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Three-stream Communal Collection: Business Case for Service Privatization Options Within a Regulated Utility

City Operations | Waste Services

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Change History

Version #	Date	Description
1.0	January 24, 2022	• Complete first draft of business case sent for review to the Steering Committee and Waste Services Subject Matter Experts (SME).
1.1	February 2, 2022	• Modified based on feedback from the Steering Committee and SME review. • Added information about private versus franchising model regulation. • Updated costs and assumptions. • Sent to the Branch Manager and Legal Services for review.
1.2	February 10, 2022	• Changes made to the Executive Summary, Section 3, Section 5 and Section 12 based on feedback from the Branch Manager, Steering Committee and Legal Services. • Minor grammatical and wording changes throughout the document. • Sent for signing.

Document Approval

Submitted By:

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1.2	Santosh Appukuttan, Finance Manager, Waste Services	Santosh Appukuttan	February 16, 2022
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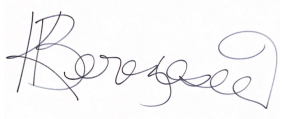
1.2	Krista Berezowski, Director of Technical Services, Waste Services		February 11, 2022

Approved By:

Version #	Approver Name	Signature	Signing Date
1.2	Jodi Goebel, Director of Waste Strategy, Waste Services		February 10, 2022
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Executive Summary

Waste Services has operated as a municipal public utility since 2009. Benefits of the utility structure include mitigating risks inherent in major infrastructure development, incentivizing desired behaviours through variable rates, setting and enforcing consistent standards, providing all residents with access to the same level of service, and ensuring consistent adequate funding for City-wide facilities and services such as Eco Stations, Recycling Depots, and waste education programs.

The City currently provides communal waste collection to approximately 167,000 multi-unit households across almost 3,400 properties. Depending on the property location, collection services are provided by the City using City equipment and staff or by a contractor working on behalf of the City. Contractors collect garbage from approximately 70 percent of units and recyclables from approximately 50 percent of the units that have recycling collection service. Contracts for communal collection are awarded through a competitive bidding process.

All communal collection waste is delivered to the Edmonton Waste Management Centre (EWMC). Some of this waste is mechanically sorted before being further processed.

Edmonton's 25-year Waste Strategy (City Operations report CR_5829) was approved on September 19, 2019. The strategy requires transformational changes to Edmonton's waste management system in order to achieve an ambitious goal of 90 percent waste diversion across all sectors, including customers who receive communal collection. As part of implementing the 25-year Waste Strategy, the *Business Case for Residential Communal Collection* (City Operations report CO00581) was presented to Utility Committee on July 9, 2021 (meeting continuation of June 25, 2021). That business case compared options to increase the diversion rate for the communal collection sector and recommended that the communal collection service transition to a three-stream source-separated collection program.

After presentation and discussion of the business case, Utility Committee passed the following motion:

> *That the Business Case and cost of service study for Residential Communal Collection be referred back to Administration to provide an alternative business model for consideration, which allows for a fully privately operated service within the regulated utility model along with a robust data sharing and accountability framework to ensure that diversion targets contained within the 25 year waste strategy are met.*

The business case presented in this document has been developed in response to the above motion. It builds on the recommendations from the June 2021 business case by considering the privatization of elements of the communal collection program. The approach recommended in the June 2021 *Business Case for Residential Communal Collection* has been included for comparison against privatized services.

Privatization was considered for the following service categories of the communal collection

program:

- Collection;
- Container Provision;
- Processing; and
- Education and Outreach.

Administration examined the legal structure of utilities and options for privatization "within the regulated utility model". It was determined that privatization is incongruous with a utility. If a utility model is paramount, City Council is able to involve private companies in the communal collection program by using a franchise agreement. This would create a parallel utility alongside the City Waste Utility for communal collection. A franchised utility would facilitate greater regulatory control and oversight through the franchise agreement terms and conditions. However, as a franchised utility service, private market competition would be undermined. Alternatively, if privatization and market competition are paramount, regulations could be implemented through a bylaw and permit structure; however,the regulatory framework provided by the bylaw and permit would have a limited scope compared to the oversight available through a franchised utility. Under a bylaw and permit framework, it appears unlikely that the rate could be regulated. But, even if it is possible to regulate rates through conditions, this would be contrary to free market principles intended by privatization.

Waste Services sent a questionnaire to private waste haulers and waste processors, asking them to provide information about their current and future capacity, costs and reporting standards related to the above services. Despite following up and extending the response timeline, the City received very few responses. Due to the limited data provided by the private sector, Administration focused its analysis on the impact of privatization on investments made by the Waste Utility and the opportunities and risks privatization poses to stakeholders.

