singleuse@richmond.ca
www.richmond.ca/singleuse

 Richmond



Bags

256 Million
Retail bags disposed in
Metro Vancouver in 2018⁷

14 Million Paper bags⁷

155 Million Re-used plastic retail bags⁷

87 Million Empty plastic retail bags⁷

600 Plastic bags labelled compostable⁷

Policy Options and Key Considerations

POLICY	KEY CONSIDERATIONS
<p>BY-REQUEST ONLY: Only distribute if the customer asks.</p>	<ul style="list-style-type: none"> • Encourages reduction of avoidable bags. • Increases awareness. • Saves businesses money through reduced purchasing. • Good first step in a phased approach. • Challenge to confirm non-compliance. • More common for items such as straws, utensils and condiment packages than bags.
<p>MANDATORY FEE: Charge a minimum fee.</p>	<ul style="list-style-type: none"> • Encourages reuse. • More effective than discounts.^{8,9} • Material agnostic. Fees can be applied to plastic, paper and reusable bags. • Determine who keeps fees. Local governments cannot keep fees without it being considered a tax. • Consider affordability when setting fees. • Set harmonized fees by matching or collaborating with neighboring jurisdictions to reduce impact to business and residents.

DID YOU KNOW?

According to Ireland's litter monitoring study plastic bag litter in Ireland decreased from from 5% to 0.5% after the introduction of a \$0.22 mandatory fee on plastic checkout bags.¹⁰

7 2018 Single-Use Item Waste Composition Study

8 Hubbub Impact Report - Disposable Cup Charge

9 Cardiff University Results of a Field Experiment To Reduce Coffee Cup Waste

10 Ireland 2018 National Litter Pollution Monitoring Study

POLICY	KEY CONSIDERATIONS
<p>BAN: Ban on the distribution of plastic bags.</p>	<ul style="list-style-type: none"> • Increases reuse. • Result in an overall decrease in plastic consumption despite increase purchase of trash bags.¹² • Include plastic bags labelled compostable or biodegradable. • Minimize environmental tradeoffs from increase in alternatives bags by requiring recycled content and setting minimum fees for alternatives such as paper and reusable bags. • Businesses need time to source alternatives and use up existing stock. • Customers may encounter challenges transporting leaky materials. • Clearly define which materials and which bags are included or excluded. Check out Retail Council of Canada summary of types of bags banned and exemption list summary here.

Government Leadership and Innovation

Several local jurisdictions in B.C. and across Canada have passed regulations to ban bags. Across Canada several jurisdictions including Montreal, Jasper and the Province of PEI have banned plastic bags. Connecticut introduced a statewide fee on bags, and provided clear jurisdiction to local government to implement stricter measures such as bans. Austin Texas monitored the impacts of their Bag Ordinance and found it reduce litter by 75-90%.¹¹ [Click here for details.](#)

Collection

Residents can recycle bags through RecycleBC's curbside program (paper bags) and depot program (plastic bags). Businesses must pay for private recycling pick-up. Plastic bag recycling is often an add-on recycling service. Plastic checkout bags labelled compostable or biodegradable are not readily accepted by composters that process materials from residential and business green bins in Metro Vancouver.

Business Leadership and Innovation

Several business have implemented fees for bags as a measure to reduce plastic retail bags. RecycleBC and the Retail Council of Canada created a guideline for businesses on how to reduce plastic bags.

DID YOU KNOW?

Plastics bags labelled compostable or biodegradable:

- ! Are not accepted in many municipal green bin programs; and
- ! Do not break down in marine environments.

WANT TO LEARN MORE?

A jurisdiction scan and an annotated bibliography are available on our single-use item reduction website.

