



The Continuous Improvement Fund (CIF)

Medium to High Density Building Code Improvements

August 2024

Disclaimer

The information contained herein is intended as training/reference material or general information and should not replace qualified professional advice on any of the matters discussed or presented.

Communities and/or other users of the information provided by the Continuous Improvement Fund (CIF), its affiliates, partners and assigns do so specifically at their own risk. This information is not a substitute for qualified legal advice and Dillon, the CIF, their affiliates, partners and assigns accept no responsibility for loss or damage, howsoever incurred, by the use of this information.

You acknowledge that in using this information neither Dillon, CIF, nor any of their agents, partners, affiliates, directors, employees, assigns and associates may be held liable, responsible or accountable for any type of damage, litigation or other legal action that may arise directly or indirectly from the reliance on this information.

© 2024 Resource Productivity and Recovery Authority and Stewardship Ontario

All rights reserved. No part of this publication may be reproduced, recorded or transmitted in any form or by any means, electronic, mechanical, photographic, sound, magnetic or other, without advance written permission from the owner.

Table of Contents

Acronyms, Abbreviations, Definitions

Executive Summary

1.0	Introduction	1
1.1	Background to Medium to High Density Building Improvements	1
1.2	Project Approach	2
2.0	Review of Background Documentation	3
2.1	CIF Past Studies	3
2.1.1	Review on Municipal Design Standards	3
2.1.2	Review on proposed Ontario Building Code changes	6
2.2	Municipal Waste Resources	7
2.2.1	Waste Management Guidelines	7
2.2.2	Waste Management Design Plan Samples.....	8
2.2.3	Academic Papers	9
2.3	Documents from CIF.....	10
2.4	Additional Background Documents.....	12
2.4.1	Ontario’s Growth Plan and its Impact on Waste Diversion Rates.....	12
2.4.2	Ontario Building Code	15
2.4.3	The Planning Act.....	16
3.0	Consultation	18
3.1	Interviewees	18
3.2	Questionnaire	18
3.2.1	What We Heard	19
4.0	Recommendations	29
4.1	Changes to the OBC and Planning Act.....	29

- 4.1.1 Ontario Building Code 29
- 4.1.2 Planning Act and Others..... 30
- 4.1.3 Other Policies or Industry Standards..... 32
- 4.2 Policies for Implementation (Municipal, Regional or Provincial)..... 32
- 4.3 Standard Clauses for Municipal Development Guidelines and Manuals..... 34

5.0 Conclusions and Next Steps 37

Tables

- Table 1: Policy Summary and Potential Jurisdictional Responsibility 33

Appendices

- A References
- B Questionnaires



Acronyms, Abbreviations, Definitions

CIF	Continuous Improvement Fund
Dillon	Dillon Consulting Limited
EPA	Environmental Protection Act
EPR	Extended Producer Responsibility
IC&I	Industrial Commercial and Institutional
LEED	Leadership in Energy and Environmental Design
MECP	Ministry of Environment, Conservation and Parks
MMAH	Ministry of Municipal Affairs and Housing
MR	Multi-residential
MWA	Municipal Waste Association
OBC	Ontario Building Code
OCC	Old Corrugated Cardboard
O. Reg	Ontario Regulation
PPS	Provincial Policy Statement
PROs	Producer Responsibility Organizations
RFID	Radio Frequency Identification
SOP	Standard Operation Procedure
SPA	Site Plan Approval
SPC	Site Plan Control
SSO	Source Separated Organics

Definitions

Accessibility	Accessibility related space design is a requirement in the Ontario Building Code. Also refers to the Accessibility for Ontarians with Disability Act (2005) which is a law that sets out a process for developing and enforcing accessibility standards by 2025.
Bulky Waste	Large items that are typically not collected through regular waste collection services due to their larger size, weight, or volume, such as mattresses, furniture, renovation waste.
Bi-sorter/tri-sorter ¹	Waste management system that separates solid waste into two or three distinct streams, typically solid waste, recyclables, and/organics. Various manufacturers, designs and brands are available to the waste industry market internationally. Also available are quad-sorters that separates waste into four distinct streams.
Organics	Waste materials derived from living organisms, such as plants and animals. These include food waste, kitchen waste, paper towels, napkins and facial tissue and are also referred to as source separated organics (SSO).

¹ Any reference to “bi-sorter or tri-sorter” only refers to the system and does not refer to any specific brand or design of sorter. The study is not referring to any trademarks, registered or not.

Executive Summary

Across Ontario, as well as across Canada, municipalities are experiencing an increase in construction of medium and high density multi-residential (MR) buildings. This presents operational challenges for diverting residential solid waste in the MR sector. Dillon Consulting Limited (Dillon) was retained by the Continuous Improvement Fund (CIF) to conduct a study that compiled current and evolving issues around the design of waste collection systems in high-density residential buildings and provide recommendations for improvement via:

- Legislative changes to the Ontario Building Code (OBC) and Planning Act
- Policies that could be implemented at municipal, regional, or provincial levels
- Standard clauses that can be included in municipal development guidelines and manuals

It is to be noted that the scope of this work only includes new MR building developments. Retrofitting of existing buildings is outside of the scope of work. However, installation of tri-sorters in existing single chute buildings or closing the garbage chute and requiring all streams to be brought down to the collection bins are two options that can be considered for adding diversion streams in these buildings.

Historically, single garbage chutes and less accessible recycling opportunities in residential buildings discouraged waste diversion. Tri-sorters, allowing for three-stream sorting through a single chute on each floor, were introduced as a solution but have faced operational challenges, including maintenance issues, safety concerns for operators, high levels of contamination and resident complaints.

Dillon used a multifaceted approach to develop recommendations:

- Information assessed from background documents
- Interviews with 20 stakeholders, including municipalities, developers, waste service providers, and other industry experts
- Input from Dillon specialists and senior advisors knowledgeable in waste management and legislation

Several documents were reviewed to understand the current landscape and historical efforts in improving waste management in MR buildings, including past CIF MR studies,

Municipal Waste Association (MWA) guidelines, and other relevant documents from municipalities and researchers.

For the interviews, Dillon prepared a questionnaire to gather insights into ways to improve waste management and diversion in the MR sector. Interviewees responses to the questionnaire were used to understand the current and evolving concerns as well as existing guidance and policies related to building design for the design of waste collection systems (i.e., collection systems for recyclables, organics/food scraps and garbage), as well as identify opportunities and barriers in implementing new guidance and policies.

Key Findings from Stakeholder Consultations

Municipalities and Regions:

- Multiple challenges identified include lack of space for waste storage, issues with waste chutes, and inadequate education for tenants
- Design challenges highlighted include the prioritization of sellable space over waste management facilities, poor placement of waste chutes, and insufficient space for waste storage
- Developers/architects lack information necessary to adequately address the management of waste by future owners/tenants/maintenance staff in their designs

Waste Collection Service Providers and Industry Experts:

- Issues with underground waste storage spaces, safety concerns, and logistical challenges in accessing waste storage areas
- Emphasis on the need for technology to track container fullness and standardization in waste management practices across the province

Developers and Architects:

- Challenges include the diversity in requirements from different municipalities and the impact of increasing e-commerce on waste storage needs
- The necessity for more specific and standardized provincial guidelines

Property Management Companies:

- Operational challenges include improper waste disposal by tenants and lack of manageable space for waste segregation
- Crucial need for a user-friendly, straightforward waste sorting system and rigorous enforcement of waste management guidelines

MR waste infrastructure manufacturers:

- Highlighted challenges in chute and sorter installations and maintenance, exacerbated by poor initial design considerations in building plans

Recommendations

Historically, waste was all comingled, but over time as environmental impacts are better understood, the waste rooms in MR buildings are evolving. Waste rooms now accommodate diversion programs (recycling, organics, batteries, textiles, electronics) enabling source separation within the footprint of the design.

Given the evolving landscape of waste management and sustainability, it is important for the Province to enhance regulations within the OBC and Planning Act. The OBC could be updated to include sustainable waste management best practices such as minimum standards for waste disposal spaces and equipment that promote occupant health, fire safety and hazard reduction. Specific requirements should mandate the installation of multiple chute or bi-sorter/tri-sorter systems to streamline the separation of garbage, recyclables, and organic waste. Waste room design must accommodate appropriate sorting bins and compactors with defined safety features, alongside specifications for collection vehicle access for efficient waste management operations and safety.

Changes to the Planning Act (particularly through zoning by-laws) and the use of stipulations in the Environmental Protection Act, could be leveraged to enforce waste management design standards comprehensively across Ontario. This includes integrating waste management regulations into the Environmental Protection Act with a focus on multi-residential sectors and creating unified provincial guidelines to standardize practices. Furthermore, municipal governments may consider including bylaws that necessitate developers to incorporate waste management designs at early stages such as the Zoning By-Law application, ensuring compliance and encouraging best practices through potential incentives and penalties for non-compliance.

Additionally, municipalities could include standard clauses in their development guidelines and manuals to apply consistent implementation of waste management practices. Due to the transition to full EPR, municipalities may need to coordinate and consult with Ontario Producer Responsibility Organizations (PROs) to align with their Blue Box recycling collection requirements post transition (January 1, 2026). This includes the requirement for licensed engineers to prepare and submit waste plan reports accompanying Site Plan Applications, the standardization of multi-waste stream generation rates for designing waste room storage, and the specification of accessible waste collection areas. Training for architects and property management staff on effective waste management can also enhance building performance. Training and education should be part of the industry's continuous improvements and included or offered by member industry organizations, industry forums, conferences and formal education. Enforcement mechanisms like contamination fees, non-compliance penalties, and mandatory inspections could be in place to support adherence to waste management protocols. This holistic approach across municipal, regional, and provincial policies may support improved waste diversion outcomes and promote sustainable urban growth and development.

