DILLON CONSULTING

75 YEARS

CITY OF WHITE ROCK

Solid Waste Operations Review

January 2021 – 19-1382

January 14, 2021

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Attention: Rosaline Choy, P.Eng. Manager of Engineering

Solid Waste Operations Review – Revised Draft Report

Dear Ms. Choy:

Dillon Consulting Limited (Dillon) is pleased to submit our Final Solid Waste Operations Review for the City of White Rock (City). Edits and comments to previously sent draft sections have been considered and are contained within.
This report documents:

- The current waste management system,
- Relevant policies, strategies and bylaws,
- Results of the City's solid waste audit,
- A best practices jurisdictional review,
- Initial solid waste management options developed for consideration (based on the results of the stakeholder engagement survey and public open house), and
- Costing and implementation considerations for priority options, as identified in collaboration with the City.

Thank you for the opportunity to assist you with this important assignment. We look forward to supporting your ongoing investigations of waste diversion opportunities.

Sincerely,

DILLON CONSULTING LIMITED

Heidi Gerlach, EP
Project Manager

Our file: 19-1382

Table of Contents

Figures

Tables

Appendices

Executive Summary

Dillon Consulting Limited (Dillon) was retained by the City of White Rock (City) to provide consulting services to conduct a Solid Waste Management Operations Review. The review included the following as documented in this report:

- Relevant policies, strategies and bylaws (**Section 3.0**);
- The current City waste management system (**Section 4.0**);
- Quantities of waste managed and diverted and results of the City's solid waste characterization study (**Section 5.0**);
- A financial overview of the City's waste management and collection system (**Section 6.0**);
- A best practices jurisdictional review (**Section 7.0**);
- Results of public consultation, evaluation of future solid waste management collection options for both the single-family and multi-family sectors (**Section 8.0**); and
- Recommendations and opportunities for improvement in other aspects of the City's waste management system (**Section 9.0**)

Following the review of the current system and research into what other jurisdictions are doing to manage waste, performance requirements and improvement opportunities were established (taking into account future waste generation trends and practices). Initial solid waste management options were developed for City consideration. Costing and implementation considerations were established for priority preferred options based on the results of stakeholder engagement surveys and a public open house, as identified in collaboration with the City.

In July of 2020, Dillon made a presentation to Council accompanying a memorandum detailing the highest priority solid waste collections options for the single-family (SF) sector (i.e. homes for which the City currently offers waste collection services). These options focused specifically on the need to replace aging SF collection trucks, and remove double handling of material at the Works Yard.

Dillon completed additional multi-family (MF) and industrial, commercial and institutional (ICI) sector surveys and investigations to evaluate the costs and feasibility to provide waste collection services internally vs. through the private sector.

The following provides summary of the findings from the review of solid waste management operations at the City of White Rock.

Overview of Policy Drivers for Municipal Consideration

To understand the larger context and drivers for waste diversion considerations and/or pressures at the municipal level, an overview of recent federal, provincial and regional policy are provided.

Federal/National Priorities

Plastic waste, largely through its impact on marine litter, has become a high priority to all levels of government across Canada. In June 2019, the Government of Canada announced two steps to reduce Canada's plastic waste by identifying six targeted single-use plastics (SUPs) to be banned in 2021 and working with provinces and territories to introduce extended producer responsibility (EPR) programs across the country. As part of the move towards zero plastic waste in Canada, the Canadian Council of Ministers of the Environment (CCME) approved in principle a Canada-wide Strategy on Zero Plastic Waste in November 2018.[1] The strategy places a significant emphasis on Single-Use Items (SUI) and prioritizes reducing demand for disposable plastic items. SUPs are one of ten priority result areas in the Strategy and a priority action focus in the accompanying Canada-wide Action Plan on Zero Plastic Waste, released in 2019.[2]

Provincial Priorities

Addressing plastic pollution is also a priority for the Ministry of Environment and Climate Change (MECC). The CleanBC Plastics Action Plan serves as a roadmap to implement policies and programs that will reduce plastic pollution in BC. The four main focus areas identified were SUI bans, adding EPR items to the Recycling Regulation, expanding the EPR program which covers deposit-refunds for Beverage Containers, and reducing plastics overall (through bans on packaging and increased recycled content requirements). As part of this plan, the Province approved by-laws banning SUIs for the municipalities of Richmond, Victoria, Saanich, Tofino and Ucluelet, This allows communities to implement their own SUI bans and sets the groundwork to allow local governments to ban certain types of plastic products. Of note, neighbouring Surrey brought their Plastic Bag and SUI Bylaw to Council in December 2020 for the first reading.

Regional Government/Metro Vancouver Policies

Metro Vancouver (MV) assumes management control of regional disposal facilities so waste reduction and diversion goals are uniformly applied to provide equity for residents and businesses in the region. As of January 1, 2015 the MV Regional District banned food scraps from disposal. In effect this caused all municipalities within the regional district to implement food collection programs.

As part of its Regional SUI Reduction Strategy, MV staff developed a toolkit which will serve as a resource for member municipalities in the region considering SUI reduction/management. The National Zero Waste Council (NZWC) Plastics Advisory Panel listed the following SUI priority plastic items in their document Regulatory Approaches for Priority Plastic Wastes:[3] Bags (single-use), Containers (rigid and foam plastic), Cups and lids (single use, plastic), Straws (single-use, plastic); and Utensils (single-use, plastic). The MV toolkit on policy and regulatory options (mandatory fees, bans) focuses on the same

[1] See: https://www.ccme.ca/files/Resources/waste/plastics/STRATEGY%20ON%20ZERO%20PLASTIC%20WASTE.pdf
[2] See: https://www.ccme.ca/files/Resources/waste/plastics/1289_CCME%20Canada-wide%20Action%20Plan%20on%20Zero%20Plastic%20Waste_EN_June%2027-19.pdf
[3] See: http://www.nzwc.ca/Documents/RegulatoryApproachesforPriorityPlasticWastes.pdf

items, as those five categories contribute an estimated 1.1 billion items to MV disposal per year (440 items per person).

Current State of Solid Waste Management in White Rock

Waste collection services in the City are managed by the Engineering and Municipal Operations Department, under the direction of the Manager of Public Works. Waste management services (garbage, recycling and organics collection) are provided to residents by both the City and private sector service providers. City services are provided to 4,038 single-family (SF) households and 67 multi-family (MF) units (townhouses), representing a total of 4,105 units. For dwellings serviced by the City, garbage collection services are provided bi-weekly while recycling and organics wastes are collected on a weekly basis. The collection truck operators service the SF residential collection program using one garbage truck, two green waste trucks and two recycling trucks. Currently, all five current collection vehicles are non-packing units and collection is done manually. The City opted into the RecycleBC program (formerly MMBC) in May 2014 which means the City continues collecting recyclables on behalf of RecycleBC. The City also encourages additional recycling (e.g., materials not collected curbside) to be brought to a Return-It depot, advertising the Return-it Semiahmoo Bottle Depot on the City website.

Following pick-up, garbage and organics are transported by City-owned vehicles to the City's Operations Yard (which is shared by several departments) where material is tipped, compacted or consolidated on site and temporarily stored. The compacted garbage is then transported to the Surrey Transfer Station (STS) by Waste Connections of Canada (WCC) and the consolidated organics is transported to the GFL Environmental compost facility in Delta by WCC. Recycling is hauled directly by City staff to Richmond Urban Impact Material Recycling Facility (MRF) for processing. Although a new sound barrier was recently built to mitigate noise from the Operations Yard's activities, complaints about odours resulting from the temporary storage of organics on site (two 40 yard bins) have been received from neighbouring residents.

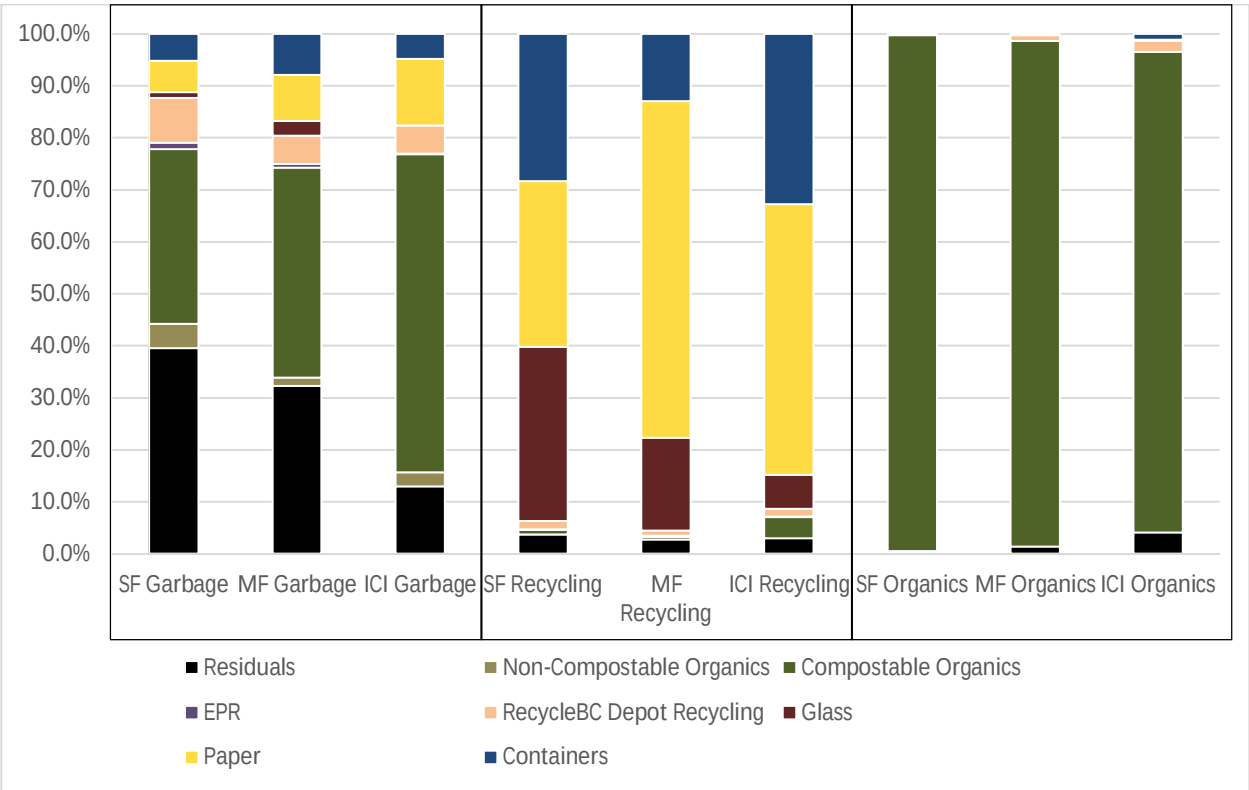
Collection for City facilities is contracted to GFL Environmental Inc. MF buildings not serviced by the City (strata, apartments), mixed-use buildings (ICI/MF on same property) and all ICI buildings must employ private waste collection services. Contractors servicing MF dwellings and ICI locations are responsible for their own hauling and waste processing/disposal. The City used to collect from MF buildings and some ICI establishments. In 2015, the City moved to privatized collection from MF and commercial properties. Recent public feedback received through the City's strategic planning process indicated interest in the City resuming this role.

In 2018, the City collected 1,182 tonnes of garbage, 799 tonnes of recyclable materials and 1,645 tonnes of green waste. A comparison of historical waste stream quantities from 2011 and 2018 are further discussed in Section 5.2 of the report. Diversion rates for all three sectors (SF, MF and ICI) are discussed in Section 5.3.

The 2018 annual operating costs for solid waste management in the City totalled almost $1.3 million with revenues of approximately $1.6 million leading to a surplus of about $284,000. User fees collected through an annual utility fee were the largest contributor to the City revenues (87%).

Waste Characterization Study Results

A waste characterization study was performed for a total of 49 samples from across the SF, MF and ICI sectors as audited over the four-day study period. A summary of the overall results for each sector and for each waste stream is provided in the Figure below. Residuals are presented as the black colour and ideally should comprise the majority of garbage stream and be non-existent in the recycling and organics streams. Alternate materials (colours) in the garbage stream represent materials that could have been diverted out of the waste stream and identify opportunities for improvement.



ES-Figure 1. Overall SF, MF and ICI Waste Composition by Stream

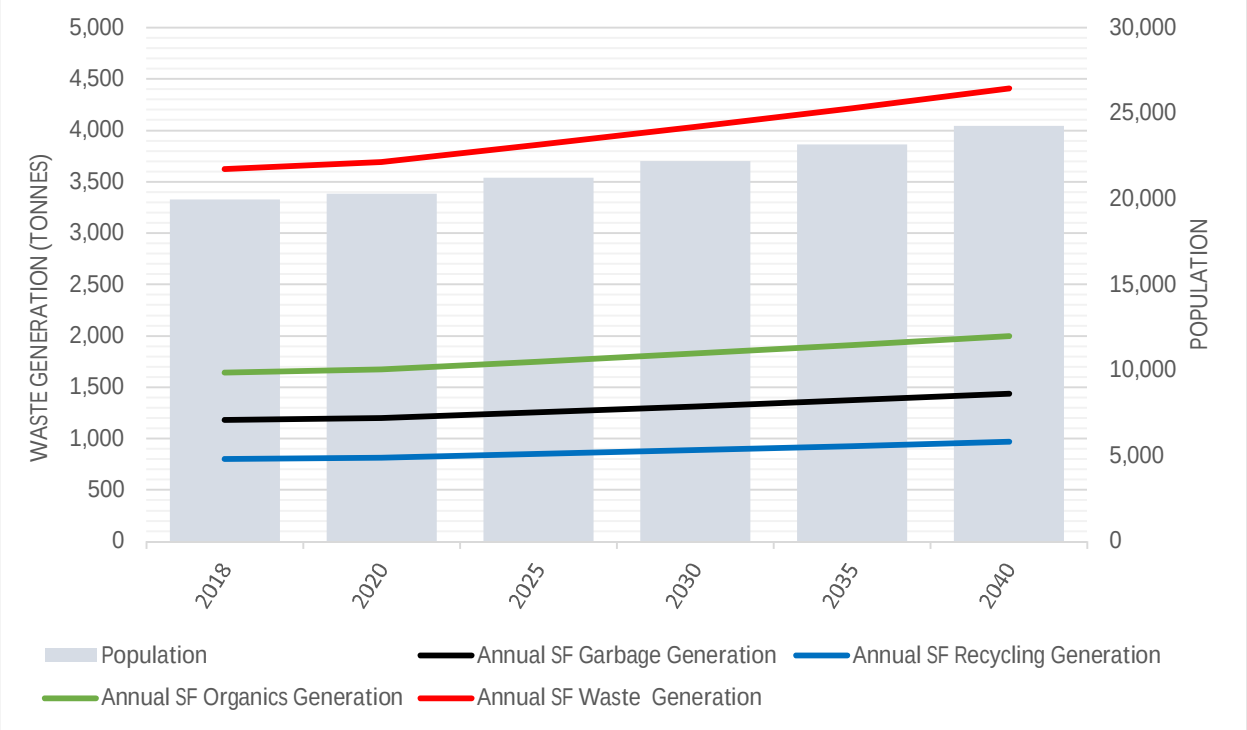
The main categories of waste found in the garbage stream were residuals and compostable organics. Residuals and non-compostable organics are the only materials that should be disposed of and account for 44.2% (SF), 33.8% (MF) and 15.7% (ICI) of the garbage streams. Meaning that approximately 55% (SF), 66% (MF) and 85% (ICI) of what was sent for disposal could have been diverted. Metro Vancouver has banned divertible materials from disposal at their waste facilities through the Metro Vancouver Tipping Fee and Solid Waste Regulation Bylaw. A significant percentage of waste disposed into the garbage stream in all three sectors falls under a banned material category per Metro Vancouver's Bylaw.

Waste audit results from the recent audit were compared to the results from the baseline 2014 waste audits. In general, there has been improvement in correctly using the recycling and organics programs (placing appropriate material in each). However, divertible materials have increased in the garbage streams for all sectors. Refer to Section 5.1.4 of the Report for a detailed comparison of results.

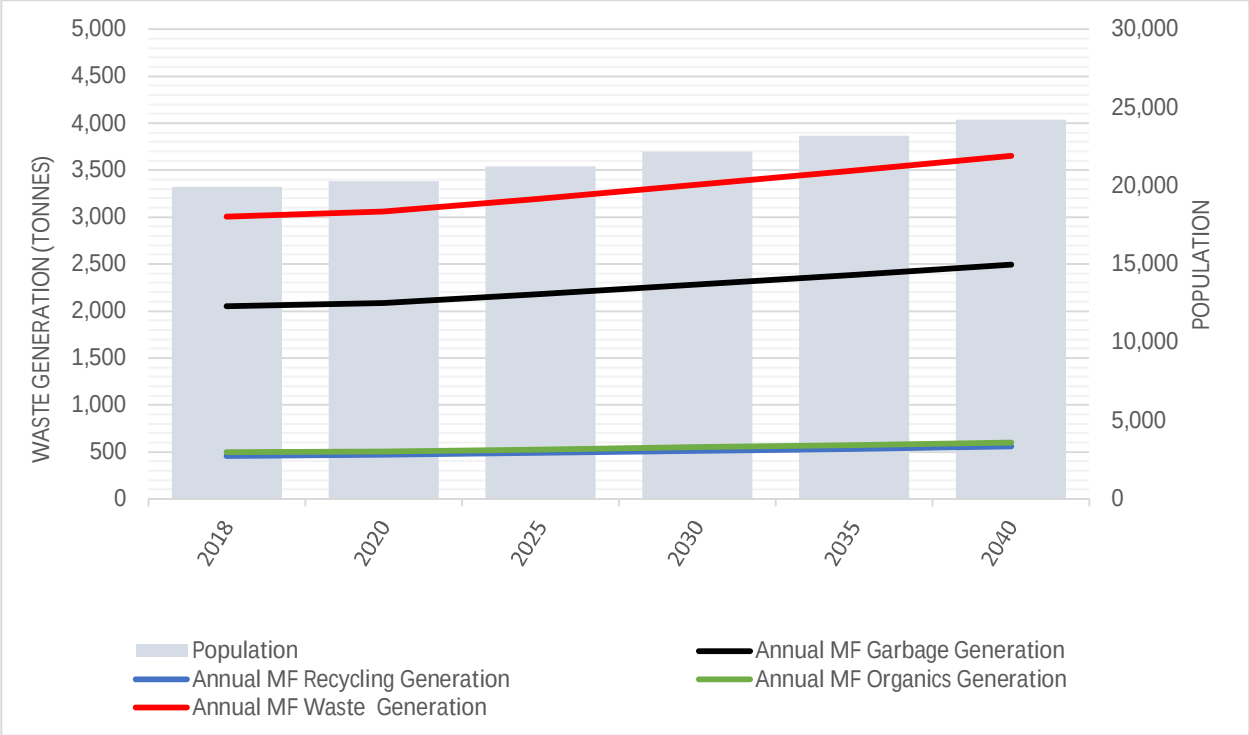
In terms of diversion rates (i.e., materials being diverted to recycling and organics streams and out of garbage stream) the SF sector had the highest tonnage diversion rate at 67% and the MF sector had the lowest diversion rate at 28%. As part of the RecycleBC program, the recycling generated in the City is subject to regular performance audits, usually once per quarter. The RecycleBC program requires contamination in amounts less than 3% or the municipality is at risk of fines. In Q2 2019, 15.5% of the recycling was categorized as incompatible material (i.e. mis-sorted or containing food residue), while 5.1% was material not accepted in the RecycleBC program.

Future Waste Generation Rates

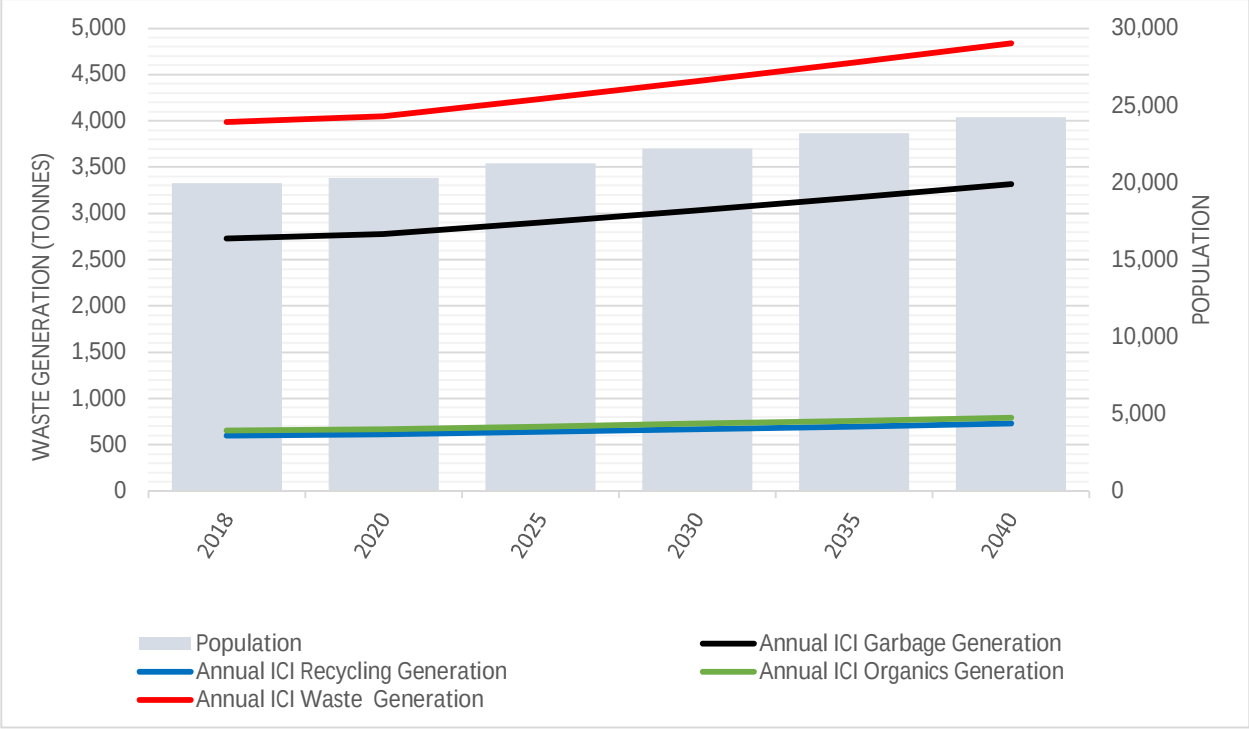
Waste generation quantities are closely linked to changes in population and economic activity. Waste quantities for all three sectors were projected for the 20-year planning period (2020-2040). Overall population and waste disposal/collection estimates for the SF, MF and ICI garbage, recycling and green waste streams are illustrated in the Figures below. Note it was assumed that the annual waste generation rate will mirror the annual population growth rate as projected by the COW Official Community Plan (approximately a 0.89% annual growth rate).



ES-Figure 2. Projected Population and SF Waste Generation



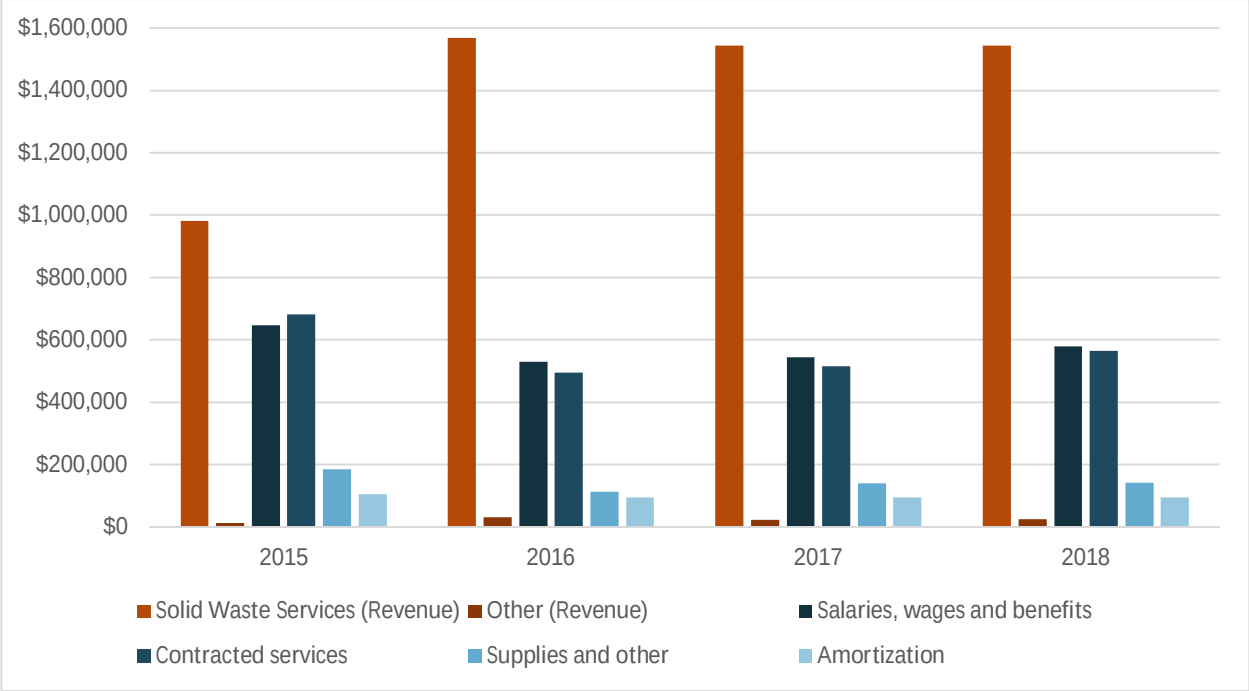
ES-Figure 3. Projected Population and MF Waste Generation



ES-Figure 4. Project Population and ICI Waste Generation

Financial Overview

As noted above, waste management and collection costs borne by the City are limited to SF dwellings, MF dwellings under six units (with some exceptions) and City facilities. A review of expenses and revenues was completed for the years 2015 to 2018 (illustrated below), with financial data provided to Dillon by the City.



ES-Figure 5. Waste Collection – Breakdown of Expenditures and Revenues for 2015 to 2018

After changes were implemented to solid waste collection services in 2015, a year in which there was a deficit in waste collection services, the City posted a surplus in 2016 and again posted surpluses in 2017 and 2018. Surpluses were reallocated to other solid waste management initiatives. It should be noted that surplus have decreased in each year following 2016. The majority of revenues are from Solid Waste Services, with comparable revenues between 2016 and 2018. Salaries, wages and benefits, along with contracted services are the two largest expenses and account for over 80% of expenses between 2016 and 2018.

ES-Table 1. Waste Collection – Breakdown of Expenditures and Revenues for 2015 to 2018

	2015	2016	2017	2018
Revenue				
Solid Waste Services	$981,917	$1,567,670	$1,543,018	$1,544,582
Other	$13,071	$31,309	$23,757	$24,753
Expenses				

	2015	2016	2017	2018
Salaries, wages and benefits	$646,906	$530,234	$544,965	$578,231
Contracted services	$681,573	$494,106	$514,741	$565,331
Supplies and other	$184,564	$113,834	$140,491	$140,913
Amortization	$104,072	$94,015	$94,015	$94,015
Surplus (Deficit)	($622,127)	$366,790	$272,563	$190,845

Jurisdictional Review

A review of waste management practices, initiatives, programs and strategies was undertaken on the following jurisdictions: City of Langley, City of North Vancouver, City of Port Coquitlam, City of Port Moody, City of Surrey; and Metro Vancouver Regional District. These jurisdictions were chosen based on how comparable the demographics were to the City of White Rock (e.g. population, density), legislative requirements and on their progressive approaches to managing waste in the following categories: Waste Diversion Programs; Waste Diversion Policy and Enforcement; Waste Avoidance and Reduction; Single-Family Waste Collection; Multi-Family Waste Collection; ICI Waste Collection; and Streetscape and Public Spaces Waste Management.

Based on the findings of the review and comparing to the City's existing waste management system, several program changes and areas for improvement have been identified and are summarized in the table below. Any existing City programs that should not change based on consistency with the best practices findings are also noted.

ES-Table 2. Opportunities for Program Changes and Improvement

Program Component Headings	Program Changes and Improvement Opportunities Based on Jurisdictional Review
Waste Diversion Programs	• The City should **continue with multi-stream recycling collection** as these programs consistently have lower contamination rates. • The City should **implement public event (e.g., Sea Festival) waste diversion programs** to increase participation in waste diversion programs and reduce waste from being landfilled. • The City should **consider a curbside large item pick-up program** to avoid illegal dumping.
Waste Diversion Legislation, Policy and Enforcement	• **If standardized carts are implemented for SF waste collection, consider increased fees based on cart size** to encourage diversion. • **If the City takes on the collection of waste materials from other sectors (MF or ICI), consider the risk of increased fines from disposal bans and contamination.** Given the high amount of contamination found in the recent MF and ICI waste audits, this could be significant.
Waste Avoidance and Reduction	• Metro Vancouver single-use item (SUI) reduction strategy /toolkit and **City of Surrey Plastics and SUI Reduction Strategy/Bylaw development should be monitored and considered given proximity.** Additional effort should be given to harmonize with local businesses who are being included in solid waste initiatives/consultation.

Program Component Headings	Program Changes and Improvement Opportunities Based on Jurisdictional Review
	• To encourage a culture of re-use, repair and community engagement, events such as **repair cafés should be considered** and potentially held in civic facilities.
Single-Family Waste Collection	• Cost analysis should be undertaken for **automated collection services** to determine if the potential reduced operating costs offset the large capital investment. • City collected **materials should be directly hauled to end processing/disposal facilities** to reduce costs from double handling of materials.
Multi-Family Waste Collection	• The total number of units, typical waste generation and participation in waste diversion programs should be considered when evaluating internal vs privatization of MF collection options. • **Space required for individual property centralized disposal set-out requirements, and practicality of container type for disposal areas, should be considered when evaluating internal vs privatization of MF collection options.** • A voluntary application for those interested in City services should be considered. • **The City's bylaw language should be updated to address segregation requirements for MF buildings.**
ICI Waste Collection	• **Space requirements, set-out requirements and practicality of container type for disposal areas at the businesses should be considered** when evaluating internal vs privatization of ICI collection options. • **The number of businesses requiring/desiring service vs. collection vehicle cost to collect from the same** should be considered when evaluating internal vs privatization of ICI collection options. • **The City's bylaw language should be updated to address segregation requirements for ICI buildings.**
Streetscape and Public Spaces Waste Management	• **Consider providing waste options in public spaces and on City streets equivalent to what residents are accustomed to at home**, to encourage diversion and ensure consistency between home, work and in the public realm. • **Consider implementing dog waste diversion programs** to reduce related fines from Metro Vancouver.

Results of Community Consultation

A community open house took place on February 19, 2020 to get feedback on waste collection services and operations in the City. As a part of the open house, residents were encouraged to fill out a survey titled "Tell Us What You Think about Solid Waste Operations in the City of White Rock". The City received almost 200 responses to the survey.

A brief summary of survey results are provided below to offer context on the developed options for the City:

- 41% of survey participants resided in SF homes, 56% resided in MF households and 2.5% did not live in White Rock but did own business in the City;
- 72% of the respondents are satisfied or very satisfied with their current collection services;
- 63% of SF residents would prefer standardized toters for waste collection services;
- 45% of MF residents are not at all or not satisfied with their current waste collection programs;
- 72% of MF residents would be 'very interested' in having the City complete their waste collection and an additional 15% would be 'interested' in this service;
- 67% of survey participants found their day-to-day living impacted or very impacted by hauler traffic; and
- No overwhelming sentiment by the ICI sector was recorded, with 4 of the 7 ICI respondents indicating they are somewhat satisfied or satisfied with their waste collection services.

Solid Waste Management Collection Options

The review and assessment of solid waste management options for the SF, MF and ICI sectors was conducted based on the identification of an initial extensive list of scenarios that was established from the background review and identification of areas of current/future deficiencies and improvement.

A number of options for solid waste management collection from the SF, MF and ICI sectors were developed. Initially, seven high level options were created (Section 8.2.2) and then, following guidance from the City, priority options were identified which were broken down into Phase 1 (Section 8.2.3) and Phase 2 priorities (Sections 8.2.4 and 8.2.5). A screening process was applied to rank each of the options developed.

Phase 1 First Priority - Single-Family Collection Options

Based on immediate City staff priorities (i.e. the need to replace SF collection trucks), four SF collection options (status quo plus three alternatives to allow for compaction and remove double handling of material) were determined as Phase 1 – First Priority.

Dillon developed an evaluation matrix for each of the four options to establish which were worthwhile for the City to pursue. The evaluation looked at the following eight criteria: capital cost, operating cost, community acceptance, ease of implementation, environmental/health and safety considerations, operational/managerial complexity, identified economic benefits and strategic fit. The qualitative evaluation of the options is provided below. Green and red shading was used to distinguish between more or least preferred considerations under each criteria.

ES-Table 3. Qualitative Evaluation of Options

Unique Scenario Components	Option 1 – Status Quo • F450 Haul All vehicles • One staff drives & collects • Capacity of 10.7 cubic metres • No compaction Works yard transfer of material	Option 2 - One Man Sideload • One staff drives & collects • Compaction ratio 3:1 • Capacity of 23.7 cubic metres • Can be retrofitted to include hydraulic lift assist for toter collection	Option 3 – Two Man Rearload • Two staff (1 drives/1 collects) • Compaction ratio 3:1 • Capacity of 19.1 cubic metres • Can be retrofitted to include hydraulic lift assist for toter collection	Option 4 – One Man Fully Automated Sideload • One staff drives & collects • Staff does not need to leave vehicle for collection • Compaction ratio 3:1 • Capacity of 23.7 cubic metres • Requires toter collection
Capital Cost	Lowest initial capital cost ✓	Second highest initial capital cost	Second lowest initial capital cost ✓	Highest initial capital cost x
Community Acceptance	No changes to existing resident responsibilities ✓ No improvement to Works Yard issues (noise, odour) x	Removal of Works Yard issues ✓ Option to convert to cart collection ✓	Removal of Works Yard issues ✓ Option to convert to cart collection ✓	Removal of Works Yard issues ✓ Ensures cart collection ✓
Ease of Implementation	No change to existing service - no challenges identified ✓	Requires operator training for new vehicle	Requires operator training for new vehicle	Requires operator training for full-automation collection Requires City decision to switch to carts prior to purchase x Potential issues with overhead clearances and narrow lanes x
EH&S Considerations	Increased risk of injury x	Medium risk of injury	Medium risk of injury	Least risk of injury ✓
Operating Cost	Highest annual operating cost x	Lowest annual operating cost ✓	Second highest annual operating cost	Second lowest annual operating cost ✓
Operational/Managerial Complexity	No change to current level of effort for ongoing management/daily operations	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site) ✓	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site) ✓	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site) ✓
Identified Economic Benefits	No increase in operating efficiency/ reduction in operating costs x	Ongoing lower annual operating costs than Status Quo ✓	Ongoing lower annual operating costs than Status Quo ✓	Ongoing lower annual operating costs than Status Quo ✓
Strategic Fit	No change to staffing level No increased efficiency in collection time x	No change to staffing level Increased efficiency in collection time ✓	Increased staffing level x Increased efficiency in collection time ✓	No change to staffing level Increased efficiency in collection time ✓

- The qualitative evaluation of the candidate options illustrates that Option 2 is the more advantageous SF collection option since it removes the use of the Works Yard and associated double handling of material, provides an option to convert to cart collection in the future and has the lowest annual operating costs among the options and the current operations.

Phase 2 Secondary Priority – City Collection/Management of MF and ICI Waste Collection Services

Phase 2 – Secondary Priorities considered a deeper dive into MF and commercial collection/ management by the City.

Since the transition to privatization of MF and commercial collection, public feedback suggested a desire to return to City collection for the MF and commercial sectors. This sentiment is largely founded on the misconception that City collection was more affordable than private collection. We note here that previous MF waste collection by the City was based on cost recovery through property taxes and was not based on a transparent user fee cost recovery model.

Various approaches to estimate the high-level costs for internalizing MF and ICI collection are presented within the report and show a review of the potential capital and operating costs associated with Scenario 2B (City provision of MF/ICI collection services City-wide), as well as the estimated unit rate for MF and ICI customers (Section 8.2.4).

One of the approaches was the use of the solid waste utility rate model that was developed in 2015, noting that this model was developed when the City was responsible for MF and ICI collection and had true costs to enter into the model. Another approach was to develop surveys for the MF and ICI sectors and send to building/business owners, Strata Councils and MF building managers in an effort to understand and gather data on the current costs of private waste collection haulers for these sectors. There were 57 responses to the MF survey and 12 to the ICI. Estimated current costs are provided based on the MF and ICI survey results. It should be noted that only small portion of MF and ICI properties participated in the survey; due to this, these results are not considered to be representative of the actual current costs across the City.

The main options reviewed were an expanded service model for City collection of all MF and ICI waste and a City-managed contract for MF and ICI waste collection services. The table below provides a qualitative evaluation of the MF and ICI collection options using the same criteria that was used to evaluate the SF collection options. Green and red shading was again used to distinguish between more or least preferred considerations under each criteria.

ES-Table 4. Qualitative Evaluation of MF and ICI Options

Unique Scenario Components	Option 1 – Status Quo	Option 2 – City Collection of Both MF and ICI	Option 3 – City Managed Contract of MF and ICI
Capital Cost	No Change in Capital Costs	Highest initial capital cost x	No Change in Capital Costs
Community Acceptance	No changes to existing resident responsibilities	Reduces number of waste collection vehicles on the street ✓	Reduces number of waste collection vehicles on the street ✓
Ease of Implementation	No change to existing service	Requires operator training for new vehicle(s)	Requires management of contract
EH&S Considerations	No change to risk	Medium risk of injury	Medium risk of injury
Operating Cost	Lowest annual operating cost ✓	Highest annual operating cost x	Second highest annual operating cost
Operational/Managerial Complexity	No change to current level of effort for ongoing management/daily operations	Increase in current level of effort for ongoing management/daily operations (additional collection vehicles, routes and crews) x	Increase in current level of effort for ongoing management/daily operations (contract management) x
Identified Economic Benefits MF	No Change	Reduced overall costs for MF sector✓	Reduced overall costs for MF sector✓
Identified Economic Benefits ICI	No Change	Increased overall costs for ICI sector x	Reduced overall costs for ICI sector✓
Strategic Fit	No change to staffing level	In-line with Council Goals and Objectives ✓	In-line with Council Goals and Objectives ✓

The qualitative evaluation table illustrates that Option 3 - City Managed Contract of MF and ICI for either and/or both of these sectors, is the more advantageous given the following rationale:

- Community acceptance associated with a reduction in the number of waste collection vehicles on the street compared to current operations;
- Reduction in overall costs for both sectors compared to current operations; and
- An overall strategic fit with the Council's goals and objective.

Dillon recommends that in order to get accurate comparative costs regarding MF and ICI collection, and potentially implementing this as a City-managed program performed either internally or by the private sector, a Request for Proposals be developed. An objective of the selection process would be to choose the most cost-effective and operationally sound arrangement, regardless of whether the collection is done by an external Proponent or internal (in-house) group. As such, Proponents would be advised that the process will include an internal staff submission from the City. To be fair, the internal staff submission and external Proposals would respond to the same submission requirements and be evaluated as set out in the RFP Documents.

Phase 2 – **Additional Secondary Priorities** considered options for continued SF collection of recycling given a change in end processing location as well as a deeper dive into the procurement of toters (wheeled carts) for SF waste and organics collection.

Following Dillon's consideration of the cost for contracting out this service to a private company or asking RecycleBC to take over the recycling collection services for the SF sector, Dillon recommends the City retain collection of SF recycling and transfer to the new location for processing. This is based on the RecycleBC incentive received, a private hauler quote from three years ago (higher than current City costs to provide service) and a concerted effort to avoid additional trucks on city roads (public survey responses).

Given the public interest in cart collection, as identified through the public consultation, , it is recommended the City consider wheeled carts for SF collection of garbage and organics. White Rock has consistently low contamination rates in recycling due to multi-stream collection and no change to the service model is recommended.

Given a changing market and current oversupply of collection carts, it is recommended a Request for Quotes/Request or Expression of Interest be issued to procure more accurate costs for the City based on potential needs (~10,000 carts).

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the City of White Rock (City) to provide consulting services to conduct a Solid Waste Management Operations Review. As part of this review, Dillon explored the feasibility of the City carrying out solid waste operations for all residential, multi-family and commercial properties as well as public/private combinations. Costing and implementation considerations were established for priority options.

1.1 Study Area

The City of White Rock was incorporated in 1957 and is located in the southwest corner of the Lower Mainland and within the Metro Vancouver Regional District (Figure 1). The City lies along the edge of Semiahmoo Bay, located to the south and is bordered by the City of Surrey to the west, north and east. It is located 45 km from Vancouver and five minutes from the Canada/US border.

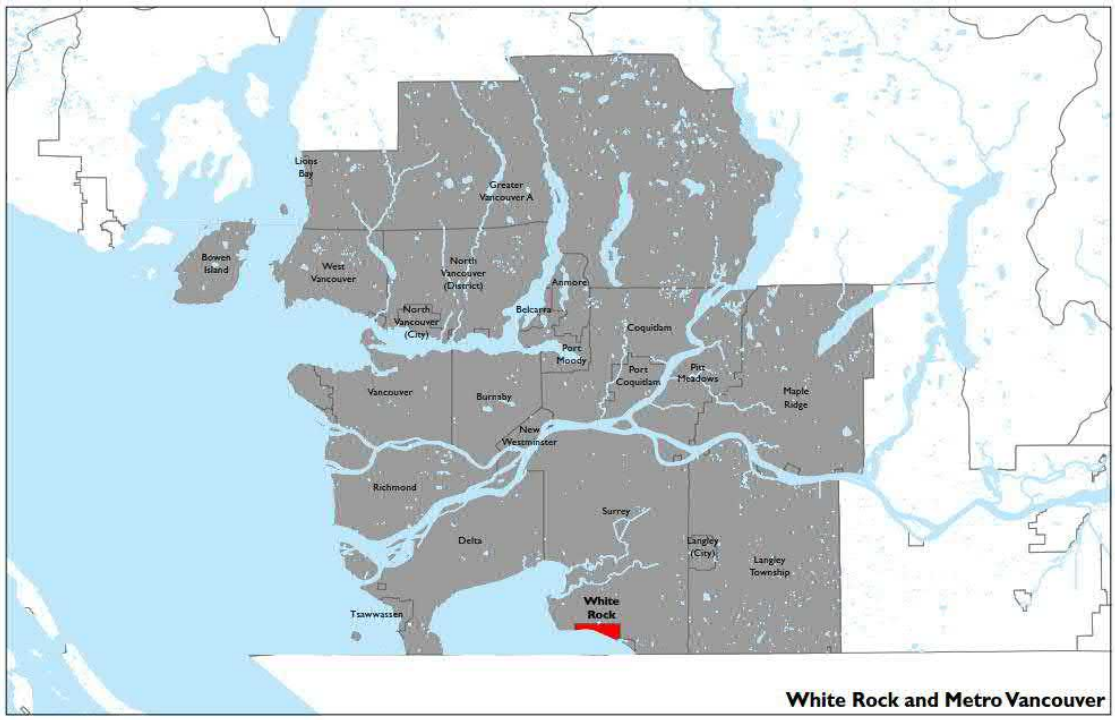


Figure 1. Metro Vancouver Regional Map

1.2 Population and Housing

The City has a population of just under 20,000 (2016 Census); an increase of 3.2% from the 2011 Census. The City witnessed a rapid population growth prior to 1976, with an approximate increase of 33% between 1966 and 1971. White Rock's population has been projected to grow to 27,000 by the year

2041, an increase of approximately 40%. According to Statistics Canada Census data, the 40-64 age group currently makes up the largest demographic (38%). Individuals over the age of 65 comprise the second largest demographic group (34%) and individuals under 40 years old comprise 27% of the population. Fifty-seven percent (57%) are part of the 'working age' (15 to 64 years of age) population category.

In White Rock, approximately 9,270 residents are employed in the labour force and are primarily engaged in health care and social assistance, professional, scientific and technical services and retail trade. The employment rate is approximately 10% lower than the Metro Vancouver regional average and the unemployment rate is marginally higher than the regional average[4].

The total number of occupied private dwellings in the 2016 Census was 10,005 units, an increase of 1.4% from the 2011 Census (9,865 units). Units include single-family households and units within multi-residential buildings. Among the 4,525 single-family households, single-detached houses account for 25% and semi-detached, row house, apartment or flat in a duplex, other single-attached house and movable dwelling units account for 19% of single-family households. There are almost 5,500 multi-residential building units (e.g., condominium and apartment units).

The City provided slightly higher unit counts for single-family and multi-family households (total of 10,370) compared to the 2016 Census data. For the purposes of waste management services the number of single-family and multi-family residential buildings and number of ICI facilities in the City is presented in Table 1, based on information provided to Dillon by the City. For our purposes, City provided information will be used throughout this report. Density is provided to serve as an indicator of average number of stops required in a given area for collection purposes.

Table 1. City Building Type Information

	Number of Households/Units (Stats Can)	Total Number of Properties (City Provided)	Total Number of Units (City Provided)	Number of Units Serviced by City (2019)	Approximate Density
Single-Family	4,525[1]	4,038[2]	4,038[2]	4,038	884 households/km^2
Multi-Family	5,480[1]	252[2]	6,265[2]	67	54 locations/km^2
Mixed Use[3]	-	92	n/a	0	20 locations/km^2
ICI[4]	-	96[2]	96[2]	0	20 locations/km^2

1. City of White Rock, 2016 Census. Statistics Canada. Accessed at https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5915007&Geo2=CD&Code2=5915&SearchText=white+rock&SearchType=Begins&SearchPR=01&B1=Labour&TABID=1&type=0
2. Values provided to Dillon by City of White Rock staff (Greg Newman, Manager of Planning).
3. ICI and MF units in mixed use buildings together (ICI/MF).
4. Stand-alone ICI – non strata

[4] City of White Rock, 2016 Census. Statistics Canada. Accesses at https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5915007&Geo2=CD&Code2=5915&SearchText=white+rock&SearchType=Begins&SearchPR=01&B1=Labour&TABID=1&type=0

2.0 History of Waste Management in White Rock

The City completed a Review of Solid Waste Operations in 2014 to determine where efficiencies or changes could be made and included the development of a solid waste utility model. Recommendations and implementation plans from this review considered alignment with Metro Vancouver's Integrated Solid Waste and Resource Management Plan (ISWRMP) and enhancement of the current waste management system. As a result of this review, significant changes were made to the waste collection operations and financing model employed by the City.

Prior to the review, the City provided collection for single-family (SF), multi-family (MF) and some Industrial, Commercial and Institutional (ICI) properties. As a result of the review, the City now only collects from eligible single-family and multi-family dwellings under six units (with some exceptions). All larger multi-family residences and ICI properties are required to procure private waste collection services. In addition, a utility fee was introduced to finance the City's waste collection operations (operations were previously financed from the general tax revenue pool) for single-family homes and eligible multi-family properties. This was a significant change to the operations and was initially met with resistance from residents; however, this model is now adopted and the City receives relatively few calls regarding the utility fee.

3.0 Solid Waste Management Policies and Recent Actions

3.1 Federal Policies

Canadian Environmental Protection Act[5]

The Canadian Environmental Protection Act, 1999 (CEPA 1999) is an important part of Canada's federal environmental legislation aimed at preventing pollution and protecting the environment and human health. The goal of CEPA 1999 is to contribute to sustainable development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

Highlights of CEPA 1999 include the following:

- Makes pollution prevention the cornerstone of national efforts to reduce toxic substances in the environment;
- Sets out processes to assess the risks to the environment and human health posed by substances in commerce;
- Imposes timeframes for managing toxic substances;
- Provides a wide range of tools to manage toxic substances, other pollution and wastes;
- Ensures the most harmful substances are phased out or not released into the environment in any measurable quantity;
- Includes provisions to regulate vehicle, engine and equipment emissions;
- Strengthens enforcement of the Act and its regulations;
- Encourages greater citizen input into decision-making; and
- Allows for more effective cooperation and partnership with other governments and Aboriginal peoples.

Current Federal Priorities

Plastic waste, largely through its impact on marine litter, has become a high priority to all levels of government across Canada. In June 2019, the Government of Canada announced two steps to reduce Canada's plastic waste by identifying 6 targeted single-use plastics to be banned in 2021 and working with provinces and territories to introduce extended producer responsibility (EPR) programs across the country.

In their Greening Government Strategy (2019) they commit to better manage the use and disposal of plastics in their own operations. This includes eliminating the unnecessary use of single-use plastics in government operations.

[5] Canadian Environment Protection Act, 1999 and related documents. Government of Canada. Accessed at https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/related-documents.html

As part of a move towards zero plastic waste in Canada, the Canadian Council of Ministers of the Environment (CCME) approved in principle a Canada-wide Strategy on Zero Plastic Waste in November 2018.[6] The strategy places a significant emphasis on Single-Use Items (SUIs) and prioritizes reducing demand for disposable plastic items. Single-use plastics are one of ten priority result areas in the Strategy and a priority action focus in the accompanying Canada-wide Action Plan on Zero Plastic Waste, released in 2019.[7]

Phase 1 of the Canada-wide Action Plan on Zero Plastic Waste focuses on product design, single-use plastics, collection systems, recycling capacity, and domestic markets. Details include the development of a roadmap to strengthen management of SUIs, identifying the SUIs that are most likely to be released into the environment or pose management challenges, and working with stakeholders to promote solutions and identify sustainable alternatives. Phase 2 of the Action Plan was released in July 2020 and focuses on plastic pollution in oceans and freshwater ecosystems, consumer awareness, and monitoring impacts.

Canada also launched the Plastics Innovation Challenges in 2018. This included funding for small and medium-sized businesses to reduce waste and turn waste into resources. Included on the list of seven innovation challenges were:

- Food packaging; and
- Improved compostability of bioplastics.

Canada is seeking to develop updated national performance requirements and standards for plastics. The following key activities and timelines may affect SUI Reduction Strategies in current development:

- Recycled content targets, timelines and standards (2020); and
- Standards for bio-based plastic products, such as certified compostable packaging and single-use products (2021).

3.2 Provincial Policies

BC Environmental Management Act[8]

In British Columbia's Environmental Management Act (Part 3 – Municipal Waste Management), Municipal Solid Waste (MSW) is defined as refuse that originates from "residential, commercial, institutional, demolition, land clearing or construction sources". Local governments are responsible for preventing and disposing of solid waste for homes and businesses in their area. Under the Environmental Management Act the BC MOECCS requires that all regional districts prepare and submit a solid waste management plan to the department. As part of this process, many local governments have developed management strategies that reduce their disposed amount of MSW. The BC MOE has

[6] See: https://www.ccme.ca/files/Resources/waste/plastics/STRATEGY%20ON%20ZERO%20PLASTIC%20WASTE.pdf
[7] See: https://www.ccme.ca/files/Resources/waste/plastics/1289_CCME%20Canada-wide%20Action%20Plan%20on%20Zero%20Plastic%20Waste_EN_June%2027-19.pdf
[8] Environmental Management Act. Government of British Columbia. Accessed at http://www.bclaws.ca/civix/document/id/complete/statreg/03053_00

developed guidelines to prepare Regional Solid Waste Management Plans, transfer stations, compost facility requirements, waste to energy facilities and various guidelines for landfills and landfill gas management.

Also under the Environmental Management Act is the Recycling Regulation and the Organic Matter Recycling Regulation (OMRR)[9]. The Recycling Regulation sets out requirements for Product Stewardship (or EPR – Extended Producer Responsibility) in BC. EPR is a policy mechanism used to make producers of products responsible for the end-of-life management of their products and provides incentives for producers to better design their products for safer disposal/management. There are stewardship programs in place for products such as beverage containers, electronics, used oil and antifreeze and most recently, packaging and printed paper. The OMRR governs the compost facilities, and the production, distribution, storage, sale and use of biosolids and compost and provides guidance for local governments.

Current Provincial Priorities

The CleanBC Plastics Action Plan is an effort by the Ministry of Environment and Climate Change Strategy to consult with British Columbians and all stakeholders to have their say on proposed action and options to reducing plastic pollution. The Plan will serve as a roadmap to implement policies and programs that will reduce plastic pollution in BC.

In a consultation paper released in July 2019,[10][11] The Ministry of Environment and Climate Change Strategy proposed action and requested input on four connected areas:

1. Bans on Single-Use Packaging (possible actions include total phase out, partial ban with exemptions, and allowing use only to those with health/accessibility requirements);
2. Dramatically Reducing Single-Use Plastic in Landfills and Waterways (adding items to the Recycling Regulation and requiring producers to take responsibility for their recovery);
3. Expanding the EPR program which covers deposit-refunds for Beverage Containers (including milk and milk substitutes, increasing minimum deposit to 10 cents from 5 cents, allowing electronic refunds); and
4. Reducing plastics overall (bans for plastic packaging under the Environmental Management Act, support for increasing recycled content in standards led by the Federal Government).

The intention of the engagement was to hear from stakeholders, collaborate to avoid duplication of efforts, support a harmonized approach, and create immediate impact and protection for BC's environment. The engagement period closed on September 30, 2019, and the publication of the "What we Heard" report was released March 2020.

[9] Organic Matter Recycling and Regulation. British Columbia Government. Accessed at https://www2.gov.bc.ca/gov/content/environment/waste-management/food-and-organic-waste/regulations-guidelines
[10] See: https://news.gov.bc.ca/releases/2019ENV0084-001516
[11] See: https://cleanbc.gov.bc.ca/app/uploads/sites/436/2019/08/CleanBC_PlasticsActionPlan_ConsultationPaper_07252019_B.pdf

On October 1, 2019, 29 local governments sent an open letter to the Province calling for bold legislation to significantly reduce and regulate plastics in BC.[12] The joint letter highlights five topic areas which include:

1. The need for a greater focus on reduction and reuse over recycling and disposal;
2. Clarification of local government authority to regulate for environmental reasons through local bylaws;
3. An appeal for a stepped or phased implementation approach;
4. Improved extended producer responsibilities; and
5. Sufficient consultation with key stakeholders when policy tools are developed and evaluated.

On September 25, 2019, the City of Victoria announced that it would be asking the Supreme Court of Canada to review the decision that set aside its business bylaw to regulate the use of plastic checkout bags.[13] This BC Court of Appeal had previously ruled that the purpose of Victoria's bylaw was the protection of the natural environment and that it required approval from the Province of BC prior to being enacted.

Most recently, as part of the CleanBC Plastics Action Plan, the Province approved bylaws banning single-use plastics for the municipalities of Richmond, Victoria, Saanich, Tofino and Ucluelet, This allows communities to implement their own bans (Surrey has one in front of Council shortly), and sets the groundwork to allow local governments to ban certain types of plastic products.

3.3 Regional Government/Metro Vancouver Policies

Integrated Solid Waste and Resource Management Plan[14]

In July 2010, Metro Vancouver released its Integrated Solid Waste and Resource Management Plan (ISWRMP) for the Greater Vancouver Regional District and Member Municipalities. There are four main goals within the ISWRMP:

1. Minimize waste generation;
2. Maximize reuse, recycling and material recovery;
3. Recover energy from the waste after recycling; and
4. Dispose remaining waste in landfill.

The ISWRMP identifies strategies to reach the goals and responsibilities and timelines for Metro Vancouver and municipalities. The municipalities, as represented by the Metro Vancouver Board, agreed

[12] See: https://tofino.civicweb.net/filepro/document/97415/2019-09-29%20Joint%20Local%20Government%20Submission%20to%20MOECCS%20re.%20Plastics%20Action%20Plan.pdf

[13] See: https://www.victoria.ca/assets/City~Hall/Media~Releases/2019/2019.09.25_MR_City%20of%20Victoria%20Appeals%20to%20Supreme%20Court%20of%20Canada%20on%20Bag%20Ban.pdf

[14] Integrated Solid Waste and Resource Management Plan. Metro Vancouver. Accessed at http://www.metrovancouver.org/services/solid-waste/about/management-plan/Pages/default.aspx

to and approved the diversion actions in the ISWRMP. It is up to the BC MOE to determine how it will enforce the ISWRMP, and its associated goals and targets, on Metro Vancouver.

According to Metro Vancouver's Zero Waste Implementation Group, the goals set out in the ISWRMP are regional goals and there are no mechanisms for Metro Vancouver to penalize member municipalities that do not meet the regional diversion targets. Municipalities that do not take action to divert waste will be affected indirectly as a result of the higher costs at disposal facilities, through higher disposal tipping fees and surcharges for disposing of banned items.

Each member municipality can choose how they implement their programs. Metro Vancouver attempts to harmonize its member municipalities' programs but does not dictate exactly how municipalities provide collection services for organics, recyclables or solid waste. They respect the solutions developed by individual municipalities to improve waste diversion. In the case of food scraps recycling, for example, municipalities can decide how the material will be collected and transported to any type of processor.

Metro Vancouver assumes management control of regional disposal facilities so waste reduction and diversion goals are uniformly applied to provide equity for residents and businesses in the region. Private sector solid waste management facilities are regulated by Metro Vancouver's Municipal Solid Waste and Recyclable Material Regulatory Bylaw No. 181, as amended by Bylaw 183. Licenses that specify operating requirements are issued under the bylaw to: a) protect the environment and public health, b) establish facilities within the region's land base in accordance with the host municipality zoning and land use policies, and c) ensure that regional, municipal and private facilities operate to equipment standards and achieve objectives of regional SWMP.

As of January 1, 2015 the Metro Vancouver Regional District banned food scraps from disposal as food. In effect this caused all municipalities within the regional district to implement food collection programs prior to the ban.

Current Regional and Metro Vancouver Priorities

In British Columbia, the Union of BC Municipalities (UBCM) endorsed the following resolution in 2018, put forward by the City of Vancouver (with amendments) as follows:

1. 2018 – B126 Provincial Single-Use Item Reduction Strategy
   Therefore be it resolved that the Province of British Columbia engage the packaging industry to develop a provincial Single-Use Item Reduction Strategy as part of a provincial Zero Waste Strategy, which would include, but not necessarily be limited to, plastic and paper shopping bags, polystyrene foam cups and polystyrene foam take-out containers, other hot and cold drink cups and take-out containers, straws and utensils, but would exclude all single-use items needed for medical use or for people with disabilities.

At the September 2019 UBCM Conference, the City of Richmond put forth two further resolutions (both of which were endorsed):

1. B42 Adopting a Comprehensive Single-Use Item Reduction Strategy (to further the previous resolution and emphasize reduction and reuse and cover all sectors); and
2. B149 Developing provincial standards for Compostable Single-Use Items to standardize compostable packaging and ensure commercial composting infrastructure is capable of accomplishing degradation, as well as recommending collection and management through an EPR program.

As part of its Regional Single-Use Item Reduction Strategy, Metro Vancouver (MV) staff were directed by the Greater Vancouver Sewer and Drainage District (GVS&DD) Board to determine actions to reduce SUIs that are best done on a regional level, following consultation with member municipalities. Staff have put together a toolkit which will serve as a resource for member municipalities in the region designed to identify regulatory considerations for a variety of SUIs and provide content to support education and awareness activities. The purpose of the toolkit is to provide best practices and resources to inform MV municipalities considering SUI reduction/management. They hope to promote regional harmonization and regional alignment with 5Rs. Options for consideration include:

- Source reduction/prevention – item given out by-request only (reduce first);
- Mandatory fees (charging a fee for SUIs can be more effective than offering a discount for bringing a reusable alternative);
- Bans (in particular for foam items); and
- Requiring reusable options.

The National Zero Waste Council (NZWC) Plastics Advisory Panel listed the following SUI priority plastic items in their document Regulatory Approaches for Priority Plastic Wastes:[15]

- Bags (single-use);
- Containers (rigid and foam plastic);
- Cups and lids (single use, plastic);
- Straws (single-use, plastic); and
- Utensils (single-use, plastic).

The MV toolkit on policy and regulatory options focuses on the same items, given the 2018 waste composition study identifying those single-use items as representing an estimated 2.4% of the total waste stream by weight.[16] Even more importantly, and noting most SUIs are light, those five categories contribute an estimated 1.1 billion items to MV disposal per year (440 items per person), as summarized in the Table 2 below.

[15] See: http://www.nzwc.ca/Documents/RegulatoryApproachesforPriorityPlasticWastes.pdf
[16] See: TRI Environmental Consulting. 2018 Solid Waste Composition Report http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/2018Single-UseItemsWasteCompositionStudy.pdf

Table 2. Single-Use Item Disposal (millions of items) in Metro Vancouver

Category	Number of items disposed (millions/year)
Retail Bags	260
Disposal Cups	260
Takeout Containers	180
Straws	96
Utensils	330
Total	1,126

3.4 City Policies, Bylaws and Strategies

Collection, Removal, Disposal and Recycling of Solid Waste Bylaw, 2015, No. 2084[17]
The City of White Rock Collection, Removal, Disposal and Recycling of Solid Waste Bylaw, 2015, No. 2084 was adopted in May 2015, most recently consolidated with other bylaws as of April 2017.

The bylaw defines the authorization of the City to carry out waste collection and defines eligible properties to receive City collection services. The bylaw is structured with the following headings:

- Part 1: Interpretation;
- Part 2: Authorization;
- Part 3: Municipal Garbage Collection;
- Part 4: Municipal Recycling Collection;
- Part 5: Municipal Organics Collection;
- Part 6: Owner and Occupier Responsibilities;
- Part 7: Rates, Billing and Collection; and
- Part 8: General Conditions of Service and Penalties.

Under the bylaw, eligible properties to receive waste collection services from the City are defined as a "Single-Family dwelling, with or without a suite or bed and breakfast; each unit in a duplex, triplex or other multi-family property (including townhouse complexes) with 6 or fewer dwelling units". Properties not under the above definition can receive City collection through authorization by the City Engineer.

[17] Collection, Removal, Disposal and Recycling of Solid Waste Bylaw, 2015. No. 2084. City of White Rock. Accessed at https://www.whiterockcity.ca/177/Bylaws

4.0 Solid Waste System – Programs and Facilities

As previously indicated, the City's waste management program is guided by the Collection, Removal, Disposal and Recycling of Solid Waste Bylaw, 2015, No. 2084.

4.1 Organizational Structure

Waste collection services are managed by the Engineering and Municipal Operations Department, under the direction of the Manager of Public Works. Operations of waste services are completed by an Operations Manager, Administrative Assistant, Public Works Foreman, front-end customer service support staff and five collection truck operators. The collection truck operators service the single-family residential collection program using one garbage truck operator, two green waste truck operators and two recycling truck operators. There is one collection operator per truck who acts as both driver and swamper (i.e., the role of unloading waste from the waste bins into the collection truck).

4.2 Collection Programs

Waste management services (garbage, recycling and organics collection) are provided to 4,038 single-family households and 67 multi-family units (townhouses), representing a total of 4,105 units receiving City collection. Collection for City facilities (museum, library, City Hall, Operations Yard, Community Centre, Kent Street Activity Centre, Centennial Arena and Centre for Active Living) is contracted to GFL Environmental Inc. (formally Smithrite). Multi-family buildings not serviced by the City (strata, apartments), mixed use buildings (ICI/MF on same property) and all ICI buildings must employ private waste collection services.

4.2.1 Single-Family Dwellings

For single-family dwellings and multi-family dwellings being serviced by the City, garbage collection services are provided bi-weekly while recycling and organics waste is collected on a weekly basis. Residents must place containers at the curbside or alleyway by 8:00 AM on collection day. Approximately 4,100 homes are serviced a week, over a Tuesday-Friday collection schedule (approximately 1,000 homes per day). Garbage and green waste collection is completed using three F450 Haul All vehicles, each with a capacity of 10.7 cubic meters and hoist capacity of 4.5 tons. Recycling is collected using two Peterbilt Single Axle Labrie Top Select Box trucks with a capacity of 32 cubic meters and a hoist capacity of 2.5 tons. All five current collection vehicles are non-packing units and collection is done manually.

The City allows for collection of up to two 110 L garbage containers per home with a maximum allowable weight of 23 kg (50 lb). White Rock does not have public drop off locations for garbage. If residents wish to dispose of excess garbage, additional garbage tags are available for purchase at select City facilities (City Hall, Centennial Arena, Engineering and Municipal Operations, Kent Street Activity

Centre and White Rock Community Centre) at a cost of $5.00 per tag. Residents can also take surplus garbage to Metro Vancouver disposal facilities for a fee.

The City opted into the RecycleBC program (formerly MMBC) in May 2014. The program currently consists of a blue box for containers (plastic and metal), yellow bag for paper (including cardboard and newspaper) and a red box for glass. Red and blue boxes are available for residents to purchase from the City. Recycling bags and boxes are available for pick up at specific City facilities (City Hall, Centennial Arena, Engineering and Municipal Operations, Kent Street Activity Centre and White Rock Community Centre). The City encourages additional recycling (e.g., materials not collected curbside) to be brought to a Return-It depot, advertising the Return-it Semiahmoo Bottle Depot on the City website.

Collection of green waste (yard trimmings and food scraps) occurs weekly through the City's Green Can program. The City does not supply green waste containers, but residents can use any container up to 110 L in size as long as it displays a Green Can decal on the outside of the container. Decals are available at no charge at most City facilities. Residents are permitted to set out up to 10 containers of green waste (containers, Kraft bags, bundles or combination) weekly for curbside collection.

4.2.2 Multi-family Dwellings

Multi-family waste collection is largely completed by private contractors. As per the Collection, Removal, Disposal and Recycling of Solid Waste Bylaw, 2015, No. 2084., the City provides garbage, recycling and organics collection services to eligible multi-family locations under six units (with some exceptions determined by the City Engineer). All remaining multi-family dwellings are required, by the bylaw, to make provisions for a private contractor to collect and dispose of the three waste streams originating on the premises, at a minimum once every two weeks.

4.2.3 Industrial, Commercial and Institutional (ICI) Sector

The City employs GFL Environmental Inc. (formally Smithrite) for waste collection services at City-owned facilities (e.g., Centennial Arena, City Hall). Collection occurs weekly and includes garbage and recycling. Organics collection is currently only provided at one of these facilities. Other ICI sector facilities (e.g., private businesses) are required to hire private contractors for their waste collection services. Non-City owned ICI facilities within the City are further required through Bylaw No. 2084 to separate garbage, recyclable and organic waste and employ a private contractor to collect and dispose of the waste at a minimum of once every two weeks.

4.3 Facilities

The City's Public Works Yard is located at 877 Keil Street and is shared by several departments including: Roads, Solid Waste, and Parks. The Works Yard additionally acts as a temporary waste transfer station for the City's garbage and organics waste collection services prior to hauling to their respective end processing/disposal facilities. A new sound barrier was recently built to mitigate noise complaints

resulting from activities at the yard. Neighbouring residents have also complained about odours resulting from the temporary storage of organics on site (two 40 yard bins).

4.4 Haulage and Processing/Disposal

Waste collected from single-family households and multi-family residential buildings serviced by the City is hauled and disposed at separate facilities for each waste stream. Following pick-up, garbage is transported by City-owned vehicles to the Operations Yard where it is tipped and compacted on site. The compacted garbage is then transported to the Surrey Transfer Station (STS) by Waste Connections of Canada (WCC). Recycling is driven from the collection truck directly to the Urban Impact materials recovery facility in Richmond, often requiring multiple trips per day. Green waste material is collected and consolidated at the Operations Yard, then transported to the GFL Environmental compost facility in Delta by WCC. Contractors servicing multi-family dwellings and ICI locations are responsible for their own hauling and waste processing/disposal.

4.5 Promotion, Education and Outreach

The City offers residential education and promotion of waste collection services offered by the City through multiple media. The City's website offers information on waste collection programs including accepted materials. Additional information is provided in the sections below.

4.5.1 Promotion and Education – General

General promotion and education for waste collection services within the City is provided on the "Garbage & Recycling" webpage within the City's website. From this page, the "My Schedule" app can be accessed. General information on collection and containers, in addition to links to external websites (Metro Vancouver, RecycleBC, RCBC) are provided. Links are provided to obtain more information on the recycling program, Green Can program, illegal dumping, multi-family and commercial waste disposal, backyard composting and answers to frequently asked questions (FAQs).

4.5.2 Waste Diversion Education

Waste diversion education is provided on the City's website on the "Recycling Program", "Green Can Program" and "Backyard Composting" webpages including information on acceptable materials and a Recycling Materials Collected Curbside guide. Links to Recycling Council of BC (RCBC) and the Return-It Depot websites are also provided. Lastly, residents can enter their home address into the online "My Schedule" tool to view and/or print their waste collection calendar.

4.5.3 Communications

Contact information is listed on the City's website for several organizations included the City's Engineering and Municipal Operations Department, RCBC, the Return-It Depot and RecycleBC. Residents can also sign up to receive waste collection reminders using the "My Schedule" app.

4.5.4 Customer Service

Residents with questions regarding waste collection are directed to contact the City through the Engineering and Municipal Operations Department or the RCBC Hotline. Contact phone numbers and the Recycling Council's website are provided on the "Garbage & Recycling" webpage.

4.5.5 City-Wide Initiatives

City-wide initiatives include the promotion of backyard composting as a diversion method for organic waste produced in the household, in addition to participation in the Green Can program. As required by Metro Vancouver bylaws, recycling and organics waste diversion programs are required to be available across the City, as these materials are banned from disposal at all Metro Vancouver waste facilities.

4.6 Capital and Operating Costs

The 2018 annual operating costs for solid waste management in the City totalled $1,284,474 with revenues of $1,569,509 leading to a surplus of $284,035 (Table 3). User fees collected through an annual utility fee were the largest contributor to the City revenues, while the cost of green waste collection was the largest expense in 2018. Further financial information is provided in Section 6.0.

Table 3. 2018 Waste Management Operating Costs

Item	Annual Cost ($)
Revenues	
User Fees	$1,368,297
Civic Facilities Recovery[1]	$24,753
RecycleBC Payment[2]	$166,085
Other Revenues[3]	$10,374
Expenses[4]	
Garbage Collection Program	$312,521
Green Waste Collection Program	$371,093
Recycling Collection Program	$255,860
Allocated Admin Fees	$345,000
Total (surplus)	$284,035

[1]Internal accounting exercise. The costs of facilities collection is removed from the solid waste funds to general funds.
[2]RecycleBC provides a financial incentive payment of $40.5 household/year for those serviced through the City's collection program.
[3]Other revenue includes revenues from the sale of excess bag decals, Kraft bag, red and blue boxes, and roll out totes.
[4]Costs included in the expenses for collection of each material stream include employee wages, supplies, cost of collection tipping fees and vehicle costs.

5.0 Waste Characterization, Quantities and Diversion

As part of the solid waste operations review, Dillon completed a waste composition study from October 15-18, 2019 on the single-family, multi-family and industrial commercial and institutional (ICI) sectors. The main objectives of the waste composition study were to:

- Report on the composition of the single-family (SF), multi-family(MF) and ICI garbage, recycling and organics waste streams;
- Identify Single Use Plastics (SUPs) currently in the waste streams;
- Compare results to the 2014 baseline study; and
- Provide the City with identified opportunities for improvement with which to create targeted diversion efforts.

Single-family waste samples were delivered to the Surrey Transfer Station (STS) by City collection operators and Dillon staff collected the MF and ICI samples. To ensure consent of the selected properties to participate in the waste composition study, a MF and ICI Property Consent Form was drafted by Dillon and approved by the City. The intent of this consent form was to receive a formal agreement from property managers, store owners and/or building managers at each location to collect and audit their waste. In the weeks leading up to the audit, Dillon staff contacted the locations and collected completed consent forms. A copy of the consent form can be found in **Appendix A**.

5.1 Characterization of Waste

This section of the report summarizes the results of the waste characterization study. Detailed results are provided in Appendix B. There were a total of 49 samples from across the SF, MF and ICI sectors audited over the four-day study period. Waste was sorted, by sector, into eight primary categories which included:

- Containers;
- Paper;
- Glass;
- RecycleBC Depot Recycling;
- Extended Producer Responsibility (EPR) (Electronic Waste and HHW);
- Compostable organics;
- Non-compostable organics; and
- Residuals.

The main categories of waste found in the garbage stream were residuals and compostable organics. Residuals ranged from 12.9% (ICI) to 39.6% (SF) and compostable organics ranged between 33.6% (SF) and 61.2% (ICI).

As the only materials that should be disposed of are residuals and non-compostable organics, together, they accounted for 44.2% (SF), 33.8% (MF) and 15.7% (ICI) of the garbage stream. Meaning that approximately 55% (SF), 66% (MF) and 85% (ICI) of what was sent for disposal could have been diverted.

In order to compare results among each sector, recycling streams were amalgamated into five high level categories. Containers, paper and glass comprised the majority of the samples in the recycling stream. The percentage, by weight, of containers in the recycling ranged from 13.0% (MF) to 32.8% (ICI), paper ranged from 31.8% (SF) to 64.7% (MF) and glass ranged from 6.6% (ICI) to 33.5% (SF).

Compostable organics comprised the majority of the organics samples ranging between 92.4% (ICI) to 99.1% (SF) by weight. These results indicate the program is effective at keeping contaminants (i.e., materials not accepted in the program) out of the Green Can.

A summary of the overall results for each sector and for each waste stream is provided in Figure 2 with data provided in Table 4.

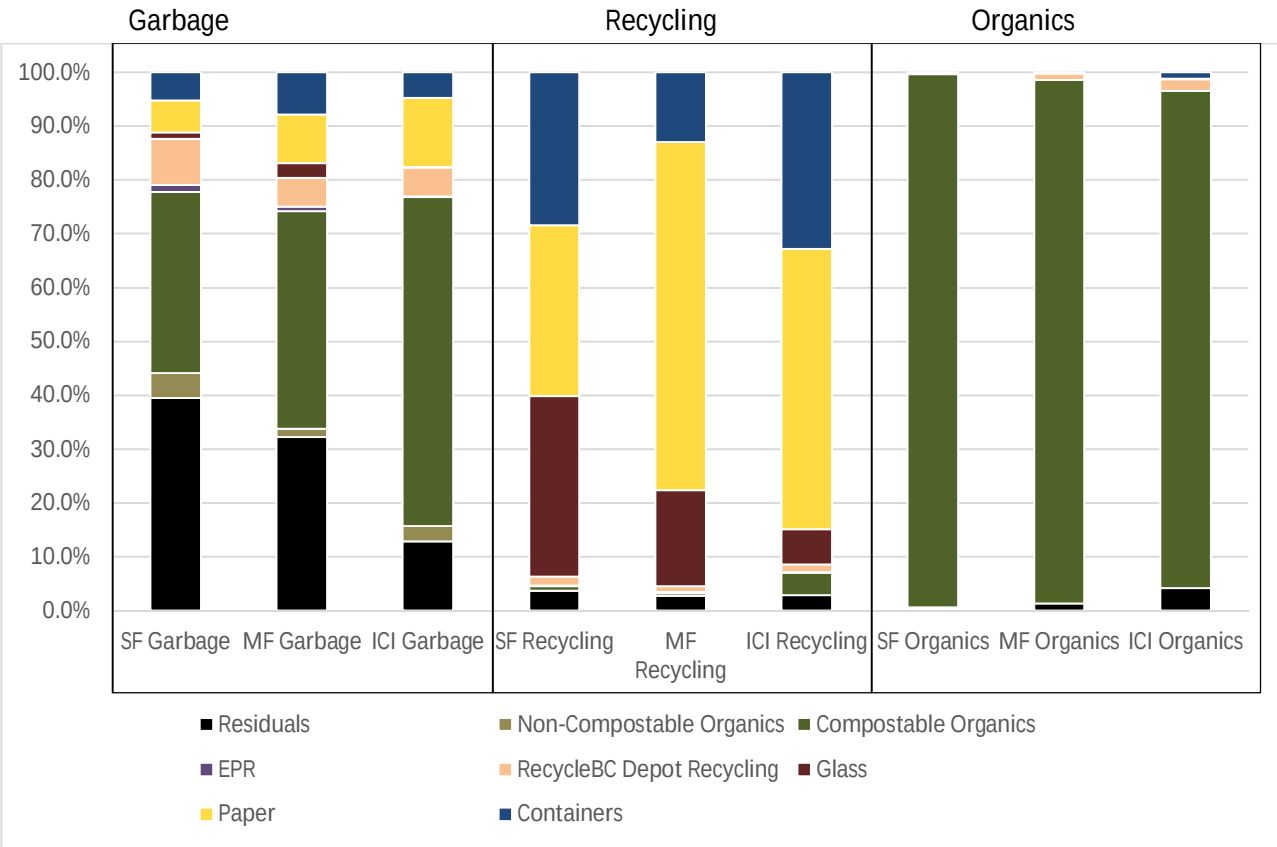


Figure 2. Overall Average Sector Waste Composition by Stream

Table 4. Overall Average Sector Waste Composition by Stream

	Garbage			Recycling			Organics		
	SF Garbage	MF Garbage	ICI Garbage	SF Recycling	MF Recycling	ICI Recycling	SF Organics	MF Organics	ICI Organics
Containers	5.2%	7.9%	4.8%	28.4%	13.0%	32.8%	0.1%	0.3%	1.1%
Paper	6.0%	9.0%	12.8%	31.8%	64.7%	52.0%	0.0%	0.0%	0.0%
Glass	1.2%	2.8%	0.0%	33.5%	17.8%	6.6%	0.0%	0.0%	0.2%
RecycleBC Depot Recycling	8.5%	5.4%	5.4%	1.7%	1.0%	1.5%	0.1%	1.1%	2.1%
EPR	1.2%	0.8%	0.1%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%
Compostable Organics	33.6%	40.4%	61.2%	0.9%	0.5%	4.1%	99.1%	97.2%	92.4%
Non-Compostable Organics	4.6%	1.6%	2.8%	0.1%	0.0%	0.0%	0.3%	0.0%	0.0%
Residuals	39.6%	32.2%	12.9%	3.7%	2.8%	3.0%	0.3%	1.4%	4.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

5.1.1 Single-Family Residential

Garbage, recycling and organics were collected by City staff and tipped at the STS each waste auditing day. City staff collected waste from a section of their normal collection routes in the morning prior to tipping at the STS.

