

To: Shannon Betts, Halifax Regional Municipality
From: Sarah Devereaux, Project Manager, Partner
Date: February 5, 2024
Subject: Solid Waste Strategy Review: P3 - ICI Multi-Residential Best Practices
Our File: 23-6547-1005

1.0

Introduction

Dillon Consulting Limited (Dillon) was retained by Halifax Regional Municipality (HRM) in July 2023 to support a review of HRM's Solid Waste Strategy. Dillon completed a review of current best practices for the multi-residential, industrial, commercial, and institutional (ICI), and construction and demolition (C&D) sectors. Canadian and American jurisdictions that have demonstrated best practices in these sectors were selected for review. The review included a combination of research through a desktop study and interviews with jurisdictions.

1.1

Purpose

Completing best practices reviews are essential to learn from the experiences of other jurisdictions so that a jurisdiction can maintain and improve performance, manage risks, and stay competitive in a constantly evolving sector.

This exercise is intended to provide HRM with a summary review of best practices for the multi-residential, ICI and C&D sectors. Dillon completed research to build on the following best practices that have been implemented across Canada and internationally:

- Regulations regarding installation, use and closure of waste chutes in multi-residential/high rise properties;
- Regulations and/or policies with a mandatory volume of receptacles required for each waste stream;
- Permits, bonds or approvals related to the management or minimization of waste generated from C&D activities; and
- Solid waste by-law best practices that promote source separation in multi-residential properties and/or ICI properties.

1.2

Methodology

To determine the jurisdictions to include in this review, Dillon considered those that have established best practices within the multi-residential, ICI and/or C&D sectors. Dillon provided HRM with a list of

jurisdictions which included an overview of their program design, service levels and population. In consultation with HRM, Dillon refined the list of jurisdictions to ten for review.

Best practice research was completed through a combination of desktop research (e.g., by-laws, documents, standards) and consultation with jurisdictions. Dillon prepared a list of questions for each jurisdiction based on the best practice(s) and sector(s) that were being reviewed. Dillon connected with jurisdictions via email and/or virtual interviews. Following the best practices review; the themes, benefits, and challenges regarding each best practice were summarized.

HRM's current state for the reviewed sectors is provided in **Section 2**. **Section 3** outlines the results of the best practices review; key considerations and findings are provided in **Section 4**.

2.0 Current State

HRM recognizes that the ICI sector represents a significant opportunity for meeting the waste diversion, disposal goals and disposal rates. In HRM, ICI waste encompasses all properties which do not receive curbside solid waste collection, including but not limited to big retail, schools, manufacturing, offices, and multi-residential buildings (with seven or more units). Waste from this sector accounts for approximately 72% of the per capita waste disposed in 2020/2021). Waste from multi-residential buildings with six units or less is considered residential waste.

Currently, HRM's solid waste collection service is provided curbside for residential garbage, organics, and recycling. Curbside collection for small businesses in rural communities is provided if they meet residential set out requirements. HRM also provides a commercial style collection service for registered condominiums. All other collection from the ICI sector needs to be arranged with a private waste hauler. Currently, there is no flow control for ICI garbage disposal. These materials can be disposed at the Otter Lake Waste transfer facility (where it is exported for disposal) or direct hauled to a landfill outside of the boundaries of HRM. However, the ICI sector is still required to have containers in place for recycling and organics under By-law S-600.

C&D waste is managed under By-law L-200, respecting licensing of C&D materials recycling and disposal operations. This by-law reviews the licence requirements for privately owned and operated C&D transfer, processing, and disposal facilities. It also stipulates that all loads of C&D material are required to be weighed (recycled or residuals) and those weights must be maintained in a record. An annual diversion target of 75% recycling must be attained for facilities to maintain their license.

3.0

Best Practices Review

Dillon prepared specific questions for each of the ten jurisdictions for this review. The questions were pre-populated based on the combination of publicly available information and knowledge based on Dillon's previous work with participating jurisdictions. Each of the ten jurisdictions were reached out to for further comment on best practices for the multi-residential, ICI and C&D sectors. Nine of the ten jurisdictions were able to provide further comment. The City of Long Beach was unable to provide additional comment.

3.1

Jurisdiction Selection and Rationale

The ten jurisdictions included as part of this review and the rationale behind their selection is presented in **Table 1**. This table also outlines the relevant by-laws for each jurisdiction and general overview of the services provided in these areas.

Table 1: Selected Jurisdictions

Jurisdiction	Population	Sector Researched	Rational for Selection/Relevance	Relevant Bylaws	General Service Provided
Richmond, British Columbia	209,937	- MR - ICI - C&D	- Multi-residential and ICI development guidelines - Richmond has requirements for handling demolition waste and recycling materials	- No. 9516: Demolition Waste and Recyclable Material - No. 1000: Single-Use Plastic - No. 6803: Solid Waste and Recycling Regulation	- Waste services are provided to single-family, multi-residential, mixed-use and commercial buildings - Residents can drop off recyclables at Richmond Recycling Depot
Vancouver, British Columbia	662,248	C&D	The City of Vancouver requires a minimum salvage (deconstruction) permit when a heritage-listed house or pre-1910 house is going to be demolished	- No. 8417: Solid Waste By-Law - No. 11023: Green Demolition Bylaw	- Vancouver provides residential waste and organics collection to single-family and a small number of multi-residential. A contractor provides recycling services on behalf of RecycleBC - There are no collection services provided for construction waste. C&D materials can be dropped off to the Vancouver landfill for a tipping fee
Regional District of Nanaimo, British Columbia	170,367	- MR - ICI	There are two initiatives set out in the Regional District of Nanaimo Solid Waste Management Plan that aim to build the business of diversion in the ICI sector	- No. 1784: Tipping Fee and Solid Waste Disposal Regulation - No. 1802: Collection of Garbage, Food Waste and Recyclables - No. 1812: Mandatory Waste Source Separation - No. 1813 Waste Hauler Licensing	The Regional District provides residential garbage, recyclables, and food waste collection to single-family homes. The Regional District does not provide collection services to multi-residential buildings or ICI
BC Housing, British Columbia	-	MR	BC Housing has developed two toolkits to support behavioural changes that improve waste reduction and diversion	N/A	BC Housing is a crown corporation that reports to the Minister of Housing. The key responsibilities of BC Housing include develop, manage, and administer subsidized housing options
Region of Peel, Ontario	1,451,022	- MR - ICI	The Region of Peel has a Waste Collection Design Standards Manual for new developments to meet to receive a development permit	No. 36-2021: Waste Collection	Peel provides waste collection services to residential properties (single-family and multi-residential) and some institutions and small businesses located in business improvement areas (BIAs) and located within residential neighbourhoods/along residential collection routes
Richmond Hill, Ontario	202,022	MR	Richmond Hill's By-law provides requirements for municipal collection service for multi-residential buildings, including active participation in applicable diversion programs, dedicated chutes for garbage, recyclable material and organics, provision of education materials to all dwelling units, and participation in waste audits upon request	No. 18-19	Provides collection of bulk items, metal and appliances, garbage, recycling, and organics. Collection is provided for single-family and multi-residential. Collection is not provided to ICI except in downtown Core
Hamilton, Ontario	569,353	MR	The City of Hamilton has a Waste Requirements for Design of New Developments and Collection document. It indicates that multi-residential buildings are required to have a waste separation system that includes three separate chutes, one for each waste stream. Small multi-residential buildings can opt out and have other requirements	No. 20-2021 Waste Management System	- Hamilton provides services to single-family, multi-residential, and ICI meeting curbside limits - Collection is provided for garbage, recycling, organics, and bulk waste. Garbage/organics provided by 50-50 split of public and contracted forces. Recycling provided 100% by contracted service provider
Toronto, Ontario	2,794,356	MR	The City of Toronto introduced a Chute Closure Program in 2010 as a tool to support improved waste diversion	- Municipal Code Chapter 844: Waste Collection Residential Properties - Municipal Code Chapter 846: Waste Management Facility	Toronto collects garbage, recycling, organics oversized and metal items for single- family, multi-residential and some ICI

Jurisdiction	Population	Sector Researched	Rational for Selection/Relevance	Relevant Bylaws	General Service Provided
					Multi-residential (nine units or more) waste collection is provided via curbside or front-end collection programs. There are also pick-up programs for electronics and hazardous waste
San Diego, California	1,374,076	C&D	- San Diego has a recycling ordinance that requires that businesses separate recyclables and organics - They also have a C&D debris deposit ordinance that requires that the majority of C&D projects divert C&D debris from landfill disposal	- San Diego Municipal Code, Article 6, Division 7: Recycling Ordinance - San Diego Municipal Code Article 6, Division 9: Single Use Plastic Reduction Ordinance	- San Diego provides garbage, recyclables, and organics collection from eligible residential properties - Does not provide ICI waste collection services
Long Beach, California	450,062	C&D	All C&D permit applicants are required to submit a surety bond as a waste diversion deposit. As part of the permit condition, the permit applicant must submit a waste management plan detailing the estimated volume or weight of the project's C&D waste	Municipal Code 8.60370: Mandatory Organics Waste Disposal Reduction	- Long Beach collects garbage, recyclable (contracted to Waste Management Inc.), and commercial food scrap collection (pilot program) - Municipal serviced accounts can receive up to four special collections annually at no additional cost. This includes household hazardous waste, electronic waste, bulk items, used motor oil or filters. Can also be dropped off at a depot

3.2

Best Practices Findings

This section of the report outlines the results of the best practices review based on sector. Findings are organized in the following sectors:

- Multi-residential;
- ICI;
- Joint multi-residential and ICI; and
- C&D.