Summary of Recommendations

Changes to the OBC (maintained and regulated by the Ontario Ministry of Municipal Affairs and Housing, MMAH):

- Incorporate minimum requirements for waste disposal and storage spaces, including accessibility for residents
- Requirements for multiple chutes and compaction of the garbage stream for new buildings of a specified size

Planning Act and Other Acts (maintained and regulated by the MMAH):

- Potential amendments to the Planning Act, to further emphasize waste management as a provincial interest
- Consideration of new regulations under the Environmental Protection Act by the Ministry of Environment, Conservation and Parks (MECP), specifically for MR waste management design minimum requirements

- Consideration of updates to Ontario Regulation 103/94 (3.6 Multi-unit residential buildings) by the MECP, to correspond more clearly to current diversion programs in Ontario

Municipal Development Guidelines:

- Standardize calculation rates for waste storage space and bin sizes to inform developers of minimum waste management needs for spacing and access
- Provide waste collection vehicles minimum access based on front end loading truck dimensions, including clearance for the tip of overhead bins and side loads
- Incorporate feedback from property managers and service providers into the development of design guidelines to support functional waste management systems and support simple and manageable diversion of residential waste

Conclusion

This study underscores the need for standardized, comprehensive guidelines to address the design challenges in MR waste management effectively. Legislative amendments, policy enhancements, and detailed municipal guidelines are essential steps toward improving waste diversion rates and creating sustainable urban communities.

1.0

Introduction

Across Ontario, as well as across Canada, municipalities are experiencing an increase in construction of medium and high-density multi-residential (MR) buildings. Dillon Consulting Limited (Dillon) was retained by the Continuous Improvement Fund (CIF) to conduct a study that compiled the current and evolving issues regarding the effective design of waste collection systems in new and medium to high density residential buildings and identified ways that these systems can be improved through the following:

- Changes to the Ontario Building Code (OBC) and Planning Act or other related legislation
- Policies that could be implemented municipally, regionally or provincially
- Standard clauses that can be included in municipal development guidelines and manuals

1.1

Background to Medium to High Density Building Improvements

MR buildings historically have lower performance rates in waste diversion programs such as recycling and organics collection. A key contribution to the historically lower diversion rates in MR buildings is that building designs and infrastructure did not include three-stream (garbage, recyclables and organics) waste collection systems when first designed and constructed.

In the recent past, all garbage was collected in one common receptacle for disposal, before recycling programs were established. The one garbage chute system on each floor does not encourage waste diversion, as it does not provide equal opportunity and convenience for residents to dispose of each type of waste stream (garbage, recyclables and organics). It is easier and more convenient for residents to use the garbage chute than it is to take the elevator or stairs down to a waste room or outdoor waste area to sort out their recyclables and organics waste.

Tri-sorter technology was introduced as a potential solution to the single garbage chute infrastructure. The tri-sorter offers three-stream sorting while still only having a single chute accessed on each floor. The purpose of implementing tri-sorters was to make organics and recycling as convenient as garbage to dispose of down a chute. While not a

uniform experience, issues and operational challenges have been raised with tri-sorters from both residents and building maintenance operators and staff. Operational and safety concerns with the tri-sorter chute infrastructure include:

- Materials becoming trapped, especially oversized bags or cardboard, resulting in costly maintenance of tri-sorter flaps that are prone to breakage
- Temporary closures of the chute for service and safety issues for operators
- Frustration and complaints by building residents and condo owners regarding out of service, lock out or long waits for sorter to react
- Increased contamination of the recycling stream

1.2 Project Approach

Dillon's approach to developing recommendations were based on:

- Information synthesized through background documents
- Dillon specialists' knowledge of waste management in MR buildings and regulations
- Interviews with relevant stakeholders

Dillon has conducted a high-level review of past CIF MR studies, documents from the Municipal Waste Association (MWA) and other relevant documents. For this review, Dillon leveraged its in-house experience in waste management, as well as in-house senior advisors (two Senior Architects and an Urban Planner) on the OBC, Ontario's Planning Act and Leadership in Energy and Environmental Design (LEED) Accredited Professionals.

To compile a current understanding of the waste management system in MR buildings, Dillon and CIF selected 20 stakeholders that represented:

- Municipalities and Regions
- Developers and architects
- Waste collection service providers
- Waste infrastructure manufacturers
- Building operators
- Other MR waste sector stakeholders (e.g., PROs, MR waste auditors)

Dillon gathered information from waste management staff in selected municipalities and industry experts. Municipalities were chosen as those that are experiencing a

growth in medium and high-density buildings and represent a diversity of experiences from across the sector. Dillon prepared a draft list of interview questions that was reviewed and approved by the CIF. Interviewees were contacted and provided responses via in-person or video conference interviews. Some provided written responses.

Recommendations in this report are the results of information distilled from background documents, input provided by stakeholders in the interviews, and insights from Dillon experts.

2.0 Review of Background Documentation

Dillon reviewed a variety of relevant documents from past CIF MR studies, multi-residential studies, municipal guidance, and provincial government documents to understand how different municipalities provide guidance on waste management for MR buildings. A comprehensive list of background documents that were reviewed is provided in **Appendix A**.

2.1 CIF Past Studies

In 2011 and 2012, Genivar² conducted a review for CIF of municipal MR building infrastructure design requirements for waste diversion with the purpose to change and improve the standards at the time. The concern was that MR buildings were not reaching diversion targets. The review presented a best practice guide for storage and collection of recyclables. The review also outlined recommended changes to the existing design standard for new buildings with some recommendations being appropriate for implementation in existing MR buildings.

2.1.1 Review on Municipal Design Standards

Genivar first conducted a review on municipal design standards specifically related to site plan design which was completed in February of 2011. Recommendations in this report included:

² <https://www.wsp.com/en-ca/who-we-are/our-story>

- Mandatory 'Site Plan Approval (SPA)' process for buildings to qualify for municipal waste collection services. This confirms that waste collection requirements such as vehicle access, loading facilities, placement and number of bins, and compactor safety requirements are adequate
- Mandatory internal garbage room area, built in accordance with all applicable regulations (i.e., OBC) for new buildings that do not qualify for curbside collection. Minimum floor space of 15m² and one bin for the first 40 units and additional 5m² and one bin for each additional 60 units
- Bulky storage space shall include at minimum, 10m² of space for un-compacted garbage such as bulky items
- The requirement of external bin storage should be consistent across all municipalities and should only be permitted for developments that contain interior roads
- Clearance for outdoor enclosures must be at least three meters for a single bin and up to eight meters for double bins with four gates; gates must swing open 135 degrees
- For bin sizes and quantities, MR buildings with 100 or more units should have mechanical compactors
- Organics bins should be 3yd³
- Garbage calculations for the number of bins required should be calculated using 0.06yd³ per person for compacted or 0.18yd³ per person for uncompacted garbage
- For compactors, specifications shall be submitted during site plan approval that show safety features. Tri-sorters need to have 'out of service' warning lights and a lock-out system for staff safety when performing operational duties
- A separate recycling space should be provided and should be separated by a closure if it is in the same room as the garbage room
- Recycling: One 360L cart is required for each seven units. If providing front-end loading bins, recycling rooms must have at least 10m² floor space for the first 40 units and additional 5m² for each additional 60 units
- Air conditioning and/or odour control must be provided in the recycling room and at the location of organic waste storage
- Front end collection service is recommended for MR buildings with 100 or more units and single-stream recycling. Carts should be discouraged for buildings with 100 or more units due to less efficient diversion and storage problems
- Internal Collections Systems:

- Dual and triple chute systems
- Single chute and floor-to-floor collection
- No chutes or closed chutes replaced by a garbage and recycling room
- A separate recycling room for resident access, separate from garbage storage room
- For chute in-take rooms, a separate area with fire rated door on each floor for storage of other waste streams (Blue Box, Green Bin)
- Loading and Access Facilities:
 - Level loading area (2% grade for front end bins with rolling prevention mechanisms, 0% for carts)
 - Vertical loading clearance 6.1 m
 - Area: 4 m x 13 m with an additional 2.5 m per bin >1 front end loading bin
 - Loading pad: 200 mm thick with reinforced concrete
 - Turnaround area for waste collection vehicles or a drive through access route
 - Turning radius 9.5 m, inside, 14 m outside along route
 - Route access has 4.4 m clearance throughout route
 - Structural support along route for 35,000 tonnes

Recommendations made in the 2011 report are generally still applicable today. The mandatory 'Site Plan Approval' process with respect to waste management has not been adopted by all municipalities in Ontario. Similarly, front-end service is efficient and still recommended for high-density MR buildings today. Large buildings should be offered front end collection for recyclables and not multiple carts. One common theme throughout the recommendations is standardization in calculating space required for all waste streams storage and their bin sizing. This is still reasonable as a recommendation since standardization can support developers in designing effective waste collection and storage areas upfront. The recommendations of 3yd³ bins for organics may be oversized, depending on the number of units serviced, therefore 2yd³ bins is also an option for organics storage.

Since this report was released, changes in planning and density requirements in Ontario have altered the built form of residential design, the option of newer waste containment units have been introduced and compaction has slightly altered due to changes in what we consume and dispose of. For example, the introduction of underground waste collection container systems equipment requires a different access

and footprint in a new build to meet the requirements for MR waste, recycling and organics collection. The material in the waste stream compaction formulas have altered slightly primarily due to the lightweighting of packaging. And notably, the development industry has chosen to build back-to-back townhouses and stacked units versus apartment towers to meet consumers preference of ownership. These units are often serviced on private condominium roadways to meet both residential preference of design and the density requirements dictated by the province. In condominium designed sites, centralized MR waste collection is often required as opposed to curbside service. The footprint to accommodate storage of the bins, as denoted in the [KPMG Blue Box Program Enhancement and Best Practices Assessment Project](#), is difficult to achieve in these newer tighter designs, forcing developers to choose private versus municipal collection.

2.1.2 Review on proposed Ontario Building Code changes

Genivar followed with a review and recommended changes on the OBC which was completed in October of 2012. Recommendations in this report are included in the section below.

Background

The OBC is a regulation established under the Building Code Act. It applies to the construction of new buildings, renovations of existing buildings, and changes in the use of existing buildings that result in an increase in hazard, as determined by the applicable provisions.

Provisions Pertaining to Refuse and Waste Collection

Article 3.6.3.3 of the OBC, details requirements for refuse chutes, including provisions on material properties, fire resistance ratings for shafts and enclosures, minimum room size requirements for chute access intake rooms on each floor, and the extension of the shaft enclosure above the roof.

