



**The Corporation of the City of Guelph**  
**Solid Waste**  
**Management**  
**Master Plan**  
**Downtown Service Review**

September 2021



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# Executive Summary

The City of Guelph (City) is updating its Solid Waste Management Master Plan (SWMMP). This Downtown Services Review Report (Report) is a sub-report for the SWMMP. The purpose of this report is to provide an overview of the current waste collection services in Guelph's downtown in terms of waste collection services for businesses and the use of public space containers and options to increase efficiencies.

## Overview

The City of Guelph offers six day a week waste collection services in the downtown core of grey, blue and green carts to all businesses and residents. Public space containers (PSC) are also provided and used by both the general public and downtown businesses and residents.

The objective of the downtown services review was to identify the key waste management challenges experienced in the downtown core and identify viable solutions that meet the needs of impacted stakeholder groups. The following steps were taken to identify key challenges and solutions associated with the Downtown:

- Established a Downtown Stakeholder Group (DSG);
- Completed a comprehensive questionnaire with specific questions about the level of service provided to downtown areas or BIAs;
- Carried out research on five Ontario municipalities that are comparable to Guelph (City of Hamilton, City of Kingston, City of Ottawa, Halton Region and the Region of Waterloo);
- Reviewed alternative funding models (e.g., Pay-as-you-throw); and,
- Carried out a preliminary review of the public space containers in the Downtown.

Based on the steps identified above, some of the current challenges facing the downtown core include:

- Current collection system does not provide any financial incentives to reduce garbage.
- Businesses and residences lack space to store carts on their premises.

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- PSC are used by pedestrians, businesses and residents which results in frequent over-flow conditions.
- The mobile PSCs are being moved about constantly and often are bunched together in locations that block store entrances or parking areas.

Based on the above, two recommendations were developed to address some of the waste management needs specific to the downtown core and are outlined below.

It should be noted that originally the City had planned to generate waste collection services options for Guelph's Downtown based on extensive engagement with the DSG. However, engagement was put on hold in March of 2020 due to COVID-19 and the special challenges facing the downtown. It was decided to engage the downtown stakeholders at a more suitable time as part of the Downtown Infrastructure Revitalization Program which is set to launch in 2022. The Downtown Infrastructure Revitalization Program will provide additional opportunities to engage Downtown stakeholders, including the DSG.

### Feedback from Engagement Activities

In the context of the SWMMP Update, feedback on the downtown core was mainly gathered through Survey #1. A question about the Public Space Containers was included in Survey#1. Overall, we heard that respondents were dissatisfied with the following elements of the PSCs: odour, appearance, and pests.

#### What we heard:

- **Bins are often full and overflow**
- **Improve sorting for the Public Space Containers**
- **The Public Space Containers are not aesthetically pleasing**

Staff from Economic Development and By-Law were also engaged on the Downtown Services Review. Overall there was strong support from the By-Law and Economic Development stakeholders engaged in the SWMMP Update.

**What we heard:**

- **There was a suggestion to speed up the process and do the pilot project next year with a few volunteer business**
- **Businesses see that the current system is not working and want a better alternative sooner**
- **Businesses will see this as a service improvement and it will benefit guests to the downtown**
- **There is a desire to keep garbage off the streets of the downtown**
- **By-law should be consulted and engaged through the pilot to provide feedback, understand the process and determine enforcement measures**

**Recommendations**

Based on the information presented above, the following recommendations are put forward as part of the SWMMP Update to address waste collection services in Downtown Guelph.

**Downtown Waste Collection Service:**

- Conduct further engagement, as part of the Downtown Infrastructure Revitalization Program, for a potential pilot project where participating businesses and residents receive daily door-to-door collection system that will move materials to a central collection area for pick-up. Pilot door-to-door collection and use information to explore enforcement measures and alternative funding models.

**Downtown Public Space Containers:**

- Permit the use of PSCs for pedestrians only. Consolidate PSCs and strategically place in permanent locations with colour coding to help reduce contamination and improve the quality/quantity of recyclable materials captured.

The COVID-19 pandemic has had a significant impact on the Downtown Services Review for the SWMMP. Therefore, based on the research completed to date and the feedback received from the TAC, DSG and other impacted stakeholder groups, it is recommended that the City conduct a pilot project to better understand the partnership arrangements with the Downtown Guelph Business Association (DGBA) and the costs to implement and manage the requirements for a centralized collection approach.

Through the pilot project, aspects of the centralized collection approach can be tested such as using yellow bags for garbage, separate collection systems for Blue Box recyclables and Green Bin organics, the collection equipment, and staffing. The pilot project would further evaluate cost effectiveness of waste collection in the downtown and work through operating issues and concerns specific to the downtown Guelph, as well as address future funding models.

The City will continue consultation on downtown waste collection beyond the initial presentations made to the Economic Development Advisory Committee (E D A C) and D G B A, as part of the Downtown Infrastructure Revitalization Program. The Downtown Infrastructure Revitalization Program will focus on underground and above ground distribution and space needs, with waste management being a key component to be considered.

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# 1.0 Introduction

The City of Guelph offers extensive waste collection services to establishments in the downtown core, providing green, blue and grey cart collection to all businesses and residents using a variety of approaches. Service is provided six days per week, Monday to Saturday. Despite the waste management and diversion services currently provided to the downtown core, the downtown area is currently dealing with several issues:

- Service level and performance - Waste management services provided to businesses in the downtown area need to ensure a balance is achieved between a satisfactory level of service and a cost-efficient service, which is affordable to businesses.
- Public space recycling – The Downtown Guelph Business Association (DGBA) has suggested that despite being satisfied with the availability of public space containers (PSCs) in the downtown area, the PSCs could be more aesthetically appealing. It is unclear, however, whether the public space containers are meeting performance needs (e.g., high diversion and low cross contamination).
- Mixed use buildings – There is a need to address mixed use living to ensure both businesses and residents are effectively serviced.

City staff have identified these challenges as priority areas, which were intended to have been addressed through the Solid Waste Management Master Plan (SWMMP) but with face-to-face engagement curtailed due to COVID-19, the framework needed to be modified to enable staff to continue engaging in discussions with downtown stakeholders post SWMMP and addressing these needs over time.

## 1.1 Objectives

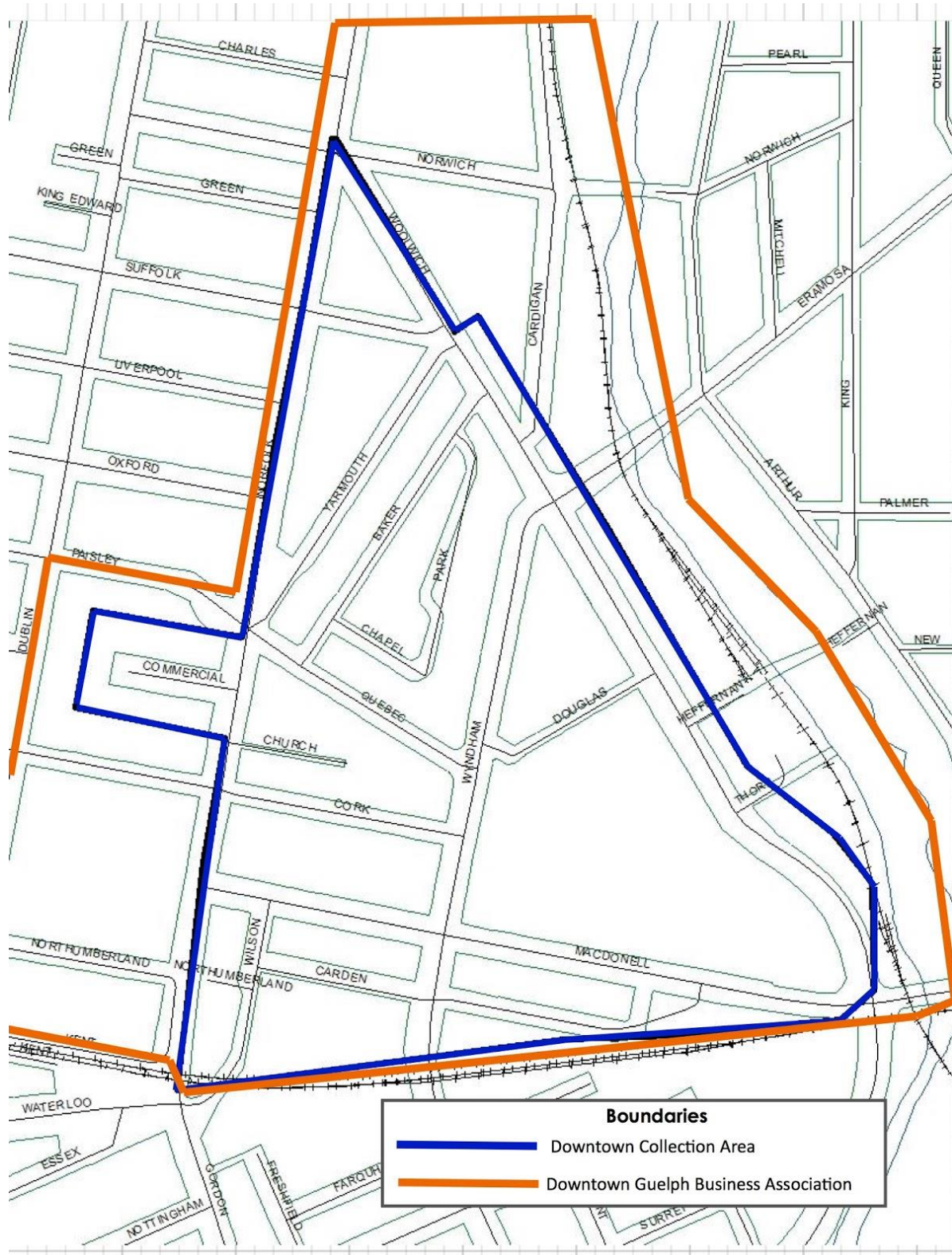
The objective of the Downtown Service Review task is to identify the key waste management challenges experienced in the downtown core and, using different research and engagement approaches, identify viable solutions that meet the needs of impacted stakeholder groups.

## 2.0 Current State of Downtown Collection Services Provided by the City of Guelph

As shown in **Figure 2.1**, the area outlined in orange outlines the boundary for the Downtown Guelph Business Association (DGBA) and the area in blue outlines the boundary for the Downtown Collection Area's (DCA) specialized waste collection service. The boundary lines drawn are either in the middle of the road, which means only the downtown side of the line gets City service, or along the side of road, which means both sides of the street receive City collection service. The DGBA boundary encompasses about one-third more area than what is covered by the downtown collection area.

### 3 | Current State of Downtown Collection Services Provided by the City of Guelph

Figure 2.1: Areas Defining the Downtown Collection Area and Downtown Guelph Business Association



## 4 | Current State of Downtown Collection Services Provided by the City of Guelph

### 2.1 Collection Services Provided to Downtown Businesses and Residential Units

The City provides three stream (garbage, recycling and organics) collection services in the downtown core on a six day per week (Monday through Saturday) schedule.

The City of Guelph offers a range of flexible three-stream waste collection approaches to establishments in the downtown core that best meet their needs, including:

- Collection of green, blue, and grey carts from individual establishments.
- Collection from a communal set of carts - green for organic, blue for recyclables, and grey for garbage - shared with other businesses and/or residents.
- Use of public space containers along the street for garbage, recyclables and organics.

Businesses in the downtown core can choose from a variety of cart sizes including:

- Green cart(s) for organics – 80 litres, 120 litres, 240 litres.
- Blue cart(s) for recyclables – 120 litres, 240 litres and 360 litres.
- Grey cart(s) for garbage -120 litres, 240 litres and 360 litres.



The City collects the carts early morning at 5 a.m., before business hours, when traffic and parked cars are lowest. Since the three streams are collected with residential collection, separate tonnage information is not available for the DCA. A summary is provided in **Table 2.1**.

## 5 | Current State of Downtown Collection Services Provided by the City of Guelph

**Table 2.1: Summary of Waste Services to Guelph's Downtown Core**

Jurisdiction	Collection Service			Collection Schedule	Access to PSC permitted
	Garbage	Recycling	Green Bin		
<b>City of Guelph</b>	6 days/week variable sized carts & use of PSC	Yes 6 days per week	Yes 6 days/week	Monday to Saturday	Yes

**Table 2.2** shows a breakdown of total units served and assumed residential versus commercial addresses and units. The numbers were derived from the City's database and provide a rough estimation of units served based on the streets in the City's Downtown Collection Area.