3.2.1

Multi-Residential

BC Housing, City of Richmond Hill (Richmond Hill), City of Hamilton (Hamilton), and City of Toronto (Toronto) were selected for their multi-residential best practices. A summary of each of these programs is provided below.

3.2.1.1

BC Housing

BC Housing is a crown corporation that reports to the Minister of Housing. The key responsibilities of BC Housing include developing, managing and administering subsidized housing options¹. BC Housing is committed to contributing positively to local communities and reducing the negative environmental and social impacts of their activities. BC Housing has more than 12,800 supportive and transitional housing units and over 2,200 permanent shelter spaces across the province.

BC Housing has developed two toolkits to support behavioural changes that improve waste reduction and diversion in multi-family buildings. The toolkits were developed based on a pilot at four social housing provider sites. The pilot entailed a review of baseline information for each site, which included reviewing existing reports and the completion of site assessments with building managers, to identify barriers and benefits for waste diversion at each site. Following the baseline information review, customized activities based on a Community Based Social Marketing (CBSM) framework that utilized several tools and resources were implemented in each of the four pilot buildings. CBSM is a framework and methodology used in the field of environmental and social behaviour change. It is designed to encourage individuals and communities to adopt more sustainable and pro-social behaviors.

The overall objectives of these pilots were to facilitate a high level of tenant engagement on sustainability that addressed potential challenges while providing a BC Housing-specific approach that would guide future tenant engagement strategies. A total of eight outreach activities (two activities per each site) were completed which included a movie screening, community barbeque, garbage chute education and closure sessions, and holiday celebrations. In addition to tenant engagement, waste audits were completed at each of the four sites. The results from these audits provided a quantitative

¹ [Province of British Columbia](#) (2023). Affordable Housing Page

analysis of the effectiveness of the outreach activities based on changes to diversion rates at each site. Results indicated that these outreach events did support waste diversion; however, ongoing messaging and support is required to maintain this behaviour change.

To obtain feedback to evaluate the engagement activities, feedback forms were distributed near the end of each activity and collected as soon as the tenant completed the form. This exercise ran simultaneously with the implementation of tenant engagement activities. The responses from the feedback forms and other observations made at the activity were used to analyze and evaluate each activity. Tenant feedback, results of the waste audit and the background review fed into the development of two tool kits:

- Guide for Social Housing Providers²; and
- Facilitators Handbook for Social Housing Providers³.

Guide for Social Housing Providers

This toolkit is designed to help social housing providers develop and implement a tenant engagement initiative focused on improving the diversion of recyclables and organics from disposal and reducing waste generation. This toolkit was developed to assist with waste management for multi-residential buildings, overall. The toolkit aims to support behavioural changes for waste reduction and diversion, as well as implementing activities that lead to community development. The overall approach that the document focuses on is CBSM, which is consistent with HRM's current waste management educational efforts. The documents within the toolkit build on a previous BC Housing publication, Tenant Engagement on Sustainability – Focus on Energy Conservation (published in 2012). While each publication is intended to be used individually, there could be a benefit from partnering with other initiatives to deliver combined education and outreach, similar to the City of Surrey's Project Green Suites⁴.

This toolkit consists of two main sections.

- **Overview of tenant engagement on sustainability:** It includes information on the foundation for the guide, why the initiative is important and the overall goals. It also discusses the tenant engagement approach taken during the pilot and why a similar approach should be considered when considering a building's own tenant engagement program. The toolkit focuses on research that indicates that CBSM can be highly effective in influencing behavioural change. The toolkit outlines a five-step process for developing and delivering behavioural change initiatives based on the principles of social psychology. These five steps include: selecting behaviours, identifying barriers and benefits to a specific behaviour change, developing, and piloting a strategy to overcome those barriers, evaluating the initiative, and implementing the strategy across the community.

² [BC Housing](#) (2015). Tenant Engagement on Sustainability.

³ [BC Housing](#) (2015). Tenant Engagement on Sustainability Facilitators Handbook.

⁴ Project Green Suites ([Link](#)) was a sustainability outreach pilot program for waste diversion and water and energy conservation in multi-family buildings using an ambassador approach that built off of the concepts of CBSM.

- **Resources to initiate these programs at a social housing site:** Resources regarding how to initiate and implement a CBSM campaign are included. This toolkit includes several examples for consideration.

Facilitators Handbook for Social Housing Providers

This Facilitator's Handbook is designed as a guide for in-house or independent facilitators who will be directly implementing engagement on sustainability initiatives focusing on waste reduction and diversion. This Facilitator's Handbook includes the following elements:

- **Social marketing materials:** Multi-residential buildings can be a difficult place to implement waste diversion programs due to the number of barriers these types of sites may face (e.g., inconvenience regarding the location of recycling areas or temporary tenants who may not understand the recycling programs on site). This guide supports the reader to understand potential barriers encountered by tenants.
- **Educational resources:** This toolkit provides examples of educational materials; however, it is stipulated that these materials should be specific to the jurisdiction in which facilitation is taking place.
- **A step-by-step guide for planning interactive activity modules and tenant engagement activities:** Practical ideas on tenant engagement activities are provided within this toolkit and include information on how to plan, budget and promote the event.

This second toolkit provides activity examples, how to execute those activities and how to prepare for the activity itself. It also provides lessons learned for the activities that can support the engagement team in having a successful facilitation of events. This has similar components as HRM's waste management certification course for multi-residential properties, which is an online course that supports education for waste management practices in HRM from collection through to processing.

Both toolkits have been created for social housing providers who are interested in engaging their tenants on sustainability, specifically waste management. Dillon followed up with BC Housing regarding the current use of the toolkits. During this conversation, BC Housing staff indicated that the toolkits are used as a reference tool for ongoing consultation; however, they are not currently used in the manner they were intended. At the time of this report, BC Housing had two active job postings related to waste reduction and sustainability. These roles are expected to assist in the development, promotion, delivery and evaluation of tenant and staff engagement initiatives. These programs will support BC Housing's waste reduction and sustainability commitments. The hired individuals are anticipated to focus mainly on sustainable waste management practices at public housing sites in the Lower Mainland and other regions in British Columbia with the goal of reducing the amount of residential waste generated at BC Housing sites, increasing compliance with existing recycling programs and ongoing education on sustainable practices.

There have been several lessons learned since the development of these toolkits which include the following:

- Ongoing support through staff resources (full-time resources) is required for success in tenant engagement and tenant behaviour change;
- Use resources from vendors and municipalities (Regional Districts) to help in education and engagement;
- Partnerships and developing relationships with not-for-profits and local municipalities is helpful for ongoing success;
- BC Housing works together with municipalities with new BC Housing development permit applications. This approach has led to less staff time being required on development applications;
- There will always be ongoing issues with waste management. These issues could include understanding the requirements of different by-laws, accessibility requirements, meeting design guidelines and keeping waste management in mind when developing or redeveloping housing; and
- It is important to develop and maintain social capital in reference to the relationships, networks, and social connections that individuals and communities have, which can be harnessed to promote and support environmental conservation and sustainability efforts.