Currently, the OBC does not include any provisions for multiple chutes or designated storage space required for waste, recycling or organics bins in a designated waste room. The following changes to existing provisions in the Code are recommended:

- Requirement for installation of separate recycling and garbage chutes

- Permission for recycling to be stored within chute intake rooms with a minimum size, including accessibility requirements for use by all building occupants, and appropriate countermeasures to address associated risks
- Chute intake room doors should swing outward, but not into a fire exit, and without encroaching into the minimum corridor width of 1100 mm
- Provision of a separate recycling room with sufficient space for the storage of different recyclable materials
- Recycling facilities to be, at a minimum, equally provided as garbage disposal facilities and infrastructure

The report also recommended adding a new section to the OBC under Part 12 “Resource Conservation”. Currently there are two categories under Part 12 for energy efficiency and water efficiency. The report proposes adding a new category called “Waste Diversion Efficiency.” Under this new proposed category, the recommended additions are:

1. Separate recycling chutes, if greater than four storeys
2. Recycling storage permitted in chute intake rooms on each floor
3. Intake room doors that swing outwards (allowing cart storage)
4. Separate recycling room for storage of various recycling streams
5. Recycling facilities to be as convenient as garbage facilities

2.2 Municipal Waste Resources

Municipal waste resources reviewed for this study included an assortment of documents from waste collection guidelines, waste management design plan for developments and academic papers that study waste management in MR buildings.

2.2.1 Waste Management Guidelines

The level of detail identified in waste management guidelines reviewed varied among municipalities and regions. However, many guidelines required information related to site access routes, vehicle movement, turnaround areas, safety measures, waste separation and waste storage areas for MR buildings, and requirements for the development’s site plan application.

Generally, municipalities request the submission of the waste management plan during the zoning or site plan development application SPA phase. If the proposed waste management plan is not approved, the municipality can provide comments and feedback regarding the proposed design presented for amendments. Requirements related to site access, vehicle movement entering and exiting the site, sufficient space for vehicles to efficiently move throughout the site on its route and bin set outs aims to confirm the safety of waste collection vehicle operators and pedestrians moving throughout the site.

Municipalities where waste and recycling collection is mandatory through municipal services, such as the City of Edmonton, tend to have more prescriptive requirements compared to those where municipal waste collection is an option to the alternative of private collection services. Many, but not all, municipal waste design guidelines provide details and specifications on how to calculate waste generation rates based on the number of units and the type and number of bins or carts required for each stream of waste collected. The guidelines are not consistent across municipalities on the calculation rates to apply to each waste stream and bin sizes are not always presented the same way. Some municipalities provide bin dimensions but do not include the wheels, lid, nor arms on the bins in the dimensions which results in miscalculations for tipping or loading in the site design.

2.2.2 Waste Management Design Plan Samples

Two Waste Management Design Plans prepared by waste management consultants submitted to the City of Mississauga in the Region of Peel were reviewed. These plans clearly listed the Region's minimum requirements and provided detailed Site Plans that show how waste generation, the number of bins, and waste room configurations were estimated and designed. The approved waste plans aligned with the requirements in the Region's guidelines.

The Region of Peel's Waste Collection Design Standards Manual is detailed and prescriptive so both Waste Management Design Plans are, in turn, detailed. For example, the Region of Peel provides guidance on the number of bins per dwelling unit required. This leaves little space for assumption or justification to the developer.

Based on Dillon's multiple sources of in-house SPA plans, the better the guidance in municipal guidelines, the better the final design. Guidelines that are not comprehensive

are still referred to by a developer/architect. They, in partner with a waste consultant, apply the guidelines to their proposed design. If a best practice item or specification is not in the guideline, typically they will not add it to their design and reference the guideline in their SPA application and municipal planning review.

2.2.3 Academic Papers

The two academic papers that were reviewed had studied waste behavior in MR buildings. One focusing on social housing in the United Kingdom and the second was a waste behaviour case study in Toronto.

Evaluation of Interventions for Improving Pro-Environmental Waste Behaviour in Social Housing completed in the United Kingdom concluded that co-created solutions between residents and other stakeholders led to increased waste diversion, improved recycling quality, and increased composting rates. A unique communication and engagement plan for each site studied encouraged trust and involvement from residents, suggesting this approach could be a globally replicable model for similarly sized buildings. The referenced study included 43 buildings with on average, 30 apartments per site and 39 residents. Sites with a co-created solution showed improvement in recycling quality and uptake in composting. Follow-up work showed that the behavior is sustained because residents have taken ownership of the project. The paper also notes that governments need to provide inclusive services to all to provide more opportunities to meet their waste goals. While social media is increasingly used for public engagement, this research emphasized the importance of face-to-face interactions for effective community engagement.

The case study for the City of Toronto concluded that technological fixes do not solve all the problems related to low waste diversion and high contamination in the MR sector. In fact, they can create new challenges such as chute blockages, system malfunctions and the need to empty out chute rooms due to some residents being unwilling to wait for the chute arm to pivot to the requested waste stream.

The case study also found that contamination is an issue for property managers, regardless of the type of waste sorting system in place. Property managers regularly experience mechanical issues (such as chute arm malfunctioning or chute blockages) for bi-sorters and tri-sorters due to design and resident misuse. There is a disconnect between property managers and developers/designers in the sharing of their

operational experience and knowledge of actual building operations once occupied post design. In order to achieve an improvement in waste diversion in this sector it may require monitoring or follow up creating a feedback loop of data to property managers, developers and designers in the multi-residential sector on performance that can also inform future waste management decisions and design for the sector. The goal is to create a system where information about waste diversion performance, issues like chute blockages, and resident behavior can be collected and shared. The feedback loop would help property managers address operational challenges more effectively and provide insights to developers and designers to create systems that are better suited to real-world conditions.

2.3 Documents from CIF

The *'Review & Update of Niagara Region's Requirements for Waste Collection Policy and Procedure for Requirements of Waste Collection'* study by Policy Integrity Inc. in 2019 provided recommendations to Niagara's existing Waste Collection Policy. This was prepared in anticipation of an increased need for local services given the predicted population projection growth. The proposed changes aimed to confirm that all residents have equal and convenient access to municipal waste programs, while prioritizing safety and efficiency. The goals of the recommendations were to enhance waste diversion and manage contamination, adapt to evolving market conditions and legislative requirements in Niagara. A summary of the recommendations follows:

- Include provisions to confirm that developers can adopt functional design solutions that qualify their developments for the Region's waste collection and recycling services
- Establish a new standard mandating that all new developments and redevelopments comply with the Region's minimum eligibility criteria for waste collection services, regardless of whether the developer intends for their developments to be serviced by the Region or by private waste collection services
- Consider including a requirement in the new standard for clearly defined set-out areas in front of developments so that "ownership of waste" is easily identifiable
- Consider setting limits on the amount of waste that can be placed at the curb when there is no on-site collection

- Require either a common sorting room within 100 meters (with ownership of waste) or a three-chute system on each floor to enable residents to sort waste into the three streams
- Enforce measures to prevent cross-contamination of chutes (e.g., security cameras, Radio Frequency Identification (RFID))
- Create a separate defined area for the collection of bulky materials (e.g., mattresses)
- Consider requiring that all residents have convenient access to waste storage rooms or set-out locations, ensuring that no resident needs to travel more than 100 meters round trip to dispose of their waste
- Allow the number of carts/bags placed at curbside to match the bag/cart limits per unit. Developers should be required to define the set-out area during the planning stage, ensuring there is enough space for the necessary number of bins/bags. Waste collection should be limited to the allowed number of units
- All waste collection vehicle access routes³ should have a vertical clearance of a minimum of 4.4 meters
- Provide incentives (such as enhanced services, recognition programs, and technical assistance) for developers and property managers to enable waste collection services
- Establish more uniform waste collection policies and procedures. To confirm compliance, it proposes creating a standardized checklist for developers to include with their site applications
- Advocate to the provincial government for enhanced planning direction so that new residential and mixed-use developments adequately integrate waste collection and recycling considerations. This includes influencing Provincial Policy Statements and Building Code regulations to encompass these requirements effectively

Many recommendations in this report are applicable for Ontario, even though they were written for the Region of Niagara. Requiring all developments to meet the Region's or municipality's requirements for waste and recycling collection services may be a beneficial strategy to influence the design phase of a new development. Methodologies to track ownership of waste is also relevant today as high contamination in MR buildings persist. Using technology such as RFID or key fob access to the waste room could allow buildings to collect information on how the waste room is used and by whom. A three-

³ Noting, while not included in the reference, a typical specification for minimum road width of 6 metres along the site access route is a typical road width specification.

chute system provides equal convenience for residents to deposit recyclables, organics, and garbage. This could encourage participation in diverting waste from landfill by increasing recyclable and organics collection from this sector.

2.4 Additional Background Documents

2.4.1 Ontario's Growth Plan and its Impact on Waste Diversion Rates

The master's thesis "*Ontario's Growth Plan for the Greater Golden Horseshoe and its Impact on Waste Diversion Rates: Case study of the Regional Municipality of Durham*" by Carol Slaughter (2017) describes how two Ontario provincial acts, with sustainability as their primary objective, have contradictory environmental strategies. The author describes how the *Places to Grow Act* and its companion document, the *Growth Plan for the Greater Golden Horseshoe* (the Growth Plan), aim to increase urban density in new residential developments, promoting the creation of complete and sustainable communities. On the other hand, the *Waste-Free Ontario Act* focused on reducing greenhouse gas emissions and combating climate change through a circular economy that emphasizes resource recovery and waste management reduction. However, higher-density environments pose challenges for effective waste management by municipalities.

For this thesis, a case study was conducted in Durham Region, a community within the Greater Golden Horseshoe and subject to the Growth Plan, to evaluate the impact of density levels on the Region's waste diversion goals, and to determine if new residential density designs create barriers to waste diversion. It also aimed to identify pre-construction factors that could influence participation in curbside collection and subsequently affect diversion levels in the Region.