**Table 2.2: Property Types and Number of Units in the Downtown Collection Area**

Properties	Number
Commercial Addresses	274
Residential Addresses	34
Mixed Addresses	26
<b>Total Addresses</b>	<b>334</b>
Commercial Units	424
Residential Units	460
<b>Total Units</b>	<b>884</b>

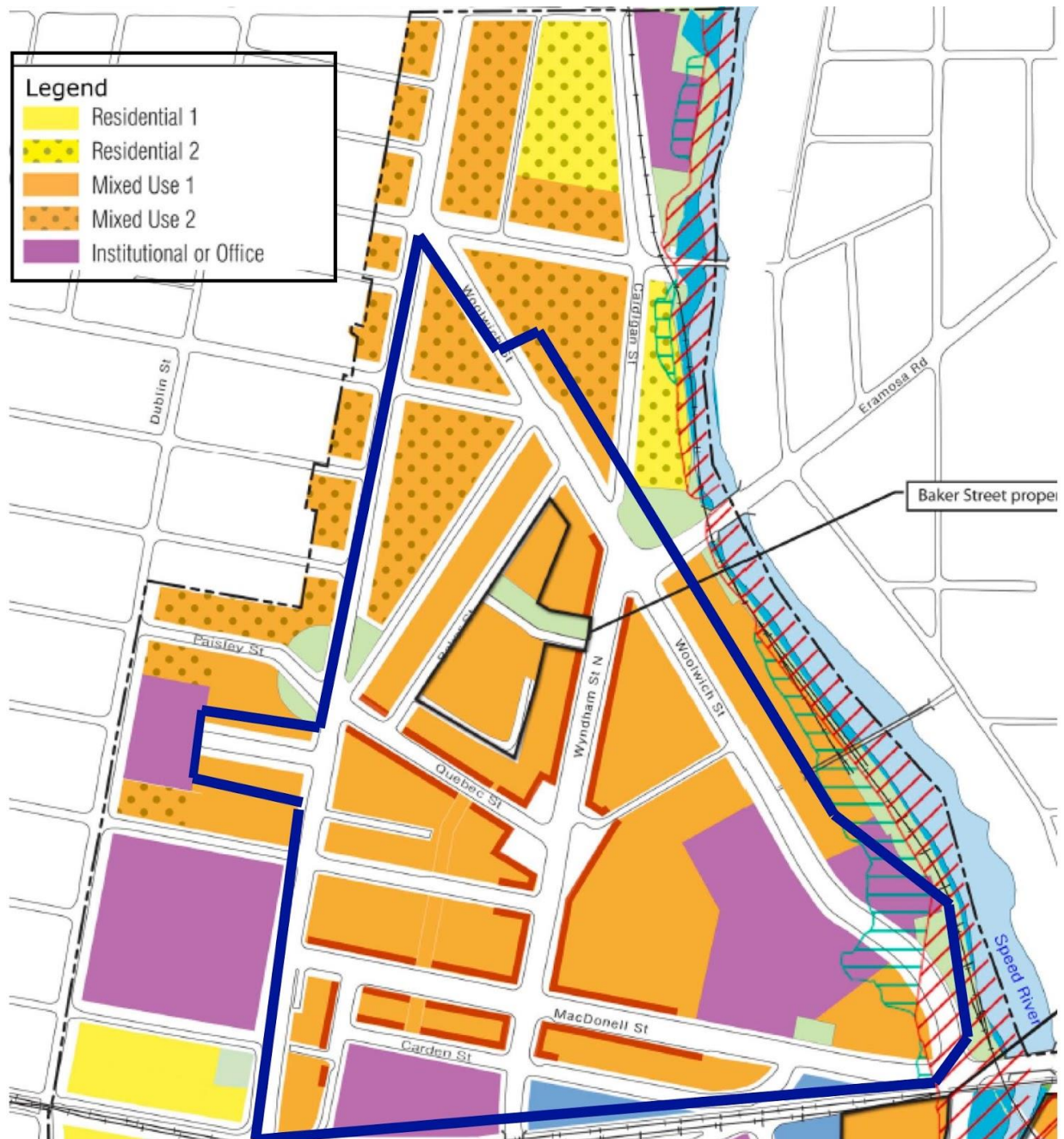
**Figure 2.2**, which has been obtained from a 2016 report titled "Downtown Guelph Secondary Plan"<sup>1</sup>, provides a map of the Downtown Guelph Business Association (DGBA) and the type of properties within its boundaries. The map shows that most of the downtown area consists of mixed use (residential and commercial) with some institutional or office and a

<sup>1</sup> Downtown Guelph Secondary Plan. November 2016 Consolidation in the City of Guelph's Official Plan at <https://guelph.ca/plans-and-strategies/official-plan/>

## 6 | Current State of Downtown Collection Services Provided by the City of Guelph

smattering of residential. The blue outline shows the current downtown collection area, which comprises mixed use and institutional (the City Hall).

**Figure 2.2: Property Types within the Downtown Guelph Business Association**



## 7 | Current State of Downtown Collection Services Provided by the City of Guelph

### 2.2 Program Costs and Funding

Currently, the operating and capital costs for all downtown waste services are funded through property taxes. Blue box stewardship funding (for residential material) and revenues from the sale of recyclable material offset the cost of eligible recycling services. No other funding approach or revenue sources are used to augment the costs to provide waste management and diversion services to downtown businesses, residents and public space containers.

The City provides three stream (organics, recycling and garbage) curbside collection to the downtown six days a week, 52 weeks of the year at an annual cost of \$149,240. On average, the collection crew spend almost 21 hours per week providing waste management services to the downtown core at an hourly operating cost of \$140/hr.

### 2.3 Public Space Containers Services

The City provides sets of public space containers (PSCs) throughout the downtown area to serve two key purposes:

- To provide a public disposal and waste diversion system for customers and the public, in general; and
- To enable businesses and residents to use the PSCs to augment their waste containers or replace them altogether.

The PSCs permit three stream sorting – garbage, recycling and organics. Each container has a 227 litre capacity and can be collected using an automated collection truck.



## 8 | Current State of Downtown Collection Services Provided by the City of Guelph

### 2.4 Previous Activities and Surveys

The City of Guelph transitioned to a cart based system from a three stream bagged based collection program for organics, recycling and garbage for the downtown area in 2015. Prior to 2015, businesses would set out organics, recycling and garbage in transparent green, blue and clear bags, respectively to the curb for collection five days a week (Monday through to Friday).

#### 2.4.1 2012 Survey

A set out monitoring study and survey, conducted in 2012, provided information about waste storage, set out data (e.g. number of bags a set outs for each business) and set out operations by individual businesses (e.g. who is responsible for putting out the waste and distance the business owner would be willing to take their waste for collection).

**Table 2.3** shows the results from the set-out monitoring (see **Appendix A - 2012 Set Out Monitoring Results** for set out details). The results are organized into general business classifications, such as food service, clothing retail, other retail, miscellaneous, office and medical.

**Table 2.3: 2012 Garbage Set-out per Week by Business Classification**

Business Classification	Number of Businesses	Average number of set out days per week	Average number of bags/week*
Food service	8	7	35.2
Clothing retail	10	2.2	2.5
Other retail	10	5.2	12.8
Miscellaneous	3	1.7	1.3
Offices	2	3.5	31.5**
Medical	1	5	5

\* assumes B = bags of garbage in set out summary

\*\* One business set out 60 bags of waste in total compared with 3 bags for the other office related business.

## 9 | Current State of Downtown Collection Services Provided by the City of Guelph

Those businesses generating the greatest amount of waste included food services (averaging 36.2 bags of waste per week) and other retail (averaging 12.8 bags per week). While offices indicated a high set out, upon closer investigation, the set out was skewed by one business that set out 60 bags during the study.

While food service-related businesses set out waste every day of the week, many other businesses, under the classifications of clothing, offices and miscellaneous, set out waste about three days or fewer per week. The one medical office (dental) and other retail classification set out waste five days a week.

A survey of businesses was also conducted in 2012 to gather information about waste management practices in the establishments. About 36 businesses participated in the survey anonymously, without indicating their names or business classification. The survey questions and results are provided in **Appendix A - Set Out Monitoring Results**. Some of the relevant questions and responses from the survey are as follows:

- When asked who was responsible for putting out the waste, most respondents (83%) indicated that employees were responsible for putting out the waste, followed by the owner (11%) and cleaning service (6%).
- The question - Where do you store your waste before collection? - showed that just over half (52%) of respondents used a back room, with 20% identifying the outside and 29% identifying throughout the store.
- When asked how often the business set out its waste for collection, almost half (49%) of the respondents indicated that they put out their waste daily, whereas, slightly more than half (51%) indicated that they put their waste out only a couple of times a week.
- The question - How far would you be willing to take your waste for collection? - resulted in about half (49%) of respondents saying 50 metres or less, and the remaining half (51%) saying up to 100 metres. None of the respondents indicated that they would be willing to go further than 100 metres.

The Downtown Core report, developed by staff to discuss the survey results, identified several waste management challenges faced by businesses and residents - see the shaded box below.

## 10 | Current State of Downtown Collection Services Provided by the City of Guelph

“Some of the streets in the downtown core do not have a back access to their store and would have no suitable place to put the carts. An example of these streets would be Carden, MacDonnell and some parts of Douglas and Wilson St. The majority of businesses in this situation are open to the idea of sharing carts in designated areas (those with small amounts of waste) as long as it is not too far away.

The majority of the businesses located on Quebec St., Cork St., Yarmouth, Wyndham St. and parts of Woolwich St. all have back alley ways where they would be able to store the carts. Businesses on these streets are the most comfortable receiving their own sets of carts because they do have an area to put them without sharing. Some businesses stated they would have no place to store the carts but after looking at their storage area found sufficient place to store the carts on many occasions.

Residents living in above-store apartments will not be able to store the carts and bring them down each day for collection. Some businesses have already mentioned that they are having issues with the above-store residents and the sorting of their waste.

A number of businesses in the downtown core have voiced their concerns about the amount of cardboard they produce and their concern that it will not all fit in the cart. Some of the businesses have said that it would be okay for them to store the carts but the cardboard will not fit.”

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### 2.4.2 2015 Survey

In 2015, the Downtown Guelph Business Association conducted an online survey to better understand how businesses use the waste services and feel about the waste services. Survey Monkey was used to conduct the Downtown Guelph Solid Waste Pick Up survey that was completed by 100 businesses located in the downtown core (see **Appendix B - 2012 Survey Results**, for the complete survey and results). The participating businesses were asked to identify the commercial category that best reflected their operations as shown in **Table 2.4**.

## 11 | Current State of Downtown Collection Services Provided by the City of Guelph

**Table 2.4: 2015 Downtown Survey Business Operations**

<b>Business Operations</b>	<b># Responses</b>	<b>%</b>
Property Owner with Retail/Office uses	9	9.2%
Property Owner with Retail/Office and Residential uses	10	10.2%
Restaurant/Food Service	28	28.6%
Retail	39	39.8%
Office	11	11.2%
Health and Wellness Services	6	6.1%
Salon and/or Spa	4	4.1%
Professional Service	9	9.2%
Total Respondents	98	100%

The survey results provided some interesting insights about how businesses use and feel about carts versus public space containers.

- When asked what collection system the respondents used:
  - 55% exclusively used the PSCs;
  - 25% exclusively used the individual carts;
  - none indicated that they shared carts; and
  - Almost 20% indicated they used a combination of PSCs and carts.
- When respondents were asked how often they set out garbage for collection:
  - 44% set out four or five days a week;
  - 17% set out three days per week; and
  - 39% set out two or fewer days per week.
- When asked how likely they would support another type of funding model (such as user fees) to provide Saturday or Sunday service, only 6% of respondents supported the idea, with 11% undecided and the remaining 83% not supporting the idea.

## 3.0 Research Methodology

### 3.1 Downtown Stakeholder Group

As part of the task's engagement process, the City established the Downtown Stakeholder Group (DSG).

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#### 3.1.1 Objective and Overview

The City established the DSG to address solid waste collection issues and service levels in the downtown core. The DSG has played an important role in facilitating in-depth discussions of downtown issues, concerns and solutions for the Downtown Services Review.

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#### 3.1.2 Downtown Member Outreach

The City approached various stakeholder groups in the downtown core to participate in the Downtown Stakeholder Group. As reflected in the Terms of Reference (see **Appendix C - Downtown Stakeholder Group Terms of Reference**) staff identified key stakeholder groups for the DSG, including:

- Up to 3 individuals from businesses in the downtown core that use the City public space containers or carts to set out their waste,
- Up to 3 individuals living in the downtown who use the City's public space containers to set out their household waste;
- Up to 3 individuals representing institutions, including educational institutions, faith based groups, and community services, receiving waste collection in the downtown core.

Individual businesses and organizations contacted included Guelph's Downtown Business Association. Members were asked to attend four planned meetings over a six-month period. The first meeting was held but the subsequent meetings were put on hold due to COVID-19 resulting in competing priorities and lack of interest expressed at that time. The exercise will be resumed at a later time, potentially as part of the Downtown Renewal Project.

In addition, City staff responsible for or impacted by downtown waste collection services were invited to participate in the DSG. City staff from targeted departments included:

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- Solid Waste,
- Planning and Development,
- Business Development and Enterprise and Downtown Renewal,
- Guelph Public Library,
- Facilities Management and Civic Precinct Facilities,
- Downtown Infrastructure Maintenance and Winter Control, Public Works,
- By-law Compliance, Security and Licensing, and
- Guelph Transit.

### 3.2 Comparative Municipal Questionnaire

To provide valuable insight into how other comparable Ontario municipalities service their downtown businesses and industrial, commercial and institutional (IC&I) establishments, the Dillon team developed a comprehensive questionnaire with specific questions about the level of service provided to downtown areas or BIAs. The downtown waste services section of the survey explored garbage and waste diversion services and public space container operations.

### 3.3 Municipalities Selected for Research and Rational

Five Ontario municipalities, with characteristics similar to the City of Guelph were selected for the questionnaire from the City Council's list of 30 approved comparator municipalities. The Dillon team used the following criteria to select the five comparator municipalities:

- Must be an urban municipality
- Must have a distinct downtown area that receives separate municipal waste and recycling collection services
- Must have public space container collection provided in the downtown area

Using these criteria, five municipalities were selected – City of Hamilton, City of Kingston, City of Ottawa, Halton Region and the Region of Waterloo. Their relevant characteristics are shown in **Table 3.1**.