¹¹ Environmental Effects of the Single Use Bag Ordinance in Austin, Texas

¹² The Effect of Disposable Carryout Bag Regulations on Unregulated Bags



Containers

179 Million
Cups disposed in
Metro Vancouver in 2018¹³

71 Million Rigid Plastic Takeout Containers¹³

62 Million Plastic-Lined Paper
Takeout Containers¹³

34 Million Foam Takeout Containers¹³

12 Million Unlined Paper Takeout Containers¹³

Policy Options and Key Considerations

POLICY	KEY CONSIDERATIONS
<p>BY-REQUEST ONLY: Only distribute if the customer asks.</p>	<ul style="list-style-type: none"> • Encourages reduction of avoidable containers. • Increases awareness of the need for container reduction. • Businesses save money through reduced purchasing. • Good first step in a phased approach. • Challenge to confirm non-compliance. • No readily available data on reduction impact.
<p>MANDATORY FEE: Charge a minimum fee.</p>	<ul style="list-style-type: none"> • More effective than discounts.^{14,15} • Encourages reduction and reuse. • Material agnostic. Fees can be applied to all takeout containers. • Health authority requirements would need to be updated to allow customers to bring their own containers more easily (currently businesses must wash containers first) or business would need develop reusable container share programs to meet current requirements.¹⁶ • Set harmonized fees by matching or collaborating with neighboring jurisdictions to reduce impact to business and residents.
<p>FOAM CONTAINER BAN: Ban on the distribution of foam takeout containers.</p>	<ul style="list-style-type: none"> • Eliminates use of foam containers which are challenging as they are only collected at depot. • Engage with stakeholders such as hospitals, churches, shelters and small business which commonly use foam containers. • Businesses need time to source alternatives and use up existing stock.
<p>REQUIRE REUSABLES: Require restaurants to provide reusable food service ware for customers.</p>	<ul style="list-style-type: none"> • Reduces cups disposed. • As phased-in approach starting with dine-in businesses would allow reusable options to develop. • Container-shares would allow the option to be used for to-go. • Some businesses lack dishwashing infrastructure.

¹³ 2018 Single-Use Item Waste Composition Study

¹⁴ Hubbub Impact Report - Disposable Cup Charge

¹⁵ Cardiff University Results of a Field Experiment To Reduce Coffee Cup Waste

¹⁶ Public Health Act Food Premises Regulation

Government Leadership and Innovation

City of Vancouver and City of Richmond are looking to implement foam cup and container bans. City of Portland banned foam cups and containers in 2013. [Click here for more details.](#)

Collection

Single-use containers are made out of a number of materials. Rigid plastic containers are typically made out of PET (#1) or PP (#5) plastics and can be readily recycled in residential and commercial recycling programs. Residential foam cups can be recycled at RecycleBC depots; however, they are not readily recycled in the commercial and institutional sectors.

Plastic-lined paper containers are accepted in RecycleBC residential blue bins programs; however, they are not readily recyclable in the commercial sector. Some commercial service providers include them in paper recycling which can be problematic as the plastic liners gum up paper pulping machines. Other commercial programs include plastic-lined paper in container recycling which are then made into low grade fuels with other hard-to-recycle plastics and multi-layer products. Rigid plastic containers and plastic-lined paper containers labeled compostable are not readily accepted in green bin programs.

Business Leadership and Innovation

Retailers are taking voluntary actions to reduce containers in advance of regulations. Some institutions have implemented container share programs. Businesses have started container-deposit return programs.

DID YOU KNOW?

Plastics containers labelled compostable or biodegradable:

- ! Are not accepted in all municipal green bin programs; and
- ! Do not break down in marine environments.

WANT TO LEARN MORE?

A jurisdiction scan and an annotated bibliography are available on our single-use item reduction website.



Cups

262 Million
Cups disposed in
Metro Vancouver in 2018¹⁷

122 Million Plastic-Lined Paper Hot Cups¹⁷

59 Million Plastic-Lined Paper Cold Cups¹⁷

53 Million Rigid Plastic Cups¹⁷

28 Million Foam Cups¹⁷

Policy Options and Key Considerations

POLICY	KEY CONSIDERATIONS
<p>BY-REQUEST ONLY: Only distribute if the customer asks.</p>	<ul style="list-style-type: none"> • Encourages reduction of avoidable cups. • Increases awareness of the need for cup reduction. • Businesses save money through reduced purchasing. • Good first step in a phased approach. • Challenge to confirm non-compliance. • No readily available data on reduction impact.
<p>MANDATORY FEE: Charge a minimum fee.</p>	<ul style="list-style-type: none"> • Encourages reuse. • Material agnostic. Fees can be applied to all types of cups. • More effective than discounts.^{18,19} • Determine who keeps fees. Local governments cannot keep fees without it being considered a tax. • Set harmonized fees by matching or collaborating with neighboring jurisdictions to reduce impact to business and residents.
<p>FOAM BAN: Ban on the distribution of foam cups.</p>	<ul style="list-style-type: none"> • Eliminates use of foam cups which are challenging as they are only collected at depot. • Engage with stakeholders such as hospitals, churches, shelters and small business which commonly use foam cups. • Businesses need time to source alternatives and use up existing stock.
<p>REQUIRE REUSABLES: Require sit down restaurants and for-here options to provide reusable cups.</p>	<ul style="list-style-type: none"> • Reduces cups disposed. • As phased-in approach starting with dine-in businesses would allow reusable options to develop. • Cup-shares would allow the option to be used for to-go. • Some businesses lack dishwashing infrastructure.