3.2.1.2

City of Richmond Hill

The City of Richmond Hill is a municipality located in York Region, Ontario. Richmond Hill provides waste collection services for single-family and multi-residential buildings. Richmond Hill's By-law No. 18-19 provides requirements for municipal collection service for multi-residential buildings, including active participation in applicable diversion programs, dedicated chutes for garbage, recycling and organics, provision of promotion and education materials to all dwelling units, and participation in waste audits upon request by Richmond Hill⁵. Approximately 95% of all multi-residential buildings are collected with front-end collection vehicles. The development standards mention an option for cart collection; however, this option is only available if the development is less than 33 units and less than five storeys. Richmond Hill does not allow carts if a chute system is proposed. Within Richmond Hill's last community plan (2009) there were over 17,000 multi-residential units within the City. No updated statistics were available on the number of multi-residential buildings in Richmond Hill. A new City of Richmond Hill community plan is currently in development.

The by-law was amended in 2019 to require new multi-residential buildings with five or more storeys to provide three separate waste chutes (garbage, recycling, and organics). All multi-residential buildings above five storeys are required to have these waste chutes and cannot opt out. Property owners must confirm that all occupants of the property can participate in waste diversion programs and that infrastructure is maintained and in good working order. This is accomplished through a solid waste review of the development drawings. ICI properties are not included or eligible for waste collection services under this by-law. Additional conditions related to multi-residential waste collection as set-out in this by-law include:

⁵ The Corporation of the City of Richmond Hill (2019). [By-Law 18-19](#).

- All waste generated within a multi-residential building must be stored indoors within a specifically designed waste storage room or within an approved external enclosure as per Richmond Hill's waste standards;
- The maximum quantity of garbage placed out for collection by owners and occupants of any multi-residential building shall not exceed the equivalent of thirty-six kilograms of garbage per dwelling unit per week (though this is currently not monitored); and
- Occupants of eligible multi-residential buildings may set out for collection:
 - Garbage, recycling and organics once a week on the scheduled collection day;
 - Bulk waste once every two weeks; and
 - Metal items and large appliances once a month.

Previously the use of tri-sorters was required; however, it was observed by Richmond Hill that these systems malfunction/break down frequently hindering access to diversion programs and that they are not convenient for residents who wish to access the chutes at the same time (i.e., system is locked out until material has been sorted/disposed properly). Richmond Hill indicated there has been some push back from developers regarding the mandatory three chute requirements, as they cannot opt out of this program. Three waste chutes take up more space than the previous standard of tri-sorters. Within Richmond Hill, most multi-residential developments are greater than five stories; therefore, three waste chutes are required. Smaller developments typically have different concerns including access routes for waste collection vehicles and waste storage requirements. It was not shared how many small versus large multi-residential buildings exist in Richmond Hill.

Specific waste containers approved for multi-residential buildings are also outlined in the By-law. Garbage must not exceed 6.12 cubic meters for loose garbage or 3.06 cubic meters for compacted garbage. All garbage must be front-end load type containers. Garbage placed in carts is accepted; however, it must be uniquely identified as garbage only. Recycling can be placed in carts not exceeding 365L and must be identified as recycling; additionally, recycling can be placed in a metal front-end load container that does not exceed 6.12 cubic metres. Organics can be placed in carts not exceeding 246L and must be identified as organics. Organics can also be placed in a metal front-end load container that does not exceed 1.53 cubic metres.

Richmond Hill has also developed a Waste Management Design and Collection Standards Document for Development and is outlined in the development permit application process⁶. This document provides direction for designers, owners and operators of new developments and redevelopments regarding their responsibilities for the design and operation of waste management systems. The document outlines the minimum requirements for the minimum number of waste containers based on collection type and access route standards. Should these minimum requirements not be met, development permits will not be issued. These guidelines are used to issue development permits. The objectives of this document include the following:

⁶ Richmond Hill (2023). [Waste Management Design and Collection Standards for Development](#). Page 45 to 48

- Establish design and collection requirements to confirm safe and efficient municipal waste collection;
- Confirm that residents are provided with convenient opportunities to participate in all waste management programs; and
- Outline the required waste management documentation and submission drawings that must be included as part of development applications.

Commencement of municipal waste collection services with Richmond Hill requires a letter stamped by a licensed Ontario Professional Engineer. This letter needs to confirm and certify that all access routes, loading spaces and staging pads have been constructed in compliance with the design requirements specified in the standards document. The letter must also confirm that any access routes or loading spaces that require a waste collection vehicle to drive over a supported structure (such as an underground parking garage) can support a fully loaded vehicle weighing up to 35,000 kilograms and a point load of 6,000 kilograms. Finally, the letter must confirm that the reinforced structures adhere to all applicable legislation, including Section 4, Structural Design of the Ontario Building Code. The City of Richmond Hill was the only reviewed jurisdiction with this requirement. This requirement must be incorporated in development applications for properties that are not receiving municipal collection to confirm that they can receive collection and that there is space to incorporate other waste streams besides solely garbage. The owner of the development is responsible for completing or contracting their own waste collection until they are approved to receive municipal waste collection services. Should the developer not meet minimum requirements, development permits will not be issued as per development by-laws.

In discussions with Richmond Hill, it was stated that a mandatory waste management plan and checklist which is provided during the development application, supports both developers and Richmond Hill in the review process. The Richmond Hill solid waste team has one full time equivalent utilizing 50% of their time on solid waste development permits review. The solid waste team is included at each stage of the review process (pre application to final approval). On average, Richmond Hill receives 13 formal applications and nine pre-submissions to review per month. There was no noted pushback from developers on this checklist requirement.

3.2.1.3

City of Hamilton

The City of Hamilton provides waste collection services to multiple sectors (183,095 single-family properties, 52,808 multi-family units and 5,255 ICI customers) that meet the requirements of curbside collection. The City of Hamilton's collection services include garbage, recycling, organics, yard waste and bulk items. However, the amount of garbage and bulk items allowed for collection is limited for each property type. If a property generates more garbage and bulk items than the permitted limit, then the owner must arrange for other means of disposal, as it becomes their responsibility.

The City of Hamilton also has a Waste Requirements for Design of New Developments and Collection Document⁷. This document provides information on how new developments must be designed to confirm safe waste collection services throughout Hamilton. Additionally, the design requirements include design principles for new developments to:

- Provide efficient movement of waste collection vehicles; and
- Confirm that all occupants have equal access to both garbage disposal and waste diversion programs provided by Hamilton for that development type OR provide greater accessibility to waste diversion programs than garbage disposal.

In all cases, best efforts should be made to satisfy these principles. All properties requesting municipal waste collection services must:

- Be constructed according to the submitted drawings approved by Hamilton; and
- Successfully apply for waste collection services.

These design guidelines indicate that all multi-residential buildings need to have a waste separation system that includes three separate chutes, one for each waste stream; or, in cases where that cannot be achieved, due to space or collection requirements, the building must be designed to have a storage area for all waste that is accessible to all residents. However, when possible, the chute is required. The chute for recyclable material must be equipped with a bi-sorter to divide material into fibres and containers. Each floor must be equipped with a chute room and the door for each chute in each chute room is required to be colour coded. Multi-residential buildings are not permitted to be designed with a chute that is for garbage only or equipped with a tri-sorter. These requirements are reviewed as part of the development process and development permits will not be issued until all mandatory requirements are met.

Small multi-residential buildings (less than 30 dwelling units) are not required to have a waste separation system that includes separate chutes but may include this system if they would like to and if the City approves the use of such a system for the building. In cases where small multi-residential buildings opt to not utilize a waste separation system with separate chutes, or the City does not approve the use of such a system for the building, due to space or collection requirements, the building must be designed to have a storage area for all waste that is accessible to all residents.

The Waste Requirements for Design of New Developments and Collection also identifies the required number of containers for waste storage based on the number of units. Design requirements related to the multi-residential sector include the following:

⁷ City of Hamilton (2021) [City of Hamilton Waste Requirements of New Development and Collection](#). Page 20-27

Waste Storage:

- Submitted drawings must include a fully enclosed storage area (or storage areas). This area is expected to be used between the scheduled waste collection events (times in which waste is collected); and
- The minimum number of waste containers based on the number of units is also provided in these design guidelines. These minimum requirements are outlined in **Table 2**.