The research findings suggest that growth and increased housing density negatively impact the community's sustainability goals. Although municipal waste diversion rates appear unaffected by new, higher-density developments due to service exclusions and reporting requirements, unsustainable urban design in these new buildings leads to waste being managed by private service providers. This private handling of waste, classified as Industrial Commercial and Institutional (IC&I) waste, involves less waste diversion and more landfill disposal, according to the author. Consequently, despite being residential waste, it is not adequately reported, measured, or diverted,

undermining the overall waste management efficiency and sustainability goals of Durham Region.

The study shows that building designs under the *Growth Plan* in Durham Region are increasing vertically, which creates challenges for municipal waste collection due to narrower roads, reduced turn radius, and limited curb access. Private waste collection was considered unsustainable by the author when the thesis was published. To achieve responsible waste management, the author recommends municipalities consider waste collection methods, building approval processes, and seek innovative solutions to promote sustainable waste practices. Furthermore, it was pointed out that the waste collection system in Durham Region relies on large diesel vehicles, which are getting larger to improve route efficiency and capacity, thereby reducing the number of trucks on the roads and their greenhouse gas emissions. Smaller vehicles or alternative collection methods for higher-density environments were not an option due to the scattered nature of infill developments in the Region. The thesis suggests that with an increase of developments with higher-density buildings and when more infill sites are developed, specific waste collection contracts using smaller vehicles may become a service option; otherwise, these areas will continue to be serviced privately.

The case study puts emphasis on incorporating waste management considerations during the pre-consultation phase of new residential developments planning applications. This may significantly enhance waste diversion. Including innovative storage solutions or set-out areas into the design makes waste diversion convenient for residents. It is essential for designers, engineers, and architects to understand how waste is managed and collected municipally to meet these requirements from the outset.

The author shows that municipal waste services offer financial benefits to condominium corporations if builders comply with guidelines, but without such policies, many new developments rely on private waste services at their own cost. As an example, the author mentions the Town of Whitby and the City of Oshawa, where homes on private roads were not provided municipal waste collection service (garbage, organics, recycling) at the time of the report. Regional waste service staff were not as involved in the municipal planning process in these two municipalities but do provide comments at pre-construction and site plan approval in all other local municipalities. With the exception of Whitby, municipalities are addressing collection and extending

comprehensive services to private roads which meet the guidelines and when developers apply for municipal servicing. With the increase in private road developments due to the Growth Plan, the thesis points out that there is a need for clearer guidelines and direction regarding waste service requirements. In addition, the study showed that there was little incentive for private contractors or residents in privately serviced areas to separate and divert waste, as they assumed payment supports environmental compliance despite a lack of monitoring or penalties. It was suggested that a clearer provincial strategy on residential waste managed privately could improve environmental compliance with respect to waste diversion.

The thesis concludes that as residential growth continues to meet the density requirements of the Growth Plan, many new homes will be built as apartments or stacked townhouses on private roads, without guaranteed municipal collection service. This trend has affected all municipalities in the Greater Golden Horseshoe Region since the Growth Plan's adoption. The environmental impact of these practices warrants consideration, as poor waste management can hinder provincial goals for reducing greenhouse gas emissions. Without mandatory sustainable waste practices and oversight by property management or condominium boards, environmental impacts from privately managed waste are likely to persist.

As for future needs, the author states that there is an opportunity to better understand why homeowners are not fully participating in waste diversion programs. Although audits show some participation by residents, complacency remains high, evident from contamination in Blue Boxes and lack of Green Bins (at the time of the publication of the thesis). Data is lacking for privately managed sites, and no academic research exists on participation in these areas. Moreover, the author suggests that the rise in condominium-style housing is altering municipal collection services in the Greater Golden Horseshoe, with many sites receiving private collection. The thesis recommends further research to assess if privately managed multi-residential waste provides adequate diversion services and how new materials will be handled.

The author states that the Growth Plan has negatively affected residents' ability to participate in waste diversion due to compact and intensified environments lacking proper waste management and storage space. The thesis suggests that if designs do not meet municipal service guidelines from the start, these guidelines may be ignored, leading to inadequate road width and turning radius and insufficient density conducive

to waste diversion. In conclusion, the thesis highlights that designing homes with waste diversion in mind from the outset can facilitate easier and more seamless waste diversion for residents, while inconvenient designs could lower participation, increase frustration, and compromise waste diversion goals, which is ultimately harming the environment.

2.4.2 Ontario Building Code

The OBC encompasses technical requirements for minimum provisions of occupant health, fire protection, accessibility, structural sufficiency and energy efficiency of buildings. The OBC identifies minimum requirements in a manner to not impede the diversity of the buildings such as use, cost, locations, configurations and solutions.

Changes to the OBC are driven by several factors, and the process can vary in length depending on the complexity of the proposed changes. The need for change often starts with ongoing research. Stakeholders including industry professionals, government agencies, building officials, developers and builders provide input for proposed changes. Expert committees review these proposals, considering technical feasibility, occupant health and safety, and economic impact. Formal hearings may also be held where stakeholders can present their views on the proposed changes. Approved changes are incorporated into the next edition of the OBC. A transition period may be provided to allow the construction industry to adapt to the new requirements.

The OBC identifies the requirement for components within buildings, such as exit stairs, elevators and washrooms. The OBC works in conjunction with other Codes and Standards referenced by the OBC to provide a comprehensive framework of minimum technical requirements to meet the objectives of the OBC. The OBC is intended to align with municipal by-laws respecting the construction and demolition of buildings; however, the OBC supersedes such by-laws.

The OBC does not identify the minimum requirements for waste disposal spaces and equipment within a building. The OBC however does identify the minimum requirements regarding occupant health and fire safety for waste disposal spaces and equipment within buildings if provided, such as lock out and access to mechanical equipment, ventilation and fire rated doors. These elements, however, do not improve or impact waste diversion performance in this sector.

The Planning Act

In Ontario, the Planning Act addresses recycling and waste management in a very high level and general approach. Section 2 of the Planning Act outlines matters of provincial interest, specifically:

- Section 2 (f) states that a municipality must have adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems
- Section 2 (g) states that the minimization of waste is a provincial interest which municipalities must have regard to

This suggests that municipalities may be the level of government that tends to the development of specifications, guidelines and standards. However, a common set of standards to create standardization of design guidelines across the Province would be beneficial. This currently does not exist.

Section 3 of the Planning Act addresses these matters of provincial interest, in that all planning decisions shall be consistent with the *Provincial Policy Statements* (PPS) issued under the Planning Act. The Provincial Policy Statement states that:

“waste management systems need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage, and promote reduction, reuse and recycling objectives. Waste management systems shall be located and designed in accordance with provincial legislation and standards (PPS 1.6.10).”

However, the PPS does not indicate what are appropriate sizes and/or types nor how to determine them.

In the PPS, waste management system means sites and facilities to accommodate solid waste from one or more municipalities and includes recycling facilities, transfer stations, processing sites and disposal sites. The PPS captures waste management on the municipal level, and not specifically for individual residential properties.

The Provincial Policy Statements are high level in nature and are intended to guide planning decisions. Given the high-level nature of the PPS, strengthening this language

may not achieve the desired result to regulate recycling and waste management specifics in mixed use or MR buildings.

Section 41 of the Planning Act deals with Site Plan Control (SPC), and focuses on the exterior of buildings only, specifically access and circulation of the site. Control over interior design is limited to walkways, stairs, elevators and escalators to which members of the public have access from the streets, open spaces and interior walkways in adjacent buildings. It does address sustainable design elements, such as waste and recycling containers in these areas. Site Plan Control does not address the interior of the building (i.e., chutes, waste rooms and storage) to the extent required to achieve better recycling or more efficient waste management.

Other provincial legislation may be more suited to achieve the goal of better waste diversion through regulations such as policy statements under the *Environmental Protection Act*, specifically for the MR sector.

3.0 Consultation

This section summarizes the main themes heard and key findings related to the current and evolving issues regarding effective design of waste collection systems.

3.1 Interviewees

Interviewees were selected based on those that are experiencing a growth in medium and high-density buildings and represent a diversity of experiences from across the MR sector:

- Municipalities (Upper and Lower Tiers):
 - Eight Ontario municipalities
 - One former municipal contact
- Three waste collection service providers/industry representatives
- One waste characterization auditor
- Two MR developers/architects
- One multi-family property association
- One property management company
- One MR waste infrastructure manufacturer
- One Blue Box Producer Responsibility Organization

3.2 Questionnaire

Dillon prepared a questionnaire to gather insights into ways to improve waste management in the MR sector. The questions were tailored to learn more about the current and evolving concerns, existing guidance and policies, and opportunities and barriers to implementing new guidance and policies around effective design of waste collection systems.

Interviewee responses to the questionnaire were used to compile the current and evolving concerns from the sample. This also included existing guidelines and policies related to building design for the design of waste collection systems (i.e., collection systems for recyclables, organics/food scraps and garbage). The questions varied by sector interviewed for relevancy (i.e., Municipalities, Developers/Architects, Property Managers, etc.). The questionnaires submitted are included in **Appendix A**.

3.2.1

What We Heard

A summary of perspectives and ideas from each interviewed group is presented below.

3.2.1.1

Municipalities / Regions

From the interviewed municipalities, it was evident that there are multiple challenges related to waste management in MR properties, including lack of space for proper waste storage and sorting, issues with waste chutes and tri-sorters that lead to improper waste diversion or contamination and insufficient education for tenants. Other issues mentioned were the lack of proper planning for collection vehicle accessibility, separate locations for different types of waste streams and sources and challenges in making waste services accessible for all residents. It was also mentioned that it is challenging to hold individual residents accountable for their waste disposal habits in MR buildings. Even though it was not the focus of this study, it was mentioned that the redesign of older buildings (retrofits) to accommodate diversion streams can be challenging. The number of waste diversion programs continues to expand, however current design and space limits make implementation challenging in older buildings. This was repeatedly mentioned. Lastly, municipalities expressed that there is a general lack of understanding by developers and architects about generation of solid waste and waste management operations needed to handle the volume generated in MR buildings.