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Table 3.1: Comparable Characteristics of Selected Municipalities

Municipality/City	Population	Downtown BIAs	Downtown Public Space Containers
Municipality A	536,917	13	Yes ✓
Municipality B	136,685	1	Yes ✓
Municipality C	994,837	1	Yes ✓
Municipality D	584,435	8	Yes ✓
Municipality E	535,154	7	Yes ✓

3.3.1 Questionnaire Development

The drafting of the downtown waste services questionnaire went through several iterations in consultation with Guelph staff. Prior to being contacted by a member of the Dillon Team, a letter and copy of the questionnaire was emailed to key staff in each of the five municipalities notifying them of the project. A copy of the letter and the questionnaire for the downtown business section is provided in **Appendix D - Letter to Comparative Municipalities**.

Over the course of two weeks in late February 2020, members of the Dillon team called staff in each of the selected municipalities and worked with them to complete the entire questionnaire during a telephone interview. On average, each questionnaire required an hour to complete with staff, who were very helpful and willing to dedicate their time to the process.

The findings from the questionnaire are discussed in Section 6 of this report.

3.3.2 Unforeseen Challenges and Solutions

There were no unforeseen challenges encountered in completing the questionnaires.

### 3.4 Pay-as-you-Throw Research

As part of the Downtown Service Review task, the Dillon team has conducted a review of alternative funding (e.g., PAYT) options used by Canadian municipalities to fund waste management services provided to downtown business areas. The information will help compare alternative funding options with the existing costs to provide waste management services to the downtown business area as part of the solid waste financial model being developed as part of the SWMMP.

### 3.5 Public Space Container Review

The task also involved conducting a review of public space container approaches in other jurisdictions and developing outcome-based performance criteria and apply the criteria to the existing downtown public space containers to determine opportunities to enhance operations and aesthetics.

## 4.0 Initial Downtown Business Engagement

### 4.1 Downtown Member Involvement

As part of the SWMMP, the City launched a Downtown Stakeholder Group (DSG) with the intention of holding several meetings with downtown stakeholders in the DSG to better understand their waste management issues and needs. The DSG met once, as is described in this section, before the COVID-19 pandemic curtailed face-to-face meetings. For the time being, the DSG has been suspended and the framework modified to enable staff to continue engaging in discussions with downtown stakeholders post SWMMP and addressing their needs over time.

### 4.2 First Downtown Stakeholder Group Meeting

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#### 4.2.1 Downtown Stakeholder Group Meeting #1 January 14, 2020

Objectives of Meeting #1:

- Build understanding of the project
- Provide initial opportunity for input from downtown stakeholders, to identify the key concerns and issues to be addressed within the project
- To clarify this group's aspirations for the outcome of the project

Insights gained from the downtown stakeholders and City staff during the first meeting are presented below.

### 4.3 Downtown Stakeholder Group – Challenges and Needs in the Current Downtown Collection Services

DSG members, including City staff, identified the following challenges in Guelph's downtown collection services, including its public space bin system:

- Overflowing street bins
- 6-day service
- Improper sorting and set out
- No user accountability
- Bins overwhelm sidewalks
- Evolving downtown (busier, more people)
- Storage constraints for businesses and residents
- Bins move around
- Bins are unattractive (block art, landscaping)
- Bins are unattractive for visitors too
- Bins next to patios are a concern (odour, bees)

Members also explored their vision of the future waste management system in the downtown core:

- More density
- Circular economy
- Less or no plastic
- Waste management paid for by producers/users
- Better solution for merchants
- Create excitement
- Make it easy to use
- Replace the bins - make it visually appealing
- Measure our current system
- Pilot/test innovations
- Upstream and downstream solutions

# 5.0 Public Survey #1

A public survey was held online from August 17th to September 30th, 2020 on the project engagement page at “Have Your Say Guelph”. The purpose of this survey was to solicit feedback from the public on what's working well, what needs to be improved, and what’s missing from the current waste management system in Guelph. The survey contained a section on the downtown to solicit feedback on the Public Space Containers. Over 560 respondents completed the survey and the results were incorporated in the initial development of options for the SWMMP, as applicable.

## 5.1 Survey Responses

The questions and responses regarding how the public uses the downtown and their thoughts about waste management services in the downtown, include the following:

- Question: Recognizing that your travel patterns may have changed in recent months due to COVID-19, did or do you visit, work and/or live in downtown Guelph?
  - 561 responses were provided for the question.
  - 63% of respondents visit downtown, 15% live downtown, 14% never visit downtown, and 7% work downtown.
- Thinking about the public space containers located on the streets downtown please let us know how satisfied or dissatisfied you are with the following elements (482 responses provided):

Element	Somewhat Satisfied	Neither Satisfied or Dissatisfied
Locations	X	
Size	X	
Appearance	X	
Odour		X
Ease of Use	X	
State of Good Repair	X	
Cleanliness	X	X
Preventing Pests		X

## 19 | Public Survey #1

- Do you have any other comments about the Public Space Containers you want to share with us?
  - Of the 136 responses to this open ended question, the following themes were most common:
    - Bins are often full and overflowing - mentioned by 25% of participants
    - Improve users understanding of how to sort properly for the Public Space Containers, with better signs, improved bin design to indicate where items should be disposed, and improved education to ensure people sort properly- mentioned by 24% of participants
    - The Public Space Containers are not aesthetically pleasing - mentioned by 21% of participants
    - More bins are needed in the downtown - mentioned by 16% of participants

Overall, the survey results indicate that most respondents are somewhat satisfied with the Public Space Containers, but a number of respondents felt that improvement could be made, specifically around improved appearance, better sorting information, availability of more bins, and ensuring the bins don't overflow.

# 6.0 Overview of Downtown Collection Services in Selected Municipalities

The downtown collection services questionnaire results are summarized in **Table 6.1**. In general, each selected municipality offers a variety of collection services to downtown businesses; however, none permit businesses to use the public space containers as garbage, recycling or organic receptacles. A summary of the responses is provided in **Appendix E – Downtown Waste Services Responses from Comparative Municipalities**.

**Table 6.1: Comparison of Municipal Responses**

Jurisdiction	Collection Service			Collection Schedule	Access to PSC Permitted
	Garbage	Recycling	Green Bin		
<b>Municipality A</b>	Variable collection – most BIAs receive 2 days/week to a max. of 3 days per week  6 bags per week	Yes  Same schedule as garbage	Yes  same schedule as garbage	Varies by area	No
<b>Municipality B</b>	1 day per week  6 bags per collection then bag tag required	Service not provided	Service not provided	Tuesday	No

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Jurisdiction	Collection Service			Collection Schedule	Access to PSC Permitted
	Garbage	Recycling	Green Bin		
<b>Municipality C</b>	2 days per week Max 16 yellow bags per collection Yellow bag program at \$3.90/bag	Yes 2 days per week – same schedule as garbage	Yes 2 days/week – same as garbage	Tuesday & Wednesday	No
<b>Municipality D</b>	2 days /week 1x 360 litre cart or equivalent per collection	Yes 2 days per week – same schedule as garbage	Service not provided	Tuesday & Friday	No
<b>Municipality E (3 urban BIAs)</b>	6 days week 10 bags per collection	Yes 1 day per week	Service not provided	Monday to Saturday	No

### 6.1 Level of Collection Service to Downtown Businesses

The level of collection services provided to the downtown businesses in the five selected municipalities is summarized as follows:

- All municipalities, except for municipality C, provide different levels of waste service to the downtown businesses compared with waste services provided to commercial establishments outside of the downtown or BIA.
- Garbage collection frequency varies from one to six days per week with three (municipalities A, C and D) of the five municipalities providing two days per week collection service and municipality B offering once a week collection service. Only municipality E provides the same level of service (six days per week collection) as the City of Guelph.
- Municipality B offers once a week collection service to downtown businesses and requires businesses to complete an application form to receive service. Businesses are permitted to place up to six bags of garbage free of charge and must purchase tags (\$2 per tag) for any excess bags of garbage. If businesses cannot meet the once a week garbage collection service then they must use a private hauler. No other services are provided to downtown businesses.
- With one exception (municipality D), the municipalities permit businesses to place bags of garbage at the curb for collection. In the case of municipality D, it offers different sized carts for garbage and recycling.
- All municipalities, except for municipality B, provide Blue Box recycling.
- Only two of the municipalities (A and C) provide green cart service to downtown businesses or BIAs. Some municipalities cited the reason that providing Green Bin service was too costly and challenging to implement and monitor.
- None of the municipalities allow businesses to use public space containers as waste receptacles.
- Municipality E has installed Molok in-ground containers in back alleys for excess garbage but staff stated that the containers are being overused by businesses and are very expensive to service.

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### 6.2 Funding of Downtown Collection Services

The following funding model is used to pay for waste services in the downtown business areas:

- Three of the five municipalities fund the cost of waste services from property taxes.
- Only one municipality (C) has a full Pay-as-you-throw (PAYT) program for garbage collection service with municipality B requiring businesses to buy tags (\$2 per tag) for any bags of garbage exceeding the six bag limit, in addition to paying an annual flat fee of \$267.39 to businesses for once a week garbage collection service.
- Municipality C pays for waste collection and diversion services through the Yellow Bag Program, in lieu of property taxes. Businesses must apply to the Program and once approved, must purchase yellow bags for garbage collection. The bags are \$3.90 each (purchased in packages of four for \$15.60). The price of the bag pays for Blue Box recycling and Green Bin services. Businesses are permitted to set out a maximum of 16 bags of garbage or bulky waste every collection. The yellow bags must be purchased at participating Home Hardware retailers or the Administration Client Service Centre.

### 6.3 Other Support Systems Provided

The following waste management and diversion programs are provided to downtown businesses areas:

- None of the five municipalities offer formal waste management or diversion promotion and education programs to downtown businesses. Assistance is provided on as needed basis, when a business calls the department.
- Municipality D is pursuing the development of a waste management/diversion tool kit for businesses in the BIAs and will deliver a lunch and learn talk to a business, if requested.
- The municipalities do not provide help with storage capacity limits in the downtown business areas. Municipality D offers different sized garbage carts for garbage, including one 360 litre cart or one 240 litre cart or two 120 litre carts. Staff have discovered that most businesses prefer to order

## 24 | Overview of Downtown Collection Services in Selected Municipalities

the two 120 litre carts and none of the businesses have ordered the 240-litre cart.

### 6.4 Level of Public Space Container Service in the Downtown and Accessibility

The following public space container (PSC) service is provided in the downtown areas:

- The PSCs in the downtown areas are managed by Solid Waste departments in all five municipalities, with PSCs in parks and transit areas managed by other departments.
- In municipality C, the BIA is part of the Restricted Advertising Area (RAA) in which no commercial advertising is permitted on the PSCs. The PSCs are collected on a winter and summer schedule with the PSCs collected several times a day depending on the schedule and may occur throughout the day and night.
- None of the municipalities permit businesses to use the PSCs as receptacles for their garbage, recycling or organics collection. In many cases, this prohibition is written into the solid waste by-law.

### 6.5 Challenges and Lessons Learned

All surveyed municipalities reported some challenges associated with the provision of waste management services in downtown areas:

- For those municipalities providing two days per week collection service, staff say that businesses always want more frequency of service.
- Monitoring set outs from mixed use buildings (business and residential) is challenging in determining the source of the set out. In the case of municipality C, unless there is a yellow bag set out then the collection crew will not collect regular garbage bags. Staff have found that businesses will take home their garbage to avoid paying for the yellow bags.
- Participation in recycling cart and green cart services is not as high as many staff would like, especially in cases where the bag limit is high, such as municipality C's 16 bag limit, municipality E's ten bag limit and municipality A's six bag limit.

## **25 | Overview of Downtown Collection Services in Selected Municipalities**

- Unless the Green Bin program is used properly it can cause pest problems for businesses.
- Waste services provided to downtown areas require more administration time to manage service and complaints.

### **6.6 Trends in Downtown Collection and Public Space Container Services**

The City of Guelph provides six days per week collection and unlimited garbage set out, which is considered an exceptionally high level of service compared with the surveyed municipalities, with four of five surveyed municipalities offering one or two collection days per week. Along with the City of Guelph, only municipalities A and C offer Green Bin services to their downtown businesses. Unlike Guelph, none of the surveyed municipalities allows businesses to use PSCs as alternative garbage, recycling or organic waste receptacles. Municipalities recognize the need to provide collection services to their BIAs but the level of service depends on Council approved budget and infrastructure. The municipalities have few options to respond to space shortages and higher service demands.

## **7.0 Alternative Downtown Collection Approaches in North America and Europe**

### **7.1 Alternative Downtown Collection Approaches in Cities in North America**

Downtowns are densely populated areas that provide waste service challenges to service providers because of the space limitations in the buildings and right of way (ROW) issues, below it and above it. This section outlines waste services approaches that have been used in North America and European cities. Approaches outlined in this Section for the downtown will be coordinated with overall waste management system options for the SWMMP.