5.1.1.1 Garbage

Four garbage samples were collected over the four-day audit period (September 15-18) and delivered to the STS on the same day. In total, 6,145 kg of garbage was delivered to the facility for auditing. Dillon staff subsampled and sorted one sample from each inbound load totalling 435 kg. The audited material was largely residuals (39.6%), compostable organics (33.6%) and RecycleBC depot recycling (8.5%). A breakdown of primary categories is illustrated in Figure 3.

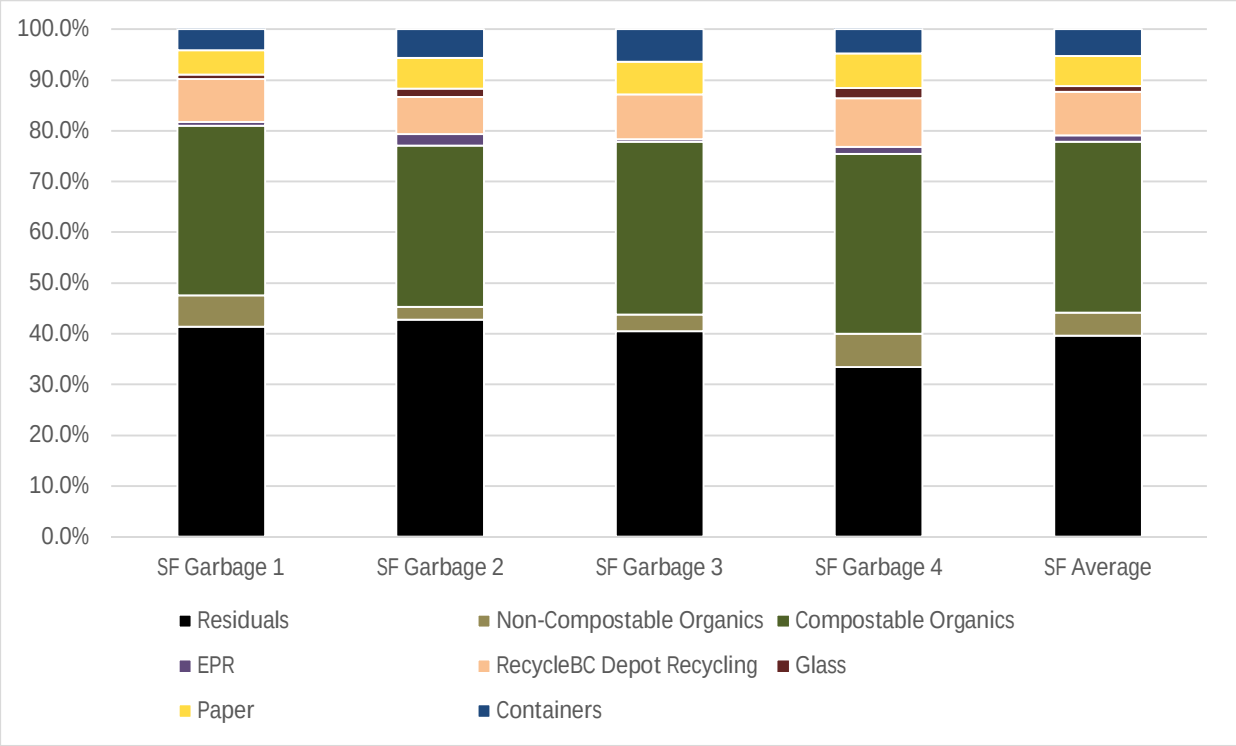


Figure 3. SF Garbage Results by Sample and Overall Average

5.1.1.2 Recycling

Recycling samples from the three recycling streams (containers, paper and glass) were collected each day over the audit period, a total of four recycling samples were assessed in this study. In total, 4,415 kg of recycling was delivered to the STS for auditing purposes. From each recycling sample three sub-samples were taken for auditing, one from each recycling stream (containers, paper and glass). The containers stream was largely containers, with the percent composition ranging from 77.4% (SF 3) to 88.2% (SF 4) and residuals, ranging from 3.3% (SF 4) to 11.3% (SF 3). The most common contaminant was residuals which ranged from 3% to 11%.

The paper stream was largely comprised of paper material and ranged from 90.8% (SF 3) to 97.3% (SF 2). The most common contaminant was glass material, ranging from a low of 0.8% (SF 2) to a high of 4.4% (SF 4).

The sub-samples audited from the glass recycling stream were almost entirely glass material. The glass material category ranged from 91.3% to 100.0%. These results are illustrated between Figure 4 and Figure 6.

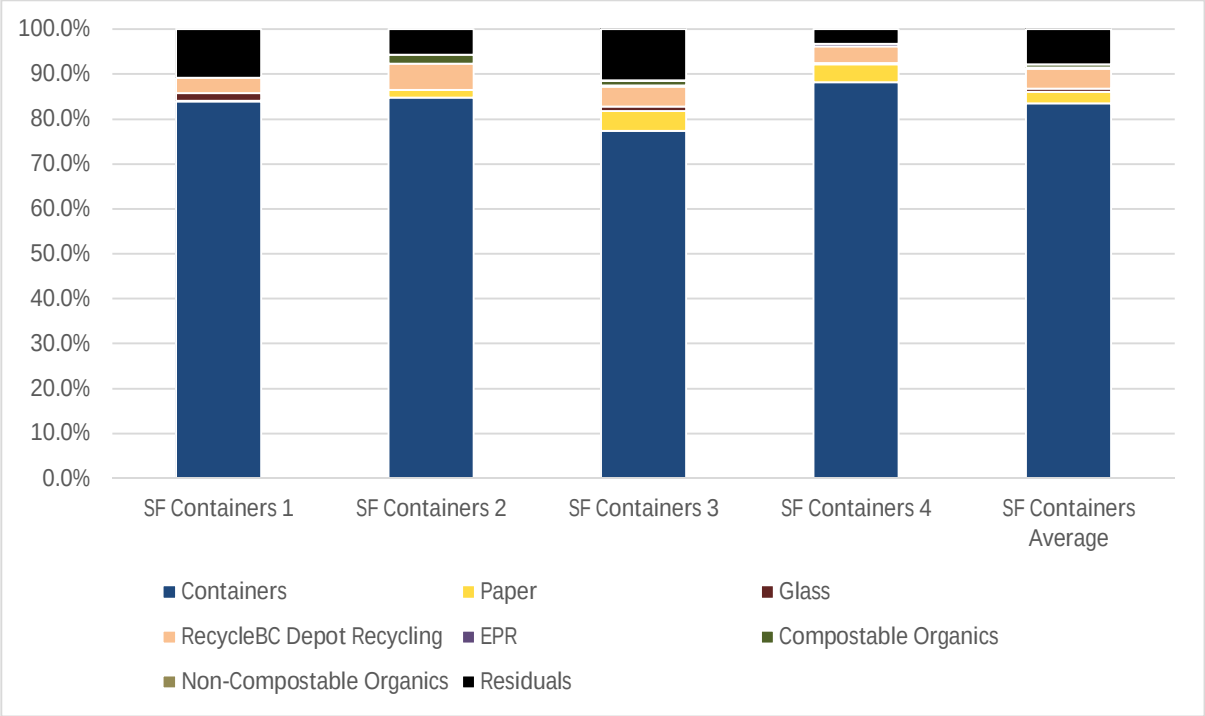


Figure 4. SF Recycling Containers Results by Sample and Overall Average

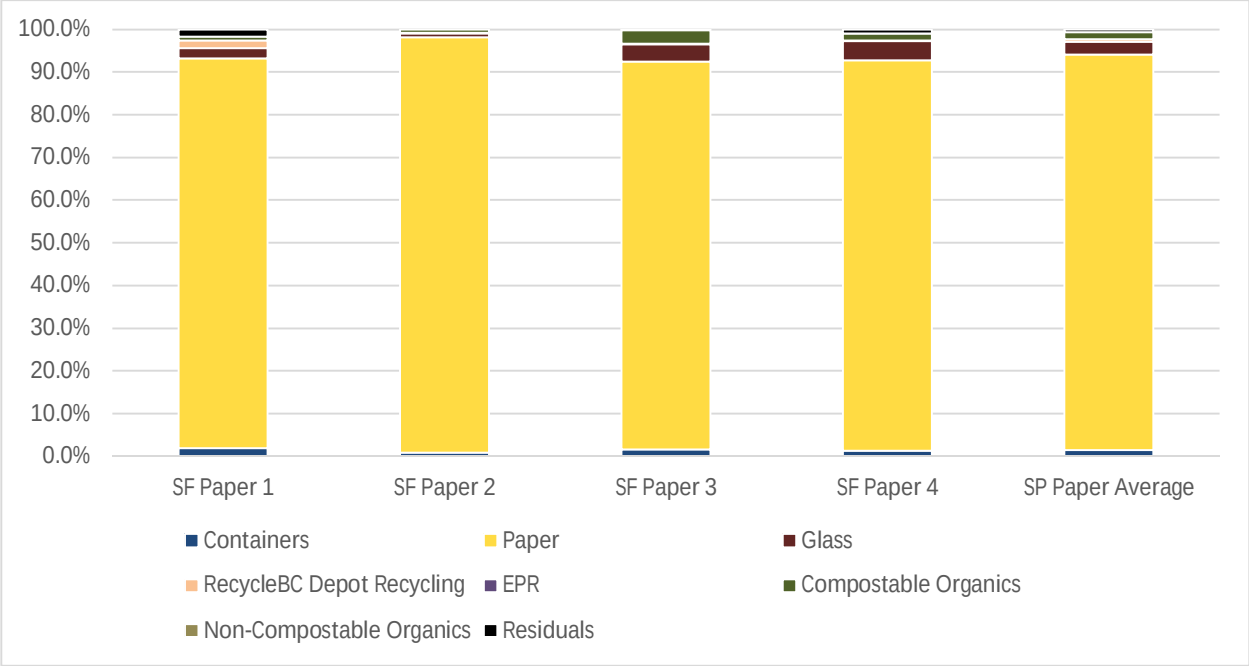


Figure 5. SF Recycling Paper Results by Sample and Overall Average

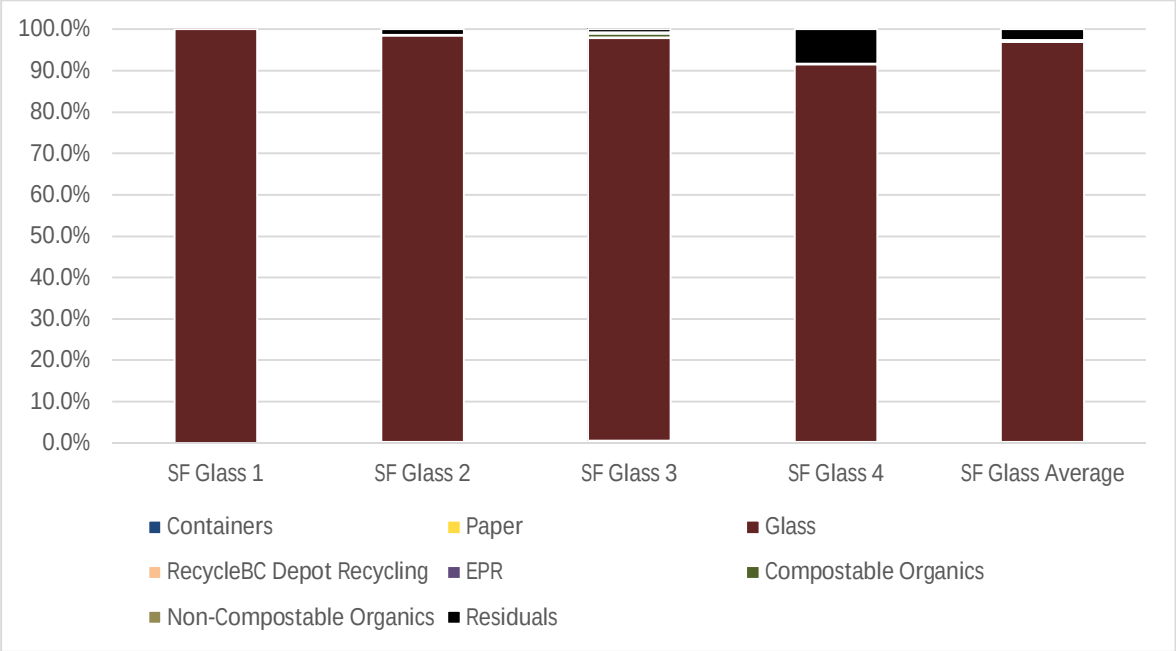


Figure 6. SF Recycling Glass Results by Sample and Overall Average

5.1.1.3 Organics

Organics were collected and delivered to the STS each of the four audit days; however, only three of the samples were audited. The Friday sample was not audited due to unforeseen circumstances at the transfer station. The three samples brought to the transfer station for auditing purposes totalled 2,180 kg. Dillon staff sub-sampled and sorted three samples equalling 313 kg. In each sub-sample audited the compostable organics category comprised at least 97.7% of the overall category. The remaining material was distributed amongst the other material categories. The breakdown of primary categories is illustrated in Figure 7.

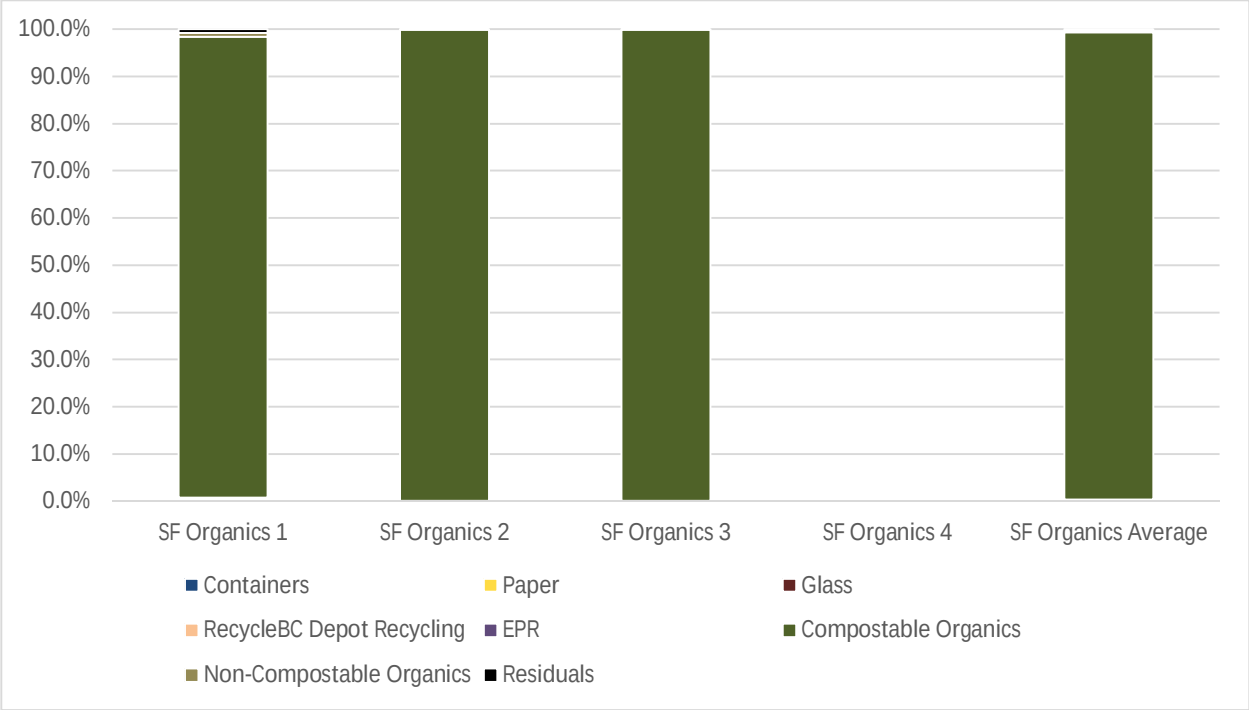


Figure 7. SF Organics Results by Sample and Overall Average

5.1.1.4 Overall Waste Composition

On average, the single-family garbage contained largely residuals (39.6%), compostable organics (33.6%) and RecycleBC depot material (8.5%). The recycling containers stream consisted of mainly containers (83.6%) with residuals (7.7%) and RecycleBC depot material (4.4%). In the paper recycling stream, 92.7% of the material sampled was paper, while 2.9% was glass material. The glass stream was fairly clean with 96.7%, with another 2.6% categorized as residuals. In the organics stream the material was almost entirely compostable organics (99.1%). The breakdown of primary categories is illustrated in Figure 8.

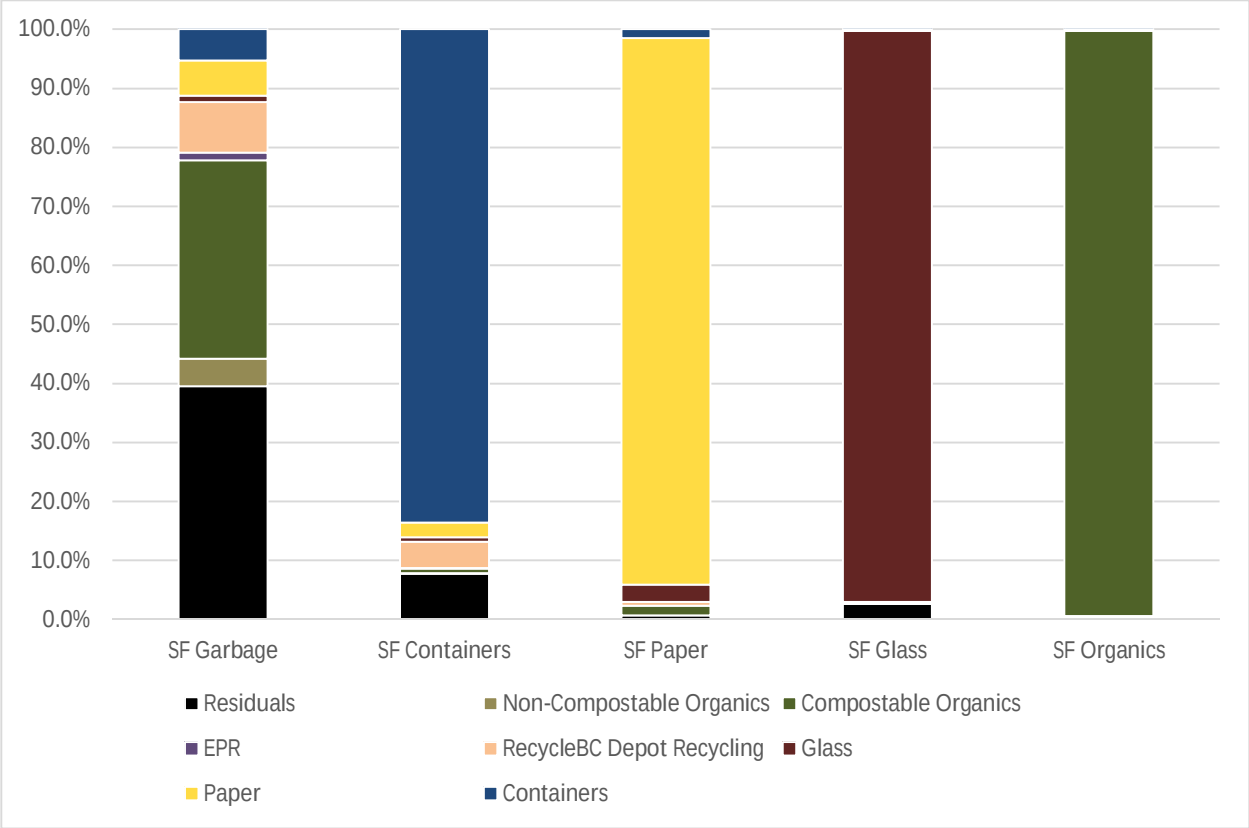


Figure 8. SF Waste by Stream - Overall Average Composition

5.1.2 Multi-Family Residential

Waste samples from multi-family residential buildings were collected and delivered to the STS by two Dillon staff. Collection from the different buildings was spread out over three collections days (September 15-17). The size of each building ranged from 48 to 100 units per building. Waste from four buildings was collected, totalling 17 samples across the different waste streams (garbage, recycling and organics).

5.1.2.1 Garbage

Garbage was collected from four multi-family buildings over three days (September 15-17) and was delivered to the STS for sorting on the same day as collection. In total, 335 kg of waste was collected from the buildings, an average of 84 kg per building. All garbage collected was sorted during the audits. The garbage samples were largely compostable organics, ranging from 32.7% (MF 4) to 47.3% (MF 2), and residuals, ranging from 27.7% (MF 2) to 36.2% (MF 1). The breakdown of primary categories is illustrated in Figure 9. On average, just under 70% of what was contained in the garbage samples could have been diverted.

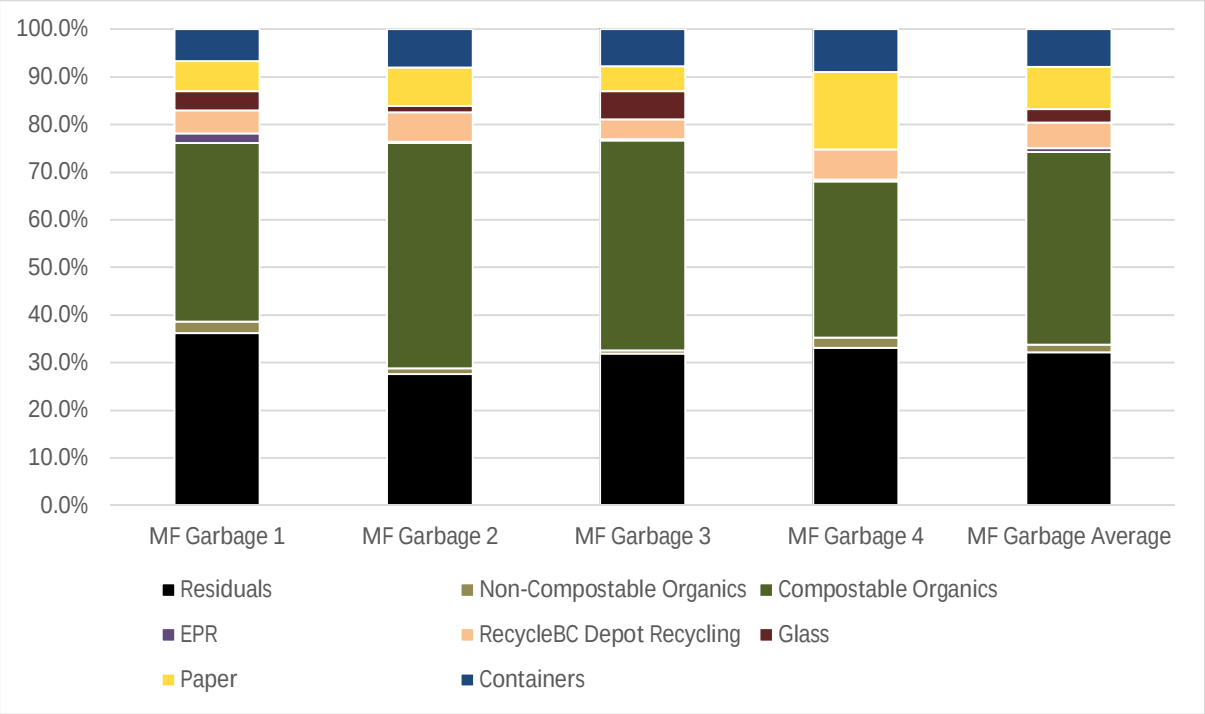


Figure 9. MF Garbage Results by Sample and Overall Average

5.1.2.2 Recycling

Recycling samples were collected over a three-day period (September 15-17) from four multi-family buildings. A total of nine samples were collected from the recycling stream at the buildings (commingled recycling, cardboard and beverage containers), which were combined for the analysis, and totalled 68.6 kg (average of 7.6 kg per sample). For all four buildings, paper comprised at least 50% of the overall material composition (52.9%, MF 4 to 72.2%, MF 1), by weight. The samples were also largely comprised of glass (7.8%, MF 1 to 33.5%, MF 4) and containers (8.4%, MF 4 to 16.8%, MF 3). The breakdown of 8 primary categories for the recycling stream at each of the four buildings and the overall average is illustrated in Figure 10.

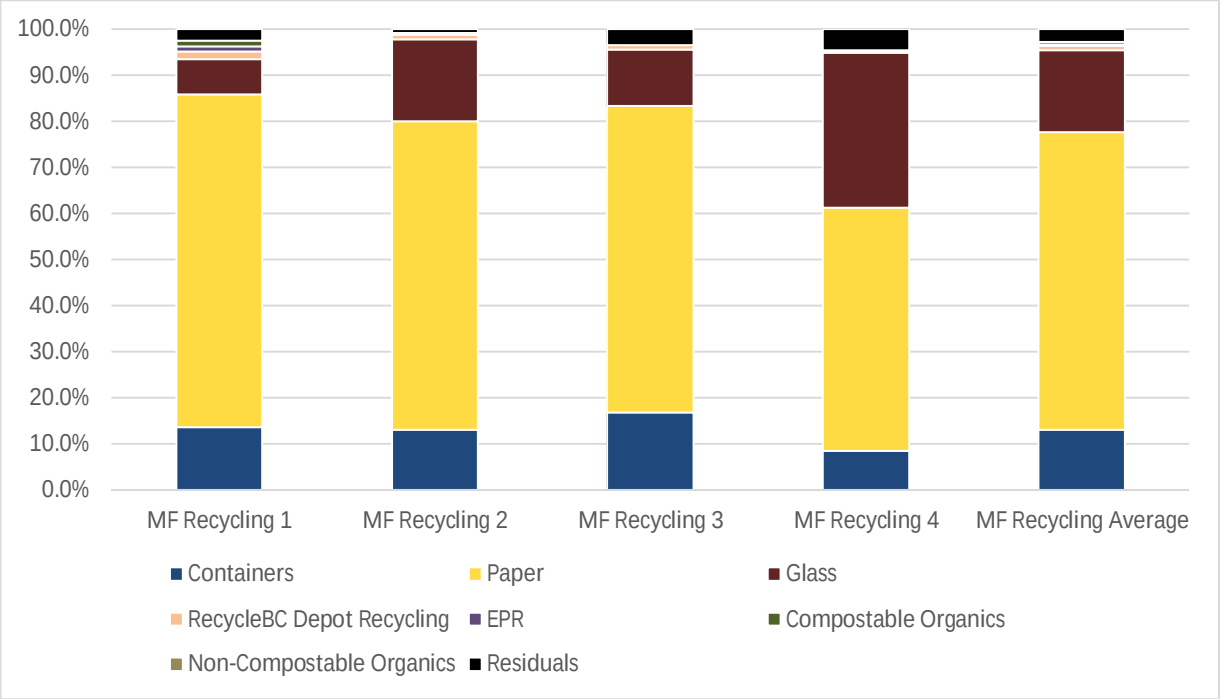


Figure 10. MF Recycling Results by Sample and Overall Average

5.1.2.3 Organics

A total of four organic samples were collected, one from each multi-family building and delivered to the STS for sorting during the audit period. In total, 71.75 kg of organic waste was collected from the buildings and sorted (an average of 17.94 kg per sample). The vast majority of each sample categorized as compostable organics, ranging from 92.6% (MF 4) to 99.2% (MF 3). Of significance, is the low levels of contamination in the organics samples? The breakdown of primary categories of each of the four samples and the overall average is illustrated in Figure 11.

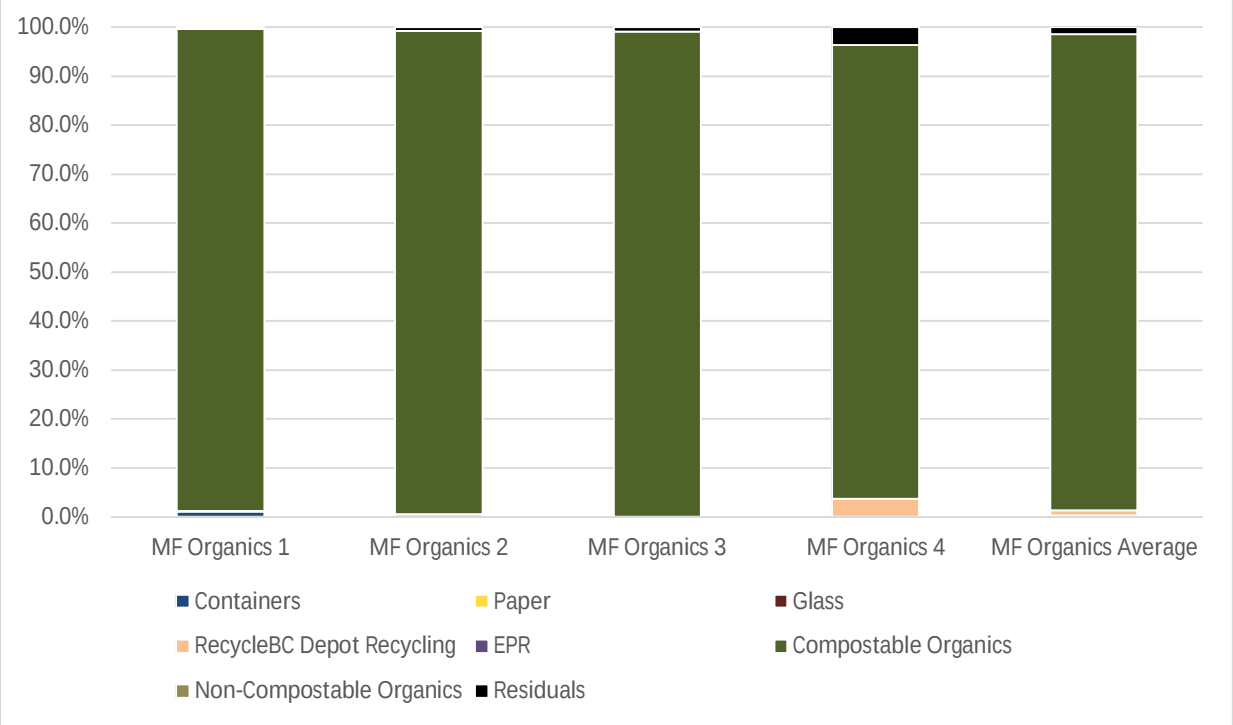


Figure 11. MF Organics Results by Sample and Overall Average

5.1.2.4 Overall Waste Composition

On average, the multi-family garbage stream consisted of less than 35% of actual residuals and non-compostable organics. The largest category of waste in the garbage stream was compostable organics (40.4%). The recycling stream is fairly clean consisting of, on average, 64.7% paper, 17.8% glass and 13.0% containers, while the organics samples were almost entirely compostable organics (averaged 97.2%) with a small amount of residuals (1.4%) and RecycleBC depot materials (1.1%). The breakdown of primary categories is illustrated in Figure 12.

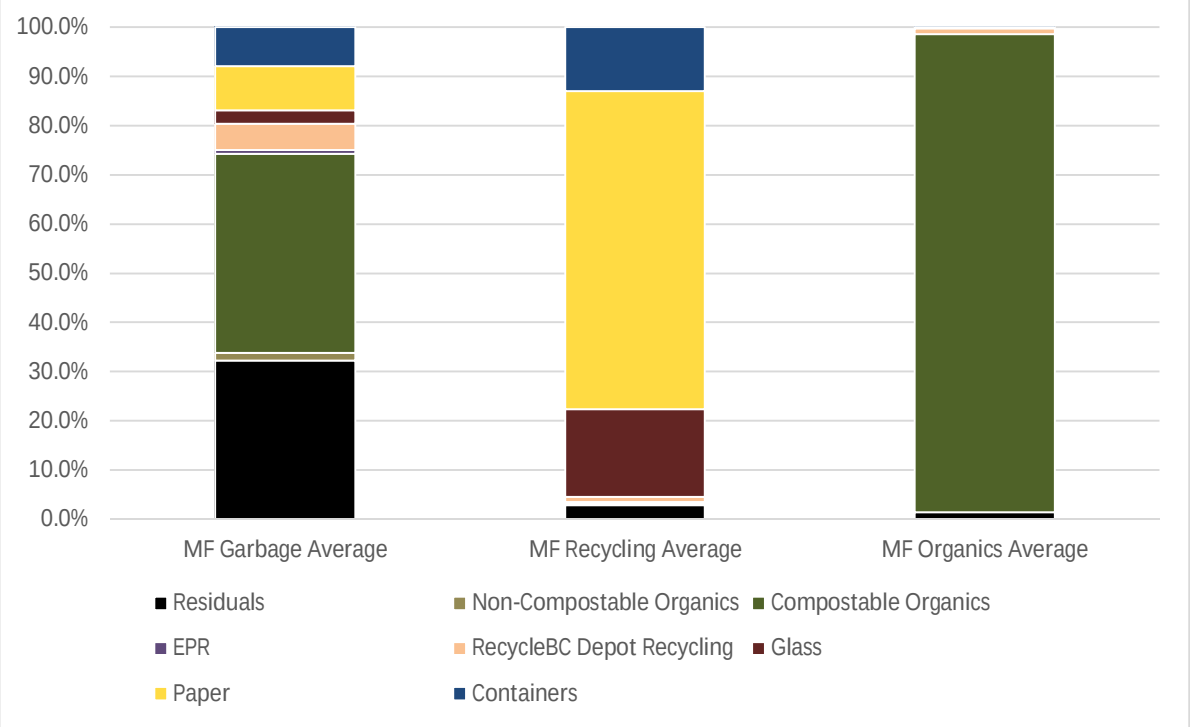


Figure 12. MF Waste Composition - Overall Average Composition

5.1.3 ICI

Waste samples from ICI locations were collected and delivered to the STS by two Dillon staff. Collection from the different locations was spread out over three collection days (September 15, 17 and 18).

The ICI locations were spread across multiple sectors and included City facilities, a restaurant and a food service location. Waste from four locations was collected, totalling 13 samples across the different waste streams (garbage, recycling and organics). We note the ICI sector is highly variable in terms of types of wastes generated and these are snapshots of potential waste in the community.

5.1.3.1 Garbage

Garbage was collected from four ICI locations over three collections days and sorted at the STS. In total, 161.2 kg of samples were collected and sorted, an average of 40.3 kg per sample. Although there is a level of variability in the four samples' composition, all four are largely compostable organics, which ranged from a low of 41.3% (ICI 1) to a high of 83.2% (ICI 3) and residuals, with an observed range between 5.2% (ICI 3) to 25.4% (ICI 2). ICI 1 also had a large component of paper material in its composition (34.7%), a significantly larger amount than observed in the samples from the other facilities. The breakdown of primary categories is illustrated in Figure 13. On average, almost 85% of the contents of the garbage stream could have been diverted.

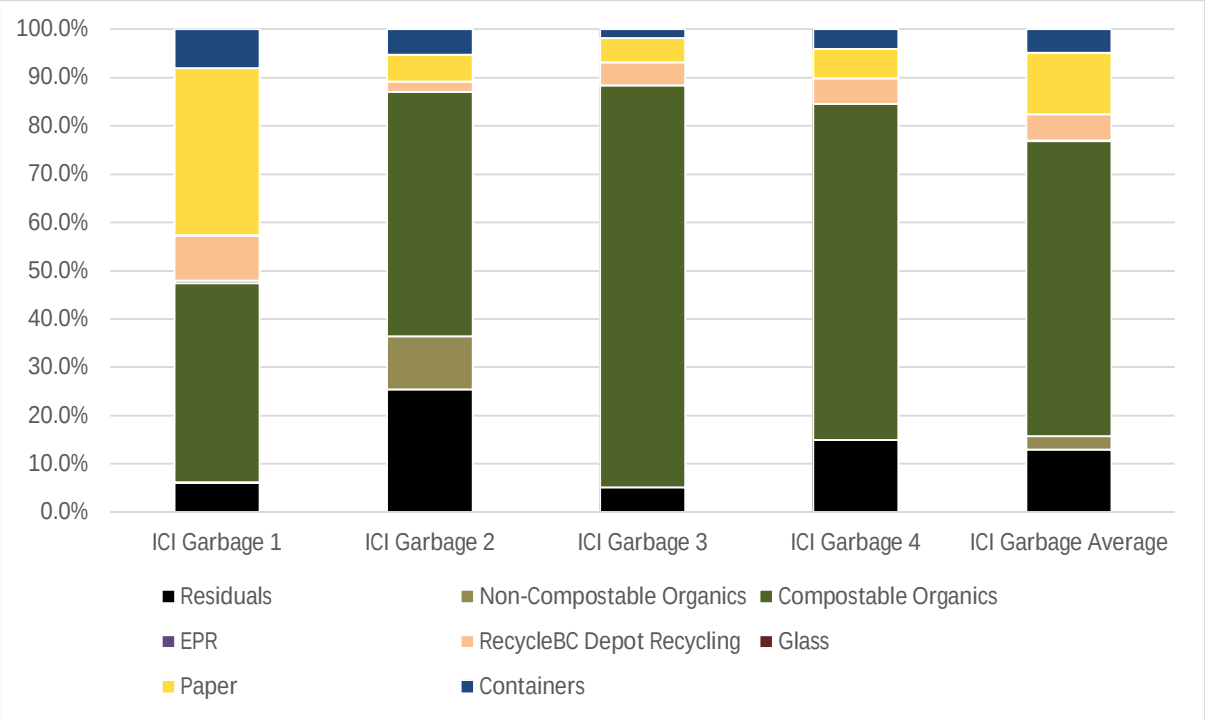


Figure 13. ICI Garbage Results by Sample and Overall Average

5.1.3.2 Recycling

In total, 66.95 kg of recycling samples were collected from the ICI facilities (an average of 9.6 kg per sample). There was a high level of variability observed in the composition of the recycling from each facility. At three of the facilities (ICI 1, ICI 2 and ICI 4), paper comprised the largest part of the recycling sample ranging from 41.8% (ICI 2) to 82.5% (ICI 1). Containers were the largest category of material at the other ICI facility, ICI 3, making up 70.0% of the material sampled. The breakdown of primary categories is illustrated in Figure 14.

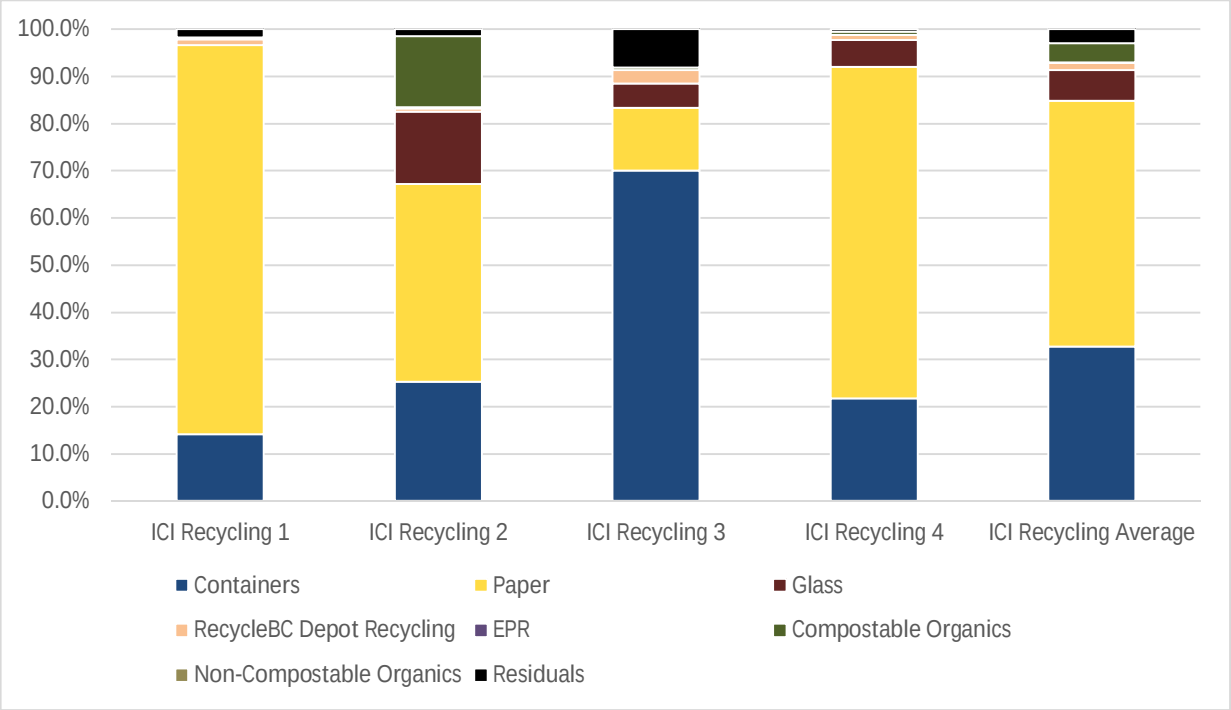


Figure 14. ICI Recycling Results by Sample and Overall Average

5.1.3.3 Organics

Only two of the four ICI facilities (ICI 3, ICI 4) used in the study separately collected organic waste on site. The two samples weighed a total of 65.30 kg, an average of 32.65 kg. Both samples were largely compostable organics, with the material from the ICI 3 sample sorted almost entirely into this material category (96.6%). ICI 4 was also largely compostable organics (88.1%), but also residuals (6.4%). The breakdown of primary categories of each of the two sub-samples is illustrated in Figure 15.

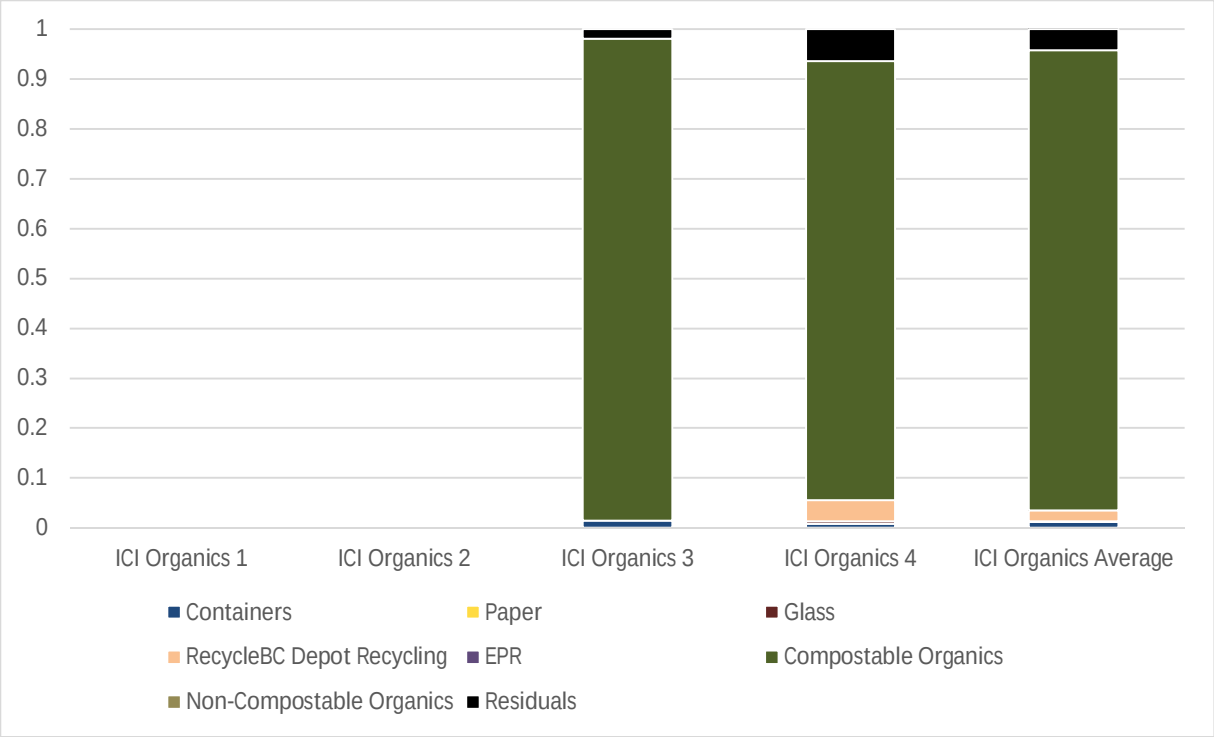


Figure 15. ICI Organics Results by Sample and Overall Average

5.1.3.4 Overall Waste Composition

The average garbage composition from the four ICI facilities indicated that only 15% of the waste was actual residual or non-compostable organic waste. Compostable organics (61.2%) and paper (12.8%) were the largest streams, by weight. In the recycling samples, paper averaged 52.0% of the material sampled, while containers average 32.8% and glass averaged 6.6%. The two organics samples were largely compostable organics (92.4%), residuals (4.2%) and RecycleBC depot material (2.1%). The breakdown of primary categories is illustrated in Figure 16.

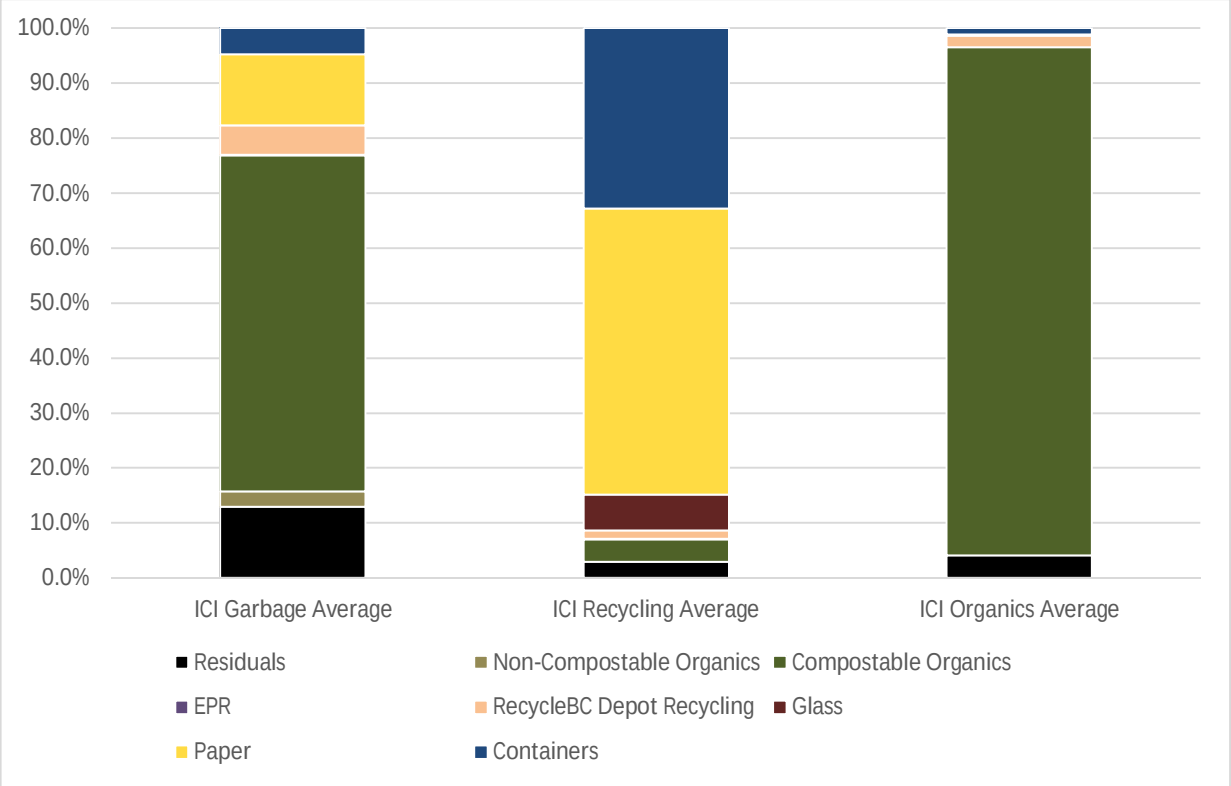


Figure 16. ICI Waste Composition - Overall Average Composition

5.1.4 Comparison to the Baseline Audit

Waste audit results from the recent audit were compared to the results from the baseline 2014 waste audits. In the 2014 study, only one sample from each SF waste stream was audited, two samples from each MF waste stream and one sample of ICI waste. It should be noted that ICI waste originated from two locations; a garbage sample from one location, while the recycling samples were collected from a different ICI location. The 2014 recycling results, which were presented as paper and containers, were amalgamated into one set of recycling results for comparison to the 2019 results. There were no source separated organics samples taken from the MF and ICI sectors in 2014. Due to differences in sorting categories between the two audits, 2014 categories were grouped into the 2019 categories where applicable. As a result of this comparison method, there are no 2014 results that could be converted

into the EPR and non-compostable organics categories. 2014 percentage totals presented in this section may not add to 100% due to rounding of numbers, as values were taken directly from the finalized 2014 report.

5.1.4.1 Single-Family Residential

In the 2014 study, one sample from each SF waste stream was audited. There were a number of observed differences in the results between the two audits. Significant differences include the increase in compostable organics in the garbage increasing from 26% in 2014 to 33.6% in 2019. The containers recycling stream saw a decrease in contamination, decreasing from 40% of the material to 16.4% in 2019. The glass stream also observed a decrease in contamination from 22% in 2014 to only 3.3% in 2019. The paper recycling and organics streams were largely similar between the two survey years. The breakdown of primary categories is illustrated in Figure 17.

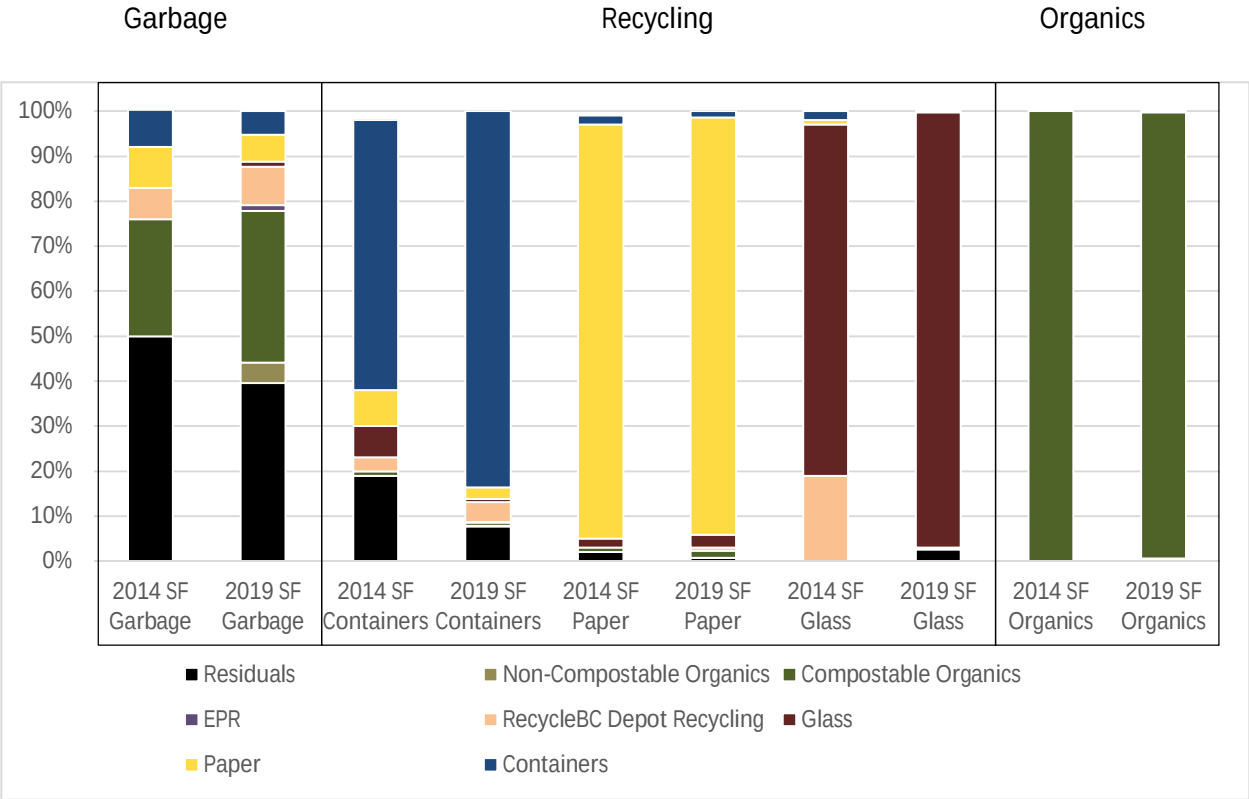


Figure 17. SF Waste Composition - 2014 vs 2019 Comparison

5.1.4.2 Multi-Family Residential

There are some observed differences in the material composition of the evaluated garbage samples between the two audits. There was slightly more divertible materials in the garbage stream in 2019 compared to 2014. Residuals in the garbage decreased by approximately 6% between 2014 and 2019, while compostable organics increased slightly by approximately 1.5%. Residuals in the recycling stream decreased by approximately 4% (7% to 2.8%) from 2014 to 2019. The percent composition of the recycling also varied between the two survey years, which may be a result of the different buildings audited for each survey year. As mentioned above, there was no multi-family organics sample in 2014. The breakdown of primary categories is illustrated in Figure 18.

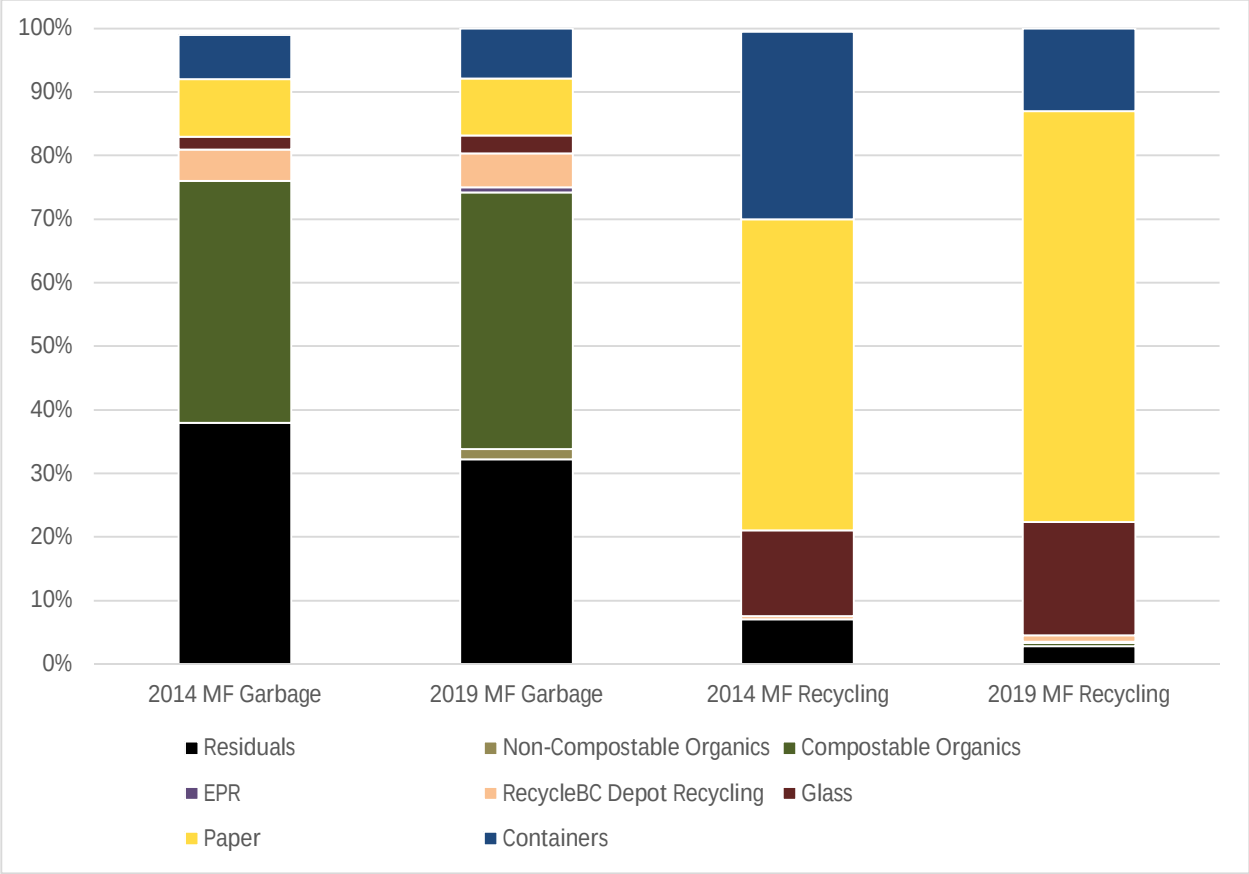


Figure 18. MF Waste Composition - 2014 vs 2019 Comparison

5.1.4.3 ICI

There are large differences in the composition of the garbage and recycling waste streams observed between the two audits (which may be attributed to the facilities audited). The amount of compostable organics in the garbage stream increased significantly to 61.2% in the 2019 audit up from 15% in 2014. Residuals in the garbage decreased significantly from 79% in 2014 to only 12.9% in 2019 meaning that over 85% of the waste found in the garbage stream could have been diverted. Changes in these values could be from differing ICI sectors being selected. Contamination in the garbage stream from recyclables had an observed increase, with containers and paper increasing by approximately 4% and 11% respectively.

In the recycling stream, compostable organics increased slightly by approximately 2%; however, residuals decreased by approximately 2%. There was an observed difference in the percent composition of the containers, paper and glass material categories. Differences in the composition of the garbage and recycling between 2014 and 2019 results are likely due to the differences in characteristics in the facilities selected to be audited. As previously mentioned, recycling was collected from only one ICI location, while in 2019 waste was collected from four locations. In 2014, ICI recycling was collected from businesses along the waterfront and the garbage stream was collected from a senior healthcare centre. There was no ICI organics sample audited in 2014. The breakdown of primary categories is illustrated in Figure 19.

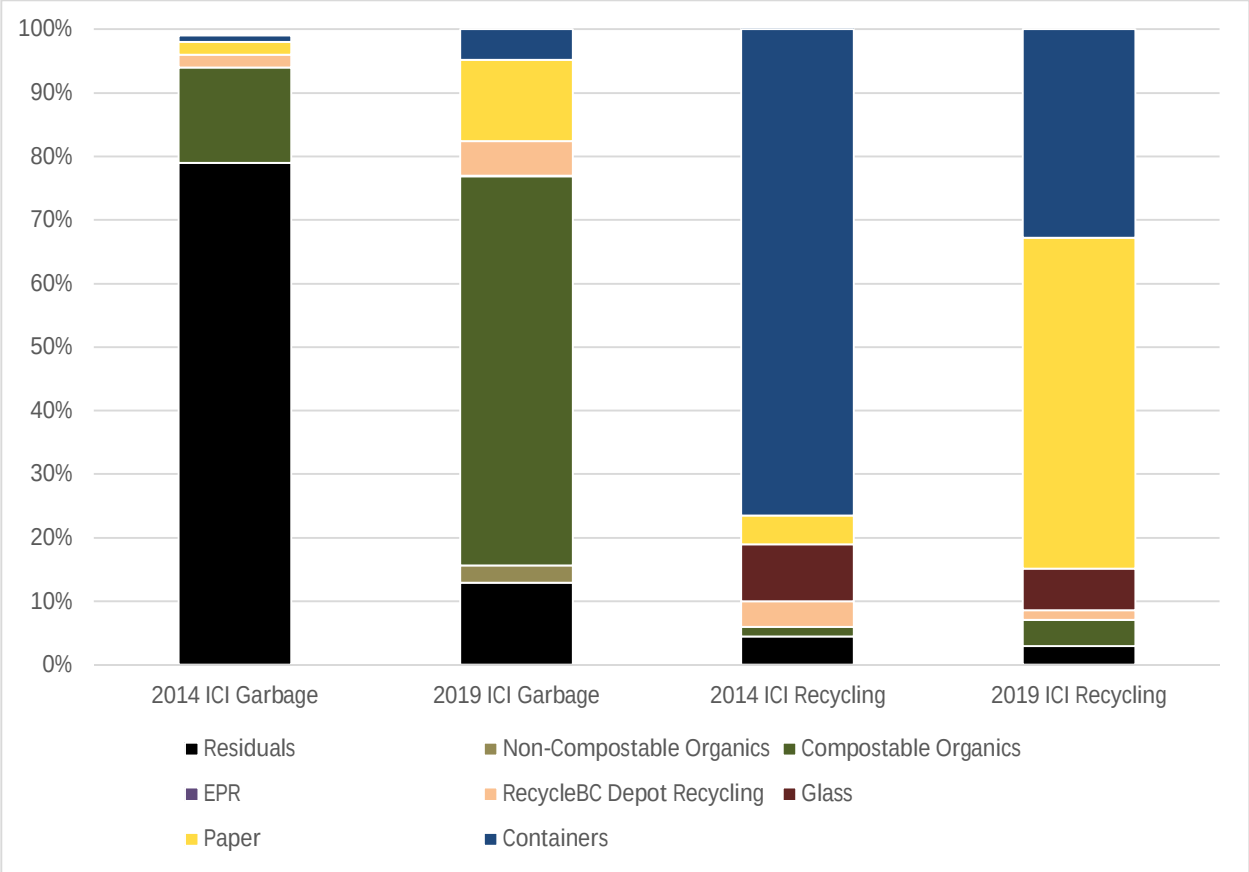


Figure 19. ICI Waste Composition - 2014 vs 2019 Comparison

5.1.5 Banned Materials

Metro Vancouver has banned divertible materials from disposal at their waste facilities through the Metro Vancouver Tipping Fee and Solid Waste Regulation Bylaw. Table 5 provides a list of the banned materials types as defined by Metro Vancouver, and the corresponding material sorting categories used in the waste audit. A significant percentage of waste disposed into the garbage stream in all three sectors falls under a banned material category per Metro Vancouver's Bylaw. The SF sector had the lowest percentage of banned materials in the garbage with 42.6% of garbage audited, while the ICI sector had the highest percentage of banned materials with 54.1% in the garbage. Food waste was the largest percentage of banned materials across all three sectors with 22.4% (SF Garbage), 32.1% (MF Garbage) and 36.2% (ICI Garbage) of material. Table 6 provides the overall data for banned materials as categorized by Metro Vancouver.

Table 5. Metro Vancouver Banned Material List & Corresponding Audit Sorting Categories

Metro Vancouver Banned Material	Audit Sorting Categories
Beverage Containers	• Refundable Deposit Beverage Containers (Non-glass) • Beverage Containers (Glass)
Containers	• #1 Plastic Containers – Rigid (PPP EPR) • #2 & #4 Plastic Containers – Rigid (PPP ERD) • #6 Plastic Containers – Rigid (PPP EPR) • All Other Plastic Containers – Rigid (PPP ERP) • Metal Containers – PPP ERP • Paper Containers – PPP EPR
Corrugated Cardboard	Corrugated Cardboard
Recyclable Paper	• Office Paper • Newspaper and Flyers • Paper – PPP EPR • Bound Paper Products • Boxboard
Expanded Polystyrene Packaging	Foam (PPP ERR, Non-Food Ware)
Food Waste	Food Waste
Green Waste	Yard and Garden Waste
Clean Wood	Clean Wood
Product Stewardship Materials	• Electronic Waste • Household Hazardous Waste

Table 6. Overall Banned Material Contained in the SF, MF and ICI Garbage Streams

	SF Garbage	MF Garbage	ICI Garbage
Beverage Containers	0.7%	3.4%	0.4%
Containers	10.9%	6.7%	2.9%
Corrugated cardboard	0.7%	0.9%	9.1%
Recyclable Paper	5.3%	6.6%	5.2%
Expanded polystyrene packaging	0.2%	0.0%	0.1%
Food Waste	22.4%	32.1%	36.2%
Green Waste	1.2%	0.6%	0.1%
Clean Wood	0.0%	0.0%	0.0%
Product Stewardship Materials	1.2%	1.1%	0.1%
Total	42.6%	51.4%	54.1%

Shading indicates category with largest percentage of banned material.

5.2 Historical Waste Quantities

Historical waste quantities were provided to Dillon by the City for inclusion in this report. Table 7 provides the historical data from 2011 to 2018, presented in metric tonnes. It should be noted that prior to June 2015, residential weights may have included some MF/ICI waste. Garbage and recycling quantities have decreased by 43.7% and 21.1% respectively during this time (most likely due to the removal of MF/ICI materials) , while the amount of green waste generated has remained relatively constant over the eight years, with no noticeable increase given the food scraps inclusion which was introduced in 2015.

Table 7. Single-Family Residential Historical Waste Quantities in Metric Tonnes

	2018	2017	2016	2015	2014	2013	2012	2011
Garbage	1,182	1,163	1,238	1,343	1,453	1,559	2,011	2,101
Recycling	799	759	806	842	781	1,020	947	1,013
Green Waste	1,645	1,589	1,672	1,693	1,638	1,737	1,679	1,632
Total	3,626	3,511	3,716	3,878	3,872	4,316	4,637	4,746

5.2.1 Waste Quantities

Waste quantities for single-family residential households were projected for the 20-year planning period (2020-2040). Although population growth rates based on 2016 census published counts are 3.2%, as seen in the exert below population estimates from Metro Vancouver are taken from the White Rock Official Community Pan[18] (OCP) and are used for projections of population and SF tonnages as follows (approximately a 0.89% growth rate).

White Rock Population, Dwelling, and Employment Projections to 2045

	2016*	2021	2031	2041	2045
Population	19,950	20,925	22,870	24,820	25,600
Dwellings	10,860	11,670	13,290	14,910	15,560
Employment	7,400	7,800	8,400	9,300	9,600

Table 1 White Rock Population, Dwelling and Employment Projections to 2045

*the 2016 population and dwelling estimates are taken from 2016 Census published counts. Population and dwelling estimates prepared by Metro Vancouver may include additional estimates of population and dwelling Census undercount.

A detailed breakdown of the projected population and generation growth are included in Appendix C. The annual waste generation data was calculated based on a number of general assumptions which are detailed in Appendix D.

[18] City of White Rock Official Community Plan, 2017, No. 2220. City of White Rock. Accessed at https://www.whiterockcity.ca/DocumentCenter/View/276/Consolidated---Official-Community-Plan-Bylaw-2017-Number-2220-PDF?bidId=

The approximate single-family household population for the City was calculated using the number of residential households with waste collection services provided by the City (4,105 households) and the average number of people per household as per Statistics Canada (1.9)[19]. Using residential waste disposal tonnage statistics provided by the City, per capita disposal/collection rates for each waste stream were calculated. Calculated values are presented below:

- Single-family Garbage Disposal Rate = 0.42 kg/person/day;
- Single-family Recycling Collection Rate = 0.28 kg/person/day; and
- Single-family Green Waste Collection Rate = 0.58 kg/person/day.

Waste disposal/collection estimates for the single-family residential garbage, recycling and green waste streams are presented in Table 8. 2018 disposal numbers are actual generation numbers provided by the City and are displayed to provide reference to the projections. If current disposal practices remain unchanged, by 2040 the single-family residential population in the City is projected to generate 1,436 tonnes of garbage, 971 tonnes of recycling and 1,999 tonnes of green waste, up from 1,182 tonnes, 799 tonnes and 1,645 tonnes in 2018 respectively.

Table 8. Single-Family Residential Waste Disposal Quantity Projections for 20 Year Planning Period

Year	SF Population Estimate[1]	SF Garbage Generation Estimates (tonnes)	SF Recycling Generation Estimates (tonnes)	SF Green Waste Generation Estimates (tonnes)	SF Total Waste Generation Estimates (tonnes)
2018[2]	10,263	1,182	799	1,645	**3,626**
2020	10,446	1,203	813	1,674	**3,691**
2025	10,920	1,258	850	1,750	**3,858**
2030	11,414	1,315	889	1,830	**4,033**
2035	11,931	1,374	929	1,912	**4,215**
2040	12,472	1,436	971	1,999	**4,406**

[1] Population projections are taken from 2016 Canadian Census published data and consistent with the projections from the White Rock Official Community Plan, approximately 0.89%.

[2] 2018 values are actual quantities of waste collected by the City.

5.2.2 Performance Monitoring

As part of the RecycleBC program, the recycling generated in the City is subject to regular performance audits, usually once per quarter. The RecycleBC program requires contamination in amounts less than 3% or the municipality is at risk of fines. In the last quarter (Q2 2019), 15.5% of the recycling was categorized as incompatible material, while 5.1% was material not accepted in the RecycleBC program. Incompatible material includes accepted PPP material made from two or more different materials,

[19] City of White Rock Census Profile, 2016 Census. Statistics Canada. Accessed at https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5915007&Geo2=CD&Code2=5915&SearchText=white%20rock&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0

making it incompatible with recycling processes. Unacceptable material is defined as any material that is not packaging and printed paper (PPP). When compared to the City's all-time performance, in Q2 2019 there was an improvement in the contamination rate of incompatible material (17.6% all time), however the contamination rate for non-accepted material was above the all-time percentage (4.8%).

5.3 Waste Diversion Rate

In order to assess performance in terms of waste diversion, three different ways of estimating diversion rates were calculated as follows:

1. Tonnage Diversion Rate (calculated using total waste stream tonnages, even if material was incorrectly disposed in the recycling and organics streams);
2. Diversion Rate (amount of material properly diverted in the recycling and organics streams); and
3. Potential Diversion Rate (if all material was disposed in correct waste stream).

Diversion rates for the three scenarios are presented in Table 9. The single-family residential sector has the highest tonnage diversion rate and diversion rate at 67.4% and 66.0%, respectively. The multi-family residential sector has the lowest diversion rates at 28.0% (tonnage diversion rate) and 27.0% (diversion rate). The potential diversion rate of each sector was also calculated and was determined to be 84.5% (SF), 75% (MF) and 88% (ICI), respectively. Potential diversion assumes all divertible waste contained in the garbage stream is diverted into either the recycling or green waste programs. For the single-family residential calculation, 2019 audit results were used to gather material category breakdowns and extrapolated using tonnage statistics provided for 2018 by the City. Potential diversion rates for the multi-family residential and the ICI sector are subject to assumptions presented following the table.

Table 9. Diversion Rates for the SF, MF and ICI Sectors

	Tonnage Diversion Rate	Diversion Rate	Potential Diversion Rate
Single-Family Residential	67.4%	66.0%	84.5%
Multi-Family Residential	28.0%	27.0%	75%[1]
ICI	33.2%	32.0%	88%[1]

[1]MF and ICI sector potential diversion rates were calculated using the following assumptions:

- Sector potential diversion rates are averages of the four MF buildings and four ICI facilities audited for each sector and are not averages for each sector across the entire city;
- Data for MF and ICI sector rates are from the 2019 waste audit, and not sector data from the entire city;
- Weekly and annual tonnage estimates for waste streams are based on volumes estimates of waste present during sample collection and not tonnages; and
- Future requirements for all ICI facilities to implement green waste collection.

6.0 Financial Overview

Waste management and collection costs borne by the City are limited to single-family dwellings, multi-family dwellings under six units (with some exceptions) and City facilities for which the City is responsible for providing waste collection services. A review of expenses and revenues was completed for the years 2015 to 2018, with financial data provided to Dillon by the City. Overall expenses and revenues can be found in Table 10 and illustrated in Figure 20. A breakdown of waste management expenses and revenues is provided in Section 6.1 as per information provided to Dillon by the City. The breakdown was not utilized in Table 10 and Table 11, as these line items were not reflected in the City's Annual Financial Report. Sources of expenses and revenues include:

Waste Management Expenses:

- Allocated Administration Fees
- Consulting/Administration Advertising
- Collection Program Costs
  - Wages
  - Advertising
  - Supplies
  - Program Costs (Collection)
  - Tipping Fees
  - Allocated Vehicle Costs

Waste Management Revenues:

- User Fees
- Civic Facilities Recovery
- Garbage Program Revenue
  - Excess Bag Decal Sales
  - Composter Sales
  - Roll Out Totes
- Green Waste Program Revenue
  - Kraft Bag Sales
- Recycling Program Revenue
  - RecycleBC Revenue
  - Blue & Red Box Sales
  - Roll Out Totes

It should be noted that part way through 2015 the City stopped waste collection services for the majority of multi-family residential and all ICI facilities.

Table 10. City of White Rock Overall Solid Waste Management Expenditures and Revenues for 2015 to 2018

	2015	2016	2017	2018
Revenues	$994,988	$1,598,979	$1,566,775	$1,569,335
Expenses	$1,617,115	$1,232,189	$1,294,212	$1,378,490
Surplus (Deficit)	($622,127)	$366,790	$272,563	$190,845

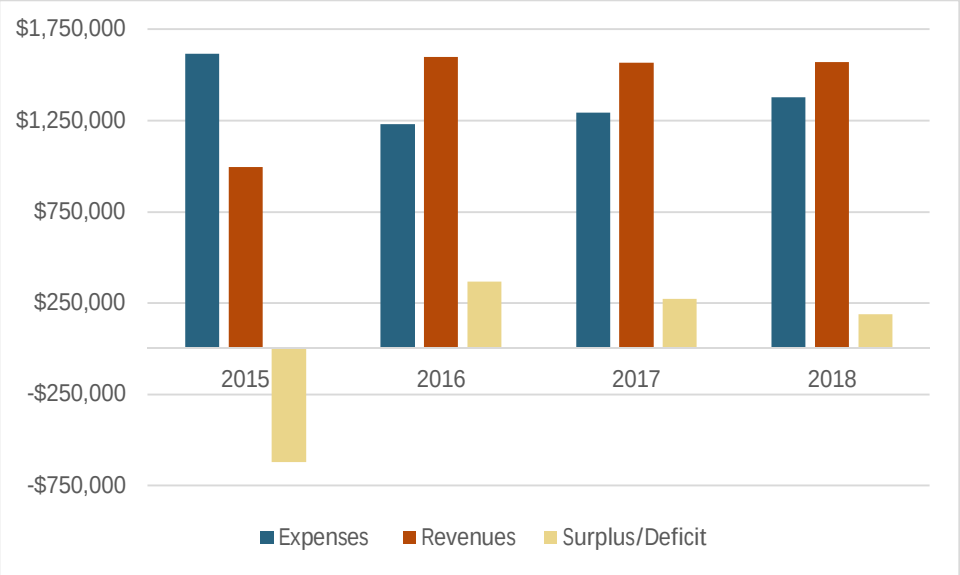


Figure 20. City of White Rock Waste Collection Expenditures and Revenues for 2015 to 2018

6.1 Breakdown of Revenues and Expenses

The financials for the waste collection program, including expenditures and revenues, are provided in Table 11 and illustrated in Figure 21. Waste collection expenses and revenues include:

Waste Collection Expenses:

- Salaries, wages and benefits
- Contracted Services
- Supplies and Other
- Amortization

Waste Collection Revenues:

- Solid Waste Services
- Other

After changes were implemented to solid waste collection services in 2015, a year in which there was a deficit in waste collection services, the City posted a surplus in 2016 and again posted surpluses in 2017 and 2018. It should be noted that surplus have decreased in each year following 2016. The majority of revenues are from Solid Waste Services, with comparable revenues between 2016 and 2018. Salaries, wages and benefits, along with contracted services are the two largest expenses and account for over 80% of expenses between 2016 and 2018.