Options for the privatization of each service were evaluated in a multi-stage process. Upon completing the first stage of evaluation, the status quo options scored higher than any of the privatization options. Nonetheless, all options were included in the more quantitative second stage of analysis to give Administration additional confidence in the final recommendation. The second stage evaluated options in terms of net present value and risk. The net present value (NPV) analysis considered only costs to the City because accurate costs for the development and operation of privately funded services were not available. The risk analysis determined each alternative's risk potential and actual risk. Diversion rate projections were not included in the evaluation, due to a lack of reliable information about the future capacity and performance of private processing facilities.

Once the evaluation of the options was completed, comprehensive packages were built, covering the full suite of services. Every possible combination of options was generated, and five packages were determined to be viable alternatives (others were eliminated based on logical inconsistency, such as private collection with City-provided containers).

After evaluating risks, costs and stakeholder impacts, the recommended alternative is to maintain service provision through the City and its contractors (Alternative 5). This alternative earned the highest total score in the first stage of evaluation and had the lowest risk and an acceptable NPV in the second stage of analysis.

If the recommendation to select Alternative 5 is approved by City Council, preparation for implementation will begin this year with three-stream collection estimated to commence in late 2023 or early 2024. Implementing three-stream collection for properties receiving communal collection requires Waste Services to make property-specific decisions regarding container type, size, placement and collection frequency. The approach to implementation will be as described in the *Business Case for Residential Communal Collection* presented in June 2021.

If City Council directs Administration to pursue privatizing or franchising some or all of the services, it is expected that program elements identified as being critical for success in the *Business Case for Residential Communal Collection* would require additional work and consultation before making any final decisions.

1. Background

1.1. Historic Context

1.1.1. Establishment of the Waste Services Utility

Waste Services has been operated as a municipal public utility since 2009, following approval of a recommendation made in the March 4, 2008 Asset Management and Public Works Department report 2008PW0082. As defined by the *Municipal Government Act* (MGA), a "public utility" is a system or works used to provide specific services for public consumption, benefit, convenience or use. Waste management is explicitly listed in the MGA as one of the services which can be implemented through a public utility.

In the MGA a public utility is further divided into two categories: municipal public utilities and non-municipal public utilities. Municipal public utilities, such as Edmonton's Waste Services Utility, are operated by or on behalf of a municipality. These utilities are not subject to agreements that grant a right to another party to provide the utility service.

The benefits of the utility structure are largely a result of the creation of a predictable customer base and have been previously described (most recently in the April 30, 2021 City Operations Report CO00391) as follows:

- The risks inherent in the long-term planning and financing of major infrastructure are mitigated, supporting investments that enable responsible waste management and aggressive waste diversion targets;
- Waste sorting and reduction behaviors can be incentivized through the rate setting process, which is required to be revenue neutral (i.e. any revenue from behaviour-targeting fees or penalties can be reinvested by the utility for the benefit of ratepayers or returned to the entire customer base through future rate reductions);
- Consistent, community-wide standards for residential waste sorting can be reinforced by proactive and customer-centric education, outreach and service support;
- All residences regardless of size, location or complexity of service need, have access to the same service level; and
- All ratepayers contribute to the costs of, and can access, City-wide facilities and services such as Eco Stations, Recycling Depots and waste education programs. All ratepayers also contribute to the costs of managing the City's closed former landfill and the operations of the Edmonton Waste Management Centre (EWMC).

1.1.2. 25-year Waste Strategy

Edmonton's 25-year Waste Strategy (City Operation report CR_5829) was approved on September 19, 2019. The strategy describes transformational changes that will be required for Edmonton's waste management system to achieve an ambitious goal of 90 percent waste diversion. This goal applies to all sectors: residents receiving curbside collection, residents receiving communal collection, and the Industrial, Commercial and Institutional (ICI) sector. Achieving this goal will be a long-term process and will require full participation by all waste generators in the City.

The Waste Strategy describes a number of significant projects that will contribute to achieving

the 90 percent diversion goal. These include:

- The Edmonton Cart Rollout for curbside customers;
- Three-stream collection for properties receiving communal collection (i.e. multi-unit properties such as condos and apartment buildings);
- Improvements to waste processing;
- Waste reduction; and
- An ICI waste diversion program.

It is important to note that in 2019, City Council made a decision (aligned with a recommendation in CR_5829) that Waste Services should stop providing collection services to the Commercial sector. Instead, the City has been directed to develop a regulatory framework to support the achievement of the diversion target for the ICI sector. As a result of this decision, Waste Services has been winding down its contracts with commercial customers and ensuring measures are in place to avoid mixing the ICI and residential waste streams.