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#### **7.1.1 Downtown Collection from Businesses**

**Cardboard Collection Bins in St. Catharines, Ontario** – The City of St. Catharines has 13 front-end cardboard recycling bins dotted throughout the downtown business area. These communal bins are available for use by any business free of charge and are collected once or twice per week. Previously, the City also provided front-end communal bins for garbage and Blue Box recyclables to be used by businesses in lieu of curbside collection. Over time, the bins became unsightly and were frequently used by non-businesses. The Region of Niagara removed the communal garbage bins in 2010 and introduced curbside garbage and recycling collection services for downtown businesses.

**In-Ground Containers in Guelph, Ontario** - EarthBin, based in Hamilton, Ontario, has bins installed in Ontario communities and at universities, including the University of Guelph and the University of Alberta. **Photo 2** and **Photo 3** show two of the three commercial installations in Guelph.

From ground level, the EarthBin appears to be a 6 yd<sup>3</sup> front end container but, in fact, is an in-ground waste system, which provides more than double the storage capacity of a regular front-end bin. An EarthBin can be picked up and emptied using a standard front-end collection vehicle, as shown in

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**Photo 1**, and does not require a specially equipped vehicle as do other in-ground systems, such as the Molok system.<sup>2</sup>

**Photo 1: Removal of Earth Bin using Front-End Collection Vehicle**



**Photo 2: EarthBin Installation in a Commercial Setting in the City of Guelph**



<sup>2</sup> EarthBin systems at <https://www.earthbin.com/>

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### Photo 3: EarthBin Installation in a Commercial Setting in the City of Guelph



### In-Ground Containers in Greenville, South Carolina –

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The City of Greenville has established a partnership with SUTERA to install four in-ground, centralized collection systems in downtown Greenville, which has eliminated the need for 30 carts used by businesses. Businesses must bring their garbage and recyclables to the centrally located bins.<sup>3</sup> One of the stations is shown in **Photo 4**.

### Photo 4: Centralized in-ground Garbage and Recycling Stations in Downtown Greenville, South Carolina



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<sup>3</sup> Sutura launches new innovative commercial waste & recycling collection system in Downtown Greenville. Sep 24, 2019. At <https://www.suterausa.com/post/sutera-launches-new-innovative-commercial-waste-recycling-collection-system-in-downtown-greenville>

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The company SUTERA, based in Waterloo, Ontario offers an in-ground waste collection system that has a smaller above ground receptacle than other in-ground system. The in-ground units are emptied by service haulers using collection vehicles with arms that vertically lift the bag out of the in-ground well or using vacuum suction as shown in **Photo 5**.

**Photo 5: SUTERA in-ground Containers Being Collected**



The units are used for a variety of uses including two units that have been installed by the City of Waterloo to collect manure from the Eby Farmstead, in the Waterloo Park, which is transported to a local farmer and converted to compost.

**New collection system piloted in New York City** - New York City's Department of Sanitation has been involved in a year long process to find alternative technologies/solutions for its street garbage. The City initiated a pilot program in March 2020 called "Clean Curbs" that will allow Business Improvement Districts (BID) to install sealed containers that would be set out in the street, adjacent to the sidewalk and used as a central collection area by businesses as illustrated in **Figure 7.1**. The aim is to leave the sidewalks open for pedestrians and use parking spots for the bins "The Clean Curbs program ... will make it much easier to pilot shared waste storage in

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the parking lane”.<sup>4</sup> The container designs were to be reviewed in the spring of 2020.

### Figure 7.1: New York City's Proposed Centralized Waste Collection System for Business Improvement Districts (BID)



**Centralized Storage in Battery Park, New York City** - Battery Park is located in the southern tip of Manhattan Island, New York City. Due to the high density of the area, the Battery Park City Authority devised a new centralized storage approach to collecting garbage from its high rise residential buildings rather than leaving the bags on the side of the road for collection. This approach employs staff from neighborhood residential buildings to collect and cart garbage from their buildings using pushcarts or small electric vehicles (**Photo 6**), and deliver it to one of several single-bay loading areas (**Photo 7**) once a day. The garbage is taken to a centralized storage site for compaction and when full, the compacted bins are collected

<sup>4</sup> City Takes Major Steps to Get Garbage off the Sidewalk. March 11, 2020 at <https://nyc.streetsblog.org/2020/03/11/exclusive-city-takes-major-steps-to-get-garbage-off-the-sidewalk/>

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by the City of New York Sanitation Department (NYSD).<sup>5</sup> See **Section 10.4** for a detailed case study.

**Photo 6: Collecting and Delivering Garbage in Downtown Manhattan, New York City**



**Photo 7: Collecting and Delivering Garbage in Downtown Manhattan, New York City**



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<sup>5</sup> Zero Waste Design Guidelines. November 2016. American Institute of Architects. At <https://www.zerowastedesign.org/>

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### Specialized Collection in Old Quebec City

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Old Quebec is a historic neighbourhood in Quebec City, Québec, and is part of the borough of La Cite-Limoilou. It is a UNESCO World Heritage Site, comprising an upper town and a lower town

Waste and recycling is collected early in the mornings, six days a week for all commercial properties, with residential properties receiving twice a week collection. In order to accommodate for the narrow streets, the City uses smaller collection trucks (14 yd<sup>3</sup>), that allow for maneuvering around the narrow streets (**Photo 8**) but requires more frequent trips to the City's incinerator. Some trucks also accommodate collection on both sides of the vehicle (**Photo 9**).

#### **Photo 8: Small Capacity Truck. Better for Maneuvering in the Small Streets**



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**Photo 9: Truck with the Ability to Load Waste and Recycling from Either Side**



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### 7.1.2 Reducing Consumer Waste in Businesses

Some progressive communities have gone beyond collection issues and are addressing opportunities to reduce the amount of waste generated by businesses, particularly food service businesses.

**Foodware Reduction in Berkeley, California** - In January 2019, the City of Berkeley amended the Single Use Disposable Foodware and Litter Reduction Ordinance, which is intended to reduce single use items such as straws, utensils, foodware, etc. Different policies are being phased in over a one year period, with the use of reusable foodware being introduced in the final phase. The ordinance stipulates the use of reusable foodware and utensils starting July 1, 2020, and requires that vendors of prepared food that is consumed onsite must only serve food on reusable (durable/washable) foodware to customers eating on the premises. Food vendors may choose to provide cleaning and sanitation facilities on-site or contract with a service for off-site cleaning. Food vendors may choose to provide cleaning and sanitation facilities on-site or contract with a service for off-site cleaning. Food vendors are permitted to use certified compostable

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paper tray/plate liners, paper wrappers, napkins, and straws and aluminum foil for dining on-premises.<sup>6</sup>

**ReThink Disposal Program** - The City of Berkeley's Single Use Disposable Foodware and Litter Reduction Ordinance is supported by a couple of programs including the ReThink Disposal program of Clean Water Action, which offers technical expertise and some funding to convert to a reusable program. Clean Water Action has also developed a foodware calculator that helps food establishments calculate their current annual usage and cost of a disposable foodware items and estimate the potential cost savings that can be achieved by switching to reusable foodware. These Clean Water Action initiatives support municipalities throughout California, including Berkeley.

### **Reusable Mugs in Boulder, Colorado**

– The City has partnered with the company, Vessel Works, to introduce a reusable mug program in the City. Customers can rent a stainless steel mug on a Vessel app and use it when they purchase a drink or coffee at a cafe. The dirty mug can be returned to any participating cafe or another participating location, up to five days after use. If the mug is not returned within the five days, the person is charged a \$15 fine, which is tracked using the app. The dirty mugs are picked up by Vessel Works and cleaned and the retailer is charged a fee per cup, which is less than the cost for paper cups.<sup>7</sup> Similar programs are being offered in Berkeley, CA; Toronto, ON and Hamburg; Germany.



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<sup>6</sup> City of Berkeley Single Use Disposable Foodware and Litter Reduction Ordinance. Chapter 11.64. January 22, 2019. At [https://www.cityofberkeley.info/uploadedFiles/Public\\_Works/Level\\_3\\_-\\_Solid\\_Waste/2019-02-19%20Item%201%20Ordinance%207639.pdf](https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Solid_Waste/2019-02-19%20Item%201%20Ordinance%207639.pdf)

<sup>7</sup> Boulder embraces a radical solution to disposable coffee cups. November 15, 2018. Treehugger at <https://www.treehugger.com/corporate-responsibility/boulder-embraces-radical-solution-disposable-coffee-cups.html>

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### Reusable GO Boxes in Portland, Oregon -

A similar idea as the reusable mugs, is the GO Box that offers reusable foodware in Portland. Users subscribe to the program by downloading the GO Box app and paying a monthly or annual subscription, which applies credits towards the reusable containers when they go to pick up food from a participating food vendor. The subscriber can return the GO Box container, using the app, to a participating drop site. When the user returns the GO Box to a participating drop site, the credit will be added back to the subscription for use again. The GO Box team collects the containers from the drop sites and cleans, sanitizes and re-distributes them to be used again. Over 110 food vendors are participating in the program throughout the city.<sup>8</sup> Similar programs are being offered in Berkeley, CA; New York City, NY and Switzerland.



**A Friendlier Company, Guelph** - In the Fall of 2020, two recent University of Waterloo graduates launched a reusable container project, called A Friendlier Company, which enables businesses and consumers in the City of Guelph to participate in a container reuse program. The company provides direct delivery of reusable containers to homeowners/consumers for a fee and once used the homeowner/consumer scans their container using the company's mobile app to receive a refund and can then deposit the used container in one of the company's collection bins set up in participating locations such as take out, coffee shops and restaurants. Businesses that participate in the system order the reusable containers for takeout and set up as a drop off location. Businesses that act as drop-off locations can expect more traffic from customers using the system.<sup>9</sup>

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<sup>8</sup> GO Box website at <https://www.goboxpdx.com/mission/>

<sup>9</sup> New project in Guelph hopes to put a dent in disposable waste. Nov 16, 2020. CBC news at <https://www.cbc.ca/news/canada/kitchener-waterloo/a-friendlier-company-offers-reusable-takeout-containers-to-restaurants-1.5803458> and <https://www.afriendliercompany.ca/>

## **7.2 Alternative Downtown Collection Approaches in Cities in Europe and Elsewhere**

### **Disposal Access Cards in Amsterdam, Netherlands**

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In the City of Amsterdam the ability of a business to use municipal waste services depends on the volume of waste generated. Businesses that generate more than 9 bags of garbage per week must subscribe to private sector waste services. Businesses that generate 9 or fewer bags of garbage can use municipal services and pay one of two annual fees based on the number of bags. Those businesses that generate four bags of garbage or fewer per week pay €373 (Cdn \$563) annually and those that generate between five and nine bags of garbage per week pay €790 (Cdn \$1,200) annually. Businesses are subject to the same rules as residents and use the same waste containers as for household waste, glass, paper and plastic.<sup>10</sup> See **Photo 10**.

**Photo 10: In-ground Containers in Amsterdam**



In the District of Noord in the City of Amsterdam an access card is required to access and deposit residential and business garbage in centralized in-

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<sup>10</sup> Waste collection charge for businesses (reinigingsrecht). 2019. City of Amsterdam at [amsterdam.nl/en/municipal-taxes/waste-business](https://amsterdam.nl/en/municipal-taxes/waste-business)

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ground waste containers. While, Amsterdam Noord residents get an access card free of charge, local businesses must pay for the access card in order to use the in-ground containers.<sup>11</sup> To open the chambers, businesses use an RFID Waste Card. The system records when a business uses a container. The chamber permits a certain size/volume of garbage before it must be emptied and accessed again.