Table 11. Waste Collection – Breakdown of Expenditures and Revenues for 2015 to 2018

	2015	2016	2017	2018
Revenue				
Solid Waste Services	$981,917	$1,567,670	$1,543,018	$1,544,582
Other	$13,071	$31,309	$23,757	$24,753
Expenses				
Salaries, wages and benefits	$646,906	$530,234	$544,965	$578,231
Contracted services	$681,573	$494,106	$514,741	$565,331
Supplies and other	$184,564	$113,834	$140,491	$140,913
Amortization	$104,072	$94,015	$94,015	$94,015
Surplus (Deficit)	($622,127)	$366,790	$272,563	$190,845

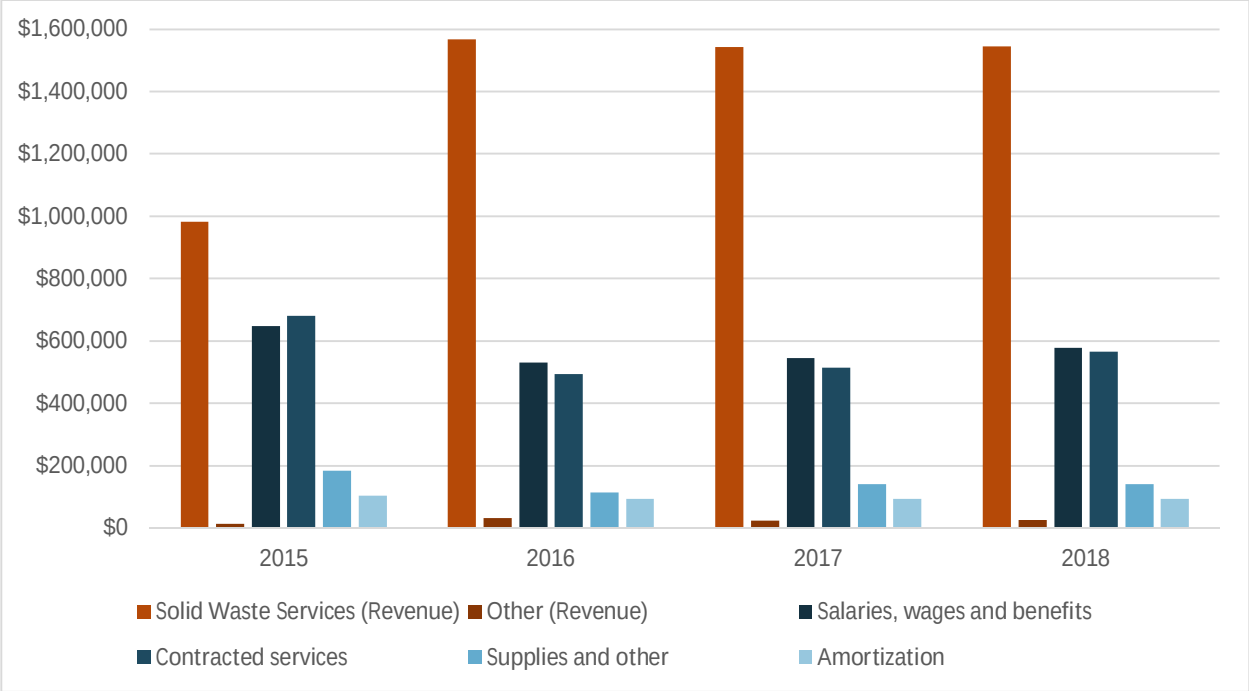


Figure 21. Waste Collection – Breakdown of Expenditures and Revenues for 2015 to 2018

7.0 Municipal Jurisdictional and Best Practices Review on Waste Diversion and Management

The waste management industry, including municipal solid waste management, is ever evolving. Solid waste management practices need to adapt to a number of changes with respect to a shift in the regulatory landscape, strategic government goals and targets, and consumer behaviours and trends to include zero waste strategies, reduced plastics/product packaging, and the circular economy. With all these changes comes innovative and exciting initiatives, programs and technologies that are being implemented by jurisdictions in order to adapt to the ever changing environment.

7.1 Methodology

A review of waste management practices, initiatives, programs and strategies was undertaken on a select number of local neighbouring jurisdictions. These jurisdictions were chosen based on how comparable the demographics were to the City of White Rock (e.g. population, density), legislative requirements and on their progressive approaches to managing waste in the following categories:

- Waste Diversion Programs;
- Waste Diversion Policy and Enforcement;
- Waste Avoidance and Reduction;
- Single-Family Waste Collection;
- Multi-Family Waste Collection;
- ICI Waste Collection; and
- Streetscape and Public Spaces Waste Management.

The following six jurisdictions were selected to be a part of this review. Rationale for each selected municipality is provided in Table 12.

- City of Langley;
- City of North Vancouver;
- City of Port Coquitlam;
- City of Port Moody;
- City of Surrey; and
- Metro Vancouver Regional District.

If additional best practices are known from outside these jurisdictions they were included in the review for consideration. Additional best practices are topic specific. If a selected jurisdiction does not have a best practice in a specific topic, they were not included in that review.

Table 12. Rationale for Selected Jurisdiction

Jurisdiction	Population	Population Density (Per km ^{2})	Rationale for Inclusion in Best Practices Research
City of White Rock	19,952	1,751	N/A
City of Langley	25,888	2,534	• Small land size; and • Manual SF collection.
City of North Vancouver	52,898	4,465	• Small land size; and • Municipal manual SF collection.
City of Port Coquitlam	58,612	2,009	• Municipal multi-family waste collection Municipal SF collection.
City of Port Moody	33,551	1,296	• Small land size; • Municipal multi-family and commercial waste collection; and • Municipal SF collection
City of Surrey	517,817	1,637	• Similar population density; and • Establishing and promoting waste reduction strategies including a single-use item strategy.
Metro Vancouver Regional District	2,463,000	912	• Material disposal bans; • Aggressive waste reduction/diversion strategy; • Innovative programs; and • Updating long term master plan.

7.2 Waste Diversion Programs

Waste diversion programs include initiatives focused on diverting valuable material from disposal through recycling and composting. Historically, municipalities have provided recycling services for the single-family sector (and some parts of the multi-family and ICI sectors – typically those that could be serviced in the same way as single-family). In 2014, the stewardship organization Multi-Materials BC (now RecycleBC) assumed responsibility for recycling packaging and printed paper (PPP) from single-family homes and multi-family buildings. Recyclables generated by the ICI sector are managed primarily by the private sector. Organics are similarly collected from single-family homes by the municipality, with the private sector often managing collection from the multi-family and ICI sectors. Recycling and composting are recovery operations where 'waste' materials are reprocessed into new products, either for the original or other purposes.

7.2.1 City's Current Approach

The City collects recycling and green waste on a weekly basis from single-family homes. Recycling consists of a blue box for containers (plastic and metal), yellow bag for paper (including cardboard and newspaper) and a red box for glass. Collection of green waste (yard trimmings and food scraps) occurs weekly through the City's Green Can program.

7.2.2 Best Practices Review Results

RecycleBC is responsible for the residential packaging and paper recycling in BC. RecycleBC advocates for multi-stream recycling over single-stream. Multi-stream means paper is separated from metal, plastic containers and glass. Single-stream recycling (all materials in the same bin/cart) is often viewed as more convenient, however sorting recycling into multiple streams has several benefits including[20]:

- Paper is protected from food or liquids that might be left over inside food containers, keeping the paper "clean" and protecting its value for end-markets.
- Residents tend to pay closer attention to what materials are accepted in their curbside program when they need to take the extra step of sorting material. This results in lower contamination levels in the recycling.
- Multi-stream collection containers allow drivers to easily see if any non-recyclables or not-accepted items have been placed into the recycling bins, which helps avoid contaminants from entering the recycling stream in the first place.

Table 13 provides 2017 recycling contamination rates for jurisdictions selected for this review and indicates if their programs are multi-stream or single-stream. It should be noted that in a recent, 2019 RecycleBC audit, the City's contamination rate was 4.8%.

[20] RecycleBc (2016) https://recyclebc.ca/sort-before-to-recycle-more/

Table 13. Recycling Contamination Rates (2017)

Municipality	Multi-Steam or Single-Stream Recycling	Recycling Contamination Rate[21]
City of White Rock	Multi-Stream	6.4%
City of Langley	Multi-Stream	5.3%
City of North Vancouver	Multi-Stream	4.2%
City of Port Coquitlam	Single-Stream	9.3%
City of Port Moody	Single-Stream	11.2%
City of Surrey	Single-Stream	10.9%

Table 14 provides best practices for waste diversion programs for select jurisdictions.

Table 14. Waste Diversion Programs Best Practices Review

Jurisdiction	Best Practice
City of Langley	Large Item Pick-Up Residents of single-family homes can have four large items per calendar year collected curbside for disposal. Residents call and schedule a collection time with the City's contracted waste hauler. This service is to be used for furniture and appliances.
City of North Vancouver	Zero Waste Coach If there is a need for recycling or organics support at a building, school or community group, the City of North Vancouver will provide a zero waste coach. The City's Zero Waste Coach provides resources and support to help increase recycling and food scraps diversion including visiting multi-family buildings, businesses or schools to assess recycling needs, educate residents on proper recycling at strata meetings, conduct lobby info sessions at multi-family buildings or at community events/meetings, and help with signage and posters. Zero Waste at Events Event coordinators, typically for smaller events and block parties, can ask for a zero waste station. The Zero Waste Station includes up to 10 collection frames for five disposal streams (beverage containers, mixed paper, mixed containers, compostable materials, garbage), along with flag banners to increase the visibility and profile of the waste station.
City of Port Coquitlam	Ask the Ambassadors The City has hired two Ambassadors to work with the community to improve compliance with the Solid Waste Bylaw. In particular, sorting waste properly and securing bear attractants. Ambassadors are available to answer questions, provide resources and make presentations to groups, strata and schools. PoCo Waste-Line App This on-line tool is used to help residents connect to City waste management services. The app can be used to: • Import a personalized collection schedule into their online calendar;

[21] RecycleBC (2017) https://recyclebc.ca/what-is-contamination/

Jurisdiction	Best Practice
	• View and print their personalized schedule; • Sign up for personalized collection reminders; • Use the Sort it Right waste wizard to know what goes where; • Stay up to date about changes to the collection schedule or service; and • Report a problem with any city service (e.g. a missed pickup, a pothole or a malfunctioning streetlight).
City of Port Moody	Solid Waste App Residents can sign up to receive a text, email, tweet, or call the night before their waste collection day. The app will remind them what carts to put out, as well as if it's a glass recycling week. Large Item Collection Residents can (for a fee) have large items collected curbside from Waste Connections of Canada (WCC). Residents call WCC and identify themselves as Port Moody residents. An appointment will be made to collect the large item, then residents will receive an invoice for the item collected.
City of Surrey	Organics Diversion Program The City of Surrey implemented their curbside organics program in 2011 and in 2018 constructed a biofuel facility to process the collected organics. One of the products created at the biofuel facility is renewable natural gas (RNG). The City uploads the RNG to the FortisBC natural gas energy grid and makes use of the equivalent of 100% of the RNG generated at the facility for use in their curbside collection contractor's vehicles. The FortisBC program currently has five suppliers including the Surrey biofuel facility. It is estimated that the FortisBC suppliers will produce 320,000 GJ of RNG, enough to heat 3,500 homes for a year. This reduces BC's carbon footprint and captures methane that would otherwise be released into the atmosphere. Large Item Pick-Up All households that receive curbside collection from the City of Surrey are entitled to up to four large item disposals throughout the course of the calendar year. Residents can call the City of Surrey Waste Collection to schedule a Large Item Pick-up or book online. The City encourages residents, if items are gently used and in working condition to consider donating them to a local thrift store, or selling them through Surrey Reuses. Items accepted in this program include: • Baby/ Kids Items • Bed/ Mattresses • Bikes • Cabinets/ Shelves/ Tables • Computers/ Electronics • Exercise Equipment • Hot Water Tank • Household Items • Kitchen Appliances • Laundry Appliances • Outdoor/ Patio • Seating/ Chairs • Tires/ Wheels

Jurisdiction	Best Practice
	• Tools/ Machines Items that are not accepted include: • Carpets & rugs • Demolition or home renovation material • Metal or wood fences or pallets • Glass & mirrors • Toilets, bath tubs, sinks or hot tubs • Musical instruments • Propane tanks
Metro Vancouver	C&D Recycling Metro Vancouver has been targeting recycling in the C&D sector as a method to achieving the region's waste diversion goals. Initiatives such as the Clean Wood Disposal Ban are proving effective by contributing to a reduction in the amount of divertible materials in the C&D waste stream (wood waste is 56.5% of C&D waste in Metro Vancouver).

Considerations for Options Review:

- Municipalities with multi-stream recycling (such as White Rock) consistently have lower contamination rates. City should continue multi-stream recycling collection.
- Best practices exist for public events. These programs should be a consideration for the City going forward to increase participation in waste diversion programs and reduce waste from being landfilled. Events such as the Sea Festival should be a consideration.
- Consider large item pick-up program to avoid illegal dumping.

7.3 Waste Diversion Legislation, Policies and Enforcement

In Canada, waste management systems are impacted by regulations from all three levels of government (federal, provincial and municipal). Waste reduction and diversion policies and programs, regulations and standards for the transportation of waste and the approval and monitoring of waste management facilities and operations are established by the federal and provincial governments. Municipalities are typically responsible for managing the collection, recycling, composting and disposal of household waste in accordance with the policies and regulations established by the regional, provincial and federal governments.

7.3.1 City's Current Approach

The City of White Rock Solid Waste Bylaw, 2015, No. 2084 was adopted in May 2015 and most recently consolidated with other bylaws effective April 2017. The bylaw defines the authorization of the City to carry out residential waste collection and defines eligible properties, storage and set out requirements, and banned materials related to receiving City collection services. The bylaw also requires properties not serviced by the City to separate garbage, recyclables and organic waste for collection and allows a bylaw enforcement officer to ascertain whether the provisions of the bylaw are being observed or require a fine in the event an offense has occurred.

7.3.2 Jurisdictional Review Results

The City of Toronto has an extensive long term waste management strategy and a number of bylaws and standards which incentivize and mandate participation in diversion programs. Toronto's waste collection bylaws require all customers, including multi-family developments, to participate in the Blue Box recycling and Green Bin organics programs and to receive garbage collection.

Development standards for new buildings are set out in the Toronto Green Standard. It includes a range of sustainability standards including solid waste for various building types (both City-owned facilities and agencies). The standard was introduced in 2006 on a voluntary basis and the third version of the standards took effect in 2018. Toronto development standards require new multi-residential buildings to establish a three-stream collection system that ensures that waste diversion is as convenient as garbage disposal. Buildings can construct a three chute system on every floor, a three stream collection station on every floor, or a tri-sorter approach. Buildings can also choose to not install a chute system at all and have all residents/tenants take their materials to a common storage location.

Toronto has also implemented the Adapt Policy to help Toronto better tackle new and emerging packaging materials, such as compostable and biodegradable packaging, that are introduced into the market without being tested for their compatibility with municipal end-use processing facilities and end market demands. It introduces a transparent process that brand owners and packaging manufacturers can refer to when designing new product packaging. It also includes the City of Toronto's expectations regarding cost recovery measures for testing the behaviour of new materials in its processing facilities

and any financial impacts to its integrated waste management system as a result of new material addition.

The policy is applied to any producer who wants to bring new packaging into Toronto's recycling or composting program (e.g., compostable coffee pods).

Halifax Regional Municipality currently collects organic waste in carts and operates a bag-based residential garbage and recyclables collection program (use of a cart-based system is currently being evaluated by staff). Single unit homes are allowed up to six garbage bags and unlimited bags of recyclables per collection day while multi-unit buildings (two to six units) are allowed up to five bags or containers per unit. Waste bags must be clear, with the exception of one permitted opaque "privacy" black bag (i.e., up to five clear bags and one opaque bag). Recyclables containers and packaging must be placed in blue bags and recyclable paper can be placed in any single-use plastic bag (e.g., grocery bags) or placed in a blue bag. Corrugated cardboard must be broken down and tied in bundles next to the recycling bags at the curb.

Table 15 provides the results of the best practices review for the local jurisdictions.

Table 15. Waste Diversion Legislation, Policies and Enforcement Best Practices Review

Jurisdiction	Best Practice
City of Port Coquitlam	Additional Annual Fee to Upsize or Increase Number of Collection Carts The City of Port Coquitlam offers two sized carts for garbage (120L and 240L) and one for green waste (240L). Waste utility fees are based on designated garbage cart size ($406 - $492/year). You can request additional carts for increased rates as well.
City of Port Moody	Additional Annual Fee to Upsize or Increase Number of Collection Carts The City of Port Moody offers three sized carts for garbage (120L, 240L and 360L) and two for food scraps/yard trimmings (240L and 360L). Garbage fees range from $105.95-$165.95/year dependant on cart size. Food scraps/yard trimmings collection costs $79.94-$89.94/year dependent upon cart size.
City of Surrey	Additional Annual Fee to Upsize or Increase Number of Collection Carts The City of Surrey provides five different sized carts for waste collection and charges an additional $145/year for residents wishing to upsize the standard 240L garbage cart for curbside collection to a 360L. For additional garbage carts requested above the basic standard carts issued, residents pay either $145/year (80L/120L), $290/year (180L/240L) or $429/year (360L) extra. Recycling Remediation/Curbside Audits City of Surrey continues to manage a private hauler collection contract for residential recycling collection. RecycleBC pays the City an incentive amount per household for them to manage this contract. Under the contract with RecycleBC, recycling contamination rates are to be <3% or the City may be fined. In 2017, average non-PPP contamination in Surrey's single-stream recycling was 10.9% (total contamination including glass neared 20%). A campaign was launched targeting the worst contamination routes (or 'hot routes'), including waste audits, brochure mail outs to approximately 35,000 homes, letters to repeat offenders (5,000 households), advertisements and cart enforcement stickers (what goes in, what stays out).

Jurisdiction	Best Practice
	In 2018 and 2019, the City targeted 2,000 households per day on 'hot routes'. Recycling material was collected via rear-load vehicles and contaminants were left in clear bags marked 'Contamination' beside the resident's blue cart. Stickers continued to be placed on carts identifying non-acceptable material and a door-to-door campaign followed to educate repeat offenders. Gold stars were left for improved homes with no continued issues.
Metro Vancouver	Disposal Bans As per Bylaw No. 306, 2017 - Tipping Fee and Solid Waste Regulation Bylaw, disposal facilities owned by Metro Vancouver all have disposal bans for organics, recyclable materials, hazardous materials, wood waste and stewardship materials. Surcharges apply if these materials are found in the garbage at Metro Vancouver disposal facilities. A $65 minimum surcharge, plus the potential cost of removal, clean-up or remediation will be applied to loads containing banned hazardous and operational impact materials or product stewardship materials. A surcharge of 50% of the tipping fee on the entire load will be applied to loads containing banned recyclable materials, and a surcharge of 100% of the tipping fee will be applied to loads containing over 20% expanded polystyrene packaging.

Considerations for Options Review:

- If standardized carts are implemented for single-family waste collection, increased fees based on cart size should be a consideration.
- Should the City take on additional responsibilities by collecting waste materials from other sectors (multi-family or ICI), the City also takes on the risk of increased fines from disposal bans and contamination thresholds. Given contamination found in the recent waste audit, this could be significant.

7.4 Waste Avoidance and Reduction

As governments and industry move towards a circular economy, waste avoidance, reduction and reuse are at the forefront of this movement. The idea behind circular economy thinking and actions is to maximize value and eliminate waste by improving the design of materials, products and business models. Avoiding and reducing waste to landfill as well as reuse of materials, minimizes waste disposed and overall generation rates.

7.4.1 City's Current Approach

Metro Vancouver's Integrated Solid Waste Management Plan [22] (ISWMP) indicates a goal for its municipalities is to reach 80% waste diversion by 2020. Metro Vancouver's ISWRMP identifies strategies to reach the goals and responsibilities and timelines for Metro Vancouver and its member municipalities. The municipalities, as represented by the Metro Vancouver Board, agreed to and approved the diversion actions in the ISWRMP. Goal one of this plan is to minimize waste generation.

[22] Metro Vancouver (2020) Integrated Solid Waste Management Plan. http://www.metrovancouver.org/services/solid-waste/about/management-plan/Pages/default.aspx

White Rock, as a member municipality, is required to partner with Metro Vancouver in support of the following actions:

- Advocate that senior governments progressively move towards the prohibition of the manufacture and distribution of non-essential, non-recyclable materials and products;
- Advocate that senior governments prohibit the manufacture and distribution of non-recyclable packaging;
- Strongly advocate for Extended Producer Responsibility (EPR) programs to reduce waste disposal through implementation of design-for-environment principles, and best management practices that focus on waste reduction, reuse, and recycling. Offer staffing support for and partnership with Ministry of Environment to help accelerate EPR;
- Work with other municipalities and regions across BC, Canada, and internationally, to advocate for more development by senior governments in encouraging and developing incentives, including regulation, that promote design of products with an emphasis on reuse and recycling (cradle-to-cradle design);
- Participate on Federal EPR initiatives such as the Canadian Council of Ministers of Environment (CCME) Extended Producer Responsibility Task Force, to develop national guidelines for sustainable packaging;
- Participate on industry stewardship advisory committees;
- Participate on the BC Product Stewardship Council to assist in evaluating existing and developing new EPR programs; and
- Ensure waste projections consider future trends in population, generation, and management, including EPR.

General promotion and education for waste collection services within the City is provided on the "Garbage & Recycling" webpage within the City's website as described in Section 4.5.1. From this page, the "My Schedule" app can be accessed. General information on collection and containers, in addition to links to external websites (Metro Vancouver, RecycleBC, RCBC) are provided. Links to information on the recycling program, green can program and information on illegal dumping, multi-family and commercial waste disposal, backyard composting and a FAQs page, with answers to frequently asked questions, can also be accessed from the general information page.

7.4.2 Jurisdictional Review Results

In the context of overall waste avoidance and reduction, the avoidance of food waste in the food supply chain and food security for all, is currently front and centre globally. In May of 2019, Guelph and Wellington County, Ontario were awarded the Canadian Smart Cities Challenge prize, which includes a $10 million grant from Infrastructure Canada to implement their Smart Cities vision: Our Food Future.

With this prize, Guelph-Wellington aim to become an inclusive food-secure ecosystem and Canada's first circular food economy. The focus of their vision is their 50x50x50 by 2025 initiative, which avoids food waste throughout the food supply chain in addition to:

- Increasing access to affordable and nutritious food by 50%;
- Creating 50 new circular business and collaboration opportunities; and
- Increasing economic value by 50% by reducing or transforming food waste.

This Smart Cities vision includes collaborations with industry, academia, community organizers, and entrepreneurs.

Table 16 describes the local jurisdiction's best practices.

Table 16. Waste Avoidance and Reduction Best Practices Review

Jurisdiction	Best Practice
City of Langley	City Website: The City of Langley provides general waste information (collection calendar, how to properly sort waste, etc.) on their website. In addition to this information, the City also includes links to where to find Metro Vancouver Disposal Facilities, Product Care Recycling, Recycling Council of BC Website, RecycleBC website and BC Recyclopedia.
City of North Vancouver	Eco Levy The Eco Levy ensures that both residential and business property owners share costs associated with efforts to reduce garbage, including the North Shore Recycling Drop-Off Depot. Before the Eco Levy, solid waste was funded exclusively through residential levies. The Eco-Levy appears as a line item on annual Property Tax statements and is based on the assessed value of the property.
City of Port Coquitlam	Repair Cafés Repair Cafés are one-day events where the community can get expert help to repair household items for free. Tools, materials and expert advice are provided and opportunities can include repairing bicycles, jewellery, electronics, appliances, furniture and toys, along with sewing and clothing alterations. The program is part of the City's waste diversion efforts and aims to find innovative ways to reduce the amount of waste going to the landfill each year. The objectives include encouraging a culture of re-use and repair and providing opportunities for intergenerational knowledge-sharing, and community building. The City's goal is to turn the program into a self-run, volunteer-managed event that runs regularly in the City.
City of Surrey	Single-Use Items and Plastics Reduction Strategy Recognizing the growing importance of addressing the impact of single-use items and plastic packaging, in May 2019 City Council requested that City staff develop a Single-Use Item and Plastic Packaging Strategy. As part of the Strategy development the City encouraged residents and businesses to provide their feedback through an online survey to assist the City in understanding the public's views, how the Strategy may impact them and which items should be included. The City is bringing forward a Plastic and Single-Use Item Reduction bylaw shortly.
Metro Vancouver	Single-Use Items (SUI) Reduction Strategy In February 2019, Metro Vancouver wrote the Minister of the Environment and Climate Change Strategy and the Minister of Municipal Affairs and Housing in support of the Union of British Columbia Municipalities' resolution requesting a provincial SUI strategy. Metro Vancouver has since released their developed SUI toolkit in an effort to provide information on a range of policy options for local governments to consider in hopes of a harmonized approach on this issue. The toolkit details the impact and potential approaches to handle SUIs and provides

Jurisdiction	Best Practice
	guidance on policy and regulatory options (e.g., by request only, mandatory fee, ban, require reusable) for different SUIs such as cups, takeout containers, bags, straws and utensils. Create Memories, not Garbage Campaign Metro Vancouver launched a waste reduction campaign that runs during the Christmas season called "Create Memories, not Garbage". This program aims to get people to think about what they are giving as gifts and consider giving gifts of time, experience or long lasting gift rather than an item that will eventually end up in a landfill. Love Food Hate Waste Campaign Metro Vancouver paid a license fee to the UK Waste and Resources Action Program (WRAP) to use the Love Food Hate Waste promotional and web based materials. The campaign was officially launched in May 2015, and was intended to assist Metro Vancouver achieve its goal of reducing per capita waste generation by 10% by 2020. Think Thrice About Your Clothes Campaign In support of Metro Vancouver's waste reduction targets outlined in their 2010 Integrated Solid Waste Management Resource Management Plan, the Think Thrice About Your Clothes campaign focuses on reducing textile waste. The campaign encourages residents to reduce, repair, and re-use their clothes to minimize waste.

Considerations for Options Review:

- Metro Vancouver SUI strategy /toolkit and Surrey (which surrounds White Rock) SUI Strategy development should be monitored and considered given proximity and in an effort to harmonize with local businesses who are being included in solid waste initiatives/consultation.
- The City of White Rock should consider hosting repair cafés in civic facilities.

7.5 Single-Family Waste Collection

Municipalities typically manage municipal solid waste generated at single-family homes. These governing bodies administer all aspects of single-family garbage collection including what materials are collected, how they are collected, how fees are collected from residents and how contamination and banned materials are remediated.

With regards to organics collection, specifically, there are common components of successfully implemented programs in different cities across Canada. In most cases, collection of the organics bins occurs weekly and the start of the organics collection program coincides with garbage collection switching to bi-weekly collection. This encourages residents to utilize their organics bins which are collected weekly instead of disposing of their organic waste in the garbage. In all successful programs, a strong and extensive educational campaign was utilized to educate residents on the new program, and the different materials that are/ are not accepted in their new organics bins. For both food scraps only

and commingled organics collection programs, a 'kitchen catcher' is typically provided to residents for in-house collection of food scraps.

7.5.1 City's Current Approach

The City collects recyclables weekly which consists of a blue box for containers (plastic and metal), yellow bag for paper (including cardboard and newspaper) and a red box for glass. Collection of green waste (yard trimmings and food scraps) occurs weekly through the City's Green Can program. The 2019 utility rate for these services is $333/year.

7.5.2 Jurisdictional Review Results

Municipalities can sign on to be a part of the RecycleBC program. As a result of RecycleBC, homeowners are no longer charged a recycling utility for curbside recycling collection and now receive the basic recycling service at no cost through RecycleBC. RecycleBC is funded by retailers, manufacturers and restaurants, shifting costs for management of printed paper and packaging away from homeowners. Materials accepted curbside are harmonized and consistent throughout each member municipality.

Table 17. Single Family Collection Best Practices Review

Jurisdiction	Current Best Practice
City of Langley	Current utility rate of $198/year • Contractor collection (private hauler dictates the price and may have bid to win the contract); • Manual collection (same as White Rock); • Direct haul garbage to the Surrey Transfer Station (11 km); • Direct haul green waste to the organics processing facility; and • Higher density of homes to service than White Rock
City of North Vancouver	Current utility rate of $253/ year • Municipal collection (same as White Rock); • Manual collection (same as White Rock); • Direct haul garbage to the North Shore Transfer Station (6 km); • Direct haul green waste to Sea to Sky organics processing facility; • Have three staff working per collection route (allows for quicker/efficiency in collection of materials) and are able to use the same compacting truck to collect garbage and then green waste (on a second route); and • Higher density of homes to service than White Rock
City of Port Coquitlam	Current utility rate of $216/year • Municipal collection (same as White Rock); • Automated collection – typically quicker; • Direct haul garbage to the Coquitlam Transfer Station (9 km); and • Direct haul green waste to organics processing facility.

Jurisdiction	Current Best Practice
City of Surrey	Current utility rate of $290/year • Contractor collection (contractor dictates the price – Surrey has economies of scale as many more homes to service); • Automated collection – typically quicker; • Direct haul garbage to the Surrey Transfer Station (13 km); and • Direct haul green waste to the Surrey organics processing facility.

Considerations for Options Review:

- Automated collection services may reduce costs overall but require large capital investment requirements.
- Direct haul of materials to end processing facilities is preferential, where feasible, because it reduces the need for materials to be handled more than once.

7.6 Multi-Family Collection

Municipalities may choose to collect or manage collection of municipal solid waste generated at multi-family (MF) buildings. As the volumes and collection scheduling differ based on property size and number of units, logistically this is typically only possible for recycling and organics streams where service levels may be similar to single-family set-out requirements. Many municipalities choose to put the responsibility back on the property owners, requiring that they contract with a private hauler for material collection. Municipalities may amend their solid waste bylaw to require that the MF sector contract with a private hauler to provide recycling and/or organics collection equivalent in scope to the City program in order to provide all residents equal access to diversion and also abide by Metro Vancouver facility bans.

The multi-family residential sector waste diversion rates are historically substantially lower than the single-family residential. Food scrap collection programs have been shown to be an effective way of increase the diversion rate in these strata and buildings. Prior to program implementation, residents are often concerned with the cleanliness of the organics bins after prolonged used, however this can be overcome through bin cleaning services and/or compostable bin liner requirement in the private hauler contracts.

7.6.1 City's Current Approach

The City does not currently collect any waste materials from multi-family (multi-level) buildings. They do continue to collect from select MF townhouse properties under six units. In mid-2015 the City made significant changes to its delivery of solid waste services, in line with recommendations arising from a solid waste review. The changes included the privatization of multi-family solid waste collection. Council has directed that the decision to privatize multi-family waste collection be reviewed.

7.6.2 Jurisdictional Review Results

Peel Region in Ontario has garbage collected from multi-residential buildings twice a week and recycling collected once a week (some buildings receive twice-a-week pickup for recycling because of storage space restrictions) for all multi-family buildings. Peel Region has introduced recent improvements including the creation of a multi-family database, improved promotion and education materials and use of onboard weigh-scales to measure and record weights of materials generated at each building.
Peel Region has developed a comprehensive promotion, education and outreach campaign focusing on incorrect set outs in multi-family buildings where residents use bags to store recyclables and then toss the tied-off bag into the recycling bin. To correct this situation, residents received reusable bags for storing the recyclables and then bring the bag to the recycling bins to empty. At the same time, Peel Region staff launched the "Recycle Right" campaign and promotion and education materials to distribute to residents. Staff also set up lobby displays and attended the displays to answer any questions that residents had about the recycling program.

The City of New Westminster implemented a successful multi-family program through a strong and extensive educational campaign in which the hauler visited each building to determine the best location for the green bin collection in the centralized waste rooms. The hauler also conducted educational lobby sessions in the buildings at which time educational material and kitchen catchers were distributed.

The City of Richmond offers a Green Cart program to residents in multi-family buildings to provide convenient food scraps recycling. With this program, the Green Cart service is available to all Richmond residents, making it easy and affordable for residents to recycle their food scraps and organics (plants and food soiled paper).

Richmond's Green Cart program is used to collect food scraps, food-soiled paper and other organics such as yard and garden trimmings. The City's program for multi-family complexes has been developed based on a pilot program that included input from residents.

The Multi-Family Green Cart program features:

- Green Carts delivered and set up in central collection area;
- Weekly or twice-weekly collection of Green Carts;
- City-provided certified liners for the Green Carts;
- Monthly cleaning service for the Green Carts;
- Complimentary kitchen containers for food scraps for all residents in the building; and
- Signage and information materials to support using Green Carts.

Additional Service Options:

1. Garbage Carts:
   To help save space along with the convenience of City-provided garbage collection, Richmond offers an option to sign up for Garbage Cart service. (Note: the City's service is for Garbage Carts

only – no front-end-load dumpsters). Garbage Carts are cleaned monthly, with weekly or twice-weekly collection. Buildings with Garbage Cart service are also eligible for the City's Large Item Pick Up service, which provides collection of up to four large household items per unit, per year.

2. Cardboard Recycling:
   Richmond offers, through application, a cardboard recycling service, which involves providing a front-loading bin for cardboard in the central collection area. Cardboard is collected every two weeks.

The Fraser Valley Regional District has created a bylaw (bylaw No. 1495, 2018) requiring any owner or occupier of a residential, commercial or institutional property where MSW of any type is generated or produced, to separate organic material and recyclable material from the garbage on their property. They are required to:

1. Take organic material and recyclable material to specific facility types; or
2. Arrange for one or more waste haulers to collect these materials and bring them to specific facility types.

Table 18. Multi-Family Collection Best Practices Review

Jurisdiction	Best Practice
City of Port Coquitlam	Through an application process, multi-family buildings in Port Coquitlam can have their organics and recycling collected by the City The costs for this service are $15 per unit for organics (plus $80 for the cart) and includes one organics cart per 20 units. Recycling is free, but there is a $30 charge for additional carts. One recycling cart is provided for every three units. Garbage collection services are not provided by the City and is provided by private sector waste management companies.
City of Port Moody	Through an application process, multi-family buildings in Port Moody can have their garbage, organics and recycling collected by the City. Port Moody is the only municipality reviewed to offer garbage collection. City collection of garbage is optional, but recycling and organics must be collected by the City. Recycling and organics are collected for $197/year/unit.
City of Surrey	The City of Surrey collects recycling and compost from most multi-family buildings in the City. City recycling and compost collection is voluntary, but it has been noted that it is more cost effective than private hauler collection of these materials. Garbage collection for multi-family buildings is currently not offered and buildings have to contract this out with a private hauler. Costs are $40/unit for recycling and organics collection services or $30/unit for recycling only. The City suggests three carts per 50 units for organics and one cart per three to four units for recycling.
Metro Vancouver	On-site composting units are available (although costly) and have been piloted for use in multi-family complexes. Metro Vancouver piloted 'The Rocket' composter unit (unit itself costed $22,000) at a social housing complex in Coquitlam. On-site composters remove the collection and disposal costs associated with a more traditional program with the added bonus of creating useable compost and soil amendments for use by residents in gardens or in the community. The unit is housed in an enclosure that is protected from the elements with access only granted to residents who have been trained on its use. Upkeep and daily feeding of food scraps to the unit is performed by building managers or by volunteer residents. A strong educational campaign was shown to result in low contamination levels and high quality end product from the composting unit.

Considerations for Options Review:

- Per multi-family unit pricing is the norm, however there are a wide range of fees.
- If the service is provided, municipalities often collect recyclables and organic waste from multi-family buildings and not garbage.
- Consider collection using toters/carts.
- Space requirements for centralized garbage rooms would need to be assessed for each individual property to be serviced.
- Number of carts required for collection depends on the number of units, typical waste generation and participation rates in waste diversion programs.
- The City could consider a voluntary application for those interested in City service.
- The City should consider bylaw language similar to FVRD segregation requirements.

7.7 ICI Collection

Municipalities rarely manage municipal solid waste generated at ICI properties. Typically municipalities choose to have this service be the responsibility of the business owners, requiring collection by private haulers. Municipalities may amend their SW Bylaw to require that the ICI sector contract with a private hauler to provide recycling and/or organics collection in order to abide by Metro Vancouver facility bans.

7.7.1 City's Current Approach

The City does not currently collect any waste materials for ICI buildings. In mid-2015 the City made significant changes to its delivery of solid waste services, in line with recommendations of the previous solid waste review. The changes included the privatization of ICI solid waste collection. Current Council has directed that the 2015 decision to privatize ICI waste collection be reviewed.

7.7.2 Jurisdictional Review Results

The City of Toronto provides garbage, recycling and green bin service to BIAs or businesses in other 'designated areas'. Eligible businesses must use a bin or yellow bag service and purchase garbage tags. Garbage tags can be purchased online or at several local retailers. The cost for five bag tags is $26.90. The City collects from the BIA areas at night on main streets providing service one night per week. In addition to the one night collection for all 3 waste streams, businesses can pay to receive additional organics collection (two, five or six times in a week) but this additional service only applies to organics. Businesses must purchase bins and subscribe to the service and can purchase tags for extra waste. To be eligible for the collection service the main criteria is that the business cannot exceed 500 square metres and must be fewer than four stories or at least one-third space is residential (no size restrictions). The City also provides curbside garbage, recycling and organics collection service to Charities, Institutions

and Religious Organizations (CIRO) that meet eligibility criteria and complete an application. In order to qualify for City collection services, the CIRO building (like other businesses) cannot exceed 500 m^2 and must be fewer than four stories or at least one-third space is residential (no size restrictions). There is no fee for recycling and once-a-week organics collection, however, CIRO can purchase extra Green Bin organics collections.

The City of Calgary offers front end bin collection services for businesses and organizations, competing directly with the private collection providers. Bylaws mandate businesses are required to recycle the same materials as residents plus materials specific to commercial waste and divert organic waste from the garbage. This bylaw applies to all businesses and organizations, including property management companies, offices, stores, malls, restaurants, hotels, schools, healthcare facilities, manufacturers, factories, non-profits, places of worship, warehouses and other operations. Landfills may apply a disposal surcharge ($180/tonne) on commercial loads containing 10% or more paper, cardboard, scrap metal and/or recyclable wood, 20% or more of food and yard waste and/or 10% or more C&D materials.

The City also supports Green Calgary, a non-profit organization that provides technical assistance to ICI establishments to help them reduce/divert waste. Services include a help desk, waste assessment and consulting services, lunch and learn programs, recycler verification programs, waste workshops, event greening and green guides for the workplace.

As stated in Section 1.6, the Fraser Valley Regional Distract has created a bylaw requiring mandatory separation of organics materials and recyclable materials from all waste generator types.

Table 19. ICI Collection Best Practices Review

Jurisdiction	Best Practice
City of Port Coquitlam	Through an application process, commercial businesses in Port Coquitlam can have their organics and recycling collected by the City. Garbage is currently not collected. Organics are collected in carts which costs $104/year for collection (typically weekly collection schedule). Recycling cart collection is completed for $80/year.
City of Port Moody	Through an application process, commercial businesses in Port Moody can have their garbage, organics and recycling collected by the City. City collection of garbage is optional, but recycling and organics must be collected by the City. If all three streams are collected using a centralized collection method it costs the business $564/ year ($177 for garbage, $149 for recycling and $238 for organics). If waste is collected for all three streams using carts, it costs $695/year ($308 for garbage, $149 for recycling and $238 for organics).

Considerations for Options Review:

- Servicing of the commercial sector is largely dependent on the number of businesses requiring/desiring service and the associated costs to deliver the service (e.g., required number of collection vehicles).
- Set-out requirements and practicality of container type for collection determine the type of collection vehicles required (e.g., automated, manual).
- Space requirements for garbage rooms/disposal areas would need to be assessed.
- The City should consider bylaw language similar to FVRD segregation requirements.

7.8 Streetscape and Public Spaces Solid Waste Management

Streetscape and public spaces waste need to adhere to the same disposal bans as all residential waste streams. Recycling in public spaces is a known challenge for municipalities. Providing recycling options alongside or as a part of streetscape and parks waste receptacles is a means to show how dedicated a City is to the regional waste management goals and targets. An integral part of increasing municipal waste diversion numbers is ensuring residents have the opportunity to divert waste and recyclable materials both at home and throughout the City.

7.8.1 City's Current Approach

The City currently places the collection and management of streetscape/public spaces bins under the responsibility of the Parks Department. Receptacles on Promenade and Marine Drive are collected by a private contractor and the remaining street cans and bins in City parks and at bus stops are collected by City staff. There are 167 bins along the waterfront which are collected daily. There are over 120 bins around the city are collected throughout the week with a Ford F350 and include single-stream (pole-mount, barrels) as well as two and three-stream receptacles (seven located near the East Beach where

visitors picnic). Currently high contamination in the recycling streams (where present) requires disposal of all collected materials.

7.8.2 Jurisdictional Review Results

City of Vancouver on-street and park recycling

In summer 2016, in partnership with RecycleBC, the City of Vancouver installed 31 zero waste recycling stations in the West End and Stanley Park as part of an on-street recycling pilot project. The purpose of the joint City and RecycleBC pilot was to evaluate certain operational aspects of a public space recycling program, such as container design. The original RecycleBC pilot bins (Emily Carr designed receptacles) were replaced with new zero waste stations that hold more waste and are more durable. Results of the pilot have been positive so far with 69% of the waste being sorted accurately and an overall diversion rate of 28%. Contamination rates were quite high in the recycling streams (34%).

Table 20. Streetscape and Public Spaces Waste Management Best Practices Review

Jurisdiction	Best Practice
City of Langley	Three Stream Waste Receptacles Three stream waste receptacles (paper, containers, garbage) are placed throughout the City. The City can advertise on the receptacles as a part of the street furniture program.
City of North Vancouver	Dog Waste Program In order to divert dog waste from the landfill, which poses a health hazard and is harmful to the environment (and banned by Metro Vancouver), the City has placed dedicated dog waste bins throughout the City.
City of Port Moody	Dog Waste Collection Program The City of Port Moody has set up red bins for dog waste throughout the city as part of their dog waste collection program.
City of Surrey	Recycling The City pairs the majority of their bus stop receptacles (Big Belly receptacles) with single-stream recycling. This ensures consistency with their curbside recycling program.
Metro Vancouver	Dog Waste Pilot Metro Vancouver completed Dog Waste pilots in September 2011 to April 2012.Three different collection methods were analysed including: • Dog Litter Box - owners supposed to pick up poop in sandbox-type area and deposit in toter with litter collection tongs. • Off Leash Area In-Ground Tank - owners supposed to place flag where dog poo located, go back with shovel (provided) and bring to in ground tank for disposal. • Dog Waste Only (DWO) Bin - bags provided and owners place full bags in red collection bins. The program selected was the Dog Waste Only Bin. The success of this pilot lead to an expansion to all regional parks. As Metro Vancouver expanded organics and recycling collection program to parks, toters were replaced with rodent and bear-resistant Haul-all Bins to keep the look consistent. Dog waste bins continue to have a red lid, organics bins have a green lid, recycling bins have a blue lid and garbage bins have a black lid.

Considerations for Options Review:

- Consistency of waste diversion programs is important. The City should consider providing waste collection options in public spaces and on City streets equivalent to what residents are accustomed to at home - at a minimum of three streams.
- Dog waste diversion programs may reduce fines from Metro Vancouver as only small amounts of dog waste is accepted at the landfill.

7.9 Summary of Jurisdictional Review

Table 21 presents a summary of the best practices, as identified through the jurisdictional review, by category.

Table 21. Best Practice Findings Summary

Program Component Headings	Best Practices
Waste Diversion Programs	• Municipalities with multi-stream recycling (such as White Rock) consistently have lower contamination rates. • Best practices exist for increasing participation and diversion of waste at public events. • Many municipalities offer a curbside large item pick-up program in an effort to avoid illegal dumping.
Waste Diversion Legislation, Policy and Enforcement	• Standardized carts for SF waste collection are typically associated with a fee that increases for a larger cart size. • Collection of waste materials from other sectors (MF or ICI) requires municipalities to takes on the risk of increased fines from disposal bans and high amounts of contamination.
Waste Avoidance and Reduction	• In addition to reducing plastic waste, single-use (SUI) reduction strategies, such as the Metro Vancouver single-use item (SUI) reduction strategy /toolkit and City of Surrey Plastics and SUI Reduction Strategy, provide an opportunity to engage local businesses affected by the changes. • Municipalities hosted repair cafés in civic facilities.
Single-Family Waste Collection	• Automated collection services may reduce operating costs but require large capital investment. • Direct haul of materials to end processing/disposal facilities is preferential, where feasible because it reduces costs as materials are not handled more than once.
Multi-Family Waste Collection	• Per MF unit pricing is the norm, however there are a wide range of fees that consider private vs. internal collection and economies of scale with SF collection. • Recycling and organics collection service are the programs most often provided by a municipality (if provided). • Collection containers are typically toters/carts. • Space requirements for centralized garbage rooms would need to be assessed for each

Program Component Headings	Best Practices
	individual property to be serviced. • Number of carts required for collection depends on the number of units, typical waste generation and participation in waste diversion programs. • Municipalities provide voluntary application for those interested in City service. • Bylaw language for segregation requirements are highlighted in the Fraser Valley Regional District (FVRD) bylaw No. 1495.
ICI Waste Collection	• Servicing of commercial sector is largely dependent on the number of businesses requiring/desiring service vs. collection vehicle cost to collect from the same. • Set-out requirements and practicality of container type determine the type of collection vehicles required. • Space requirements for garbage rooms/disposal areas at the businesses would need to be assessed. • Bylaw language for segregation requirements are highlighted in the Fraser Valley Regional District (FVRD) bylaw No. 1495.
Streetscape and Public Spaces Waste Management	• Consistency of waste diversion programs between home, work and in the public realm is important, such as providing waste options in public spaces and on City streets equivalent to what residents are accustomed to at home - at a minimum of three streams. • Dog waste diversion programs may reduce fines from Metro Vancouver as only small amounts of dog waste is accepted at the landfill.

8.0 Solid Waste Management Options

This section describes potential options that the City should consider for its future waste management system based on the background reviews, waste characterization studies and jurisdictional review as well as specific areas that the City requested additional focus on. The first part of this section involves identifying the future performance requirements of the waste management system in terms of future waste quantities to be managed (Section 8.1). Lastly, specific collection options for the SF sector (Section 8.2.3) and options to collect/manage waste from the MR and ICI sectors (Section 8.2.4) were identified and evaluated.

8.1 Performance Requirements

Dillon utilized projected population and per capita waste generation information to determine the future waste collection and disposal requirements over the next 30 years. The estimation of the future quantities of collected garbage, recycling and organics derived from this information is detailed below.

8.1.1 Future Waste Generation Trends and Practices

Waste generation quantities are closely linked to changes in population and economic activity. For divertible materials like recyclables, the collected quantity will also increase with the implementation of improved waste management systems and an enhanced user education and communication program. If successful (and waste generation rates do not outpace the diversion gained), the amount of garbage landfilled will also decrease. For this project, the amount of waste generated by White Rock residential and commercial sectors is forecasted to grow and is based on the following factors:

- Projected community population growth;
- Projected growth/use of community facilities and ICI properties; and,
- Current waste composition.

Table 22 highlights the projected population and waste generation rates for the SF, MF and ICI sectors in five-year increments to the end of the study period. A detailed breakdown of the projected population and generation growth are included in Appendix C. The annual waste generation data was calculated based on a number of general assumptions which are detailed in Appendix D. Population growth rates are taken from the White Rock Official Community Pan (OCP) and are used for projections of population and SF and MF waste quantity tonnages which are presented below. Some of this data was previously presented in Section 5.2.1. It was assumed that the annual waste generation rate will mirror the annual population growth rate (approximately a 0.89% annual growth rate). For the purposes of this study, the approximate OCP employment growth rate (0.75%) has been used to estimate the increase to future ICI properties, community facilities and amenities waste.

Table 22. Projected Population and Waste Generation

Year	Population Growth[1]		
	SF	MF	Total
2018	10,263	9,689	19,952
2020	10,446	9,862	20,309
2025	10,920	10,309	21,229
2030	11,414	10,776	22,190
2035	11,931	11,264	23,196
2040	12,472	11,774	24,246

[1] Population projections are consistent with the projections from the White Rock Official Community Plan, approximately 0.89%.

[1] 2018 values are actual generation numbers by waste stream provided by the City.

Year	Annual SF Waste Generation (tonnes)[2]				Annual MF Waste Generation (tonnes)[2]				Annual ICI Waste Generation (tonnes)[3]			
	Garbage	Recycling	Organics	Total Waste	Garbage	Recycling	Organics	Total Waste	Garbage	Recycling	Organics	Total Waste
2018[1]	1,182	799	1,645	3,626	2,051	460	495	3,006	2,731	601	655	3,987
2020	1,203	813	1,674	3,691	2,088	468	504	3,060	2,776	611	666	4,053
2025	1,258	850	1,750	3,858	2,182	489	527	3,198	2,901	638	696	4,236
2030	1,315	889	1,830	4,033	2,281	511	551	3,343	3,033	667	728	4,428
2035	1,374	929	1,912	4,215	2,385	534	576	3,495	3,170	697	761	4,629
2040	1,436	971	1,999	4,406	2,493	559	602	3,653	3,314	729	795	4,838

[2] Annual SF and MF waste generation numbers are consistent with population projections from the White Rock Official Community Plan, approximately 0.89%.

[3] Annual ICI waste generation numbers are consistent with employment projections from the White Rock Official Community Plan, approximately 0.75%.

8.2 Solid Waste Management Collection Options

The review and assessment of solid waste management collection options was completed based on a background and best practices review as well as community consultation. A screening process was applied to rank each of the options developed. Further details on each of these key steps are provided in the following sub-sections. Options were developed under six components. These six components include the following:

1. Public Education and Awareness – Education campaigns;
2. Collection and Transfer – How waste is collected and then transferred for processing or for final disposal;
3. Reduction, Reuse and Recycling – How waste is diverted from landfill;
4. Composting – How organic materials are diverted from landfill;
5. Special wastes – Management of hazardous waste and Extended Producer Responsibly (EPR) programs; and
6. Disposal – Residual and end facility waste management/processing.

8.2.1 Results of Community Consultation

A community open house took place on February 19, 2020 in an effort to facilitate conversation with local residents and business owners regarding waste collection services and operations in the City. As a part of the open house, residents were encouraged to fill out a survey titled "Tell Us What You Think about Solid Waste Operations in the City of White Rock". Through the community open house, and online promotion of the survey, 199 residents provided their input on solid waste services. Overall results of the Survey are provided in Appendix E. Open house presentation boards are provided in Appendix F.

A brief summary of survey results are provided below to offer context on the developed options for the City:

- 41% of survey participants resided in SF homes, 56% resided in MF households and 2.5% did not live in White Rock but did own business in the City;
- 72% of the respondents are satisfied or very satisfied with their current collection services;
- 63% of SF residents would prefer standardized

toters for waste collection services;

- 45% of MF residents are not at all or not satisfied with their current waste collection programs;
- 72% of MF residents would be 'very interested' in having the City complete their waste collection and an additional 15% would be 'interested' in this service;
- 67% of survey participants found their day-to-day living impacted or very impacted by hauler traffic; and
- No overwhelming sentiment by the ICI sector was recorded, with 4 of the 7 respondents indicating they are somewhat satisfied or satisfied with their waste collection services.

8.2.2 Candidate Solid Waste Management Collection Options

A number of options for solid waste management collection from the SF, MF and ICI sectors were developed. Initially, high level options were created and then, following guidance from the City, priority options were identified which were broken down into Phase 1 (Section 8.2.3) and Phase 2 priorities (Section 8.2.4 and Section 8.2.5).

8.2.2.1 High-Level Collection Options

The review and assessment of solid waste management options for the SF, MF and ICI sectors was conducted based on the identification of an initial extensive list of scenarios that was established from the background review and identification of areas of current/future deficiencies and improvement. These were provided to the public as per the Waste Collection Options board provided in Appendix F.

Dillon team members prepared seven (7) service scenarios (including status quo) for consideration, based on comments gathered from initial conversations with Staff, research findings and following the community consultation. These service scenarios and program attributes for the management of SF, MF and ICI wastes are detailed in Appendix G. As no double handling of SF recyclable material occurs, the current collection model for SF recycling was deemed efficient. Moreover, contamination rates are low therefore no change to the recycling service vehicle or three stream recycling collection model was considered high-priority.

8.2.2.2 Prioritized Collection Options

Based on immediate City staff priorities (i.e. the need to replace SF collection trucks), four SF collection options (status quo plus three alternatives to allow for compaction and remove double handling of material) were determined as Phase 1 – First Priority and the focus for immediate consideration.

Phase 2 – Secondary Priorities considered a deeper dive into MF and commercial collection/ management by the City, , continued City provision of recycling collection (given new end processing facility), as well as the procurement of toters for SF waste and organics collection . These are discussed in the following sections:

- **Section 8.2.4** City Collection/Management of MF and ICI Waste Collection Services;
- **Section 8.2.5.1** Continued City Collection of Recycling vs. Management of Private Collection Contract or Hand-over to RecycleBC; and
- **Section 8.2.5.2** Procurement of Toters for SF Garbage and Organics Collection.

8.2.3 Phase 1 Priority - Single Family Collection Options

Four SF collection options were developed which are iterations of Service Scenarios 1 (Status Quo) and 2 from the table in Appendix G above and are based on the waste quantity projections based in Table 23 below for SF garbage and green waste currently being amalgamated and transferred from the works yard, or 'double handled'. As no double handling of recyclable material occurs and contamination rates are low, the current collection model for recycling was deemed efficient.

Table 23. SF Residential Waste Quantity Projections for 20 Year Planning Period

Year	SF Population Estimate	SF Garbage Generation Estimates (tonnes)	SF Recycling Generation Estimates (tonnes)	SF Green Waste Generation Estimates (tonnes)	SF Total Waste Generation Estimates (tonnes)
2018[1]	10,263	1,182	799	1,645	**3,626**
2020	10,446	1,203	813	1,674	3,691
2025	10,920	1,258	850	1,750	3,858
2030	11,414	1,315	889	1,830	4,033
2035	11,931	1,374	929	1,912	4,215
2040	12,472	1,436	971	1,999	4,406

[1] *2018 values are actual generation numbers by waste stream provided by the City.*

Four options were developed as potential approaches to collect garbage and organics from the SF sector. The options included:

- Option 1: Current Situation/Status Quo;
- Option 2: Use of Side-Load Compaction Vehicles;

- Option 3: Use of Rear-Load Compaction Vehicles; and
- Option 4: Use of Fully-Automated Side-Load Vehicles.

Each option was reviewed under the six categories as described at the start of this section.

There were some commonalities among the three new options (i.e., Options 2, 3 and 4) which are presented in Table 24. Program components that are exclusive and unique to each of the new options are described below).

Table 24. Program Components Common to all New Options

Program Component	Description
Public Education and Awareness	• SF Public Education and Awareness will remain the same as status quo.
Collection and Transfer	• Through procurement of one new waste collection vehicle capable of compaction, garbage will be collected and direct hauled to the Surrey Transfer Station. • Through the procurement of two new waste collection vehicles capable of compaction, organics will be collected and direct hauled to the GLF Organics Processing Facility in Delta, BC. • All options include the removal of using the works yard as a transfer area and therefore the elimination of double handing the SF garbage and organics.
Reduction, Reuse and Recycling	• SF recycling collection will continue to be collected manually in three streams to maintain low contamination rates.
Composting	• SF compost collection and diversion programs will remain the same as status quo.
Special Wastes	• Special wastes programs will remain the same as status quo.
Disposal	• New waste collection vehicles will be purchased. • Garbage will be collected curbside for SF homes and direct hauled to the STS. • Organics will be collected curbside for SF homes and direct hauled to GFL.

Option 1: Current Situation/Status Quo

Option 1 is a continuation of the current solid waste management program in the City. This provides a basis for status quo comparison with the proposed changes under Options 2-4.

Public Education and Awareness:

- Public Education and Awareness are discussed in **Section 4.5** of the solid waste management operations review report.

Collection and Transfer:

- Collection programs for the City are provided in **Section 4.2** solid waste management operations review report.
- The City offers waste collection services for SF residential garbage, organics and three stream recycling.
- Garbage and organics are hauled to the works yard and stored for transfer to their processing and disposal facilities. SF recyclables are directly hauled to the Urban Impact recycling depot. MF and ICI recycling are collected by Private Hauler and disposed at a facility of their choice.
- Garbage and organics collection is completed using: three F450 Haul All vehicles, each with a capacity of 10.7 cubic meters and hoist capacity of 4.5 tons.
- Recycling is collected using two Peterbilt Single Axle Labrie Top Select Box trucks with a capacity of 32 cubic meters and a hoist capacity of 2.5 tons. All five current collection vehicles are non-compacting units.
- Five (5) staff currently complete all SF collection (two organics, two recycling, one garbage).

Reduction, Reuse and Recycling:

- The City collects three streams of recycling curbside, this includes paper, containers and glass recycling.
- Residents are encouraged to divert other recyclable materials at recycling depots.
- MF homes and ICI facilities should be diverting recyclable materials to adhere to Metro Vancouver disposal bans.

Composting:

- The City currently collects mixed organics (food waste and leaf and yard waste) curbside for SF homes in green carts.
- MF homes and ICI facilities should be diverting organic waste to adhere to Metro Vancouver disposal bans.

Special Wastes:

- Residents are encouraged to divert hazardous waste and other extended producer responsibility (EPR) materials at acceptable depots.

Disposal:

- SF garbage is stored at the works yard and compacted prior to transfer to the Surrey Transfer Station (STS) for disposal.
- SF organics is stored at the works yard and transferred to the GFL organics processing facility for processing.
- SF recycling is brought directly to the Richmond Urban Impact Material Recycling Facility (MRF) for processing.
- MF and ICI facility waste is disposed and processed at facilities chosen by their contracted waste hauler.

Option 2 – Collection Optimization Using Side-load Compaction Vehicles

Program components for this option are identical to those described in Table 24. The following features for Option 2 using side-load compaction vehicles are:

- Option of adding hydraulic lift assist in the future if toters are desired;
- Same collection by one staff member per truck, 3 trucks total (one waste, two organics); and
- Capacity: 31 cubic yard / 23.7 cubic meters with a 3:1 compaction ratio, equating to 71.1 loose cubic meters.

Option 3 – Collection Optimization Using Rear-load Compaction Vehicles

Program components for this option are identical to those described in Table 24. The following features for Option 3 using rear-load compaction vehicles are:

- Option of adding hydraulic lift assist in the future if toters are desired;
- Collection by two staff members per truck (requires 3 additional staff), 3 trucks total (one waste, two organics); and,
- Capacity: 25 cubic yard / 19.1 cubic meter with a 3:1 compaction ratio, equating to 57.3 loose yards.

Option 4 – Collection Optimization Using Fully-automated Side-Load

Program components for this option are identical to those described in Table 24. The following features for Option 4 using fully-automated side-load compaction vehicles are:

- Only compatible with toters.
- Fully-automated and does not require staff to exit vehicle;
- Does not require additional hydraulic lift assist equipment purchases;

- Requires one-way collection (i.e. vehicle must collect one side at a time for streets and laneways); and,
- Capacity: 31 cubic yard / 23.7 cubic meters with a 3:1 compaction ratio, equating to 71.1 loose cubic meters.

8.2.3.2 Financials for Options 1 through 4

Financial estimates for the three new options (Options 2, 3 and 4) were calculated using the operational service statistics to determine the truck hours per day required for each service. A summary of the operation service statistics are shown in Table 25 below for SF garbage collection and in Table 26 SF organics collection. The estimated operational service statistics are founded on professional experience and are comprised of general average times for an urban environment. Estimated monthly labour costs were based on reduced hours due to equipment optimization. It is noted that a time study of the City's actual garbage and organics collection service times will provide more conclusive truck hours per day.

Table 25. Operational Service Statistics to Determine Truck Hours Per Day, Single Family Garbage

Service Criteria	Average per Collection Day (Tuesday to Friday)	Total per Collection Week
Number of Homes	513	2052
Quantity Collected (tonnes)	5.68	22.73
Seconds per Stop[1]	21	-
Service Minutes per Day[2] 'Main-lining'[3]	141	-
Service Minutes per Day[2] One-Way Collection[4]	180	-
One-Way Disposal Trip Distance to STS (km)	26	-
Average Speed (km/hour)	60	-
Total Disposal Drive Time[5] (min)	52	-
On-site Disposal Time[6] (min)	30	-
Total Trip Time (min)	82	-
Pre-trip/Post Trip STS (min)	30	-
Lunch and Breaks (min)	60	-
Trucks Hours Per Day 'Main-lining'	5.22	20.87
Truck Hours Per Day One-Way Collection	5.86	23.44

[1] Seconds per stop includes total time for car collection and drive time to next property.

[2] Service minutes per day are calculated by number of homes multiplied by seconds per stop and include one disposal trip per day for one truck.

[3] 'Main-lining' refers to collection of carts on both sides of the street in the same collection route pass. It is estimated main-lining for laneway collection (approximately 70% of the City's collection) results in service time savings of 20%.

[4] One-way collection refers to collection of carts on one side of the street in a collection route pass. An additional pass of the collection route collects from the remaining side of street.

[5] Total disposal drive time is the two-way travel time to the disposal facility based on total trip distance and average speed.

[6] On-site disposal time is the estimated time to queue and dispose of materials at the disposal facility.

Table 26. Operational Service Statistics to Determine Truck Hours per Day, Single Family Organics

Service Criteria	Average per Collection Day (Tuesday to Friday)	Total per Collection Week
Number of Homes	1026	4105
Quantity Collected (tonnes)	7.91	31.63
Seconds per Stop[1]	21	-
Service Minutes per Day[2] 'Main-lining'[3]	282	-
Service Minutes per Day[2] One-Way Collection[4]	359	-

Service Criteria	Average per Collection Day (Tuesday to Friday)	Total per Collection Week
One-Way Disposal Trip Distance to GFL (km)	26	-
Average Speed (km/hour)	60	-
Total Disposal Drive Time[5] (min)	52	-
On-site Disposal Time[6] (min)	30	-
Total Trip Time (min)	164	-
Pre-trip/Post Trip GFL (min)	30	-
Lunch and Breaks (min)	60	-
Trucks Hours Per Day (for two trucks) 'Main-lining'	8.93	35.73
Truck Hours Per Day (for two trucks) One-Way Collection	10.22	40.88

[1] Seconds per stop includes total time for car collection and drive time to next property.

[2] Service minutes per day are calculated by number of homes multiplied by seconds per stop seconds per stop and include one disposal trip per day for two trucks.

[3] 'Main-lining' refers to collection of carts on both sides of the street in the same collection route pass. It is estimated main-lining for laneway collection (approximately 70% of the City's collection) results in service time savings of 20%.

[4] One-way collection refers to collection of carts on one side of the street in a collection route pass. An additional pass of the collection route collects from the remaining side of street.

[5] Total disposal drive time is the two-way travel time to the disposal facility based on total trip distance and average speed.

[6] On-site disposal time is the estimated time to queue and dispose of materials at the disposal facility.

A breakdown of the capital and operating costs and the total overall costs for garbage, organics and recycling for each option is provided in Table 27. Under status quo, the City has indicated five additional trucks are required to replace the existing garbage, recycling and organics collection vehicles. Annual operating costs for the City include personnel wages, hauling program costs and allocated vehicle costs (including fuel, maintenance and insurance). As noted previously, no double handling of recyclable material occurs and contamination rates are low, and the current collection model for recycling (status quo) was deemed efficient and no changes were made. The cost for pre-market estimates to replace trucks and annual operations are provided in Table 27. Depreciation is not included in the overall cost. Costs are presented in 2020 dollars (except status quo annual operating cost).

Table 27. Capital and Operating Costs for SF Collection of Garbage, Organics and Recycling Collection

	Garbage Collection			
	Option 1[1] Status Quo	Direct Haul		
	(Continued transfer at works yard)	Option 2[2] One-man Sideload	Option 3[2] Two-man Rearload	Option 4[2] One-Man Automated Sideload
		(1 trucks, 1 staff)	(1 trucks, 2 staff)	(1 trucks, 1 staff)
Capital Costs				
Vehicle[3]	$180,000	$295,000	$240,000	$385,000
Toter[3]	$0	$0	$0	$738,900
Monthly Operating Costs				
Labour (assume 16 working days per month)	See note [1]	$2,499	$4,998	$2,808
Tax and Benefits @ 40 %	See note [1]	$1,000	$1,999	$1,123
Fuel at 13 L/hour @ $ 1.2 L	See note [1]	$1,300	$1,300	$1,460
Insurance and Maintenance	See note [1]	$1,948	$1,948	$2,154
Total Costs				
Monthly Operating Cost	See note [1]	$6,747	$10,245	$7,544
Statutory Holiday Coverage	See note [1]	$2,463	$2,463	$2,463
Annual Operating Cost	$167,721	$83,422	$125,405	$92,995

[1] 'Status Quo' operating costs are actual 2018 costs and include personnel wages, hauling program costs and allocated vehicle costs (including fuel, maintenance and insurance).

[2] Labour hours for Options 2-4 are based on optimized compaction trucking and removed double-handling/ transfer of materials, as detailed in Table 25. Estimated monthly labour, fuel and maintenance costs are based on reduced hours due to equipment optimization. Actual labour hours may vary as a field study is needed for an accurate estimate.

[3] Pre-market cost estimate.

Organics Collection				
	Option 1[1] Status Quo	Direct Haul		
	(Continued transfer at works yard)	Option 2[2] One-man Sideload (2 trucks, 2 staff)	Option 3[2] Two-man Rearload (2 trucks, 4 staff)	Option 4[2] One-Man Automated Sideload (2 trucks, 2 staff)
Capital Costs				
Vehicle[3]	$360,000	$590,000	$480,000	$770,000
Toter[3]	$0	$0	$0	$738,900
Monthly Operating Costs				
Labour (assume 16 working days per month)	See note [1]	$4,278	$8,557	$4,896
Tax and Benefits @ 40 %	See note [1]	$1,711	$3,423	$1,958
Fuel at 13 L/hour @ $ 1.2 L	See note [1]	$4,450	$4,450	$5,092
Insurance and Maintenance	See note [1]	$5,705	$5,705	$6,528
Total Costs				
Monthly Operating Cost	See note [1]	$16,144	$22,134	$18,474
Statutory Holiday Coverage	See note [1]	$7,211	$7,211	$7,211
Total Annual Operating Cost	$246,283	$200,937	$272,814	$228,904

[1] 'Status Quo' operating costs are actual 2018 costs and include personnel wages, hauling program costs and allocated vehicle costs (including fuel, maintenance and insurance).

[2] Labour hours for Options 2-4 are based on optimized compaction trucking and removed double-handling/ transfer of materials, as detailed in Table 26. Estimated monthly labour, fuel and maintenance costs are based on reduced hours due to equipment optimization. Actual labour hours may vary as a field study is needed for an accurate estimate.

[3] Pre-market cost estimate.

Works Yard				
	Option 1 Status Quo	Direct Haul		
	(Continued transfer at works yard)	Option 2 One-man Sideload	Option 3 Two-man Rearload	Option 4 One-Man Automated Sideload
Capital Costs				
Rebuild Compactor and Compactor Container	$87,000	0	0	0
Monthly Operating Costs				
WCC costs garbage transfer	$4,305	0	0	0
WCC costs organics transfer	$5,445	0	0	0
Total Costs[1]				
Monthly Operating Cost	$9,750	0	0	0
Total Annual Operating Cost	$117,005	0	0	0

[1] Total works yard operating costs are included in the total annual operating cost for garbage collection and organics collection, respectively.

Totals (Garbage and Organics)				
	Option 1 Status Quo	Direct Haul		
	(Continued transfer at works yard)	Option 2 One-man Sideload	Option 3 Two-man Rearload	Option 4 One-Man Automated Sideload
Initial Capital Trucks[1]	$540,000	$885,000	$720,000	$1,155,000
Rebuild Compactor and Compactor Container	$87,000	$0	$0	$0
Capital for Residential Toters	$0	$0	$0	$1,477,800
Total Capital	$627,000	$885,000	$720,000	$2,632,800
Annual Overall Operation	$414,004	$284,359	$398,219	$321,899
Total 7 Yr Operational	$2,898,028	$1,990,514	$2,787,536	$2,253,291
Total 7 Yr Lifecycle Overall (Garbage and Organics)	$3,525,028	$2,875,514	$3,507,536	$4,886,091

[1]Pre-market cost estimate

Totals (Recycling Collection)				
	Option 1	Option 2	Option 3	Option 4
Initial Capital Trucks[1]	$516,000	Status Quo is Optimal	Status Quo is Optimal	Status Quo is Optimal
Total Capital	$516,000	$516,000	$516,000	$516,000
Annual Overall Operation	$251,253	Status Quo is Optimal	Status Quo is Optimal	Status Quo is Optimal
Total 7 Yr Operational	$1,758,771	$1,758,771	$1,758,771	$1,758,771
Total 7 Yr Lifecycle Overall (Recycling)	$2,274,771	$2,274,771	$2,274,771	$2,274,771

[1]Pre-market cost estimate

Totals (Garbage, Organics and Recycling)				
	Option 1 Status Quo	Direct Haul		
	(Continued transfer at works yard)	Option 2 One-man Sideload	Option 3 Two-man Rearload	Option 4 One-Man Automated Sideload
Total Garbage, Organics and Recycling - 7 Yr Lifecycle[1]	$5,799,799	$5,150,285	$5,782,307	$7,160,862

[1]Excludes Tipping Fees, Advertising, Administrative, and Supplies

Capital Cost Offsets

Available funds to offset the proposed capital costs include the money available in reserves and set aside for new collection vehicles. As per communication with the City, approximately $1.1 million is currently available to purchase new SF collection trucks. Of the $1.1 million, $485,000 is available for the purchase of garbage and organics collection vehicles. The estimated cost for the new vehicles are $450,000 for three garbage and organics trucks, $516,000 for two recycling trucks and $135,000 in reserves.

Based on additional information received from the City, it is estimated half of the SF households (about 2,000 households) place two additional bags out per week over a recommended five bag limit for four months (sixteen weeks) in the summer. This would equate to approximately 64,000 extra bags. A more conservative estimate of four weeks of over-limit bags would equate to 16,000 extra bags and approximately $32,000 in revenue if Tag-a-Bag stickers were required at $2 each. However, additional review is required to confirm accuracy of over-limit bags before Tag-a-Bag sticker revenue of this amount can be considered as a capital offset.

8.2.3.3 Evaluation of Single Family Collection Options

The following subsections present an analysis of the status quo and three new SF collection options.

Option Evaluation Criteria

Dillon developed an evaluation matrix for each of the four options to establish which ones are worthwhile for the City to pursue. This included the following activities:

- Creating a final evaluation matrix for cost, ease of implementation, risks and time;
- Rank the programs based on their weighted assessment scores complete with an explanation of scoring decisions; and
- Complete a qualitative review of the costs and benefits of each candidate options including identified economic benefits.

The evaluation looked at the following eight criteria: capital cost, operating cost, community acceptance, ease of implementation, environmental, health and safety considerations, operational/managerial complexity, identified economic benefits and strategic fit.

Evaluation of Candidate Options

The qualitative evaluation of the options is provided in Table 28 under the heading of the eight evaluation criteria and is founded on the professional experience of the technical team. Where appropriate, positive and negative attributes have been identified with green checkmarks and red X's. It is noted that Table 28 also includes results of the cost estimation component of this assignment, as detailed in Section 8.2.3.2. Green and red shading was used when there was a more or less preferred option in the criteria. While the selected evaluation approach does not identify one specific option that the City should select, it does provide enough information to discuss and confirm a preferred course of action for the community.

Table 28. Qualitative Evaluation of Options

	Option 1 – Status Quo • F450 Haul All vehicles • One staff drives & collects • Capacity of 10.7 cubic metres • No compaction **Works yard transfer of material**	Option 2 - One Man Sideload • One staff drives & collects • Compaction ratio 3:1 • Capacity of 23.7 cubic metres • **Can be retrofitted to include hydraulic lift assist for toter collection**	Option 3 – Two Man Rearload • Two staff (1 drives/1 collects) • Compaction ratio 3:1 • Capacity of 19.1 cubic metres • **Can be retrofitted to include hydraulic lift assist for toter collection**	Option 4 – One Man Fully Automated Sideload • One staff drives & collects • Staff does not need to leave vehicle for collection • Compaction ratio 3:1 • Capacity of 23.7 cubic metres • **Requires toter collection**
Unique Scenario Components				
Capital Cost[1]	Lowest initial capital cost ✓	Second highest initial capital cost	Second lowest initial capital cost ✓	Highest initial capital cost x
Community Acceptance	No changes to existing resident responsibilities ✓ No improvement to Works Yard issues (noise, odour) x	Removal of Works Yard issues✓ Option to convert to cart collection ✓	Removal of Works Yard issues✓ Option to convert to cart collection ✓	Removal of Works Yard issues✓ Ensures cart collection ✓
Ease of Implementation	No change to existing service - no challenges identified✓	Requires operator training for new vehicle	Requires operator training for new vehicle	Requires operator training for full-automation collection Requires City decision to switch to carts prior to purchase x Potential issues with overhead clearances and narrow lanes x
EH&S Considerations	Increased risk of injury x	Medium risk of injury	Medium risk of injury	Least risk of injury✓
Operating Cost[1]	Highest annual operating cost x	Lowest annual operating cost✓	Second highest annual operating cost	Second lowest annual operating cost✓
Operational/Managerial Complexity	No change to current level of effort for ongoing management/daily operations	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site)✓	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site)✓	Decrease in current level of effort for ongoing management/daily operations (given removal of Works Yard as a transfer site)✓
Identified Economic Benefits	No increase in operating efficiency/ reduction in operating costs x	Ongoing lower annual operating costs than Status Quo✓	Ongoing lower annual operating costs than Status Quo✓	Ongoing lower annual operating costs than Status Quo✓
Strategic Fit	No change to staffing level No increased efficiency in collection time x	No change to staffing level Increased efficiency in collection time✓	Increased staffing level x Increased efficiency in collection time✓	No change to staffing level Increased efficiency in collection time✓

[1]*Based on estimates provided in* Table 27

The qualitative evaluation of the candidate options illustrates that Option 2 – One Man Sideload is the more advantageous SF collection option for the following reasons:

- The removal of works yard from current operations (i.e. materials can be directly hauled to end facility);
- Option to convert to cart collection in the future;
- Lowest annual operating costs compared to the alternative options;
- Decrease in daily operational and managerial complexity with the removal of the works yard (i.e. no need to double-handle and compact/consolidate materials);
- Lower annual operating costs than current operations; and
- Direct haul results in an increase in efficiency in collection time.

The qualitative evaluation demonstrates that Option 3 – Two Man Rearload is a less advantageous SF collection option for the following reasons:

- Second highest annual operating costs compared to the alternative options; and
- Increased staffing levels required to operate the vehicles compared to the alternative options.

Option 4 – One Man Fully Automated Sideload is comparably the least advantageous SF collection option for the following reasons:

- Highest annual capital costs compared to the alternative options;
- Selection of this option requires City decision to switch to carts prior to purchase and implementation; and
- Potential implementation issues related to overhead clearance and narrow lanes.

8.2.4 Phase 2 Priority - City Collection/Management of Multi-Family and ICI Waste Collection Services

In mid-2015, the City of White Rock made changes to its delivery of solid waste services. The changes included the privatization of MF and commercial solid waste pickup, as well as a transition from cost recovery through property taxes to a user-fee model for SF homes.

Since the transition, public feedback suggested a desire to return to City collection for the MF and commercial sectors. Results from the February 2020 community consultation indicated residents are indeed interested in receiving MF waste collection services from the City. An overwhelming 72% of MF residents would be 'very interested' in having the City complete their waste collection and an additional 15% would be 'interested' in this service. Inconclusive results were received from the ICI sector, with four of the seven respondents indicating they are 'somewhat satisfied' or 'satisfied' with their waste collection services. This sentiment is largely founded on the misconception that City collection was more affordable than private collection. We note here that previous MF waste collection by the City was based on cost recovery through property taxes and was not based on a transparent user fee cost recovery model.

8.2.4.1 Cost Estimates to Collect/Manage MF and ICI Waste

This section looks at different approaches for estimating the collection and management costs should the City revert back to internalized servicing of the MF and/or ICI sectors. When estimating the Garbage, Recycling and Organics storage containers required for MF and ICI properties, garbage is typically collected in front-end collection dumpsters or 'overhead bins' (2 yd^3 – 6 yd^3). If this service is internalized (City staff collect), additional trucks and staffing would be required to support (over and above those currently used for SF collection services).

Financial Estimate for Scenario 2B (Appendix G).

The City identified Scenario 2B Expanded Service Model - City Collection from all Multi-Family and Commercial Facilities, from Appendix G as the preferred option for MF and ICI collection. As directed by the City, Dillon prepared costs for the internalization of MF and ICI collection services. High-level costs for Scenario 2B are presented in Table 29 and Table 30 show a review of the potential capital and operating costs associated with Scenario 2B, as well as the estimated unit rate for MF and ICI customers. Routing for MF and ICI was not reviewed as part of this scenario overview. Separate routing of MF and ICI streams will need to be considered if the City proceeds with Scenario 2B to receive the RecycleBC incentive for MF recycling collection. Additionally, three-stream waste collection from MF buildings that include ICI space (i.e. mixed-use buildings) will be serviced under ICI collection due to the space constraints for multiple bins.