1.1.3. Collection

The City of Edmonton currently provides communal waste collection to approximately 167,000 households across almost 3,400 properties (such as apartments and condos). Up to two streams of waste (garbage and recycling) are collected from these properties. Currently, properties can opt into recycling collection. Approximately 64 percent of communal collection properties, representing roughly 84 percent of communal collection customers, have opted into recycling collection.

There is currently no limit on the quantity of waste collected from communal collection customers. While bins are collected on a regular schedule, additional collection is provided at no cost to a property if a bin becomes full between regular collection days.

The City is divided into four areas (named Areas 11, 12, 13 and 14) for the purpose of providing communal collection services summarized in Table 1 below. Collection services in each area are provided either by the City or by a contractor working on behalf of the City. Contracts are awarded through a competitive bidding process. The percentage of the units serviced by each service provider are provided in Table 2 below.

Table 1: City Communal Collection Areas

Area	Number of Units (rounded to nearest 100)	Number of Properties (rounded to nearest 25)
11	34,900	475
12	47,700	1,075
13	54,900	1,175
14	29,500	650

Table 2: Contractor Communal Collection vs. City Communal Collection

Service Provider	Percentage of Total Units (Garbage)	Percentage of Total Units (Recycling and anticipated for Organics)
City of Edmonton	30%	50%
Private Contractor	70%	50%

The City currently provides all communal collection containers. Minor maintenance requirements and bin delivery/retrieval services are provided by City staff. Major repairs and bin rehabilitation (e.g. painting and welding) are contracted out by the City to third-party service providers.

1.1.4. Processing

All waste from the communal collection program is delivered to the EWMC. Residential garbage arriving at the EWMC can be mechanically sorted at the Pre-Processing Facility (PPF) inside the Integrated Processing and Transfer Facility (IPTF). Recycling is sorted at the Material Recovery Facility (MRF). After being sorted into commodity streams (paper, cardboard, plastic, etc.), the material is then sold on the recycling market.

Other residential waste streams, including electronic waste and construction and demolition waste, are also processed at the EWMC by other companies who lease space for their processing facilities.

1.1.5. Drop-off Facilities

The City operates four Eco Stations, a Reuse Centre, Big Bin Events and 19 Recycling Depots, all of which can be used by communal collection customers to dispose of various waste items.

1.1.6. Education and Outreach

Waste Services offers educational events and tools to Edmontonians in all sectors. These include school programs, tours of the EWMC, the *WasteWise* mobile app and a printable *What Goes Where* poster. Waste Services currently has limited educational resources specific to communal collection and there are currently no education staff dedicated to supporting communal collection customers.

1.1.7. Diversion Rate

It is estimated that approximately 10 percent of communal collection waste was diverted from landfill in 2021. This figure represents the total volume of waste that was recovered out of the total volume of waste generated by residents receiving communal collection. It includes both the collection and processing aspects of the communal collection program as well as contributions from waste drop-off programs such as Eco Stations and Recycling Depots.

1.2. 2021 Business Case

The *Business Case for Residential Communal Collection* (Attachment 1 of CO00581) was presented to Utility Committee on July 9, 2021 (meeting continuation of June 25, 2021). The June 2021 business case compared source separation to centralized processing of mixed waste from communal collection customers and recommended that the communal collection service transition to a three-stream source-separated collection program.

Although centralized processing of mixed waste can result in diversion, the research showed this approach would be insufficient to achieve the long-term goal of 90 percent diversion. Furthermore, since both the Waste Strategy and the City Corporate Business Plan commit to a source separation program, continuing the status quo would be a departure from the approved direction of City Council.

The recommended alternative from the June 2021 business case is described in Table 3.

Table 3: Recommended Alternative from *Business Case for Residential Communal Collection*

Recommended Program	
Three-stream source separation	Mandatory
Co-location of waste containers	Mandatory
Container types and sizes	Range of front load bin sizes for garbage and recycling. Carts for garbage and organics.
Chute closures	Voluntary
Volume limits	Yes, with excess waste program
Dedicated education and outreach	Yes, during launch and ongoing
Potential diversion increase	16%
Costs and Net Present Value (NPV)[1]	$29.2 million Capital $91.0 million Operating & Maintenance $-67.6 million NPV (over 24 years)

Administration conducted comprehensive research to identify and evaluate potential program elements in order to develop this recommendation. Mandatory programs were both the most common and the most preferred approach identified in the jurisdictional scan. Mandatory

[1] Costs and NPV calculation for this Alternative have been updated and are presented in Section 9.

programs reinforce norms, standardize requirements and increase participation. The research showed that it is not feasible to achieve 90 percent diversion without universal participation in source separation programs. This means that all residents receiving communal collection must have access to, and participate in, separating their waste into recyclables, organics and garbage streams. Therefore, a mandatory service was recommended in the business case.