A similar system employed in Leiden, Netherlands uses RFID waste cards **(Photo 11)** but users of the in-ground waste containers are charged every time they deposit garbage in them. The system in Leiden incorporates a Pay-as-you-Throw (PAYT) scheme based on the volume of waste deposited. Users are charged an annual flat fee of €136 (~Cdn \$200) and an additional charge of €1.40 (~Cdn \$2) every time they deposit their waste in the container, to a maximum of 60 litres. Users are billed annually for the total volume of waste disposed. Any illegal dumping outside the in-ground container results in a fine.<sup>12</sup>

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<sup>11</sup> Waste disposal access card in Amsterdam Noord. No date. City of Amsterdam website at <https://www.amsterdam.nl/en/waste-recycling/disposal-card-noord/>

<sup>12</sup> User Identification for Municipal Waste Collection in High-Density Contexts. February 2019. ENT at <https://ent.cat/wp-content/uploads/2019/03/User-identification-for-municipal-waste-collection1.pdf>

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### Photo 11: RFID Cards used to Access in-ground Containers in Leiden, Netherlands



The Hague, Netherlands ensures that the centralized in-ground garbage container systems are located within convenient walking distance of 75 metres of a residential building's front door. **Photo 12** shows the placement of the garbage container system between the sidewalk and street. Prior to the in-ground garbage container system being introduced in Hague in 2009, "door-to-door collection of refuse in bags or wheeled bins was the norm, with residents carrying recyclables to shared containers on certain "recycle streets." The city struggled to keep its narrow streets clean because seagulls pecked open bags left out for collection, strewing garbage and making a mess."<sup>13</sup>

In all cases, these in-ground systems must be emptied using an extendable arm that lifts the bins out of the ground and deposits the contents into the collection vehicle. **Photo 13** shows the emptying of a bin. According to the Hague web site, it takes 5 to 10 minutes to empty the contents of each container.<sup>14</sup>

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<sup>13</sup> Zero Waste Design Guidelines. November 2016. American Institute of Architects. At <https://www.zerowastedesign.org/>

<sup>14</sup> Underground containers for a Clean Neighbourhood. The Hague. At <https://www.denhaag.nl/en/waste-and-recycling/household-rubbish/underground-rubbish-containers-for-a-clean-neighbourhood-.htm>

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**Photo 12: In-ground Container in Hague, Netherlands**



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**Photo 13: In-ground Container in Hague, Netherlands**



**Front end bins in Buenos Aires, Argentina and Barcelona, Spain** - To avoid garbage bags from piling up on the streets, Buenos Aires has deployed street garbage containers that are located on the street in what were once parking spaces as shown in **Photo 14**.<sup>15</sup>

<sup>15</sup> Eyes on the Street: Keeping Trash Off the Sidewalks in Buenos Aires. July 8, 2014. At <https://nyc.streetsblog.org/2014/07/08/eyes-on-the-street-keeping-trash-off-the-sidewalks-in-buenos-aires/>

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**Photo 14: Garbage Containers in Buenos Aires, Argentina**



Barcelona also uses street parking spaces for recycling bins, which are accessed by residents and businesses as shown in **Photo 15**. In both examples the bins can be picked up using automated side-load collection vehicles.<sup>16</sup>

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<sup>16</sup> Recycling in Barcelona. April 15, 2020. At <https://www.shbarcelona.com/blog/en/recycling/>

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### Photo 15: Recycling and Organic Bins in Barcelona, Spain



**Pay-as-you-Throw (PAYT) in Aveiro, Portugal** – Using similar approach with garbage bins located on the streets as Barcelona, Spain, in Aveiro residents are charged by the volume of garbage deposited in containers. Residents are required to use an ID card (see **Photo 16** and **Photo 17**) every time garbage is deposited in the garbage containers. It is assumed that a maximum volume of garbage of 40 litres is deposited each time, with residents charged on the number of times they use the bins. Residents are billed monthly with the invoice sent along with the monthly water bill.<sup>17</sup>

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<sup>17</sup> PAYT Aveiro. No date. at <https://www.ubiwhere.com/en/case-studies/smart-cities/payt-aveiro>

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**Photo 16: Bin with ID Card System for PAYT Program in Aveiro, Portugal**



**Photo 17: Use of ID Cards for PAYT Program in Aveiro, Portugal**



Pneumatic System in Bergen, Norway - The City of Bergen uses a vacuum, pneumatic system to provide waste service in its medieval centre of the city to the residents and commercial establishments. Users place their materials into a designated pod where they are temporarily stored until the valve is opened and the materials are transported using underground system vacuum approach to transport waste and recyclables underground through large pipes. The materials arrive at a terminal on the outskirts of the city and automatically sorted into predefined containers where they are

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transported by trucks to their final destination for incineration (EFW) or processing.

The underground vacuum system provides collection for garbage, recyclables (paper and plastic in one pod, metal and glass in a pod tube and cardboard in a third pod) and organics depicted in **Photo 18**. Commercial establishments and residents can access the centralized pods using an RFID tag as part of the PAYT system **Photo 19**. It is reported that the cost for the underground waste collection to cover its entire city center (around 7 sq. km and 12,000 households and commercial establishments) is NOK 1,239.9 million (~Cdn \$165.3 million).<sup>18</sup>

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<sup>18</sup> Good practice: Bergen underground waste collection system. 2019. Interreg Europe at

[interregeurope.eu/policylearning/good-practices/item/2095/bergen-underground-waste-collection-system](https://interregeurope.eu/policylearning/good-practices/item/2095/bergen-underground-waste-collection-system)

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**Photo 18: Underground Pneumatic System in the Medieval Center of the City of Bergen, Norway**



**Photo 19: Underground Pneumatic System in the Medieval Center of the City of Bergen, Norway**



**Barcelona, Spain combines systems** - In Barcelona, residents and small businesses bring recycling to shared surface containers and trash and organic waste to pneumatic inlets. The systems are located together on the sidewalk as shown in **Photo 20**. The pneumatic inlets are on the right side of the photo and surface containers are on the right.

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### Photo 20: The City of Barcelona, Spain Combines Pneumatic Collection for Garbage and Organics with Bins for Recyclables



**Optibag systems** – The Optibag approach allows the user to store sorted waste streams in one container, such as a cart shown in **Figure 7.2**. Waste streams, such as recycling, organics and garbage, are sorted into different colour coded plastic bags and then placed in a single container. The contents of the cart are collected by a single automated collection vehicle, which delivers the contents to a sorting facility which optically sorts the different colour of bags into separate streams.

The Optibag system used in European communities focuses on curbside collection services and has been employed successfully for a decade in northern European communities (e.g., Oslo, Norway; Borås, Sweden; Jakobstad, Finland).

Optibag is designed to be as user friendly as possible for residents and has been demonstrated to achieve high waste diversion levels. The system reduces the need for storage space with one multi-use container replacing the need for three individual garbage, recycling and organic containers. Optibag also reduces collection costs and CO<sub>2</sub> emissions because only one truck is required to service each establishment.

Figure 7.2: Optibag Collection



### 7.3 Downtown Public Space Containers

A recent development in public space containers is the availability of bins with solar powered compaction and wireless sensors that sense detect various conditions such as fill level, temperature, and geo-location. The bin sensors are designed to improve the logistical performance of collection services through the creation of data-driven collection schedules. Solar compactors use smart devices that are able to determine how full a waste container is and trigger automatic compaction of the waste when the volume reaches a certain point. Some technologies enable the public space containers to serve as Wi-Fi hubs as well and have been installed in public space bins in Dublin, Ireland; Charleston, South Carolina; Bath, England and is being piloted in New York City, New York.

There are currently two solar compacting public space containers with wireless sensors and software platforms available in North America – the Bigbelly bins (**Figure 7.3**) made by Bigbelly Waste Solutions and the CleanCUBE bins (**Figure 7.4**) made by Ecube Labs. Bigbelly Waste Solutions and Ecube Labs sell their bins, sensors and software as a complete package. Both bins are well established and by several North American communities.

**Figure 7.3: Bigbelly Bins**



**Figure 7.4: Ecube CleanCUBE Bins**



The cost for these compacting and/or sensory technology is more than standard public space bins. Solar compacting bins with wireless sensors and analytic software programs are approximately four to five times the cost of regular public space bin. Non-compacting bins with sensor and software are approximately twice the cost of regular bins. Use of compacting bins can reduce collection frequency and associated costs, especially in areas with significant pedestrian traffic.

Some companies sell separate sensors and software packages that can be used in a public space container to transmit real time data about the fullness of the bin and indicate which bins need to be emptied. Sensors help to reduce complaints about overflowing bins and reduce litter.

Ecube Labs offers the CleanFLEX sensors and software package as does OnePlus Systems which offers the Smart Sensor technology for use in public space containers. Nordsense is another sensor. The sensors have been installed in several public space container systems including Greenwich, UK; Baltimore, MY; Washington, BC; and San Francisco, CA (see case study below).

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**Sensors Installed in San Francisco Public Space Containers** - In 2018, the City of San Francisco installed Nordsense (Danish Company) sensors in 48 public space waste containers (see **Photo 21** and **Photo 22**) throughout the City as part of a pilot to reduce litter and collection costs. The sensor uses a light beam to determine the fullness of the waste container and when it is 80% full the sensor transmits a signal to the waste hauler (Recology) to send a crew to empty the container. The pilot resulted in an 80% decrease in overflowing waste containers, a 64% drop in illegal dumping and a 66% reduction in street cleaning. The success of the pilot has resulted in San Francisco purchasing an additional 1,000 waste containers. According to one article, The Danish sensors were purchased at cost US \$294, compared with the rental fee of US \$3,000 per bin per year for the Bigbelly containers.<sup>19</sup>

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<sup>19</sup> Trash talking goes high-tech in San Francisco. March 19, 2019. San Francisco Chronicle at

[sfchronicle.com/bayarea/article/Trash-talking-goes-high-tech-in-San-Francisco-13657161.php](https://www.sfchronicle.com/bayarea/article/Trash-talking-goes-high-tech-in-San-Francisco-13657161.php)

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**Photo 21: Sensor Installed in San Francisco Public Space Waste Containers**



**Photo 22: Close-up of Sensor Installed in San Francisco Public Space Waste Containers**



## **7.4 Potential Application to Guelph's Downtown Collection System**

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### **7.4.1 Municipal Involvement and Collection Approaches**

Most communities provide some level of garbage and waste diversion services to the downtown businesses. Among the communities showcased in Europe, the high-density downtown areas, which couple residential buildings with business establishments, tend to offer more centralized collection for garbage, recyclables and organics. In-ground containers are more commonly used in northern European cities while above ground 6 yd<sup>3</sup> containers seem to be more prevalent in southern European cities. More importantly, the positioning of the containers is meant not to impede pedestrian movement on sidewalks by assuming locations in parking spaces or on extended side walk pads.

In North America, in-ground containers are beginning to gain traction in downtown areas, especially when associated with revitalization efforts and underground infrastructure replacement. In the past, most in-ground containers used in North America have been associated with large circular pods with diameters of 1.7 metres (5.6 feet) as in the case of the Molok in-ground container. Now more varieties of in-ground containers are available that take up smaller footprint space on the surface with large storage capacity underground. Existing underground infrastructure (e.g. sewer, water, utilities) and overhead clearance for collection make underground systems more challenging to implement in established downtown areas. New York City has been grappling with small storage capacity issues for downtown businesses and has implemented design challenges to identify innovative methods to overcome the challenges. One idea seems to mimic the approach used in Europe of providing centralized collection systems that are located on the street rather than the sidewalk. Another solution has been to have workers provide door-to-door using collection using hand carts or electric vehicles and taking the garbage to centralized location for compaction and transport.

### 7.4.2 Pay-as-you-Throw

It is not uncommon in European communities to charge residents and businesses for garbage collection and is much more prevalent in Europe than in North America. Most of the communities showcased above, issue RFID cards or tags to the business or resident that must be used to access the collection container and records each use so the user can be billed back. This approach has not been adopted in North America; instead, communities tend to use a bag/tag or pay-per-bag or cart approach. In the case of the City of Ottawa, businesses must use pre-paid yellow bags for garbage, which helps to promote waste diversion and offsets the need for program funding through the tax base. This approach has been adopted in other communities including the City of Toronto and the City of Sudbury with good success.

## 8.0 Public Space Outcome Based Criteria for Downtown PSC

### 8.1 Review of Guelph's Downtown PSC Service

The City of Guelph's downtown PSC program faces a number of challenges that can be summarized as follows:

- Despite six day a week service, the public space containers are often found overflowing due to the fact that they are used by both downtown businesses, residents and pedestrians.
- The overflowing bins can cause odour issues, especially the organic PSCs and can experience an increase of wasps and flies around the bins, which negatively impacts the aesthetics of the downtown core.
- The City of Guelph's current PSCs are 227 litre containers designed for fully-automated collection. This requires that the PSCs be unsecured and moveable which often results in collection crews having to reposition the PSCs for automated collection.
- Since the containers are not secured to the sidewalk, they can become separated from each other which can lead to higher levels of contamination.
- Limited signage and large standard openings on the containers can result in higher levels of contamination and cross-contamination among the PSC streams.
- Downtown businesses and City staff report that they would like to see more attractive stationary containers installed that enhance the urban streetscape.

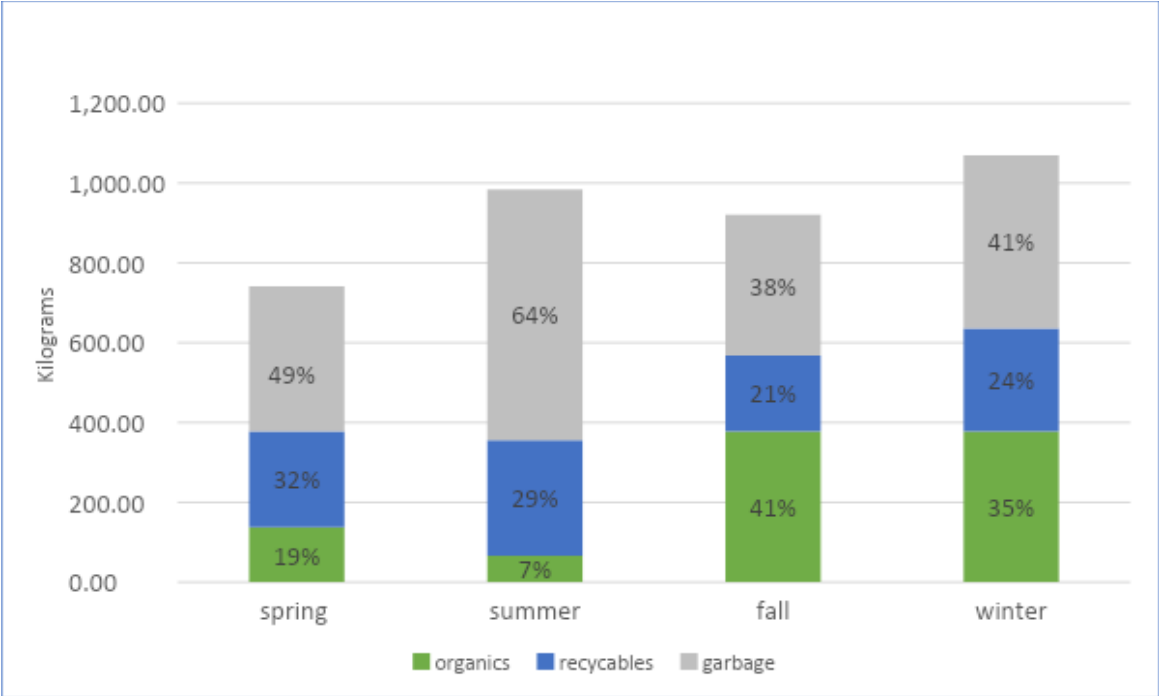
## 8.2 2016 Downtown PSC Four Season Waste Audits

The City conducted a series of four seasonal audits in the downtown PSCs from the fall of 2015 to the winter of 2016. The overall kilograms of materials collected for each of the four seasons is provided in **Table 8.1** and **Figure 8.1**. The winter generated the most amount of material compared with the other seasons. The audits did not differentiate between the materials deposited by businesses and those deposited by residents or the public.