Table 2: Minimum Number of Containers Required within Hamilton Design Guidelines

Number of Units	Blue Carts	Number of Units	Organics Carts	Number of Units	Garbage Containers ¹
6 to 10	4	1 to 9	2	6 to 9	1
11 to 19	6	10 to 18	3	10 to 18	2
20 to 29	8	19 to 27	4	19 to 27	3
39 to 39	10	28 to 36	5	28 to 36	4
40 to 49	12	37 to 45	6	37 to 45	5
50 to 59	14	46 to 54	7	46 to 54	6
60 to 69	16	55 to 63	8	55 to 63	7
70 to 79	18	64 to 72	9	64 to 72	8
80 to 89	20	73 to 81	10	73 to 81	9
90 to 99	22	82 to 90	11	82 to 90	10
100 to 109	24	91 to 99	12		
110 to 119	26	100 to 108	13		

1- Based on uncompacted 3yd containers

Waste Loading Areas:

- Submitted drawings must include details for waste collection services including:
 - A loading area for the collection of front-end containers by a front-end loading waste collection vehicle;
 - A staging pad adjacent to the loading area if more than one front-end container will be set out;
 - A set-out area where blue carts and organic carts will be collected by an automatic cart side loading collection vehicle; and
 - A set-out area where bulk items will be collected by a bulk loading waste collection vehicle.

Staging Pads:

- Developers must include a staging pad (minimum five by five metres in size) for each container that will be collected.

Set- Out Areas for Multi-Residential Townhouse Developments:

- The set-out area must be located on private property and be located as close as possible to the private road. The minimum required size of the set-out is:
 - 0.9 metres x 0.65 metres for each blue cart;
 - 0.6 metres x 0.5 metres for each organics cart; and
 - 10 square metres for bulk items.

In-ground containers may be permitted at the discretion of the City of Hamilton. These containers may be used for garbage collection at multi-residential townhouse developments only. To be permitted, in-ground containers must be compatible with front-end waste collection vehicles used to provide waste collection services on behalf of the City. In-ground containers must not exceed eight cubic yards in volume for loose material. At the time of this report, only the EarthBin⁸ in ground waste containers could be collected by Hamilton's Contractor's vehicles. Hamilton endorses the EarthBin directly in the design guidelines; however, Hamilton is not in anyway exclusive to EarthBin. If another company were to have in ground waste containers that could also be collected by Hamilton's Contractor's vehicles, they would also be included in the design guidelines.

3.2.1.4

City of Toronto

Toronto offers waste collection services to multi-residential buildings with nine or more units. Currently, there are nearly 2.8 million people living in multi-residential units in the City of Toronto.

In 2010, the City of Toronto developed a Chute Closure Program as a tool to support improved waste diversion. In older multi-residential buildings, residents typically have access to a garbage chute on every floor and recycling and organics are typically located either outside or in a basement/garage. This program allows for multi-residential buildings to close their garbage chutes to allow for greater control over the waste stream, save money and reduce overall contamination. The rationale for chute closure is to make other waste streams as convenient as garbage disposal to promote increased recycling and organics separation. Relative to using chutes, it is inconvenient to walk further to drop off recycling or organics. The waste closure program was previously only for multi-residential buildings receiving City waste collection. However, in 2021 Toronto considered extending the program to buildings not receiving City collection; this is still under review. To date, 25 waste chutes have been closed. Waste chutes are replaced with waste rooms where access to all waste streams is closer in proximity. Waste chutes are part of the approval process for new multi-residential front end collection sites; chutes and sorters are confirmed via architectural drawings that are submitted in the planning stage of development and then again onsite when the site wants to opt into Toronto's waste collection services.

⁸ [EarthBin](#) (2023).

In 2003, City of Toronto City Council introduced design requirements for waste management systems in multi-residential buildings, stipulating that the collection of recyclables must be as convenient as garbage collection to residents. Solid waste staff worked with the Chief Planner to apply these requirements to the development proposals to determine eligibility to receive waste management collection services from Toronto. Buildings can construct a three-chute system on every floor, a three-stream collection station on every floor, or a tri-sorter approach. Buildings can also choose to not install a chute system at all and have all residents/tenants take their materials to a common storage location. Property owners of multi-residential buildings pay a fee based on how much garbage the building generates during the billing period and the number of units in the building. There is no fee for recycling or organics collection as they are covered under the rate charged for garbage, known as the “garbage rate”. Toronto is unique in the current transition to individual producer responsibility (IPR). Toronto will continue to be the service provider for the provision of recycling collection rather than opting into an agreement with a producer-responsibility organizer (PRO). The current contract between the PRO and City of Toronto was finalized in January of 2023⁹. This contract is not public, so it is unknown what incentives/agreements exist to support this collection process; however, it is assumed there are financial incentives to provide the collection service. The City of Toronto contract will be reviewed in 2026.

Toronto has also developed the Toronto Green Standard which is a set of sustainable building and development guidelines. Its primary goal is to promote environmentally responsible and energy-efficient development in Toronto. This document sets standards for new construction and major renovation projects to reduce the environmental impact of buildings and infrastructure. It focuses on various sustainability aspects, including waste management. The Toronto Green Standard is divided into two tiers. All developments are required to meet at minimum, tier one requirements:

- **Tier 1:** This is the basic level of compliance that all new development and redevelopment projects in Toronto are required to meet. It includes a range of mandatory requirements related to energy efficiency, water efficiency, stormwater management and other environmental factors.
- **Tier 2:** This is the enhanced level of compliance and includes more stringent sustainability measures. Projects that meet Tier 2 standards receive various incentives and bonuses, such as increased height and density allowances, reduced development charges and faster permitting processes.

Tier 1 and Tier 2 standards related to waste management in multi-residential buildings are provided in **Table 3** and **Table 4**.

Table 3: Toronto Green Standards for New Low-Rise Residential Developments

Development Feature	Tier 1 – Required	Tier 2 – Voluntary
Storage and collection of recycling and organic waste to facilitate waste sorting and reduction	Provide an easily accessible dedicated area or areas for the	Provide separated cabinet space in all kitchen suites for segregated collection of:

⁹ [Circular Materials](#) (2023). Agreement finalized with the City of Toronto to deliver a seamless transition

Development Feature	Tier 1 – Required	Tier 2 – Voluntary
	collection and storage of materials for recycling for each unit. Materials must be consistent with the City of Toronto waste diversion programs	- Recyclables - Organics - Waste
Construction waste management – recycle and/or salvage non-hazardous construction and demolition debris	N/A	Recycle at least 75% of non-hazardous construction and demolition debris.
Regional materials – Increase demand for building materials and products extracted, processed and manufactured in the region	N/A	Ensure that at least 20% of a project's building materials or products have been extracted, harvested, recovered, or processed within 800 km (2400 km if moved by rail or water) of the final manufacturing site.

Table 4: Toronto Green Standards for New Mid to High-Rise Residential Developments

Development Feature	Tier 1 – Required	Tier 2 – Voluntary
Storage and collection of recycling and organic waste	Provide a waste sorting system using a single chute with a tri-sorter or two chutes, one with a bi-sorter.	Provide three separate chutes for collection of each of the three waste streams on all floors.
Facilitate waste sorting and reduction	Provide an easily accessible waste storage room with a minimum floor space of 25 m² for the first 50 units plus an additional 13 m² for each additional 50 units. Provide a minimum of 10 m² for bulky items and additional diversion programs.	Provide separated cabinet space in all kitchen suites for segregated collection of: - Recyclables - Organics - Garbage OR Provide a dedicated area or areas within the building for the collection and storage of recycling and organics. Household hazardous waste. Provide a dedicated collection area or room for the collection of household hazardous waste and/or electronic waste.
Building Reuse – Maintain existing walls, floors, and roof	N/A	Maintain at least 55% of the existing building structure (including structural floors and roof decking) and envelope.

Development Feature	Tier 1 – Required	Tier 2 – Voluntary
Construction Waste Management – Recycle and/or salvage non-hazardous construction and demolition debris	N/A	Recycle at least 75% of nonhazardous construction and demolition debris.
Recycled Content – Reduce demand for new materials and increase market for recycled materials	N/A	Ensure that at least 20% of a project's construction materials (based on value) comprise recycled content.
Regional materials – Increase demand for building materials and products extracted, processed, and manufactured in the region	N/A	Ensure that at least 20% of a project's building materials or products have been extracted, harvested, recovered, or processed within 800 km (2400 km if moved by rail or water) of the final manufacturing site

3.2.2

ICI

The City of San Diego (San Diego) was selected as an ICI jurisdiction for the best practice review for their recycling ordinance.