¹⁷ 2018 Single-Use Item Waste Composition Study

¹⁸ Hubbub Impact Report - Disposable Cup Charge

¹⁹ Cardiff University Results of a Field Experiment To Reduce Coffee Cup Waste

Government Leadership and Innovation

City of Vancouver and City of Richmond are looking to implement foam cup and container bans. City of Portland banned foam cups and containers in 2013. [Click here for more details.](#)

Collection

Single-use cups are made out of a number of materials. The most common takeout cups are plastic-lined paper more commonly known as coffee cups. Paper cups for hot and cold beverages are accepted in RecycleBC residential blue bins programs; however, they are not readily recyclable in the commercial sector. Some commercial programs accept them in paper which can be problematic as the plastic liners gum up paper pulping machines. Some commercial programs include paper cups in containers, which is then made into low grade fuels with other hard-to-recycle plastics and multi-layer products. Residential foam cups can be recycled at RecycleBC depots; however, they are not readily recycled in the commercial and institutional sectors. Rigid plastic cups are typically made out of PET (#1) or PP (#5) plastics and can be readily recycled in residential and commercial recycling programs. Rigid plastic cups and plastic-lined paper cups labeled compostable are not readily accepted in green bin programs.

Business Leadership and Innovation

Retailers are taking voluntary actions to reduce cups in advance of regulations. They are piloting and implementing a variety of tactics including: cup-share programs; skip-the line if you bring your own mug; fees for disposable; discounts if you get a for-here cup or bring your own mug. Some retailers even stopped providing disposable cups for a day to raise awareness.

DID YOU KNOW?

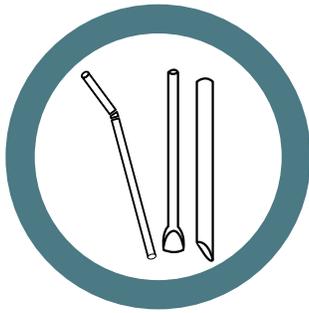
Most paper coffee cups have a plastic liner and shouldn't go in the green bin.

Cups labeled biodegradable or certified compostable:

- ❗ Are not accepted in all municipal green bin programs; and
- ❗ Do not break down in marine environments.

WANT TO LEARN MORE?

A jurisdiction scan and an annotated bibliography are available on our single-use item reduction website.



Straws

102 Million
Straws disposed in
Metro Vancouver in 2018²⁰

102 Million Plastic Straws²⁰

300 Thousand Paper Straws²⁰

Policy Options and Key Considerations

POLICY	KEY CONSIDERATIONS
<p>BY REQUEST ONLY: Only distribute if the customer asks.</p>	<ul style="list-style-type: none"> • Encourages reduction of avoidable straws. • Increases awareness of the need for straw reduction. • Businesses save money through reduced purchasing. • Good first step in a phased approach. • Challenge to confirm non-compliance. • No readily available data on reduction impact.
<p>MANDATORY FEE: Charge a minimum fee.</p>	<ul style="list-style-type: none"> • Encourages reuse. • Material agnostic. Fees can be applied to plastic and paper straws. • More effective than discounts.^{21,22} • Determine who keeps fees. Local governments cannot keep fees without it being considered a tax. • Set harmonized fees by matching or collaborating with neighboring jurisdictions to reduce impact to business and residents.
<p>BAN: Ban on the distribution of plastic straws.</p>	<ul style="list-style-type: none"> • Effective at reducing straws. • Include plastic straws labelled compostable or biodegradable. • Consider and engage with customers who rely on straws for accessibility. • Could impact on businesses selling frozen blended beverages or bubble tea. • Businesses need time to source alternatives and use up existing stock.