If MF recycling and/or organics collection was to be internalized without 'overhead' bins, toters (wheeled carts) would be required. Capital costs for the toters (approximately $150 each) would be purchased by the City and amortized over a period to be determined by the City's finance department (typically 7-10 years) and offset by a user rate per year per MF unit. The truck hydraulic lift required to transfer material from a wheeled cart into a truck would be purchased by the City. This is at a cost of $15,000 per unit installed and can be added on to compaction trucks at any time.

Further granular costing to implement this option is recommended as it is outside the scope of this project. Additional consideration regarding a return to recycling collection services for the MF sector includes potential receipt of the RecycleBC incentive. However, MF collection will need to be collected separately from single-family and ICI collection if the City wants the RecycleBC incentive for MF tonnage. Additional information is provided in Appendix H.

Table 29. High-Level Capital Cost for Service Scenario 2B: Expanded Service Model - City Collection from all Multi-Family and Commercial Facilities

Scenario 2B: Expanded Service Model - City Collection from all Multi-Family and Commercial Facilities

	Collection and Transfer	Capital Cost	Preliminary Cost Estimate			
			Initial Capital	Quantity	Overall Initial Capital Cost	Total Cost
1	Purchase of compacting side load 25 yard waste collection vehicles for MF Collection	Yes	$295,000[1]	2	$590,000	$590,000
2	Purchase of compacting side load 25 yard waste collection vehicles for ICI Collection	Yes	$295,000[1]	2	$590,000	$590,000
3	Purchase of Toters for MF Buildings (Recycling and Compost Only)	Yes	$150	1854	$278,100	$278,100
4	Purchase of Toters for ICI Facilities (Recycling and Compost Only)	Yes	$150	576	$86,400	$86,400
5	Purchase of Toters for Mixed-use Buildings (Recycling and Compost Only)	Yes	$150	402	$60,300	$60,300
6	Purchase of Cart Tippers for Toters	Yes	$15,000	4	$60,000	$60,000
7	Purchase of a Front-End Load Waste Collection Vehicle	Yes	$450,000	1	$450,000	$450,000
8	Purchase of Garbage Dumpsters for MF Buildings	Yes	$1,400	338	$472,780	$472,780
9	Purchase of Garbage Dumpsters for ICI Facilities	Yes	$1,400	96	$134,400	$134,400
10	Purchase of Garbage Dumpster for Mixed Use Buildings	Yes	$1,400	67	$93,800	$93,800
					Total:	$2,815,780

[1] Pre-market value

Table 30: High-Level Operating Cost and Unit Rate for Service Scenario 2B: Expanded Service Model - City Collection from all Multi-Family and Commercial Facilities

	Garbage	Organics	Recycling
	One Man Front-End Load (Shared MF & ICI)	One-man Sideload (1x MF & 1x ICI)	One-man Sideload (1x MF & 1x ICI)
	1 truck, 1 staff	2 trucks, 2 people	2 trucks, 2 people
Operating Costs			
Labour Cost Month @ $30 hour 16 working days per month[1]	$ 3,600	$ 7,200	$ 7,200
Tax and benefits costs @ 40 %	$ 1,440	$ 2,880	$ 2,880
Fuel cost at 13 liter/hour @ $ 1.2 liter	$ 1,872	$ 3,744	$ 3,744
Ave Maintenance cost @ $ 20 hr	$ 2,682	$ 5,082	$ 5,082
Total Operating Cost Per Month	$ 9,594	$ 18,906	$ 18,906
Labour Statutory Holiday Coverage (annual)	$ 3,606	$ 7,211	$ 7,211
Solid Waste Coordinator, 1x FTE[2] (annual)		$66,667	
Total Operating Cost Per Year	$ 140,956	$ 256,305	$ 256,305
Total MF Total Operating Cost Per Year (all streams)			$ 326,783
Total ICI Total Operating Cost Per Year (all streams)			$ 326,783

[1] Estimated monthly labour, fuel and maintenance costs are based on a 7.5 hour working day. Actual labour hours may vary as a field study is needed for an accurate estimate.

[2] The solid waste coordinator would manage all three streams for both MF and ICI sectors. Costs are estimated assuming two thirds of a full-time equivalent (FTE) staff member at $100,000/year is required oversee MF and ICI waste management contracts. The remaining one third of the FTE staff member's time will oversee SF collection and general SWM services and programs.

Tipping Fees (year)

	MF	ICI
Tipping Fees ($/tonne)		
Garbage[1]	108	108
Organics [1]	105	105
Recycling	-	99
Annual Waste Generation Tonnage (2020)[2]		
Garbage	2,088	2,776
Organics	504	666
Recycling	468	611
Annual Estimated Tipping Cost		
Garbage	$ 225,486	$ 299,778
Organics	$ 52,916	$ 69,948
Recycling	-	$ 60,455
Recycling Incentive[3]	-$ 69,552	-
Total All (year)	$ 208,850	$ 430,181

[1] 2020 tip fees.
[2] Note, 67 mixed-use property tonnages are distinctly accounted for in the ICI and MF waste streams. Mixed-use tonnages are assumed included to be included both MF and ICI tonnages totals.
[3] Based 2019 RecycleBC Incentive.

Totals

	MF	ICI
Total Capital Cost[1]	$ 2,815,780	
Annual Overall Operation Cost[2]	$ 535,633	$ 756,964
Total 7 Yr Operational[3]	$ 3,749,431	$ 5,298,747
Total 7 Yr Lifecycle Overall MF and ICI		$ 11,863,958
Average Yearly Overall MF and ICI		$ 1,694,851

[1] Includes costs detailed Table 29.
[2] Total overall operation is the summation of the labour and maintenance costs and tipping fees.
[3] Excludes advertising, administrative, and supplies costs.

Unit Cost

	MF	ICI[1]
Weekly Number of Stops[2]	252	163
Stream's Portion of Total Number of Stops	60.7%	39.3%
Cost based on portion of Total Number of Stops	$ 1,029,163	$ 655,689
Number of Units / Properties	6,265	163
Unit Cost per year	$ 164	$ 4,084

[1] ICI weekly number of stops includes stops at mixed-use buildings to reflect that mixed-use buildings do not qualify for the RecycleBC incentive.
[2] 'Stops' refers the number of building requiring collection services.

Jurisdictional Review Findings

The jurisdictional review (Section 7.0) looked at how neighbouring municipalities service the MF and ICI sectors. Neighbouring jurisdictions of Surrey, Port Coquitlam and Port Moody all provide collection services for MF dwellings; only Port Moody and Port Coquitlam provide collection to the commercial sector. Surrey and Port Coquitlam provide organics and recycling collection only, Port Moody is the only municipality collecting all three streams from these sectors.

Costs per unit per year range from $15/unit (Port Coquitlam) to $40/unit (Surrey) for two-stream collection and as high as $197/year for three stream collection in Port Moody. It should be noted Port Moody is the only Metro Vancouver member municipality that provides in-house collection for MF and ICI sectors. Costs in Port Coquitlam and Surrey (and even Port Moody) may be offset by SF collection fees and economies of scale. Costs to provide services to the MF and ICI sectors are presented in the presentation board titled "How Does White Rock Compare to Other Municipalities?" presented in Appendix F.

Dillon recommends that in order to get accurate comparative costs regarding MF and ICI collection, and potentially implementing this as a City-managed program performed either internally or by the private sector, a Request for Proposals be developed. An objective of the selection process would be to choose the most cost-effective and operationally sound arrangement, regardless of whether the collection is done by an external Proponent or internal (in-house) group. As such, Proponents would be advised that the process will include an internal staff submission from the City. To be fair, the internal staff submission and external Proposals would respond to the same submission requirements and be evaluated as set out in the RFP Documents.

MF and ICI Survey Results

MF and ICI surveys were developed and sent to building/business owners, Strata Councils and multi-family building managers in an effort to understand and gather data on the current costs of private waste collection haulers for these sectors. Surveys were sent out by mail the week of October 26, 2020 and participants could complete the survey any time before November 13, 2020. City staff mailed out 257 MF surveys and 108 ICI surveys. In addition to these mail-outs, an email was sent to the BIA to advise members of the survey. There were 57 responses to the MF survey and 12 to the ICI. The detailed survey results are provided in Appendix I with a summary of results provided below:

1. Results of the MF Survey:
    - 33% of participants charge more than $25/unit for waste collection, 28% were unsure of fees and 19% paid less than $15/ unit (10% were $16-$20/unit and 9% were $21-$25/unit).
    - All participants indicated that garbage, organics and recycling is collected in their building.
2. Results of the ICI Survey:

- 42% of participants were stand-alone businesses, 25% were businesses within a business complex and an additional 25% were businesses within a mixed-use building (business and residential). The remaining 8% were "other".
- 58% of participants paid more than $61 and 9% paid less than $20 for waste collection services. The remaining 33% were unsure of their waste collection costs.

2015 Model Results

As part of the previous Solid Waste Operations Review, completed by Dillon in 2015, a solid waste utility rate model was developed that was used to estimate future user fees for collection of waste from the SF, MF and ICI sectors. The model was developed in consultation with the City's Finance division, along with Public Works. The City provided direct operating expenses (e.g., wages, benefits, tip fees, vehicle operating costs, etc.), other operating expenses (e.g., administration costs and vacation pay) and operating revenues (e.g., decal sales, sale of recyclables, sale of composters). Waste generation ratios were developed for the five different customer types (SF, SF with secondary suites, MF strata units, MF rental units and ICI) and customer equivalents were then estimated based on the generation ratios. The total operating costs and revenues from the base year of 2013 were entered into the model to estimate the remaining revenue required from the City's customers.

In an effort to utilize this model to estimate potential costs should the City resume collection of MF and ICI, a number of assumptions and data sources were used as follows:

- 2018 financial data provided by the City;
- 2019 waste quantity estimates for SF, MF and ICI sectors and number of units to establish the generation ratios; and
- Tipping fees and operational costs for the MF and ICI sectors developed by Dillon for Scenario 2B mentioned above.

The above-mentioned data was inputted into the model. It is noted that the following were not available and/or considered as part of this high level approach to estimating costs for the City to resume collection services to the MF and ICI sectors:

- The 2015 model was based on actual total operating costs borne by the City to service all three sectors; individual costs by sector were not available in 2015;
- The updated model also factors in the total estimated operating costs and then allocates costs based on the number of customer equivalents per the three sectors;
- Estimates on program supplies, advertising and program contract costs were not available for MF and ICI;
- WCB claim allowances for SF collection were not available; and
- Amortization costs for new and required assets to provide service were not available (i.e., carts, collection vehicles).

The resulting estimated annual costs per MF unit was $135 and over $5,880 for the ICI customers. It is noted that these are considered rough estimates given the number of differences between how waste was handled by the City in 2013 (i.e., City responsible for all sectors and thus had solid actual costs) compared to today (i.e., City only services SF sector and has limited to no information on actual costs to service the MF and ICI sectors). A breakdown of the costs and assumptions used to estimate the Utility Rate Models cost unit rates are provided in **Appendix I**.

Summary of Cost Estimates for MF and ICI

Table 32 provides the overall results of MF and ICI waste collection cost estimates. The estimated current costs are based on the MF and ICI survey results. It should be noted that only a small portion of MF and ICI properties participated in the survey; due to this, these results are not considered to be representative of the actual current costs across the City. MF survey results were reviewed two ways. The first was by analysing costs based on the most frequently selected response, overall (<$25/unit/month). The second way was to look at the larger buildings (greater than 101 units). It is assumed that these buildings would have reduced costs based on economies of scale. Two respondents for the MF survey indicated their buildings were over 101 units. One respondent did not know the monthly cost of waste collection and the other indicated their costs were <$15/unit/month). It should be noted that only five of 242 MF buildings the City are over 101 units (Table 31).

Table 31: Number of MF Buildings with Range of Unit Count

Total Number of Units in a Building	Number of Buildings
1-20 Units	141
21-40 Units	72
41-60 Units	22
61-80 Units	7
81-100 Units	6
101-120 Units	2
121-140 Units	1
141-160 Units	0
161-180 Units	0
181-200 Units	1

The potential internalized costs are based on costs estimates completed by Dillon staff as well adapting the 2015 internal utility rate model that is used to estimate rates for solid waste collection based on multiple cost and operational factors. The general premise of this model of cost recovery is based on funding solid waste services in a manner similar to that used for water, natural gas or electrical power. This system of funding is based on the principal that the “cost causer” pays for the service that he/she receives in proportion to the cost of providing that service. This principal has been established and implemented successfully by the water, natural gas and electrical service providers.

Table 32. Estimated Overall Costs for MF and ICI Waste Collection

Sector:	Annual Cost	Estimated Current Costs:	Potential Internalized Costs	
		Survey	Dillon Estimated Costs	Estimated Cost from Utility Rate Model
MF	Per Unit[1]	>$300	$164	$135
	Per Unit[2]	>$180		
ICI	Per Property	>$732	$4,084	$5,880

[1] *Survey results are based on a small number of survey participants and likely not representative. Results are calculated based on the most frequently selected survey response.*

[2] *Response (1) from buildings over 101 units.*

8.2.4.2 Options Analysis and Discussion

Dillon reviewed multiple MF and ICI waste collection options. The main options reviewed were an expanded service model for City collection of all MF and ICI waste and a City managed contract for MF and ICI waste collection services.

The advantages of either one of these public sector waste collection options includes:

1. Having and maintaining a degree of ongoing direct control over the provision of the service;
2. Bargaining power when negotiating with private contractors; and
3. The ability to maintain a personalized level of service and interaction with customers/residents.

Potential advantages to private sector waste collection includes:

1. The potential of establishing a more cost-efficient service through competitive bidding; and
2. Less WCB injury claims in the City.

If the City decides to take on MF and ICI waste collection services, then there will be logistical modifications to current operations such as purchasing the required assets, hiring and training of staff and outreach and education. It will require an increase in administration efforts to work with all MF and ICI properties to determine contract end dates and develop a transition plan to move from private to public waste collection services. Both the Dillon estimated costs and the Utility Rate Model have included 2/3 of a FTE staff to manage an MF/ICI collection contract. It is assumed this same staff will be available 1/3 of the time to assist with SF curbside collection (done internally) as well as other waste management initiatives.

If the City chooses to contract MF and ICI waste collection then outreach will have to occur to inform residents of the change in service delivery. It will require an increase in administration efforts to negotiate a contract with a private collector and placing staff in new areas/positions. There will be lower customer service requirements for the City, but continuous performance monitoring of the contractors will be required. The City would also have to work with all MF and ICI properties to determine current contract end dates and develop a transition plan to move from private the selected universal private hauler. Using a universal contractor removes the requirement of the City to purchase required assets

such as waste collection vehicles and containers. It is anticipated that a universal contractor would increase economies of scale and reduce costs overall for MF and ICI facilities in the City.

Table 33 provides a qualitative evaluation of the MF and ICI collection options using the same criteria that was used to evaluate the SF collection options. Green and red shading was again used to distinguish between more or least preferred considerations under each criteria.

Table 33. Qualitative Evaluation of MF and ICI Options

Unique Scenario Components	Option 1 – Status Quo	Option 2 – City Collection of Both MF and ICI	Option 3 – City Managed Contract of MF and ICI
Capital Cost	No Change in Capital Costs	Highest initial capital cost x	No Change in Capital Costs
Community Acceptance	No changes to existing resident responsibilities	Reduces number of waste collection vehicles on the street ✓	Reduces number of waste collection vehicles on the street ✓
Ease of Implementation	No change to existing service	Requires operator training for new vehicle(s)	Requires management of contract
EH&S Considerations	No change to risk	Medium risk of injury	Medium risk of injury
Operating Cost	Lowest annual operating cost ✓	Highest annual operating cost x	Second highest annual operating cost
Operational/Managerial Complexity	No change to current level of effort for ongoing management/daily operations	Increase in current level of effort for ongoing management/daily operations (additional collection vehicles, routes and crews) x	Increase in current level of effort for ongoing management/daily operations (contract management) x
Identified Economic Benefits MF	No Change	Reduced overall costs for MF sector✓	Reduced overall costs for MF sector✓
Identified Economic Benefits ICI	No Change	Increased overall costs for ICI sector x	Reduced overall costs for ICI sector✓
Strategic Fit	No change to staffing level	In-line with Council Goals and Objectives ✓	In-line with Council Goals and Objectives ✓

The qualitative evaluation table illustrates that Option 3 – City Managed Contract of MF and ICI is more advantageous given the following rationale:

- Community acceptance associated with a reduction in the number of waste collection vehicles on the street compared to current operations;
- Reduction in overall costs for MF sector compared to current operations;
- Reduction in overall costs for ICI sector compared to current operations; and
- An overall strategic fit with the Council's goals and objective.

The qualitative evaluation table illustrates that Option 2 – City Collection of Both MF and ICI is less advantageous given the following rationale:

- Higher initial capital cost compared to Option 1 and 2;
- Additional implementation requirement for the provision of operator training for new vehicles;
- Higher annual operating cost when compared to Option 1 and 2;
- Increase in level of effort for ongoing management and daily operations related to additional vehicles, routes and staff; and
- Increase in overall costs for ICI sector when compared to Options 1 and 2.

8.2.5 Next Steps for Other Phase 2 Priorities

As mentioned in Section 8.2.2.2, there were three secondary priorities identified that required a deeper dive into the how these could be considered and/or implemented. Section 8.2.4 looked into the City collecting waste from the MF and ICI sectors. The following sub-sections speaks to considerations for the remaining two secondary priorities (Recycling Collection, Procurement of Toters for SF collection).

8.2.5.1 Continued City Collection of Recycling vs. Management of Private Collection Contract or Hand-over to RecycleBC

Recycling is currently collected using two Peterbilt Single Axle Labrie Top Select Box trucks (one staff per vehicle) with a capacity of 32 cubic meters and a hoist capacity of 2.5 tons. Until June of 2020 it was hauled directly to the end processing facility in Surrey. RecycleBC have recently revised their authorized processor to be Urban Impact in Richmond, BC. They have asked White Rock to deliver recyclables to this new facility, which is twice the distance from the City, requiring more staff hours and additional fuel. The City had asked Dillon to consider the cost for contracting out this service to a private company or asking RecycleBC to take over the recycling collection services for the SF sector.
Considerations include the following:

1. The current City recycling program results in an overall deficit as the RecycleBC incentive does not cover the current City collection costs. A comparison of the total expenses and revenue for the City's recycling program from 2015 to 2018 is shown in Figure 22. Revenue generated is inclusive of blue/red box sales and program incentive form RecycleBC. Operating costs are inclusive of advertising, supply, and allocated vehicle costs.
2. As per the Emterra quote provided to the City in 2017, the cost of a private recycling collection contract could be approximately $20,000 higher than current operational costs incurred by the City. It should be noted that Emterra's quote applies to delivery to the Surrey facility and it is expected private hauler delivery costs will be greater for delivery to the new end processing facility in Richmond.
3. Transferring the responsibility of recycling collection to RecycleBC adds additional hauler traffic to City's roads. This would be contrary to the responses on hauler traffic impacts from the community consultation, 67% of survey participants found their day-to-day living impacted or

very impacted by hauler traffic. Furthermore, it will not be guaranteed the RecycleBC hauler will conform to the City's current collection schedule for garbage and organics.

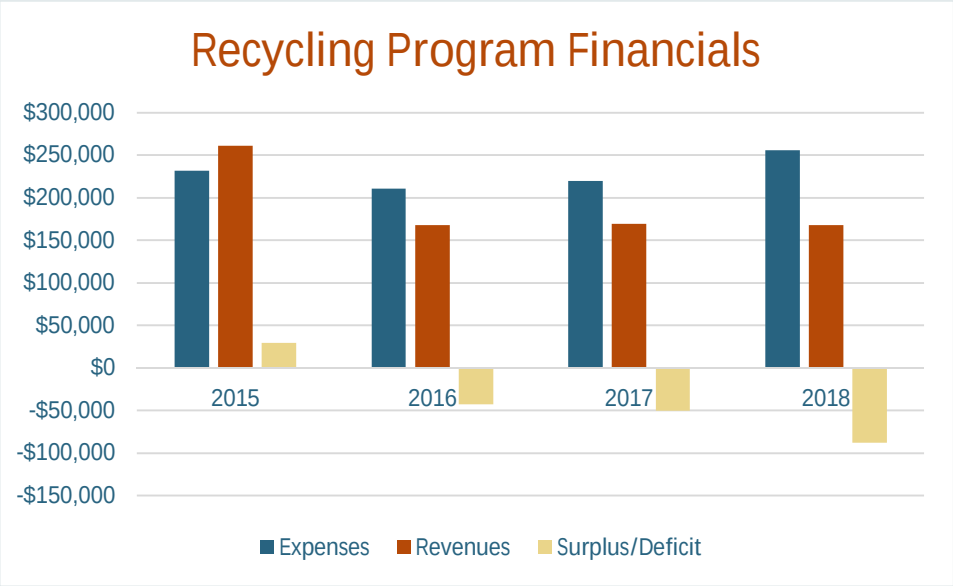


Figure 22. Recycling Program Financials (2015 to 2018).

8.2.5.2 Procurement of Standardized Wheeled Carts for Single-Family Garbage and Organics Collection

The option to transition to carts was considered as a separate cost item given residents support for standardized cart collection. Capital costs are included as wheeled carts (toters) and truck hydraulic lift assist which is required to transfer material from the cart into the truck, the full purchase price of which would be amortized over a period to be determined by the City's finance department (typically 7-10 years) and offset by municipal reserves and/or an increased user rate per year per resident. Wheeled carts are only under consideration for garbage and organics as municipalities with multi-stream recycling (such as White Rock) consistently have lower contamination rates. The City should continue with the existing multi-stream recycling collection program. A preliminary capital cost for standardized toters is provided in Table 34. The actual cost for toters may be lower as increased production and use province-wide has led to lower costs currently. It is recommended a Request for Quotes/Request or Expression of Interest be issued to procure more accurate costs for the City.

Table 34. Collection Optimization and Reduction of Double Handling of Materials - Standardized Toters

		Preliminary Cost Estimate					
Collection and Transfer		Capital Cost	Operating Cost[1]	Initial Capital	Quantity	Overall Initial Capital Cost	Total Cost
1	Purchase of Toters for SF Homes	Yes	Yes	$ 150	9852	1,477,800	1,477,800
2	Purchase of Hydraulic Cart Tippers for Toters	Yes	Yes	$ 15,000	3	$ 45,000	$ 45,000
						Total	$ 1,507,800

[1] Delivery and Assembly included,
Maintenance and depreciation monies not included in estimate

9.0 Recommendations and Program Improvement Opportunities

The following provides a summary of the recommendations based on the review of potential options for the priority areas as well as additional program improvement opportunities based on the findings of the jurisdictional review.

9.1 Phase 1 Priority – Single Family Collection Options

A breakdown of the capital and operating costs and the total overall costs for garbage, organics and recycling was developed for each of four options investigated for the City. As noted previously, no double handling of recyclable material occurs in the City and contamination rates are low, therefore the current collection model for recycling (status quo) was deemed efficient and no changes are recommended. For this reason status quo recycling costs were added in to provide the overall cost of the program.

As outlined in our presentation to Council (and accompanying memorandum) Dillon recommends Option 2 - Use of Side-Load Compaction Vehicles for the collection of SF curbside garbage and organics materials. The qualitative evaluation (Section 8.2.3.3) of the candidate options illustrates that Option 2 is the more advantageous SF collection option for the following reasons:

- The removal of the Operations Yard from current operations (i.e. materials can be directly hauled to end facility);
- Option to convert to cart collection in the future;
- Lowest annual operating costs compared to the alternative options;
- Decrease in daily operational and managerial complexity with the removal of the Operations Yard (i.e. no need to double-handle and compact/consolidate materials);
- Lower annual operating costs than current operations; and
- Direct haul results in an increase in efficiency in collection time.

9.2 Phase 2 Priority – Single Family Collection Options

As directed by the City, Dillon considered two different approaches for estimating the collection and management costs should the City revert back to internalized servicing of the MF and/or ICI sectors. These estimates were compared to current costs MF residents and commercial businesses currently pay with the private sector, as understood through the (limited) survey results received by the City in late 2020.

The potential internalized costs were based on costs estimates completed by Dillon staff as well adapting the 2015 internal utility rate model that was used to estimate rates for solid waste collection

based on multiple cost and operational factors. The general premise of this model of cost recovery is based on funding solid waste services in a manner similar to that used for water, natural gas or electrical power.

Based on the results of the evaluation, Dillon recommends Option 3 – City Managed Contract of MF and ICI for either and/or both of these sectors. The qualitative evaluation table illustrates that Option 3 is the more advantageous given the following:

- Community acceptance associated with a reduction in the number of waste collection vehicles on the street compared to current operations;
- Reduction in overall costs for MF sector compared to current operations;
- Reduction in overall costs for ICI sector compared to current operations; and
- An overall strategic fit with the Council's goals and objective.

Dillon recommends that a Request for Proposals be developed and issued in order to get accurate comparative costs regarding MF and ICI collection, and potentially implementing this as a City-managed program performed either internally or by the private sector. An objective of the selection process would be to choose the most cost-effective and operationally sound arrangement, regardless of whether the collection is done by an external Proponent or internal (in-house) group. As such, Proponents would be advised that the process will include an internal staff submission from the City. To be fair, the internal staff submission and external Proposals would respond to the same submission requirements and be evaluated as set out in the RFP Documents.

9.3 Other Phase 2 Priorities

9.3.1 Single Family Recycling

RecycleBC recently revised their authorized processor to be Urban Impact in Richmond, BC. They asked White Rock to deliver recyclables to this new facility, which is twice the distance from the City, requiring more staff hours and additional fuel. The City asked Dillon to consider the cost for contracting out this service to a private company or asking RecycleBC to take over the recycling collection services for the SF sector.

Dillon recommends the City continue collection of SF recycling with transfer to the facility in Richmond based on the RecycleBC incentive received, a private hauler quote from three years ago (higher than current City costs to provide service) and in an effort to avoid additional trucks on city roads (public survey responses).

9.3.2 Potential Procurement of Standardized Wheeled Carts for Single-Family Garbage and Organics Collection

Given the public interest in cart collection as identified through the public consultation (63% of SF residents would prefer standardized toters for waste collection services), it is recommended the City

consider wheeled carts for SF collection. Wheeled carts are only under consideration for garbage and organics as White Rock has consistently low contamination rates in recycling due to multi-stream collection.

Given a changing market and current oversupply of collection carts, it is recommended a Request for Quotes/Request or Expression of Interest be issued to procure more accurate costs for the City based on potential needs (~10,000 carts).

9.4 Additional Program Improvement Opportunities

In Section 7.0, a review of waste management practices, initiatives, programs and strategies was undertaken on a select number of local neighbouring jurisdictions with the key findings presented in Table 21 in Section 7.9. These jurisdictions were chosen based on how comparable the demographics were to the City of White Rock (e.g. population, density), legislative requirements and on their progressive approaches to managing waste in the following categories:

- Waste Diversion Programs;
- Waste Diversion Legislation, Policy and Enforcement;
- Waste Avoidance and Reduction;
- Single-Family Waste Collection;
- Multi-Family Waste Collection;
- ICI Waste Collection; and
- Streetscape and Public Spaces Waste Management.

Based on the findings of the review and comparing to the City's existing waste management system, several program changes and areas for improvement have been identified and are summarized in Table 35. Any existing City programs that should not change based on consistency with the best practices findings are also noted.

Table 35. Opportunities for Program Changes and Improvement

Program Component Headings	Program Changes and Improvement Opportunities Based on Jurisdictional Review
Waste Diversion Programs	• The City should continue with multi-stream recycling collection as these programs consistently have lower contamination rates. • The City should implement public event (e.g., Sea Festival) waste diversion programs to increase participation in waste diversion programs and reduce waste from being landfilled. • The City should consider a curbside large item pick-up program to avoid illegal dumping.
Waste Diversion Legislation, Policy and Enforcement	• If standardized carts are implemented for SF waste collection, consider increased fees based on cart size to encourage diversion. • If the City takes on the collection of waste materials from other sectors (MF or ICI), consider the risk of increased fines from disposal bans and contamination. Given the high amount of contamination found in the recent MF and ICI waste audits, this could be significant.
Waste Avoidance and Reduction	• Metro Vancouver single-use item (SUI) reduction strategy /toolkit and City of Surrey Plastics and SUI Reduction Strategy/Bylaw development should be monitored and considered given proximity. Additional effort should be given to harmonize with local businesses who are being included in solid waste initiatives/consultation. • To encourage a culture of re-use, repair and community engagement, events such as repair cafés should be considered and potentially held in civic facilities.
Single-Family Waste Collection	• Cost analysis should be undertaken for automated collection services to determine if the potential reduced operating costs offset the large capital investment. • City collected materials should be directly hauled to end processing/disposal facilities to reduce costs from double handling of materials.
Multi-Family Waste Collection	• The total number of units, typical waste generation and participation in waste diversion programs should be considered when evaluating internal vs privatization of MF collection options. • Space required for individual property centralized disposal set-out requirements, and practicality of container type for disposal areas, should be considered when evaluating internal vs privatization of MF collection options. • A voluntary application for those interested in City services should be considered. • The City's bylaw language should be updated to address segregation requirements for MF buildings.
ICI Waste Collection	• Space requirements, set-out requirements and practicality of container type for disposal areas at the businesses should be considered when evaluating internal vs privatization of ICI collection options. • The number of businesses requiring/desiring service vs. collection vehicle cost to collect from the same should be considered when evaluating internal vs privatization of ICI collection options. • The City's bylaw language should be updated to address segregation requirements for ICI buildings.
Streetscape and Public Spaces Waste Management	• Consider providing waste options in public spaces and on City streets equivalent to what residents are accustomed to at home, to encourage diversion and ensure consistency between home, work and in the public realm. • Consider implementing dog waste diversion programs to reduce related fines from Metro Vancouver.

10.0 Closing

A detailed review of the City's solid waste management system was undertaken. Research into what similar jurisdictions are doing as it relates to waste management was completed. Based on these reviews and research, and direction from the City, several potential approaches and options for improvement were identified and/or evaluated. This report represents a reasonable review of available material within the established scope and schedule but is by no means exhaustive. Dillon prepared this report for the sole benefit of the City of White Rock. The material in the report reflects Dillon's best judgement and information available at the time of preparation. The information prepared for this report is intended to feed into future solid waste management considerations by the City.

We look forward to supporting your ongoing investigations of waste diversion opportunities.

Appendix A

Consent Form

Project Information

Project Title: City of White Rock Waste Composition Study

Project Description
The City of White Rock has contracted Dillon Consulting Limited to perform a number of waste composition studies on commercial and multi-family residential building waste to gather information on waste generation in different sectors of the city. This involves conducting an audit on the garbage, recycling and organics waste streams of participating properties.

These waste composition studies are part of broader Solid Waste Operations Review Dillon Consulting is completing for the City.

We are interested in using a sample of your building's garbage, recycling and organics as part of our composition study. Your participation will help inform future waste management decision within the City.

Confidentiality
All waste from properties is collected anonymously, and no identifying details are associated with the study results. Following the study, all waste materials are sent to disposal or processing at the normal end facilities for the City.

Participation
Your participation in this study is voluntary, and you may withdraw your consent to participate at any time prior to the collection of the waste material.

Project Team
Heidi Gerlach | Project Manager | 604.278.7847 ext. 4216 | hgerlach@dillon.ca
Klaryssa Lawrie | Project Coordinator | 604.278.7847 ext. 4243 | klawrie@dillon.ca
JP Hervieux | Project Support | 604.278.7847 ext. 4251 | jp.hervieux@gmail.com

Dillon Consulting Limited, Richmond, BC

If you have any questions or concerns about this project, please contact a member of the project team.

Consent

I, _____, consent for a sample of waste to be collected

from _____ (*property name*), located at

_____ (address).

_____ _____

Signature of Property/General Manager Date

Appendix B

Waste Characterization Study Results

This Appendix provides the detailed results of the waste characterization study that took place study from October 15-18, 2019 on the single-family, multi-family and industrial commercial and institutional (ICI) sectors. The main report **Section 5.0** provides a summary of these results.

Overall Results

Overall composition of each waste generating sector based on waste stream is provided in **Table B-1.**

Table B-1. Overall Average Sector Waste Composition by Stream

	Garbage			Recycling			Organics		
	SF Garbage	MF Garbage	ICI Garbage	SF Recycling	MF Recycling	ICI Recycling	SF Organics	MF Organics	ICI Organics
Containers	5.2%	7.9%	4.8%	28.4%	13.0%	32.8%	0.1%	0.3%	1.1%
Paper	6.0%	9.0%	12.8%	31.8%	64.7%	52.0%	0.0%	0.0%	0.0%
Glass	1.2%	2.8%	0.0%	33.5%	17.8%	6.6%	0.0%	0.0%	0.2%
RecycleBC Depot Recycling	8.5%	5.4%	5.4%	1.7%	1.0%	1.5%	0.1%	1.1%	2.1%
EPR	1.2%	0.8%	0.1%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%
Compostable Organics	33.6%	40.4%	61.2%	0.9%	0.5%	4.1%	99.1%	97.2%	92.4%
Non-Compostable Organics	4.6%	1.6%	2.8%	0.1%	0.0%	0.0%	0.3%	0.0%	0.0%
Residuals	39.6%	32.2%	12.9%	3.7%	2.8%	3.0%	0.3%	1.4%	4.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Single-Family Sector Results

Garbage Results

Four garbage samples were collected over the four-day audit period (September 15-18) and delivered to the STS on the same day. In total, 6,145 kg of garbage was delivered to the facility for auditing. Dillon staff subsampled and sorted one sample from each inbound load totalling 435 kg. The audited material was largely residuals (39.6%), compostable organics (33.6%) and RecycleBC depot recycling (8.5%). The breakdown of primary categories is illustrated in **Figure B-1** and **Table B-2** provides the overall data for the primary categories.

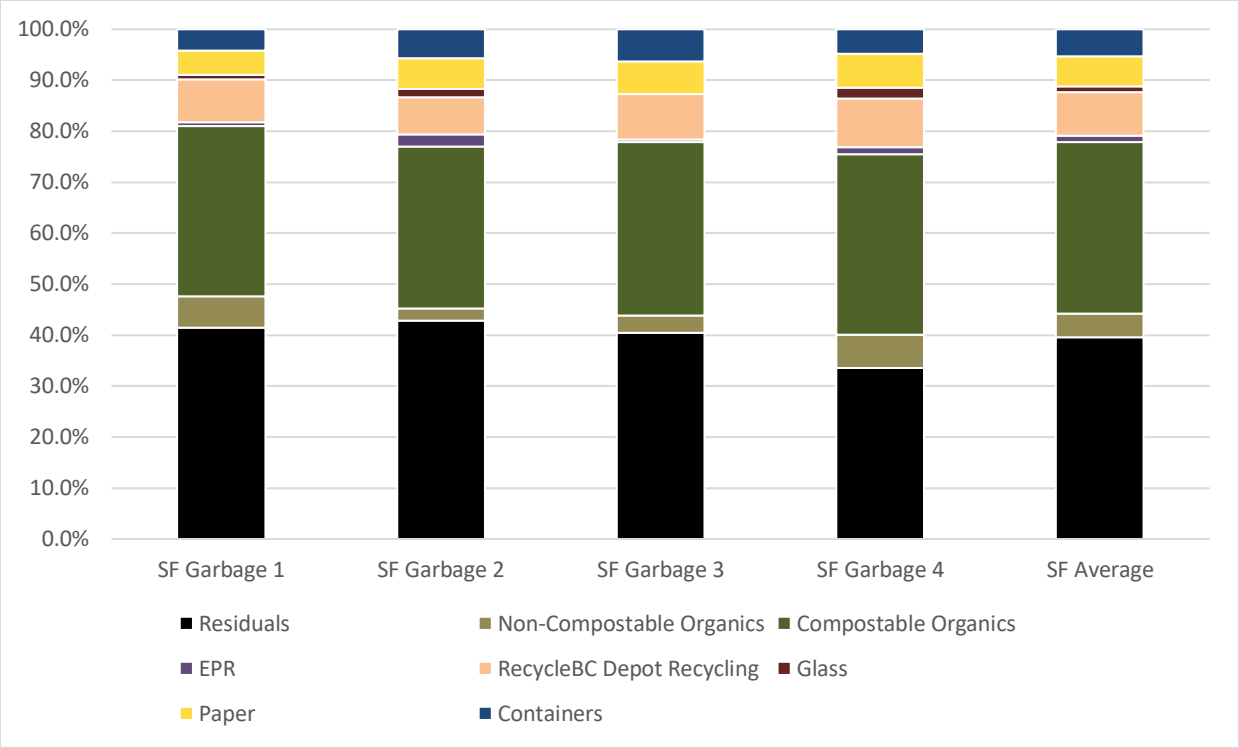


Figure B-1. SF Garbage Results by Sample and Overall Average

Table B-2. SF Garbage Results by Sample and Overall Average

	SF Garbage 1	SF Garbage 2	SF Garbage 3	SF Garbage 4	SF Garbage Average
Containers	4.1%	5.7%	6.3%	4.8%	5.2%
Paper	4.8%	6.0%	6.4%	6.7%	6.0%
Glass	0.9%	1.7%	0.0%	2.1%	1.2%
RecycleBC Depot Recycling	8.5%	7.3%	8.9%	9.5%	8.5%
EPR	0.7%	2.3%	0.5%	1.4%	1.2%
Compostable Organics	33.4%	31.8%	34.0%	35.4%	33.6%
Non-Compostable Organics	6.2%	2.5%	3.3%	6.5%	4.6%
Residuals	41.4%	42.8%	40.5%	33.5%	39.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Shading indicates the only materials that actually should be in the waste stream.

Recycling

Recycling samples from the three recycling streams (containers, paper and glass) were collected each day over the audit period, a total of four recycling samples were assessed in this study. In total, 4,415 kg of recycling was delivered to the STS for auditing purposes. From each recycling sample three sub-samples were taken for auditing, one from each recycling stream (containers, paper and glass). The containers stream was largely containers, with the percent composition ranging from 77.4% (SF 3) to 88.2% (SF 4) and residuals, ranging from 3.3% (SF 4) to 11.3% (SF 3). The most common contaminant was residuals which ranged from 3% to 11%.

The paper stream was largely comprised of paper material and ranged from 90.8% (SF 3) to 97.3% (SF 2). The most common contaminant was glass material, ranging from a low of 0.8% (SF 2) to a high of 4.4% (SF 4).

The sub-samples audited from the glass recycling stream were almost entirely glass material. The glass material category ranged from 91.3% to 100.0%. These results are illustrated between **Table B-2** and **Figure B-4**, with overall data for the primary categories provided between **Table B-3**and **Table B-5.**

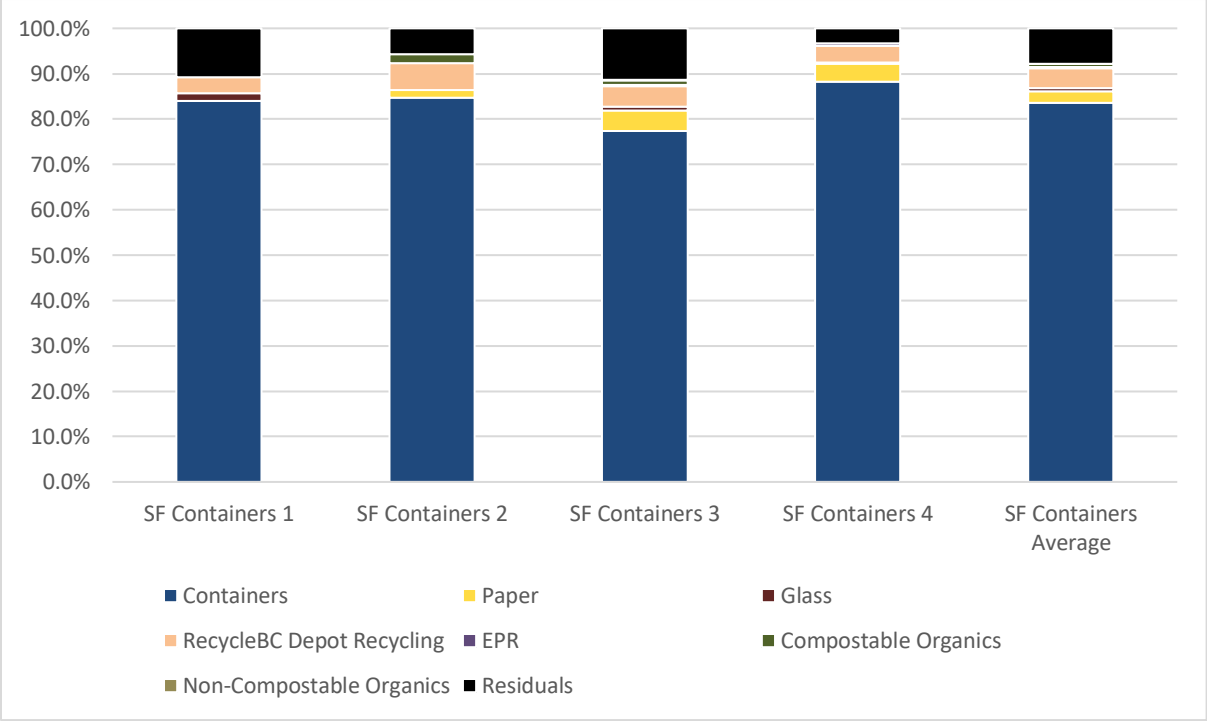


Figure B-2. SF Recycling Containers Results by Sample and Overall Average

Table B-3. SF Recycling Containers Results by Sample and Overall Average

	SF Containers 1	SF Containers 2	SF Containers 3	SF Containers 4	SF Containers Average
Containers	83.9%	84.7%	77.4%	88.2%	83.6%
Paper	0.1%	1.7%	4.4%	4.0%	2.6%
Glass	1.7%	0.0%	0.9%	0.3%	0.7%
RecycleBC Depot Recycling	3.5%	5.8%	4.5%	3.7%	4.4%
EPR	0.0%	0.0%	0.3%	0.5%	0.2%
Compostable Organics	0.0%	2.1%	0.9%	0.0%	0.7%
Non-Compostable Organics	0.0%	0.0%	0.3%	0.0%	0.1%
Residuals	10.8%	5.7%	11.3%	3.3%	7.7%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

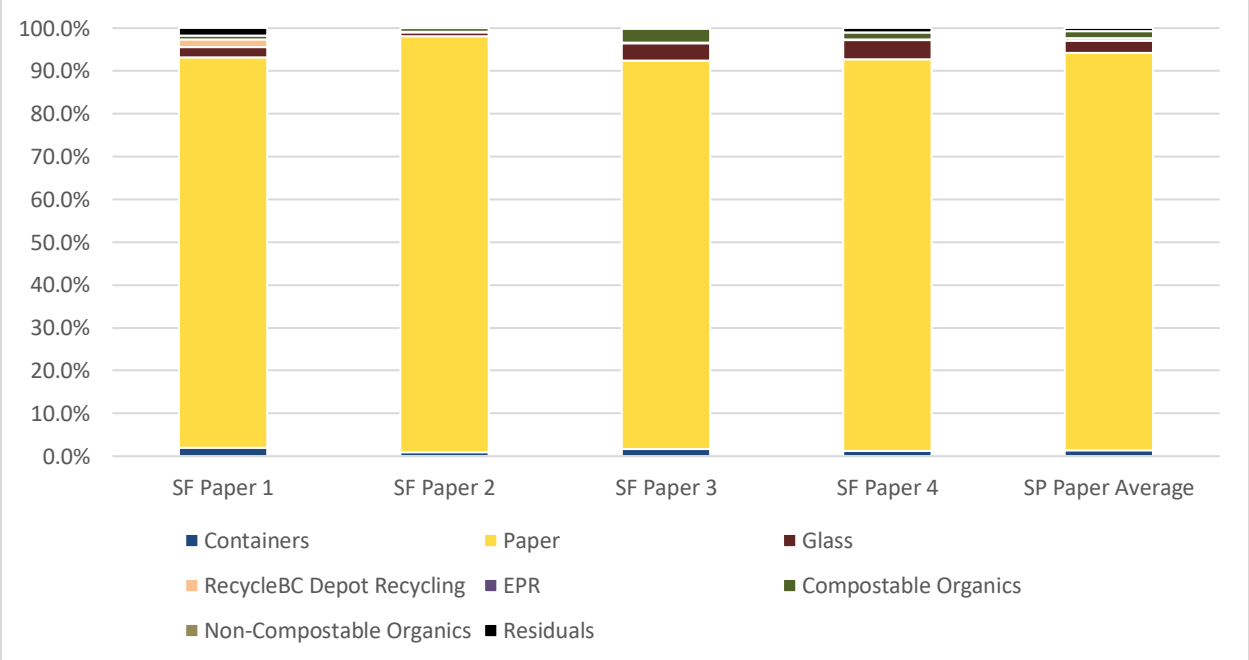


Figure B-3. SF Recycling Paper Results by Sample and Overall Average

Table B-4. SF Recycling Paper Results by Sample and Overall Average

	SF Paper 1	SF Paper 2	SF Paper 3	SF Paper 4	SF Paper Average
Containers	1.9%	0.9%	1.7%	1.3%	1.4%
Paper	91.3%	97.3%	90.8%	91.5%	92.7%
Glass	2.4%	0.8%	4.0%	4.4%	2.9%
RecycleBC Depot Recycling	1.8%	0.2%	0.2%	0.2%	0.6%
EPR	0.0%	0.0%	0.0%	0.0%	0.0%
Compostable Organics	0.9%	0.8%	3.2%	1.6%	1.6%
Non-Compostable Organics	0.0%	0.0%	0.1%	0.0%	0.0%
Residuals	1.7%	0.0%	0.1%	1.0%	0.7%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

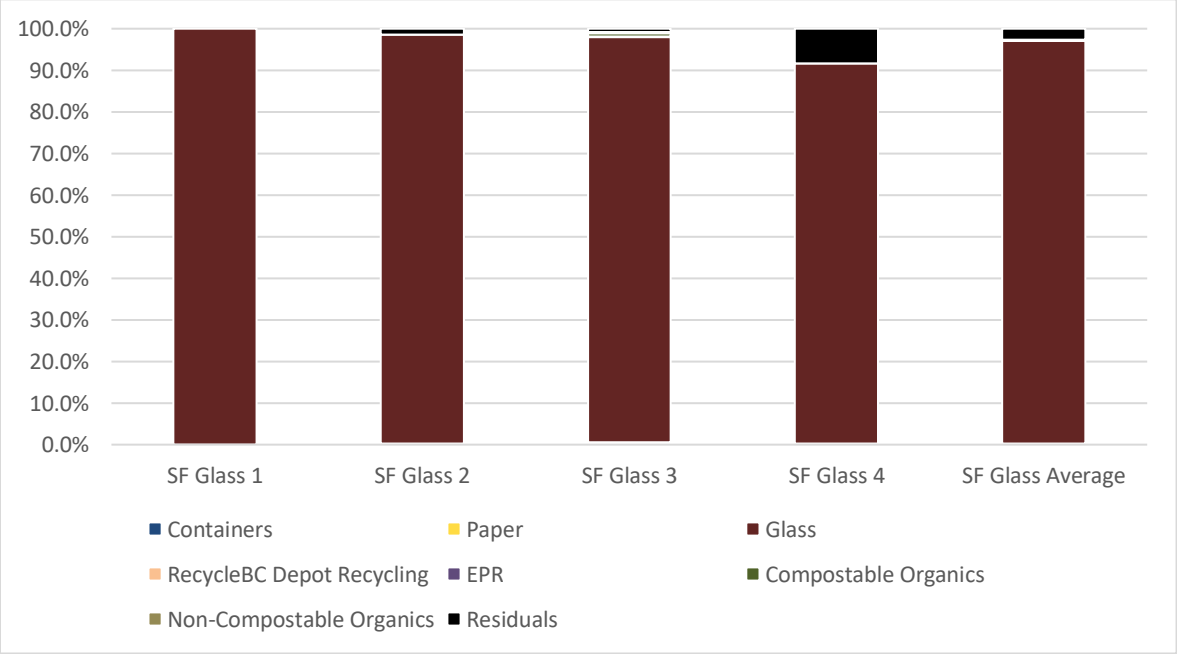


Figure B-4. SF Recycling Glass Results by Sample and Overall Average

Table B-5. SF Recycling Glass Results by Sample and Overall Average

	SF Glass 1	SF Glass 2	SF Glass 3	SF Glass 4	SF Glass Average
Containers	0.0%	0.1%	0.4%	0.1%	0.1%
Paper	0.0%	0.2%	0.1%	0.2%	0.1%
Glass	100.0%	98.2%	97.4%	91.3%	96.7%
RecycleBC Depot Recycling	0.0%	0.1%	0.1%	0.1%	0.1%
EPR	0.0%	0.0%	0.0%	0.0%	0.0%
Compostable Organics	0.0%	0.0%	0.9%	0.0%	0.2%
Non-Compostable Organics	0.0%	0.0%	0.3%	0.0%	0.1%
Residuals	0.0%	1.4%	0.8%	8.3%	2.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Organics

Organics were collected and delivered to the STS each of the four audit days; however, only three of the samples were audited. The Friday sample was not audited due to unforeseen circumstances at the transfer station. The three samples brought to the transfer station for auditing purposes totalled 2,180 kg. Dillon staff sub-sampled and sorted three samples equalling 313 kg. In each sub-sample audited the compostable organics category comprised at least 97.7% of the overall category. The remaining material was distributed amongst the other material categories. The breakdown of primary categories is illustrated in **Figure B-5** and **Table B-6** provides the overall data for the primary categories.

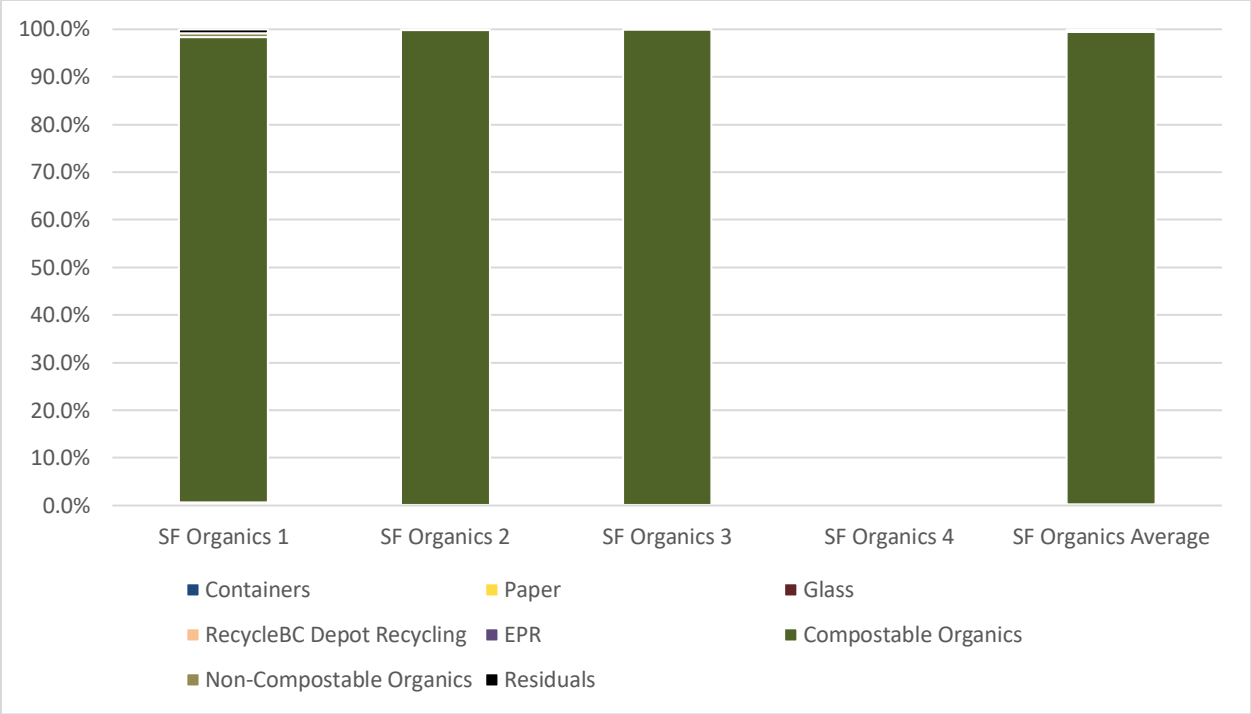


Figure B-5. SF Organics Results by Sample and Overall Average

Table B-6. SF Organics Results by Sample and Overall Average

	SF Organics 1	SF Organics 2	SF Organics 3	SF Organics 4	SF Organics Average
Containers	0.3%	0.0%	0.1%	-	0.1%
Paper	0.0%	0.0%	0.0%	-	0.0%
Glass	0.0%	0.0%	0.0%	-	0.0%
RecycleBC Depot Recycling	0.4%	0.0%	0.0%	-	0.1%
EPR	0.0%	0.0%	0.0%	-	0.0%
Compostable Organics	97.7%	99.8%	99.9%	-	99.1%
Non-Compostable Organics	0.8%	0.0%	0.0%	-	0.3%
Residuals	0.8%	0.1%	0.0%	-	0.3%
Total	**100.0%**	**100.0%**	**100.0%**	-	**100.0%**

Overall Single- Family Waste Composition

On average, the single-family garbage contained largely residuals (39.6%), compostable organics (33.6%) and RecycleBC depot material (8.5%). The recycling containers stream consisted of mainly containers (83.6%) with residuals (7.7%) and RecycleBC depot material (4.4%). In the paper recycling stream, 92.7% of the material sampled was paper, while 2.9% was glass material. The glass stream was fairly clean with 96.7%, with another 2.6% categorized as residuals. In the organics stream the material was almost entirely compostable organics (99.1%). The detailed average composition for the garbage, recycling and organics streams is provided in **Figure B-6** to **Figure B-11**. The amalgamated single-family recycling breakdown for all three streams is provided below in **Figure B-10**.

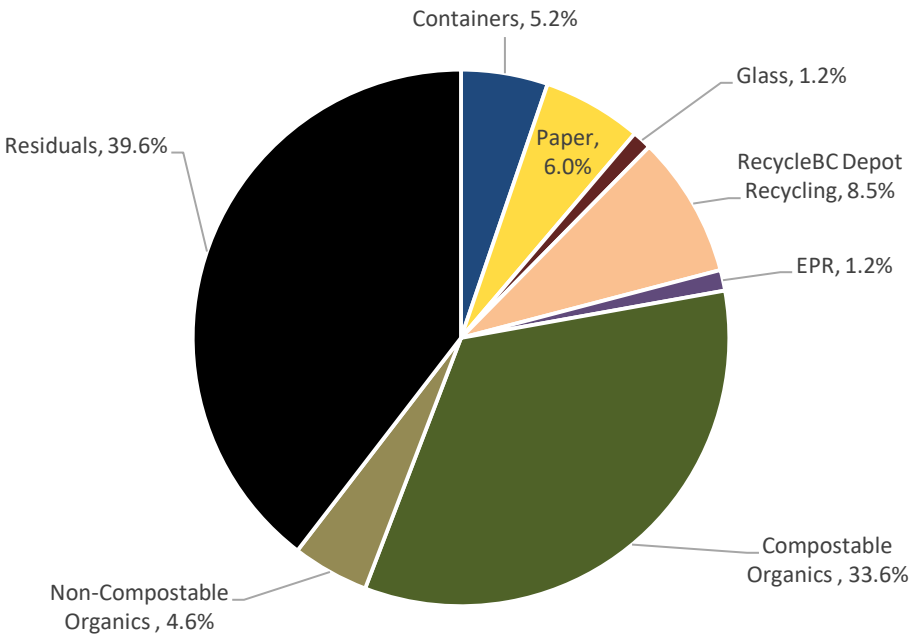


Figure B-6. SF Garbage Average Composition

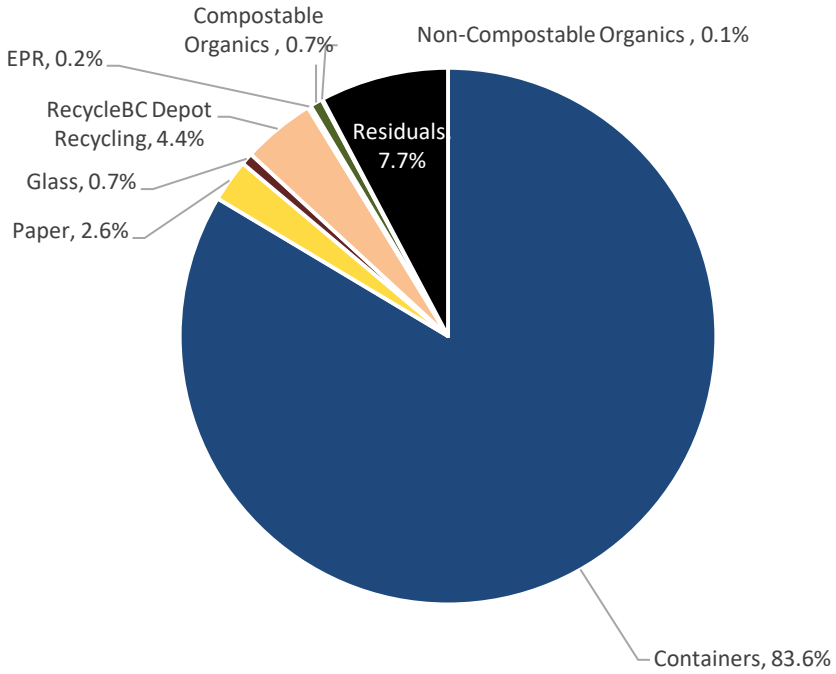


Figure B-7. SF Recycling Containers Average Composition

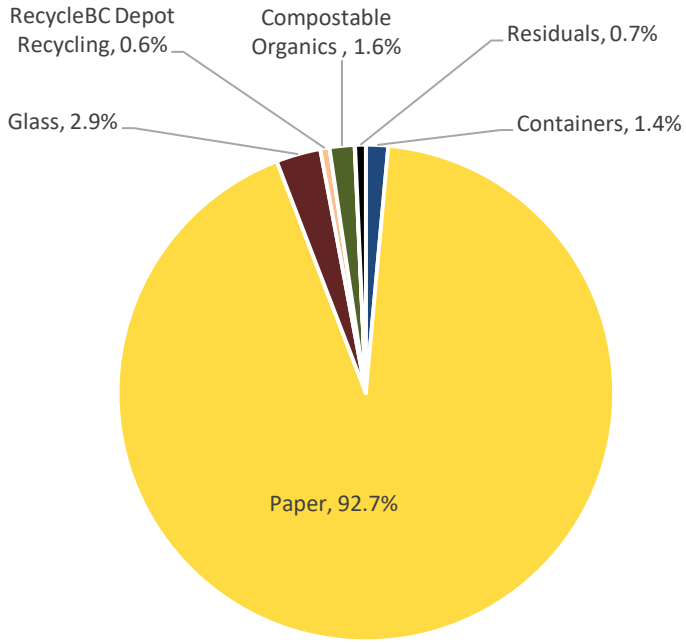


Figure B-8. SF Recycling Paper Average Composition

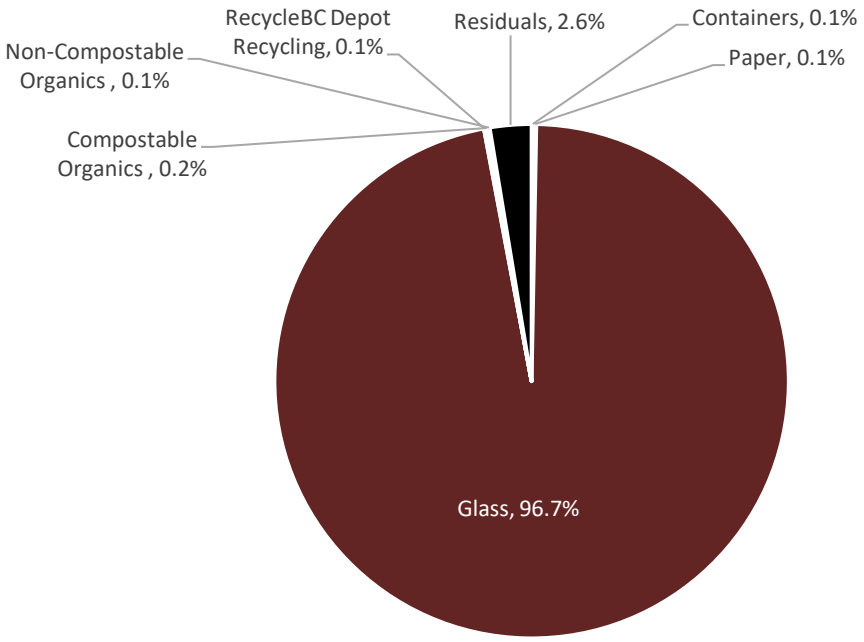


Figure B-9. SF Recycling Glass Average Composition

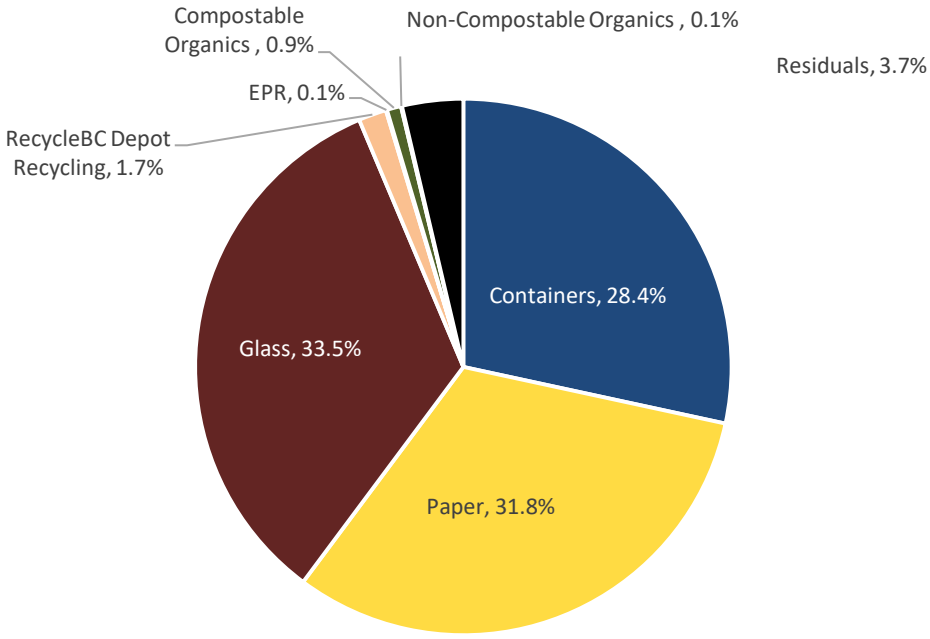


Figure B-10. Overall SF Recycling Breakdown

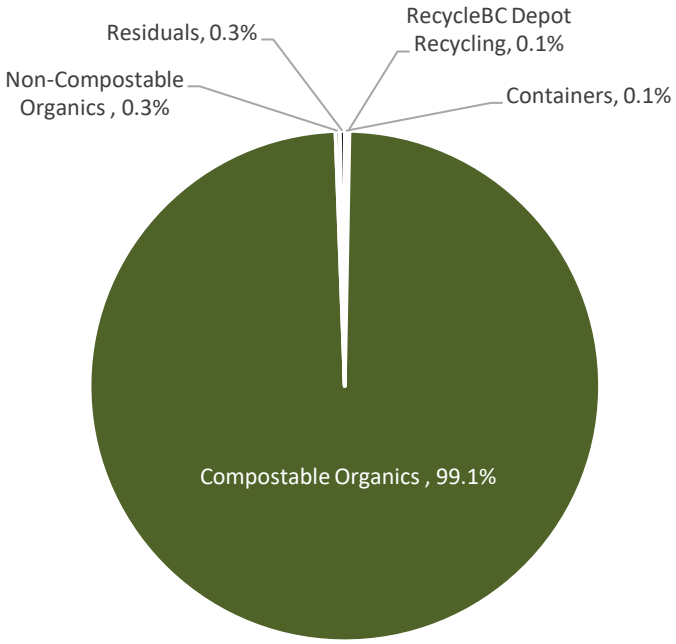


Figure B-11. SF Organics Average Composition

Multi-Family Sector Results

Garbage

Garbage was collected from four multi-family buildings over three days (September 15-17) and was delivered to the STS for sorting on the same day as collection. In total, 335 kg of waste was collected from the buildings, an average of 84 kg per building. All garbage collected was sorted during the audits. The garbage samples were largely compostable organics, ranging from 32.7% (MF 4) to 47.3% (MF 2), and residuals, ranging from 27.7% (MF 2) to 36.2% (MF 1). The breakdown of primary categories is illustrated in **Figure B-12** provides the overall data for the primary categories. On average, just under 70% of what was contained in the garbage samples could have been diverted.

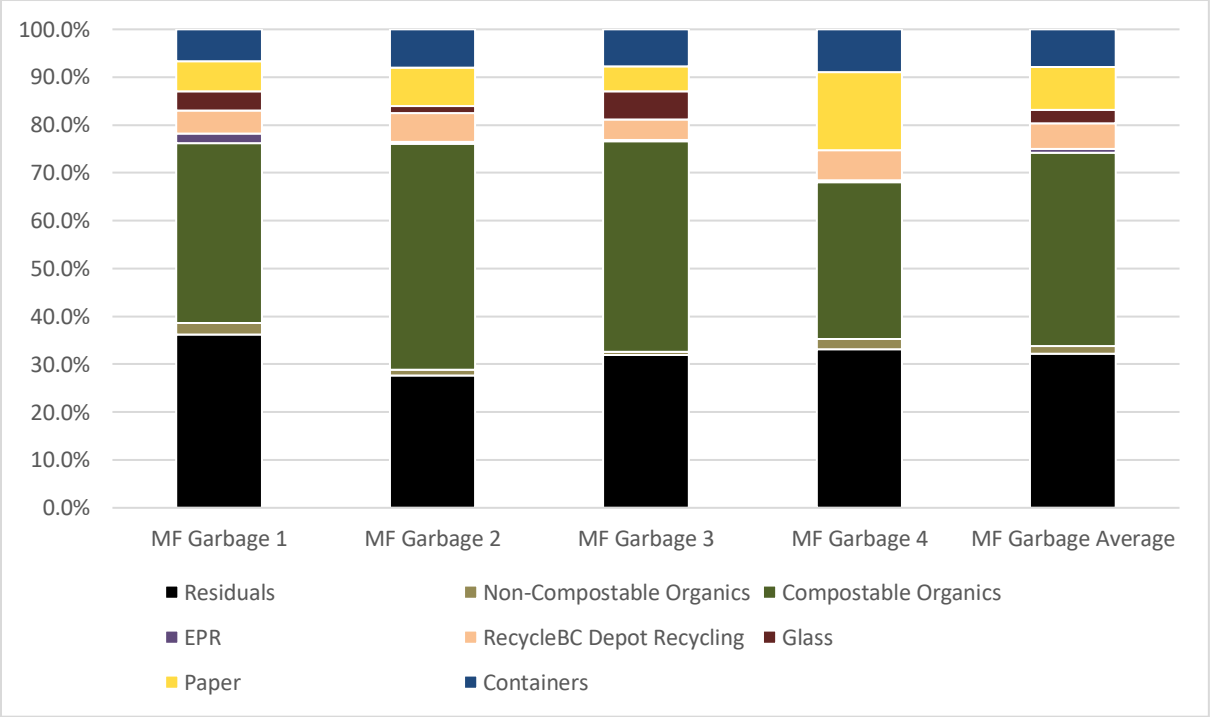


Figure B-12. MF Garbage Results by Sample and Overall Average

Table B-7. MF Garbage Results by Sample and Overall Average

	MF Garbage 1	MF Garbage 2	MF Garbage 3	MF Garbage 4	MF Garbage Average
Containers	6.7%	8.0%	7.8%	8.9%	7.9%
Paper	6.3%	8.0%	5.2%	16.3%	9.0%
Glass	4.0%	1.4%	5.9%	0.0%	2.8%
RecycleBC Depot Recycling	4.8%	6.1%	4.2%	6.3%	5.4%
EPR	2.0%	0.3%	0.3%	0.5%	0.8%
Compostable Organics	37.5%	47.3%	44.1%	32.7%	40.4%
Non-Compostable Organics	2.5%	1.2%	0.7%	2.2%	1.6%
Residuals	36.2%	27.7%	31.9%	33.2%	32.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Shading indicates the only materials that actually should be in the waste stream.

Recycling

Recycling samples were collected over a three-day period (September 15-17) from four multi-family buildings. A total of nine samples were collected from the recycling stream at the buildings (commingled recycling, cardboard and beverage containers), which were combined for the analysis, and totalled 68.6 kg (average of 7.6 kg per sample). For all four buildings, paper comprised at least 50% of the overall material composition (52.9%, MF 4 to 72.2%, MF 1), by weight. The samples were also largely comprised of glass (7.8%, MF 1 to 33.5%, MF 4) and containers (8.4%, MF 4 to 16.8%, MF 3). The breakdown of 8 primary categories for the recycling stream at each of the four buildings and the overall average is illustrated in Figure **B-13** and **Table B-8** provides the overall data for primary categories.

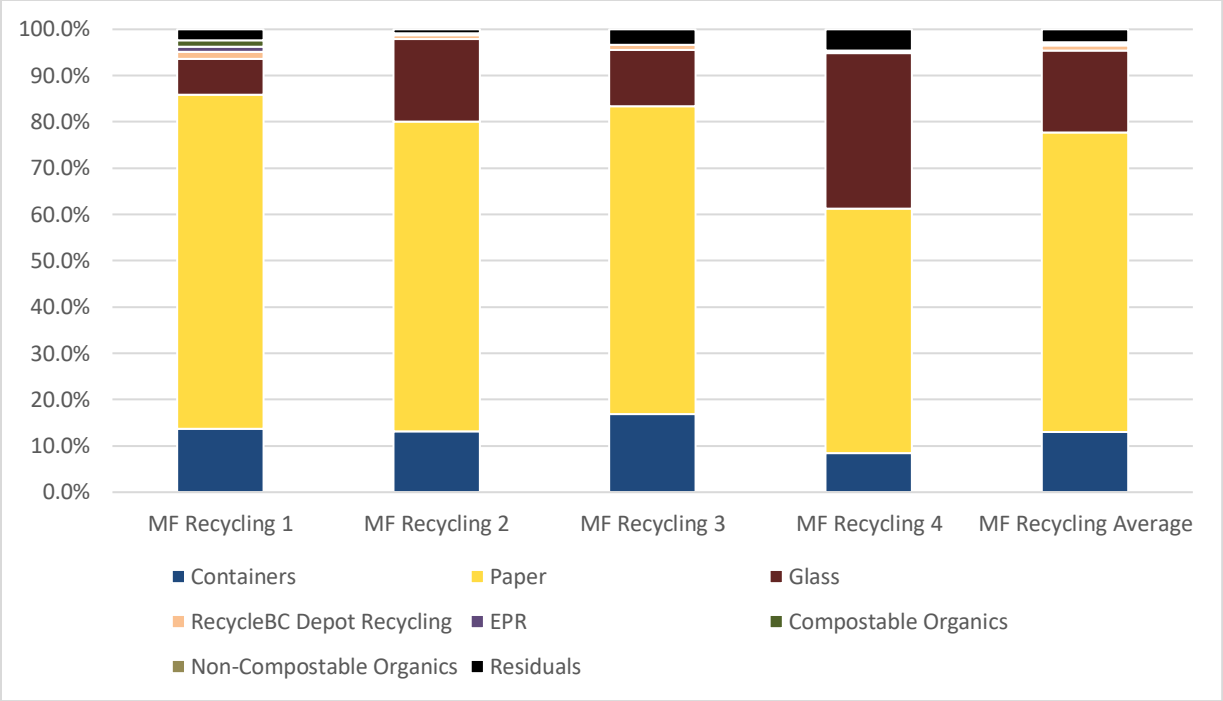


Figure B-13. MF Recycling Results by Sample and Overall Average

Table B-8. MF Recycling Results by Sample and Overall Average

	MF Recycling 1	MF Recycling 2	MF Recycling 3	MF Recycling 4	MF Recycling Average
Containers	13.6%	13.1%	16.8%	8.4%	13.0%
Paper	72.2%	67.0%	66.6%	52.9%	64.7%
Glass	7.8%	17.8%	12.2%	33.5%	17.8%
RecycleBC Depot Recycling	1.6%	0.8%	1.0%	0.5%	1.0%
EPR	1.1%	0.0%	0.0%	0.0%	0.3%
Compostable Organics	1.3%	0.4%	0.0%	0.2%	0.5%
Non-Compostable Organics	0.0%	0.0%	0.0%	0.0%	0.0%
Residuals	2.4%	0.8%	3.4%	4.5%	2.8%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Organics

A total of four organic samples were collected, one from each multi-family building and delivered to the STS for sorting during the audit period. In total, 71.75 kg of organic waste was collected from the buildings and sorted (an average of 17.94 kg per sample). The vast majority of each sample categorized as compostable organics, ranging from 92.6% (MF 4) to 99.2% (MF 3). Of significance, is the low levels of contamination in the organics samples. The breakdown of primary categories of each of the four samples and the overall average is illustrated in **Figure B-14** and **Table B- 9** provides the overall data for primary categories.

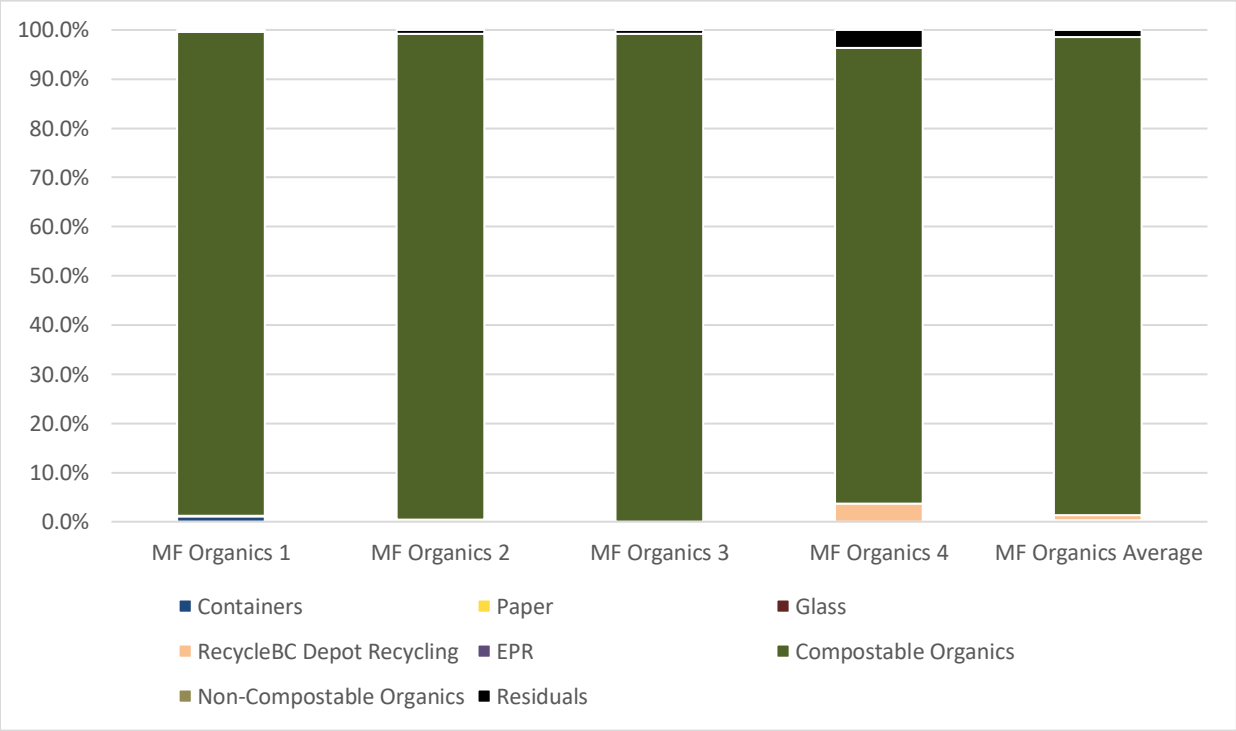


Figure B-14. MF Organics Results by Sample and Overall Average

Table B- 9. MF Organics Results by Sample and Overall Average

	MF Organics 1	MF Organics 2	MF Organics 3	MF Organics 4	MF Organics Average
Containers	1.1%	0.0%	0.0%	0.0%	0.3%
Paper	0.0%	0.0%	0.0%	0.0%	0.0%
Glass	0.0%	0.0%	0.0%	0.0%	0.0%
RecycleBC Depot Recycling	0.2%	0.5%	0.0%	3.7%	1.1%
EPR	0.0%	0.0%	0.0%	0.0%	0.0%
Compostable Organics	98.4%	98.8%	99.2%	92.6%	97.2%
Non-Compostable Organics	0.0%	0.0%	0.0%	0.0%	0.0%
Residuals	0.4%	0.7%	0.8%	3.7%	1.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Overall Waste Composition for the Multi-Family Sector

On average, the multi-family garbage stream consisted of less than 35% of actual residuals and non-compostable organics. The largest category of waste in the garbage stream was compostable organics (40.4%). The recycling stream is fairly clean consisting of, on average, 64.7% paper, 17.8% glass and 13.0% containers, while the organics samples were almost entirely compostable organics (averaged 97.2%) with a small amount of residuals (1.4%) and RecycleBC depot materials (1.1%). The detailed average composition for the garbage, recycling and organics streams is provided in **Figure B-15** to **Figure B-17**.