When asked to describe what design challenges they tend to see from the perspective of developers and architects, most municipalities expressed an understanding that they want to maximize sellable space to improve financial return, but also pointed out that they often seem to lack an understanding for how essential waste management is for the operational management of the building for the entire life of the building. Many mentioned that waste management rooms do not have sufficient space provided and seem to be added too late in the design process, and that the design of the waste rooms are often less than ideal. This includes placement of chutes (in the corner thus making connection to bins problematic) and not enough indoor space for the required number and size of bins. It was also pointed out that there seems to be insufficient thought given to how to design for efficient in-unit/apartment storage of materials by residents prior to taking it to a disposal/recycling location within their building. In addition, residents with mobility issues are sometimes not taken into consideration.

Municipalities understand that property managers are the main contact for tenants and service providers. They are left responsible for “making it work” in their building, no matter what the staging pad, waste storage room or waste diversion system is. However, some pointed out that training does not always seem to include how to properly manage a waste storage room, including equipment like bi- or tri-sorters and compactors as well as their preventative maintenance. In addition, the interviewed municipalities understand that collection service providers face challenges with collection pick up area spacing, dimensions, insufficient snow removal and parked cars. One municipality pointed out that there is a difference in private and municipal collection, where some private companies might allow drivers to exit the trucks or allow reversing/backing-up on public roads. Municipal design guidelines do not allow drivers to exit their trucks or the backing up of collection vehicles onto any public roads.

The most common new design challenges that municipalities identify as the areas that need improvement include site and loading access for collection vehicles. Not only considering collection area dimension design, such as overhead clearance and space to maneuver bins for tipping, but also risks such as crossing bike lanes, backing up waste vehicles, illegally parked vehicles and having secured FOB access to buildings. Some have also seen a trend that waste storage areas proposed in newer building designs are getting smaller. Other challenges mentioned include issues with tri-sorters and the lack of sufficient space in waste storage rooms as diversion programs expand, which requires more bins, carts and/or receptacles for material storage. It has also been observed that there is a considerable difference in the volume of Old Corrugated Cardboard (OCC) before and after Covid-19 (attributed to increased online shopping/deliveries), which provides a new challenge as it most often forces the residents to bring OCC down separately to a waste storage room or the chutes are at higher risk of being blocked.

Several of the municipalities have implemented measures to improve the waste management in MR properties. Most municipalities have by-laws or guidelines/requirements published and available to developers and designers. These provide a basis for calculating waste generation and allocation, considering factors like the number of units of occupancy in a planned property. It is noted that the guidelines can vary significantly between municipalities, possibly due to demographics. One example of a measure taken is that one municipality has formed a stakeholder group

consisting of property owners and managers that consult on new waste management policies and programs.

To improve diversion rates and minimize contamination, some municipalities are requiring four stream (organics, recyclable fibres, recyclable containers and garbage) collection and some have a specification for three separate chutes in their guidelines. In addition, there are efforts to increase waste diversion performance by educating residents and training building staff.

It is standard practice that municipalities review and approve proposed waste plans of new developments⁴. An obligatory site visit follows with a collection truck drive-through⁵, to confirm that the approved waste plan was followed during construction. These site inspections are important to verify that the construction of the building aligns with the approved design, particularly in terms of waste storage areas and collection access points, both for residents and collection service providers. They are also used to confirm the number of dwelling units in the property⁶. Often the waste management service provider is involved in this process. If the site does not meet the approved plan, the municipalities may withhold waste collection services as a repercussion. One municipality mentioned that they perform ongoing random site visits to established properties to inspect containers and do an inventory of waste operations. One municipality holds back a financial deposit from the developer until the occupied development has demonstrated implementation of the waste plan as was proposed during the design approval stage.

When asked about impactful strategies to encourage residents to effectively dispose of their waste with a higher diversion rate, the responses highlighted accessibility for all tenants (including wheelchair users and seniors), equal access to all waste stream bins and clear signage. A user-friendly system with straightforward disposal routines that facilitates diversion for the residents was mentioned as a key strategy. Some municipalities do this by requiring separate chutes for different waste streams. It was reiterated that a good in-unit design helps residents to separate waste streams and divert more material. Other tools, like the possibility of non-compliance and

⁴ CIF/M3RC noted: 'in most instances a formal application for service on private property is completed and submitted'.

⁵ CIF/M3RC noted: 'usually when the developments reach occupancy levels of greater than 50%'.

⁶ CIF/M3RC added: 'and appropriate insurance coverage to indemnify the municipality'.

contamination fees were mentioned as strategies to force appropriate waste disposal, with possibilities of denying pickups for offenders and charging for extra collections. The benefits of promotion and education of residents was also mentioned as impactful, as well as training building staff in the importance of appropriate waste management.

Some municipalities are in the process of updating their current by-laws or guidelines, some due to the transition to full Extended Producer Responsibility (EPR) and some are adding new diversion programs, such as organics or will start to offer a curbside program for smaller MR buildings. It was also mentioned that there is an uncertainty regarding how the Blue Box program will look after January 1st, 2026 (post transition⁷), which could affect how municipalities design their guidelines. Other mentions were a possible requirement of three separate chutes, a requirement of a dedicated main floor hub for waste and exploring options for roll-off collection in high density buildings.

Overall, municipalities would benefit from having the ability to confirm that waste can be stored and sorted within a new building and then set out for collection in a safe, efficient way that maximizes waste diversion potential. The majority of the interviewed municipalities would like to see a province-wide guideline, as they anticipate it would be a standard design tool for developers. Some concerns are raised about how differences in by-laws, green standards, collection vehicles, waste allocation and diversion programs offered would be difficult to accommodate in one provincial standard. Some think it could be part of the OBC with the motivation that it might get better adherence than a guideline, while others suggest a provincial guideline or other form of code/standard. It is pointed out that any discussion about a province-wide approach should consider the province's own goals and objectives under the More Homes Built Faster Act (2022) and the Cutting Red Tape to Build More Homes Act (2024) as well as the province's commitments to divert more waste from landfills. Moreover, it should also include strengthening and enforcement of existing provincial policies and regulations, including the requirements for MR buildings under the Food and Organic Waste Provincial Policy Statement and O. Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs.

⁷ The Producer Responsibility Organizations in Ontario for the Blue Box program could be part a stakeholder group when designing future MR guidelines for new developments.

3.2.1.2

Waste Collection Service Providers, Auditors to MR Sector, and other Contacts

Waste collection service providers, waste auditors, and other related industry contacts were interviewed. The waste collection service providers interviewed identified several challenges related to waste management in MR properties. Issues included the practicalities of dealing with underground waste storage spaces and systems that require waste containers to be moved prior to collection, leading to potential double-handling of containers and collection schedule delays due to waiting.

In addition, site entry and exit poses problems when developers adhere to minimum guidelines, rather than allowing for extra space that could mitigate potential accidents or equipment maneuvering. Enclosed garage and parking structures intended to keep waste materials out of sight can also be challenging to service. Health and safety issues are a major concern for collection drivers as poor site visibility or being forced to reverse and back up can cause life-threatening situations. They agree that ensuring proper overhead clearance for collection trucks, particularly front-end loading vehicles, should be a priority.

When asked about challenges related to staging pads and collection areas, the responses mention numerous issues faced during waste collection in MR buildings. Some of these include design oversights regarding the number and volume of waste streams generated, resulting in the necessity to use carts instead of larger front-end containers. Another issue is doors that do not open fully (swing wide pen) and complicate pick-up servicing. During the design phase for a new development, if sufficient waste storage space is not reserved, residents would potentially have to use space intended for other uses (such as parking space) for waste storage. This leads to complaints between residents and building management.

The location of the staging pad and collection area for collection containers can be a challenge. For example, if they are located in the back of a parking lot, this is inconvenient for the collection vehicle to access and maneuver. The varying thickness of asphalt on roadways and concrete on staging pads adds a layer of complexity for the driver as to avoid damaging the thinner layers.

Collection service providers do not often get consulted for feedback in an early stage of development design and planning, but sometimes are used for test runs. They are aware that some regions and municipalities have waste design guidelines, but service providers

are not well-informed on what they contain. The general opinion is that it may be beneficial to have a province-wide guideline, but it is not clear what that would look like. One participant suggested it to be a Standard Operation Procedure (SOP) for Ontario developers to follow.

When asked what improvements collection service providers would like to see in MR buildings, the interviewees outlined several improvements. These include keeping containers in accessible open areas, standardizing waste generation calculations and the waste management system/process, standardize container/bin sizes and waste streams across the province, even if it means involvement of amending by-laws.

Another consideration is the process of residents taking their waste from within multi-residential units to the shared collection location. People are driven by convenience. To encourage residents to properly sort waste, the waste collection area and bin provided needs to be equally convenient and accessible. For example, in some cities, garbage collection is charged based on bin size, whereas recycling is free. Some buildings choose the smallest garbage bin to save on waste collection cost. This can result in increased recycling contamination. When the garbage bin runs out of space; people start putting garbage in recycling containers.

From the experience of this group of key informants, MR residents that have to walk outside to participate in waste sorting make a concerted effort to be a good participant. If residents have to make an extra effort, usually only the tenants that really care participate in waste diversion. One perception is that residents that own the units (owners versus renters) also tend to take pride, and participate more actively, than those who rent units. Good education is pertinent to provide knowledge regarding the correct places to place the various waste streams. Lastly, collection service providers would also like to see technology used more in waste management. For example, technology to track container fullness can optimize servicing schedules as needed, rather than scheduled days of the week.

3.2.1.3

Developers, Architects, Building Operators and Associations

Developers, architects, and building operators interviewed each have unique perspectives and challenges they face. In the discussions with developers, multiple challenges with effective design of waste collection systems were mentioned. One being that the difference in requirements from different regions and municipalities makes it

difficult to design effectively. Some municipalities do not even have waste design guidelines and therefore assumptions are made by the designers based on other guidelines from other jurisdictions or from the past experience of the designer. It is a large capital investment for developers and their investors to successfully build a new development. They are constantly looking for cost efficiencies and are trying to understand space constraints. They admit that waste does not always take priority among the many other considerations that must be complied with for municipal planning approvals.

Architects implied that they try to design buildings that are functional but that a functional building comes with an increase in price that the developers are not always ready to accept based on their pro- forma and investment partners. Developers often request minimizing space for waste storage as that could be used for sellable unit space on each floor, parking spaces, amenities, lockers, etc.