3.2.2.1

City of San Diego

The City of San Diego does not collect ICI waste; however, San Diego has a recycling ordinance which requires that businesses separate recyclables and organics¹⁰. A recycling ordinance is a local law or regulation established by a municipal government that outlines specific requirements and guidelines for recycling within that jurisdiction. These ordinances are typically designed to promote and regulate recycling efforts to reduce waste, conserve resources, and minimize the environmental impact of a community. San Diego's recycling ordinance includes provisions related to:

- **Recycling Services:**
 - Recycling services for commercial facilities shall include, at a minimum, collection in a separate container and as frequently as necessary to meet demand of commingled plastic and glass bottles and jars, paper, newspaper, metal containers, cardboard, and rigid plastics, including clean food containers, jugs, tubs, trays, pots, buckets, and toys. Collection of yard waste and food material is also required; and
 - Collection of other recyclable materials for which markets exist, such as scrap metal.
- **Reporting:** Collectors are required to submit semi-annual reports to San Diego by March 1 and September 1 of each year. Semi-annual reports include information for each facility serviced for the period January 1 through June 30 or July 1 through December 31, as applicable, of the immediately preceding six-month period.

¹⁰ [San Diego Municipal Code](#). Chapter 6: Public Works and Property; Public Improvement and Assessment Proceedings (2022).

- **Special Events Recycling:** For a community special event requiring an event permit from San Diego, the responsible person shall provide recycling receptacles throughout the event venue and shall provide recycling services.

San Diego monitors compliance through the reporting requirements outlined in the ordinance. The goal of the recycling ordinance is to protect the environment and public health and safety. To confirm everyone is following the regulations, the City of San Diego employs Code Compliance Officers that will routinely visit facilities to observe if regulations are being met. Under the recycling ordinance, Code Compliance Officers may:

- Issue a written warning regarding non-compliance and determine a follow-up date in accordance with the violation and the amount of time needed to reach compliance; and
- Coordinate technical assistance with San Diego staff to aid if needed. If the deadline is not met to comply with the requirements, the Code Compliance Officer may:
 - Issue a citation not below \$100 for the first offense;
 - Issue a new follow-up date in accordance with the citation;
 - Continue to coordinate technical assistance with San Diego staff; and
 - Continue to issue citations not to exceed \$500 for each subsequent offense should compliance not be met by follow-up date(s). A \$100 re-inspection fee will also be issued for each inspection starting at the third inspection.

Fines are not currently being issued; however, fines may begin to be issued in 2024 following an educational campaign. Overall, San Diego has seven Recycling Specialists and 14 Code Compliance Officers working on commercial recycling. Recycling Specialists focus on reviewing reports, education, talking to businesses and developing best practices. San Diego also has annual business waste reduction and recycling awards and highlights successful business/commercial recycling programs on their website to promote the businesses.

In conversations with San Diego, it was stated that the largest concerns from businesses included that some businesses (laundromats, hairdressers, auto parts shops, etc.) did not require organics diversion as they do not generate organic waste. As a result of this, San Diego revised the ordinance to include a de minimis waiver (a de minimis waiver is a legal concept that allows certain violations or discrepancies to be overlooked or exempted if they are deemed to be minor or inconsequential). This de minimis waiver is eligible to all business types with the exclusion of businesses that make or serve food, and plant businesses. The de minimis waiver is available on the City of San Diego's website and requires supporting documentation including current contracted hauler, account number and proof of business type. It is clearly laid out in the waiver which businesses are not included in this option and the requirements for ongoing diversion and set-out requirements. This de minimis waiver should not undermine any additional regulations. A review of these waivers is also within the job description of the recycling specialists. The City could not provide information on the number of de minimis waivers received.

Grocery stores within the area often back haul their own recycling with suppliers. Since it cannot be confirmed that these processes are completed by reputable recyclers, these grocery stores are still required to have recycling containers on-site. The largest lessons learned in the recycling ordinance development included:

- Building and maintaining relationships with businesses matter;
- An education first campaign is better than immediate enforcement;
- Enforcement and enforcement plans are important; and
- Finding a champion within the business that will support the City is a good tool for success.

3.2.3

Multi-Residential and ICI

The selected jurisdictions that were reviewed for their best practices for the multi-residential and ICI sectors included the City of Richmond, Regional District of Nanaimo and Region of Peel (Peel).

3.2.3.1

City of Richmond

Richmond provides collection services to all single-family and some multi-residential buildings where front-end load containers are not required. The City of Richmond also provides residents in multi-residential buildings with reusable indoor collection bags to facilitate an easier transfer of waste from the resident's apartment to waste room.

In 2019, there was a pilot program to collect from commercial properties that could be serviced the same as residential properties; however, this program likely will not be implemented long-term.

Richmond has developed Multi-Residential and Commercial Building Design Guidelines that assist developers of multi-residential and commercial properties to provide for the design of appropriate recycling and waste storage areas¹¹. As part of a development application developers must submit a waste overlay plan that highlights the key garbage and recycling components for the design of the buildings. These guidelines fall under the development application process regulated by the City Zoning by-law.

The guidelines identify the number of receptacles required for each waste stream for development approval. In particular, these guidelines provide support for disposal bans and waste diversion targets that are in place for the Metro Vancouver region, and expanded recycling is a key component. This results in a corresponding requirement to provide sufficient space in multi-residential and commercial complexes for a range of recycling services along with garbage collection.

Permits for development are not provided unless the design meets the requirements outlined in this document. In addition to the waste overlay plan and number of receptacles required, the guidelines

¹¹ City of Richmond (2023). [Commercial and Multi-Family Developments Waste Management Design Guidelines](#). page 25 to 29

provide the expected waste generation for each waste stream based on the anticipated development and outlines the requirements for type of collection (municipal versus private collection).

During discussions with Richmond staff, it was revealed that the planning department is primarily responsible for development permits. However, the solid waste management team is responsible for reviewing waste storage requirements. The time required to review each application can range from 30 minutes to three hours, depending on the size and complexity of the proposed development. Reviewing applications takes up approximately 30% of one full-time staff member's time. On average, Richmond solid waste staff review 20 development applications per month. This process simplifies application reviews for Richmond as it is easy to refer to the guidelines to identify gaps or missing information in submitted development applications. Richmond staff believe these guidelines are accessible for developers; however, it was noted that there are still a significant number of issues with submitted development applications for waste storage requirements.

Following the approval of the developments, Richmond staff will not review that the proposed waste storage areas were constructed. However, the City does complete multi-residential waste collection services; therefore, those assessments are completed should the property owner sign on to municipal waste collection.

3.2.3.2 Regional District of Nanaimo

Regional districts in British Columbia are mandated by the Provincial Environmental Management Act to develop a Solid Waste Management Plan that is a long-term vision of how each regional district would like to manage their solid waste, including waste diversion and disposal activities. The Regional District of Nanaimo prepared its first Plan in 1988 and made amendments to it in 1996 and 2004. The most recent update was initiated in 2018 is projected for a 10-year planning horizon, from 2018 to 2027. This revised plan is targeting a diversion rate of 90%.

There are two initiatives set out in the Regional District of Nanaimo's Solid Waste Management Plan that aim to build the business of diversion in the ICI and multi-residential sectors. The Regional District of Nanaimo encourages recycling by the ICI sector through variable tipping fees and landfill bans which prohibit the disposal of recyclables, food waste and yard waste in the landfill in favour of recycling and composting instead. However, a significant amount is still making its way to the landfill. In addition to enhancing education, enforcement and assistance for multi-family and commercial, new regulations/bylaws were proposed that require waste generators to separate garbage from recycling and food waste. In 2022 the Regional District of Nanaimo submitted the bylaws to the Province of British Columbia for approval. These draft bylaws have been provided in **Appendix A**.