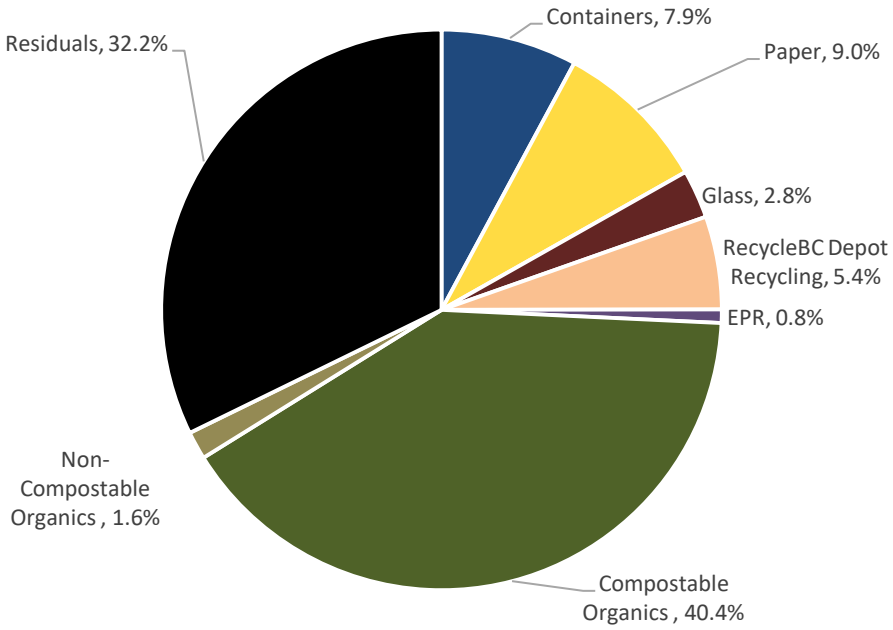


Figure B-15. MF Garbage Average Composition

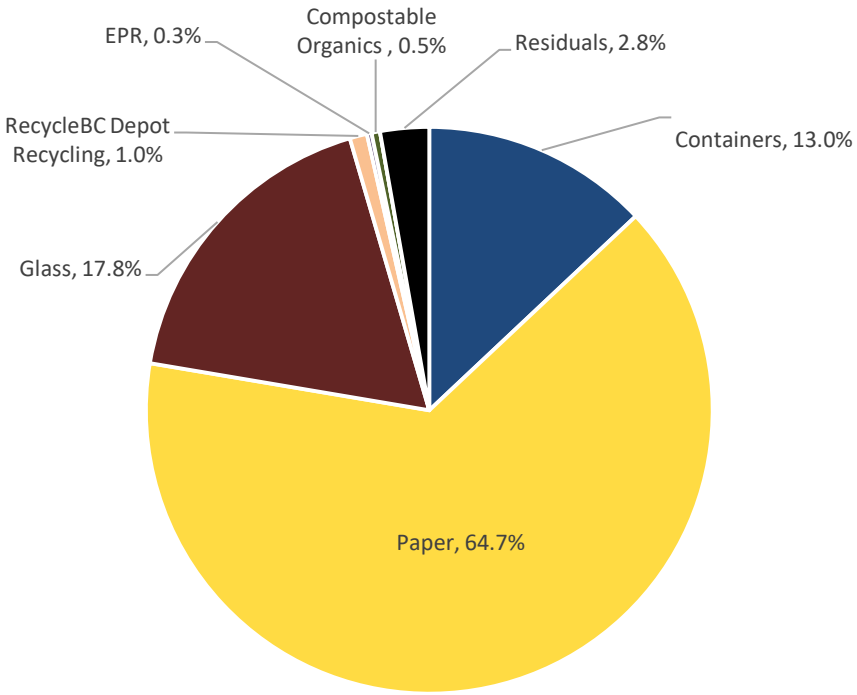


Figure B-16. MF Recycling Average Composition

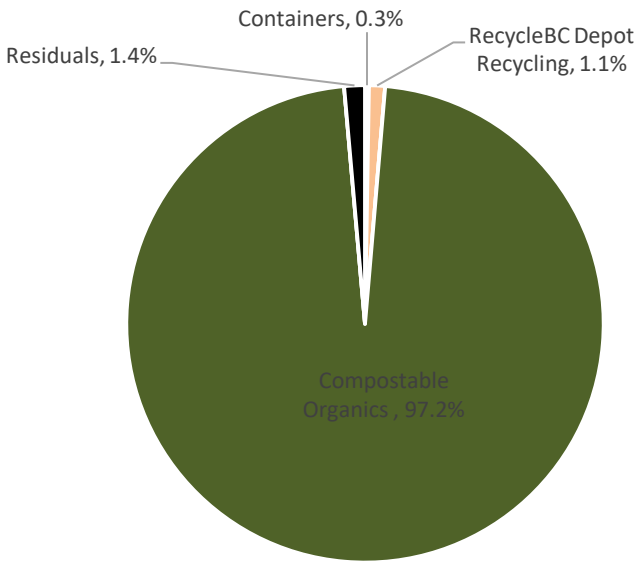


Figure B-17. MF Organics Average Composition

ICI Sector Results

Waste samples from ICI locations were collected and delivered to the STS by two Dillon staff. Collection from the different locations was spread out over three collection days (September 15, 17 and 18).

The ICI locations were spread across multiple sectors and included City facilities, a restaurant and a food service location. Waste from four locations was collected, totalling 13 samples across the different waste streams (garbage, recycling and organics). We note the ICI sector is highly variable in terms of types of wastes generated and these are snapshots of potential waste in the community.

Garbage

Garbage was collected from four ICI locations over three collections days and sorted at the STS. In total, 161.2 kg of samples were collected and sorted, an average of 40.3 kg per sample. Although there is a level of variability in the four samples' composition, all four are largely compostable organics, which ranged from a low of 41.3% (ICI 1) to a high of 83.2% (ICI 3) and residuals, with an observed range between 5.2% (ICI 3) to 25.4% (ICI 2). ICI 1 also had a large component of paper material in its composition (34.7%), a significantly larger amount than observed in the samples from the other facilities. The breakdown of primary categories is illustrated in **Figure B-18** and **Table B-10** provides the overall data for primary categories. On average, almost 85% of the contents of the garbage stream could have been diverted.

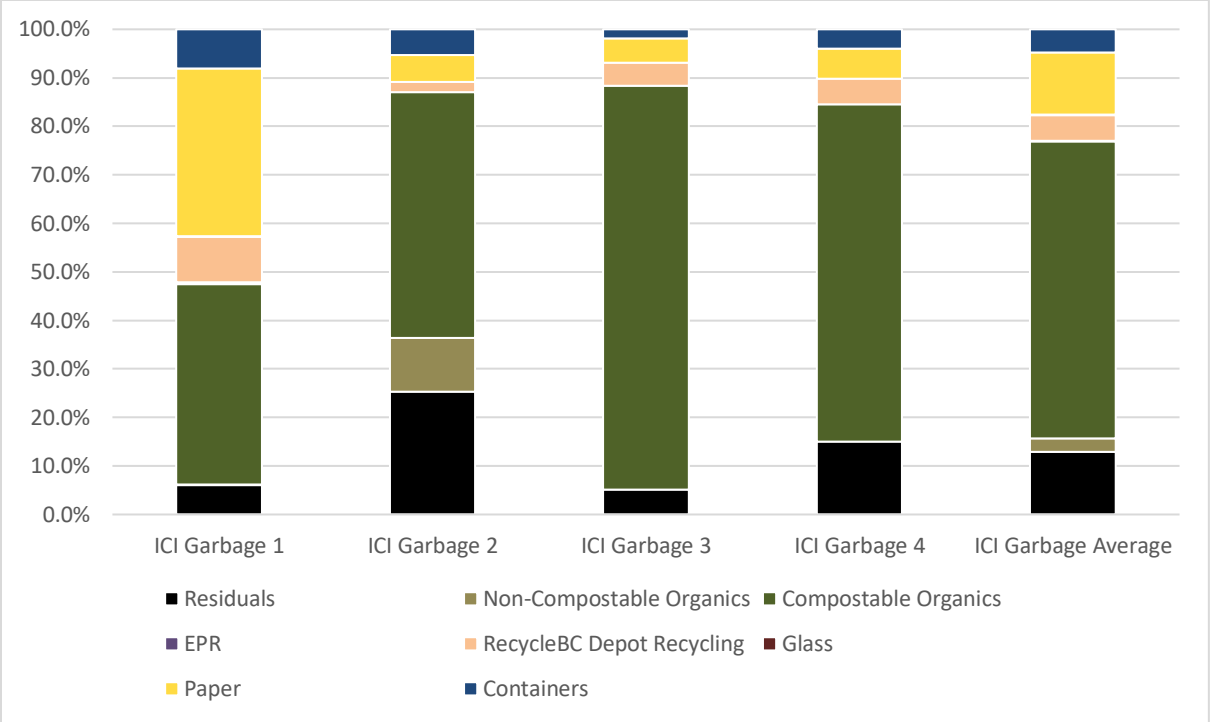


Figure B-18. ICI Garbage Results by Sample and Overall Average

Table B-10. ICI Garbage Results by Sample and Overall Average

	ICI Garbage 1	ICI Garbage 2	ICI Garbage 3	ICI Garbage 4	ICI Garbage Average
Containers	8.0%	5.3%	1.9%	4.0%	4.8%
Paper	34.7%	5.5%	5.0%	6.1%	12.8%
Glass	0.1%	0.0%	0.0%	0.0%	0.0%
RecycleBC Depot Recycling	9.3%	2.1%	4.8%	5.4%	5.4%
EPR	0.4%	0.0%	0.0%	0.0%	0.1%
Compostable Organics	41.3%	50.7%	83.2%	69.5%	61.2%
Non-Compostable Organics	0.1%	11.0%	0.0%	0.0%	2.8%
Residuals	6.1%	25.4%	5.2%	15.0%	12.9%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Shading indicates the only materials that actually should be in the waste stream.

Recycling

In total, 66.95 kg of recycling samples were collected from the ICI facilities (an average of 9.6 kg per sample). There was a high level of variability observed in the composition of the recycling from each facility. At three of the facilities (ICI 1, ICI 2 and ICI 4), paper comprised the largest part of the recycling sample ranging from 41.8% (ICI 2) to 82.5% (ICI 1). Containers were the largest category of material at the other ICI facility, ICI 3, making up 70.0% of the material sampled. The breakdown of primary categories is illustrated in **Figure B-19** and **Table B-11** provides the overall data for primary categories.

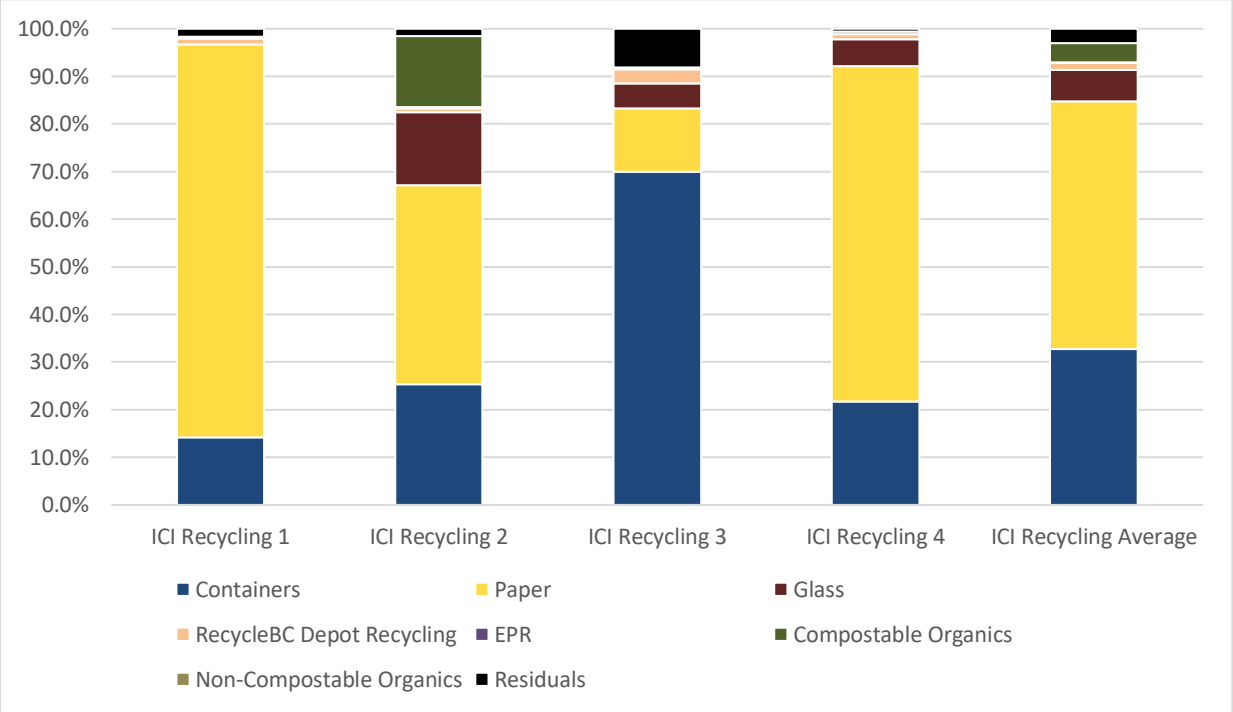


Figure B-19. ICI Recycling Results by Sample and Overall Average

Table B-11. ICI Recycling Results by Sample and Overall Average

	ICI Recycling 1	ICI Recycling 2	ICI Recycling 3	ICI Recycling 4	ICI Recycling Average
Containers	14.2%	25.3%	70.0%	21.8%	32.8%
Paper	82.5%	41.8%	13.3%	70.3%	52.0%
Glass	0.0%	15.4%	5.2%	5.6%	6.6%
RecycleBC Depot Recycling	1.3%	0.7%	2.9%	1.1%	1.5%
EPR	0.0%	0.3%	0.0%	0.0%	0.1%
Compostable Organics	0.4%	15.0%	0.5%	0.6%	4.1%
Non-Compostable Organics	0.0%	0.0%	0.0%	0.0%	0.0%
Residuals	1.7%	1.5%	8.1%	0.6%	3.0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Organics

Only two of the four ICI facilities (ICI 3, ICI 4) used in the study separately collected organic waste on site. The two samples weighed a total of 65.30 kg, an average of 32.65 kg. Both samples were largely compostable organics, with the material from the ICI 3 sample sorted almost entirely into this material category (96.6%). ICI 4 was also largely compostable organics (88.1%), but also residuals (6.4%). The breakdown of primary categories of each of the two sub-samples is illustrated in **Figure B-20** and **Table B-12** provides the overall data for primary categories.

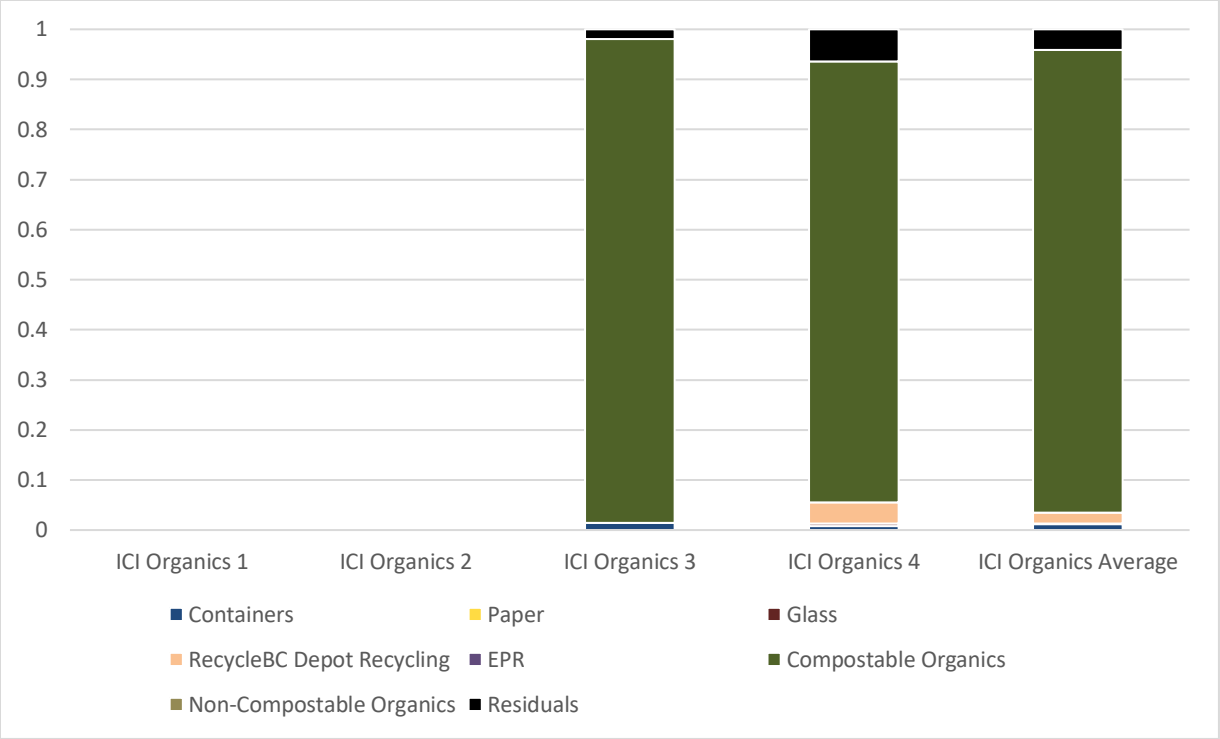


Figure B-20. ICI Organics Results by Sample and Overall Average

Table B-12. ICI Organics Results by Sample and Overall Average

	ICI Organics 1	ICI Organics 2	ICI Organics 3	ICI Organics 4	ICI Organics Average
Containers	-	-	1.4%	0.8%	1.1%
Paper	-	-	0.0%	0.0%	0.0%
Glass	-	-	0.0%	0.4%	0.2%
RecycleBC Depot Recycling	-	-	0.0%	4.3%	2.1%
EPR	-	-	0.0%	0.0%	0.0%
Compostable Organics	-	-	96.6%	88.1%	92.4%
Non-Compostable Organics	-	-	0.0%	0.0%	0.0%
Residuals	-	-	1.9%	6.4%	4.2%
Total	-	-	**100%**	**100%**	**100%**

Overall Waste Composition

The average garbage composition from the four ICI facilities indicated that only 15% of the waste was actual residual or non-compostable organic waste. Compostable organics (61.2%) and paper (12.8%) were the largest streams, by weight. In the recycling samples, paper averaged 52.0% of the material sampled, while containers average 32.8% and glass averaged 6.6%. The two organics samples were largely compostable organics (92.4%), residuals (4.2%) and RecycleBC depot material (2.1%). The detailed average composition for the garbage, recycling and organics stream is provided in **Figure B-21** to **Figure B-23.**

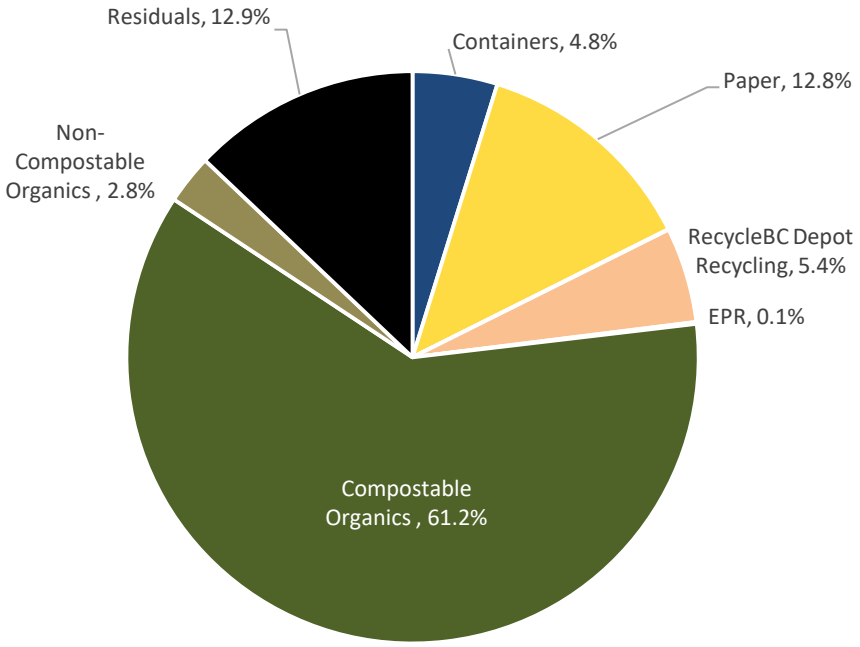


Figure B-21. ICI Average Garbage Composition

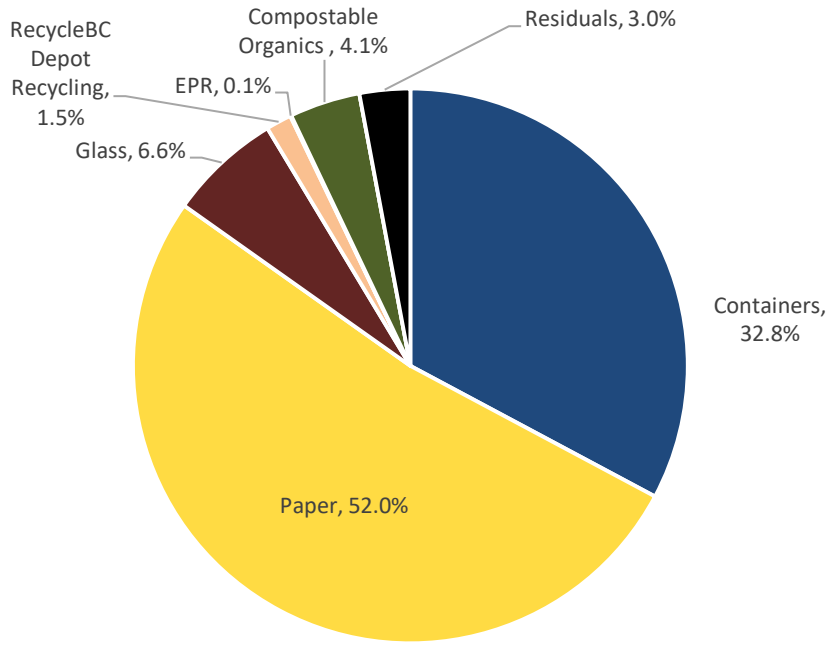


Figure B-22. ICI Recycling Average Composition

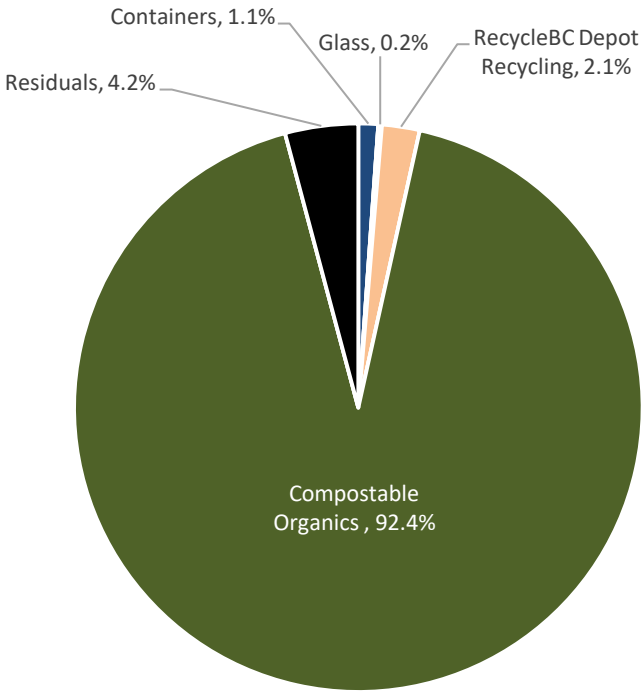


Figure B-23. ICI Organics Average Composition

Comparison to the 2014 Baseline Audit

Waste audit results from the recent audit were compared to the results from the baseline 2014 waste audits. In the 2014 study, only one sample from each SF waste stream was audited, two samples from each MF waste stream and one sample of ICI waste. Audit categories were amalgamated as closely as possible; however a direct comparison could not be directly completed as a result of policy change from 2014-2019.

Single-Family Sector Comparison

In the 2014 study, one sample from each SF waste stream was audited. There were a number of observed differences in the results between the two audits. Significant differences include the increase in compostable organics in the garbage increasing from 26% in 2014 to 33.6% in 2019. The containers recycling stream saw a decrease in contamination, decreasing from 40% of the material to 16.4% in 2019. The glass stream also observed a decrease in contamination from 22% in 2014 to only 3.3% in 2019. The paper recycling and organics streams were largely similar between the two survey years. **Table B-13** provides the results for this comparison. It should be noted that 2014 may not add to 100% due to rounding of numbers, as values were taken directly from the finalized 2014 report.

Table B-13. SF Waste Composition - 2014 vs 2019 Comparison

	2014 SF Garbage	2019 SF Garbage	2014 SF Containers	2019 SF Containers	2014 SF Paper	2019 SF Paper	2014 SF Glass	2019 SF Glass	2014 SF Organics	2019 SF Organics
Containers	10%	5.2%	60%	83.6%	2%	1.4%	2%	0.1%	0%	0.1%
Paper	9%	6.0%	8%	2.6%	92%	92.7%	1%	0.1%	0%	0.0%
Glass	0%	1.2%	7%	0.7%	2%	2.9%	78%	96.7%	0%	0.0%
RecycleBC Depot Recycling	7%	8.5%	3%	4.4%	0%	0.6%	19%	0.1%	0%	0.1%
EPR	-	1.2%	-	0.2%	-	0.0%	-	0.0%	-	0.0%
Compostable Organics	26%	33.6%	1%	0.7%	1%	1.6%	0%	0.2%	100%	99.1%
Non-Compostable Organics	-	4.6%	-	0.1%	-	0.0%	-	0.1%	-	0.3%
Residuals	50%	39.6%	19%	7.7%	2%	0.7%	0%	2.6%	0%	0.3%
Total	**102%**	**100.0%**	**98%**	**100.0%**	**99%**	**99.9%**	**100%**	**99.9%**	**100%**	**99.9%**

Note: numbers in table may not add up to 100% due to rounding

Multi-Family Residential Sector Comparison

There are some observed differences in the material composition of the evaluated garbage samples between the two audits. There was slightly more divertible materials in the garbage stream in 2019 compared to 2014. Residuals in the garbage decreased by approximately 6% between 2014 and 2019, while compostable organics increased slightly by approximately 1.5%. Residuals in the recycling stream decreased by approximately 4% (7% to 2.8%) from 2014 to 2019. The percent composition of the recycling also varied between the two survey years, which may be a result of the different buildings audited for each survey year. As mentioned above, there was no multi-family organics sample in 2014. **Table B-14** provides the overall data for the primary categories.

Table B-14. MF Waste Composition - 2014 vs 2019 Comparison

	2014 MF Garbage	2019 MF Garbage	2014 MF Recycling	2019 MF Recycling
Containers	7%	7.9%	30%	13.0%
Paper	9%	9.0%	49%	64.7%
Glass	2%	2.8%	14%	17.8%
RecycleBC Depot Recycling	5%	5.4%	1%	1.0%
EPR	-	0.8%	-	0.3%
Compostable Organics	38%	40.4%	0%	0.5%
Non-Compostable Organics	-	1.6%	-	0.0%
Residuals	38%	32.2%	7%	2.8%
Total	**99%**	**100.1%**	**100%**	**100.1%**

Note: numbers in table may not add up to 100% due to rounding

ICI

There are large differences in the composition of the garbage and recycling waste streams observed between the two audits (which may be attributed to the facilities audited). The amount of compostable organics in the garbage stream increased significantly to 61.2% in the 2019 audit up from 15% in 2014. Residuals in the garbage decreased significantly from 79% in 2014 to only 12.9% in 2019 meaning that over 85% of the waste found in the garbage stream could have been diverted. Changes in these values could be from differing ICI sectors being selected. Contamination in the garbage stream from recyclables had an observed increase, with containers and paper increasing by approximately 4% and 11% respectively.

In the recycling stream, compostable organics increased slightly by approximately 2%; however, residuals decreased by approximately 2%. There was an observed difference in the percent composition of the containers, paper and glass material categories. Differences in the composition of the garbage and recycling between 2014 and 2019 results are likely due to the differences in characteristics in the facilities selected to be audited. As previously mentioned, recycling was collected from only one ICI location, while in 2019 waste was collected from four locations. In 2014, ICI recycling was collected from businesses along the waterfront and the garbage stream was collected from a senior healthcare centre. There was no ICI organics sample audited in 2014. **Table B-15** provides the overall data for the primary categories.

Table B-15. ICI Waste Composition - 2014 vs 2019 Comparison

	2014 ICI Garbage	2019 ICI Garbage	2014 ICI Recycling	2019 ICI Recycling
Containers	1%	4.8%	77%	32.8%
Paper	2%	12.8%	5%	52.0%
Glass	0%	0.0%	9%	6.6%
RecycleBC Depot Recycling	2%	5.4%	4%	1.5%
EPR	-	0.1%	-	0.1%
Compostable Organics	15%	61.2%	2%	4.1%
Non-Compostable Organics	-	2.8%	-	0.0%
Residuals	79%	12.9%	5%	3.0%
Total	**99%**	**100.0%**	**102%**	**100.1%**

Note: numbers in table may not add up to 100% due to round

Appendix C

Detailed Project Population and Waste Generation Growth

Table C-1: Detailed Projected Population at Historic Growth

Year	Population Growth[1]		
	SF	MF	Total
2018	10,263	9,689	19,952
2019	10,354	9,775	20,130
2020	10,446	9,862	20,309
2021	10,539	9,950	20,489
2022	10,633	10,039	20,672
2023	10,728	10,128	20,856
2024	10,823	10,218	21,041
2025	10,920	10,309	21,229
2026	11,017	10,401	21,418
2027	11,115	10,493	21,608
2028	11,214	10,587	21,801
2029	11,314	10,681	21,995
2030	11,414	10,776	22,190
2031	11,516	10,872	22,388
2032	11,618	10,969	22,587
2033	11,722	11,066	22,788
2034	11,826	11,165	22,991
2035	11,931	11,264	23,196
2036	12,038	11,364	23,402
2037	12,145	11,466	23,610
2038	12,253	11,568	23,820
2039	12,362	11,671	24,032
2040	12,472	11,774	24,246

[1]Population projections are taken from 2016 Canadian Census published data and consistent with the projections from the White Rock Official Community Plan.

Table C-2: Detailed Projected Waste Generation

Year	Annual SF Generation (tonnes)[2]				Annual MF Generation (tonnes)[2]				Annual ICI Generation (tonnes)[3]			
	Garbage	Recycling	Organics	Total Waste	Garbage	Recycling	Organics	Total Waste	Garbage	Recycling	Organics	Total Waste
2018[1]	1,182	799	1,645	**3,626**	2,051	460	495	**3,006**	2,731	601	655	**3,987**
2019	1,193	806	1,660	**3,658**	2,069	464	500	**3,033**	2,751	605	660	**4,017**
2020	1,203	813	1,674	**3,691**	2,088	468	504	**3,060**	2,776	611	666	**4,053**
2021	1,214	821	1,689	**3,724**	2,106	472	508	**3,087**	2,800	616	672	**4,089**
2022	1,225	828	1,704	**3,757**	2,125	476	513	**3,114**	2,825	622	678	**4,125**
2023	1,236	835	1,720	**3,790**	2,144	481	518	**3,142**	2,850	627	684	**4,162**
2024	1,247	843	1,735	**3,824**	2,163	485	522	**3,170**	2,876	633	690	**4,199**
2025	1,258	850	1,750	**3,858**	2,182	489	527	**3,198**	2,901	638	696	**4,236**
2026	1,269	858	1,766	**3,892**	2,202	494	531	**3,227**	2,927	644	703	**4,274**
2027	1,280	865	1,782	**3,927**	2,221	498	536	**3,256**	2,953	650	709	**4,312**
2028	1,292	873	1,797	**3,962**	2,241	502	541	**3,285**	2,980	656	715	**4,350**
2029	1,303	881	1,813	**3,997**	2,261	507	546	**3,314**	3,006	661	721	**4,389**
2030	1,315	889	1,830	**4,033**	2,281	511	551	**3,343**	3,033	667	728	**4,428**
2031	1,326	897	1,846	**4,069**	2,302	516	556	**3,373**	3,060	673	734	**4,467**
2032	1,338	905	1,862	**4,105**	2,322	520	560	**3,403**	3,087	679	741	**4,507**
2033	1,350	913	1,879	**4,141**	2,343	525	565	**3,433**	3,115	685	748	**4,547**
2034	1,362	921	1,896	**4,178**	2,364	530	571	**3,464**	3,142	691	754	**4,588**
2035	1,374	929	1,912	**4,215**	2,385	534	576	**3,495**	3,170	697	761	**4,629**
2036	1,386	937	1,929	**4,253**	2,406	539	581	**3,526**	3,198	704	768	**4,670**
2037	1,399	945	1,947	**4,291**	2,427	544	586	**3,557**	3,227	710	774	**4,711**
2038	1,411	954	1,964	**4,329**	2,449	549	591	**3,589**	3,256	716	781	**4,753**
2039	1,424	962	1,981	**4,368**	2,471	554	596	**3,621**	3,285	723	788	**4,796**
2040	1,436	971	1,999	**4,406**	2,493	559	602	**3,653**	3,314	729	795	**4,838**

[1] 2018 values are actual generation numbers by waste stream provided by the City.

[2] Annual SF and MF waste generation numbers are consistent with population projections from the White Rock Official Community Plan, approximately 0.89%.

[3] Annual ICI waste generation numbers are consistent with employment projections from the White Rock Official Community Plan, approximately 0.75%

Appendix D

Assumptions for Waste Generation Projections and Options Calculations

Table D-1: Summary of the Assumptions used in Generation Projections and Options Calculations for SF, MF and ICI Sectors

Population Growth	SF Waste Generation (kg/person/day)	MF Waste Generation (kg/person/day)	ICI Waste Generation (kg/employee/day)
0.89%	0.97	0.84	1.18
	SF Garbage Disposal	MF Garbage Disposal	ICI Garbage Disposal
	0.32	0.58	0.81
	SF Recycling Generation	MF Recycling Generation	ICI Recycling Generation
	0.21	0.13	0.18
	SF Organics Generation	MF Organics Generation	ICI Organics Generation
	0.44	0.14	0.19

Site	Tip Fee ($/tonne)[1]		Round trip distance[2] (km)	Time for Round Trip (hr)[3]	Notes
Surrey Transfer Station	Garbage	$108.00	26	1.7	-
GFL	Organics	$105.00	26	1.3	-
Sector	**Number of Properties (City Provided)**	**Number of Units**	**Number of Units Serviced by City**	**Approximate Density**	**Notes**
Single-Family	4,038	4,038	4,038	884 households/km^2	4105 units serviced by City including current MF collections
Multi-Family	252	6,265	67	54 locations/km^2	-
ICI	96	-	-	20 locations/km^2	-

[1] Current tip fees (2020).
[2] One way distance from City centre using Google Maps.
[3] Drive time including time for tipping.

Table D-2: Summary of the Assumptions used in Generation Projections and Options Calculations for SF, MF and ICI Sectors (Continued)

SF Assumptions

1)	White Rock SF/MF Units Serviced	4,105 (4038 SF and 67 MF units)
2)	Tonnes per year Garbage Collected (2018 data)	1,182
3)	Tonnes per year Recycling Collected (2018 data)	799
4)	Tonnes per year Organics Collected (2018 data)	1,645

MF Assumptions

1)	Multi-Family Units	1-20 Units	141	**252 Units Total**
		21-40 Units	72	
		41-60 Units	22	
		61-80 Units	7	
		81-100 Units	6	
		101-120 Units	2	
		121-140 Units	1	
		141-160 Units	0	
		161-180 Units	0	
		181-200 Units	1	
2)	Tonnes per year Garbage Collected	Assumption based on average MF kg/capita 2017 MV recycling and solid waste generation data.		
3)	Tonnes per year Recycling Collected	Assumption based on average kg/capita RecycleBC generation data[1].		
4)	Tonnes per year Organics Collected	Assumption based on local waste audit results.		

[1] RecycleBC MetroVancouver Annual Report.

ICI Assumptions

1)	Mixed Use Buildings	Included in MF Unit Count	25	**92 Units Total**
		Not-Included in MF Unit Count	67	
	Commercial Licences	Strata	92	**188 Units Total**
		Land [1]	96	
2)	Tonnes per year Garbage Collected	Assumption based on average ICI disposal kg/capita 2017 MV recycling and solid waste generation data and White Rock Stats Total Labour Force[2].		
3)	Tonnes per year Recycling Collected	Assumption based on amalgamation of kg/capita 2017 MV recycling and solid waste generation data and local waste audit diversion rates.		
4)	Tonnes per year Organics Collected	Assumption based on amalgamation of kg/capita 2017 MV recycling and solid waste generation data and local waste audit diversion rates.		

[1] Stand alone businesses that would require their own collection services.
[2] White Rock total labour force is estimated at 9270 employees.

Table D-3: Cart Assumptions for All Streams, Recycling and Compost Only and Garbage Only

Cart Assumptions (All Streams)[1] Number of Units							Cart Assumptions (Recycling and Compost Only) [1] Number of Units						Dumpster Assumptions (Garbage Only)[1] Number of Units		
	Paper Recycling	Container Recycling	Glass Recycling	Compost	Garbage	**Total**	Paper Recycling	Container Recycling	Glass Recycling	Compost	Garbage	**Total**	Size	Quantity	**Total**
1-20 Units[2]	2	1	1	1	6	**1,551**	2	1	1	1	0	**705**	3 yard	1	**141**
21-40 Units[2]	4	2	1	1	12	**1,440**	4	2	1	1	0	**576**	6 yard	1	**72**
41-60 Units[2]	6	3	1	2	16	**616**	6	3	1	2	0	**264**	4 yard	2	**44**
61-80 Units	8	4	1	3	24	**280**	8	4	1	3	0	**112**	6 yard	2	**14**
81-100 Units	10	5	1	4	36	**336**	10	5	1	4	0	**120**	6 yard	3	**18**
101-120 Units	12	6	1	5	48	**144**	12	6	1	5	0	**48**	6 yard	4	**8**
121-140 Units	14	7	1	6	48	**76**	14	7	1	6	0	**28**	6 yard	4	**4**
141-160 Units	16	8	1	7	60	**0**	16	8	1	7	0	**0**	6 yard	5	**0**
161-180 Units	18	9	1	8	72	**0**	18	9	1	8	0	**0**	6 yard	6	**0**
181-200 Units	20	10	2	9	72	**113**	20	10	2	9	0	**41**	6 yard	6	**6**
					Overall Total	**4,556**					**Overall Total**	**1,894**		**Total 3 yard**	**141**
					Total of What City Can Collect	**3,607**					**Total of What City Can Collect**	**1,545**		**Total 4 yard**	**44**
														Total 6 yard	**122**

[1] Cart data assumptions from City of Richmond's Commercial and MF Development Waste Management Design Guidelines.

[2] Size of MF building that City can collect from.

Appendix E

"Tell Us What You Think" Survey Responses

Survey Report

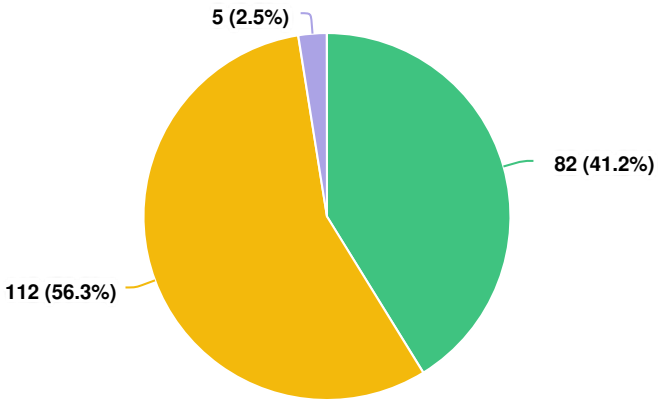
08 February 2020 - 08 March 2020

Tell us what you think about Solid Waste Operations in the City White Rock

PROJECT: Solid Waste Operations in the City White Rock

Talk White Rock

Q1 If you live in White Rock, please indicate your type of residenceIf you both live in the City and own/operate a business, y...

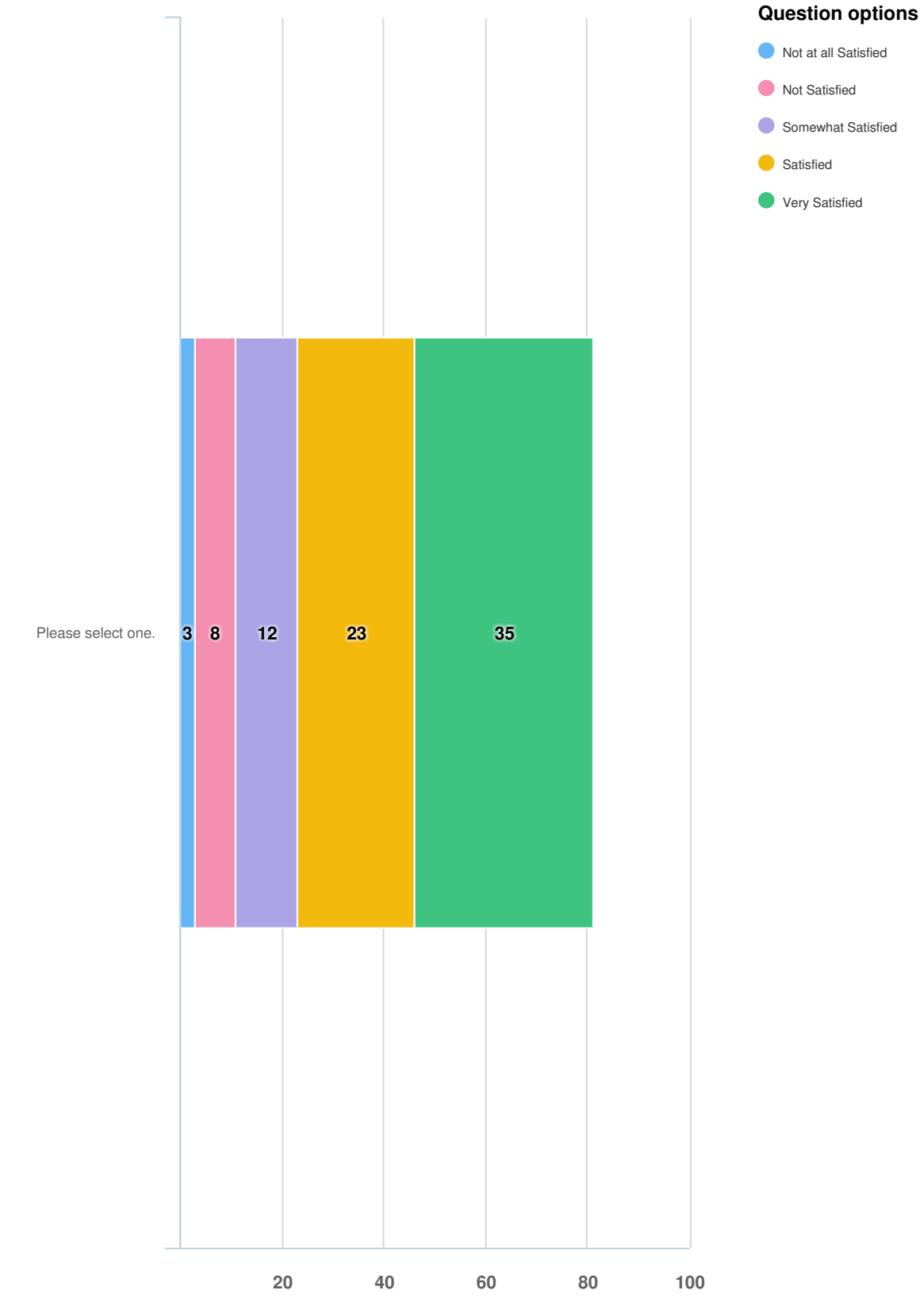


Question options

Single-family household | Multi-family household | I don't live in the City but I own/operate a business

(199 responses, 0 skipped)

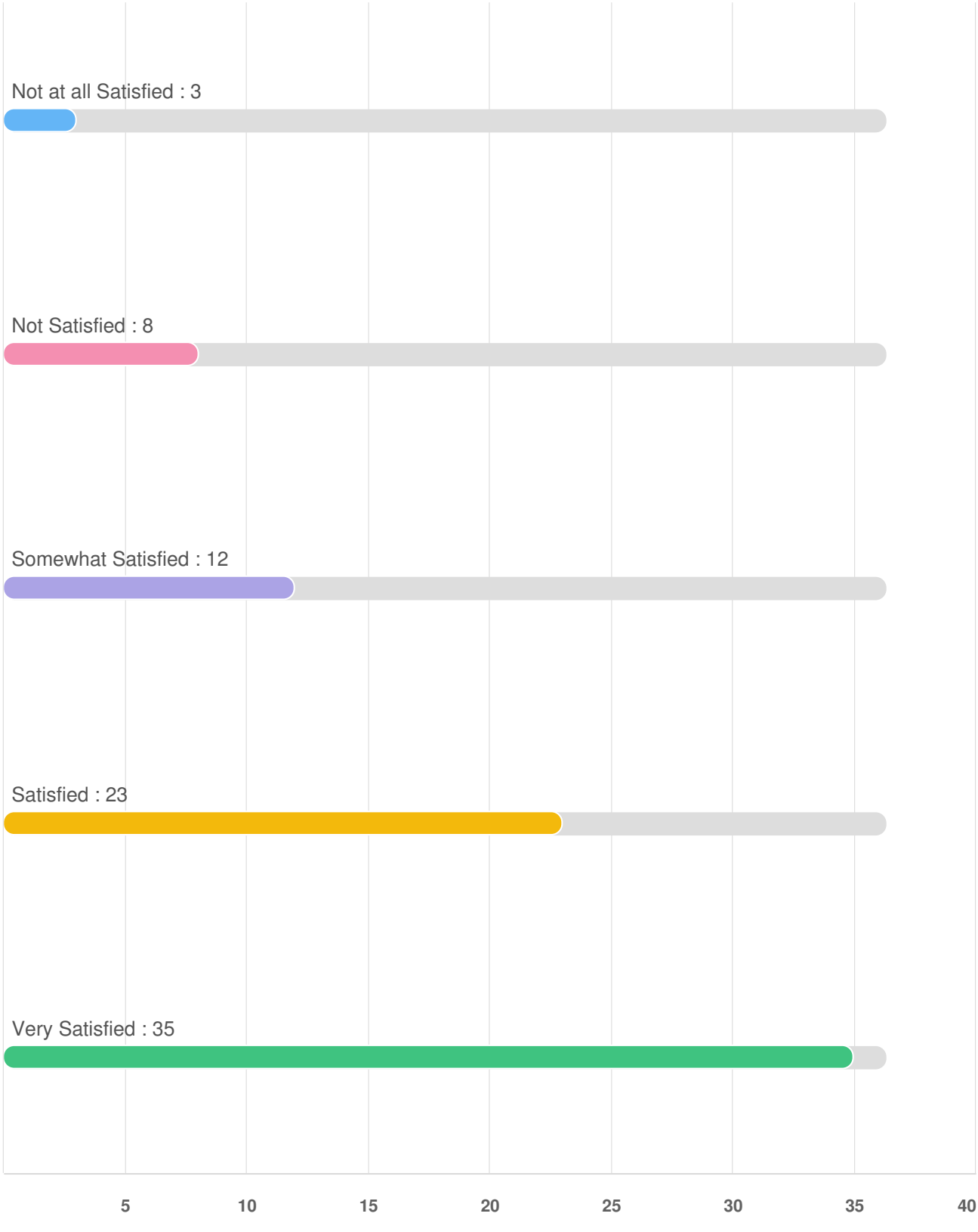
Q2 How satisfied are you with your current waste collection services?



Optional question (81 responses, 118 skipped)

Q2 How satisfied are you with your current waste collection services?

Please select one.



Q3 What would you like to see done differently, if anything?

Anonymous 2/19/2020 06:27 PM	Automated waste coooe toon and bigger cans
Anonymous 2/19/2020 06:34 PM	The collection has only been getting worse and messier. Recently there has been more trash on the road after garbage days than in previous years
Anonymous 2/19/2020 06:35 PM	Would be lovely to see more business and multi family involvement in yard waste and recycling programs. Possibly the city could mandate that they must use these services.
Anonymous 2/19/2020 09:51 PM	I think the cobbled together pile of containers looks messy. Surrey has 3 containers, they can be sized, 3 clear colors and an automated system. It is crazy that we pay for a separate garbage collection system when we could be buying their service for a much cheaper rate. I am sick of cleaning up all of the Paper and plastic that blows around the laneway because nothing is secured.
Anonymous 2/20/2020 06:49 AM	Provision of garbage cans - similar to Surrey. Also, it would be helpful if all contents of the garbage and organics is actually removed. Oftentimes, we are left cleaning out the bottom of the can - especially the organics. This defeats the purpose of separating waste.
Anonymous 2/20/2020 11:44 AM	Nothing . The people we have here are wonderful . There is never a mess after they have collected the waste .
Anonymous 2/20/2020 02:26 PM	Maybe the universal can system, or perhaps can cleaning services
Anonymous 2/20/2020 05:41 PM	Pick up once a week for house hold garbage.
Anonymous 2/20/2020 08:13 PM	Automated waste collection with single stream recycling.
Anonymous 2/20/2020 09:26 PM	I live in a condo. I try to recyle but with 4 or 5 bins it is very confusing. I see things in the waste paper bin that am not sure should be there i.e milk cartons. Have gone to the recycle web site and it is not that helpful. Also do not like navigating around the many garbage trucks, collecting waste from many different condos. Very inconvenient. I would like to see single stream recycling
Anonymous 2/21/2020 08:38 AM	Better Bins
Anonymous 2/21/2020 09:01 AM	I previously lived in Burnaby and had standard bins provided by the city. They worked well. But I don’t have any complaints about the current system.
Anonymous	Provide large garbage cans like Surrey does

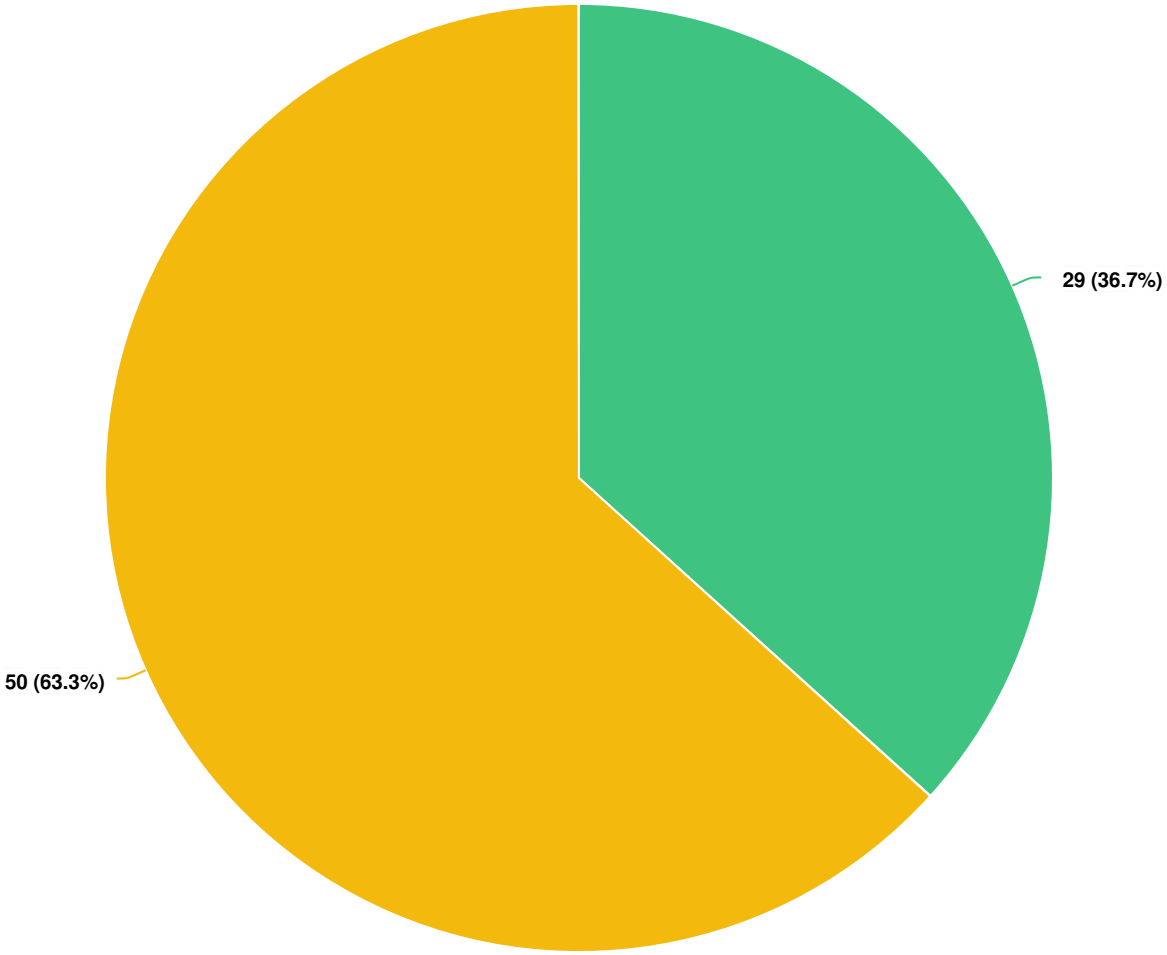
2/21/2020 03:23 PM	
Anonymous 2/21/2020 05:11 PM	We are generally really happy with things, but it looks such a mess. I would love to see coordinated bins/recycling/greenwaste made available, even if I have a moderate one time cost associated.
Anonymous 2/21/2020 06:11 PM	would prefer weekly collection of ALL waste
Anonymous 2/21/2020 08:52 PM	Adopt the same system (larger cans) as Surrey
Anonymous 2/21/2020 09:21 PM	Nothing. I think collection of garbage every 2 weeks and recycling & yard waste collection every week is sufficient for a single family house. We make do with that. Except in the spring & fall, yard waste could be reduced to every week. Blue box (& red box) recycling seems to be needed every week.
Anonymous 2/22/2020 09:43 AM	No more separation of recycling accepting of styrofoam
Anonymous 2/23/2020 09:32 AM	would like one company to collect white rock waste. What we have is garbage collection 7 days week way to many trucks on our roads
Anonymous 2/23/2020 11:02 AM	Used to see Semaihmoo House volunteers helping out. Appeared to be a constructive contribution for all concerned.
Anonymous 2/23/2020 02:25 PM	I would like to see garbage picked up weekly instead of biweekly. Also , twice this month, our organic shave not been picked up.
Anonymous 2/23/2020 06:31 PM	Nothing. The guys are great.
Anonymous 2/24/2020 10:32 AM	Workers employed by the City collect garbage from all residences. And weekly garbage pick-up
Anonymous 2/24/2020 02:58 PM	Weekly garbage pick up
Anonymous 2/25/2020 10:09 AM	standardized bins
Anonymous 2/25/2020 10:29 AM	Maybe a call-up system like Surrey for occasional very large objects
Anonymous 2/27/2020 12:02 AM	We missed a garbage pickup last week. I called the Engineering line and was told we would be put on a callback list, and the garbage was picked up! Unbelievably great service! Keep it up!
Anonymous 2/28/2020 01:16 PM	Do we need to bag trash -- not recyclable paper, plastics, glass or wet garbage -- the " other stuff", which in our case is mostly kleenex and non-recyclable plastic jar lids or frozen berry bags? We are trying to eliminate single use plastics and wonder if all thT dry matter can't just be dumped as is. Sorry we missed the meeting.
Anonymous	White Rock should collect it's own garbage, there are too many companies

2/28/2020 01:26 PM	coming into the area, causing pollution, noise pollution and conflict. Environmentally speaking this is a disaster not to mention the wear and tear of all those heavy trucks, we just got the trains shut down, it would be much appreciated if we could get this issue contained as well. Plus, the cardboard, kitchen waste and recycling trucks, what complete piece of mayhem. So much of this is unnecessary and redundant.
Anonymous 2/28/2020 04:45 PM	bi-annual free large item pickup offered.
Anonymous 2/28/2020 06:06 PM	Weekly garbage. It’s gets smelly when we have to wait 2 weeks. If we are out of town, it can be one month between pickups.
Anonymous 2/28/2020 08:14 PM	It would be nice to have a have a transfer station in the community or at least the option to have some larger items picked up curbside.
Anonymous 2/29/2020 11:06 AM	I would like more materials recycled through my building's recycling plan. As is, although I do have many recycling options in my building, I still have to make trips to the Semiahmoo Recycling Depot.
Anonymous 2/29/2020 01:05 PM	And once or twice a year collection of larger waste items which is done in other areas and used to be done here.
Anonymous 2/29/2020 02:46 PM	Very happy with current program
Anonymous 2/29/2020 03:46 PM	Standard White Rock garbage bins, much like the standard blue bins and paper/cardboard recycle bags. (I just answered that without seeing what the next questions were!)
Anonymous 2/29/2020 06:34 PM	At times, pick ups are missed At times, containers and lids are left all over the lane
Anonymous 2/29/2020 08:37 PM	Ability to have a limited amount of larger (old furniture or appliances) removed during the year
Anonymous 3/01/2020 09:22 AM	Garbage pickup weekly and bins that lock for pest control, a recycling bin for all recycling (no need to separate), a compost bin that locks for pest control.
Anonymous 3/01/2020 04:00 PM	Take soft plastics and styrofoam. The people collecting the garbage seem careless at times and have broken my organic bin twice. They sometimes leave allowable things behind for no apparent reason.
Anonymous 3/02/2020 07:00 PM	For the city to pickup garbage from condos uptown. When the service was taken away, condos went solo to find companies to pickup. Meaning it was not co-ordinated that (now) one Street would have 5 or six different companies picking up. Pollution was of gasoline and noise. Garbage collection from these companies could happen early in the morning or late afternoon, 5:30/6pm. Since there are 3 different pickups, garbage/recycle/organic per building it creates a lot of traffic/noise of the trucks. Bring back White Rock garbage/recycle/organic with White Rock.
Anonymous 3/03/2020 10:14 AM	I would like a large bin for mixed recycling and a large bin for composting foods and mixed organics. Also, free pickup of old appliances, etc., available one to three times per year. I see a lot of debris stored on properties because

	there is no convenient way to recycle or dispose of it. This, in turn, provides a breeding ground for pests.
Anonymous 3/03/2020 10:35 AM	Back to the way it was for condo owners
Anonymous 3/03/2020 12:51 PM	windy White Rock ... why are we still using plastic yellow bags? Having moved from Surrey, this seems so antiquated. Raccoons can access regular garbage bins. The ones on wheels, raccoons can't open the lids.
Anonymous 3/03/2020 07:30 PM	Weekly pick up.
Anonymous 3/04/2020 08:04 AM	Bigger collection bins
Anonymous 3/04/2020 10:45 AM	Can we have bigger trash cans please? For a family of eight, the cans, especially the black trash can is too small.
Anonymous 3/05/2020 08:56 AM	Would like to see the same collection as city of Surrey with the large bins
Anonymous 3/06/2020 10:18 PM	I'd like the city to stop using a corner of the works yard as a deposit/dumping area for green waste. It attracts large numbers of rats and raccoons to the immediate neighbourhood. Hasn't the city's temporary permit for dumping green waste here expired?
Anonymous 3/06/2020 10:54 PM	lived in South Surrey with standard bin collection. noisy but efficient. main complaint would be the speed of trucks - wow watch out! although it's done quickly.
Anonymous 3/07/2020 12:12 AM	Have spring cleaning days much like how Delta has dump days in April.

Optional question (52 responses, 147 skipped)

Q4 What style of waste collection bin do you prefer?

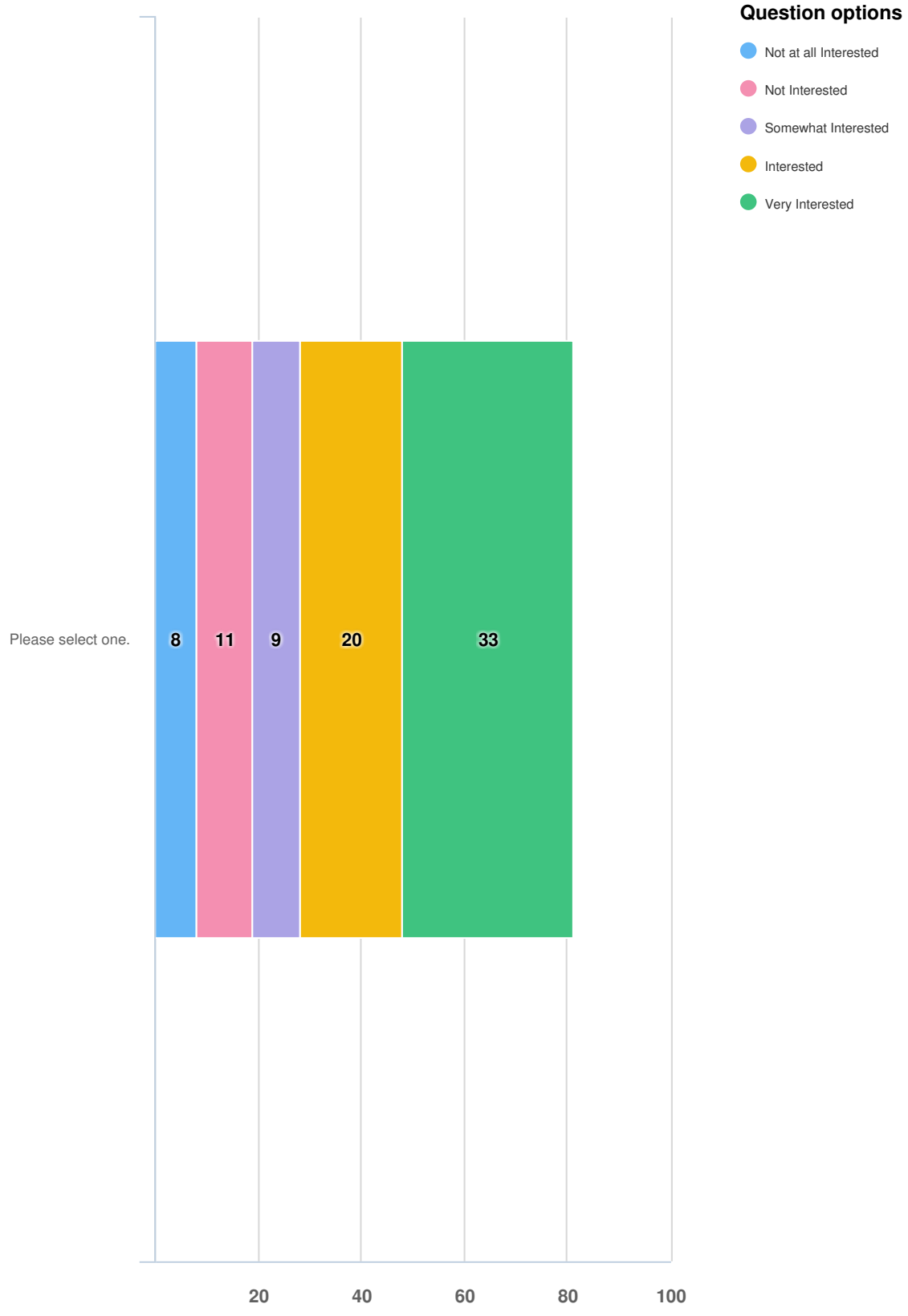


Question options

- Standardized bins purchased through the City for curbside collection
- Bin supplied and chosen by each household for curbside collection

Optional question (79 responses, 120 skipped)

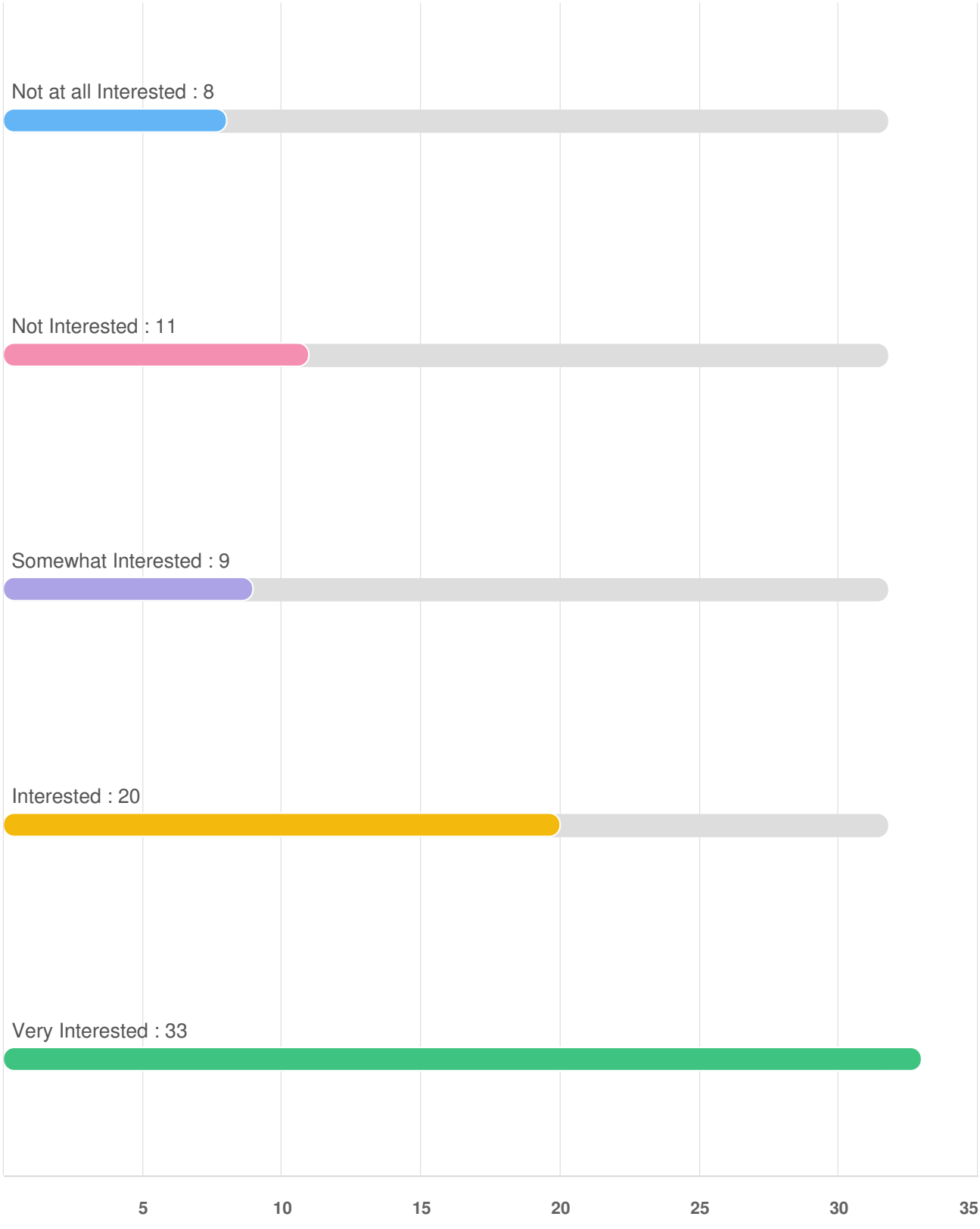
Q5 How interested are you in the City providing a standardized collection bin for Garbage and Organics Collection?



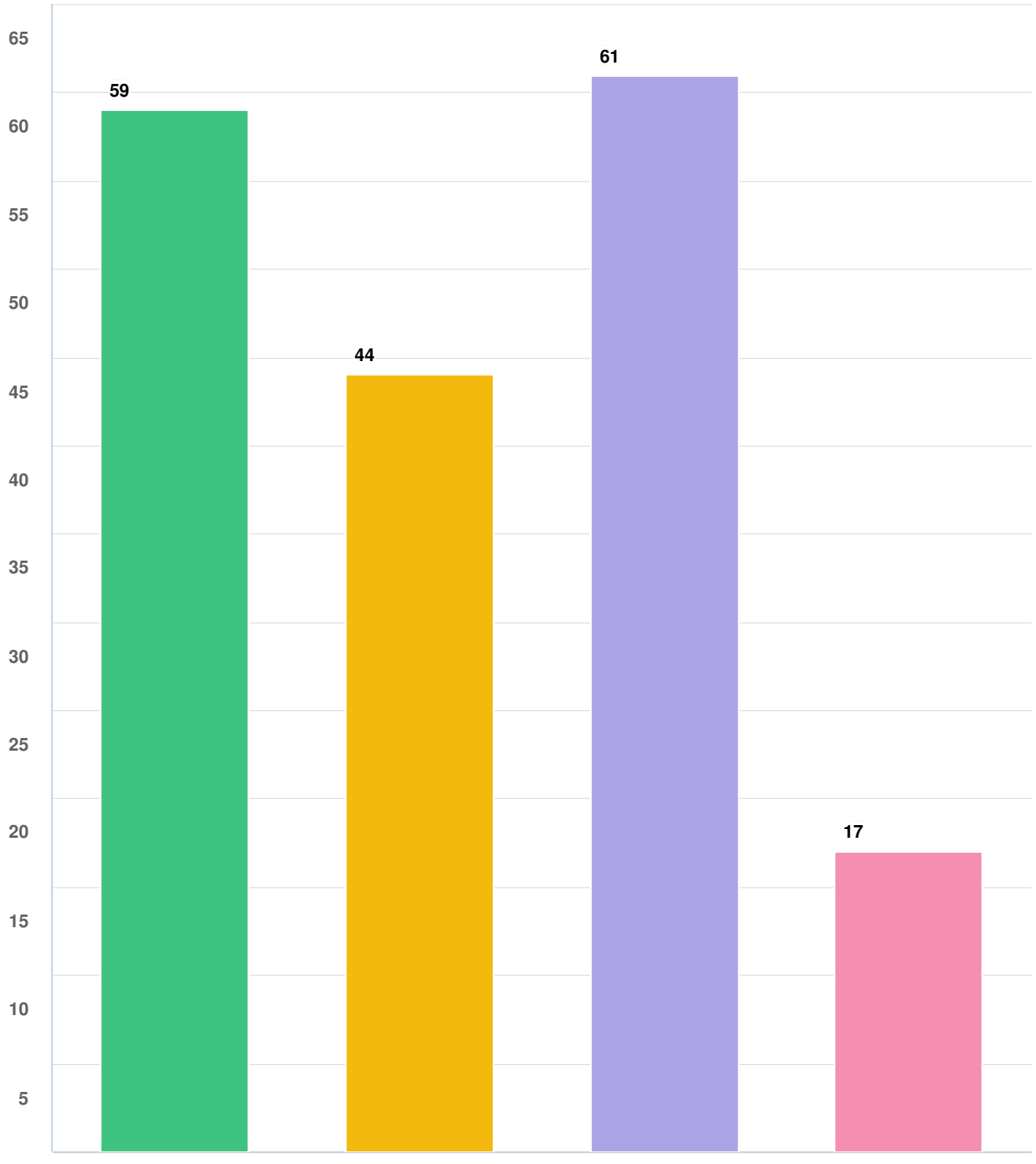
Optional question (81 responses, 118 skipped)

Q5 How interested are you in the City providing a standardized collection bin for Garbage and Organics Collection?

Please select one.



Q6 What is important to you in a standardized curbside garbage bin? Select all that apply

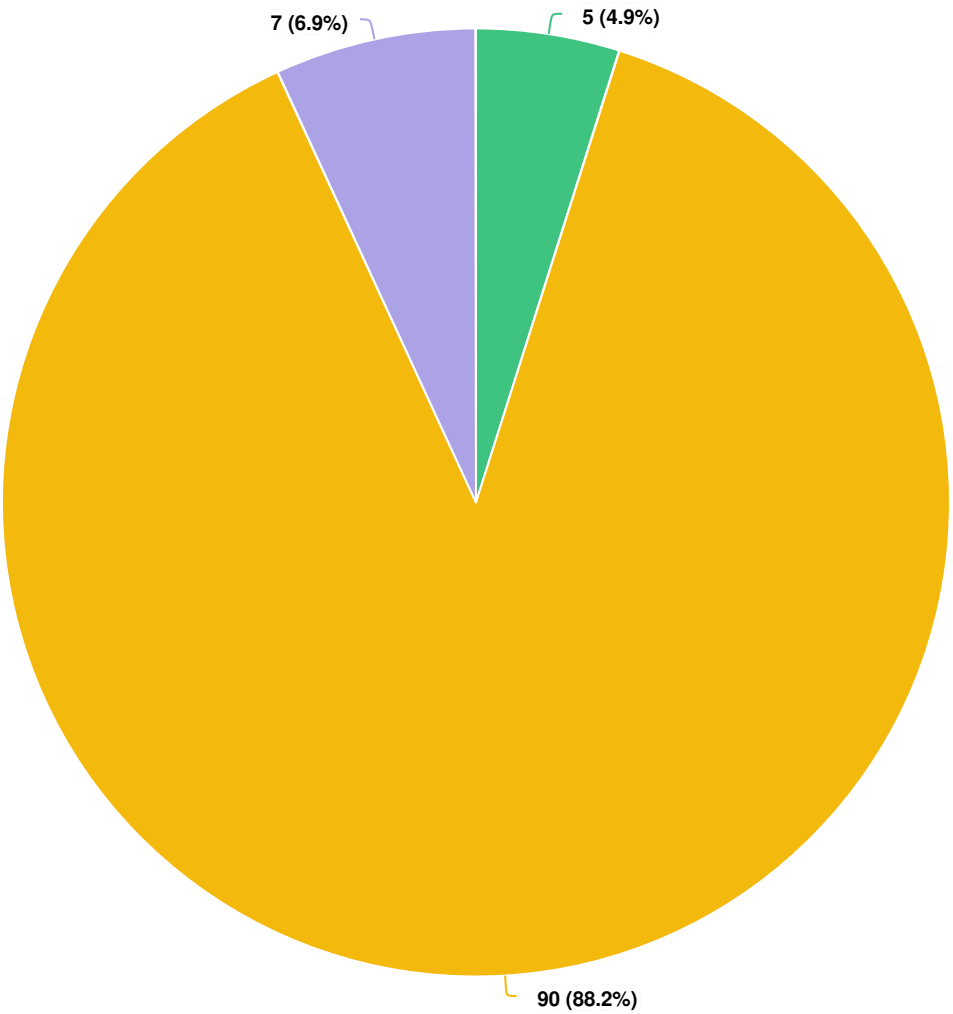


Question options

Other (If you selected other, please explain) Wildlife Resistant Low Cost Wheeled

Optional question (81 responses, 118 skipped)

Q7 Who collects your waste?