Both research and engagement show how important it is for residents to have equally convenient access to containers for the disposal of all waste streams. Equal access to all streams is referred to as co-location. Co-location means placing containers for garbage, recycling and organics next to each other in the same area or room. It also means that properties with garbage chutes require a mechanism to allow for the disposal of the other streams near the chute location on every floor. Co-location is in contrast to placing a garbage container or having garbage chute access in one location, with organics and recycling containers elsewhere. Co-location encourages participation in sorting and decreases contamination. The recommended alternative included provisions to make co-location mandatory.

Co-location can be facilitated by offering a variety of container types and sizes. Flexibility in container offerings will enable the City to work with property managers to "right size" the containers to suit the layout of each property. The use of smaller containers may also decrease opportunities for illegal dumping. The recommended alternative in the *Business Case for Residential Communal Collection* included a range of sizes of front load bins for garbage and recycling, and carts for garbage and organics.

Waste chutes are constructed in some properties to make waste disposal more convenient for residents. Chutes are typically used for garbage disposal only and the comparatively remote location of recycling containers is a barrier to recycling. However, closing chutes can be a significant undertaking and when co-location is made mandatory, closing chutes does not substantially change the expected diversion rate. Therefore, closing chutes was left as voluntary in the recommended alternative, with mandatory co-location still stipulating that containers for recycling and organics be provided adjacent to chutes if they remain open.

Setting volume limits motivates residents and property managers to participate in source separation programs and to reduce waste. Since the Edmonton Cart Rollout has also adopted volume limits (based on garbage cart size), the use of volume limits could be adopted in the communal collection program. An excess waste program could be developed to provide additional volume when required. All alternatives examined in the *Business Case for Residential Communal Collection* were based on the premise that volume limits would be enforced.

Research and engagement both revealed that dedicated education and outreach for property managers and residents are important for programs to succeed. A targeted and sustained effort with residents is required to overcome challenges such as resident turnover and anonymity. Campaigns should include a comprehensive mix of digital and traditional marketing tactics, as

well as face-to-face interactions. Property managers should be provided with resources to share with residents, access to dedicated customer support and ongoing education.

Finally, the business case noted that while an immediate increase in diversion would be expected, program maturity will require time and depend on a number of factors, including the City's ability to provide processing capacity and educational programs. Together, these factors will shift resident waste behaviours, leading to increased diversion from landfill and decreased contamination in the diversion streams.

When the June 2021 business case was presented to Utility Committee, haulers, landlords, and building owners indicated a desire for more private sector involvement in servicing the communal collection program. In response, Utility Committee passed the following motion:

> *That the Business Case and cost of service study for Residential Communal Collection be referred back to Administration to provide an alternative business model for consideration, which allows for a fully privately operated service within the regulated utility model along with a robust data sharing and accountability framework to ensure that diversion targets contained within the 25 year waste strategy are met.*

This business case evaluates options that could be implemented under the conditions described in the motion.

2. Constraints and Challenges

This section describes the constraints and challenges associated with developing this business case.

2.1. Constraints

The primary constraint impacting the development of this business case was the lack of information available from private haulers and processors. The City sent a questionnaire to both private haulers and processors, asking for information about current and future anticipated capacity, costs and reporting standards. Despite following up and extending the response deadline, the City received very few responses, which impacted the ability to accurately gauge the private sector's ability to collect and process each waste stream, and report on their activities with the level of detail that is required for the City to monitor progress towards the goals of the 25-year Waste Strategy.

Similarly, the lack of cost data provided means that the complete cost of service for communal collection customers, with privatization, cannot be forecast with sufficient confidence. The costs of privatization to the City can be calculated, but the cost of privatization to customers could not be included in the calculations. The costs presented for alternatives involving any degree of privatization are therefore not complete, or comparable to the costs of the status quo.

A secondary constraint impacting the development of the business case was the timeline for completing the work. In conjunction with the timing of the municipal election, the timeline

meant it was not feasible to conduct formal public engagement to inform the business case. If a privatization option is preferred by Council, public engagement is recommended prior to making a final decision based on the potential for significant impacts to residents and properties. Public engagement would also provide Administration with the confidence required to make a sound recommendation.

Another constraint was the result of the lack of fit between the standard procedures used to develop business cases, and the level of information available regarding the options under consideration. A strong business case can be developed when there is a clear program goal and well defined information for each alternative. In this case, the objective of the motion needed to be inferred, and accurate information for privatization options was not available. This means that the evaluation of cost and diversion impacts has been at a strategic level that does not meet the standard to which Administration would typically evaluate and make program recommendations.