Developers also identified the change in e-commerce as an impactful challenge to spacing needs. It requires added space requirements that did not recently exist before. Added space is needed both for parcel deliveries and when its packaging is being discarded, i.e., the increase in OCC generated on site has proven to be a growing challenge. The differences among jurisdictions in collection systems, required waste streams, and diversion programs also contributes to challenges. Building operators provided similar feedback in that cardboard boxes and packaging disposal is a pain point. For example, sometimes residents would mis-use cardboard designated recycling carts by contaminating with unacceptable materials like Styrofoam. Other times, cardboard is not flattened leading to carts overflowing that adds burden on the operator to clean up. One of the operators said they sometimes put unfolded cardboard boxes by the resident's door if the box still has the apartment's address.

The most common feedback received during the development approvals application phase are comments related to accessibility (door size being one thing often mentioned), size of the waste storage space, and waste management operations. If the region/municipality has waste design guidelines, they reference back to them. However, some guidelines seem to be unreasonable when compared to other jurisdictions, from a developer's perspective and architects points out that some guidelines are outdated.

During design, there is almost always a debate on where to put the waste storage room or rooms. Developers are beginning to realise that they should include waste management plans earlier in the process, rather than await municipal Planning Department comments during the reviews process. Developers would prefer a streamlined, user-friendly waste sorting system and would like guidelines to be as specific as possible to minimize speculation or error in interpretation. Furthermore, they would like to see reasoning included in the guidelines so that they can understand the motivation and rationale behind some of the requirements. This can support the design process.

One building operator mentioned their waste storage area is a designated space with multi-stream recycling bins in one room and garbage and organics in a separate room. They expressed the design is good but resident behavior is not. They noted that some residents do not care to separate waste in correct bins, and this leads to more work on their part to pre-sort waste before collection to avoid penalties from waste collectors. One operator's building is older and the waste management areas puts a lot of pressure on building maintenance staff⁸ but offers good service to the residents. However, residents still produce contamination issues and all do not apply the regular educational efforts by the in-house "Green Team".

Developers interviewed support a province-wide waste guideline in some format but suggest that the OBC might not be the most suitable place, as it is mainly focused on safety-based standards as code. The architects are of the same opinion; the OBC is not the right place, they would like to see something like an environmental guideline that includes garbage and preferable other waste streams as well, such as household hazardous waste and small electronics, so that they can design for space for these streams as well which they believe could increase diversion in the buildings. The building operators interviewed did not have an opinion on implementing province-wide waste guidelines, but one mentioned they support the concepts of buildings implementing a penalty system to improve the diversion and reduce incorrect waste disposal behaviour.

⁸ We note that the health and safety of building staff should also play a consideration in operations and design. However, this was not mentioned by interviewees of this study.

MR Waste Infrastructure Manufacturers

There are several manufacturers of MR chutes, bi-sorters, tri-sorters, garbage compactors and waste bins in the local market. During discussions, it was mentioned that they are not involved in the initial design of waste planning for new developments. They are usually presented with the waste room spacing after it has been constructed and are then brought in to manufacture, install, commission and service the chute and sorting system. Often the spacing is not laid out for optimal operations and adjustments have to be made. One example is the placement of a chute in the corner of a waste room. A tri-sorter needs to supply material to three waste containers for recycling, garbage and organics. A chute placed in the corner of a room poses challenges for connecting all three containers to one chute. The interviewees are unaware of any municipal guidelines that specify the placement of chutes⁹. Likewise, guidelines currently do not provide specifications for issues such as footprint and size of sorters and compactors. Many times, offsets (angled extensions) to a bi-or tri-sorters are needed, yet there is a limitation to what is functional. Chutes and sorters are gravity fed thus bins cannot be too far from a sorter. This important information about equipment is not provided in guidelines.

While bi-sorters and tri-sorters reduce the need for multiple chutes, especially for retrofitting older buildings, they do have unintended consequences. The width of a chute is relatively narrow. Only the size of a shopping bag of waste is meant to be deposited down a chute. Anything bigger will become stuck. For example, a full standard sized black garbage bag is too large to go down a chute. Chute manufacturers often receive service calls from buildings to unblock or repair chutes, including torn chute linings due to heavy items being thrown down a chute. This also results in damage to the one chute bi-sorter or tri-sorter at the bottom. Sorters have a flap system that moves according to the button selection (waste stream) at the access door on each floor by the user. When a chute becomes blocked or is out of operation, building management will set the default option to the garbage stream. This means all materials (including recycling and organics) deposited in the chute ends up in the garbage stream. The situation remains until the chute is serviced, which may take days to occur and result in added operational

⁹ CIF/M3RC added 'only through consultation is this issue caught and reflected through the pre-construction stage'.

costs. This is an issue for one chute systems. If buildings have multiple chutes, which is not common practice, the other two streams are not impacted.

In addition, compactors for the garbage stream should use a standard sized three cubic yard bin with a steel lid. However, references for multiple sized larger bins for the garbage stream were found in some municipal guidelines. Compactors cannot use bins that do not have steel lids. Also, bins that are larger than three cubic yards, when full, becomes too heavy to move without mechanical assistance, such as a bin pulley or a tractor. Lastly, standard bins that are four cubic yards or larger would have to be custom manufactured for compaction use. This is an added cost for the initial set up of the waste room.

4.0

Recommendations

Recommendations for the effective design of solid waste collection systems, including recycling and organics streams, in new and medium to high density residential buildings are provided for the following three categories:

1. Changes to the OBC and Planning Act
2. Policies that could be implemented municipally, regionally, or provincially
3. Standard clauses that can be included in municipal development guidelines and manuals

Together, these recommendations aim to create a cohesive framework for effective waste management in medium to high-density residential buildings, enhancing waste diversion rates, and aligning with Ontario's sustainability and environmental goals.

4.1

Changes to the OBC and Planning Act

4.1.1

Ontario Building Code

Waste disposal solutions for buildings can originate through municipal waste disposal plans and be articulated in municipal waste disposal design guidelines. The OBC can then articulate the minimum requirements of waste disposal spaces and equipment in terms of accessibility, occupant health and fire safety. Recommendations for the OBC are as follows:

- **Incorporate Minimum Requirements:** Amend the OBC to include minimum requirements for waste disposal spaces based on the number of units serviced or occupant load, focused on occupant accessibility, health and fire safety where waste is stored
- **Multiple Waste Chutes:** Mandate the installation of conveyance systems (chutes) for multi-level buildings to facilitate equal access to garbage, recyclables, and organics waste streams for source separated collection
- **Waste Room Design:** Identify the minimum clearances within waste and recycling rooms to accommodate sorting bins and compactors, with clearly defined safety features including air filtration, access/egress and water and drain connections for

cleaning. The requirements could be based on the number of units serviced or occupant load

- **Collection Vehicle Access:** Identify minimum turning radii, minimum loading area spacing for vehicles, minimum staging area for bins, and minimum overhead clearance for vehicles. Requirements for collection vehicle access to be clearly included on site plans

4.1.2

Planning Act and Others

Ontario's Planning Act (Section 17) requires that a municipality have an Official Plan. The Official Plan sets out the municipality's goals, objectives and policies to manage and direct physical change and its effects on the social, economic, built and natural environment¹⁰.

The Official Plan is a blueprint for how a municipality will grow in the long-term to meet the specific needs of the community. It is prepared in consultation with residents to reflect a community vision for future change. It provides direction on the location of new housing, employment uses, industrial and commercial land uses, parks, community services and other land uses. The Official Plan also establishes policies for the built environment, for improvements to hard services such as transit, roads and sewers, and for the protection of the natural environment.

The Official Plan is very high level but could include a waste management and recycling framework to guide decision making. For example, some policies that could be included are:

- The municipality will establish site design standards that allow adequate flexibility in waste handling for development proposals. Standards will address a range of waste management options including on-site material separation, multiple waste streams and composting
- The efficient use of materials and resources and minimizing waste generation through reduction, reuse and recycling is critical to the success of an integrated solid waste management system

¹⁰ <https://www.toronto.ca/city-government/planning-development/application-forms-fees/building-toronto-together-a-development-guide/official-plan-and-zoning-by-law-amendment/>

Zoning By-law

Ontario's Planning Act (Section 34) gives a municipality authority to implement land use controls through Zoning By-laws. The Zoning By-law is the legal document that implements goals, objectives and policies described in the Official Plan. It regulates the use and development of buildings and land by stating exactly what types of land uses are permitted in various areas and establishing precise standards for how the land can be developed. These include setting lot sizes and frontages, building setbacks, the height and configuration of buildings, the number and dimensions of parking and loading spaces and requirements for open space.

The Planning Act can mandate preparation of by-laws as a requirement and set fundamental elements regarding design features. Alternatively, specific design guidelines can be implemented through regulations.

The Environmental Protection Act (EPA) may be a more appropriate legislation to better regulate waste diversion in the MR sector. One approach is to add a section in the EPA regarding Provincial Interest which establishes a provincial design guideline to provide specific guidance to municipalities in preparing its by-laws for the collection of storage for the multi-family sector with the objective for improved performance.

The EPA already has regulation (O. Reg 103/94) which states that multi-unit residential buildings shall implement a source separation program for waste generated at the building. This regulation only addresses Blue Box material and has recently been the focus of concern by the provincial auditor.¹¹ The province could expand or amend this regulation and incorporate fundamental design elements or create a new updated regulation with maximizing resource recovery as its mandate reflecting the framework as found in the *Resource Recovery and Circular Economy Act, 2016* and the Food and Organic Waste Policy Statement. The *Municipal Act* may be another option – Section 97.1 deals with environmental standards in the construction of buildings. It already addresses building features such as green roofs. This approach would have to also work with the OBC. Also, by-laws under this section of the Municipal Act could provide

¹¹ https://www.auditor.on.ca/en/content/annualreports/arreports/en21/ENV_ICI_en21.pdf and https://auditor.on.ca/en/content/annualreports/arreports/en23/1-22FU_ICIwaste_en23.pdf

additional review consideration than under the Planning Act (Section 2(d)), for interior waste garbage facilities.