Question options

Don't know Private Hauler The City

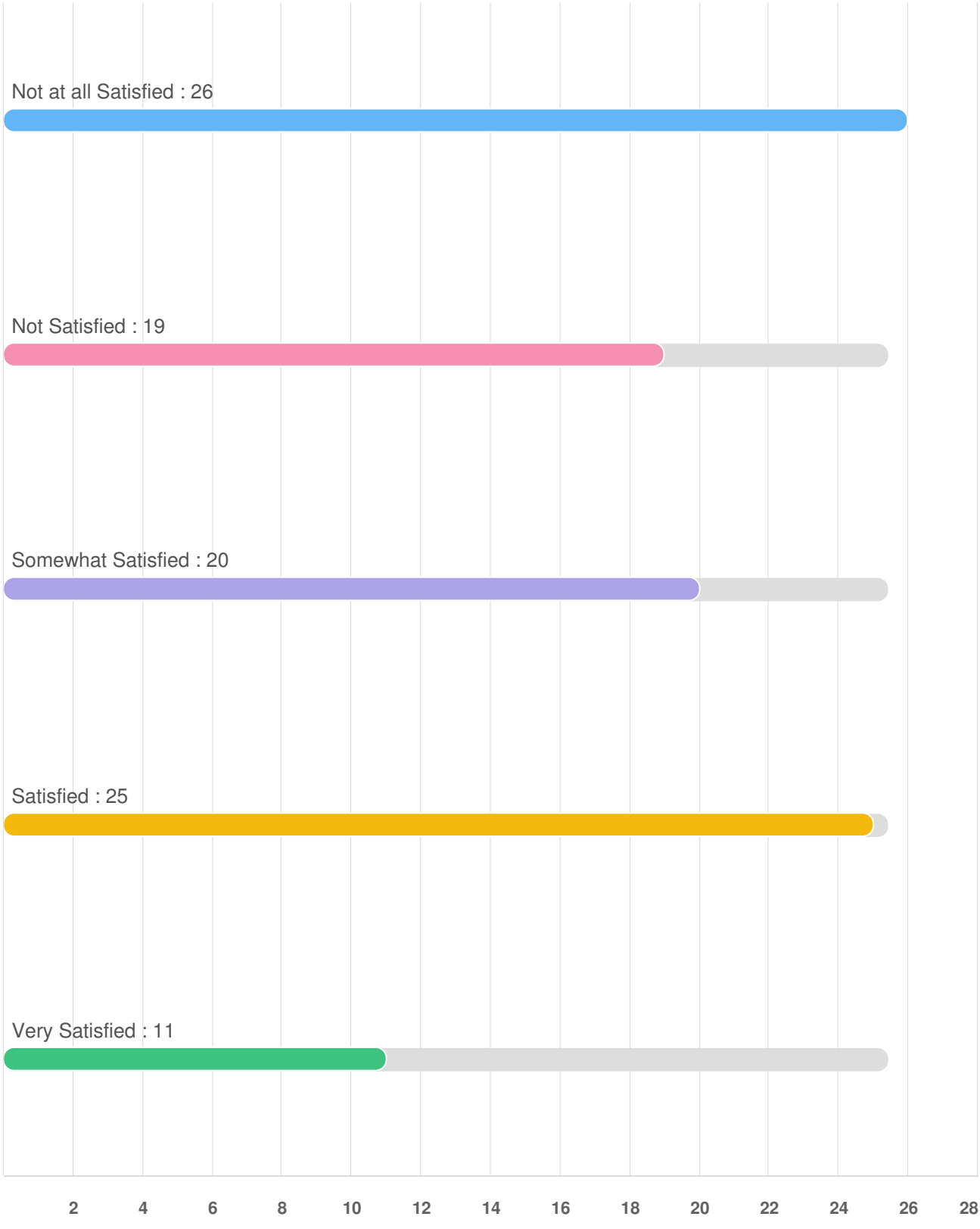
Optional question (102 responses, 97 skipped)

Q8 How satisfied are you with your current waste collection services?

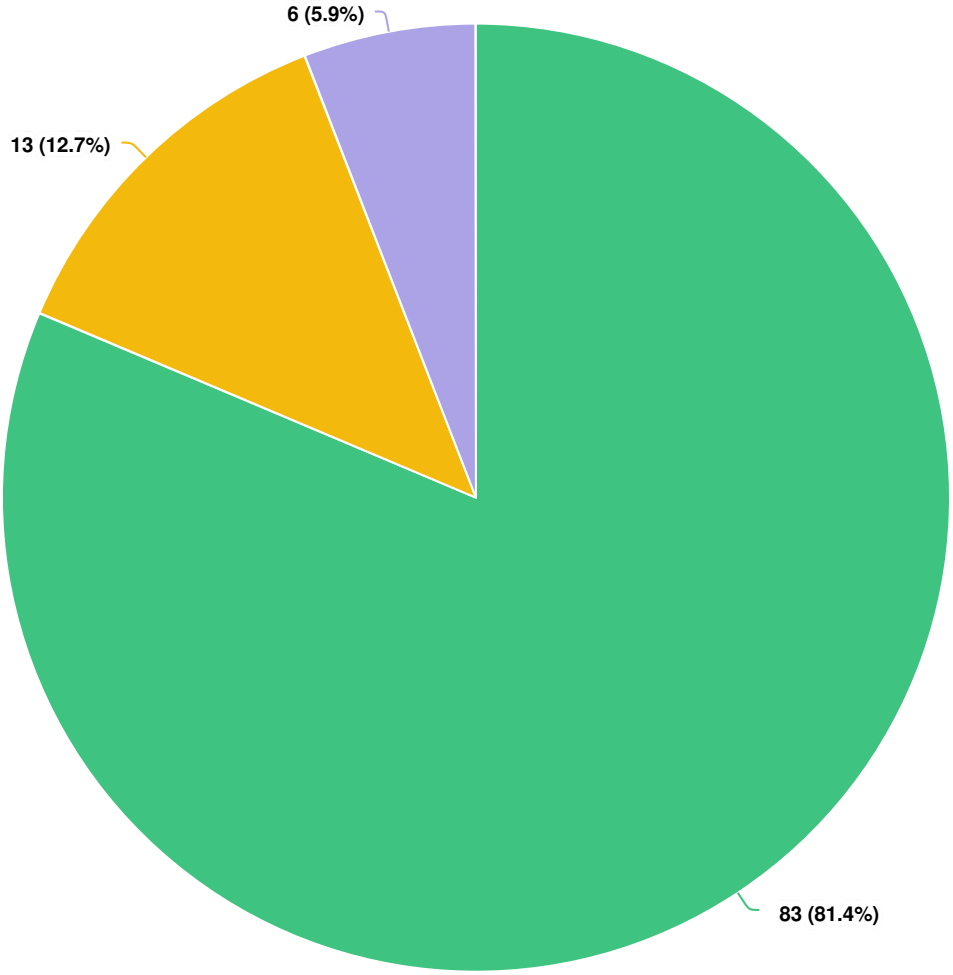
Optional question (101 responses, 98 skipped)

Q8 How satisfied are you with your current waste collection services?

Please select one.



Q9 Does your building provide educational material on proper waste disposal practices? (e.g. signs in the garbage room)



Question options

Not Sure No Yes

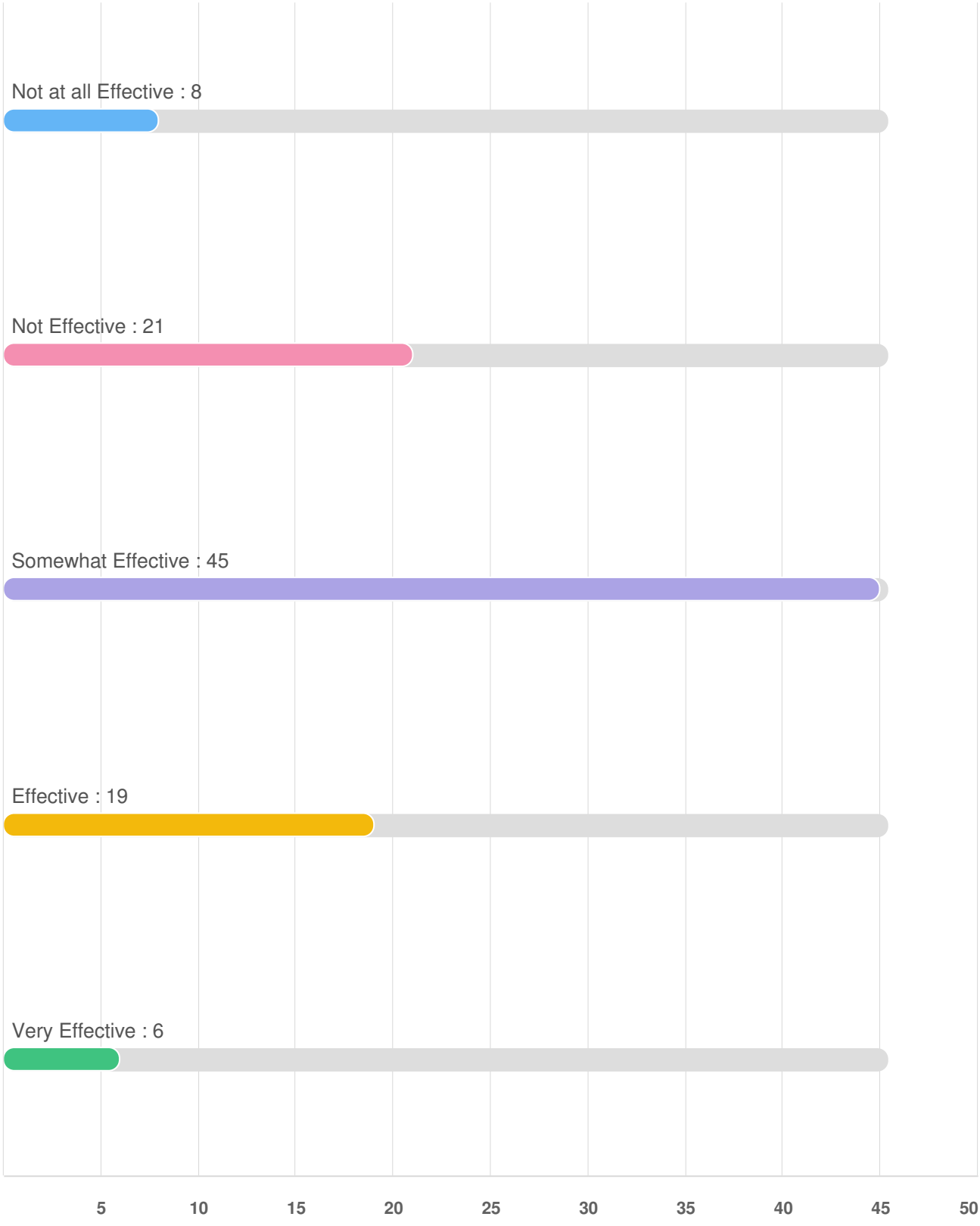
Optional question (102 responses, 97 skipped)

Q10 How effective do you think the educational materials provided in your waste collection area are?

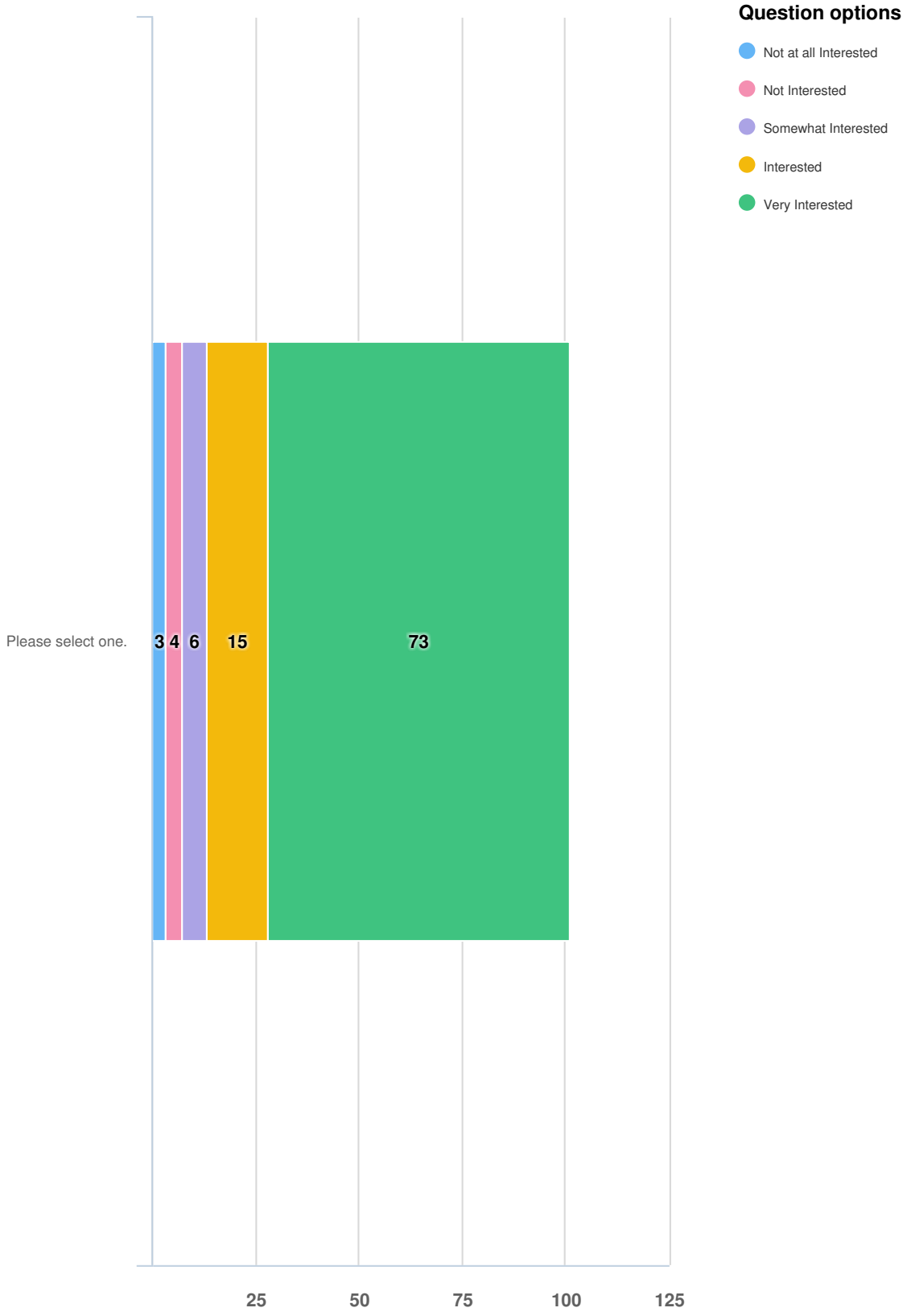
Optional question (99 responses, 100 skipped)

Q10 How effective do you think the educational materials provided in your waste collection area are?

Please select one.



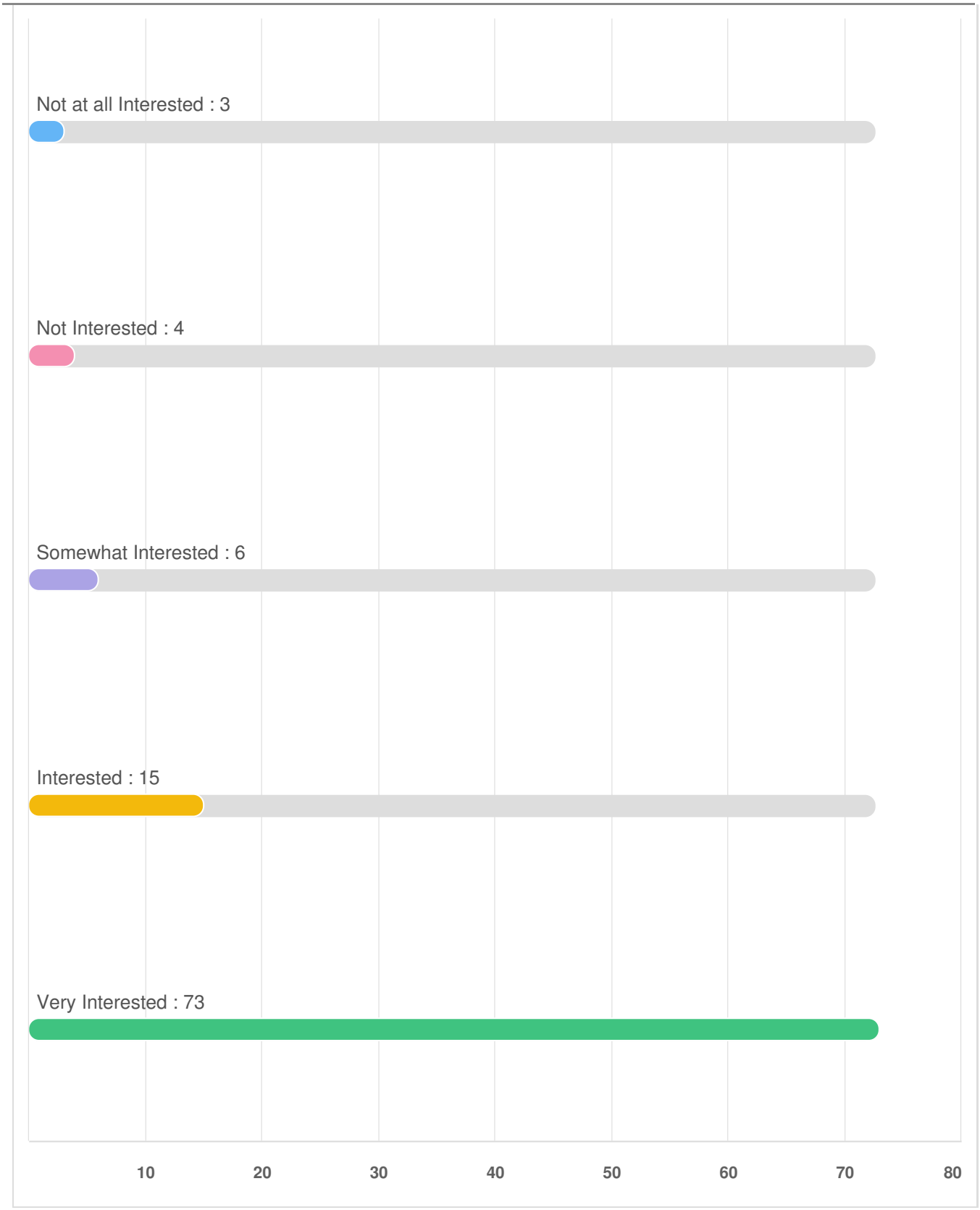
Q11 How interested are you in having the City manage collection services for your building? (please note this may affect fees, collection day and set out requirements)



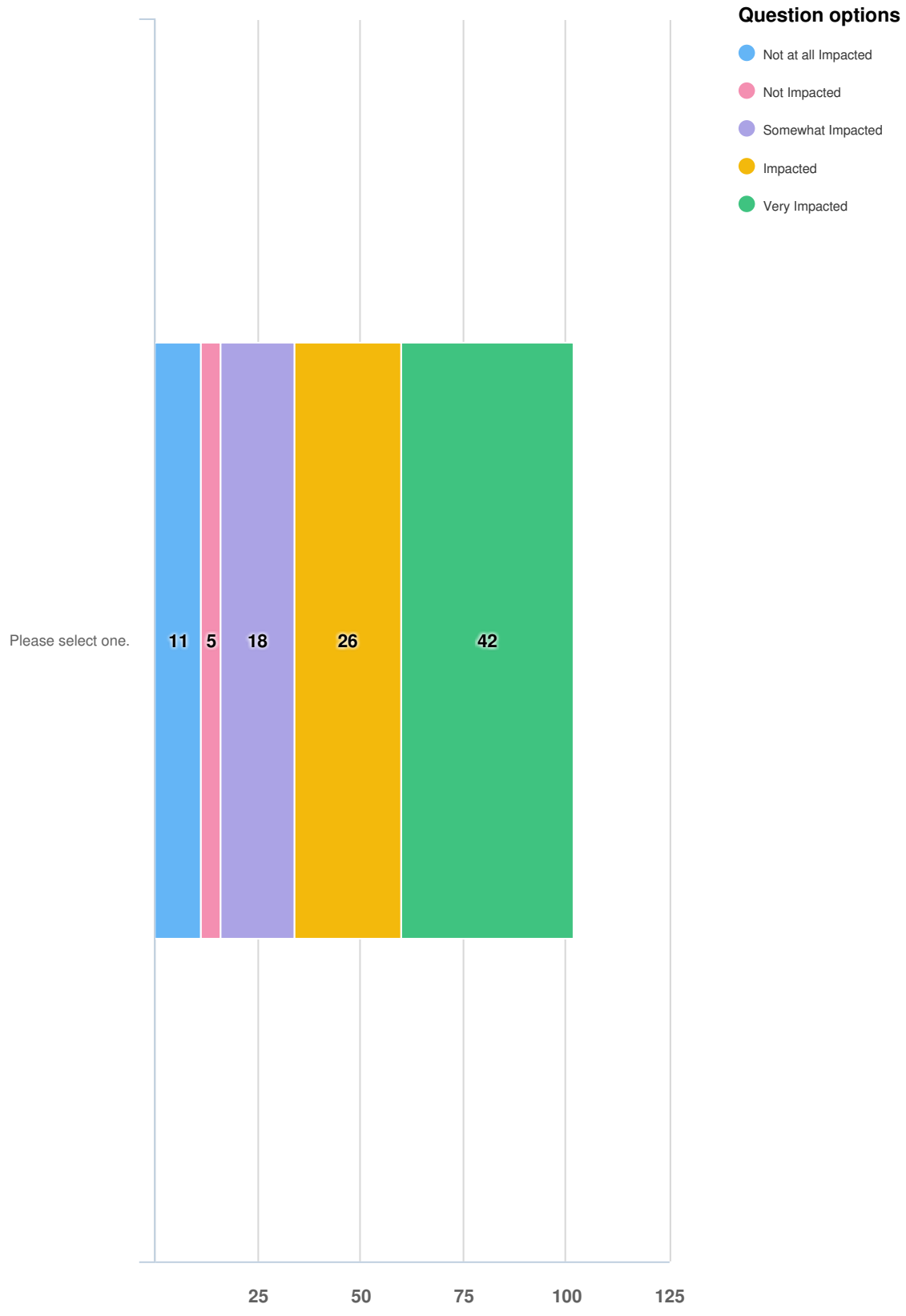
Optional question (101 responses, 98 skipped)

Q11 **How interested are you in having the City manage collection services for your building? (please note this may affect fees, collection day and set out requirements)**

Please select one.


Not at all Interested : 3
Not Interested : 4
Somewhat Interested : 6
Interested : 15
Very Interested : 73
10
20
30
40
50
60
70
80

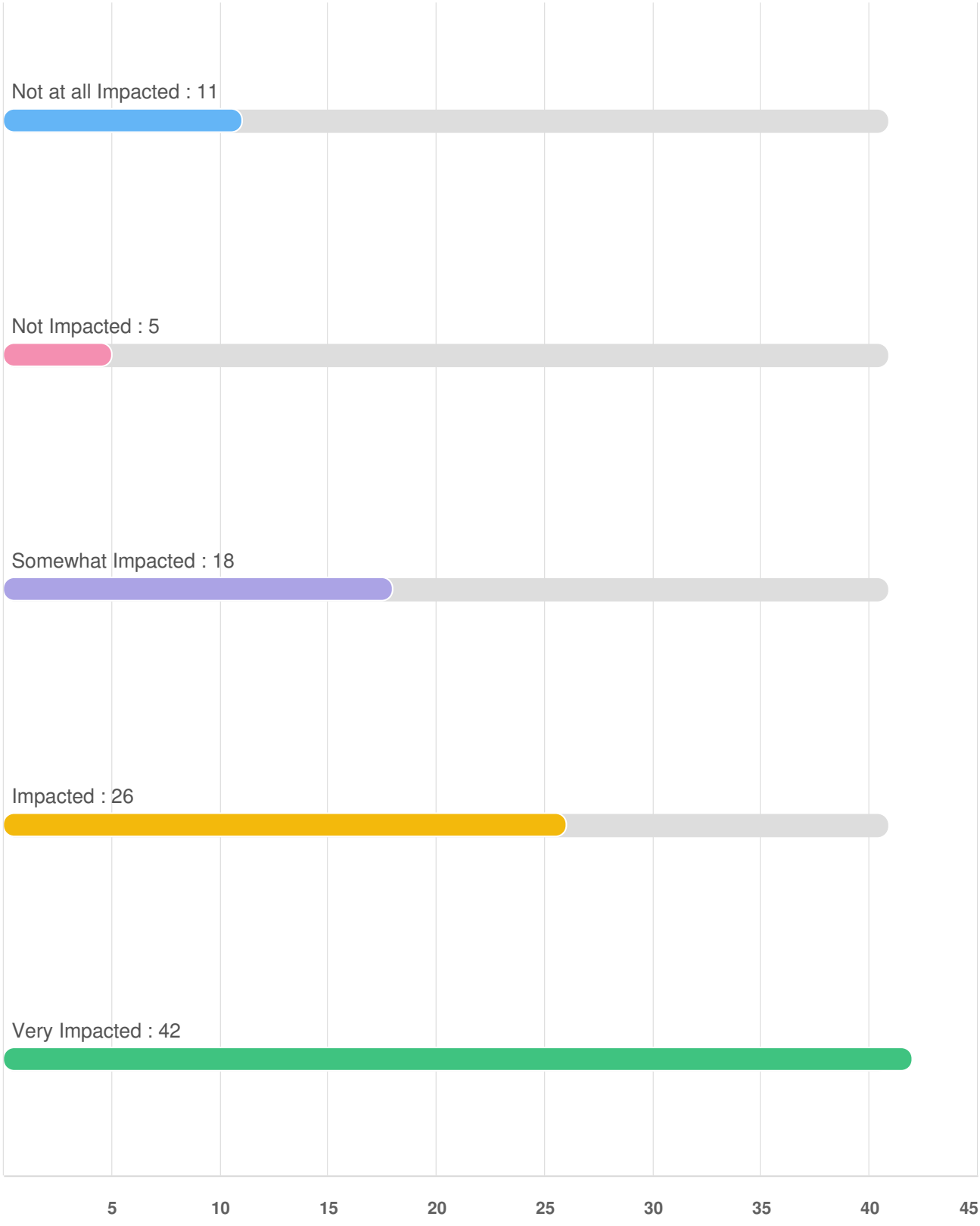
Q12 Does Hauler Traffic (current number of collection vehicles on the road) impact your day-to-day living?



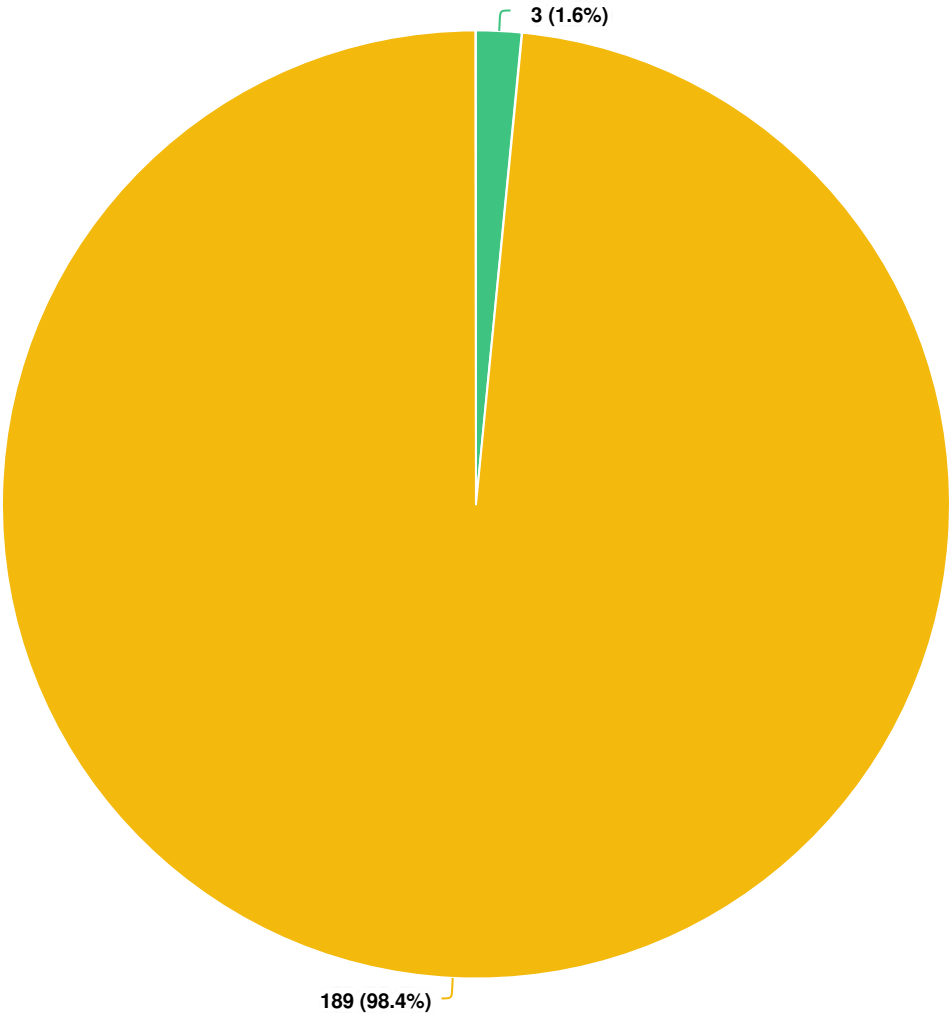
Optional question (102 responses, 97 skipped)

Q12 Does Hauler Traffic (current number of collection vehicles on the road) impact your day-to-day living?

Please select one.



Q13 Do you own or operate a business in White Rock?



Question options

No Yes

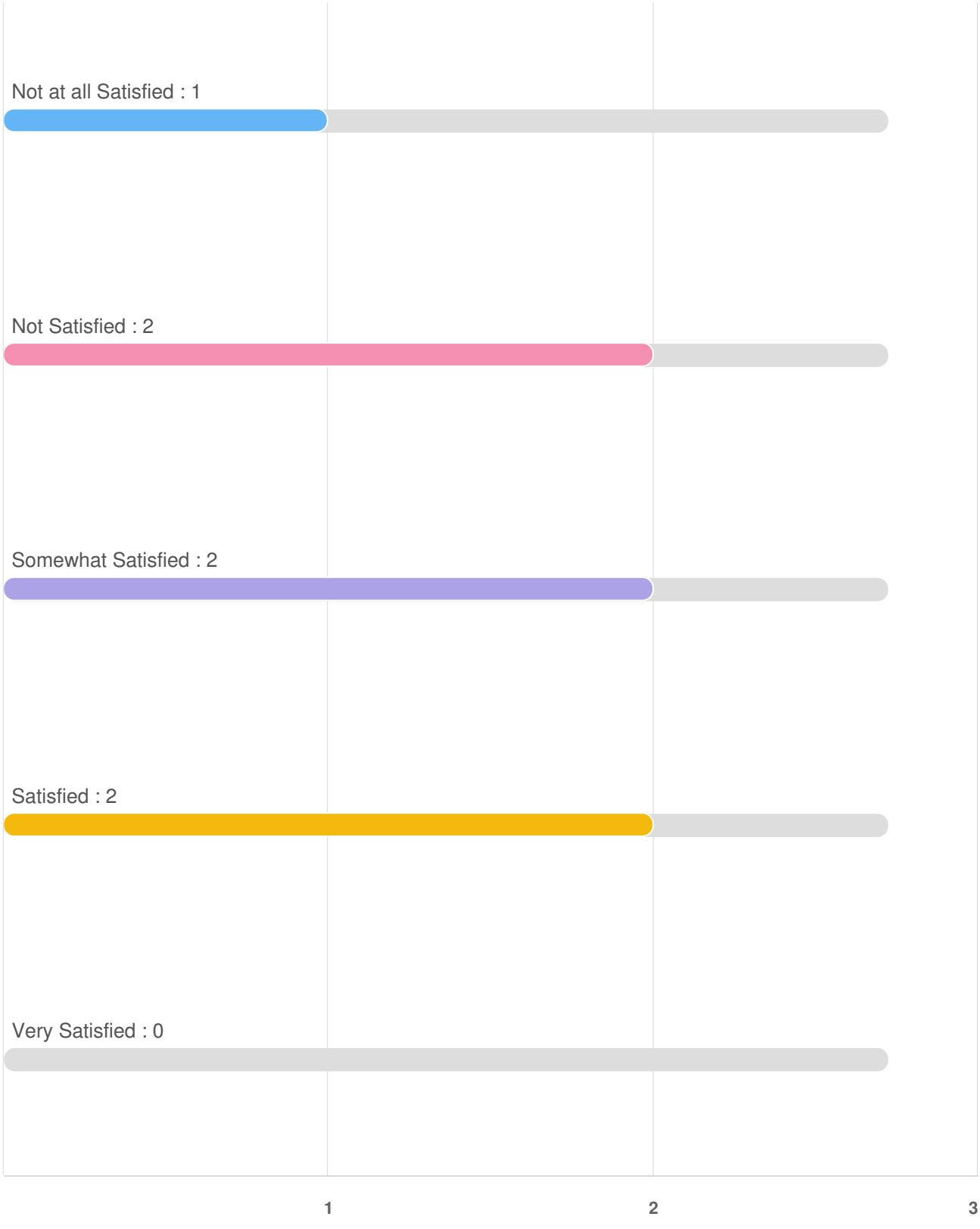
Optional question (192 responses, 7 skipped)

Q14 How satisfied are you with your current waste collection services?

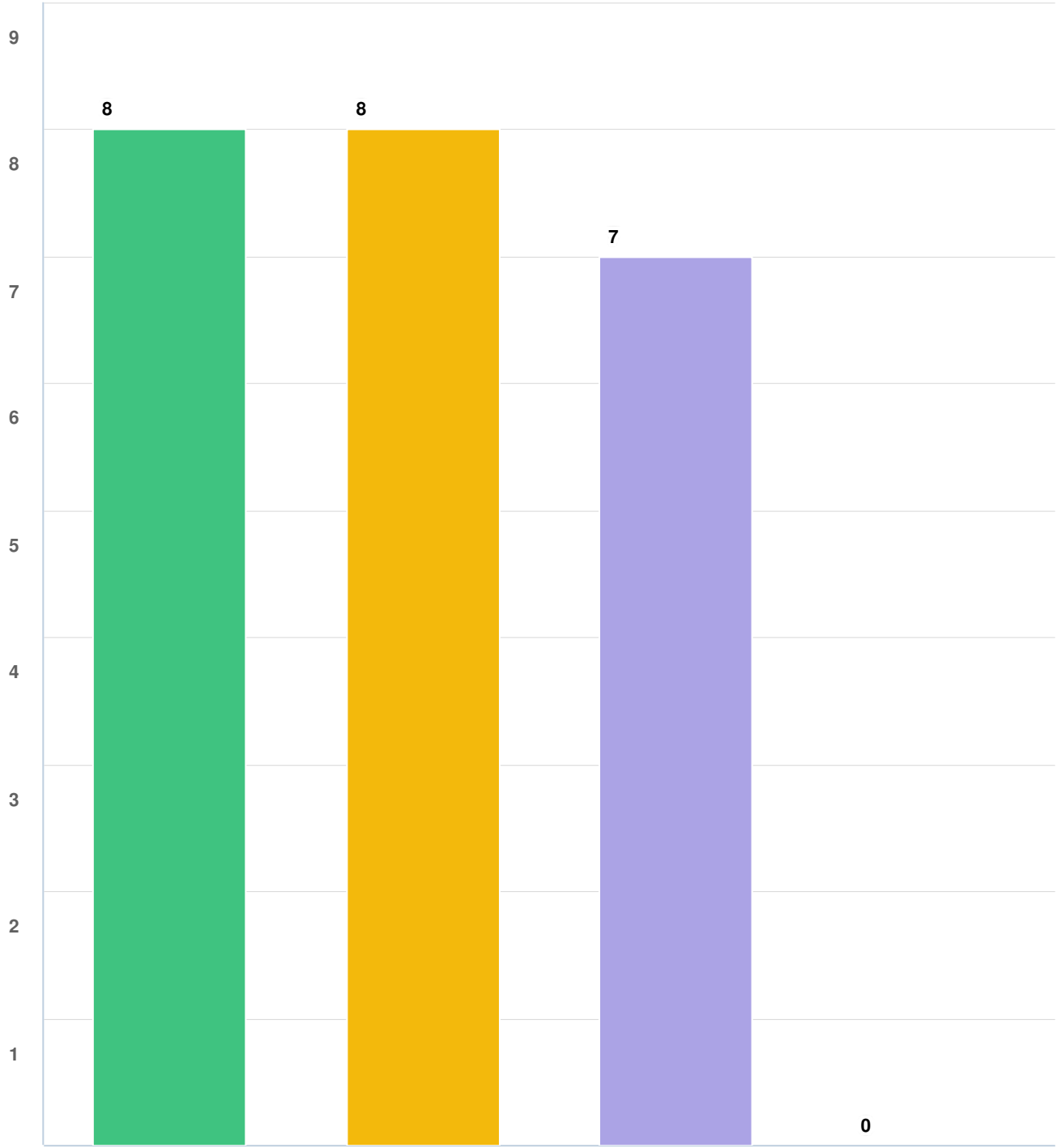
Optional question (7 responses, 192 skipped)

Q14 How satisfied are you with your current waste collection services?

Please select one.



Q15 Which materials are collected for processing/final disposal at your business?



Question options

Other (If you selected other, please indicate which additional materials are collected)
Organics
Recycling
Garbage

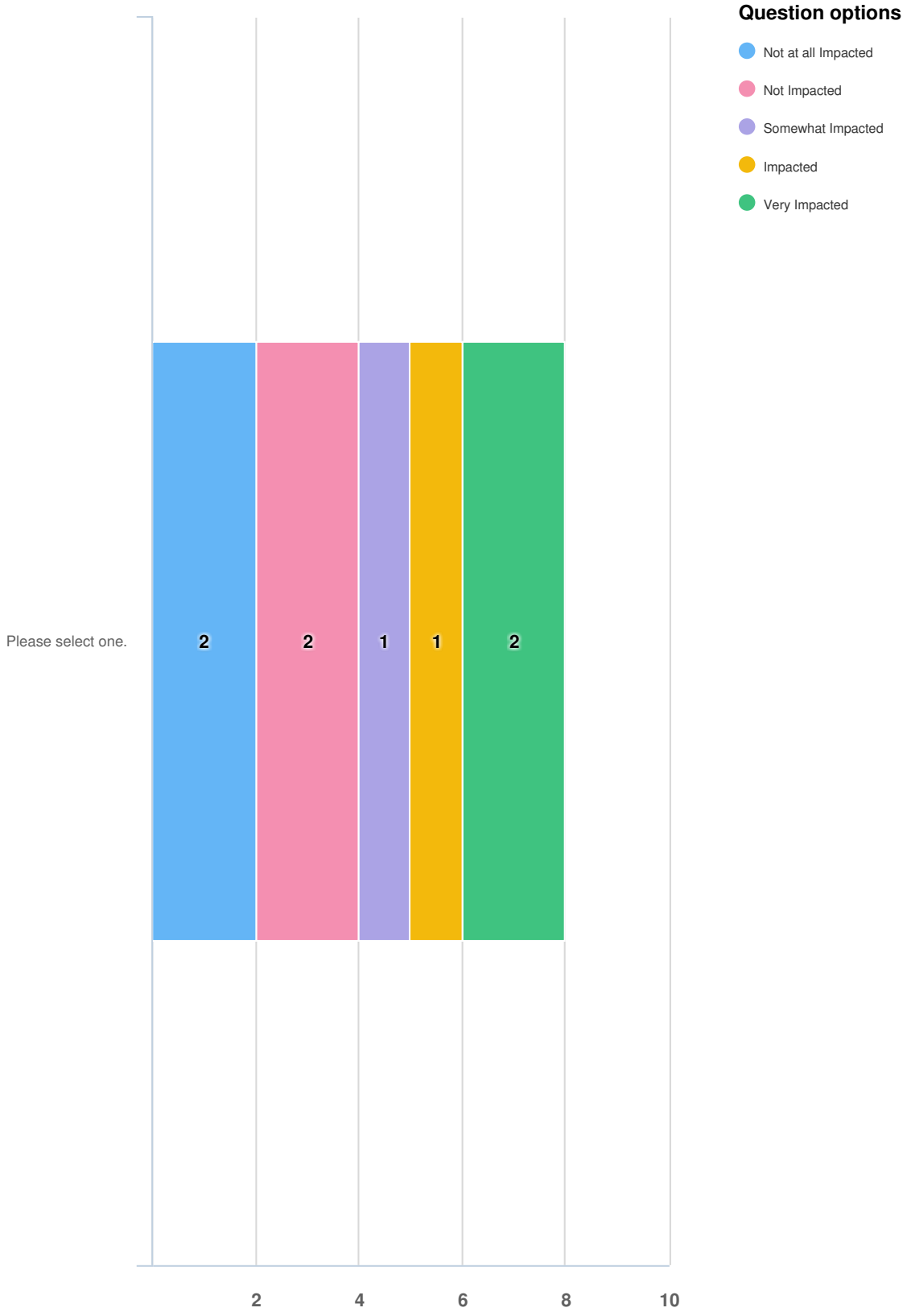
Optional question (8 responses, 191 skipped)

Q16 What would you like to see done differently, if anything?

Anonymous 2/24/2020 04:59 PM	I would like the City to pick up and charge er units in a building
Anonymous 2/24/2020 05:01 PM	Less noise and traffic
Anonymous 2/24/2020 05:06 PM	Collection sites and cost of collections for 3 (20 units) strata's using one site and one cost. Sharing cost of service for collection.
Anonymous 2/24/2020 05:12 PM	Better education of what can go in/can't. Best way to leave things in bin/how. Some common questions from staff: "should i rinse recycling?" "where do compostable plastics go?" "can I put recyclables in plastic garbage bags?"
Anonymous 2/26/2020 04:42 PM	We were forced to accept a commercial option and although the company is good - we pay far more now than we had with the City of WR picking up!
Anonymous 2/28/2020 09:09 PM	Unified waste contract

Optional question (6 responses, 193 skipped)

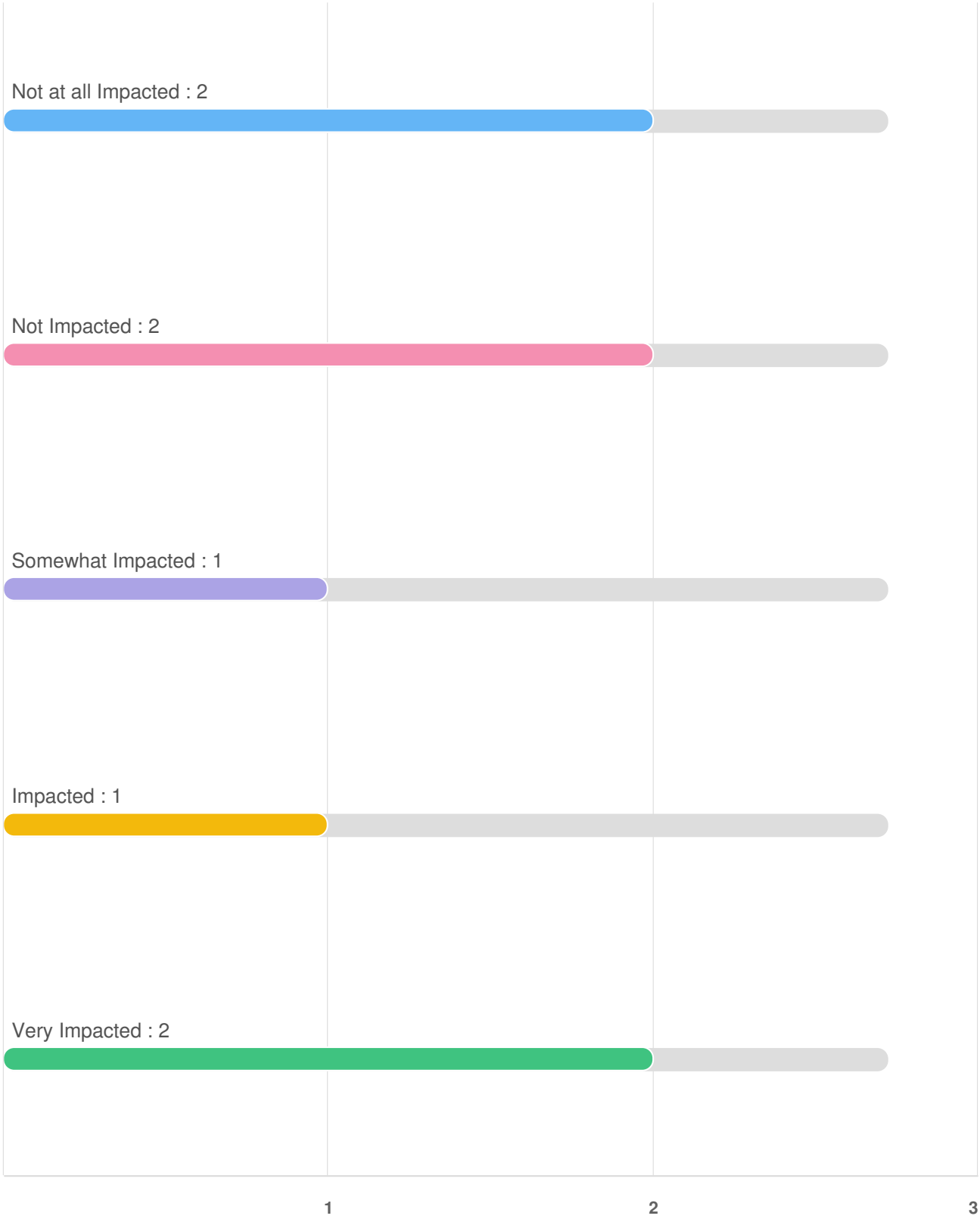
Q17 Does Hauler Traffic (current number of collection vehicles on the road) impact your customers or day-to-day business?



Optional question (8 responses, 191 skipped)

Q17 Does Hauler Traffic (current number of collection vehicles on the road) impact your customers or day-to-day business?

Please select one.

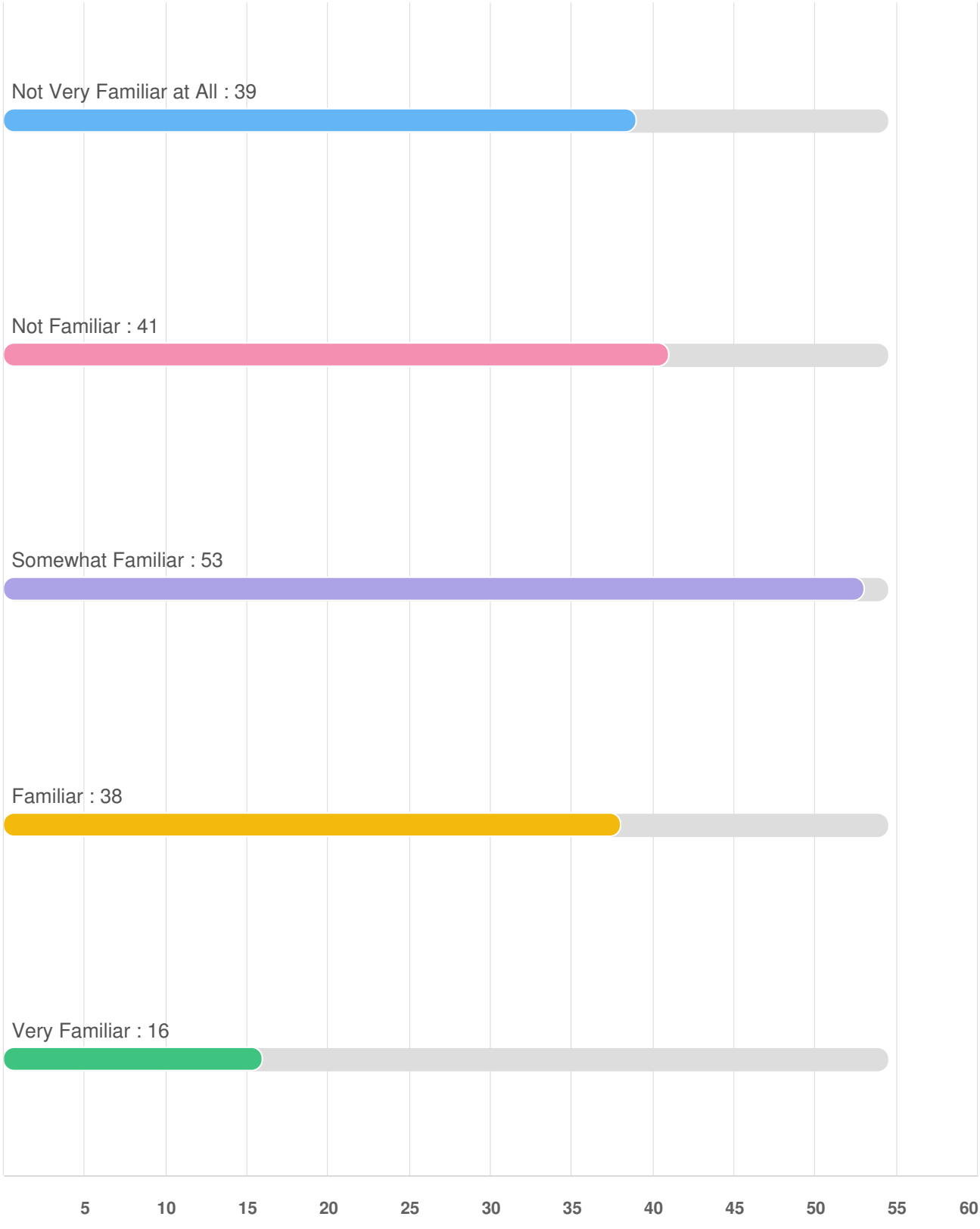


Q18 How familiar are you with the City's Solid Waste Management Bylaw?

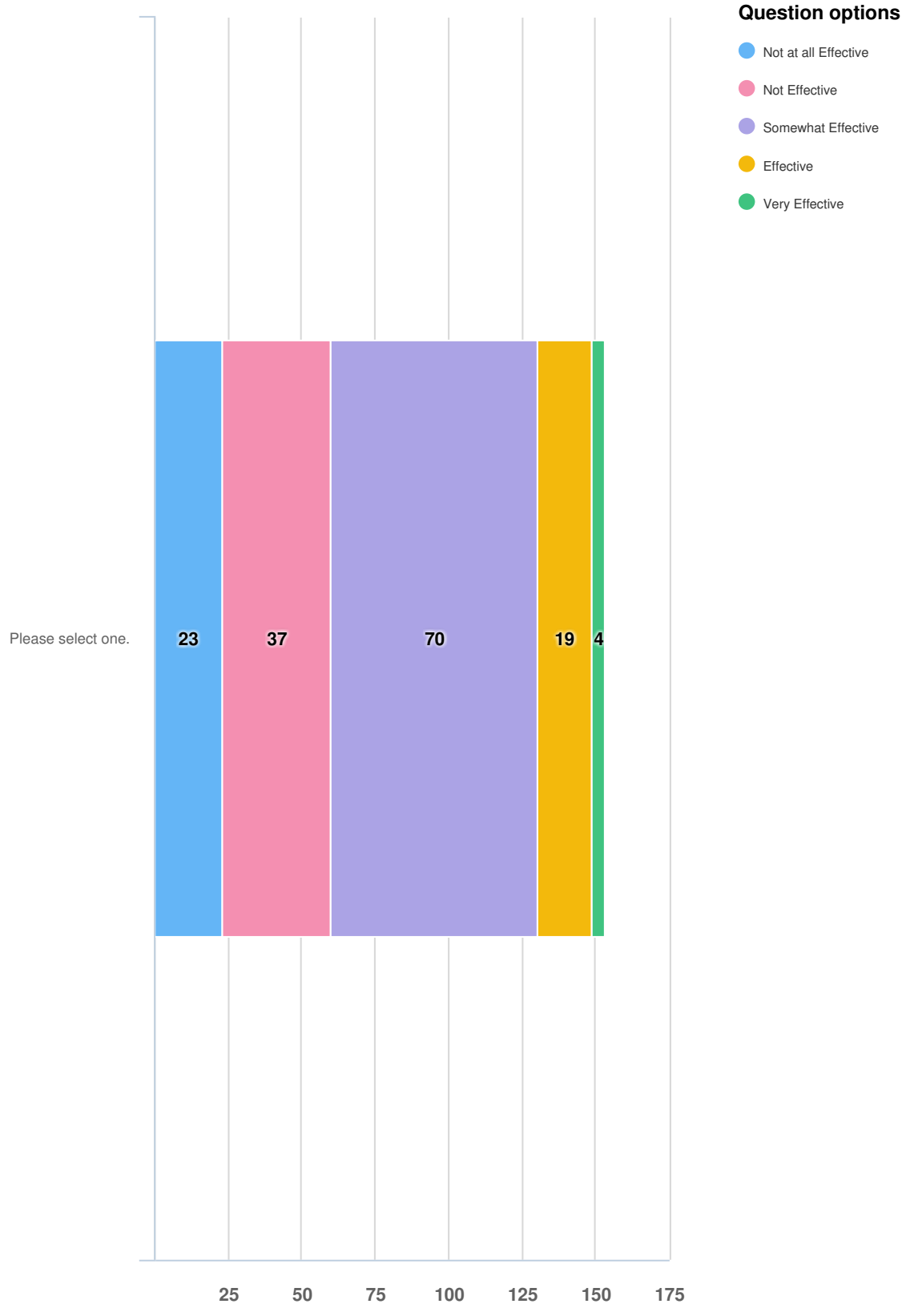
Optional question (187 responses, 12 skipped)

Q18 How familiar are you with the City's Solid Waste Management Bylaw?

Please select one.



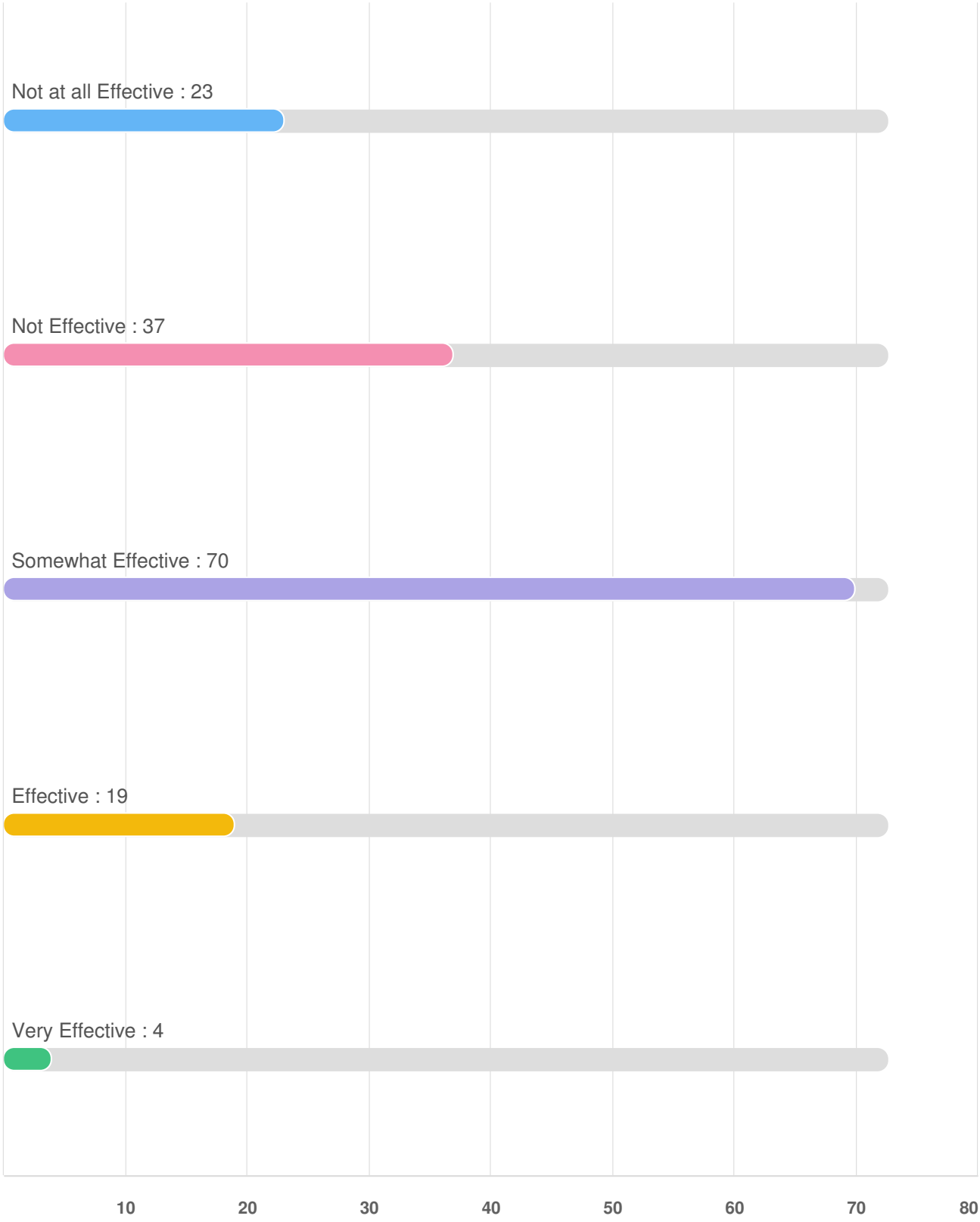
Q19 The City fines for Solid Waste Bylaw infractions. How effective do you think the City is at enforcing Solid Waste Bylaw Infractions?



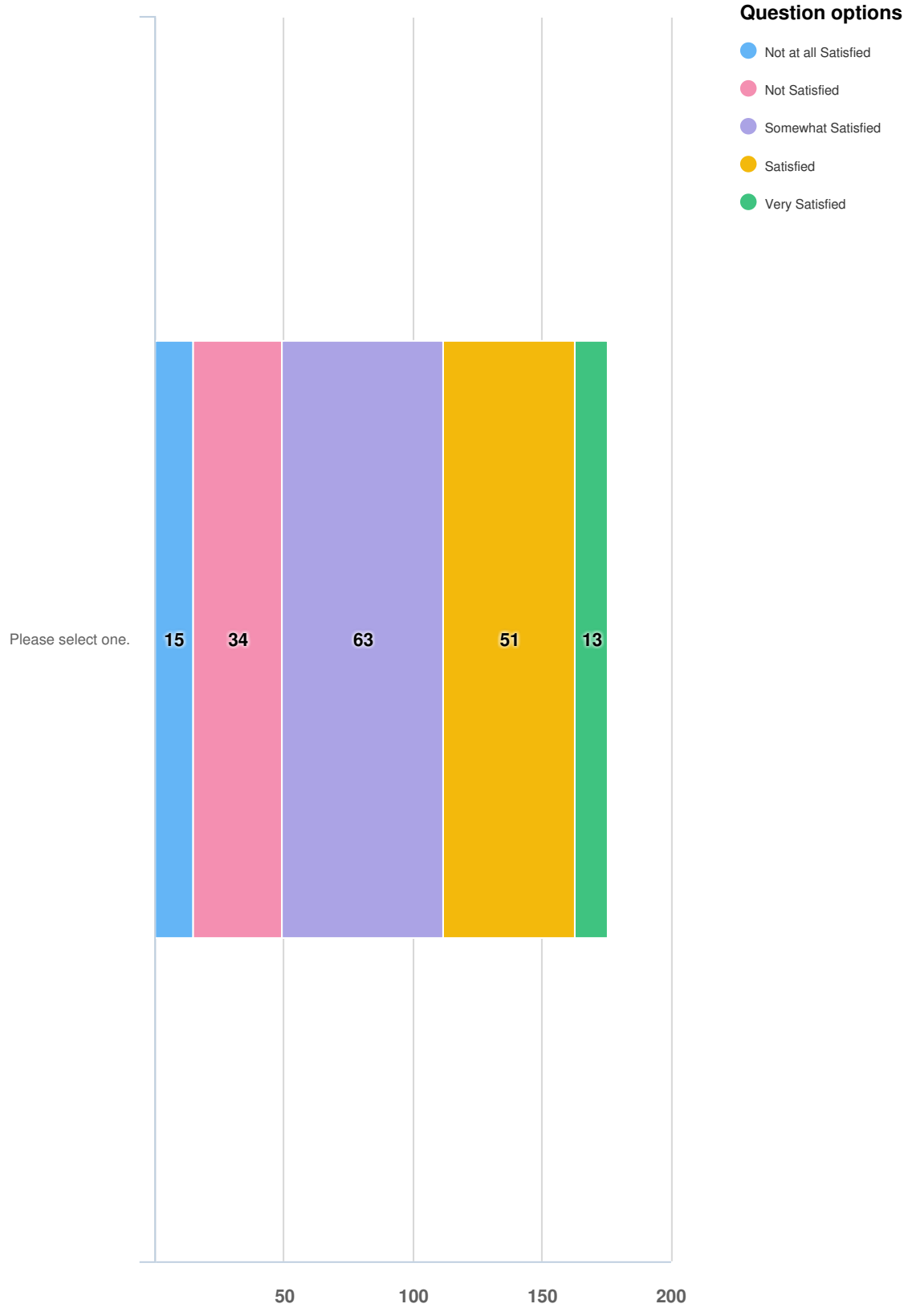
Optional question (153 responses, 46 skipped)

Q19 The City fines for Solid Waste Bylaw infractions. How effective do you think the City is at enforcing Solid Waste Bylaw Infractions?

Please select one.



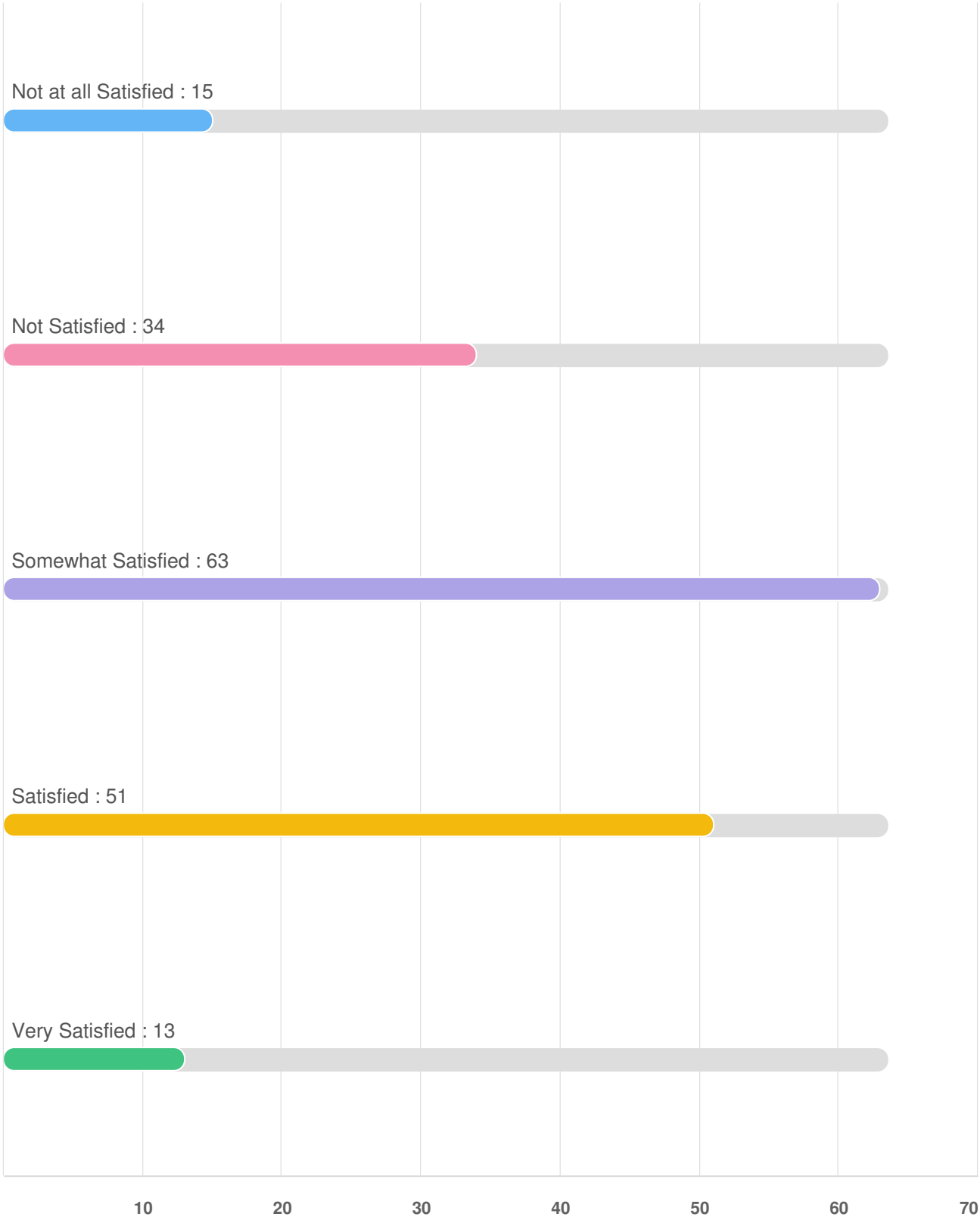
Q20 How satisfied are you with the educational material provided by the City relating to waste collection services?



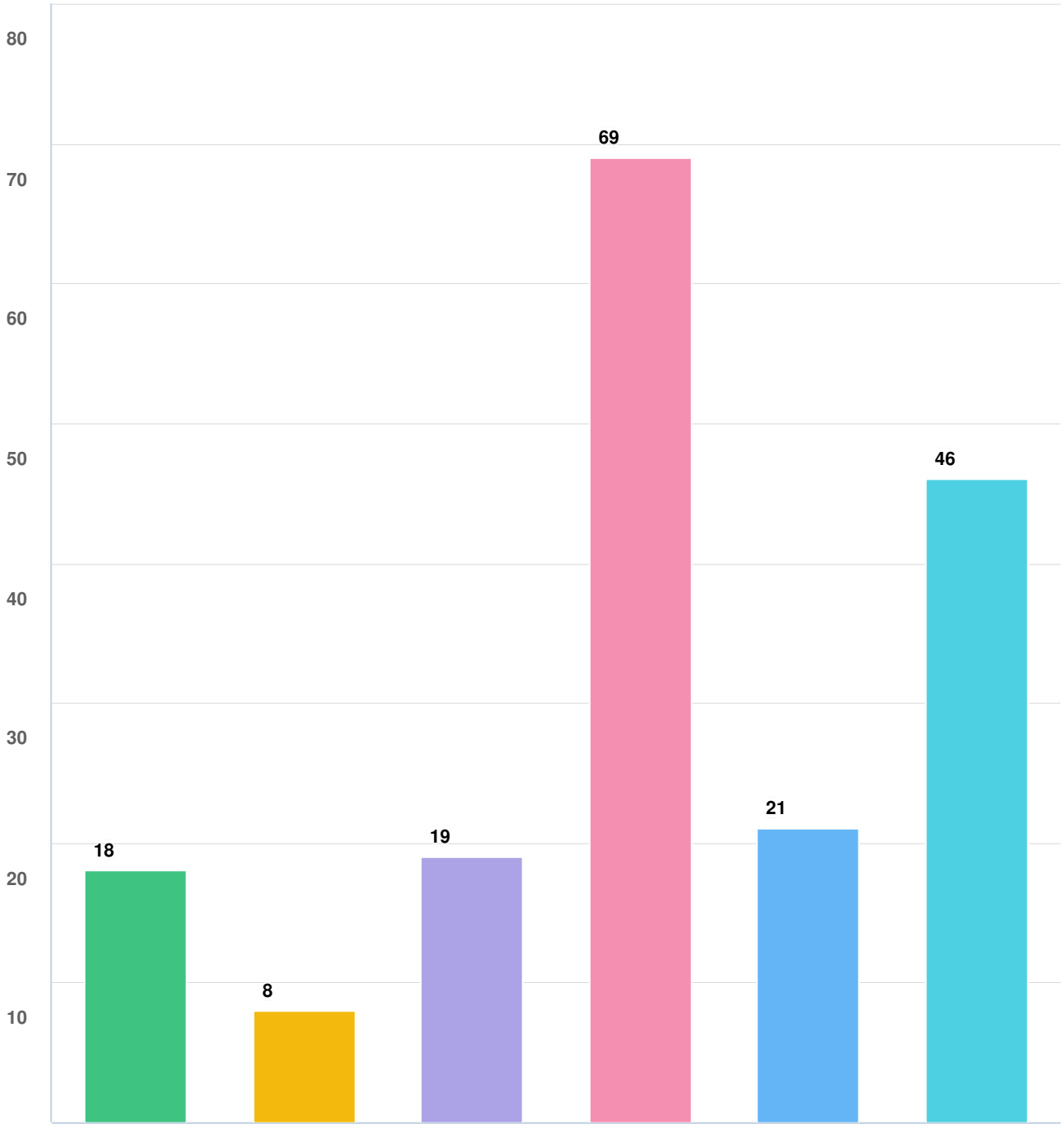
Optional question (176 responses, 23 skipped)

Q20 How satisfied are you with the educational material provided by the City relating to waste collection services?

Please select one.



Q21 **The City has a solid waste app that provides waste collection schedule reminders and a materials search tool for residents. Do you use the "My Schedule" or "Put Waste In Its Place" features in the app?**



Question options

- I Was Unaware of the "Put Waste In Its Place" Feature
- I Was Unaware of the "Get Reminder" Feature
- No, I don't use either feature
- Yes, I use the Both Features
- Yes, I use the "Put Waste In Its Place" Feature, Only
- Yes, I use the "Get Reminder" Feature, Only

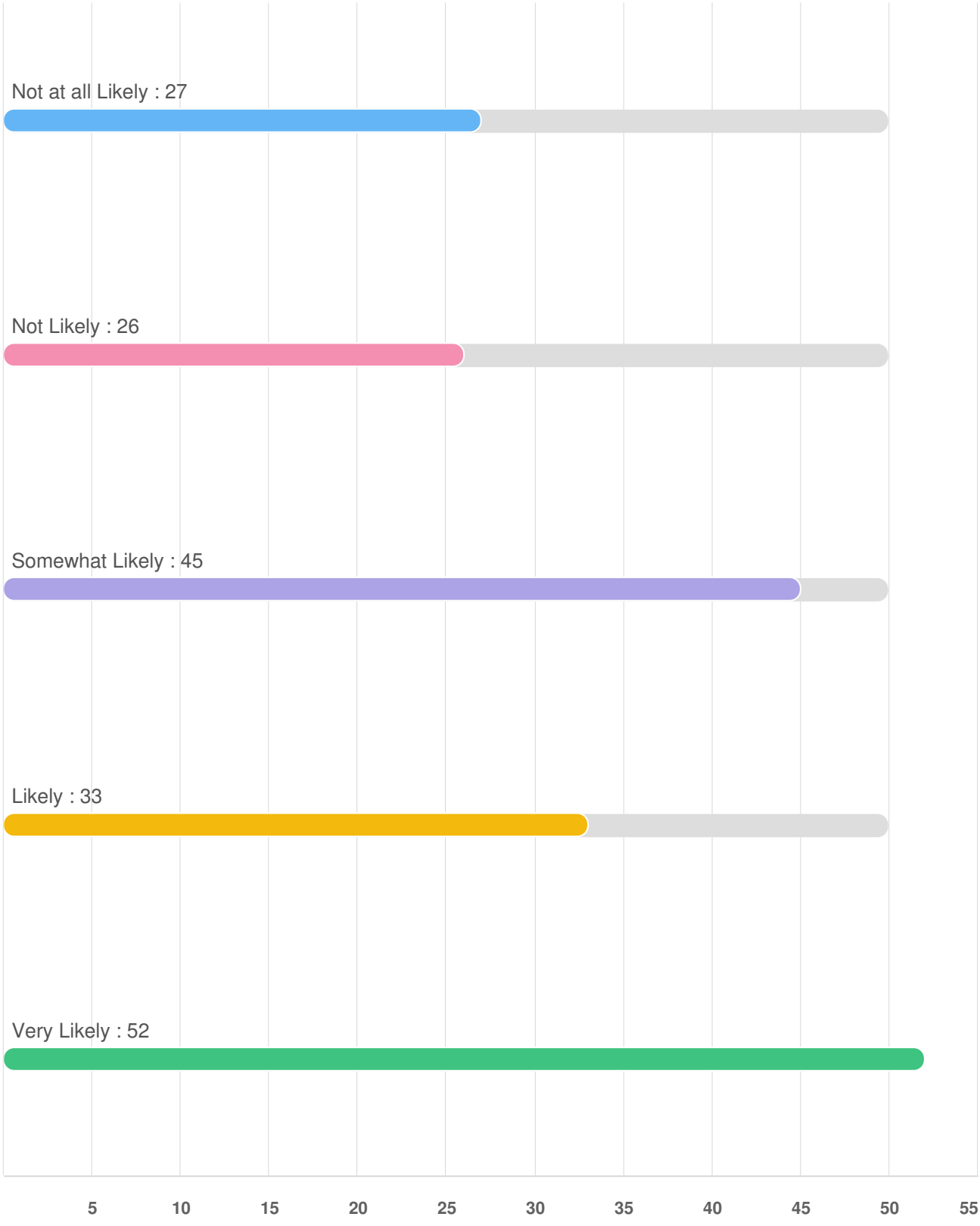
Optional question (181 responses, 18 skipped)

Q22 How likely are you to use the City's solid waste collection app in the future?

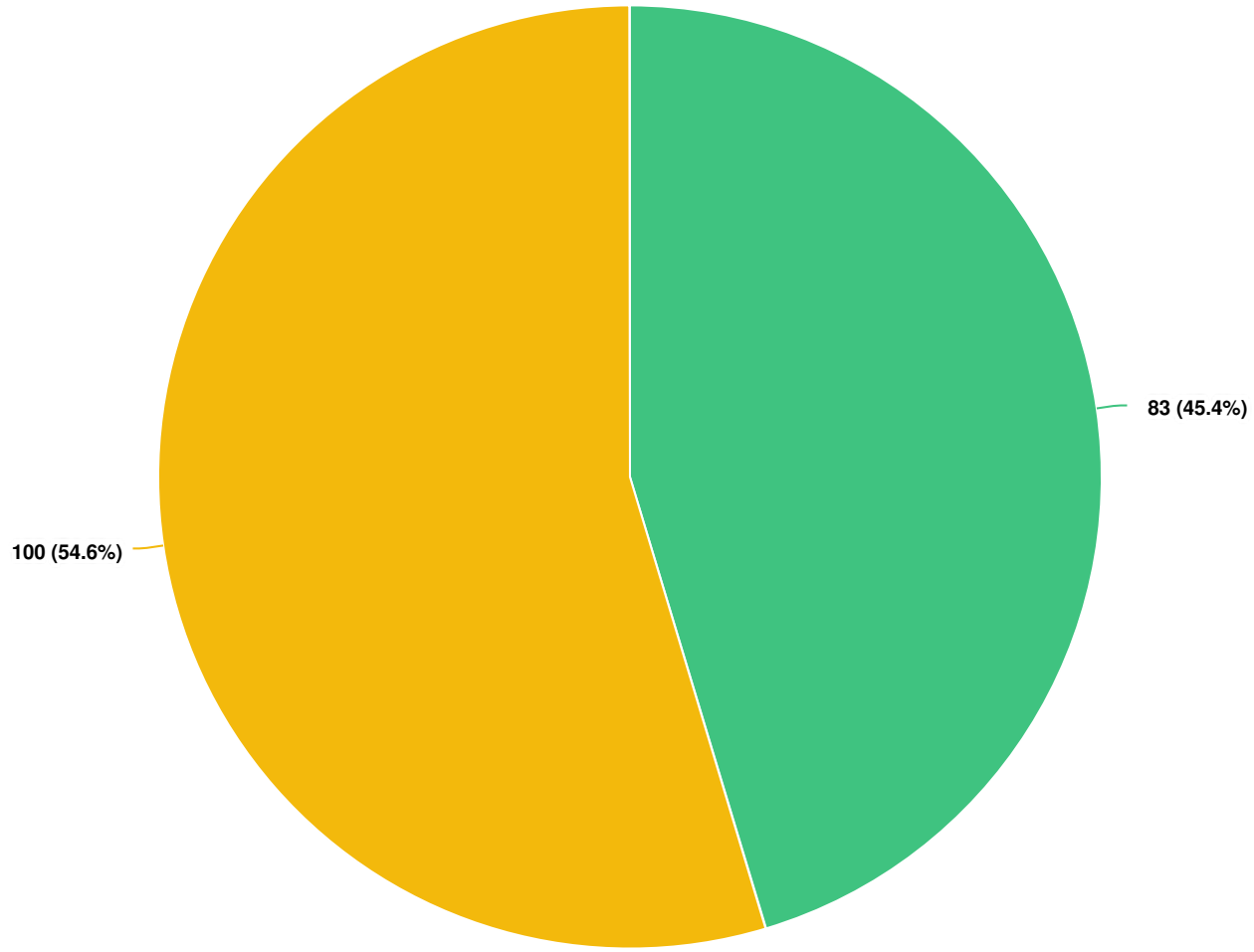
Optional question (183 responses, 16 skipped)

Q22 How likely are you to use the City's solid waste collection app in the future?

Please select one.



Q23 Have you visited the City's solid waste website?