2.2. Challenges

The following challenges were encountered while writing the business case:

- Significant work was required to interpret the motion due to the lack of specifics regarding the extent of privatization to be considered, and the incongruity between privatization and the structure of a utility.
- The scope of the work was very broad, and was defined to include waste collection and processing, container provision, and education and outreach.
- No other jurisdictions were identified that offered a fully privatized service within a regulated utility for residential waste collection. There were no reference cases to learn from or to base assumptions on.
- The scope of the City's role as a utility regulator, while maintaining a fully privately operated service, was difficult to define, as there were no other examples of this approach.
- It was difficult to project anticipated diversion rates for private processors since those facilities have not yet been proposed or developed. Further, Administration had no information on which to base reasonable assumptions about the type or capacity of future private processing facilities. These facilities would also be impacted by the potential future implementation of province-wide regulations, e.g. Extended Producer Responsibility (EPR), which are expected to set province-wide recovery targets for packaging, paper products and single-use plastics (PPP and SUP). While the introduction of EPR may drive the development of more processing capacity for some materials, insufficient detail is available at this time regarding the specific materials that will be included and the recovery targets. There is nothing equivalent planned at the provincial level to drive investment in organics processing capacity.

2.3. Opportunities

The development of the business case presented Administration with the following opportunities:

- Develop an understanding of the difference between franchising a utility versus contracting out services through the City versus privatization, as described in Section 3.1; and

- Provide various means for industry to provide information regarding collection and processing capacity and reporting capabilities to Administration, to be used in preparing a recommendation in the best interest of residents.

3. Initiative and Scope

3.1. Initiative Description

The work presented in this business case includes the development and evaluation of business models in which the private sector plays a larger role in delivering services to communal collection customers, within the context of a regulated utility model. Should privatization be pursued, there would also be a need to develop a data sharing and accountability framework that would allow the City to monitor progress towards its goals. Enforcement mechanisms and practices would also need to be developed and implemented.

The types of communal collection services that could potentially be privatized fall into four primary categories:

- Collection (three streams: garbage, recycling, organics);
- Container Provision;
- Processing (recycling, organics and potentially garbage, for the production of refuse derived fuel); and
- Education and Outreach.

The following definitions were developed to establish a clear interpretation of the motion:

- "Privately operated service" means a service in which contracts are between customers and the service provider they select. For example, this can mean contracts between property owners/managers and haulers, and contracts between haulers and processors. Privately operated services are in contrast to the status quo, in which the City delivers services using its own equipment and staff, and contracts private operators as agents of the City to deliver portions of the utility's residential waste collection services.
- A "regulated utility" means that the rates and services (including service standards) are approved and overseen by a governing body. In this specific case, the governing body is City Council. City Council relies on oversight and recommendations provided by the Utility Committee but retains ultimate authority over the waste utility.
- A "robust data sharing and accountability framework" involves the establishment and application of a strong and regular reporting methodology that allows the Utility regulator (in this case City Council) to track progress towards a set of established goals. The regulator must have the tools and resources to enforce compliance with the regulated service standards, to ensure progress towards the program objectives.

This initiative does not evaluate options for franchising communal collection service because the Utility Committee requested an expanded business case considering privatization. Privatization of an existing utility service is very different compared to franchising a utility service. Privatized services would not fall under the scope of the existing Waste Utility and would not create a separate utility. Franchising would continue the existence of a utility for communal collection services by granting an exclusive right to one or more entities to provide that utility service in accordance with a franchise agreement between City Council and a

franchisee. If communal collections were franchised, the result would be two utilities: one operated by a private entity delivering communal collection, the other operated by the City for curbside collection. The two utilities would operate independently and would not be accountable to each other. Each utility would be independently accountable to City Council.

The City does not currently grant a franchise to private entities to deliver waste services. Current City contracts with collection service providers are not franchise agreements. They are instead a means for the City, as the waste utility provider, to carry out part of the City's utility obligations. The difference is that a franchise agreement grants an exclusive right to an entity for them to create and operate their own utility service (subject to requirements specified in the franchise agreement) whereas a service contract between the City and a contractor results in the City retaining control over all aspects of the waste utility.

Privatization is different from franchising because any entity licensed to handle waste is free to compete for customers; no exclusive right exists to deliver the service. Under the status quo, only the City waste utility (i.e. Waste Services) is accountable and answerable to the governing authority (City Council); the City's collection contractor is merely a mechanism for the City to deliver its utility to customers and it does not answer to City Council as the utility regulator. With privatization, there is no utility and no private entity is subject to direct governance by City Council over rates and service levels.

In summary, a franchise agreement gives much greater control and oversight powers compared to privatization. Privatization provides less control than franchising because performance and regulatory constraints are imposed through a bylaw and permitting structure with conditions imposed on the permit holder. With privatization, business conduct would only be influenced through vigorous enforcement of bylaw requirements with fines and sanctions in a reactive manner. With privatization, no private entity would be directly answerable to a governing body controlled by the City such as Utility Committee.