²⁰ 2018 Single-Use Item Waste Composition Study

²¹ Hubbub Impact Report - Disposable Cup Charge

²² Cardiff University Results of a Field Experiment To Reduce Coffee Cup Waste

Government Leadership and Innovation

Several BC communities have included straws in their single-use item reduction bylaws. As of October 1, 2019 the City of Portland requires that business only provide straws to customers if they request them. [Click here for details.](#)

Collection

Plastic straws are hard-to-recycle and are not included in residential recycling programs and are rarely included in paid commercial recycling programs. Plastic straws labelled compostable are not readily accepted in compost programs. Paper and edible straws (i.e. pasta-noodles type straws) are commonly accepted in green bin programs provided they don't have any adhesives, coatings or linings that impact the composting process.

Business Leadership and Innovation

Retailers are taking voluntary actions to reduce straws in advance of regulations. Some retailers have done away with straws completely. Others have switched to reusable straws or provide disposable straws only by-request. Many are now aware of the importance of stocking plastic bendy straws for accessibility.

DID YOU KNOW?

Plastics straws labelled compostable or biodegradable:

- ❗ Are not accepted in all municipal green bin programs; and
- ❗ Do not break down in marine environments.

WANT TO LEARN MORE?

A jurisdiction scan and an annotated bibliography are available on our single-use item reduction website.



Utensils

331 Million
Utensils disposed in
Metro Vancouver in 2018²³

217 Million Wood Utensils²³

114 Million Plastic Utensils²³

Policy Options and Key Considerations

POLICY	KEY CONSIDERATIONS
<p>BY-REQUEST ONLY: Only distribute if the customer asks.</p>	<ul style="list-style-type: none"> • Encourages reduction of avoidable utensils. • Increases awareness of the need for single-use utensil reduction. • Businesses save money through reduced purchasing. • Good first step in a phased approach. • Challenge to confirm non-compliance. • No readily available data on reduction impact.
<p>MANDATORY FEE: Charge a minimum fee.</p>	<ul style="list-style-type: none"> • Encourages reuse.¹ • Material agnostic. Fees can be applied to wood and plastic utensils. • More effective than discounts.^{24,25} • Determine who keeps fees. Local governments cannot keep fees without it being considered a tax. • Set harmonized fees by matching or collaborating with neighboring jurisdictions to reduce impact to business and residents.
<p>BAN: Ban on the distribution of plastic utensils.</p>	<ul style="list-style-type: none"> • Effective at reducing utensils. • Include plastic utensils labelled compostable or biodegradable. • Business need time to source alternatives and use up existing stock.
<p>REQUIRE REUSABLES: Require sit down restaurants and for-here options to provide reusable cutlery.</p>	<ul style="list-style-type: none"> • Reduces utensils disposed. • As phased-in approach starting with dine-in businesses would allow reusable options to develop. • Some businesses lack dishwashing infrastructure.

23 2018 Single-Use Item Waste Composition Study

24 Hubhub Impact Report - Disposable Cup Charge

25 Cardiff University Results of a Field Experiment To Reduce Coffee Cup Waste

Government Leadership and Innovation

City of Vancouver included utensils in their Single-Use Item Reduction Strategy. City of Portland requires them to be by-request only - even restaurants that use third party apps to deliver meals to customers. [Click here for details.](#)

Collection

Plastic utensils are hard-to-recycle and are not included in residential recycling programs and are rarely included in paid commercial recycling programs. Plastic utensils labelled compostable are not readily accepted in compost programs. Wood utensils, including bamboo chopsticks, are commonly accepted in green bin programs provided they don't have any adhesives or coatings that impact the composting process.

Business Leadership and Innovation

Some food outlets are switching to reusable cutlery for-here and disposables by-request only. Mobile food delivery applications have piloted a required question in the order form to confirm if cutlery is needed by the customer.

DID YOU KNOW?

Plastics utensils labelled compostable or biodegradable:

- ! Are not accepted in all municipal green bin programs; and
- ! Do not break down in marine environments.

WANT TO LEARN MORE?

A jurisdiction scan and an annotated bibliography are available on our single-use item reduction website.

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