4.1.3 Other Policies or Industry Standards

Other recommendations that pertain to policies or industry standards are as follows:

- Harmonization with the Canadian LEED Green Buildings Rating System
- Canadian Standards Association to develop a new design standard to guide new developments
- National Building Code additions regarding MR design for waste diversion
- Guidance should be provided to building owners on the Food and Organic Waste Policy Statement, issued under section 11 of the Resource Recovery and Circular Economy Act, 2016

4.2 Policies for Implementation (Municipal, Regional or Provincial)

Eleven recommendations for implementation in municipal, regional, or provincial policies are as follows:

- **Green Standards** can be implemented for sustainable design and performance requirements for new private and municipal-owned developments
- Requirement for the developer to consult and **meet with the municipal Planning Department** and staff on their waste management proposed design at the Zoning By-Law stage of new development applications
- The municipality should have policy to issue a **Planning Application Checklist** that includes the requirement for a Waste Management Study/Plan early in the application process
- Integrate **Waste Management Studies/Plans** as a requirement for Zoning By-Law amendment applications
- **Mandatory By-laws:** Require municipalities to prepare and enforce by-laws related to waste management design standards with specifics for new development design, ensuring uniformity and compliance across Ontario
- **Make recycling mandatory** in MR buildings as a condition for receiving garbage collection. Although Ontario Regulation (O.Reg) 103/94 requires all MR buildings to have Blue Box recycling, as noted by the Provincial Auditor, given the amount of MR buildings in the province this almost impossible for the Ministry to enforce properly.

Placing the responsibility on the collection service provider, as is done in other jurisdictions, may provide for clearer and enforceable requirements. This could also apply to organics diversion requirements.

- **Environmental Protection Enhancements:** Integrate waste management design and infrastructure considerations into the EPA and create specific regulations for MR buildings, expanding on existing source separation programs
- **Uniform Provincial Policies:** The municipal sector should advocate for the adoption of a province-wide standard guideline or code that can unify waste management practices, ensuring developers have clear and comprehensive standards to follow
- **Incentives for Compliance:** Introduce incentives for developers and property managers to adopt best practices in waste management, such as expedited permit processes or financial incentives for implementing efficient recycling facilities. Municipalities could provide guidance on what constitutes “efficient” in their guidelines
- **Financial Incentive:** Development charges and deposit-based incentives held by municipalities or regions pending compliance approval for occupied new development
- **Technological Integration:** Encourage the use of technology to improve waste management efficiency, such as sensors for bin fullness and RFID tracking to identify potential sources of contamination and waste accountability

The following **Table 1** provides a summary of the above policies for consideration and the potential jurisdiction(s) that may lead their implementation.

Table 1: Policy Summary and Potential Jurisdictional Responsibility

	Policy for Implementation	Potential Lead Jurisdiction(s)
1	Green Standards	Municipal/ Regional, Provincial
2	Consult with Municipal Planning Department requirement	Municipal/ Regional
3	Planning Application Checklist	Municipal/ Regional
4	Waste Management Studies/Plans required for Zoning By-Law Amendment applications (ZBA)	Municipal/ Regional
5	Mandatory By-laws	Municipal/ Regional

	Policy for Implementation	Potential Lead Jurisdiction(s)
6	Mandatory Recycling	Municipal/ Regional, Provincial
7	Environmental Protection Enhancements	Provincial
8	Uniform Provincial Policies	Provincial
9	Incentives for Compliance	Municipal/ Regional, Provincial
10	Financial Incentive	Municipal/ Regional
11	Technological Integration	Municipal/ Regional, Provincial

4.3 Standard Clauses for Municipal Development Guidelines and Manuals

Recommendations for standard clauses for municipal development guidelines and manuals are as follows:

- Site Plan Application Process
 - Include requirement for a Waste Plan Report to accompany Site Plan Application prepared by a licensed professional engineer for the jurisdiction
 - Include a requirement for Traffic Impact Studies prepared by an Ontario licensed professional engineer
 - Include requirement for illustration of AutoTURN™ sweep layouts for adequate access for maximum sized collection vehicles design and loading types
- Calculations
 - Standardization of waste storage calculations: Develop standardized multi-waste stream generation rates for determining required waste room storage space and bin sizes, offering clear and consistent guidelines for developers early in design stages
 - Bin requirements and size calculations for waste storage areas both within and external to a building
- Outdoor Operations
 - Requirement for loading areas and vehicle collection points to not be located in underground parking levels
 - Requirement for illustration(s) of the loading area depicting a waste collection vehicle, staging area and bins to indicate sufficient spacing needed for functional operations

- Weight of bins: consideration of the weight of waste collection bins when full should be calculated so movement from compactors to the collection point is safely met. Tow-bar and equipment to move bins as well as lockable wheels on bins to stop their movement, and installation of bollards at the collection staging area to secure them from rolling when staged for collection is required
- Staging point for collection: A concrete skirt in front of the collection bins equal to or greater than the width of the waste collection vehicle should be installed to enable the collection vehicle to tip bins. Staging area for waste collection must be signed to reflect 'No Parking'
- Provision of current waste collection vehicle dimensions for use with AutoTURN™ software
- Specification of spacing at collections points (loading areas) for exit and entry of driver in and out of vehicles with doors open and mirrors extended
- Infill developments (dense space limited developments) and the specification for smaller sized collection vehicles or alternative equipment
- Indoor Storage
 - Accessible waste collection areas: Design waste collection areas that are readily accessible for residents on all floors of the building and waste collection service providers. Consideration of factors such as overhead clearance for front end loading waste collection vehicles, vehicle maneuverability, turning radius, ground floor loading and staging areas, and security/access to waste areas/doors/locked bins
 - Requirements for an accessible indoor clean drop-off area, separate from organics and garbage storage, for residents for material for reuse, free swaps, EPR programs (paint, cleaners, solvents, batteries, electronics etc.), textiles and other new diversion programs
 - Requirement for an accessible indoor drop off area for oversized OCC, large bags of garbage and items that do not go down a chute
 - Suggested sizes and layouts of waste storage for space for operators to maneuver bins for functional operations in the storage rooms
 - Addition to the OBC regarding ventilation for waste rooms
 - Bin washing and cleaning infrastructure required in waste storage rooms

- Requirements for clear signage on waste management and recycling procedures in MR buildings
- Chutes and Sorters
 - Multiple chutes required for large multi-family developments. For example, multiple chute system, (two or more chutes with or without sorters) for more than 100 units or more than four stories. The number of chutes required may be dependent on local waste streams managed
 - Specification of chutes in a waste storage room (not in corners)
 - Requirements for the application of tri-sorters or bi-sorters up to a maximum number of stories or maximum number of units
 - Requirement for adherence to the OBC regarding safety requirements about equipment. This would include bi-sorters, tri-sorters and mechanical compactors areas with access by building staff only
 - Updates to required lock out safety mechanisms regarding safety in the OBC
 - Configurations for waste chutes and shafts to accommodate multiple waste streams
- Continuous Improvement
 - Professional development for architectural industry and training regarding waste management design for the sector
 - Resident education and engagement: Mandate education programs for MR occupants to promote correct waste disposal, storage, and sorting to minimize contamination and maximize diversion
 - Ongoing industry training and professional development for property management staff on effective waste management practices, monitoring and improving building performance. This training could be organized by the waste management industry, using member associations, forums, conferences, formal education, training programs, etc. to do continuous education within the land development and architectural sectors as it relates to best practices
- Compliance
 - Enforcement and compliance mechanisms: Implement mechanisms to monitor and enforce correct waste disposal practices, such as requiring developers to post letters of credit so that sorting systems work effectively,

contamination fees, non-compliance penalties, and mandatory periodic inspections¹²

- Reporting to new owners: Require clear documentation related to waste collection services by the builder to the condominium board related to the decision of public or private service level before transfer of ownership occurs. Owners must be fully aware of the decision of non-compliance related to design of the waste collection area if the service is to be provided by a private collection contractor, not the municipality

5.0 Conclusions and Next Steps

The study underscores the need for standardized, comprehensive guidelines to address the design challenges in MR waste management effectively. Legislative amendments, policy enhancements, and detailed waste design guidelines are potential key steps toward improving waste diversion rates and creating sustainable urban communities with respect to the medium to high density MR sector in Ontario.

With this background compilation and recommendations, potential next steps are to:

- Identify a lead to form a stakeholder and industry working group of key players and representatives that will play a role in the future design and function of effective waste management services and waste diversion in the MR sector
- Establish a provincial standard for common waste design elements which can be achieved through efforts of a working group
- Improve the awareness and education among the new development and architectural industry (including architectural student curriculum, or waste industry seminars). The responsibility of education could lie on the waste management

¹² CIF noted that the City of Markham, as part of the site plan approval process, requires MR building developers to post letters of credit (LoCs) to ensure that properly sized internal garbage/recycling rooms with three chutes or a single chute incorporating an automated sorting system are built. The LoC amount is based on the square footage of building and ranges from \$5K to \$50K. The City requires an additional LoC amount of \$50K for buildings with automated recycling systems to ensure that high quality systems are installed and operating properly. The LoC is released after two years once a building inspector confirms the City's requirements have been met. Otherwise, the LoC is held until all deficiencies are rectified (C. Marsales, Senior Manager of Waste and Environmental Management, City of Markham, 2017).

industry, using member associations, forums, conferences, formal education, training programs, etc. to do continuous education within the land development and architectural sectors as it relates to best practices

- With the change to full EPR for the Blue Box recycling residential program, the role of municipalities is shifting, and the private sector will take on a larger role. Due to full EPR, municipalities may need to coordinate and consult with Ontario PROs to align with their Blue Box recycling collection requirements post transition (January 1, 2026). The private sector will be the service providers for the Common Collection System for the future Blue Box program.
- There is a possibility for improved regulations for the IC&I sector as mentioned in Section 4.2 per the provincial auditor's concerns. Current documentation and comprehensive research of the IC&I sector is limited to municipally serviced sites. To determine if best practices for diversion exist in privately serviced sites, additional research is required. It is the developer's decision prior to construction to choose public versus private waste collection and architects' design will reflect this. Opportunities exist at an early design stage to assist residents to effectively manage and divert waste however currently no advantage exists to meet or exceed best waste practices. Considering Ontario's residential growth is focused on higher density, there is an opportunity to improve upon current guidelines and regulations to ensure improved diversion and recovery from the multi-residential sector to meet environmental and sustainability goals.