From an external perspective, a switch to a franchise model may not make a significant difference to residents, assuming that a franchisee has sufficient equipment and resources to deliver services that are comparable to what the City currently provides. However, from an operational perspective, a franchise agreement would remove the City from its role as operator of the Waste Utility for any services described within the franchise agreement. If franchising was adopted, a new regulatory framework to oversee the private franchisee would be necessary to guard against potential abuses that can result from granting a monopoly over a utility service through a franchise agreement.

As per the motion passed by the Utility Committee, and although seemingly not permitted under the MGA, this business case assumes that it would be possible to regulate fully private services at a level equivalent to that of the current Waste Utility, including setting the rate.

3.2. Anticipated Outcomes

As noted above, the assumption is that modifications to the status quo City Waste Utility model for communal collection services would implement service parameters that drive diversion rates, such as volume limits, collection frequency, co-location of containers and the number of streams, and would be implemented as described in the business case attached to CO00581

through amendments to the Waste Services Bylaw. If privatization is implemented, it seems likely that amendments to the business licence bylaw or drafting a stand-alone bylaw would also be necessary. These changes would create a permit structure with conditions on private waste haulers to require that services be provided in a way that will lead towards the achievement of the goals of the 25-year Waste Strategy. A separate bylaw is not required if Waste Services delivers communal collection because Utility Committee can impose constraints through its powers of oversight and approval of strategy plans prepared by the City Waste Utility.

Parameters for increasing diversion through the communal collections program have been designed to achieve the following outcomes:

- Clear and consistent expectations, enforcement, outreach and education, resulting in a decrease in the amount of garbage set out by residents;
- Equity for residents between the curbside and communal collection programs;
- Cleaner feedstock for organic processing facilities, resulting in increased processing efficiency and a higher quality end product;
- Effective separation of recyclable materials from garbage to increase the amount of recyclables that can be processed and sold to end markets;
- Improved preprocessing at the IPTF due to reduced garbage volume;
- Improved production of refuse derived fuel (RDF) as a result of reduced moisture content in the garbage stream;
- Effective up front planning with regards to serviceability and optimal impact on usable space in new developments as a result of enforceable Developer Standards; and
- Improved responsiveness to the needs and constraints of complex developments, including mixed-use properties, where innovative design approaches are required to achieve serviceability and program outcomes without compromising city building outcomes.

Privatizing the service could impact the ability to achieve the anticipated outcomes both positively and negatively. Potential opportunities are highlighted in Section 5.3; risks are described in Section 10.

3.3. In Scope

Table 4 describes the scope for this business case.

Table 4: In Scope Items

Component	In Scope
Customers	• All residential properties which are currently being serviced or will be served in the future by the communal collection program. This includes the residential units in properties that contain both residential and commercial units (referred to as mixed-use properties).
Collection	• Reach out to waste haulers to determine current activity, anticipated future capacity and ability to report at required level of detail;

Component	In Scope
	• Identification of preferred contract structure (between property and hauler, or between city and hauler); and • Complete high-level research into the franchise model.
Container Provision	• Identification of preferred model for container provision (City provides no containers or City provides some or all containers).
Processing	• Reach out to processors to determine current level of activity, anticipated future capacity and ability to report at required level of detail; and • Identification of preferred model for processing services (haulers choosing their own processing facilities or the City deciding which facilities haulers use).
Education and Outreach	• Identification of preferred model for providing education and outreach to communal sector residents and property managers.
Risk	• Evaluation of risks associated with various contract structures.
Financial	• Stranded costs analysis; • Revenue requirement (RR) analysis for services remaining with the City (e.g. drop-off facilities); and • Overall cost impact to residents analysis.

3.4. Out of Scope

Table 5 describes the items that are managed separately and that are out of scope for this business case.

Table 5: Out of Scope Items

Component	Out of Scope
Customers	• All residential units that are in scope of the Edmonton Cart Rollout project; and • Non-residential customers, including commercial units in mixed-use properties.
Collection	• Changes to waste drop-off programs such as Eco Stations, Recycling Depots, the Reuse Centre, Big Bin Events and the Residential Transfer Station; • Method of separating organics and recyclables (i.e. collection and processing of three streams of source-separated waste was determined to be preferable to single-stream collection in the 2021 business case);