Mandatory Waste Source Separation Bylaw

Upon approval, all ICI businesses will be required to have a system to separate their waste into organics, recycling, and garbage containers for collection. Collection can be completed by a Regional District of

Nanaimo Licensed Hauler, or businesses can self-haul their own waste. Licensed haulers will have reduced tipping fees at Regional District facilities. Businesses that choose to self-haul their waste will pay regular tipping fees that are subject to surcharges if recyclable materials are observed in their loads. The intention of the Mandatory Waste Source Separation Bylaw is to require that all businesses, multi-family dwellings and institutions have separate containers for garbage, food waste and recycling, or a contract for post-collection sorting. The Mandatory Source Separation Bylaw outlines the requirements for waste generators including:

- **Waste Storage – Existing Building or Structure:** Every waste generator in an existing building or structure that was approved from construction before the date of adoption of this Bylaw shall, at all times, maintain on the property at which refuse is generated:
 - Separate containers or a partitioned container or containers that are clearly labeled and identifiable as storage for each of garbage, recycling material and organics; or
 - Containers for non-separated garbage, recyclable material and organics and contract for one or more waste collectors to pick-up and haul all such organics, recyclables and Garbage to a facility that separates and sorts organics and recycling.
- **Waste Storage – New Buildings:** Every waste generator in a building or structure that is approved for construction after the date of adoption of this Bylaw shall maintain on the property at which refuse is generated, separate containers or a partitioned container or containers that are clearly labeled and identifiable as storage for each of garbage, recycling, and organics.

Additionally, the Mandatory Source Separation Bylaw includes requirements for notification and reporting. All waste generators are required to maintain waste collection records for 12 months as proof of collection service. Suggested penalties for not meeting the requirements of the Mandatory Source Separation Bylaw are anywhere from \$200 to \$500 depending on the infraction¹².

Waste Hauler Licensing Bylaw

Businesses that haul waste for profit, usually the same companies who pick up waste from commercial buildings, will be required to obtain a license. Licenced waste haulers will be charged a reduced tipping fee at the landfill and will also be subject to remitting a “disposal levy” on waste that is landfilled or incinerated. When applying for the licence, haulers are required to estimate their annual expected tonnage for disposal. The payment for the licence is based on this estimate. The reduced tipping fee is allocated to the estimated tonnage as well. If a hauler underestimates their tonnage, they will be required to pay regular tipping fees once that estimate is reached. The levy will not be applied to material that is recycled or composted. The purpose is to encourage industry’s focus on waste reduction by making it more profitable to divert than dispose. This model will also provide reliable tracking of waste diversion/disposal and has the economic benefit of growing the local waste industry.

The Waste Hauler Licencing Bylaw covers licence requirements, licence applications as well as licence issuance and refusal. The Waste Hauler Licencing Bylaw also states that a licensee shall submit to the

¹² [Mandatory Waste Source Separation and Waste Hauler Licensing Bylaws | Get Involved RDN](#)

Regional District of Nanaimo's General Manager a report, within 30 days of the end of each calendar month that includes the following information in respect of such ended calendar month:

- Total tonnage of mixed municipal solid waste deposited at Regional District of Nanaimo facilities and, total tonnage of mixed municipal solid waste deposited at non- Regional District of Nanaimo facilities including destination details which must include:
 - The name and address of any landfill, incinerator or waste to energy facility;
 - The name and address of any refuse derived fuel facility; and
 - The name and address of any material recovery facility.

The goals of these two bylaws is that together they will result in an increased diversion through:

- Licensed haulers will be motivated to educate and work closely with customers (that are obligated under the Mandatory Waste Source Separation Bylaw) to increase diversion and reduce contamination; and
- Increase in the quantity and quality of recyclables available, making them easier to market.

Additionally, the Regional District of Nanaimo believes these two bylaws will support in creating new recycling markets where they currently do not exist and will grow the waste industry around diversion, creating new jobs and local economic benefit. Dillon staff reached out to the Regional District of Nanaimo for further comment on these bylaws. It was stated by the Regional District of Nanaimo that the waste separation bylaw has received its order in council; however, the Regional District of Nanaimo is still working with the Province of British Columbia for the licencing bylaw. The Regional District of Nanaimo is current assessing the staffing requirements of these bylaws. The administration of these bylaws is not fully known at this time.

3.2.3.3

Region of Peel

Peel is responsible for effective planning and delivery of municipal services for their region. The three member municipalities, Mississauga, Brampton, and Caledon are known as lower tier municipalities. Peel is responsible for a wide range of municipal services and functions within its jurisdiction, including waste collection. Peel collects, processes, and disposes of residential waste within the cities of Mississauga, Brampton, and the Town of Caledon. Peel also provides waste collection services to small businesses in Business Improvement Areas, municipal facilities, and eligible institutions, including schools, retirement homes, and places of worship.

Peel has a Waste Collection Design Standards Manual for new developments to meet to receive a development permit¹³. This includes standards related to garbage, recycling, bulk items, organics and leaf and yard waste for single-family, multi-residential, mixed-use buildings, and institutions. Design standards include the minimum number of containers, information on chute requirements and waste

¹³ Region of Peel (2020) [Waste Collection Standards](#). xv to xviii

storage room requirements. Peel's Waste Management Division provides comments on all development applications that will receive Peel waste collection.

A waste management plan is required to be submitted by a development applicant which details how the proposed development will adhere to standards established by the design standards document as laid out in Peel's waste collection by-law. The waste management plan confirms that waste collection is feasible early in the design and development process. The following required information must be clearly indicated in the waste management plan:

- A description of the proposed development and number of units;
- The location of waste storage and collection areas;
- Adequate space for collection vehicle access to collection and loading areas. The vehicle shall be able to maneuver with proper turning radii along the access route for the collection vehicle to and from collection areas; and
- Confirming residents have convenient and efficient access to waste management services.

Peel provides a waste collection design checklist (**Appendix A**). Developers may use this checklist summary to review the design standards and are encouraged to refer to and review the checklist prior to submitting site plans for the proposed development. The design standards also indicate that specific features must be incorporated into the design for proposed developments. These features include collection for garbage, recyclable materials, bulk items, organics, and yard waste.

The development application process includes pre-consultation with developers. The items/details that Peel requests to review during pre-consultation meetings include the following:

- **Method of collection:** The developer needs to let Peel know what method of collection they are proposing. Sometimes this is not included in basic site plans and developers assume curbside collection can occur.
- **Access route with collection vehicle maneuvering diagram for entering and egressing the site:** The number one issue observed by Peel staff are no turnarounds provided and it is not clear how the collection vehicle will exit the site.
- **Collection point with sufficient space and overhead clearance:** Developers often assume the lower tier municipalities loading requirements to be the same as Peel's collection point requirements. They are different, so developers must provide adequate space to meet Peel's requirement for vehicle loading guidelines.
- **Waste storage:** Waste storage room (internal in the building or external concealed) and storage for bulk items.

Once the development has reached 90% completion, the developer is required to contact Peel, to initiate waste collection. At this time, Peel staff will visit the site to confirm the approved site plan details are correct, i.e., vehicle access route, collection point requirements and containers and advise

when waste collection services can start. For Peel Region, all development applications for the lower tier municipalities are reviewed by Peel. This review process is 100% of one full-time staff member's time. The average number of applications reviewed could not be provided; however, it was stated that additional staff are trained for review within the lower tier municipalities for efficiencies.

3.2.4 Construction and Demolition

The Cities of Richmond, Vancouver, San Diego, and Long Beach were selected as the jurisdictions for review of C&D best practices which included by-laws, ordinances, salvaging and deposit structures.

3.2.4.1 City of Richmond

Richmond has requirements for handling demolition waste and recycling materials (Bylaw No. 9516¹⁴) for single-family and accessory structures. Waste and recycling materials must be reused or sent to an approved waste disposal and recycling facility. All demolition applications must be accompanied with a Waste Disposal and Recycling Services Plan, non-refundable application fee, waste disposal and recycling services fee based on the square footage of the building to be demolished. Upon completion of the demolition the applicant must submit to the building inspector a compliance report and all original copies of receipts/weigh bills. The recyclable materials list includes 23 materials Appliances;

- Architectural detail elements;
- Asphalt roofing shingles;
- Bricks, blocks, ceramic tile;
- Cabinetry;
- Cardboard;
- Concrete;
- Doors;
- Drywall;
- Fixtures and hardware;
- Glass;
- Glass windows in frames;
- Green waste;
- Metal (steel, aluminum, copper, brass, etc.);
- Metal cable and wiring;
- Metal window frames;
- Paper;
- Plastic, rigid;
- Plastic, soft;
- Wood, structural;
- Wood (plywood, particle board)
- Wood shingles/siding; and
- Wood flooring.