**Table 8.1: PSC Seasonal Waste Audit Results**

Season	Green Container (kg)	Recycling Container (kg)	Grey Container (kg)	Total (kg)
Spring	137.55 (19%)	239.92 (32%)	363.93 (49%)	741.40
Summer	65.85 (7%)	289.65 (29%)	628.53 (64%)	984.03
Fall	377.98 (41%)	189.61 (21%)	352.63 (38%)	920.22
Winter	377.98 (35%)	257.96 (24%)	434.20 (41%)	1,070.14

Figure 8.1: PSC Seasonal Waste Audit Results



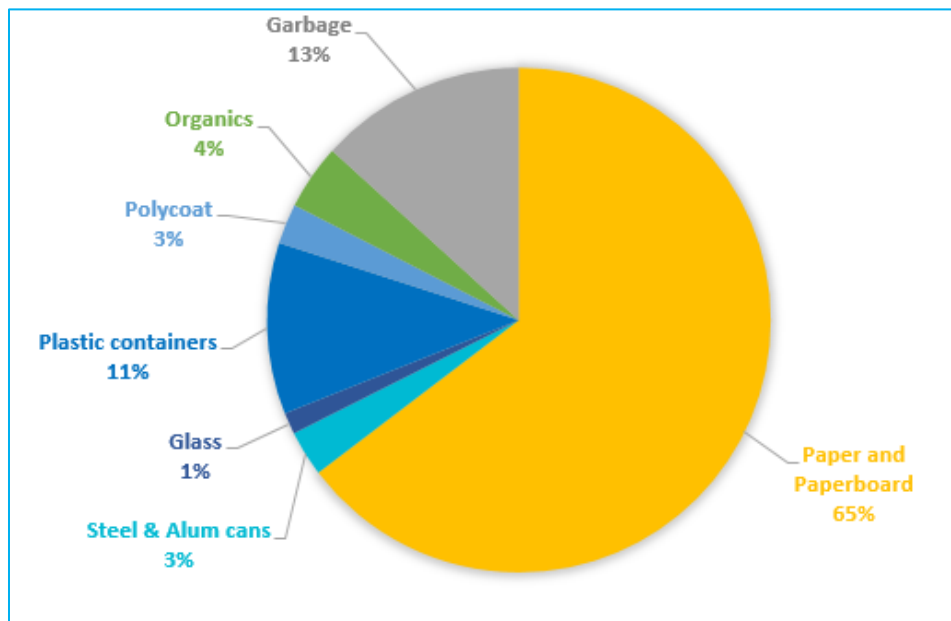
The summary results of the 4-season audits are presented in **Table 8.2** and **Figure 8.2**. The results show that the level of contamination and cross-contamination among the PSC streams is relatively low compared with other public space audits.

The recycling PSCs contained 83% recyclable material, 13% garbage and 4% organics, which likely soiled a portion of the paper rendering it non-recyclable.

Table 8.2: PSC Seasonal Waste Audit Results

Categories	Kilograms	%
<b>Paper and Paperboard</b>	631.83	65%
<b>Steel &amp; Alum cans</b>	28.64	3%
<b>Glass</b>	13.45	1%
<b>Plastic Containers</b>	107.27	11%
<b>Polycoat</b>	25.22	3%
<b>Organics</b>	40.97	4%
<b>Garbage</b>	129.76	13%
<b>Total</b>	<b>977.14</b>	<b>100%</b>

Figure 8.2: PSC Seasonal Waste Audit Results

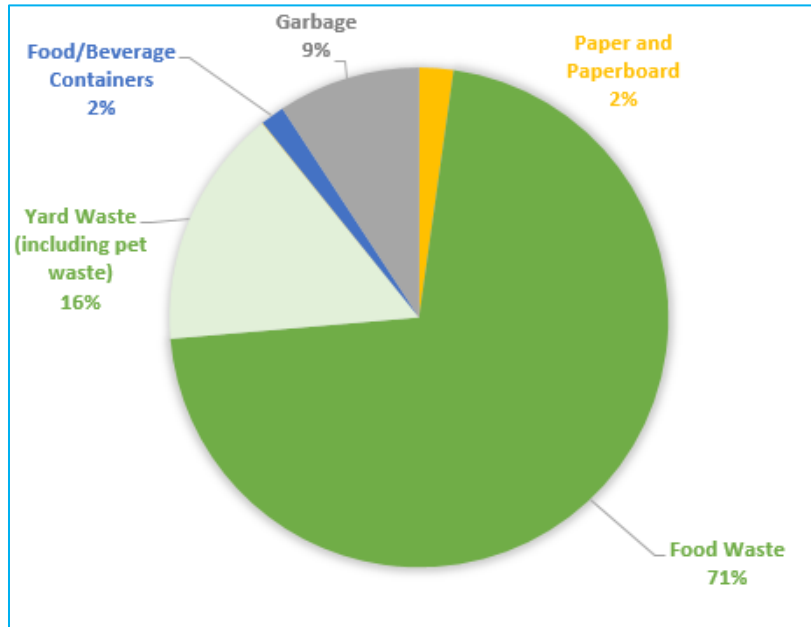


The organics PSCs contained 71% food waste, 9% garbage and 4% recyclable materials, of which some of the paper items (e.g. napkins, tissues) would have been compostable – see **Table 8.3** and **Figure 8.3**.

Table 8.3: The 4-Season Organics PSC Summary

Categories	Kilograms	%
<b>Paper and Paperboard</b>	21.03	2%
<b>Food Waste</b>	675.57	71%
<b>Yard Waste (including pet waste)</b>	147	16%
<b>Other Compostables</b>	0.36	0%
<b>Food/Beverage Containers</b>	14.68	2%
<b>Garbage</b>	87.34	9%
Total	<b>945.98</b>	<b>100%</b>

Figure 8.3: The 4-Season Organics PSC Summary

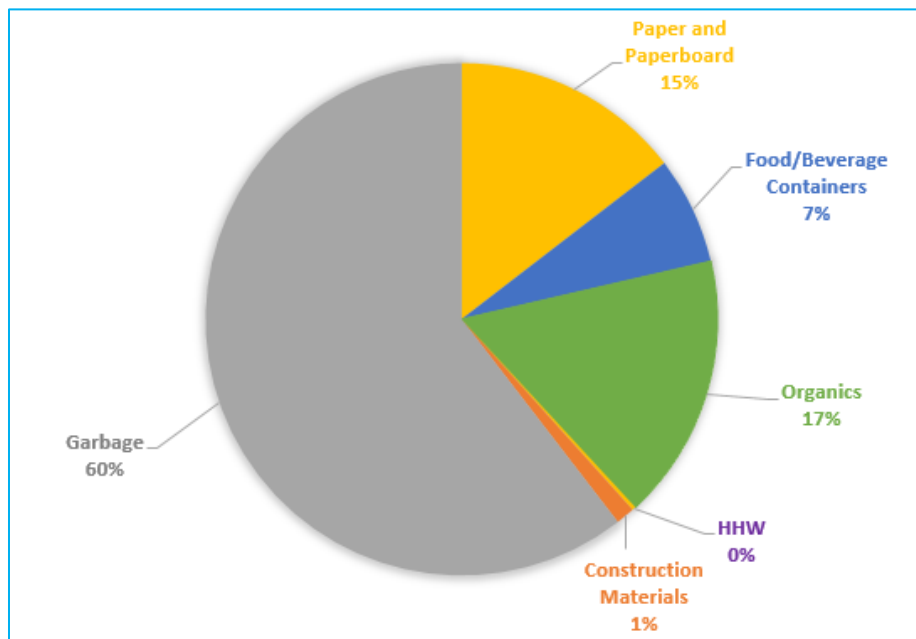


The garbage PSCs contained 60% garbage, 22% recyclable material, 17% organics and 1% construction materials, as shown in **Table 8.4** and **Figure 8.4**.

Table 8.4: The 4-Season Garbage PSC Summary

Categories	Kilograms	%
<b>Paper and Paperboard</b>	259.11	15%
<b>Food/Beverage Containers</b>	120.92	7%
<b>Organics</b>	298.17	17%
<b>HHW</b>	4.07	0%
<b>Construction Materials</b>	21.3	1%
<b>Garbage</b>	1075.72	60%
Total	<b>1779.29</b>	<b>100%</b>

Figure 8.4: The 4-Season Garbage PSC Summary



These audit findings underscore the challenges associated with the effectiveness of current PSC program in diverting recyclables and organics from the garbage stream.

### 8.3 Public Space Container Research

Research conducted on municipal public space containers has shown that when each PSC unit is separated, even by a short distance, some pedestrians will deposit their discarded items in the bin closest to them.<sup>20</sup> In addition, to increase proper usage, PSCs openings should always be positioned to face pedestrian traffic and be oriented in the same direction. Even having PSCs facing back to back can result in users selecting the closest PSC to discard their items.<sup>21</sup>

<sup>20</sup> Make the Drop: Public space Three Stream Waste Diversion Parks Pilot. November 2008. York Region at <http://archives.york.ca/councilcommitteearchives/pdf/dec%2010%20three%20att%201.pdf>

<sup>21</sup> PLANNING FOR SUCCESS – 10 tips for public space recycling 'Keep America Beautiful at <https://americarecyclesday.org/wp-content/uploads/2013/07/Public-Space-Recycling-Guide11.pdf>

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Research has also shown that distinctly shaped openings for recyclables and garbage recycling PSCs assist people in making the right decision with their discarded items. For example, a restricted circular opening combined with a thin rectangular opening on recycling PSCs indicates that the PSC is for containers and paper materials only; whereas, a slightly larger square or rectangular opening for garbage PSCs distinguishes them from the recycling PSCs while still being small enough to prevent larger waste items from being deposited in the garbage PSC as illustrated in **Figure 8.5**.<sup>22</sup>

**Figure 8.5: Public Space Container Shapes**



The location of the opening also needs to be considered. Pilots conducted by York Region concluded that bins with the openings at the front were better than bins with openings at the top because the front openings prevented rain and snow from coming into contact with material deposited in the bin. Furthermore, municipalities have found that having flaps or rubber flanges over PSC openings can discourage people from using the bins due to concerns about coming in contact with a soiled surface.

During the selection of new PSCs in the downtown core, the City of Barrie determined that the bottom edge of PSC openings should be no higher than 48 inches to allow access for children and people in wheelchairs.

In Ontario, municipalities have adopted the universal colour scheme for material streams, including blue for recycling, dark grey/black for garbage and green for organics. This colour scheme is often applied to PSCs as well.

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<sup>22</sup> PLANNING FOR SUCCESS – 10 tips for public space recycling 'Keep America Beautiful at <https://americarecyclesday.org/wp-content/uploads/2013/07/Public-Space-Recycling-Guide11.pdf>

## 61 | Public Space Outcome Based Criteria for Downtown PSC

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In Ontario, municipalities have adopted the universal colour scheme for material streams, including blue for recycling, dark grey/black for garbage and green for organics. This colour scheme is often applied to PSCs as well.

Most Ontario municipalities have chosen to not employ organic PSCs due to the additional expense and high contamination.

Companies that market outdoor amenities such as benches and PSCs for urban settings often refer to them as “street furniture”, which indicates that they should be an attractive addition to the streetscape. Municipalities are increasingly aware that the aesthetics of PSCs need to be considered along with functionality and user experience. The PSCs need to be attractive enough to be used by the public but functional enough to hold up against wear and tear and collection operations and maintenance of the containers.<sup>24</sup>

Ontario municipalities tend to choose among three PSC design options that allow for different collection approaches:

- Manual internal receptacle collection - Rigid internal storage receptacles with grab handles that allow collection staff to remove the receptacle and replace it after emptying. This is the most common design option.

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<sup>23</sup> Make the Drop: Public space Three Stream Waste Diversion Parks Pilot. November 2008. York Region at <http://archives.york.ca/councilcommitteearchives/pdf/dec%2010%20three%20att%201.pdf>

<sup>24</sup> Street furniture: a challenge for public space bins. 2017 at <https://www.husson.eu/en/event/Street-furniture-a-challenge-for-public-spaces,40725.html>

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- Manual bag collection – Internal storage receptacles can be lined with bags that are lifted out of the PSC and tossed into the collection vehicle and then replaced with a new bag<sup>25</sup>
- Semi-automated cart collection – Wheeled carts that fit into the PSC and are manually removed and emptied into the collection vehicle with a lift arm then placed back in the PSC after emptying.