Appendix A

References

- **Past CIF Multi-residential Studies:**
 - Report 1: Site Plan Design, Genivar, February 28, 2011
 - Report 2, The OBC Proposed Changes, Genivar, October 30, 2012
- **Multi-residential studies, standards, and guidance:**
 - Review & Update of Niagara Region’s Requirements of Waste Collection Policy and Procedure for Requirements of Waste Collection (PDF)
 - MR Jurisdictional Scan, June 3, 2019 (Excel)
 - An Evaluation of Interventions for Improving Pro-Environmental Waste Behaviour in Social Housing
 - Aylmer MR & Private Road Waste Collection Policy
 - City of Calgary Development Reviews: Design Standards for the Storage and Collection of Waste
 - City of Edmonton Waste Storage Guidelines for Residential Properties
 - City of Mississauga Waste Management Plan
 - Waste Management Design Plan for The Proposed Mixed Use Residential Building at 805 Dundas St. East Mississauga ON
 - City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments
 - County of Brant Multi Residential Collection
 - Exploring Policy-Mandated Building Design Requirements as an Intervention for Waste Diversion in MR Building
 - City of Hamilton Waste Requirements for Design of New Developments and Collection
 - Region of Halton Development Design Guidelines for Source Separation of Solid Waste
 - Region of Peel Waste Collection Design Standards Manual 2020
 - Region of Waterloo Waste Collection Guidelines
 - Richmond Hill Division “J” Waste Management Design and Collection Standards for Development
 - Ontario’s Growth Plan for the Greater Golden Horseshoe and its impact on waste diversion rates: Case study of the Regional Municipality of Durham. Slaughter, C., 2017. Royal Roads University, Victoria, British Columbia

- **Provincial Government Documents:**
 - The Planning Act, R.S.O. 1990. (as related to Waste Management of MR buildings in Ontario)
 - Ontario Regulation 103/94 “Industrial, Commercial and Institutional Source Separation Programs
 - 2024 Ontario Building Code
 - “The Food and Organic Waste Policy Statement”, issued under the Resource Recovery and Circular Economy Act, MECP, 2016

Appendix B

Questionnaires

Key Informants Questionnaires by Group

Municipalities / Regions

Understanding the current and evolving concerns regarding effective design of waste collection systems.

Q1. How does your municipality define multi-residential buildings?

Q2. What do you think are the primary challenges with respect to the design of waste collection systems to support collection and diversion from the medium to high density multi-family residential sector?

Q3. What multi-family building design challenges do you tend to see from the perspective of a developer/architect? property manager? collection service provider?

Q4. Are there strategies that your municipality/Region has implemented, or observed in other jurisdictions, which have helped to increase diversion from the medium to high density multi-family residential sector? This is in relation to the design of new buildings or developments, and not retrofitting old buildings.

Q5. What are some of the most common new design challenges you encounter for the multi-stream waste management of new medium to high density buildings? Where is the greatest need for improvement? (i.e., truck access, staging area, waste generation calculations, recycling accessibility, storage space etc.).

Understanding the existing guidance and policies related to building design for multi-stream waste collection.

Q6. What calculation guidance, if any, does your municipality/Region provide for waste generation and the waste, recycling and organics storage containers needs for a new building?

Q7. What other design guidance, if any, for multi-stream waste collection systems does your municipality provide for the medium to high density multi-family sector?

Q8. How does your municipality ensure developers comply with the design guidance? (i.e., design guidelines are referenced in a By-law, Ontario Building Code reference, defer to private services, etc.).

Q9. To what extent, after the planning approval of a new building design, is the constructed building inspected? If it is done with a site visit, are there repercussions for not following the approved waste design plan?

Understanding opportunities and barriers to implementing new guidance and policies.

Q10. Would the municipality/Region like to see a province-wide guideline to standardize the medium to high density multi-family residential sector? If yes, how would it benefit you? If no, how would it negatively impact you?

Q11. If the municipality/Region was revising its guidelines for the design of multi-stream waste collection systems, what would you like to see included or improved upon? Is there a reason this was not included previously?

Q12. What are some strategies that may be most impactful to encourage residents to effectively divert recyclables and organics in the multi-family sector?

Developers/Architects

Understanding the current and evolving concerns around effective design of waste collection systems.

Q1. What would you consider a “multi-family building”?

Q2. What are the primary challenges with respect to effective design of waste, recycling and organics collection systems to support collection and diversion of recyclables and organics from the medium to high density multi-family residential sector?

Q3. When proposed multi-stream waste collection designs for new developments are reviewed by municipal planners, what are the most common review comments you receive related to your design? How often is rework/resubmission of your application required?

Q4. In general, is there currently a good understanding for assessing building multi-stream waste management needs in the Architectural profession in Ontario? (i.e., Are waste management design trends a topic? Does the profession stay up to date on changing waste design recommendations or best practices? If so, from what sources?) What would be a suggested pathway for the waste sector and the design sector to discuss best practices?

Understanding the existing guidance and policies related to building design for waste collection.

Q5. At what stage of a new building design process is multi-stream waste storage currently considered? Do you suggest it could be more prioritized in the design process? At what stage?

Q6. Are there examples of waste guidelines specs that are not realistic and are frequently dismissed in your opinion?

Understanding opportunities and barriers to implementing new guidance and policies.

Q7. What design strategies have you implemented to help support increasing multi-stream waste diversion from the multi-family residential sector?

Q8. What do you think are some design strategies that may be more impactful to encourage multi-family residents to dispose of their waste? (i.e., equal convenience for all waste streams, more chutes, ground floor waste room access, odour controls, etc.).

Q9. What information is most useful to you as a developer/architect when it comes to design guidance for multi-stream waste collection systems?

Q10. Do you think a province-wide waste design guideline for the medium to high density multi-family residential sector should be established? If yes, how would it benefit you? If no, how would it negatively impact you?

Q11. If the guidelines for the design of waste collection systems were to be revised, what would you like to see included?

Q12. Should the guidelines be in the Ontario Building Code or another industry standard reference?

Property Managers

Understanding the current and evolving concerns around effective design of waste collection systems.

Q1. What would you consider a “multi-family building”?

Q2. Would you consider the solid waste management and waste diversion system in your building efficient? If yes: Can you describe why? If no: can you describe what's lacking?

Q3. Are the waste storage areas in your building "user-friendly" from a staff perspective? (Can they easily move around equipment/containers/bins, is the frequency of exchanging bins acceptable, do they have to assist the collection service provider (waste/recycling hauler) on waste collection days?).

Q4. What are the most common waste/recycling/organics related complaints you receive from residents and/or waste collection staff from medium to high density multi-family residences?

Q5. What would make the waste room a better environment to work in, in your opinion (i.e., safety, space, ventilation, odor control, etc.).

Understanding the existing guidance and policies related to building design for waste collection.

Q6. Are residents participating in the intended waste sorting and collection program in the building. If not, do you think the issue is the design of the waste storage system, or is it a behavioural issue? What could be improved in the design of the waste system?

Q7. What guidance is given to tenants on how to sort waste in the form of a move-in handbook, signage, or contact number for questions?

Understanding opportunities and barriers to implementing new guidance and policies.

Q8. What collection system design has been the most effective in terms of achieving good waste diversion and tenant satisfaction?

Q9. What do you think are some strategies that may be more impactful to encourage tenants to effectively dispose of their waste, recycling, and organics?

Q10. What is the property manager’s role to support tenants in participating and adjusting to any new changes in waste, recycling, or organics implemented in a building? i.e., addition of a new recycling or organics collection program?

Collection Service Providers

Understanding the current and evolving concerns around effective design of waste collection systems.

- Q1. What would you consider a “multi-family residence”?
- Q2. What is the preferred collection type for your company in the multi-family sector? (i.e., type of trucks used).
- Q3. What's the biggest challenges during the collection of waste, recycling and/or organics pick-ups from multi-family sites with respect to how the site and loading area is laid out?
- Q4. What is the most common design challenge of a staging pad/collection area in the multi-family sector?

Understanding the existing guidance and policies related to building design for waste collection.

- Q5. How does your sector provide feedback on common concerns and common challenges as it relates to the design specifications for new developments of new multi-residential buildings?
- Q6. Are you aware of existing design guidelines and policies related to multi-family building design for waste collection? If yes, which parts of the guideline impact your servicing and how?

Understanding opportunities and barriers to implementing new guidance and policies.

- Q7. Would it be helpful for the multi-family residential waste management sector to have a provincial-wide waste design guidelines in place? Is this practical, given the variation in building sites? What common elements should be included?
- Q8. If the guidance for the design of waste collection systems for multi-family buildings were to be revised, what would you like to see included or improved?

Infrastructure/Equipment Manufacturers (Multi-family Waste Design)

Understanding the current and evolving concerns around effective design of waste collection systems.

Q1. What would you consider a “multi-family residence”?

Q2. What kind of waste management infrastructure for the multi-family sector do you design/manufacture/install/service?

Q3. Do you offer a warranty/guarantee and or include service on the waste management equipment/infrastructure you install in the multi-family sector?

Q4. What is the most common servicing call required on the equipment/infrastructure you install in the multi-family sector?

Q5. What is the typical life span of the equipment/infrastructure you design by type in the multi-family sector?

Understanding the existing guidance and policies related to building design for waste collection.

Q6. What waste management or building code guidelines or specifications and policies impact your designs?

Q7. Has any existing waste management or multi-family guidelines or policy directly impacted the infrastructure/equipment you have designed for this sector (positively or negatively)? I.e., the number of chutes required and or tri-sorters, bi-sorters, compactors.

Understanding opportunities and barriers to implementing new guidance and policies.

Q8. If the guidelines for the design of waste collection systems for the multi-family sector were to be revised, what would you like to see included or improved?

Q9. Should the guidelines be in the Ontario Building Code or another industry standard reference.