In an effort to minimize the demolition of livable houses and to expand Richmond's Demolition Waste Recycling initiative, Richmond encourages homeowners to post houses to sell for the purposes of moving to another site on Richmond's website instead of demolition. At the time of this report, no households were listed on the website. Dillon staff reached out to Richmond staff regarding this

¹⁴ The City of Richmond (2016). [Demolition Waste and Recyclable Materials Bylaw](#). Page 9 and 10

program; however, no additional information was provided. The process to post a house for move or salvage includes the following steps:

- The homeowner is required to complete a consent to disclosure form and sent it to Richmond for review;
- House moving companies must obtain a permit to move a house and submit the permit application along with fees to Richmond; and
- Following the removal of the household, a separate demolition permit is required for the remaining foundation.

During discussions with Richmond, it was indicated that the development of the demolition waste and recycling materials Bylaw was established entirely by the solid waste management team; however, the review of Richmond's demolition waste recycling initiative is not the responsibility of the solid waste team, and no data has been provided on the success or lessons learned on this new initiative.

3.2.4.2 City of Vancouver

The City of Vancouver has a long-term strategic plan to become a zero-waste community called Zero Waste 2040. One key focus area of Zero Waste 2040 is reducing waste from the built environment. In May 2018, Vancouver approved an expansion of the existing green demolition requirements from pre-1940 homes to include pre-1950 homes and approved funding to support the creation of a Deconstruction Hub. Pre-1940 homes represent approximately 40% of residential demolitions; the shift to pre-1950 homes was intended to capture 70% of demolitions¹⁵. The rationale for pre-1950's is due to these homes being built in a way where they are easier to deconstruct. Typically, household development post 1970's used more composite materials, making it more challenging to recycle. Additionally, there is local capacity to manage these materials. This is both for local processing facilities and local staffing to confirm the requirements of demolition.

A minimum salvage requirement also applies when a developer demolishes a heritage-listed house, or a house built before 1910 due to the materials typically used around this timeframe. The City of Vancouver has several programs for C&D waste including a Green Demolition By-law, clean concrete and asphalt diversion and a partnership with the Rebuild Hub.

In addition to the City of Vancouver requirements, Metro Vancouver has developed a C&D Waste Reduction and Recycling Tool Kit¹⁶. This toolkit contains a reference guide and directory to help contractors, project managers and homeowners learn more about:

- Demolition waste recycling requirements in different municipalities throughout Metro Vancouver;
- Resources for the management of hazardous materials commonly found in construction sites;

¹⁵ [Green Demolition By Law Update](#) (2018)

¹⁶ [Metro Vancouver C&D Toolkit](#) (2023).

- Alternatives to traditional demolition;
- Ways to reuse and recycle leftover building materials; and
- C&D facilities, recycling depots and service providers in Metro Vancouver.

Green Demolition By-law

Vancouver's Green Demolition By-law¹⁷ aims to preserve and renew character homes, encourage reuse of C&D materials, and reduce the amount of landfilled and incinerated C&D waste. The By-law establishes different reuse and recycling requirements depending on the type and age of building demolished. Mandatory minimum reuse and recycling rates are applied to character homes and houses built prior to 1950; however, contractors are encouraged to voluntarily meet the minimum rates for all demolished houses.

As part of the By-law, contractors must apply for a demolition permit. The permit has four components: a demolition permit fee, a building permit fee, cost-of-work fee, and a demolition waste compliance fee. In addition, a \$14,650 deposit is required for the applicable building types and is refunded if the minimum rates are met. As of 2020, the Green Demolition By-law has diverted nearly 40,000 tonnes of demolition waste from the landfill and incinerator. The average diversion rate for pre-1940 homes has been 86%, which is significantly higher than the typical rate of 40 to 50% traditional residential demolitions. Dillon reached out to Vancouver to determine if updated statistics for this By-law could be provided. Unfortunately, updated statistics were not available at the time of this report.

Clean Concrete and Asphalt Diversion

If there is a need to divert 100 or more tonnes of clean concrete and asphalt, the Vancouver landfill will take that material for \$3/tonne. The landfill will reuse this material in the construction and maintenance of their roads.

The Rebuild Hub

Vancouver recently partnered with The Rebuild Hub to make it as simple as possible to deconstruct and salvage materials. The Rebuild Hub is a deconstruction and salvage network in the Greater Vancouver area with all proceeds going towards Habitat for Humanity's affordable housing projects. This hub provides space to drop-off and purchase salvaged materials. The outlined benefits of deconstruction include:

- Homeowner tax receipts;
- Landfill diversion; and
- Allowing for eco friendly options to integrate into new builds.

¹⁷ City of Vancouver (2018). [Green Demolition Bylaw Update](#).

During a waste audit, it was determined that C&D waste was approximately 25% of materials disposed at the San Diego landfill. As a result of these statistics, San Diego has made continual efforts to reduce this waste to landfill including the development of a C&D Debris Deposit Ordinance that requires that most C&D projects divert C&D debris from landfill disposal¹⁸. A refundable recycling deposit is paid back upon meeting program conditions. The following steps need to be completed:

- Submit an online waste management form;
- Pay a refundable C&D debris recycling deposit;
- Divert C&D debris generated from the project by recycling, reusing, or donating usable materials; and
- Submit all garbage and recycling weight receipts, and documentation within 180 days from final inspection of the project to request the deposit. It should be noted that San Diego has a list of approved facilities for diversion. Materials brought to unapproved facilities are not considered in the review process.

Since July 2016, diversion requirements for deposit return are allocated to 65%. Waste can be measured by volume or weight, whichever is the more accurate or practical. A deposit which is not refunded or claimed in accordance with this requirement is the property of San Diego. Diversion rates are calculated based on provided scale tickets and volume estimates.

During discussions with San Diego, it was determined that two departments support the C&D ordinance and refund requests. Demolition applications are submitted to San Diego's development services group. This group is responsible for determining if a project meets the requirements for the C&D ordinance. A project must be a minimum of 1,000 square feet to meet these requirements.

If the application meets the requirements of the C&D ordinance, a recycling specialist with the City of San Diego will reach out to the primary contact on the development application and send them an educational package that includes the requirements of the C&D ordinance, a list of haulers and approved recycling facilities, and tips on how to meet the requirements of the ordinance. The developer is also required to fill out the online waste management form. Within this form, there are four key acknowledgements:

1. *I acknowledge receiving CALGreen's information (the purpose of CALGreen is to improve public health, safety, and general welfare through enhanced design and construction of buildings using concepts which reduce negative impacts and promote those principles which have a positive environmental impact and encourage sustainable construction practices.);*
2. *I acknowledge receiving the C&D information packet, which includes a C&D facility directory, franchise hauler list, and C&D debris fact sheet;*

¹⁸ [City of San Diego Municipal Code](#) (2016). Article 6: Collection, Transportation and Disposal of Refuse and Solid Waste.

3. *I acknowledge that C&D material taken to a facility not listed on the certified C&D recycling facility directory will not receive diversion credit unless they are reused or donated; and*
4. *I acknowledge that all contractors and subcontractors will collect all garbage and recycling weigh ticket/documentation for the project and provide them to me to submit to the City within 180 days after final inspection and request a refund of the deposit paid for the project.*

The solid waste team will receive a notice of the completed form and will review the application. Once the development is underway, a City of San Diego code compliance officer will visit the site and drop off a second educational package. This package has similar information as the first package; however, it is often delivered to the foreman on-site. Following the final inspection, a final courtesy letter will be provided to the development applicant as a reminder of their submission requirements to return their deposit.

The City of San Diego was unable to provide statistics; however, it was stated that the majority of deposits are returned to development applications and deposits are prorated based on diversion statistics. Development applicants also receive credit for reuse and donation. Applicants are required to submit pictures and are given a weight credit when there is proof of reuse or donation.

Overall, there are 13 recycling specialists working on the C&D ordinance and they all receive support from code compliance officers. There are no dedicated code compliance officers devoted to the C&D ordinance; however, there are 30 officers trained on this ordinance and they are each required to monitor and educate the development applications within their designated zip codes.

3.2.4.4

City of Long Beach

The State of California, through its California Green Building Standards Code and as part of the Long Beach's commitment to sustainable development, requires that certain C&D projects divert at least 65% of waste through recycling, salvage, or deconstruction.

Hauling of refuse, recyclable or organics within the City of Long Beach is required to be performed by a permitted hauler or self-hauled. A list of permitted haulers is available on-line. The C&D Debris Recycling Program, which took effect on November 5, 2007, encourages permit applicants to recycle all C&D materials through a refundable performance deposit. All approved recycling facilities are listed on Long Beach's website. This program also encourages the use of green building techniques in new construction and promotes reuse or salvaging of recyclable materials in demolition, deconstruction, and construction projects.