As described in **Section 7.3**, two recent innovations are the availability of PSCs with solar compaction and internal wireless sensors that can send a signal to a monitoring station when a PSC is full and needs servicing and wireless sensors that can be installed in conventional non-compaction PSCs. The solar compaction PSCs tend to be two to three times higher in cost than a conventional PSC but wireless sensors in conventional PSCs are lower in costs and show promise.

Signage plays an important role in society by drawing attention to an activity or place and providing useful information. Research shows that a person's average reading time is four to eight words in four seconds. Therefore, if the average person takes no more than five seconds to read a sign on a public space container, it would suggest that the signs should feature no more than eight words.<sup>26</sup>

Signs serve two main purposes: identification and instruction. In the case of public space recycling, signage is often used to convey both identification and instruction. The signage helps to identify recycling and garbage PSCs on city streets. At the same time, the recycling signage provides instructions about how to properly use the recycling PSCs and reduce contamination of the recycling stream.

In order to convey the information properly, users need to receive clear, easy to understand messages that can be processed in a matter of seconds. A study conducted by the Research Labs, University of British Columbia and Metro Vancouver demonstrated that coloured images (photos) provided the

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<sup>25</sup> Note: The current collection contract does not require collection crew to replace bags in bins; therefore, this approach is not recommended

<sup>26</sup> Guidelines for Designing Effective Signage. 2011. Continuous Improvement Fund

## 63 | Public Space Outcome Based Criteria for Downtown PSC

most accurate responses during testing and signs with words only yielded the slowest and least accurate responses.<sup>27</sup>

Research conducted by York Region as part of its Make the Drop Public Space Program resulted in updated signage for PSCs as shown in **Figure 8.6**. The research demonstrated that effective signage needs to employ some simple concepts:

- Use easy to recognize images
- Use bright colours to attract attention
- Harmonize the signage colours with the program
- Limit the use of wording and pair with images<sup>28</sup>

**Figure 8.6: York Region Signage**



<sup>27</sup> How does the design of waste disposal signage influence waste disposal behavior? By David W.-L. Wua, Peter J. Lenkica, Alessandra DiGiacomoa, Peter Cechb, Jiaying Zhaoa,c, Alan Kingstonea in Journal of Environmental Psychology. Vol 28. 2018 at [http://zhaolab.psych.ubc.ca/pdfs/JEVP\\_2018.pdf](http://zhaolab.psych.ubc.ca/pdfs/JEVP_2018.pdf)

<sup>28</sup> Make the Drop: Public space Three Stream Waste Diversion Parks Pilot. November 2008. York Region at <http://archives.york.ca/councilcommitteearchives/pdf/dec%2010%20three%20att%201.pdf>

### 8.4 Future Considerations

In June 2021, the Blue Box Regulation (O. Reg. 391/21) came into law and outlines requirements for the transition of the blue box program to full individual producer responsibility (IPR).<sup>29</sup> The legislation requires producers to provide public space recycling service to outdoor areas including parks, playgrounds and sidewalks, as part of their IPR requirements. This may impact Guelph's decision as to what type of public space containers it wants to use. For example, using individual public space containers for each waste stream (garbage, blue box recyclables and organics) and ensuring that they are paired together may reduce potential collection complications.

The legislation does not require producers to provide recycling service to businesses.

### 8.5 Public Space Outcome Based Criteria

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#### 8.5.1 Addressing the Current Challenge in PSC Use

To address the challenges described in Section 8.1, a set of outcome-based criteria for a successful PSC program were developed. However, prior to developing outcome-based criteria for PSCs, it is important to address two interrelated features of Guelph's PSC program that makes it unique among North American PSC programs and which create a unique set of challenges to the City:

- First, the City's downtown PSC containers are not only used by pedestrians but by downtown businesses and residents as well. As noted above, this can result in significantly more material being collected than in other PSC programs and can often lead to overflowing bins.
- Second, the City's downtown PSC program collects an organic food waste stream as well as the mixed recyclables and garbage streams. Consequently, in addition to collecting food waste from pedestrians, the program is likely collecting significantly more food waste from downtown food establishments, which can result in odour and pest issues. This requires the containers to be collected on a more frequent basis (e.g.

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<sup>29</sup> Ontario Regulation 391/21 was filed on June 2, 2021 under the Resource Recovery and Circular Economy Act, 2016

<https://www.ontario.ca/laws/regulation/r21391#BK31>

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daily, particularly in the summer months) and either rinsed out on a frequent basis or lined with plastic bags.

To address these challenges, it is recommended that Guelph's PSC program be aligned with other PSC programs by implementing the following changes going forward:

1. Dedicate the PSC program to material generated by pedestrians only and establish alternative collection programs for material generated by downtown businesses (as described above). This should result in a reduction in the PSC collection frequency.
2. It is expected that food waste quantities in the organics PSCs will decline significantly if and when downtown food service establishments are no longer allowed to place food waste in them. Eliminating the organics PSCs would improve collection efficiency and potentially allow the City to reduce operation costs.

It is also recommended that the City consider replacing the current PSCs with internal storage receptacles or wheeled carts for the following reasons:

- The existing PSCs have several shortcomings including that they are not stationary, have large standard openings, inadequate signage and are considered unattractive.

Manual bag collection requires collection crews to carry replacement bags which is an ongoing expense and in the case of the recycling stream would require the bags to be manually opened at the collection truck or in the MRF.

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### 8.5.2 PSC Design Criteria

Development of outcome-based criteria for the City's PSC program first requires a clear statement of desired outcomes that address the challenges described in Section 8.1. The proposed outcomes of an effective PSC program for the City are as follows:

- Attain low levels of contamination in PSCs and low levels of cross-contamination among PSCs.
- Ensure that PSCs that are seen by pedestrians and businesses as an attractive addition to the downtown streetscape.
- Ensure that PSCs that can be efficiently serviced and require minimal maintenance.

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Specific outcome-based criteria for PSCs, based on the experience of other municipal PSC programs and findings of PSC studies, are presented below in three sections: PSC Design Criteria, Functionality and PSC Signage Criteria.

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### 8.5.2.1 PSC Design Criteria

**Uniform Container Design and Aesthetics** - A uniform design for recycling and garbage PSCs helps to increase public awareness of the program and strengthens program branding. Multiple bin designs in the same urban setting can make it more difficult to promote the program to residents and visitors. The design must address the aesthetics, which needs to be weighed against functionality and user experience. The PSCs needs to be attractive enough to be used by the public but functional enough to be easily maintained and hold up against wear and tear and collection operations.<sup>30</sup>

Criteria:

- Select a uniform design for public space containers in the downtown core – all PSCs should be consistent in material construction, shape, size and placement of signage with the only difference being colour-coding and opening size and shape.
- Select PSCs with tops that slope back from the front or are curved in a convex shape to prevent pedestrians from placing discarded items on top of the containers and to prevent buildup of moisture and dust.
- Make PSC aesthetics as important as functionality.
- Select PSCs that are an attractive addition to the urban streetscape.

**Paired (co-located) Installation of PSCs** - One of the key rules of PSC installation is that all containers (e.g. garbage, recycling and organics) must always be paired together and never separated.

Criteria:

- Always pair public space units together

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<sup>30</sup> Street furniture: a challenge for public space bins. 2017 at [https://www.husson.eu/en/event/Street-furniture-a-challenge-for-public-spaces\\_40725.html](https://www.husson.eu/en/event/Street-furniture-a-challenge-for-public-spaces_40725.html)

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- PSCs should be placed in permanent locations and secured to a concrete surface
- Always position PSCs so that the openings face pedestrian traffic and orient PSCs in the same direction

**Container Openings** - Research has shown that distinctly shaped openings for recyclables and garbage recycling PSCs assist people in making the right decision with their discarded items.

Criteria:

- Choose openings that indicate what material is accepted in the PSC; for example, a round opening for containers, a slit opening for newspapers and an oval opening for food waste
- Openings should be uncovered and on the side of the PSC (avoid using flaps or rubber flanges over the PSC openings)
- The bottom of the openings should be no higher than 48 inches off the ground

**Container Colours** - A critical feature of public space bin recycling is the use of colour-coded PSCs that use well recognized colour schemes to enable pedestrians to easily identify the correct container for their discarded items.

Criteria:

- Select public space recycling bins that are medium blue in colour
- Select public space garbage bins that are dark grey or black in colour
- Select public space organic bins that are green in colour

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### 8.5.2.2 Functionality

**Collection Functionality** – Ensuring effective and efficient access to PSCs by collection staff is a critical feature of a well function PSC service.

Criteria:

- Select PSCs with rigid Internal storage receptacles or wheeled carts
- Select PSCs with lockable access doors, preferably on the rear of the PSC to prevent unauthorized access to the internal storage receptacles and allow for more efficient servicing by collection staff

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**Container Placement** - PSCs need to be placed in locations where there is higher pedestrian traffic and in sufficient locations to allow easy access by the user. Studies have shown that People will use bins that are conveniently located where they need them and that generally they will not walk more than 12 metres (40 feet) to dispose of their litter in a public place.<sup>31</sup>

Criteria:

- Locate PSCs in high pedestrian traffic areas (e.g. street corners/intersections)
- Ensure that PSCs are in numbers to encourage use

**Adequate PSC Storage Capacity** - PSCs that lack adequate capacity resulting in messy or overflowing containers, will deter the public from using them properly. The capacity of PSC has to be large enough to prevent frequent overflowing, but small enough to facilitate safe movement and manual emptying of internal containers by collection staff. Research shows that most PSCs range in capacity from a minimum 120 litres to a maximum 155 litres.

Criteria:

- Select recycling and garbage PSCs with the same volume capacity – a minimum of 120 litres and a maximum of 155 litres per PSC
- Consideration PSCs with the ability to accommodate the future addition of sensor technology

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### 8.5.2.3 PSC Signage Criteria

**Signage Text** – The rule of thumb for signage is keep it clear, concise and easy to understand; for example, a simple message, such as “Empty Containers and Clean Paper Only” on recycling PSCs in capital letters will help to reduce contamination and send a clear message about what can be deposited in recycling PSCs.

Criteria:

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<sup>31</sup> Better Practice Guide for Public Place Recycling, 2005. Department of Environment and Conservation, New South Wales, Australia at <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/warrlocal/050156-public-place-recyclguide.pdf>

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- Use key words like “EMPTY CONTAINERS AND CLEAN PAPER ONLY” and “GARBAGE” with easy to recognize images (see below)
- Use contrasting colours for the text that stand out against the PSC colour (e.g. white lettering for labels on the black garbage and blue recycling bins)

**Images** - Pairing simple text with an image has been found to work best but it is important not to clutter the space with too much text and images. Not only should the signage take up a significant space on the PSC but it needs to be placed where it will be easily seen and read, e.g. at eye level or immediately below the opening

Criteria:

- Pair images with text
- Use coloured photographic images (avoid using icons) and make the signage as large as possible on the front of the PSC and on sides where there are other openings and place the sign/label just below the opening
- All signage must be protected from the elements and vandalism by using plastic sleeves or metal plates for signs - avoid adhesive signs/labels unless they are being used for short-term purposes to address contamination issues

## 9.0 Key Findings from the Research

When providing waste services to downtown businesses or BIAs, some of the key findings from the survey conducted of the five selected municipalities:

- All municipalities, except for one, provide different levels of waste service to the downtown businesses.
- Garbage collection frequency varies from one to six days per week with three of the five municipalities providing curbside collection two days per week and one municipality offering once a week collection service. Only one municipality provides the same level of service (six days per week collection) as the City of Guelph.
- All municipalities, except for one, provide Blue Box recycling.
- Only two of the municipalities provide green cart service to downtown businesses or BIAs. Some municipalities cited the reason that providing Green Bin service was too costly and challenging to implement and monitor.
- None of the five surveyed municipalities allow businesses to use public space containers as waste receptacles.
- Most of the five municipalities fund the cost of waste services through property taxes with the one supplementing the service with a partial Pay-as-you-Throw program and the other municipality funding the full waste management service through a full Pay-as-you-throw (PAYT) program.

Staff from the surveyed municipalities admitted that monitoring garbage set outs from mixed use buildings (with business and residential units) is challenging in trying to determine the source of the set outs. Staff also reported that providing waste services to downtown areas required more administration time to manage the service and the complaints. Staff also reported that they have few options to respond to space shortages and higher service demands from businesses in downtown cores.

Some innovative waste services approaches that have been used in North America and European cities to address the challenges of space shortage and mixed use buildings in crowded downtown areas. Many European cities have combined Pay-as-you-Throw with a centralized in ground collection

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system that requires users (businesses and residents) to take their waste and divertable materials (organics and recyclables) to a centralized location and use a fob or user card to access the bins. Each time the bin is accessed, the user is charged. The charges may be augmented with an annual user fee. A few European cities have invested in underground vacuum, pneumatic systems but they tend to be very expensive and require high density rates to justify the expense.

In North America, cities have begun to use in-ground containers to accommodate commercial businesses, especially in businesses districts and malls. Other large, urban cities, such as New York City, struggle with providing consistent collection services to densely populated, downtown areas and maintaining clean sidewalks and public spaces. In New York City's Battery Park, a downtown business district, centralized compactors have been installed in loading areas which are accessed by staff, from neighborhood buildings and businesses, who collect the garbage door-to-door and cart the garbage to the centralized compactors for storage. The compacted garbage bins are hauled away for disposal by waste haulers.