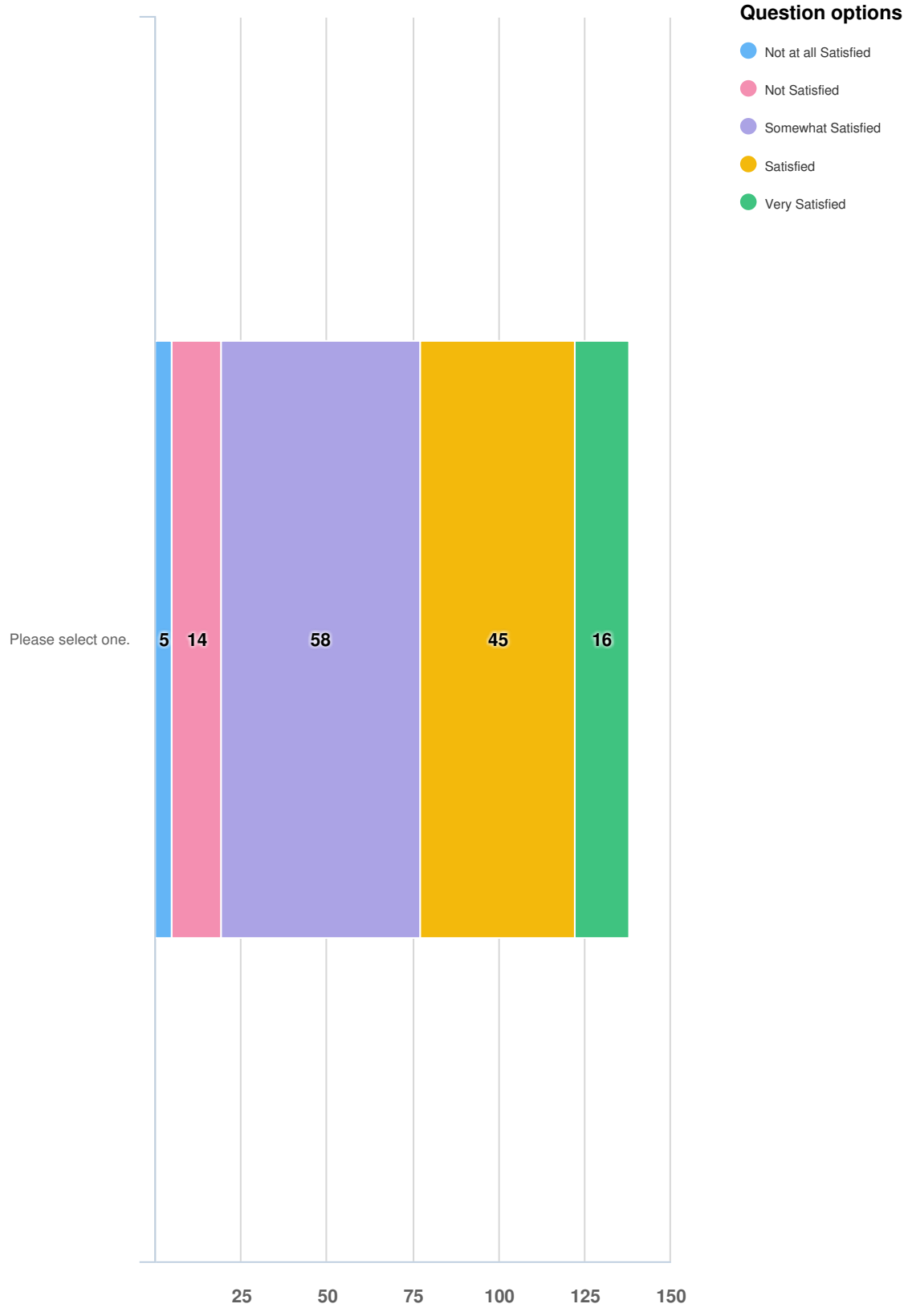


Question options

No Yes

Optional question (183 responses, 16 skipped)

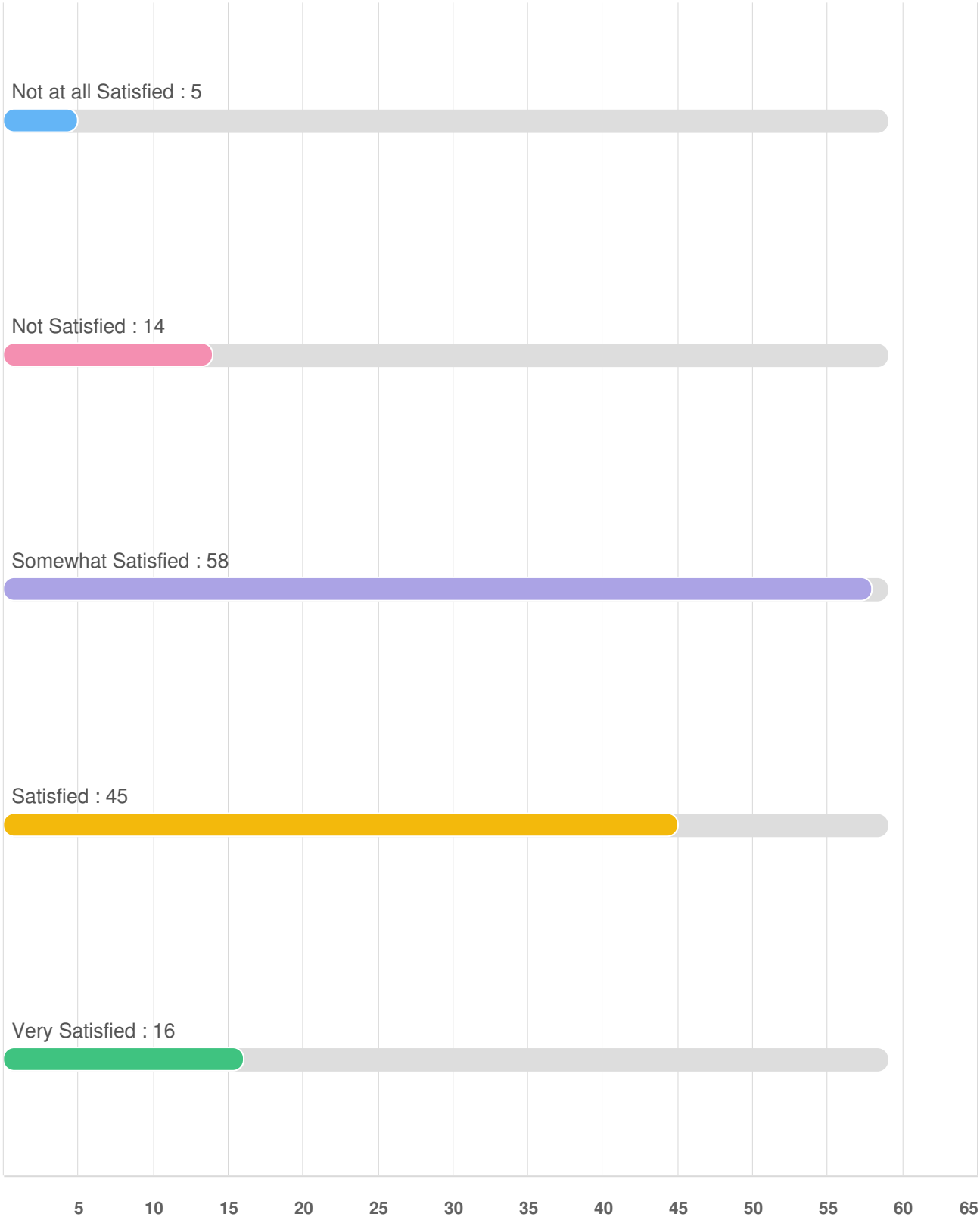
Q24 How satisfied are you with the Garbage, Recycling and Green Can Program section of the City's website?



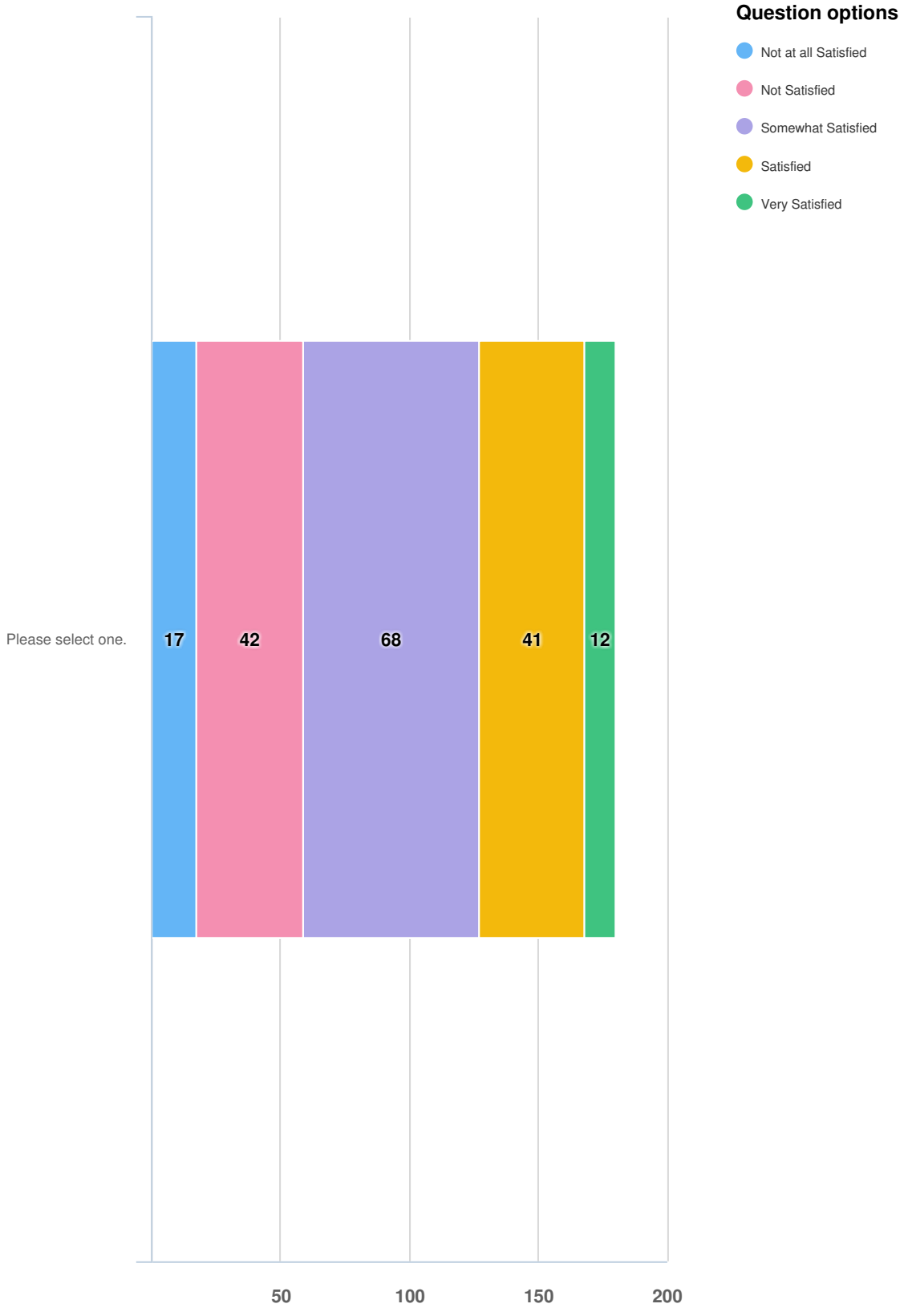
Optional question (138 responses, 61 skipped)

Q24 How satisfied are you with the Garbage, Recycling and Green Can Program section of the City's website?

Please select one.



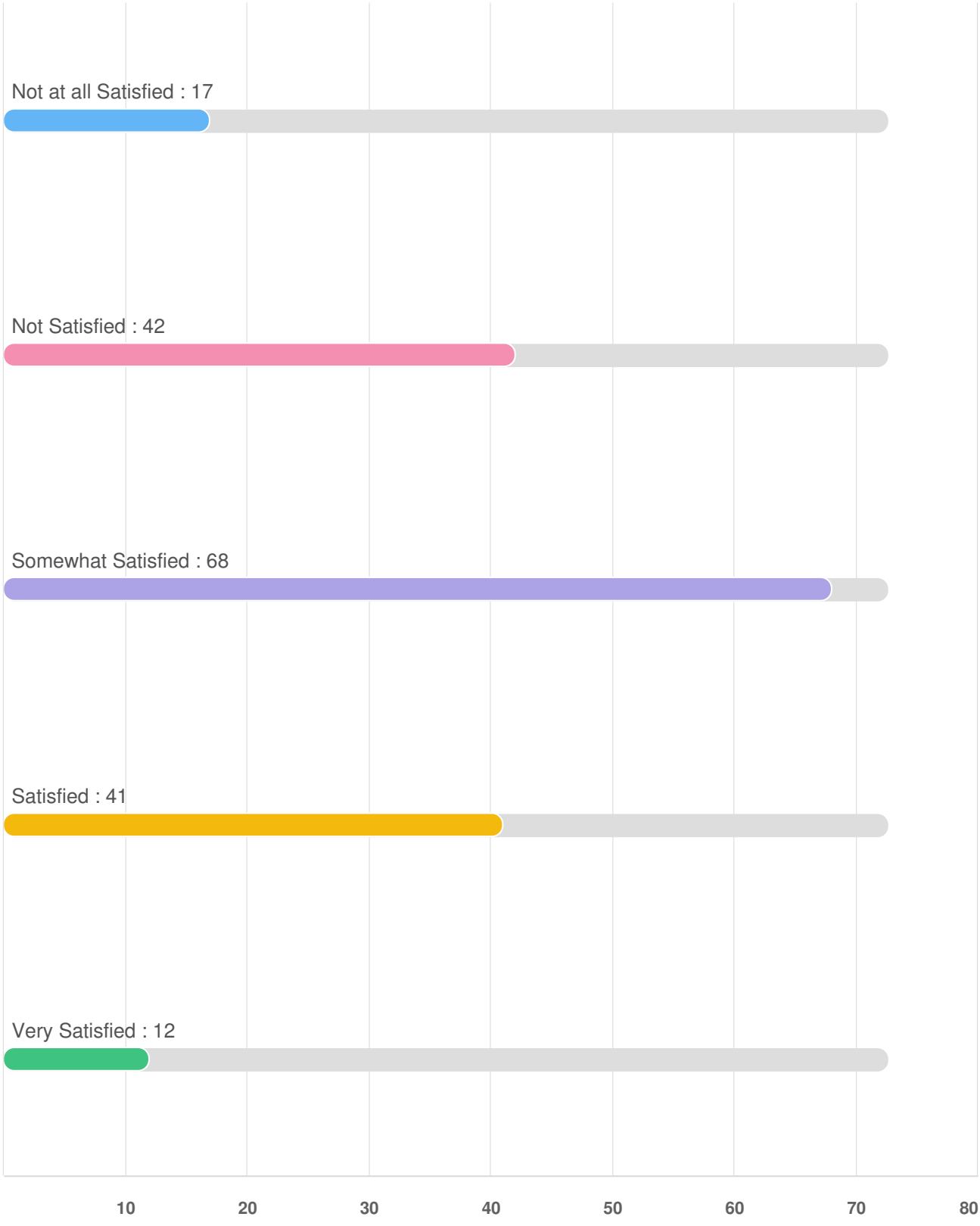
Q25 How satisfied are you with the availability of recycling and green waste bins in public spaces (i.e. On streets, in parks, at the pier)?



Optional question (180 responses, 19 skipped)

Q25 How satisfied are you with the availability of recycling and green waste bins in public spaces (i.e. On streets, in parks, at the pier)?

Please select one.



Q26 Are there any additional garbage, recycling and green waste services you would like to see in White Rock?

Anonymous 2/19/2020 06:34 PM	Styrofoam collection and soft plastic collection
Anonymous 2/19/2020 06:35 PM	Soft plastic and styrofoam collection
Anonymous 2/19/2020 09:48 PM	The decision of the previous council needs to be reversed when it comes to multi family residences. The frequency of garbage trucks is ridiculous.
Anonymous 2/20/2020 01:58 PM	We would like to see pickup done by one company not the many companies that do it now.
Anonymous 2/20/2020 02:26 PM	Green waste is hard to do because of the dirtiness of the nature. It is unclear what types of bags are allowed and not allowed.
Anonymous 2/20/2020 03:04 PM	I would like to see the City take back the collection(s). This is expensive for condo and the traffic with all the different trucks is dangerous.
Anonymous 2/20/2020 05:47 PM	Automated control arm trucks and with city issued cans like Vancouver Port Coquitlam, New Westminster, Burnaby, Anmore, and Port Moody all use. Also single stream recycling
Anonymous 2/20/2020 08:13 PM	There is an ever increasing number of items which are being accepted for recycling, although it seems more and more difficult to determine where to take everything. It would be ideal if there was one confident location for everything or more items accepted through curbside pick up such as styrofoam
Anonymous 2/20/2020 09:26 PM	More green waste and recycling bins along waterfront
Anonymous 2/20/2020 11:31 PM	Automated lift system and city provided carts
Anonymous 2/21/2020 03:23 PM	More green waste and recycling options in public spaces
Anonymous 2/21/2020 05:11 PM	YES! With most of us not having room to park a pickup truck in apartments and skinny lots, it would be really great to have a monthly or even quarterly "for fee" large item pickup. Perhaps anytime, drop off of certain items at the Keil yard or maybe Buena Vista space. It should be a break-even undertaking, but I just have to walk around the neighbourhood to see piled up old fencing, building materials, broken planters and furniture just piled up next to homes. It would really help with the look and feel of things, and also help with unsightly premises complaints if there was a mechanism in place from the city to help deal with those one-off large item pickups.
Anonymous	I would like the City to revert to picking up condo/townhouse garbage. There

2/21/2020 05:36 PM	are 4 different company trucks picking up garbage on my street three times per week, sometimes four times for the glass. The noise is horrendous and holds up traffic. Life was much quieter when it was only the City trucks on the road.
Anonymous 2/21/2020 09:21 PM	How to best deal with cardboard, plastic (of all kinds), and styrofoam. It seems the handling of these items is questionable in the current recycling program.
Anonymous 2/22/2020 09:43 AM	Depot for cardboard like there used to be at Kent
Anonymous 2/22/2020 06:02 PM	Would appreciate a pickup of large items once or twice a year similar to Surrey's service.
Anonymous 2/23/2020 01:30 PM	Yes, the main reason I'm filling out the survey is regarding there is No Large Item Pick-up. Recently I wanted to get rid of an old chesterfield. I had to pay a rubbish remover $200 to pick it up and take it to the dump. Langley picks up large household items 4 times a year. Surrey also picks up large items. Why should a White Rock resident not have the same service? I don't have a truck and I am a single senior. I have no way of getting rid of large items unless I pay a rubbish removal company. I am on a fixed income, and cannot afford this. I have asked at the City office re this and they couldn't tell me.
Anonymous 2/23/2020 02:25 PM	Would like to see specific bins for dog waste so the city could compost the waste rather than putting it in our landfills.
Anonymous 2/23/2020 06:31 PM	Yes
Anonymous 2/24/2020 10:32 AM	There should be recycle bins at the library. The garbage bins on the street by Totem Park and other beach areas don't have stickers showing where to put recycling, garbage and green waste. Glad there are dog dirt bags
Anonymous 2/24/2020 04:32 PM	Have a phone number on the container for cell users to report overflowing bins in summer particularly along promenade; Have coordinated schedule and less days for private haulers or get city to do apartments again. Have a phone number at the promenade washrooms for cell users to report floods/plugged toilets and lack of paper.
Anonymous 2/24/2020 05:06 PM	Allowing example: Three 20 unit strata's to share 1 space for service pick up. Discount price - less trucks on. Not if the same (truck) service company is used already by the strata's.
Anonymous 2/24/2020 05:12 PM	More education on compostable plastics. More enforcement of bylaws - inspector or by feedback on current practice of business and how they can do better. Solid waste collection app needs letter publishing - educational tool. *Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:26 PM	Recycling depot - plastic bags, glass, electronics, large plastic, styrofoam etc.
Anonymous 2/25/2020 10:09 AM	Would like to see more compost/recycle combination garbage in public areas
Anonymous	No, very adequate for single family

2/25/2020 10:14 AM	
Anonymous 2/25/2020 10:16 AM	Cans and bottles are not recycled at the beach
Anonymous 2/25/2020 10:29 AM	Could WR have its own composting system
Anonymous 2/25/2020 10:31 AM	Plastic bag recycling
Anonymous 2/25/2020 10:37 AM	More education. Compostable plastics. Enforcing of Bylaw.
Anonymous 2/25/2020 11:03 AM	Bins are often overflowing at beach. Inadequate signage regarding what to recycle or trash.
Anonymous 2/25/2020 11:22 AM	Education for smokers - non biodegradable and toxic affects fish birds etc. etc.
Anonymous 2/25/2020 11:25 AM	Education on Smoking! Poisonous!
Anonymous 2/25/2020 11:36 AM	Education for smokers - so many butts everywhere and filters are harmful to the fish etc. Perhaps a few tall stands for cigarette butt disposal.
Anonymous 2/25/2020 11:42 AM	More available recycling and green waste bins in public spaces. Same or similar to ones that are used near 16th and Johnston Rd.
Anonymous 2/25/2020 12:04 PM	Street compacting
Anonymous 2/25/2020 12:12 PM	Only get recycling.
Anonymous 2/25/2020 12:21 PM	Clothing recycling
Anonymous 2/25/2020 12:54 PM	No
Anonymous 2/25/2020 12:59 PM	We need more re-cycling/green receptacles in public areas.
Anonymous 2/25/2020 01:07 PM	Yes, get rid of multiple haulers and single source through city or have city contract with one hauler.
Anonymous 2/25/2020 01:15 PM	I need a well written list for where to put what - garbage, recycling, compost. It is confusing.
Anonymous 2/25/2020 01:17 PM	Soft plastic!

Anonymous 2/25/2020 01:22 PM	Ruth Johnson Park has virtually nothing south of.
Anonymous 2/25/2020 01:24 PM	We'd like to see City resume garbage collection using competitive bidding to get the best price. Concerned about cost of conversion. *Hard copy received.
Anonymous 2/25/2020 01:26 PM	I would like to see more garbage cans around the city as I walk a lot and pick-up coffee cups, cigarette packs, wrappers, bags etc. and never find a can to put it in so end up carrying it.
Anonymous 2/25/2020 01:35 PM	dangerous waste/styrofoam
Anonymous 2/25/2020 01:52 PM	Bring garbage and recycling collection back in house.
Anonymous 2/25/2020 01:54 PM	More garbage/recycling and green waste bins throughout White Rock.
Anonymous 2/25/2020 01:59 PM	Our strata has 4 blue bins, separates pop and plastic containers for resale and green. 1 glass, 1 metal cans, 1 paper, 1 plastic containers. Plastic for plastic containers.
Anonymous 2/25/2020 02:06 PM	No plastics, used clothing
Anonymous 2/25/2020 02:21 PM	I realize that we will need more education and more involvement within the individual stratas and apt. buildings
Anonymous 2/25/2020 03:32 PM	Recycling week where items are put out and people can come pick them up and what's left the city collects.
Anonymous 2/25/2020 03:36 PM	More bins and more frequent emptying in public spaces. Clear labeling of what goes where.
Anonymous 2/26/2020 01:22 PM	• Plastic Bags • Styrofoam • Packaging Foam There is a misconception that plastic bags are not recycled and ends up in the landfill. I have contacted the Recycling Council of BC and they confirmed that plastic bags are indeed recycled. Many residents, and particularly the elderly, find it difficult to determine whether something is included or not included in our recycling bins. As a result, many things just go to garbage. Every resident has to spend time, energy, and gasoline to drive to different locations to recycle. Is that good for the environment? We have to wash all plastic bags before London Drugs would take them. Is the large use of detergent to wash plastic bags good for the environment? Some one needs to look at the total picture.
Anonymous 2/26/2020 04:42 PM	We've never seen a public green waste bin yet! Go to one company pick up service for all and get us a reduction in cost!
Anonymous 2/28/2020 01:26 PM	By law enforcement to fine businesses for not cleaning up loose garbage, raw waste, cooking oil etc on their property, then the garbage flows onto city streets and flies around, not pretty. Also, why is there so much garbage not collected in parks and beach?

Anonymous 2/28/2020 06:06 PM	I would like to see a household collection option for plastic bags etc.
Anonymous 2/28/2020 07:10 PM	More garbage cans at every bus stop, including individual can break down for each type of waste.
Anonymous 2/28/2020 08:43 PM	Back to the way it was,city pickup
Anonymous 2/28/2020 09:44 PM	Large objects pick-up
Anonymous 2/29/2020 11:06 AM	Yes, in buildings like the mall.
Anonymous 2/29/2020 11:48 AM	Need more waste disposal/recycling bins in public places, streets etc !!! Also, it is time for disposal of cigarette butts and dog feces to be addressed. Our streets are being overtaken by cigarette butts in particular!!!!
Anonymous 2/29/2020 02:46 PM	No
Anonymous 2/29/2020 03:46 PM	Would like to see more green/recycle bins visible in the city.
Anonymous 2/29/2020 06:34 PM	schedule pick up for large household items, like Surrey
Anonymous 2/29/2020 08:37 PM	fee based removal of larger items
Anonymous 3/01/2020 11:51 AM	No
Anonymous 3/01/2020 04:00 PM	Pick up styrofoam, soft plastics curb side. Improve recycling and organic bin throughout the city. Provide dog waste bins for the public.
Anonymous 3/02/2020 09:45 AM	Dog waste disposal locations
Anonymous 3/02/2020 11:17 AM	Why should I look at the city waste services if my garbage is managed by private hauler. Garbage management and collection should be a city service.
Anonymous 3/02/2020 01:38 PM	City to go back to picking up garbage and recycling. Our provider seems ok but we have many collection services daily up and down alleyway and street.
Anonymous 3/02/2020 01:40 PM	City of White Rock, please
Anonymous 3/02/2020 01:53 PM	Yes to pickup our garbage, recycling and organics.
Anonymous 3/03/2020 10:13 AM	Provision of bins for new residents

Anonymous 3/03/2020 10:35 AM	All services back to the way it use to be for condo owners
Anonymous 3/03/2020 08:19 PM	More bins, especially green waste, and more explanation of what is acceptable in each bin.
Anonymous 3/04/2020 10:45 AM	As a new comer in White Rock, I'd like to know more information about disposal programs for large items. Some of the information i found online were out of date.
Anonymous 3/04/2020 11:39 AM	There can’t be to many !
Anonymous 3/05/2020 08:08 AM	I would like the city to treat condos as individual home owners We pay municipal taxes as well
Anonymous 3/05/2020 08:56 AM	More garbages on the street near business
Anonymous 3/06/2020 07:20 PM	I would like more information for the websites some of this is my responsibility to educate myself
Anonymous 3/06/2020 10:54 PM	possibly trucks and bins like surrey. efficient.
Anonymous 3/07/2020 12:12 AM	More additional garbage and recycling bins in parks and beach side. My wife walks from 16th to the pier and can only say she knows of 2 on her walks.
Anonymous 3/07/2020 09:03 AM	I would like pickup for plastic bags and especially Styrofoam. Currently I have to drive to the recycling depot to dispose of these. I do it, but the other tenants throw them in the garbage.

Optional question (85 responses, 114 skipped)

Q27 Please provide any additional feedback below.

Anonymous 2/19/2020 06:35 PM	Would like to see more multi family, and commercial units should be mandated to have green waste and recycling programs
Anonymous 2/19/2020 09:51 PM	Questions 13 and 18 are one and the same. Please explore a service agreement with the city of Surrey. Our taxes are way too high to be offering such a Cadillac service that looks trashy every week.
Anonymous 2/20/2020 11:11 AM	there are too many garbage trucks polluting the city. why can't we have just city service.
Anonymous 2/20/2020 11:40 AM	It would make sense to have only one waste contractor in the city, less noise, less traffic congestion, and probably less expensive. The previous administration did not consult the residents, just dumped it on us with hardly any notice. Due to the lack of property for waste disposal and equipment parking and servicing it would be best to contract the waste and composting. The highrise frenzy used up all the available property, and infastructure didn't keep up either.
Anonymous 2/20/2020 02:26 PM	I would love to know better where the recycling goes and how well it is recycled. Can the city ensure us that our efforts for a greener world and a greener White Rock are not in vain?
Anonymous 2/20/2020 05:41 PM	I would like to be able to take recycling to the Kent street yard.
Anonymous 2/20/2020 07:54 PM	Sick to death of private contractors roaring up our streets/ lanes every day if the week. Why can they All not have a designated day? And continue to be concerned re the crosswalk in the 1500 block Martin St. ...on garbage days, the apartments put their big bins out on roadside and I constantly see pensioners peering around them to see if it is safe to use the crosswalk. The bins block pedestrians view.
Anonymous 2/20/2020 09:37 PM	The design of this survey is strange. The initial question says do you live in Single-family household Multi-family household I don't live in the City but I own/operate a business Could it not have said:" do you live in an apartment, condo or multiplex or a single family unit". The first questions sets up the rest of the survey and I misunderstood it thereby filling out the survey twice. I do not think many people in my condo witll fill this out. Also a bit difficult to register ... had to fill in the postal code several times before it registered. Do you think that anyone believes that filling out this survey witll change the way that the garbage is collected? Can't get people here excited about the increasing condo insurance or increasing density or much else. Good luck with the garbage.
Anonymous 2/20/2020 10:14 PM	As a condominium owner and a taxpayer, I feel garbage collection is an essential service and since our taxes doubled last year it is really unfair that we have to pay private services and single-family dwellings don't. Extremely unfair and not good for people on a restricted income. How dare you do this to us??

Anonymous 2/20/2020 11:31 PM	Non separated recycling
Anonymous 2/21/2020 05:11 PM	1) Just a thanks to the crews, they do a good job for us. 2) Please keep costs from escalating if new programs are undertaken. Our taxes are ballooning already.
Anonymous 2/21/2020 05:36 PM	See above
Anonymous 2/21/2020 06:20 PM	it is sad as i have 2 green bins for food scrap and most people in white rock do not use them at all
Anonymous 2/22/2020 09:43 AM	Time to move on from boxes and bags
Anonymous 2/22/2020 12:49 PM	Green waste should be taken away from the city to a proper facility.
Anonymous 2/22/2020 06:02 PM	The service used for condo apartments has a major drawback. This is the many added vehicles on our streets daily. Often dificult and time consuming to pass these vehicles in the back lanes. Traffic congestion is a major problem and increasing apartment construction will intensify the problem. Too few narrow streets - one lane traffic . No or insuffient parking.
Anonymous 2/23/2020 12:56 PM	The private garbage pick up imposed on strata units has caused complete chaos on the streets.
Anonymous 2/23/2020 01:20 PM	Please revert to the city collecting garbage from businesses and multi-family dwellings. The number of garbage trucks from different collection companies in the city every day is ridiculous and very noisy!
Anonymous 2/23/2020 01:30 PM	I really would like an answer to my question. PLEASE answer my question on your website and/or in the Peace Arch News. I‘m sure there are others in White Rock with the same question. Thank you in advance.
Anonymous 2/23/2020 06:31 PM	Green waste at all parks
Anonymous 2/23/2020 09:57 PM	The questions above re the City's program didn't really apply as our complex is serviced by a private contractor....so I wasn't quite sure how to answer. We have a commercial component to our strata that generates a lot of waste. Although it's more expensive for our budget, we have had greater access to waste pick up with the private hauler. I just wish the City would arrange one contract for all of us not using the City's facilities. I understand with the new metro rules, it was not possible for the City to continue picking up the organics etc., but I think the way it was rolled out telling everyone to take a hike and deal with it yourselves was not appropriate. Past council not my favourite folk. I'm not on the strata council any longer so not sure how our council feels, but the above are my personal observations. Thanks.
Anonymous 2/24/2020 04:32 PM	Dog poop disposal information needs to be on waste site; diapers and adult depend disposal information needs to be on city site - care givers never sure and compost bin is not correct place in apartments or single family homes.

	Have the facts about benefits of sorting correctly. Give Metro Vancouver link on WR site also for more info & re-use, donate etc.
Anonymous 2/24/2020 04:59 PM	White Rock should never have stopped. I am aware it was the last council. The new Mayor should follow through with his promise from the election he won. *Hard copy received. Entered by City staff 2/24/2020.
Anonymous 2/24/2020 05:01 PM	*Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:06 PM	Great information. Good Feedback regarding questions. Over all very helpful. *Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:19 PM	I am a resident on Blackwood Street and the City's decision to offload waste and recycling has resulted in multiple vehicles daily picking up from the multi-family buildings. This creates pollution in the forms of noise and particularly exhaust gases. GHG's from diesel trucks are especially harmful to human health and the environment so I consider that our City should revert to waste and recycling being under the control of the city thus reducing atmospheric pollution. *Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:21 PM	*Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:26 PM	*Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/24/2020 05:27 PM	*Hard copy received. Entered by City Staff 02/24/2020
Anonymous 2/25/2020 10:09 AM	Better education as to what can go in curbside recycling (ie. soft plastics) and compost/organic bins. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:14 AM	Staff providing the service is very good and always accommodating. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:16 AM	No green waste pick up at the community centre. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:29 AM	The present garbage collectors are doing a great job *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:31 AM	don't use the app but check the website for collection schedule. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:33 AM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:37 AM	Would like to see more education of goals as a city - ie. goal of how much waste per person and an assessment of how they are doing. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 10:42 AM	Please keep up with recycling and making us aware of what's available. *Hard copy received. Entered by City staff 2/25/2020

Anonymous 2/25/2020 10:44 AM	City of WR wants to make a difference regarding climate change. Fewer trucks on the road would be a good place to start. Way too many private and city trucks on the road! *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:03 AM	Garbage and recycling collection in multi-family should be centralized by city on single. Too many trucks on roads crossing paths in multi-family buildings. It would be great to have clear signage for recycling/trash/green bins. More education. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:14 AM	Never know for sure when they are coming. Bin sits outside for days, other people dump their garbage in it. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:22 AM	Please can we W.R. garbage pick-up so we have one service instead of multitudes of smelly, noisy trucks running up and down and polluting the air. Can we be more careful of the environment. Paper pickers please! So much garbage on streets and down by beach. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:25 AM	Singular City pick-up. One service for us all. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:36 AM	I would like to see the City return to be the garbage/recycling collector for all residents in White Rock. We need fewer trucks and some standardization with clear instructions so that we would have less contamination. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:42 AM	*hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 11:45 AM	My condo pays over $800.00 monthly. Surely it would be less if the City collects. Multiple trucks driving up and down the streets and lanes is very annoying. Thanks for the open house - the City didn't consult last time, just told us it was a done deal - go get a contractor! :(We would love to have the City collect or contract. Less trucks. Less noise. Less expensive. *hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:04 PM	*hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:10 PM	It doesn't reflect well to see a parade of different garbage trucks all over our small city. I have been to the City waste management location and spoke to staff and she was very informed and helpful. Public workshops on food waste education. Sources Food Hub is providing some. Might be good to contact for more info www.sourcesfoodhub.ca Thanks for the opportunity to give feed back. *Hard copy received. Enteredby City staff 2/25/2020
Anonymous 2/25/2020 12:12 PM	See white sheet. There is considerable differences between condos and townhomes. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:21 PM	Not enough information to make informed decision. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:22 PM	*Hard copy received. Entered by City staff 2/25/2020

Anonymous 2/25/2020 12:25 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:27 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:54 PM	Cost for collection services is less through our strata fees than we were paying through our property taxes. Organic collection was a hit and miss when City was providing collection service. Private contractor (maple leaf)ha s been flawless. We are currently on a 5 year contract with maple leaf. NoStr ikes! Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:57 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 12:59 PM	question 1,2,3 are n/a for me. I would like the City of White Rock to select the top 2 or 3 garbage/recycling companies and employ them. This would cut down on the noise disturbance in our alleyways. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:03 PM	I would like the city to eliminate the number of companies running up and down my street. Our strata has revolution and we are very happy with them. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:04 PM	The noise and pollution from all the different company trucks in our alleyways is very disturbing. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:07 PM	We have too many hauling companies in a single day and week up and down our alleyway. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:09 PM	City needs to take back multi family garbage pick up to reduce the number of trucks on road and have uniform rules - Mayor's election promise!! *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:12 PM	Waste connections invoices for a 12 unit strata have gone from $288 in October 2018 to $569 in Jan 2020. - help! *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:15 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:17 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:19 PM	More recycling bins in public places and at events. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:22 PM	Too many other companies invading our alley on too many days. Initially for multiples the city should have used a good negotiator to get an outstanding deal for all condos = the buying power of concentration. Perhaps that could be done now. *Hard copy received. Entered by City staff 2/25/2020
Anonymous	*Hard copy received. Entered by City staff 2/25/2020

2/25/2020 01:24 PM	
Anonymous 2/25/2020 01:26 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:28 PM	I hope not too much garbage gets infected in a way that makes it not recyclable. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:30 PM	I want the City to take back all solid waste recycling. We have no recourse for bad service, missed pickups, fee increases. Very poor attitude once that contract is signed. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:33 PM	Don't use the app because multi-family. Anything the city can do to reduce the use of plastic would be welcome. If the city could contract with one private hauler so that multi-family buildings could get the most favourable contract, many complaints would go away. Fast escalating prices charged to m-f dwellings and the noise resulting from so many different haulers operating through the week. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:35 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:52 PM	It makes no economic or ecological sense to have 3 or 4 trucks a day going up and down the laneways. Think of the pollution and think of the wear and tear on the roads. In addition, these companies do not check to make sure garbage and recycling is being properly sorted. In fact, a couple of residents have told me that they have seen their providers dump all the garbage and recycling compost together. I've not seen this myself, but this would surprise me because when you have companies more interested in profit, it's rather to be expected. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:54 PM	Strata should not be penalized by being a strata and having to pay for privatized garbage. The city should collect for strata as they currently do for single family. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 01:59 PM	No cost info. Dog poop often in garbage containers.
Anonymous 2/25/2020 02:06 PM	Just want White Rock to do the collecting on a specific collection schedule. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 02:07 PM	*Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 02:21 PM	should be one unified carrier for all of White Rock *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:32 PM	I currently pay about $600.00 per year for waste disposal (small 9 unit strata), and it keeps going up due to GVRD changes with waste. We need to do something about garbage from restaurants ie. styrofoam and single use containers thrown into city garbage cans and everyone pays to dispose of it. Having one contractor/municipal company dealing with the waste should be more cost effective then having multiple trucks/companies driving through the

	city daily and definitely more environmentally friendly. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:34 PM	Resume municipal collection for multi-family residences. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:36 PM	A single collector would be very beneficial in 1400 Blk George Street, where 3 multi-unit dwellings (including two large condos) will use a single narrow laneway for garbage/recycling pick-up. A planned, coordinated approach will be essential. We need an active PR program promoting recycling and publicizing the penalties for improper waste separation. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:40 PM	How is it the City picks up for single family dwellings while those of us residing in strata have to pay very high privatized rates? We are a small 9 unit townhouse complex not in any way far or equitable. The City should collect throughout or SFD's should also be charged for privatized services. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:41 PM	I live in a townhome complex (9 units) and receive recycling services only from the city. My neighbors on both sides live in the same style of homes and the city picks up all their waste. We need all of these collections done by the city - we have a literal garbage dump in the middle of our complex! *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:42 PM	Thank you for organizing today's open house. The very frequent truck trafficin our alley is very disturbing (noise and pollution) and I hope that we will goback to city collection. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:44 PM	I think the City's decision to cease collection for multi-family waste was wrong and ill conceived. Preferably we would be very happy if the unionized city workers took back the service to multi-family. A one provider system. They provide the best service of all. All complaints are handled through Operations. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:46 PM	The City should have never gone to private collection for multi-family buildings. This caused obnoxious noise pollution and traffic congestion. *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:48 PM	-cost implication - reality of moving bins to roadside which is uphill - cost of hiring someone to take bins to roadside - more information required to make informed decision ie. cost, operational plan *Hard copy received. Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:51 PM	13 garbage trucks drive and operate down our alley 6 days a week. Our apartment overlooks the alley. The noise is frequent and intrusive. Up and down the streets of White Rock, large dumpsters block visibility for pedestrians and drivers, causing dangerous situations 6 days a week. In summer, the terrible smell from the garbage receptacles and trucks makes walking White Rock streets very unpleasant. This occurs 6 days a week. Is this the kind of City we want? If the City hired one company to collect garbage, organics, and recyclables by areas, this would mean garbage receptacles would be put out on only 1 day a week in each area, a huge improvement. *Hard copy received.

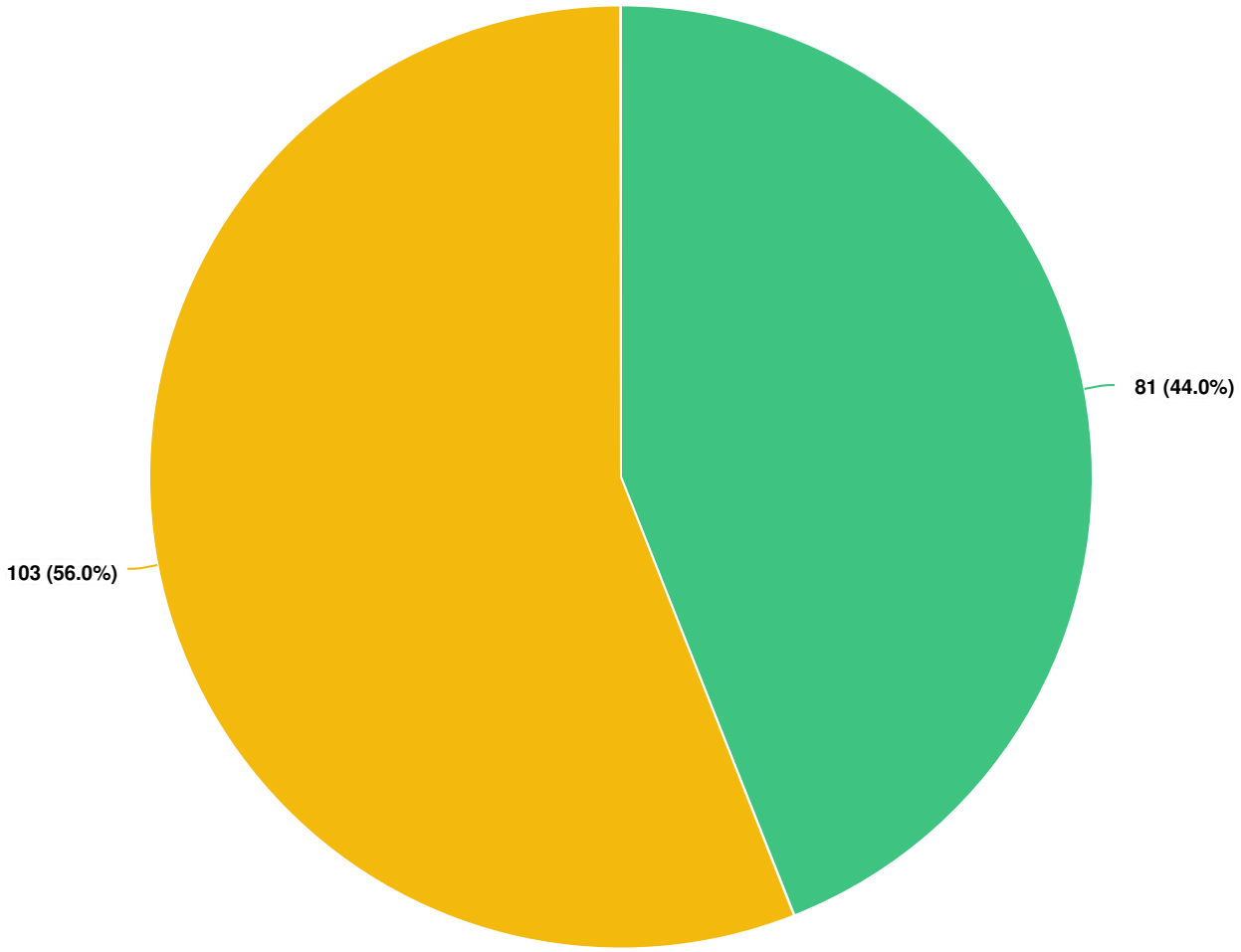
	Entered by City staff 2/25/2020
Anonymous 2/25/2020 03:55 PM	Recycle trucks in our lane (Prospect/Roper/Johnston): Mondays Smithrite - 7am & green bin (2) Revolution - 8:49 Waste connection - 9:03 Waste Connection again GFL - 12:30 Maple Leaf - 4:09 AJM - 10:45 Tuesdays Waste connection - 9:10 AJM Disposable - 10:40 another (5) Ridiculous noise and pollution Green bin and large garbage can *Hard copy r eceived. Entered by City staff 2/25/2020
Anonymous 2/26/2020 12:58 AM	I would like for the city to take back/refund stratas for blue bins reqd for previous service but now take up valuable space in u/g parking.
Anonymous 2/26/2020 01:22 PM	LOCAL MODEL FOR CONSIDERATION: The City of Richmond has a very comprehensive recycling program. While it does not take all materials for recycling, it covers quite a large percentage, including plastic bags. It is resident friendly, has excellent hours of operation (including weekends), has very knowledgeable and helpful staff, and is fairly easy to understand. Here is a link to their program. https://www.richmond.ca/services/recycling/recyclingdepot.htm COMMERCIAL ESTABLISHMENTS: While there are no MacDonald's or Tim Horton's in White Rock, it would make sense if the City of White Rock has a bylaw that requires businesses to recycle. It is always painful to see the plastics and papers thrown into the garbage bins at MacDonald's, etc. WEBSITE: I have visited the City's Garbage and Recycling Website. I don't know which section is the "Solid Waste Website" you refer to in Question 19 below. You should label your sections in the website consistently.
Anonymous 2/26/2020 04:42 PM	#1 question seems misleading - Yes we like our service provider, but no we weren't satisfied with being forced to find our own service provider. Ours is very accommodating and best prices of those we called but still much costlier than the City proved (and still provides for private residents). #4,5,6 questions - why would we use City "Apps" when we don't have WR City recycle service available to us? *Hard copy received. Entered by City staff 2/26/2020.
Anonymous 2/28/2020 01:16 PM	See query above on bagging or not for general trash.
Anonymous 2/28/2020 07:10 PM	Thanks for reaching out!
Anonymous 2/29/2020 11:48 AM	Cigarette butt disposal recepticals are needed !
Anonymous 3/01/2020 11:51 AM	Don't know why garbage pick-up at businesses particularly are not coordinated and restricted to certain days and times of the week.
Anonymous 3/02/2020 11:17 AM	current system with private hauler is most inefficient and expensive. The first year the cost was somewhat competitive, but now they are all charging the same (competition ???) and cost increases are happening all the time. It is also wrong to have different service from the city depending if you are living in a house, a small multi building or a larger multi building. The city should remember that the tax revenue by area of land is a lot bigger in Condos then

	house, but house received a better service.
Anonymous 3/02/2020 01:38 PM	If you want to become responsible for cleaner air - go to a one system. *Hard Copy received. Entered by City Staff 3/2/2020.
Anonymous 3/02/2020 01:40 PM	Weekly 18-20 trucks in our lane, City does not pick up in this area please change this for us! The air pollution - The noise pollution! Hard Copy received . Entered byCity Staff 3/2/2020.
Anonymous 3/02/2020 01:53 PM	We need one company for all the condos not 6 different companies that equals 18 trucks a week up and down alley. Would use the app if City collected. Again, we need the City to go back to picking up. We should rename White Rock to Garbage Truck City. *Hard Copy received. Entered by City Staff3/2/2020.
Anonymous 3/02/2020 03:40 PM	I live in a condo ln Merklin St and on any given day (Mon-Fri) there are at least 3 garbage trucks go up our lane. One (City) would be preferable.
Anonymous 3/02/2020 03:52 PM	Some questions need another option, such as "Don't know" for question 10. One should also be able to cancel a choice, not just change it.
Anonymous 3/02/2020 04:50 PM	Want our waste collection discontinued by private haulers. Continuous large truck traffic in the lane way caused by a variety contractors providing service to apartments, scheduled for different days. A nightmare. The previous council instigated this with no public feedback and no concern for the chaos and unbelievable noise created.
Anonymous 3/03/2020 10:35 AM	We are paying tax, yet have been abandoned by city garbage disposal
Anonymous 3/04/2020 08:04 AM	The standings larger bins will accommodate the larger families who currently have to pay extra every week just to set an appropriate amount for the size. This will also help with homes with rental suite as well
Anonymous 3/04/2020 11:39 AM	Right now there are to many trucks on the road. I see the same trucks go up & down the street many times a day all week long.
Anonymous 3/05/2020 08:08 AM	There are far too many trucks in the road for garbage, organics and recycling - on top of construction vehicles If the city would do all the pickups, it would eliminate many of these trucks
Anonymous 3/06/2020 10:18 PM	My neighbourhood is overrun with rats and raccoons, not to mention crows and seagulls. They are specifically attracted to the green waste dumped in the corner of the works yard on Keil St. Please find a permanent solution because the permit for doing this was only supposed to be temporary. It's been years now with no end in sight.
Anonymous 3/07/2020 12:53 AM	Our condo bought a new garbage bin after receiving a letter from City (Paul) saying that our bin was rusting and had a crack at bottom. We paid $1200.00 for a new bin. Three months later, the city quit services. We had to use the bin provided by the new company. Finally were able to sell our bin for $500.00 When i complained to Paul his answer was - that the city did not know these changes were coming. This was proven to be false. We were not at all happy with how the City quit collection services.

Anonymous 3/08/2020 03:25 PM	Please don't change to a standardized bin

Optional question (108 responses, 91 skipped)

Q28 Have you visited the City's solid waste website?



Question options

No Yes

Optional question (184 responses, 15 skipped)

Appendix F

Open House Presentation Boards

WELCOME TO THE SOLID WASTE OPEN HOUSE!

BACKGROUND

In mid-2015, the City of White Rock made changes to its delivery of solid waste services. The changes included the privatization of multi-family and commercial solid waste pickup, as well as a transition from cost recovery through property taxes to a user-fee model for single-family homes. Since the transition, public feedback suggested a desire to return to City collection.

WHITE ROCK CITY COUNCIL

STRATEGIC PRIORITIES

SOLID WASTE REVIEW

White Rock City Council has directed a review of the decision to privatize multi-family and commercial waste pickup after receiving feedback from the community during the strategic priority consultation process. Dillon Consulting was retained to review waste collection services in the City and to get community input on the options that include City collection, or City-managed collection, for multi-family and commercial waste.

WE WANT TO HEAR FROM YOU!

The City is seeking your input to determine whether or not multi-family and commercial waste collection should be provided (or managed) by the City. Your feedback will help the City understand the preferences of residents and business owners regarding solid waste management. This open house is one step in a series of communication pieces aimed at sharing information and gathering community input.

For more information about solid waste and recycling in White Rock, visit www.whiterockcity/waste.

WHITE ROCK
City by the Sea!

DILLON
CONSULTING

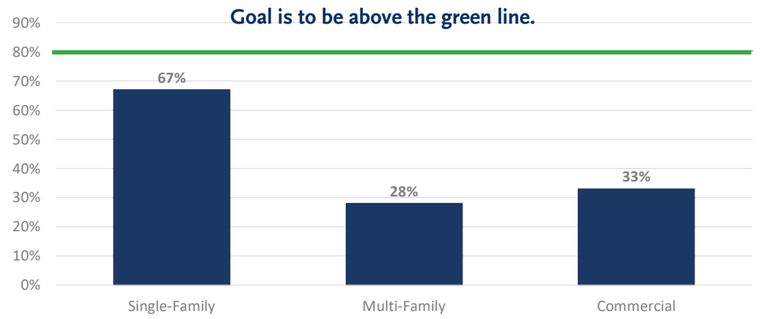
SOLID WASTE REQUIREMENTS

REQUIREMENT	WHERE WE ARE AT? Results obtained from City of White Rock Waste Audit	ADDITIONAL INFORMATION

METRO VANCOUVER

80% Waste Diversion by 2020

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION



- Garbage is inspected for high percentages of banned materials.
- Loads that arrive at the disposal sites containing more than 5% (by volume) of banned materials are assessed a **50% surcharge.**
- These charges are passed back to the City (and residents).

BC PROVINCIAL GOVERNMENT

350 kg/person/year of waste disposal by 2020/2021

BRITISH COLUMBIA

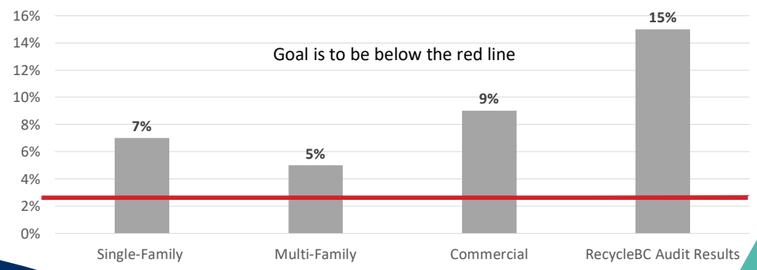
GOAL	WHITE ROCK ACTUAL
350 KG / PERSON / YEAR DISPOSED	477 KG / PERSON / YEAR DISPOSED

- City of White Rock needs to use Metro Vancouver Waste Facilities (part of the Integrated Solid Waste Management Plan).
- Capacity for waste disposal dictated by Metro Vancouver and there is a capacity constraint.
- Tipping fees are dictated based on volume.
- **Less waste disposed per person = less $ paid for disposal overall.**
- Tipping fees increase in January 2020 directly passed to users.

RECYCLEBC (SINGLE-FAMILY HOMES)

3% or less contamination rate threshold for recycling contamination.

RECYCLEBC™



- Recycling is regularly audited by RecycleBC and a report card is provided to municipalities.
- If there are ongoing issues with reaching recycling contamination thresholds, then a municipality can be fined based on the number of contaminated loads and overall tonnage.
- **Fines start at $5,000 and can be up to $250,000**.

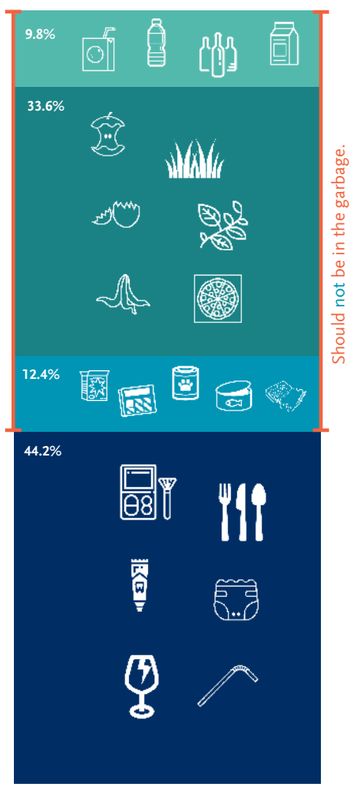
WHITE ROCK City by the Sea!

DILLON CONSULTING

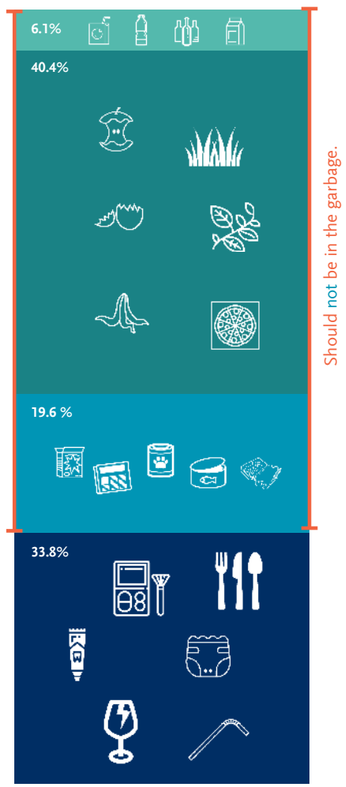
WHAT IS IN YOUR GARBAGE?

Dillon Consulting completed a waste composition study for the City.
The pictures below show what we are still putting into our garbage cans.

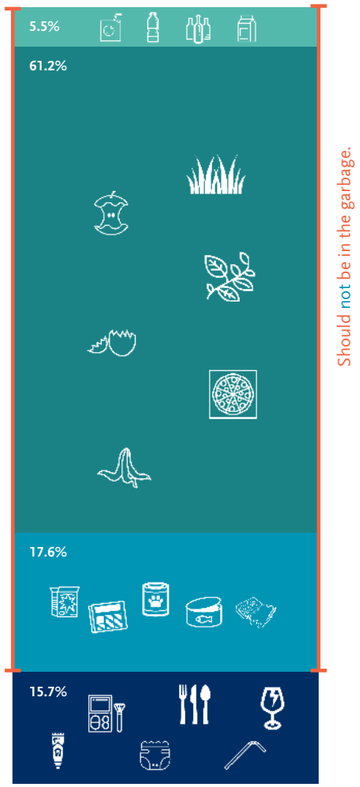
GARBAGE | RECYCLING | COMPOST | DEPOT RECYCLING



SINGLE-FAMILY GARBAGE



MULTI-FAMILY GARBAGE



COMMERCIAL GARBAGE

DEPOT RECYCLING

- Includes materials that can be brought to a recycling depot for recycling.
- IE: plastic bags, batteries, electronics, beverage containers, Styrofoam, paint and other hazardous wastes.

KEY TAKEAWAYS:

- All materials that are not “garbage” should be disposed of in another waste stream.
- We can do a lot better when it comes to recycling and composting; and
- The bulk of material we throw in the garbage is compost (food waste and food soiled paper).

RISKS:

- Loads with too much divertible materials (should not be sent to landfill) are subject to fines from Metro Vancouver.
- Increased tipping fees from waste facilities.
- Increased costs for residents when divertible materials are in the garbage stream.

WHITE ROCK City by the Sea!

DILLON CONSULTING

WASTE COLLECTION OPTIONS

SINGLE-FAMILY HOMES

MULTI-FAMILY BUILDINGS

COMMERCIAL BUILDINGS

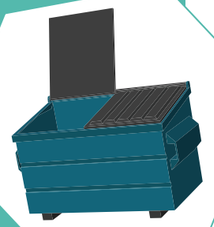
CURRENT PRACTICE

MANUAL WASTE COLLECTION

- Garbage, recycling and organics collected
- Driver required
- Manual labour to collect materials
- Allows for multi-stream waste collection and no carts

PRIVATE HAULER COLLECTION

- Garbage, recycling and organics collected by multiple haulers
- Mix of toters and garbage bins based on space requirements
- Multiple contractors/trucks on the road



PRIVATE HAULER COLLECTION

- Garbage, recycling and organics collected by multiple haulers
- Mix of toters and garbage bins based on space requirements
- Multiple contractors/trucks on the road

ALTERNATIVE PRACTICES

FULLY-AUTOMATED WASTE COLLECTION

- Garbage, recycling and organics collected, requires purchase of standardized toters
- Driver required
- Automated “arm” collects waste carts
- Single-stream recycling (typically higher contamination)

CITY COLLECTION (OR A PRIVATE HAULER CONTRACT MANAGED BY THE CITY)

- Garbage, recycling and organics collected by one hauler or City
- Typically all toters (to use the same truck) depending on space availability
- Fewer trucks on the road

CITY COLLECTION (OR A PRIVATE HAULER CONTRACT MANAGED BY THE CITY)

- Garbage, recycling and organics collected by one hauler or City
- Typically all toters (to use the same truck) depending on space availability
- Cannot always collect from large generators
- Fewer trucks on the road

SEMI-AUTOMATED COLLECTION

- Garbage and organics collected semi-automatically, requires purchase of standardized toters
- Driver and labourer collects waste carts for garbage and organics
- Recycling collected manually (multi-stream - typically less contamination)

MIXED CITY/PRIVATE HAULER COLLECTION

- Garbage collected by private hauler (can be multiple or one)
- Recycling and organics collected by City
- Mix of toters and garbage bins depending on space availability
- Likely fewer trucks on the road

MIXED CITY/PRIVATE HAULER COLLECTION

- Garbage collected by private hauler (can be multiple or one)
- Recycling and organics collected by City
- Mix of toters and garbage bins depending on space availability
- Likely fewer trucks on the road

WHITE ROCK City by the Sea!

DILLON CONSULTING

HOW DOES WHITE ROCK COMPARE TO OTHER MUNICIPALITIES?

	WHITE ROCK City by the Sea!	CITY OF SURREY the future lives here.	PORT COQUITLAM	PORT MOODY City of the Arts	city of north vancouver	Langley City THE PLACE TO BE
Population (2016)	19,952	517,887	58,612	33,551	52,898	25,888
Population Density (2016) (persons/km²)	1,751	1.637	2,009	1,296	4,465	2,534
Distance to Transfer Station	26 km	13 km	9 km	6 km	9 km	11 km

Does the City Collect this Waste?

■ = YES

Sector	White Rock			Surrey			Port Coquitlam			Port Moody			North Vancouver			Langley City		
	Garbage	Recycling	Organics	Garbage	Recycling	Organics	Garbage	Recycling	Organics	Garbage	Recycling	Organics	Garbage	Recycling	Organics	Garbage	Recycling	Organics
Single-Family	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Multi-Family					■	■		■	■	■	■	■						
Commercial								■	■	■	■	■						

Does the City have a Waste Contract or Municipal Collection?

	White Rock	Surrey	Port Coquitlam	Port Moody	North Vancouver	Langley City
Single-Family	Municipal - Manual Collection	Contract - Automated Collection	Municipal - Automated Collection	Municipal - Automated Collection	Municipal - Manual Collection	Contractor - Manual Collection
Multi-Family	Does not Collect	Contract - Recycling and Compost	Municipal (must apply) - Recycling and Compost	Municipal - Recycling and Compost. Garbage by application	Does not Collect	Does not Collect
Commercial	Does not Collect	Does not Collect	Municipal (must apply) - Recycling and Compost	Municipal - Recycling and Compost. Garbage by application	Does not Collect	Does not Collect

Annual Collection Fees

	White Rock	Surrey	Port Coquitlam	Port Moody	North Vancouver	Langley City
Single-Family	$333/year	$290/year	$216/year	$592/year	$253/year	$198/year
Multi-Family	*	$40/unit	$15/unit	$197/year	*	*
Commercial	*	*	$184/cart set	$546/year	*	*

* dependant upon waste hauler contracts.

WHITE ROCK City by the Sea!

DILLON CONSULTING

NEXT STEPS

We want to hear what you think about single-family, multi-family and commercial waste pickup in White Rock.
Please complete the brief survey at www.whiterockcity.ca/waste.

Deadline for online feedback submission:
midnight on **Friday, Jan. 31, 2020**.

Scan the QR Code with your smart phone to link to the web site.

WHITE ROCK
City by the Sea!

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Appendix G

High-Level Summary of Service Scenarios

Table G-1: High-Level Summary of Service Scenario 2 to 4 for MF and ICI Sectors

Scenario	Sub-Scenario	Description and Considerations	New Equipment Required	Fleet Size	Staffing Requirements	Waste Stream	Estimated Weekly Tonnage	Weekly Number of Stops[1,2]	Daily Number of Stops	Disposal Facility
Status Quo	-	City waste management services (garbage, recycling and organics collection) are provided to 4,038 SF households and 67 MF locations. Collection for City facilities (museum, library, City Hall, Operations Yard, Community Centre, Kent Street Activity Centre, Centennial Arena and Centre for Active Living) is contracted to GFL Environmental Inc. (formally Smithrite), while MF locations not serviced by the City and all ICI facilities must employ private waste collection services.	Replace existing vehicles with similar non-compacting units	Currently 5 non-compaction units (1x garbage, 2x organics, 2x recycling)	5 current staff (1x garbage, 2x organics, 2x recycling,)	SF Garbage	22.73	2053	513	Hauled to City Works Yard to stockpile then transferred to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct hauled to Urban Impact in Richmond
						SF Organics	31.63	4105	1026	Hauled to City Works Yard to stockpile then transferred to a GFL Facility in Delta
						MF Garbage	39.45	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
						MF Recycling	8.84	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
						MF Organics	9.52	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
						ICI Garbage	52.51	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
						ICI Recycling	11.55	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
						ICI Organics	12.60	N/A	N/A	Collected by Private Hauler and disposed at a facility of their choice
1	A	**Collection Optimization and Reduction of Double Handling of Materials - No Toters** **-** SF garbage and organics collected using new compacting waste collection vehicles; - Recycling collected same as status quo; - No addition of toters; - MF and ICI remain as status quo	2 new compacting organics trucks 1 new compacting garbage truck	5 units (3 new compacting trucks, 2 trucks recycling)	No additional staff	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	N/A	N/A	Status Quo
						MF Recycling	8.84	N/A	N/A	
						MF Organics	9.52	N/A	N/A	
						ICI Garbage	52.51	N/A	N/A	Status Quo
						ICI Recycling	11.55	N/A	N/A	
						ICI Organics	12.60	N/A	N/A	
	B	**Collection Optimization and Reduction of Double Handling of Materials - Standardized Toters** -SF garbage and organics collected using new compacting waste collection vehicles; - Recycling collected same as status quo; - Purchase of toters for garbage and organics collection for all SF households and eligible MF buildings; - MF and ICI remain as status quo	2 new compacting organics trucks 1 new compacting garbage truck Toters for garbage and organics for all SF homes	5 units (3 new compacting trucks, 2 trucks recycling)	Unknown, dependant on vehicle type. (1 – 2 staff per truck dependent on vehicle type and whether swamper required)	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	N/A	N/A	Status Quo
						MF Recycling	8.84	N/A	N/A	
						MF Organics	9.52	N/A	N/A	
						ICI Garbage	52.51	N/A	N/A	Status Quo
						ICI Recycling	11.55	N/A	N/A	
						ICI Organics	12.60	N/A	N/A	

Scenario	Sub-Scenario	Description and Considerations	New Equipment Required	Fleet Size	Staffing Requirements	Waste Stream	Estimated Weekly Tonnage	Weekly Number of Stops[1,2]	Daily Number of Stops	Disposal Facility
2	A	**Expanded Service Model - City Collection from MF and Commercial Facilities that can be Serviced in a Similar Manner[3]** - SF same as Scenario 1B - All MF and ICI facilities that can be serviced by toters will be collected by the City - MF collection will need to be separate from SF and ICI collection if the City wants the RecycleBC incentive for MF tonnage - Significant work would need to be completed to understand current waste management contracts with private haulers and when MF and ICI customers would be able to sign on to City programs - Spacing issues regarding toters required for all 3 streams - particularly garbage - Space constraints for fleet required at PW Yard	Same as Scenario 1B, however includes: 2x garbage - 1x ICI, 1x MF 2x organics - 1x ICI, 1x MF 2x recycle - 1x ICI, 1x MF	11 units (5 units for SF and 6 units for MF/ICI)	Unknown, dependant on vehicle type. (1 – 2 staff per truck dependent on vehicle type and whether swamper required)	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	252	50	Direct haul to Surrey Transfer Station
						MF Recycling	8.84	252	50	Direct haul to Urban Impact
						MF Organics	9.52	252	50	Direct haul to GFL
						ICI Garbage	52.51	96+67 = 163	33	Direct haul to Surrey Transfer Station
						ICI Recycling	11.55	96+67 = 163	33	Direct haul to Urban Impact
						ICI Organics	12.60	96+67 = 163	33	Direct haul to GFL
	B	**Expanded Service Model - City Collection from <u>all</u> MF and Commercial Facilities** - SF same as Scenario 1B - All MF and ICI facilities will be collected by the City - MF collection will need to be separate from SF and ICI collection if the City wants the RecycleBC incentive for MF tonnage - MF recycling will need to be multi-stream (currently varies based on waste hauler) - Front-end-load waste collection vehicle required - Significant work would need to be completed to understand current waste management contracts with private haulers and when MF and ICI customers would be able to sign on to City programs - Purchase of front-end bins of different sizes will be required - Space constraints for fleet required at PW Yard	Same as Scenario 1B, however includes: 2x organics - 1x ICI, 1x MF 2x recycle - 1x ICI, 1x MF 1x shared front-end for garbage	10 units (5 units for SF and 5 units for MF/ICI)	Unknown, dependant on vehicle type. (1 – 2 staff per truck dependent on vehicle type and whether swamper required)	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	252	50	Direct haul to Surrey Transfer Station
						MF Recycling	8.84	252	50	Direct haul to Urban Impact
						MF Organics	9.52	252	50	Direct haul to GFL
						ICI Garbage	52.51	96+67 = 163	33	Direct haul to Surrey Transfer Station
						ICI Recycling	11.55	96+67 = 163	33	Direct haul to Urban Impact
						ICI Organics	12.60	96+67 = 163	33	Direct haul to GFL
3		**Expanded Service Model - City Managed Contractor for MF and Commercial Facilities** - SF same as Scenario 1B - All MF and ICI facilities will be collected by a singular waste hauler under contract with the City - MF collection will need to be separate from SF and ICI collection if the City wants the RecycleBC incentive for MF tonnage - MF recycling will need to be multi-stream (currently varies based on waste hauler)	N/A	Same as Scenario 1B	1 staff to manage contract/oversee new MF/ICI coming onto program as contracts expire.	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	252	50	Collected by one private hauler for entire City and disposed at a facility of their choice
						MF Recycling	8.84	252	50	
						MF Organics	9.52	252	50	

Scenario	Sub-Scenario	Description and Considerations	New Equipment Required	Fleet Size	Staffing Requirements	Waste Stream	Estimated Weekly Tonnage	Weekly Number of Stops[1,2]	Daily Number of Stops	Disposal Facility
		- Significant work would need to be completed to understand current waste management contracts with private haulers and when MF and ICI customers would be able to sign on to City programs				ICI Garbage	52.51	96+67 = 163	33	Collected by one private hauler for entire City and disposed at a facility of their choice
						ICI Recycling	11.55	96+67 = 163	33	
						ICI Organics	12.60	96+67 = 163	33	
4		**Hybrid Expanded Service Model - City Managed Contract for a Universal Waste Hauler for MF and Commercial Facilities WASTE ONLY, City Collection of MF/ICI Recycling and Organics in Toters** - SF same as Scenario 1B - All MF and ICI facilities will have garbage collected by a singular waste hauler under contract with the City (2 streams dropped to private haulers eliminating truck traffic) - MF recycling collection will need to be separate from SF and ICI collection if the City wants the RecycleBC incentive for MF tonnage - MF recycling will need to be multi-stream (currently varies based on waste hauler) - Significant work would need to be completed to understand current waste management contracts with private haulers and when MF and ICI customers would be able to sign on to City programs	Same as Scenario 2B without garbage	9 units (5 units for SF and 4 units for MF/ICI)	1 staff to manage contract/oversee new MF/ICI coming onto program as contracts expire. Unknown, dependant on vehicle type. (1 – 2 staff per truck dependent on vehicle type and whether swamper required)	SF Garbage	22.73	2053	513	Direct haul to Surrey Transfer Station
						SF Recycling	15.37	4105	1026	Direct haul to Urban Impact
						SF Organics	31.63	4105	1026	Direct haul to GFL
						MF Garbage	39.45	252	50	Collected by one private hauler for entire City and disposed at a facility of their choice
						MF Recycling	9.00	252	50	Direct haul to Urban Impact
						MF Organics	9.52	252	50	Direct haul to GFL
						ICI Garbage	52.51	96+67 = 163	33	Collected by one private hauler for entire City and disposed at a facility of their choice
						ICI Recycling	11.55	96+67 = 163	33	Direct haul to Urban Impact
						ICI Organics	12.60	96+67 = 163	33	Direct haul to GFL

[1] 'Stops' refers the number of homes requiring collection services.
[2] ICI stops include 67 mixed-use strata properties (ICI and MF) not accounted for in the MF building total. Mixed-use properties were included under ICI as mixed use recycling does not qualify for the RecycleBC incentive.
[3] 'Similar manner' refers to units receive collection services by the same type of collection equipment

Appendix H

RecycleBC Incentive Information

DILLON CONSULTING

[redacted]

RE: RecycleBC Incentive Question

1 message

[redacted] Mon, Apr 27, 2020 at 1:31 PM

Hi [redacted]

Thanks for your questions. Since the City of White Rock and Recycle BC have an active Multi-family SOW, the City can either begin collection from all of the multi-family buildings within the municipal boundaries themselves or choose to hire a sub-contractor that does the collection. It is up to the City to decide whether to perform the work itself or sub-contract out the collection work. Either option would require the City to inform Recycle BC of all of the MF building service details, anticipated start date, and number of households serviced etc., using the template provided. Recycle BC will then review the list to confirm that all of the buildings meet the criteria to begin receiving incentive payments ($ per household).

As for ICI, it is up to the City of White Rock to manage ICI separately either by doing the collection themselves, contracting out to private company, or allowing each business make collection arrangements themselves. The ICI field in the template is intended for extremely small number of ICI locations (below 2%) and for if/when it is not feasible to extract them from residential routes. Since the City of essentially beginning the process from scratch, the ICI option is not applicable to them.

I hope this helps to provide the answers you need. Please don't hesitate to let me know if you have any further questions or if anything isn't covered.

Thank you.

Kind regards,

[redacted]

Collection Coordinator

Recycle BC

[redacted]

RecycleBC.ca

-

-

-

From: [redacted]
Sent: Thursday, April 16, 2020 12:27 PM
To: [redacted]
Subject: Re: RecycleBC Incentive Question

Hi [redacted]

Thanks for this!

Given your information below - can you provide details on what the process would look like if the City intended to do a major roll-out for MF collection? Actually we also need to know if this would differ under the following scenarios...

1. City starts to collect from ALL MF units; or
2. City contract a private hauler to collect from ALL MF units (is this permitted? or would the contract need to be handed over to Recycle BC to collect? (As an aside - residents are looking to decrease the number of different haulers on the roads and the amalgamation of one hauler for all streams (waste, recycling and organics) would be for that reason.)

Also - is the ICI acceptance new? How does Recycle BC determine acceptance? So,

under the same scenarios as above - if the City either decides to

1 take over collection of ICI recycling, or

2 contract out collection of ICI recycling

how does this work?

Thanks for all your help!

[redacted]

On Thu, Apr 16, 2020 at 9 31 AM [redacted]

> thi i good info!
>
> ---------- Forwarded message ---------
> From [redacted]
> Date: Thu, 16 Apr 2020 at 09:29
> Subject RE RecycleBC Incentive Que tion
> To: [redacted]
>
> Hi [redacted]
>
> Thanks for your email.

As we have a standing multi family SOW with the City of White Rock, they are currently eligible to expand service to multi residential buildings (5 or more units per building) that is within the municipal boundaries of the City. Recycle BC provides a per household incentive to the buildings that have been reviewed and processed

Please note that you can submit a household change request up to 4 times per year, following the quarterly timeline. However, you do not need to wait until the scheduled dates or Recycle BC's approval to begin servicing the buildings

We will review the submission in a timely manner and ensure that the household count used to calculate monthly payments are reflected accordingly.

I have attached the template for Recycle BC's quarterly household baseline update process. Please follow the instructions on the 'Instructions' tab and send the completed template to me at [redacted].

If the City of planning to do a major roll-out to multi-family buildings, it would be good for us to get the details in advance as this process will be slightly different from the quarterly process I described above. If this is for tracking purposes only, the regular process can be followed.

Please feel free to give me a call if you have any questions or would like to discuss.

Thank you

Kind regards,

[redacted]

Collection Coordinator

Recycle BC

[redacted]

RecycleBC.ca

From: [redacted]
Sent: Tuesday, April 14, 2020 1:51 PM
To: [redacted]
Subject: RecycleBC Incentive Question

Hey [redacted],

Hope things are well with you! I am working on a Solid Waste Management Operations Review for the City of White Rock and a part of the project is to review the option of having the City collect from Multi-Family buildings. Currently, the City only collects from single-family homes and multi-family under 6 units (there are fewer than 100 of these).

I am wondering what are the requirements for receiving the incentive for multi-family recycling? Since the City does not currently collect from multi-residential buildings, are they eligible?

Thanks so much for your time,

[redacted]

--

DILLON CONSULTING

CANADA BEST MANAGED COMPANIES
Platinum member

[redacted]

Please consider the environment before printing this email

--

Recycle BC - Curbside, Multi-family and ICI Baseline Update Instructions

This document provides details on the information that all Curbside and Multi-family collectors participating in the Recycle BC program must provide to Recycle BC to confirm the number of households serviced under the program and, if applicable and approved by Recycle BC, the number of Industrial, Commercial, and Institutional (ICI) locations included. The following page outlines the procedure and timelines for submitting Curbside and Multi-family household addition and removals under the program.

All Curbside and Multi-family collectors may add or remove new Curbside households and Multi-family buildings to their collection service under the Recycle BC program, provided the households are located within the existing service area(s) outlined in the relevant Statement of Work with Recycle BC and meet the criteria as outlined in this document. Unless otherwise communicated by Recycle BC permission is not required before starting service to each additional household, though collectors are encouraged to contact Recycle BC if they are unsure whether a household, building or area qualifies. Collectors can determine the timeline for adding households and buildings to collection routes. Likewise, Multi-family collectors can remove buildings from service under the Recycle BC program as required for operational or contractual reasons. Advance approval is required from Recycle BC to begin collecting from any ICI locations or for any additions or changes to ICI locations serviced under the program, with the exception of removal of ICI locations.