Component	Out of Scope
	• Analysis of the cost of collection performed by City crews and contractors; and • Analysis of the percentage of collection performed by City crews and contractors.
Implementation	• A detailed implementation plan for the recommended option.
Processing	• Changes to existing processing infrastructure including contracts, equipment and resources.
Utility Model	• Analysis for the deregulation of communal collection.
Rate	• Changes to the rate charged to communal collection customers.
Environmental	• Evaluation of diversion rate impacts of various contract structures; • GHG emissions associated with collections and processing; and • Other engine exhaust pollutant emissions related to transportation.
Strategic	• Solutions for on-site management of organic waste for properties that receive communal collection; • Solutions for waste reduction for properties that receive communal collection; • Updates to the Waste Management Policy C527[2]; • Diversion rate calculation methodology for communal collection and proposed methods for measuring the diversion (presented separately at the same time of this business case); and • Solutions for cost recovery of stranded capital assets and workforce consolidation as a result of service privatization.
Regulatory	• Updates to Waste Services Bylaw 18590 (to follow at a later date based on the alternative approved by City Council). • Strategy and drafting of a new bylaw to regulate private waste haulers through permitting and conditions intended to achieve a comparable outcome with respect to robust data sharing and a regulatory framework.

3.4.1. Cost of Service Study

The motion mentions a Cost of Service Study (COSS) that was to be referred back to Administration as part of developing a new business case. Waste Services has not completed a COSS at this time because it relies on operational data to allocate indirect costs of the utility to different customer classes. With the recent implementation of the Edmonton Cart Rollout project for curbside customers, it is anticipated that the quantity of waste collected and

[2] Waste Management Policy C527

processed from the curbside and communal customers may change and materially impact the allocation of costs between the different customer classes. At least one year of operational and financial data following the implementation of the Edmonton Cart Rollout project is needed to meaningfully inform the COSS and resulting cost allocations.

Instead, a projection of costs for both capital and operating, including stranded costs was completed by Financial and Corporate Services to provide the necessary information about the alternatives presented in this business case.

3.5. Critical Success Factors

The following factors have been identified as being critical to the success of a fully privately operated service for communal waste collection customers:

- Application of findings and recommendations from the *Business Case for Residential Communal Collection* associated with CO00581;
- Council, Administration and stakeholders understand the impact privatization might have on residents, including curbside customers;
- Council, Administration and stakeholders understand the difference between privatization and franchising;
- Council, Administration and stakeholders understand the challenges and requirements with remaining a regulated utility for curbside waste collection, processing and disposal, while enabling a franchise or private model for the communal customers;
- Strong and collaborative relationships between the City and haulers and processors to ensure the objectives of the program are met;
- The development and enforcement of a strong data sharing and accountability framework. The framework would have to determine if registration or permitting processes for haulers and processors to service communal collection customers is feasible and how it could be implemented;
- Capacity of the private sector to provide containers and collection, processing and education services to all communal collection customers; and
- Risk identification and management during program planning and implementation.

4. Strategic Alignment

Mandatory source separation of waste is aligned with, and critical to support, the City of Edmonton's strategic goals as outlined in the original business case presented in City Operations report CO00581. This section addresses the extent to which privatizing communal collection services aligns with the City's strategic goals.

Strategic alignment of privatized communal collection services was reviewed in the context of the following documents: ConnectEdmonton (Edmonton's strategic plan for 2019-2028)[3], the Corporate Business Plan, the City Plan, the Energy Transition Strategy[4], and the 25-year Waste Strategy[5]. These documents share four foundational goals for Edmonton's future: healthy city, urban places, regional prosperity and climate resilience.

[3] Connect(ed) Edmonton - Edmonton's Strategic Plan 2019- 2028
[4] Edmonton Community Energy Transition Strategy 2021
[5] CR_5829 Waste Strategy - Comprehensive Waste Management Strategy 2019

Implementing mandatory source separation of waste for properties receiving communal collection through private services is less aligned with the goal of Climate Resilience than the same services offered through the Waste Utility, based on the compromised environmental outcomes privatization is expected to achieve, given the lack of processing facilities and regulatory framework.

Proponents have indicated that the privatization of services would better support goals related to Urban Places and Regional Prosperity. They claim that privatizing services offers more flexibility, ensuring that Edmonton's Urban Places are not encumbered by design standards related to waste collection. In fact, both the City and the private sector will require adaptation to serve new styles of development as Edmonton's built form transforms in the manner outlined by City Plan[6]. Waste Services is prepared to adapt collection services while maintaining a commitment to achieving environmental outcomes.

The impact to City Council's goal of Regional Prosperity is also tempered by the already high level of private sector participation in Edmonton's waste system, which includes competitively awarded contracts for waste collections and the operations and maintenance of various facilities at the Edmonton Waste Management Centre.

5. Context Analysis

5.1. Constraints

The most significant constraint is associated with the lack of any established legal mechanism to have a fully privately operated service within the regulated utility model. The interplay between privatization and the utility structure is described in the following paragraphs.