Demolition projects are required to apply for a C&D permit. All C&D permit applicants are required to submit a surety bond as a waste diversion deposit. (A surety bond is a financial guarantee that the principal will fulfill a specific obligation or duty. If the principal fails to meet their obligations, the surety steps in to cover the financial loss incurred by the obligee). This deposit of either 3% of the project value or \$53,425 (USD), whichever is less. The minimum deposit is \$1,605 per project. Applicants are also

required to pay a non-refundable administrative review fee of either \$210 for residential projects or \$415 for ICI projects. As part of the permit condition, the permit applicant must submit a waste management plan detailing the estimated volume or weight of the project's C&D waste. Developers are also required to submit a compliance report, which includes all the recycling receipts within 30 days of the completion of the construction project. Projects that meet the 65% requirement will receive a full reimbursement of the performance deposit. Projects that do not meet the 65% requirement will receive a partial return of their performance deposit in proportion to the actual diversion.

Dillon staff reached out to the City of Long Beach for follow-up on this standards code; however, Long Beach was unable to provide further comment.

Key Themes and Findings

Dillon completed research to build on the following best practices that have been implemented across Canada and internationally:

- Regulations regarding installation, use and closure of waste chutes in multi-residential/high rise properties;
- Regulations and/or policies with a mandatory volume of receptacles required for each waste stream;
- Permits, bonds or approvals related to the management or minimization of waste generated from C&D activities;
- Solid waste by-law best practices that promote source separation in multi-residential buildings and/or ICI properties; and
- Regulations including, but not limited to solid waste, building code and fire code are within the scope of this scan.

The key themes and findings are provided within this section. This section of the memo also outlines some key considerations for HRM should policies/programs be developed.

Waste Chutes in Multi-Residential/High Rise Properties

A review of waste chute requirements was completed for the City of Toronto, Hamilton, and Richmond Hill, all of which provide multi-family waste collection services (either via contract or with municipal employees). Each of these jurisdictions have requirements for waste chutes; however, none of these jurisdictions have banned waste chutes. The key theme of waste chute best practices is that requirements for waste management systems in multi-residential buildings should stipulate that the collection of recyclables should be as convenient as garbage collection to residents. This implies that there should be requirements for multiple waste chutes or bi-sorters (or tri-sorters) should waste chutes exist; however, multiple waste chutes are preferred. If waste chutes are permitted, they should only be allowed for large buildings as they take up significant space. Small buildings where chutes may not be feasible should consider the location of waste storage areas and accessibility requirements so that access to all waste streams is convenient. Waste chute requirements are often outlined in City planning documents or amended solid waste design guidelines to confirm requirements from a full design perspective including fire and building codes.

Promotion of Source Separation in the Multi-Residential Sector and Mandatory Receptacles for Waste Streams

Outreach and education events can positively impact waste diversion, especially when partnered with CBSM campaigns. However, these events need to be ongoing to support sustained behaviour change. BC Housing did indicate ongoing outreach and education can be from internal staff, partnerships and

developing social capital within multi-residential buildings. The municipalities included in this review often provided waste collection services either via contract or with municipal employees.

Additional support and promotion of source separation in the multi-family sector is regulation through design and approval of waste storage areas/rooms. These regulations should support waste diversion and have established mandatory requirements for diversion streams and minimum number of containers per unit. Many of the reviewed jurisdictions had design guidelines, included in development applications and/or regulations, that provided the minimum requirements for the number of containers per stream. There were some common themes of best practices which included:

- A checklist that supports development applicants in understanding the requirements;
- All design guidelines provided the minimum number of containers for each waste stream;
- Space requirements of both collection areas and transportation requirements (turning radius, vehicle size);
- Design guidelines create efficiencies in the development review process as it provides procedures for reviewers to reference when the design does not meet the requirements as outlined in the design guidelines; and
- Waste management plans, overlay plans or design criteria can support in demonstrating that requirements are met by the applicant.

It was noted that ongoing on-the-ground education is often well received regardless of municipal or private collection. This could include workshops and training sessions on topics related to waste management, hands-on training on proper waste sorting and disposal techniques, sustainability, or other relevant subjects and/or mobile education units that travel to various buildings to provide on-the-spot education and resources with interactive exhibits and displays, noting that many of these items are already being done by HRM. Continued targeted outreach campaigns specifically designed for residents in multi-family buildings could increase source separation.

Similar to the multi-residential design guidelines, ICI design guidelines should include minimum requirements related to the number of waste containers and space requirements. The City of Richmond commercial requirements also include sample calculations to determine waste generation based on business type. Requirements for waste diversion must be related to existing solid waste by-laws or be included in by-law revisions. Similar types of requirements could provide HRM with opportunities to enhance current waste diversion.

4.3

C&D Regulations and Education

C&D diversion requirements contribute to C&D waste diversion in Vancouver, San Diego, and Long Beach. Understanding which facilities have the capacity to recycle and divert C&D materials and including this information in educational materials to developers can be helpful. By-laws should include a list of items that are required to be diverted and expected diversion levels to increase understanding

of these by-laws. The process must be easy for developers to follow and is a process that allows for tracking through scale tickets. Applications for demolition permits should be accompanied by a prorated deposit. This deposit will need to be returned based on proof of diversion at approved facilities.

Typically, buildings developed before 1970 were built with materials that are easier to deconstruct as they are not usually composite materials. Given HRM's heritage it is likely that there would be many buildings that would fit this description. An analysis of current housing types should be completed prior to developing any deconstruction or amending demolition by-laws to understand the potential impact on waste streams and capacity of local processing facilities.

Accompanying regulations and ordinances with educational campaigns can be beneficial based on San Diego's extensive campaign. Development applicants receive education at the application process, building process and final inspection. San Diego indicated this extensive education supports the success of their overall program.

Presently, the management of HRM C&D waste falls under By-law L-200, which regulates the licensing of operations involved in the recycling and disposal of C&D materials. This by-law comprehensively outlines the license prerequisites for privately owned and operated C&D transfer, processing, and disposal facilities. Facilities are required to achieve an annual diversion target of 75% recycling to retain their license. C&D diversion requirements such as better source separation on demolition sites could support achieving 75% diversion. Additionally, a waste management plan is required for each demolition permit application in HRM. These plans specify estimates of material types and quantity, as well as to which facility material will be delivered. Solid Waste staff review these applications to ensure no export of C&D material is planned (contrary to By-law S-600).

4.4 Solid Waste By-laws

Based on recent research completed by the Regional District of Nanaimo, the two solid waste by-laws that can be developed to support waste diversion includes mandatory waste separation (on-site requirements for waste diversion streams) and waste hauler licencing (requirements to licence haulers and increase tipping fees for disposal). HRM currently has regulations in place for mandatory waste separation. The waste hauler licencing is expected to promote waste diversion but needs to be used concurrently with mandatory waste separation. Solid waste by-laws and development guidelines, backed by these by-laws are required to support ongoing waste diversion in the multi-residential sector. No municipalities in this review required clear bags for garbage.

The City of San Diego has had success with their ICI recycling ordinance through requirements for reporting and reviewing information provided in reports; however, reviews require substantial staff time. Understand business types and developing regulations specific to a building type can tailor compliance requirements based on waste generation. For example, a small business that does not generate organics waste should not be required to pay or have organics containers on site.

With regards to by-laws, additional waste management requirements in development by-laws for multi-residential buildings has been a successful way to confirm solid waste design requirements and encourage diversion. The by-laws include minimum design guidelines for waste storage and collection. These minimum requirements need to be met to issue a development permit.

5.0

Conclusions

Ten jurisdictions were reviewed for best practices within the multi-residential, ICI and C&D sectors. These sectors are often viewed as challenging due to the complexity of their waste streams, transient populations, inadequate infrastructure or lack of regulations and compliance. Strategies that were found to improve waste diversion within these sectors include the development of design guidelines (e.g., review of waste rooms, mandatory volume/number of containers), ongoing education, use of CBSM strategies, by-laws surrounding approved disposal facilities and mandatory waste diversion, and deposits for C&D waste diversion requirements.

Notable requirements of these best practices include having dedicated staff for review of development applications, education, and enforcement of by-laws. Education was a key consideration of all best practices within each of the three sectors as it plays a critical role in raising awareness and promoting responsible behaviour.