New York City's Department of Sanitation has also been involved in a year long process to find alternative technologies/solutions for its street garbage. Through this pilot, the City has identified an innovative scheme that will allow Business Improvement Districts (BID) to install sealed containers that would be set out in the street, adjacent to the sidewalk and used as a central collection area by businesses.

# 10.0 Proposed Options

## 10.1 Downtown Waste Collection Service

The proposed multi-system approach involves the use of yellow bags for garbage that businesses purchase from participating outlets or can be distributed by the City. The yellow bags are collected daily by a hired staff (managed by the DGBA) using an electric cart or some other vehicle and taken to a central location to be compacted. The City provides the compactor and uses front end bins at the compactor, which are collected and transported for disposal to the landfill when full. The yellow bag program subsidizes the salary of the collection staff and may pay for the compactor, transportation and disposal of the garbage. In the case of Battery Park in New York City, which employs a similar approach, the New York City Department of Sanitation provides hauling and disposal services free of charge as it is cheaper than providing twice weekly curbside garbage collection. See a detailed description of the Battery Park program in **Section 10.4**.

The yellow bag program could also pay for the processing of the recyclables and green bin materials. The hired staff would collect cardboard from businesses, which is taken to a dedicated cardboard compactor for processing. All other recyclables and green bin material are collected by the hired staff and taken to centralized, in-ground bins for storage. These in-ground storage bins can be provided for Blue Box recyclables, organics and garbage, which can be used by downtown businesses and residents with the use of an access card or tag.

The garbage could be collected on a less frequent schedule than the organic and cardboard materials. This will also promote higher participation in the waste diversion programs. Foodservice establishments can receive daily Green bin service with retailers receiving daily cardboard collection. If businesses require further service, they can use the centralized in-ground containers. Access to the garbage containers will be recorded and the business will be charged back based on the number of times the garbage deposited into a chamber. The chamber permits a certain size/volume of garbage before it must be emptied and accessed again.

### 10.2 Downtown Public Space Containers

To address the shortcomings associated with the current PSC program, options include:

- Dedicate the PSC program to material generated by pedestrians only and establish alternative collection programs for material generated by downtown businesses (as described above)
- Consider installing mixed recyclables and garbage PSCs only once downtown eating establishments are no longer permitted to place food waste in the organics PSCs

Another option is for the City to consider PSCs with internal storage receptacles or wheeled carts for the following reasons:

- The existing PSCs have several shortcomings including that they are not stationary, have large standard openings, inadequate signage and are considered unattractive by downtown businesses.
- Manual bag collection requires collection crews to carry replacement bags which is an ongoing expense and in the case of recycling would require the bags to be manually opened at the collection truck or in the MRF.

### 10.3 Benefits of the Proposed Collection System

**Table 10.1** below summarizes the challenges associated with the current collection system in the downtown core area and shows how the potential benefits of the proposed collection system address each of those challenges.

Table 10.1: Benefits of Proposed Collection System

Challenges with Current System	Benefits of Proposed System
<p><b>Six day per week cart-based collection of garbage, organics and recyclables from commercial properties and PSCs in the downtown core is expensive to provide, with estimated staff and fleet operating costs of \$149,240 per year paid by property taxes.</b></p>	<p>A yellow garbage bag collection system with a fee for each bag would cover the cost of garbage collection and disposal. A higher bag fee could also cover the cost of recycling and organics collection.</p>
<p><b>The current collection system does not provide any financial incentives for downtown businesses to reduce garbage and fully utilize recycling and organics bins</b></p>	<p>The yellow garbage bag fees would provide a strong financial incentive to businesses to reduce garbage generation and maximize use of recycling and organics collection.</p>
<p><b>Six day per week cart-based collection in the downtown core results in an inefficient use of waste collection staff and the collection truck fleet.</b></p>	<p>A centralized transfer location with dedicated compactors for garbage and cardboard supplemented by centralized storage of recyclables and organics will improve collection efficiency. This will allow some curbside collection staff and trucks serving the downtown core to be reassigned to residential routes.</p>
<p><b>Currently the City must provide curbside collection at 5 am to avoid disruption of service caused by parked cars and traffic.</b></p>	<p>The proposed approach provides flexibility in the collection schedule and avoids the need to send collection trucks out in the early morning hours.</p>
<p><b>Businesses and residences lack space to store carts on their premises, which has resulted in the high use of the PSCs. This enables the businesses and residents to use bags and store them more easily.</b></p>	<p>The yellow bag approach will better accommodate the storage space limitation of businesses and residences in the downtown area.</p>

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Challenges with Current System	Benefits of Proposed System
<p><b>Six day per week collection is costly.</b></p>	<p>In other similar cases, such as Battery Park in NYC, the City has experienced significant cost savings by not having to provide curbside collection for garbage and is able to haul and dispose of the compacted garbage free of charge and still save money.</p>
<p><b>Six day per week collection of garbage, recyclables and organics PSCs that are used by pedestrians, businesses and residents still results in frequent over-flow conditions, particularly in the summer months, creating an eyesore for downtown business customers and pedestrians.</b></p>	<p>PSCs for use by pedestrians only and designed specifically for collecting litter and blue box materials only will require fewer collections per week and reduce unsightly overflow conditions. Food waste, which is generated primarily by restaurants and bars, will be re-directed to the front-end organics collection bins.</p>
<p><b>The design of current PSCs (non-stationary, standard large openings, limited graphics) result in cross-contamination among material streams and also results in PSCs being separated from each other and moved to locations that are not convenient for pedestrians.</b></p>	<p>Paired, stationary, strategically placed, colour-coded recycling and garbage PSCs with distinct openings and clear graphics will reduce cross-contamination, improve the quality and quantity of recyclable material collected and enhance the public space recycling experience for pedestrians.</p>
<p><b>PSCs experience odours and pests during the summer resulting from the garbage, recyclables and green bin materials being deposited into the PSC by businesses and residents.</b></p>	<p>The proposed collection system should eliminate odour and pest problems. The new PSCs will be used by pedestrians, as intended.</p>

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<b>Challenges with Current System</b>	<b>Benefits of Proposed System</b>
<b>The mobile PSCs are being moved about constantly and often are bunched together in locations that block store entrances or parking areas.</b>	Stationary PSCs will eliminate this problem.

### 10.4 Additional Research

Additional research was conducted to find examples of other jurisdictions that employed a shared responsibility of collecting waste in a mixed use area. Contact was made with other municipalities and a representative from a private sector waste management company. Battery Park, in New York City, was noted as the most relevant example and is discussed in this section.

#### **Battery Park, New York City**

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Battery Park City, a neighbourhood located in the southern part of Manhattan, New York City is home to 16,000 residents, commercial establishments, office buildings and public schools. In total, there are garbage from 8,275 residential units, 30 residential buildings, 4 public schools, and 10 commercial, civic and institutional buildings in Battery Park City.

In 2003, the Battery Park City Authority (BPCA), a quasi-state agency, which controls leasing arrangements for the entire area, introduced a new system to manage waste and divertables generated by residential and schools. All commercial waste (including office waste) is handled by private haulers.

During the beginning of the pilot, the BPCA worked with owners of specified sites to host compactor containers that could be used by neighbouring buildings and managed by the Battery Park City Authority. Every day, except for key holidays, building staff bring the garbage to one of three compactor stations at 10:30 a.m. Building staff use a variety of equipment to deliver the garbage including push carts, vehicles pulling trailers, etc. There is no limit on the amount of garbage that can be brought to the compactor.

Once delivered, the garbage is physically put into a hopper and it is then managed by two BPCA staff located at each compactor, one who loads the garbage into the compactor and the other who operates the compactor. Each compactor manages garbage from about 2,000 units and takes about 90 minutes to load each day. The BPCA funded the pilot program by purchasing the composters and paying for the required infrastructure and is responsible for maintenance and operation of the compactors and staffing.

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The garbage and composting program is funded through an annual pilot fee charged each residential building, which is based a formula involving the age of the building and the number of residential units. The fees charged each building are in lieu of property taxes. [1]

The compacted garbage is picked up by the New York City Department of Sanitation (DSNY) when the bin is full (~10 tonnes), about three times a week. DSNY pays for the removal of the bins and the disposal of the garbage at no charge since it is saving money by not having to provide twice a week curbside garbage collection services.

In 2017 about 80% of buildings in Battery Park City participated in the compactor program. This approach has resulted in several benefits including a cleaner neighborhood, a reduction in rodent and pest populations, lower truck noise and emissions. [2]

Blue Box recyclables, including cardboard, are still collected at the curb, once a week, by the DSNY services. The bagged recyclables are piled on the sidewalk for curbside collection.

The BPCA initiated a composting pilot involving several buildings. The residential buildings are independently owned and must agree to take the composting program seriously. The organic material is limited to only fruits and vegetables, coffee grounds, tea bags, napkins, unbleached paper towels, and plant materials.

Staff from participating buildings bring the organic material to the centralized locations where the material is composted using a BPCA-operated composter. Commercial businesses can participate in the composting program. The BPCA purchased an aerobic in-vessel composter from Green Mountain Technologies, which is housed inside a building.

The biggest challenge to the centralized garbage collection program is finding space for the compactors. The BPCA would like to add two more compactors in the area but cannot find the space since building owners do not want to give up valuable real estate space. One of the biggest challenges at first was getting buildings to agree to use their own staff to move garbage to a compactor. Now, buildings see the value of the program since they don't need to store garbage for three or four days and no longer have rodent problems. The program has been very successful and popular.

# 11.0 Feedback from Engagement Activities

Public and stakeholder engagement was an important component throughout the Solid Waste Management Master Plan. The recommendations within this report were developed based on input on the proposed options from the Technical Advisory Committee (TAC), DSG, and consultation with City staff, Dillon project team, and other impacted stakeholder groups.

The COVID-19 pandemic limited the ability to engage the DSG on proposed options for downtown waste collection services. Downtown businesses also faced special challenges as a result of public health restrictions. It was decided to engage the downtown stakeholders at a more suitable time as part of the Downtown Infrastructure Revitalization Program which is set to launch in 2022. The Downtown Infrastructure Revitalization Program will provide additional opportunities to engage Downtown stakeholders, including the DSG.

Staff from Economic Development and By-Law were engaged on the Downtown Services Review. Overall there was strong support for moving forward on a Downtown Waste Collection Pilot for door-to-door collection and use the information to explore enforcement measures and alternative funding models.

Input was sought from the public on the public space containers in the Downtown in Survey #1. Overall participants indicated that they use the Downtown as visitors (70%) and were somewhat satisfied with the public space containers. Feedback from the survey related to the downtown is summarized below.

## 11.1 Summary of Feedback from Engagement Activities

The Survey asked participants to indicate their level of satisfaction with the Downtown public space containers. Overall, participants indicated that they were generally satisfied with the size and state of good repair of the containers, but that odor and keeping away of pests could be improved.

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Results are shown in **Figure 11.1** below.

**Figure 11.1: Public Survey #1 Results**

Thinking about the public space containers located on the streets downtown (pictured here) please l...



### Question options

(Click items to hide)

- Don't know
- Very dissatisfied
- Somewhat dissatisfied
- Neither satisfied nor dissatisfied
- Somewhat satisfied
- Very satisfied

## **81 | Feedback from Engagement Activities**

Participants were asked if they have other comments about the public space containers they wanted to share. Of the 136 responses to this open ended question, the following themes were most common:

- Bins are often full and overflow
- Improve sorting for the Public Space Containers
- The Public Space Containers are not aesthetically pleasing

## 12.0 Recommendations

Based on the information presented above, the following recommendations are put forward as part of the SWMMP Update to address waste collection services in Downtown Guelph.

### **Downtown Waste Collection Service:**

- Conduct further engagement, as part of the Downtown Infrastructure Revitalization Program, for a potential pilot project where participating businesses and residents receive daily door-to-door collection system that will move materials to a central collection area for pick-up. Pilot door-to-door collection and use information to explore enforcement measures and alternative funding models.

### **Downtown Public Space Containers:**

- Permit the use of PSCs for pedestrians only. Consolidate PSCs and strategically place in permanent locations with colour coding to help reduce contamination and improve the quality/quantity of recyclable materials captured.

The COVID-19 pandemic has had a significant impact on the Downtown Services Review for the SWMMP. Therefore, based on the research completed to date and the feedback received from the TAC, DSG and other impacted stakeholder groups, it is recommended that the City conduct a pilot project to better understand the partnership arrangements with the Downtown Guelph Business Association (DGBA) and the costs to implement and manage the requirements for a centralized collection approach.

Through the pilot project, aspects of the centralized collection approach can be tested such as using yellow bags for garbage, separate collection systems for Blue Box recyclables and Green Bin organics, the collection equipment, and staffing. The pilot project would further evaluate cost effectiveness of waste collection in the downtown and work through operating issues and concerns specific to the downtown Guelph, as well as address future funding models.

## 83 | Recommendations

The City will continue consultation on downtown waste collection beyond the initial presentations made to the Economic Development Advisory Committee (EDAC) and DGBA, as part of the Downtown Infrastructure Revitalization Program. The Downtown Infrastructure Revitalization Program will focus on underground and above ground distribution and space needs, with waste management being a key component to be considered.