Submission Deadlines and Adjustment Timelines (Effective 2019):

To request an adjustment, submit an updated version of the Household Baseline Quarterly Update Template by the applicable deadline. Quarterly submissions are required if any Curbside households, Multi-family buildings or ICI locations have been added or removed from service since the last submission, but are not required if there have been no changes since the last submission. Recycle BC will not remind collectors of this opportunity each quarter. Each family collector is responsible for ensuring any changes are submitted to Recycle BC by the deadlines below, in accordance with the procedures outlined in this document. All changes submitted are subject to review and approval by Recycle BC.

The following table outlines the submission deadlines for collectors and the effective date of the applicable adjustments. Please note that any late submissions made after the scheduled dates below will be made effective the following quarterly date. For example: submissions in February will be made effective April 1.

Deadline for Submission of Household Baseline Quarterly Update Template	Effective Date of Corresponding Curbside and Multi-family Household Baseline and ICI Factor Adjustments	Submission Compulsory or Voluntary by Collector?
January 1 annually	January 1 annually	Compulsory for any collectors that have added or removed households, buildings or ICI locations since last submission
April 1 annually	April 1 annually	Compulsory for any collectors that have added or removed households, buildings or ICI locations since last submission
July 1 annually	July 1 annually	Compulsory for all collectors as annual submission
October 1 annually	October 1 annually	Compulsory for any collectors that have added or removed households, buildings or ICI locations since last submission

*Note: Recycle BC reserves the right to amend these procedures with notice to collectors, including the process of permitting household, Multi-family building or ICI location additions and removals, the timeline for adjustments and the type or format of information required for submission to Recycle BC.

1. General Information

The completion of this tab is required for All Collectors

Click here to complete the General Information Tab

>>Back to Top

2. Curbside Household Adjustment Procedure

Curbside Household Baseline Definition - The number of Curbside households receiving Curbside collection in the Service Area(s), including single-family dwellings, buildings with up to four households, and rowhouse complexes with any number of households where each household sets out material separately for individual collection.

As outlined in Attachment 5 to Schedule 2.1(a) Fees - Curbside Statement of work:

(c) For purposes of reporting and determining the number of Curbside Households:

(i) A single family dwelling is considered one Curbside Household;
(ii) A laneway house is considered one Curbside Household;
(iii) A duplex is considered two Curbside Households;
(iv) A triplex is considered three Curbside Households;
(v) A fourplex is considered four Curbside Households;

(vi) A single family dwelling that has been converted into two, three or four residential dwelling units, shall be considered a duplex, triplex or fourplex, as described in (iii), (iv) and (v) respectively, if Contractor recognizes the conversion for utility and/or contract billing;

(vii) A single family dwelling that has been converted into multiple dwelling units that is recognized by Contractor as a single family dwelling for utility and/or contract billing is considered one Curbside Household; and

(viii) Each self-contained dwelling unit in a rowhouse or townhouse is considered one Curbside Household if the resident of each unit delivers In-Scope PPP to the Curb for collection in separate Containers.

The completion of this tab is required for all Curbside Collectors

Click here to complete the Curbside Household Adjustment Form

>>Back to Top

3. Multi-family Household Adjustment Procedure

Multi-family Household Baseline Definition - The number of households in the Service Area(s) receiving Multi-family collection service (households in complexes with five or more units where all households bring their recycling to a centralized location with shared collection containers).

A Multi-family building...

>> Must contain five or more households per Multi-family building
>> Must have a centralized collection location with shared collection containers where each resident deposits their recycling

*If your submission does not fit the criteria above, please provide a detailed explanation under the 'Notes' column

The completion of this tab is required for all Multi-family Collectors

Click here to complete the Multi-family Household Adjustment Form

>>Back to Top

3. ICI Baseline Adjustment Procedure

"Industrial, Commercial and Institutional" or "ICI" Location Definition- Any operation or facility other than a Curbside or Multi-family household, including but not limited to commercial facilities such as retail stores or offices located in the street level or lower levels of a Multi-family building and vacation facilities, such as hotels, motels, cottages, cabins and rental, co-operative, fractional ownership, time-share or condominium accommodation associated with sports and leisure facilities (e.g., ski resorts); and, institutional facilities such social or community service organizations and personal or health care facilities located in the street level or lower levels of a Multi-family building and residences at which medical care is provided, such as nursing homes, long-term care facilities and hospices.

The completion of this tab is required for all collectors that wish to collect from ICI Locations on either Curbside or Multi-family collection routes. Inclusion of any ICI Locations is subject to approval in advance by Recycle BC.

Click here to complete the ICI Adjustment Form

>>Back to Top

How to Submit

Please submit all completed templates by email to:
Tsung@RecycleBC.ca

Questions?

Please feel free to send an email to Tsung@RecycleBC.ca if you have any questions or comments about this form.

Appendix I

Detailed MF and ICI Survey Results

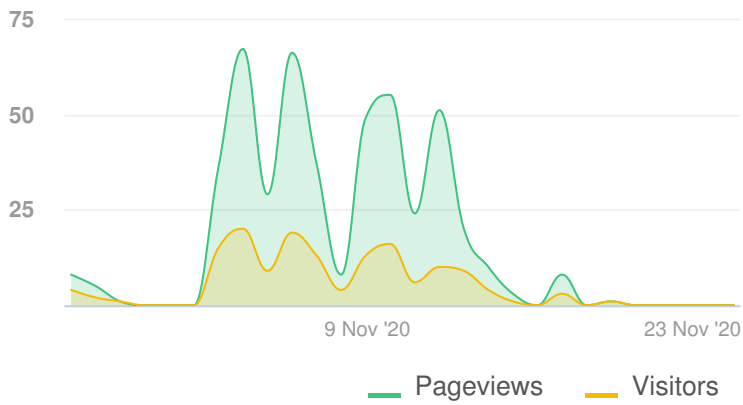
Project Report

04 January 2019 - 23 November 2020

Talk White Rock

What's In Your Can?

Visitors Summary



Highlights

TOTAL VISITS	MAX VISITORS PER DAY	NEW REGISTRATIONS
169	20	55

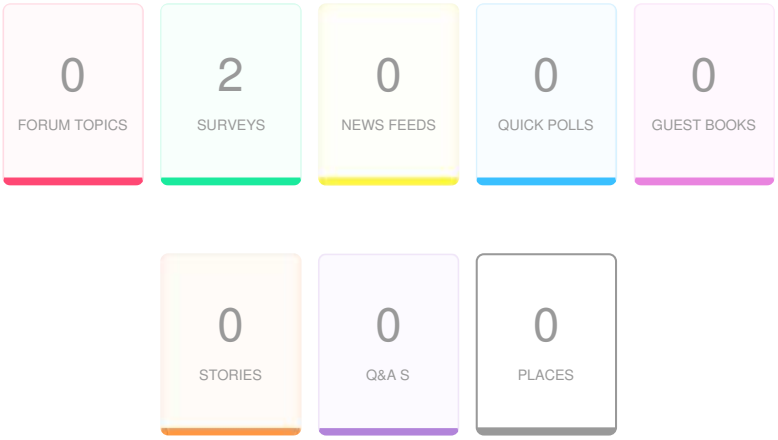
ENGAGED VISITORS	INFORMED VISITORS	AWARE VISITORS
62	117	141

Aware Participants	141
Aware Actions Performed	**Participants**
Visited a Project or Tool Page	141

Informed Participants	117
Informed Actions Performed	**Participants**
Viewed a video	0
Viewed a photo	0
Downloaded a document	0
Visited the Key Dates page	0
Visited an FAQ list Page	0
Visited Instagram Page	0
Visited Multiple Project Pages	60
Contributed to a tool (engaged)	62

Engaged Participants	62		
Engaged Actions Performed	**Registered**	**Unverified**	**Anonymous**
Contributed on Forums	0	0	0
Participated in Surveys	62	0	0
Contributed to Newsfeeds	0	0	0
Participated in Quick Polls	0	0	0
Posted on Guestbooks	0	0	0
Contributed to Stories	0	0	0
Asked Questions	0	0	0
Placed Pins on Places	0	0	0
Contributed to Ideas	0	0	0

ENGAGEMENT TOOLS SUMMARY



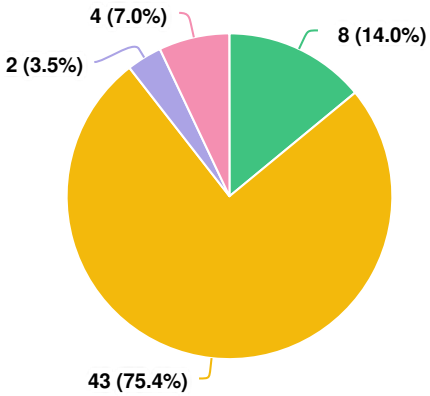
Tool Type	Engagement Tool Name	Tool Status	Visitors	Contributors		
				Registered	Unverified	Anonymous
Survey Tool	Multi-Family Waste Survey	Archived	100	53	0	0
Survey Tool	Business Owners Survey	Archived	36	12	0	0

ENGAGEMENT TOOL: SURVEY TOOL

Multi-Family Waste Survey

Visitors 100	Contributors 53	CONTRIBUTIONS 57

Please let us know who is answering this survey



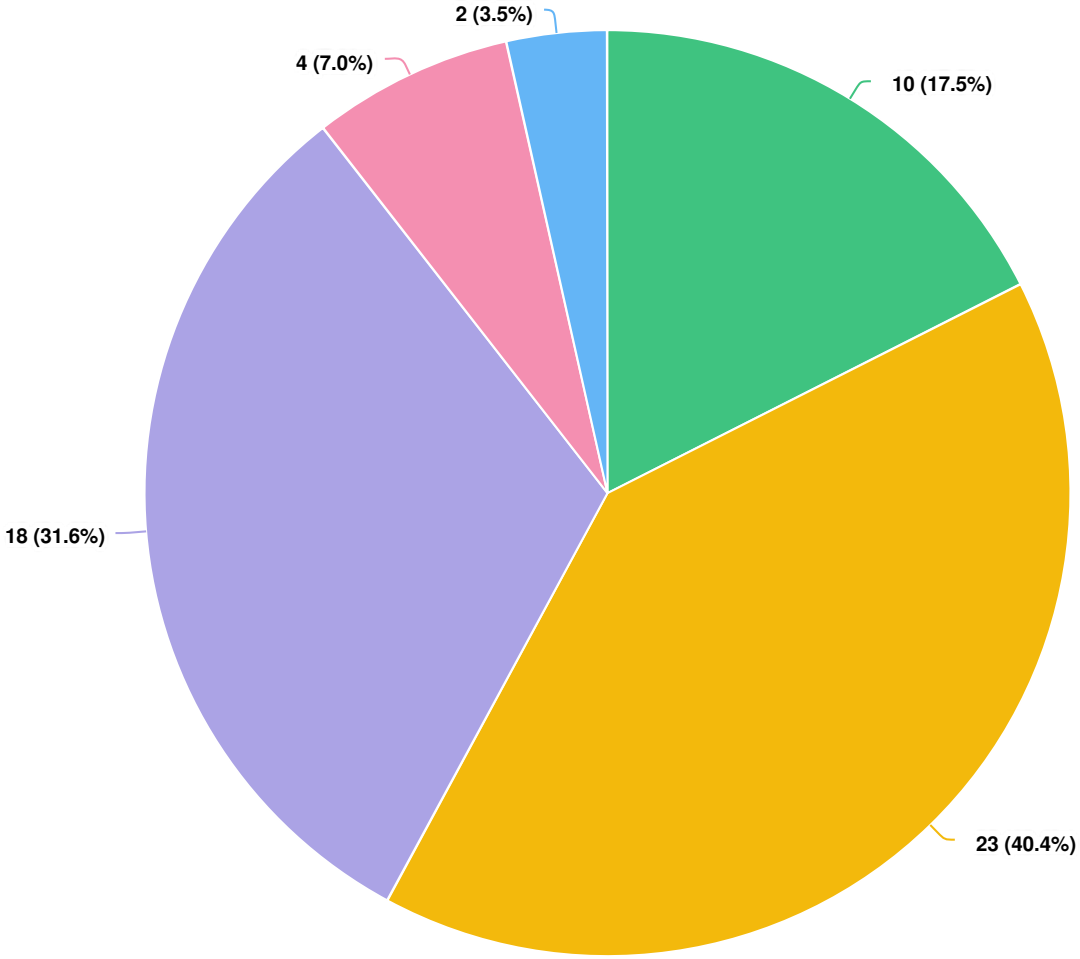
Question options

- Property Manager
- Strata Council Member
- Multi-family Building Resident (not on Strata Council)
- Other (please specify)

Mandatory Question (57 response(s))

Question type: Radio Button Question

How many units are in this building?



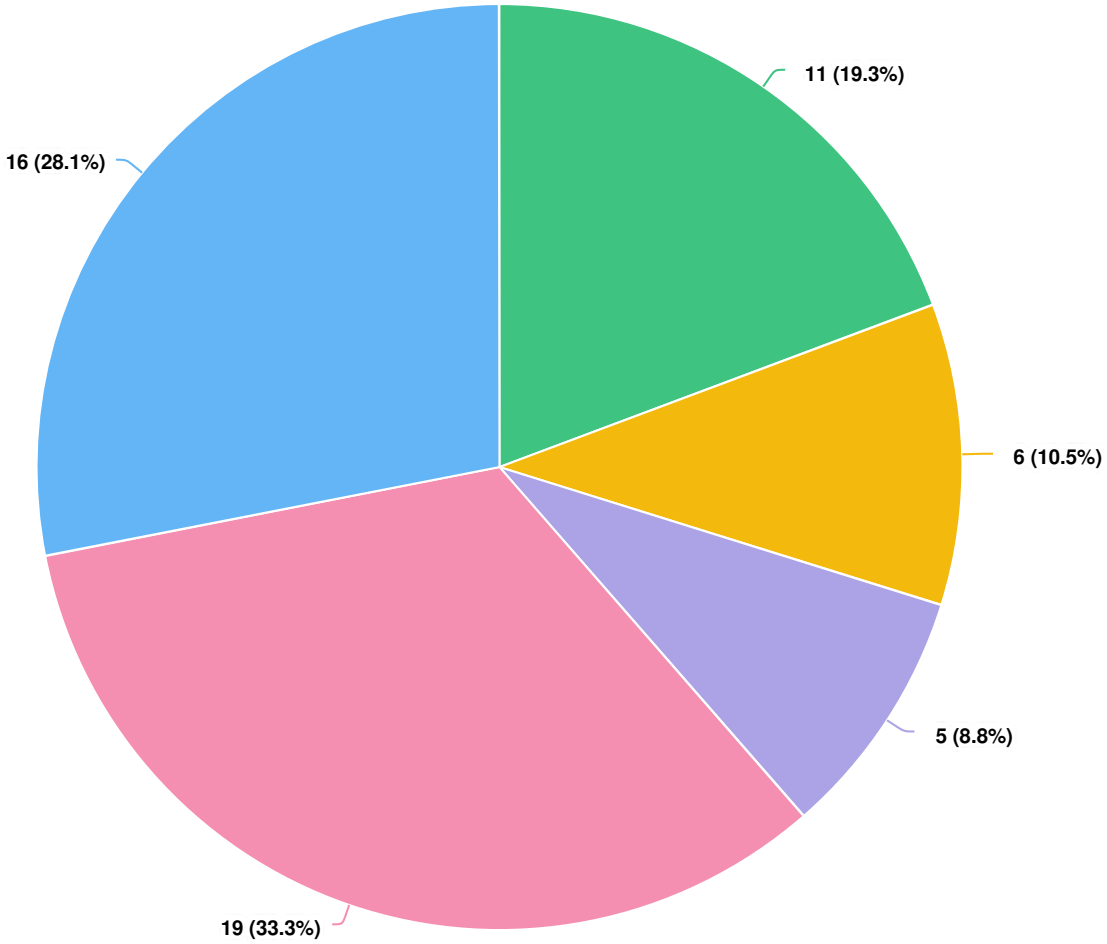
Question options

1- 10 11 - 20 21 - 50 51-100 101-150

Mandatory Question (57 response(s))

Question type: Radio Button Question

What is the monthly charge included in your Strata fees for waste collection services (per unit)?



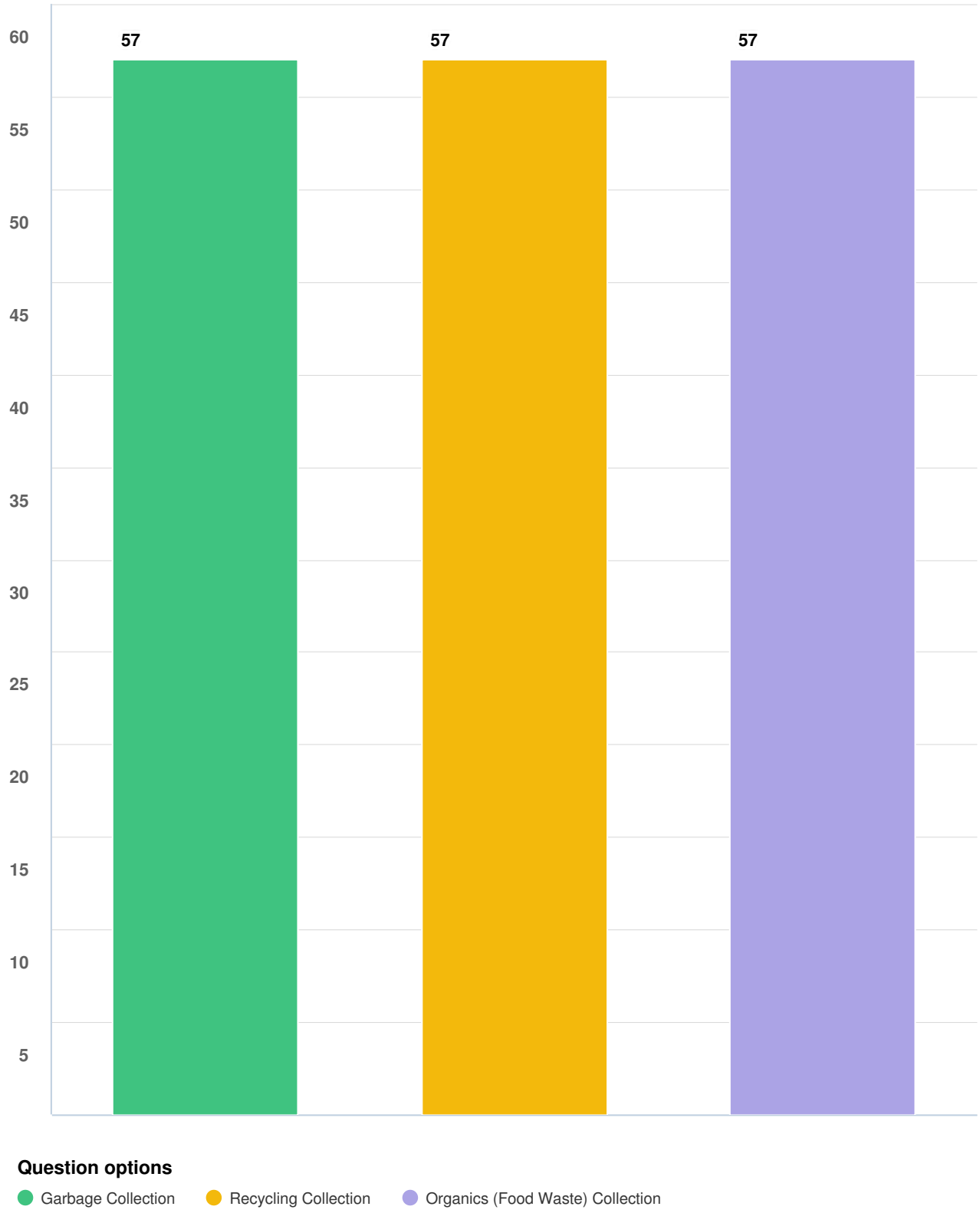
Question options

< $15 $16 - $20 $21 - $25 > $25 Unsure

Mandatory Question (57 response(s))

Question type: Radio Button Question

Which services do your current waste hauler provide (select all that apply) :



Mandatory Question (57 response(s))

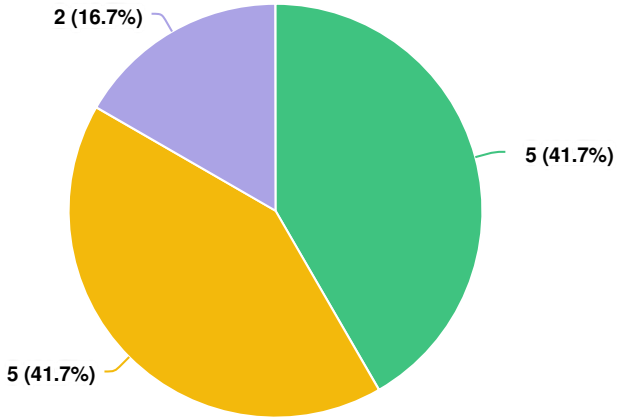
Question type: Checkbox Question

ENGAGEMENT TOOL: SURVEY TOOL

Business Owners Survey

Visitors 36	Contributors 12	CONTRIBUTIONS 12

Please let us know who is responding to this survey



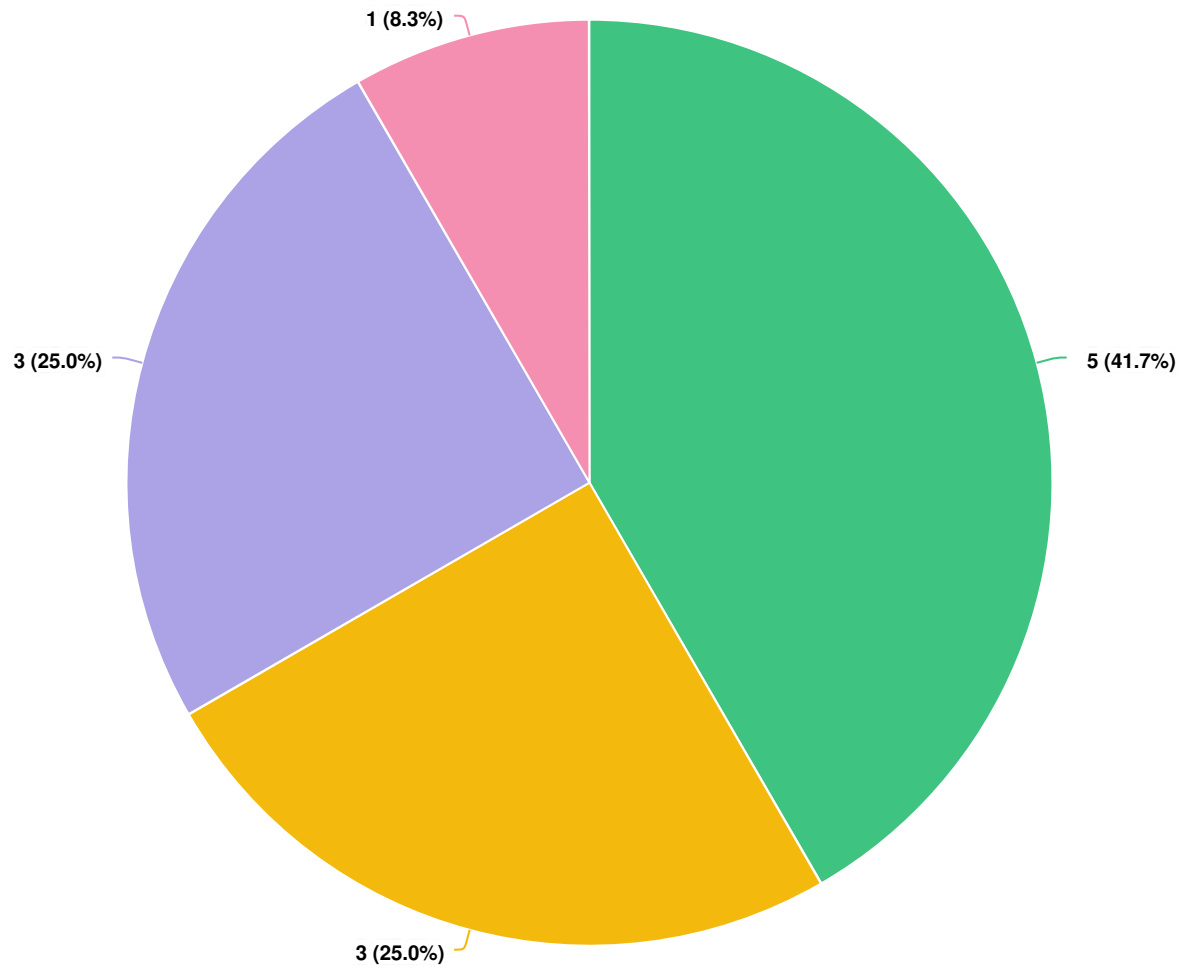
Question options

I am the Business Owner | I am a Commerical Property Owner | Other (please specify)

Mandatory Question (12 response(s))

Question type: Radio Button Question

Please describe your business type:



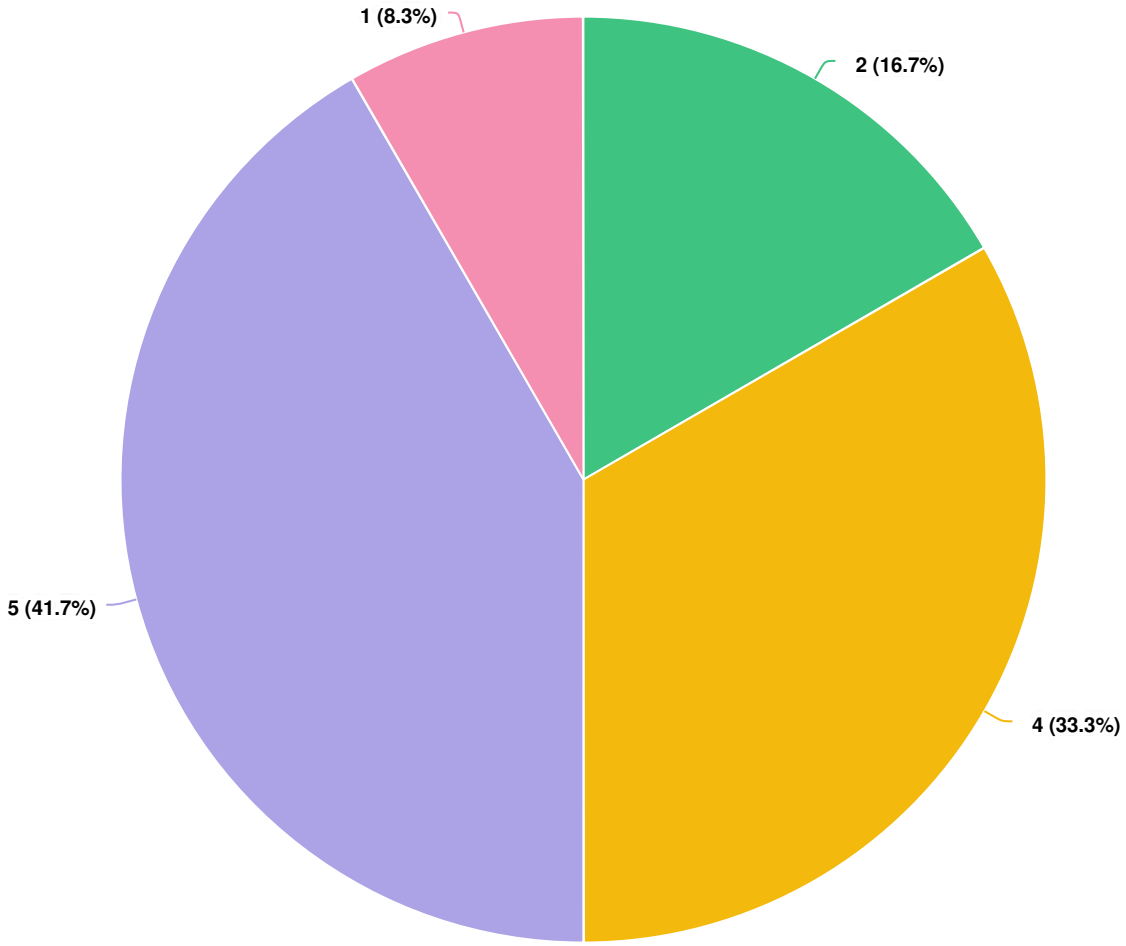
Question options

- Stand-alone building with no other businesses attached
- Business within a business complex
- Business within a mixed-use (business and residential) building
- Other (please specify)

Mandatory Question (12 response(s))

Question type: Radio Button Question

If you are situated in a mixed-use (business and residential) property, please specify how you dispose of waste:



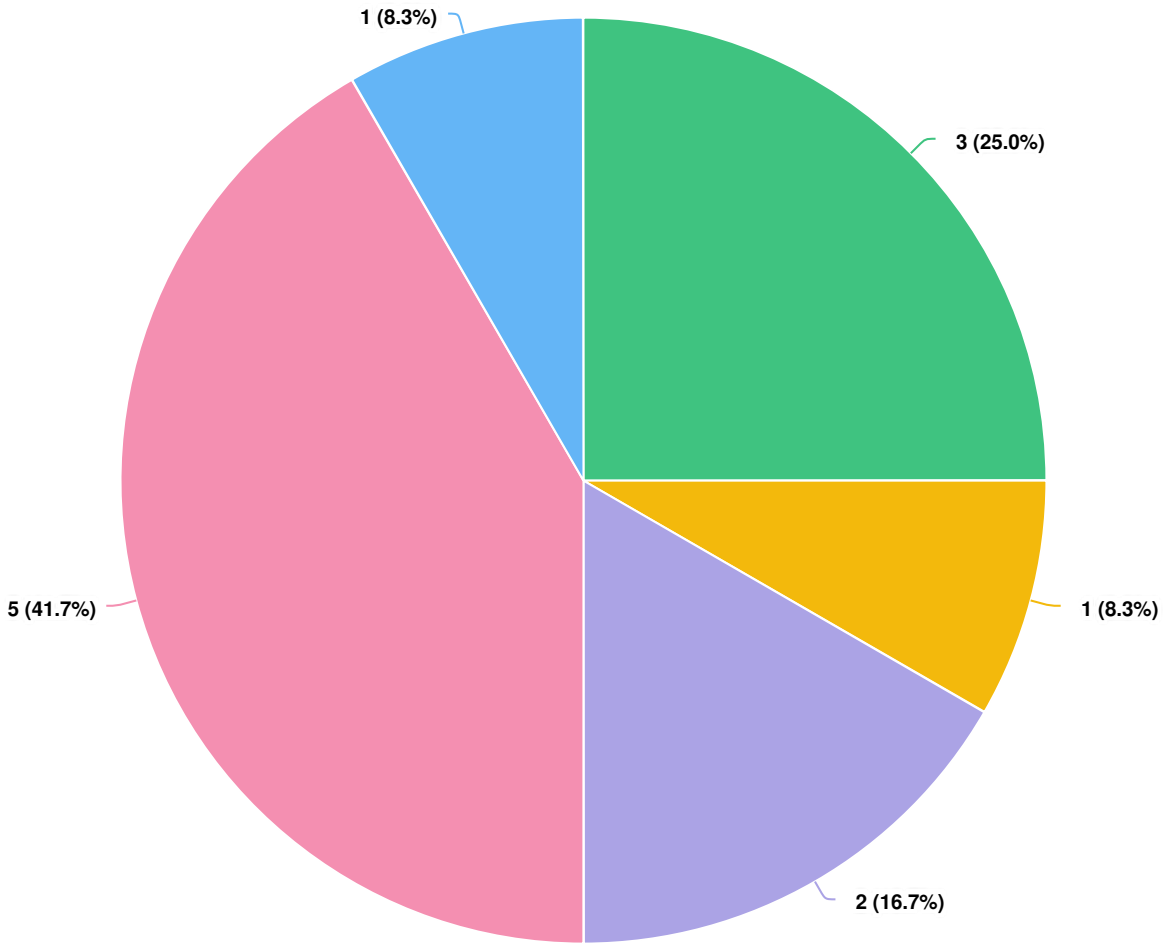
Question options

- The business shares waste bins with the residential units
- The business waste bins are separate from residential waste bins
- Not Applicable (not in a mixed-use building)
- Other (please specify)

Mandatory Question (12 response(s))

Question type: Radio Button Question

If you are in a mixed-use (business and residential) building, please specify how you pay for waste collection services



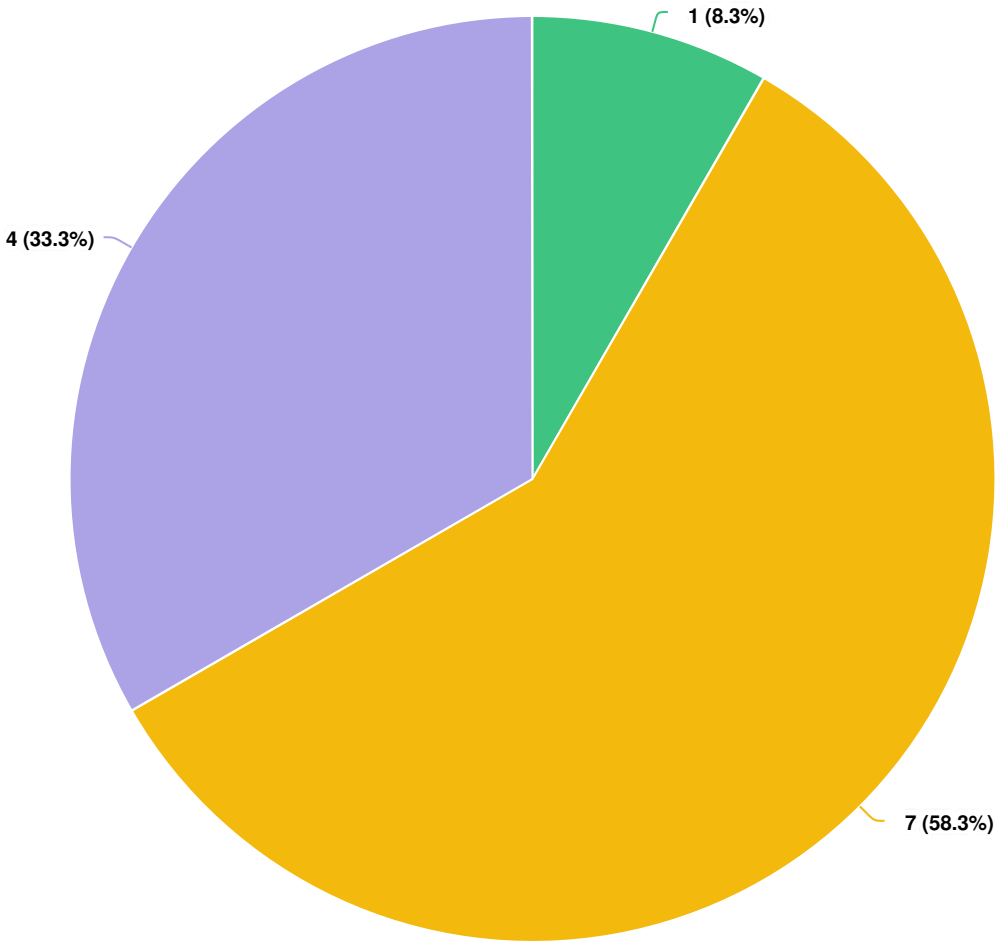
Question options

- The business pays for all waste collection services
- The business and residential units share the cost of waste collection services
- The property owner pays for the waste collection services and it is part of our lease/rent
- Not Applicable (not in a mixed-use building)
- Other (please specify)

Mandatory Question (12 response(s))

Question type: Radio Button Question

What is the average monthly charge included in your lease/rent for waste collection services?



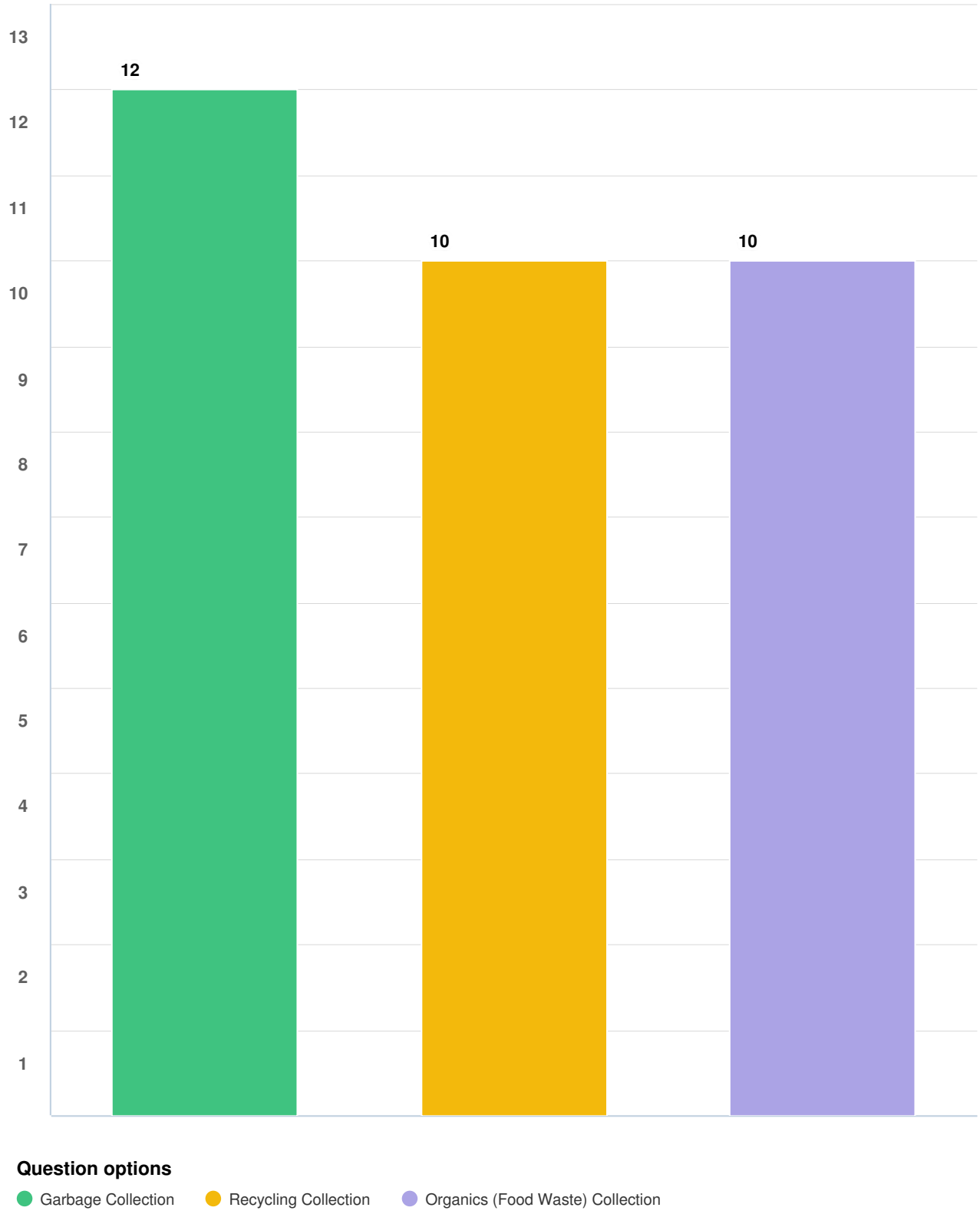
Question options

< $20 > $61 Unsure/Don't know

Mandatory Question (12 response(s))

Question type: Radio Button Question

Which services do your current waste hauler provide (select all that apply) :



Mandatory Question (12 response(s))

Question type: Checkbox Question

Appendix J

Utility Rate Model

Name of the Model Run

City of White Rock 2020 Budget Estimate

Solid Waste Services

Prepared By

Consulting Team

Date

14-Jan-21

Prepared by
Consulting Team

Worksheet 2
14-Jan-21

City of White Rock 2020 Budget Estimate
Statement of Revenue Requirements

	2018 Test Year			
DIRECT OPERATING EXPENSES	Garbage	Recycling	Green Waste	Total
Regular Wages & Benefits[1]	78,260	144,518	143,143	365,921
New FTE to administer contracts[2]	33,333	33,333	33,333	100,000
Advertising	660	1,268	280	2,208
Program Supplies (assumed Residents)	460	3,076	460	3,996
Program Contract Costs - Facility Collections	22,502	1,537		24,039
Tipping Fees - Resident Collections	121,178	263	124,070	245,511
Rental of Equipment				0
Contract Maintenance				0
Allocated Vehicle Operating Costs	37,798	83,039	37,798	158,635
Contingency				0
Program Contract Costs - Resident Collectio	51,663	22,159	65,342	139,164
Supplies - Facility Collections				0
Tipping Fees - ICI and MF[3]	525,624	60,455	122,864	708,943
Operating Costs - ICI MF[3]	237,468	365,638	365,638	968,744
Other	0	0	0	0
Sub-total	**1,108,946**	**715,286**	**892,928**	**2,717,161**
OTHER OPERATING EXPENSES (See Worksheet 3 for Details)				
Allocated Indirect/Administration Cost[4]	140,804	90,820	113,376	345,000
Vacation Pay Allowance	4,696	8,671	8,589	21,955
WCB Claims Allowance	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Total	**145,499**	**99,492**	**121,964**	**366,955**
TOTAL EXPENSES WITH ICI AND MF	**1,254,446**	**814,778**	**1,014,893**	**3,084,116**
LESS OTHER OPERATING REVENUE				
Decal Sales Revenue	4,505			4,505
Sale of Composters				0
Special Events Revenue				0
Chipping and Green Waste Program				0
External Cost Recovery				0
Sale of Recyclables				0
Blue/Red Box Sales			1,905	1,905
Kraft Bag Sales			3,794	3,794
Recycle BC - SF + MF		235,637		235,637
Civic Facilities				0
Other				**0**
Total	**4,505**	**235,637**	**5,699**	**245,841**
TOTAL REVENUE WITH ICI AND MF	**4,505**	**235,637**	**5,699**	**245,841**
REVENUE REQUIRED FROM CUSTOMERS	**1,249,941**	**579,141**	**1,009,194**	**2,838,275**

Notes:

[1] Wages and benefit costs are based on actual City 2018 costs

[2] One FTE staff member to administer contract for MF and ICI sectors, SF collections and other SWM City services and programs.

[3] Costs are summarized from **Table 30** of the Report.

[4] Allocated indirect/administrative cost" includes supervisory and management staff, allocated Engineering & Operations Dept and City Hall administrative costs, and annual contributions to the equipment replacement reserve.

Prepared by
Consulting Team

Worksheet 3
14-Jan-21

City of White Rock 2020 Budget Estimate
Breakdown of Other Operating Expenses

	2018 Test Year			
	Garbage	Recycling	Green Waste	Total
Allocated Indirect/Administration Cost				
Total Allocated Indirect/Administraion Cost[1]	345,000			
Total Existing Budget for Each Service	1,108,946	715,286	892,928	2,717,161
% of Total Budget by Service	41%	26%	33%	1
ALLOCATED INDIRECT/ADMINISTRATION COST	**140,804**	**90,820**	**113,376**	**345,000**
Vacation Pay Allowance				
Total Regular Wages and Benefits	78,260	144,518	143,143	365,921
Vacation Pay Allowance as a Percentage	6.0%	6.0%	6.0%	
Vacation Pay Allowance for Regular Wages	4,696	8,671	8,589	21,955
Total Casual, Student Wages and Benefits	33,333	33,333	33,333	100,000
Vacation Pay Allowance as a Percentage	0.0%	0.0%	0.0%	
Vacation Pay Allowance for Student Wages	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
Other	0	0	0	0
TOTAL VACATION PAY ALLOWANCE	**4,696**	**8,671**	**8,589**	**21,955**
WCB Claims Allowance				
Year - 2017				0
Year - 2018				0
Average of Previous Two Years				0
TOTAL WCB CLAIMS ALLOWANCE	**-**	**-**	**-**	**-**

Notes:

[1] Allocated indirect/administrative cost" includes supervisory and management staff, allocated Engineering & Operations Dept and City Hall administrative costs, and annual contributions to the equipment replacement reserve.

[2] Data is not available

Prepared by
Consulting Team

Worksheet 4
14-Jan-21

City of White Rock 2020 Budget Estimate
Number and Class of Customers with Garbage Collection
2018

Customer Class	Number of Customers	Generation Ratio[1]	Customer Equivalents
Single Family Residential	4,038	1.00	4,038
Single Family Residential with Secondary Suite			0
Residential Strata	6,265	0.53	3,320
Rental Units			0
ICI Customers	163	23.00	3,749
Other			
Other			
TOTAL	10,466		11,107

City of White Rock 2020 Budget Estimate
Number and Class of Customers with Recycling Collection
2018

Customer Class	Number of Customers	Generation Ratio[1]	Customer Equivalents
Single Family Residential	4,038	1.00	4,038
Single Family Residential with Secondary Suite			0
Residential Strata	6,265	0.53	3,320
Rental Units			0
ICI Customers	163	23.00	3,749
Other			
Other			
TOTAL	10,466		11,107

City of White Rock 2020 Budget Estimate
Number and Class of Customers with Green Waste Collection
2018

Customer Class	Number of Customers	Generation Ratio[1]	Customer Equivalents
Single Family Residential	4,038	1.00	4,038
Single Family Residential with Secondary Suite			0
Residential Strata	6,265	0.53	3,320
Rental Units			0
ICI Customers	163	23.00	3,749
Other			
Other			
TOTAL	10,466		11,107

Notes:
[1] Generation ratio is based on projected 2019 tonnage data.

Prepared by
Consulting Team

Worksheet 5
14-Jan-21

City of White Rock 2020 Budget Estimate
Cost of Service per Customer- Garbage
2018

Total Revenue Required for Garbage from Worksheet 2	**$ 1,249,941**
Revenue per Customer Equivalent	**112.53**

Customer Class	Generation Ratio	Total Annual Revenue for Customer Class	Annual Charge per Customer
Single Family Residential	1.00	$454,403	$113
Single Family Residential with Secondary Suite	-	$0	$0
Residential Strata	0.53	$373,656	$60
Rental Units	-	$0	$0
ICI Customers	23.00	$421,881	$2,588
TOTAL		**$1,249,941**	

City of White Rock 2020 Budget Estimate
Cost of Service per Customer - Recycling
2018

Total Revenue Required for Recycling from Worksheet 2	**$ 579,141**
Revenue per Customer Equivalent	**52.14**

Customer Class	Generation Ratio	Total Annual Revenue for Customer Class	Annual Charge per Customer
Single Family Residential	1.00	$210,541	$52
Single Family Residential with Secondary Suite	-	$0	$0
Residential Strata	0.53	$173,128	$28
Rental Units	-	$0	$0
ICI Customers	23.00	$195,472	$1,199
TOTAL		**$579,141**	

City of White Rock 2020 Budget Estimate
Cost of Service per Customer - Green Waste
2018

Total Revenue Required for Green Waste from Worksheet 2	**$ 1,009,194**
Revenue per Customer Equivalent	**90.86**

Customer Class	Generation Ratio	Total Annual Revenue for Customer Class	Annual Charge per Customer
Single Family Residential	1.0	$366,882	$91
Single Family Residential with Secondary Suite	-	$0	$0
Residential Strata	0.5	$301,687	$48
Rental Units	-	$0	$0
ICI Customers	23.0	$340,624	$2,090
TOTAL		**$1,009,194**	

Notes:
[1] Generation ratio is based on projected 2019 tonnage data.

Prepared by
Consulting Team

Worksheet 6
14-Jan-21

City of White Rock 2020 Budget Estimate

Projected Cost per Multi-Family Building

2018

	CIVIC ADDRESS	NAME	RES. UNITS	Garbage	Recycling	Green Waste	Annual Charge for Building
1	Beachview 15110	Beachview Apt	6	357.85	165.80	288.93	812.58
2	Beachview 15140	Kulleana	9	536.78	248.71	433.39	1,218.87
3	Best 1233	Hillside	11	656.06	303.98	529.70	1,489.73
4	Best 1243	Winston Churchill	19	1,133.19	525.05	914.93	2,573.18
5	Best 1255	Ambasssador	23	1,371.76	635.58	1,107.55	3,114.90
6	Best 1327	Chestnut Manor	12	715.70	331.61	577.85	1,625.16
7	Best 1347	NEW	9	536.78	248.71	433.39	1,218.87
8	Best 1367	Larchwood	17	1,013.91	469.78	818.62	2,302.32
9	Best 1447	Monticello Place	26	1,550.69	718.49	1,252.01	3,521.19
10	Best 1467	Bakerview Court	8	477.13	221.07	385.24	1,083.44
11	Best 1481-1487	Townhouses	4	238.57	110.54	192.62	541.72
12	Best 1533	Tivoli, The	36	2,147.11	994.83	1,733.56	4,875.49
13	Best 1575	Embassy, I	57	3,399.58	1,575.15	2,744.80	7,719.53
14	Best 1588	Monterey	82	4,890.63	2,266.00	3,948.66	11,105.29
15	Blackwood 1250	White Sands	26	1,550.69	718.49	1,252.01	3,521.19
16	Blackwood 1371	Bayview Chateau	45	2,683.88	1,243.54	2,166.95	6,094.37
17	Blackwood 1390	Petite Chateau	8	477.13	221.07	385.24	1,083.44
18	Blackwood 1410	Chelsea House	18	1,073.55	497.41	866.78	2,437.75
19	Blackwood 1430	Villa Sunset	15	894.63	414.51	722.32	2,031.46
20	Blackwood 1441	Capistrano, The	23	1,371.76	635.58	1,107.55	3,114.90
21	Blackwood 1442	Blackwood Manor	62	3,697.79	1,713.32	2,985.57	8,396.68
22	Blackwood 1458	Champlaine Manor	18	1,073.55	497.41	866.78	2,437.75
23	Blackwood 1459	Chartwell Manor	38	2,266.39	1,050.10	1,829.87	5,146.35
24	Blackwood 1473	Lamplighter	17	1,013.91	469.78	818.62	2,302.32
25	Blackwood 1480	Villa Solana	20	1,192.84	552.68	963.09	2,708.61
26	Blackwood 1508	Juliana	5	298.21	138.17	240.77	677.15
27	Blackwood 1520	Blue Surf	27	1,610.33	746.12	1,300.17	3,656.62
28	Blackwood 1521	Sandringham	39	2,326.03	1,077.73	1,878.02	5,281.78
29	Blackwood 1550	Blackwood Village	63	3,757.43	1,740.95	3,033.73	8,532.11
30	Buena Vista 15131	Bay Pointe	18	1,073.55	497.41	866.78	2,437.75
31	Buena Vista 15139	Bella Vista	6	357.85	165.80	288.93	812.58
32	Buena Vista 15151	Maxwell Green	9	536.78	248.71	433.39	1,218.87
33	Buena Vista 15150-15162	Cottage Terrace	6	357.85	165.80	288.93	812.58
34	Buena Vista 15169	Presidents Court II	12	715.70	331.61	577.85	1,625.16
35	Buena Vista 15176-78	Beach Pointe	8	477.13	221.07	385.24	1,083.44
36	Buena Vista 15284	Buena Vista Terrace	12	715.70	331.61	577.85	1,625.16
37	Buena Vista 15367	Palms, The	21	1,252.48	580.32	1,011.24	2,844.04
38	Buena Vista 15391	Casa Bella	14	834.99	386.88	674.16	1,896.02
39	Elm 1164	Elm Apt	5	298.21	138.17	240.77	677.15
40	Everall 1434	townhomes	5	298.21	138.17	240.77	677.15
41	Everall 1456	townhomes	9	536.78	248.71	433.39	1,218.87
42	Everall 1466	townhomes	5	298.21	138.17	240.77	677.15
43	Everall 1486	townhomes	5	298.21	138.17	240.77	677.15
44	Everall 1501 (1550)	Evergreen Baptist	84	5,009.91	2,321.27	4,044.97	11,376.15
45	Everall 1531 (1550)	Baptist Manor	110	6,560.60	3,039.75	5,296.98	14,897.34
46	Everall 1552	Everall Court	6	357.85	165.80	288.93	812.58
47	Everall 1569	Seawynd Manor	20	1,192.84	552.68	963.09	2,708.61
48	Everall 1580	Haighton Manor	57	3,399.58	1,575.15	2,744.80	7,719.53
49	Fir 1220	Vista Pacifica	37	2,206.75	1,022.46	1,781.71	5,010.92
50	Fir 1280	Oceana Villa	39	2,326.03	1,077.73	1,878.02	5,281.78
51	Fir 1320	Willows	20	1,192.84	552.68	963.09	2,708.61

	CIVIC ADDRESS	NAME	RES. UNITS	Garbage	Recycling	Green Waste	Annual Charge for Building
52	Fir 1331	Barclay	20	1,192.84	552.68	963.09	2,708.61
53	Fir 1340	Oceana villa (Starlite)	10	596.42	276.34	481.54	1,354.30
54	Fir 1355	Pauline	17	1,013.91	469.78	818.62	2,302.32
55	Fir 1360	La Playa Vista	40	2,385.67	1,105.36	1,926.18	5,417.21
56	Fir 1371	Hillcrest Villa	7	417.49	193.44	337.08	948.01
57	Fir 1378	Chatsworth Manor	12	715.70	331.61	577.85	1,625.16
58	Fir 1448	Dorchester	44	2,624.24	1,215.90	2,118.79	5,958.94
59	Fir 1455	Fir, The	58	3,459.23	1,602.78	2,792.96	7,854.96
60	Fir 1475	White Birch	25	1,491.05	690.85	1,203.86	3,385.76
61	Fir 1544	Juniper Arms	21	1,252.48	580.32	1,011.24	2,844.04
62	Fir 1555	Sagewood Place	36	2,147.11	994.83	1,733.56	4,875.49
63	Fir 1558	Firview	30	1,789.25	829.02	1,444.63	4,062.91
64	Foster 1267	Foster Terrace	21	1,252.48	580.32	1,011.24	2,844.04
65	Foster 1270	Villa Riva	23	1,371.76	635.58	1,107.55	3,114.90
66	Foster 1280	Waterford Place	12	715.70	331.61	577.85	1,625.16
67	Foster 1281	Charter Manor	11	656.06	303.98	529.70	1,489.73
68	Foster 1291	Gettington Square	7	417.49	193.44	337.08	948.01
69	Foster 1321	Crestwood Manor	30	1,789.25	829.02	1,444.63	4,062.91
70	Foster 1331	Kent Mayfair	6	357.85	165.80	288.93	812.58
71	Foster 1341	Cypress Manor	18	1,073.55	497.41	866.78	2,437.75
72	Foster 1368	Kingfisher	31	1,848.90	856.66	1,492.79	4,198.34
73	Foster 1371	Kent Manor	18	1,073.55	497.41	866.78	2,437.75
74	Foster 1437	Wedgewood Pearl	39	2,326.03	1,077.73	1,878.02	5,281.78
75	Foster 1442	W.R. Square II	55	3,280.30	1,519.88	2,648.49	7,448.67
76	Foster 1442	W.R.Square III	46	2,743.52	1,271.17	2,215.10	6,229.80
77	Foster 1461	Foster Manor	20	1,192.84	552.68	963.09	2,708.61
78	Foster 1480	W.R. Square 1	44	2,624.24	1,215.90	2,118.79	5,958.94
79	Foster 1551	Sussex #4	60	3,578.51	1,658.05	2,889.26	8,125.82
80	Foster 1581	Sussex #1	38	2,266.39	1,050.10	1,829.87	5,146.35
81	George 1328	Doral	7	417.49	193.44	337.08	948.01
82	George 1341	Oceanview	36	2,147.11	994.83	1,733.56	4,875.49
83	George 1350	Hillcrest Manor	26	1,550.69	718.49	1,252.01	3,521.19
84	George 1369	Cameo Terrace	18	1,073.55	497.41	866.78	2,437.75
85	George 1378	Franklin Place	26	1,550.69	718.49	1,252.01	3,521.19
86	George 1400	Georgian Place	16	954.27	442.15	770.47	2,166.89
87	George 1440	Georgian Square	16	954.27	442.15	770.47	2,166.89
88	George 1455	Avra NEW	100	5,964.18	2,763.41	4,815.44	13,543.04
89	George 1521	Bayview Place	31	1,848.90	856.66	1,492.79	4,198.34
90	George 1526	Sir Phillip	18	1,073.55	497.41	866.78	2,437.75
91	George 1554	Georgian	17	1,013.91	469.78	818.62	2,302.32
92	Habgood 820	Villa Dardanells	11	656.06	303.98	529.70	1,489.73
93	Johnston 1221	Presidents Court	12	715.70	331.61	577.85	1,625.16
94	Johnston 1426	Saltaire	36	2,147.11	994.83	1,733.56	4,875.49
95	Johnston 1446	Over Com.	4	238.57	110.54	192.62	541.72
96	Johnston 1473	Miramar Phase 2	96	5,725.62	2,652.88	4,622.82	13,001.31
97	Johnston 1493	Above Whaling wall	4	238.57	110.54	192.62	541.72
98	Maple 849	Maple Auto Crt	6	357.85	165.80	288.93	812.58
99	Maple 882	Above commercial	4	238.57	110.54	192.62	541.72
100	Maple 1183	Christina Place	85	5,069.55	2,348.90	4,093.12	11,511.58
101	Marine 14001-47	Ocean Ridge	36	2,147.11	994.83	1,733.56	4,875.49
102	Marine 14435	Roc Sea	8	477.13	221.07	385.24	1,083.44
103	Marine 14485	Apartments	3	178.93	82.90	144.46	406.29
104	Marine 14853	Marine Court	37	2,206.75	1,022.46	1,781.71	5,010.92
105	Marine 14881	Driftwood Arms	22	1,312.12	607.95	1,059.40	2,979.47
106	Marine 14909	Nautica	24	1,431.40	663.22	1,155.71	3,250.33
107	Marine 14965	Pacifica	18	1,073.55	497.41	866.78	2,437.75
108	Marine 15077	Above commercial	4	238.57	110.54	192.62	541.72

	CIVIC ADDRESS	NAME	RES. UNITS	Garbage	Recycling	Green Waste	Annual Charge for Building
109	Marine 15097	Top of the Rock	5	298.21	138.17	240.77	677.15
110	Marine 15117	Sand & Sea	4	238.57	110.54	192.62	541.72
111	Marine 15129	San Juan Terrace	4	238.57	110.54	192.62	541.72
112	Marine 15147	Ocean Villa	6	357.85	165.80	288.93	812.58
113	Marine 15165	Semiahmoo Shores	21	1,252.48	580.32	1,011.24	2,844.04
114	Marine 15395	Apartments	3	178.93	82.90	144.46	406.29
115	Marine 15393	Apartments	3	178.93	82.90	144.46	406.29
116	Marine 15415	Cypress Vista	8	477.13	221.07	385.24	1,083.44
117	Marine 15501	Surfside	8	477.13	221.07	385.24	1,083.44
118	Marine 15517	Over commercial	4	238.57	110.54	192.62	541.72
119	Marine 15621	Pacific Pointe	57	3,399.58	1,575.15	2,744.80	7,719.53
120	Marine 15563	Ocean View Terrace	8	477.13	221.07	385.24	1,083.44
121	Marine 15717	Pacific Sands	15	894.63	414.51	722.32	2,031.46
122	Marine 15747	Promenade	18	1,073.55	497.41	866.78	2,437.75
123	Marine 15777	South Beach	35	2,087.46	967.19	1,685.40	4,740.06
124	Marine 15791	Park Place	7	417.49	193.44	337.08	948.01
125	Marine 15809	Vista Del Mar	32	1,908.54	884.29	1,540.94	4,333.77
126	Marine 15875	Southport	59	3,518.87	1,630.41	2,841.11	7,990.39
127	Marine 15941	Heritage, The	22	1,312.12	607.95	1,059.40	2,979.47
128	Marine 15971	Mariners Estates	14	834.99	386.88	674.16	1,896.02
129	Marine 15989	Mariners Estate	9	536.78	248.71	433.39	1,218.87
130	Martin 1081	Silvermoon	26	1,550.69	718.49	1,252.01	3,521.19
131	Martin 1250	Regency	12	715.70	331.61	577.85	1,625.16
132	Martin 1285	Crest	29	1,729.61	801.39	1,396.48	3,927.48
133	Martin 1290	Seabreeze	6	357.85	165.80	288.93	812.58
134	Martin 1319	Cedars	30	1,789.25	829.02	1,444.63	4,062.91
135	Martin 1322	Blue Spruce	18	1,073.55	497.41	866.78	2,437.75
136	Martin 1330	Coach House	20	1,192.84	552.68	963.09	2,708.61
137	Martin 1351	Dogwood	18	1,073.55	497.41	866.78	2,437.75
138	Martin 1360	Westwinds	32	1,908.54	884.29	1,540.94	4,333.77
139	Martin 1361	Montague Place	8	477.13	221.07	385.24	1,083.44
140	Martin 1381	Chestnut	28	1,669.97	773.76	1,348.32	3,792.05
141	Martin 1390	Kent Heritage	17	1,013.91	469.78	818.62	2,302.32
142	Martin 1424	Patrician	14	834.99	386.88	674.16	1,896.02
143	Martin 1437	Heatherstone	16	954.27	442.15	770.47	2,166.89
144	Martin 1444	Martin View Manor	26	1,550.69	718.49	1,252.01	3,521.19
145	Martin 1460	Capistrano	20	1,192.84	552.68	963.09	2,708.61
146	Martin 1467	Searidge Court	18	1,073.55	497.41	866.78	2,437.75
147	Martin 1497	White Stone Manor	20	1,192.84	552.68	963.09	2,708.61
148	Martin 1509	Martin Manor	42	2,504.96	1,160.63	2,022.49	5,688.07
149	Martin 1550	Sussex #3	25	1,491.05	690.85	1,203.86	3,385.76
150	Martin 1580	Sussex #2	26	1,550.69	718.49	1,252.01	3,521.19
151	Martin 1589	Martin Village	48	2,862.81	1,326.44	2,311.41	6,500.66
152	Merklin 1225	Englesea Manor	37	2,206.75	1,022.46	1,781.71	5,010.92
153	Merklin 1234	Ocean Vista	27	1,610.33	746.12	1,300.17	3,656.62
154	Merklin 1264	Bayswater	6	357.85	165.80	288.93	812.58
155	Merklin 1273	Clifton Lane	35	2,087.46	967.19	1,685.40	4,740.06
156	Merklin 1280	Paterson	28	1,669.97	773.76	1,348.32	3,792.05
157	Merklin 1323	Seville By The Sea	12	715.70	331.61	577.85	1,625.16
158	Merklin 1331	Sea View Manor	20	1,192.84	552.68	963.09	2,708.61
159	Merklin 1351	Merklin Manor	20	1,192.84	552.68	963.09	2,708.61
160	Merklin 1366/86	Elmwood	16	954.27	442.15	770.47	2,166.89
161	Merklin 1379	Rosewood	18	1,073.55	497.41	866.78	2,437.75
162	Merklin 1390	Lincoln	15	894.63	414.51	722.32	2,031.46
163	Merklin 1418/24	Selina Court	4	238.57	110.54	192.62	541.72
164	Merklin 1429	Kensington Manor	26	1,550.69	718.49	1,252.01	3,521.19
165	Merklin 1449	Brendaan Place	12	715.70	331.61	577.85	1,625.16

	CIVIC ADDRESS	NAME	RES. UNITS	Garbage	Recycling	Green Waste	Annual Charge for Building
166	Merklin 1450	Merklin Residence	35	2,087.46	967.19	1,685.40	4,740.06
167	Merklin 1451/97	Hazelmere	24	1,431.40	663.22	1,155.71	3,250.33
168	Merklin 1488	Brockton Place	17	1,013.91	469.78	818.62	2,302.32
169	Merklin 1500	Cimmeron	16	954.27	442.15	770.47	2,166.89
170	Merklin 1531	Berkley Court	18	1,073.55	497.41	866.78	2,437.75
171	Merklin 1576	Embassy, II **	59	3,518.87	1,630.41	2,841.11	7,990.39
172	North Bluff 14824	The Belaire	48	2,862.81	1,326.44	2,311.41	6,500.66
173	North Bluff 14834	Sundial	50	2,982.09	1,381.71	2,407.72	6,771.52
174	North Bluff 14884	North Bluff Residence	27	1,610.33	746.12	1,300.17	3,656.62
175	North Bluff 14990	Mauritz Manor	32	1,908.54	884.29	1,540.94	4,333.77
176	North Bluff 15020	North Bluff Village	54	3,220.66	1,492.24	2,600.34	7,313.24
177	North Bluff 15280	Vista Royale	95	5,665.97	2,625.24	4,574.67	12,865.88
178	North Bluff 15310	Sunset Villa	36	2,147.11	994.83	1,733.56	4,875.49
179	North Bluff 15318	Towerside	12	715.70	331.61	577.85	1,625.16
180	North Bluff 15466	The Summit	42	2,504.96	1,160.63	2,022.49	5,688.07
181	Pacific 15208-28	Ocean Ridge	70	4,174.93	1,934.39	3,370.81	9,480.12
182	Pacific 15213	Pacific View I	23	1,371.76	635.58	1,107.55	3,114.90
183	Pacific 15233	Pacific View II	35	2,087.46	967.19	1,685.40	4,740.06
184	Pacific 15869	Concord Homes	29	1,729.61	801.39	1,396.48	3,927.48
185	Parker 1020	Pacific Vista	9	536.78	248.71	433.39	1,218.87
186	Parker 1040	Tamabuda	4	238.57	110.54	192.62	541.72
187	Prospect 15041	Sea Vista	15	894.63	414.51	722.32	2,031.46
188	Prospect 15050	Contessa, The	8	477.13	221.07	385.24	1,083.44
189	Prospect 15070	Los Arcos	10	596.42	276.34	481.54	1,354.30
190	Prospect 15080	Tiffany	16	954.27	442.15	770.47	2,166.89
191	Prospect 15115	Prospect Manor	15	894.63	414.51	722.32	2,031.46
192	Prospect 15130	Summit View	6	357.85	165.80	288.93	812.58
193	Prospect 15151	Camelot Court	24	1,431.40	663.22	1,155.71	3,250.33
194	Prospect 15161	Ocean Wynd Crt	6	357.85	165.80	288.93	812.58
195	Prospect 15164	Waterford Place	25	1,491.05	690.85	1,203.86	3,385.76
196	Roper 14989	Hilltop Garden	48	2,862.81	1,326.44	2,311.41	6,500.66
197	Roper 15010	Baycrest	19	1,133.19	525.05	914.93	2,573.18
198	Roper 15070	Sandpiper	6	357.85	165.80	288.93	812.58
199	Roper 15130	Carrington House	17	1,013.91	469.78	818.62	2,302.32
200	Roper 15150	Spring Villa	9	536.78	248.71	433.39	1,218.87
201	Roper 15154-58	Sand Dollar	12	715.70	331.61	577.85	1,625.16
202	Roper 15265	Wiltshire House	18	1,073.55	497.41	866.78	2,437.75
203	Roper 15289/99	Apartments	4	238.57	110.54	192.62	541.72
204	Roper 15311-15303	Apartments	4	238.57	110.54	192.62	541.72
205	Roper 15357	Regency Court	35	2,087.46	967.19	1,685.40	4,740.06
206	Roper 15389	Regency Court	21	1,252.48	580.32	1,011.24	2,844.04
207	Roper 15468	Peace Arch Manor	79	4,711.70	2,183.10	3,804.20	10,699.00
208	Royal 15158	Royal Villa	29	1,729.61	801.39	1,396.48	3,927.48
209	Royal 15281	Lyons Apts.	20	1,192.84	552.68	963.09	2,708.61
210	Russell 15111	Pacific Terrace	75	4,473.14	2,072.56	3,611.58	10,157.28
211	Russell 15111	Pacific Terrace	8	477.13	221.07	385.24	1,083.44
212	Russell 15152	Miramar Phase I	129	7,693.80	3,564.80	6,211.92	17,470.52
213	Russell 15321	Skyline	62	3,697.79	1,713.32	2,985.57	8,396.68
214	Russell 15380	Hazel Villa	12	715.70	331.61	577.85	1,625.16
215	Stevens 1450/68	Shaugnessy Estates	10	596.42	276.34	481.54	1,354.30
216	Thrift 14921	Nicole Place	9	536.78	248.71	433.39	1,218.87
217	Thrift 14934	Villa Positano	8	477.13	221.07	385.24	1,083.44
218	Thrift 14950	Monterey Manor	30	1,789.25	829.02	1,444.63	4,062.91
219	Thrift 14957/71	White Cliffe	20	1,192.84	552.68	963.09	2,708.61
220	Thrift 15018	Orco Vista	5	298.21	138.17	240.77	677.15
221	Thrift 15035	Grosvenor Court	14	834.99	386.88	674.16	1,896.02
222	Thrift 15088	Morgan Place	9	536.78	248.71	433.39	1,218.87

	CIVIC ADDRESS	NAME	RES. UNITS	Garbage	Recycling	Green Waste	Annual Charge for Building
223	Thrift 15290	Windermere	17	1,013.91	469.78	818.62	2,302.32
224	Thrift 15291	Loraine Manor	8	477.13	221.07	385.24	1,083.44
225	Thrift 15317	Nottingham	12	715.70	331.61	577.85	1,625.16
226	Thrift 15369	Anthea Manor	27	1,610.33	746.12	1,300.17	3,656.62
227	Thrift 15380	Birchwood	13	775.34	359.24	626.01	1,760.59
228	Thrift 15991	Arcadian	49	2,922.45	1,354.07	2,359.57	6,636.09
229	Victoria 14955	The Sausalito NEW	23	1,371.76	635.58	1,107.55	3,114.90
230	Victoria 14985	Mainsail	9	536.78	248.71	433.39	1,218.87
231	Victoria 15015	Victoria Terrace II	24	1,431.40	663.22	1,155.71	3,250.33
232	Victoria 15025	Victoria Terrace1	31	1,848.90	856.66	1,492.79	4,198.34
233	Victoria 15112	Apartments	3	178.93	82.90	144.46	406.29
234	Victoria 15156	Apartments	6	357.85	165.80	288.93	812.58
235	Victoria 15274	Victoria Apt	4	238.57	110.54	192.62	541.72
236	Victoria 15474A	Malou Apt.	8	477.13	221.07	385.24	1,083.44
237	Victoria 15474B	Apartments	4	238.57	110.54	192.62	541.72
238	Vidal 1153	Monticeto	41	2,445.31	1,133.00	1,974.33	5,552.64
239	Vidal 1350	Sea Park Manor	63	3,757.43	1,740.95	3,033.73	8,532.11
240	Vidal 1351	Sea Park Manor	12	715.70	331.61	577.85	1,625.16
241	Vidal 1353	Sea Park Manor	18	1,073.55	497.41	866.78	2,437.75
242	Vidal 1467-99	Mariners Reach	14	834.99	386.88	674.16	1,896.02
243	Vidal 1480	Wellington	21	1,252.48	580.32	1,011.24	2,844.04
244	Vidal 1520	Sandhurst	39	2,326.03	1,077.73	1,878.02	5,281.78
245	Vidal 1561	Ridgecrest	60	3,578.51	1,658.05	2,889.26	8,125.82
246	Vine 14980	Vinewood	59	3,518.87	1,630.41	2,841.11	7,990.39
247	Vine 15440	Courtyards, The	32	1,908.54	884.29	1,540.94	4,333.77
248	Vine 15445	Shearwater, The	23	1,371.76	635.58	1,107.55	3,114.90
249	West Beach 14644	Apartments	4	238.57	110.54	192.62	541.72
250	Winter 1333	Winter Street NEW	27	1,610.33	746.12	1,300.17	3,656.62
251	Winter 1354	Winter Estates	30	1,789.25	829.02	1,444.63	4,062.91
252	Winter 1355	Summerhill	34	2,027.82	939.56	1,637.25	4,604.63
253	Winter 1389	Hillside House	16	954.27	442.15	770.47	2,166.89
254	New		0	-	-	0	-
255	New		0	-	-	0	-
256	New		0	-	-	0	-
257	New		0	-	-	0	-
258	New		0	-	-	0	-
259	New		0	-	-	0	-
260	New		0	-	-	0	-
261	New		0	-	-	0	-
262	New		0	-	-	0	-
263	New		0	-	-	0	-
264	New		0	-	-	0	-
265	New		0	-	-	0	-
266	New		0	-	-	0	-
267	New		0	-	-	0	-
268	New		0	-	-	0	-
269	New		0	-	-	0	-
270	New		0	-	-	0	-
271	New		0	-	-	0	-
272	New		0	-	-	0	-
273	New		0	-	-	0	-
274	New		0	-	-	0	-
275	New		0	-	-	0	-
276	New		0	-	-	0	-
277	New		0	-	-	0	-
	TOTALS		**6191**	**369,242.53**	**171,082.87**	**298,123.93**	**838,449.32**

Source: December 2013 City of White Rock Multi-Family Residences Recycling List for MMBC

Prepared by
Solid Waste Staff

Worksheet 7
14-Jan-21

City of White Rock 2020 Budget Estimate
TOTAL Cost of Service per Customer
2018

	Annual Cost by Service			
Customer Class	**Garbage**	**Recycling**	**Green Waste**	**Annual Total**
Single Family Residential	112.53	52.14	90.86	255.53
Single Family Residential with Secondary Suite	-	-	-	-
Residential Strata	59.64	27.63	48.15	135.43
Rental Units	-	-	-	-
ICI Customers	2,588.23	1,199.22	2,089.72	5,877.17
TOTAL				

City of White Rock 2020 Budget Estimate
Comparison of Customer Cost
2018

Customer Class	**Current Rate**	**Proposed Rate**	**$ Increase**	**% Increase**
Single Family Residential	100.00	255.53	155.53	156%
Single Family Residential with Secondary Suite		-	-	
Residential Strata	50.00	135.43	85.43	171%
Rental Units		-	-	
ICI Customers	100.00	5,877.17	5,777.17	5777%
TOTAL				

Prepared by
Solid Waste Staff

Worksheet 8
14-Jan-21

City of White Rock 2020 Budget Estimate
Comparitive Statement of Operations
Fiscal Years ending March 31st

		2018						
	Number of Customers	Estimated Revenue						
		Garbage		Recycling		Green Waste		Total
		Annual Rate	Annual Total	Annual Rate	Annual Total	Annual Rate	Annual Total	
OPERATING REVENUES								
Single Family Residential	4,038	112.53	454,403	52.14	210,541	90.86	366,882	1,031,826
Single Family Residential with Secondary Suite	0	-	0	-	0	-	0	0
Residential Strata	6,265	59.64	373,656	27.63	173,128	48.15	301,687	848,471
Rental Units	0	-	0	-	0	-	0	0
ICI Customers	163	2,588.23	421,881	1,199.22	195,472	2,089.72	340,624	957,978
TOTAL	**10,466**		**1,249,941**		**579,141**		**1,009,194**	**2,838,275**
DIRECT OPERATING EXPENSES								
Regular Wages & Benefits			78,260		144,518		143,143	365,921
Casual, Student Wages & Benefits			33,333		33,333		33,333	100,000
Advertising			660		1,268		280	2,208
Program Supplies (assumed Residents)			460		3,076		460	3,996
Program Contract Costs - Facility Collections			22,502		1,537		0	24,039
Tipping Fees - Resident Collections			121,178		263		124,070	245,511
Rental of Equipment			0		0		0	0
Contract Maintenance			0		0		0	0
Allocated Vehicle Operating Costs			37,798		83,039		37,798	158,635
Contingency			0		0		0	0
Program Contract Costs - Resident Collections			51,663		22,159		65,342	139,164
Supplies - Facility Collections			0		0		0	0
Other			0		0		0	0
Tipping Fees - ICI and MF3			525,624		60,455		122,864	708,943
Operating Costs - ICI MF3			237,468		365,638		365,638	968,744
Sub-total			**1,108,946**		**715,286**		**892,928**	**2,717,161**
OTHER OPERATING EXPENSES								
Allocated Indirect/Administration Cost			140,804		90,820		113,376	345,000
Vacation Pay Allowance			4,696		8,671		8,589	21,955
WCB Claims Allowance			0		0		0	0
Other			0		0		0	0
Other			0		0		0	0
Other			0		0		0	0
Other			0		0		0	0
Other			0		0		0	0
Other			0		0		0	0
Total			**145,499**		**99,492**		**121,964**	**366,955**
LESS OTHER OPERATING REVENUE								
Decal Sales Revenue			4,505		0		0	4,505
Sale of Composters			0		0		0	0
Special Events Revenue			0		0		0	0
Chipping and Green Waste Program			0		0		0	0
External Cost Recovery			0		0		0	0
Sale of Recyclables			0		0		0	0
Blue/Red Box Sales			0		0		1,905	1,905
Kraft Bag Sales			0		0		3,794	3,794
Recycle BC			0		166,085		0	166,085
Civic Facilities			0		0		0	0
Other			0		0		0	0
			4,505		**166,085**		**5,699**	**176,289**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES			**0**		**-69,552**		**0**	**-69,552**