To achieve private service delivery the clearly available options are limited to either (i) a franchise agreement (resulting in the establishment of a parallel utility) or (ii) permitting private haulers to directly contract with customers (which would mean that communal services would no longer be part of the existing Waste Utility). The motion indicates that the desired goal of regulating the private sector is to facilitate "robust data sharing and accountability" to ensure that diversion targets contained within the 25-year Waste Strategy are met. The motion further requires that management of the communal sector would be the responsibility of "the regulated utility" which we understand to mean the existing Waste Utility. There is an inherent constraint in the motion's desire to facilitate privatization while retaining significant control over private actors through the Waste Utility. It does not seem practical and may not be feasible to establish a system of direct oversight and robust accountability, managed directly by the existing Waste Utility. There are no comparable models to evaluate and adopt that Administration is aware of.

Operating privatized services "within" a public utility is not contemplated by the MGA

[6] Charter Bylaw 20000 - Edmonton City Plan 2020

provisions authorizing public utilities. The current regulatory structure governing the City's Waste Utility (City Council and Utility Committee) is not able to accommodate an accountability framework as described in the motion, as the private entity's contractual relationship would be with property owners, not with the Waste Utility or with the City of Edmonton. Creating a business licensing and permit process for private waste haulers might be able to provide some elements of accountability to the City but not to the same extent that the Waste Utility is currently responsible to Utility Committee and City Council. A business licensing and permitting bylaw would not give Utility Committee or City Council powers to oversee and regulate contracts between private companies and owners of properties that receive communal collection. Accountability would instead be achieved through enforcement against property owners based on the Waste Services Bylaw and against private companies by enforcement of permit conditions that would need to be established in a bylaw. The City would be unable to modify the obligations imposed on private companies, or seek additional data to measure diversion goals without going through the process of updating a bylaw. Such a licensing or permitting process would not be able to regulate the service rates and service standards required to achieve the outcomes of the Waste Strategy and the principles of the Waste Management Policy. Fully privatizing services, however, would allow all service providers to compete in the market and properties would be free to choose a service provider of their choice.

In contrast, franchising allows City Council to regulate services and set requirements for the service providers that are part of the franchising agreement. The City would enter into franchising agreements with one or more service providers and grant them the exclusive right to operate the services as specified. Rates and service level standards would be regulated by the franchising agreements and an accountability framework can be developed to hold the franchisees accountable. Service providers who do not succeed in receiving the award of a franchise agreement would not be able to compete in the market.

As per the motion passed by Utility Committee, and although seemingly not permitted under the MGA, this business case assumes that it would be possible to regulate fully private services at a level equivalent to that of the current Waste Utility. It also assumes that although services are fully privatized, the Waste Utility would be able to direct aspects such as:

- The number of waste streams collected;
- Service levels (e.g. collection frequency, volume limits and collection of items dumped illegally beside bins);
- Program requirements such as co-location of collection containers; and
- Service rates charged to customers.

The following additional constraints flow directly from the motion:

- Waste from the ICI sector and from communal collection customers cannot be co-collected. There are several reasons for this, stemming from existing Waste Services regulations and policies as well as operational effectiveness considerations:
    - As per Waste Services Utility Fiscal Policy, non-ratepayers' use of assets that are funded by waste ratepayers is only permitted if the cost of the non-regulated use is funded by user fees. This means that processing capacity at the EWMC, which is funded by the residential sector, can only be used to process waste from the ICI sector if the ICI sector pays for the use. Therefore, any loads containing

waste from both communal collection customers and the ICI sector could not be processed at the EWMC unless the City was compensated for processing the ICI portion of the waste.
    - It is not possible to accurately monitor contamination by sector if ICI and residential waste streams are mixed during collection. Without contamination data, it becomes impossible to effectively target education and enforcement to help residents improve their sorting behaviour. Sorting behaviour is critical to the achievement of the goals of the 25-year Waste Strategy.
    - The facilities at the EWMC are designed to accommodate projected quantities of residential waste. Allowing residential and ICI waste to be mixed would change the quantity of incoming waste in a manner that may compromise the ability of the facilities to achieve optimal performance.
    - Co-collecting communal customer waste and ICI waste would mean the diversion rate could not be directly calculated separately for each sector, meaning the City would not be able to accurately track progress towards the objectives of the Council-approved 25-year Waste Strategy.
- Reporting must be at a frequency and level of detail that allows the City to track metrics such as the diversion rate and adjust service levels as necessary to achieve the goals; and
- Since the utility rate paid by communal customers covers more than just collection and processing, the costs for the program elements that are not privatized will continue to be recovered through a utility rate. Furthermore, if existing assets related to either collection or processing are stranded due to privatization of services, their value will need to be recovered.

5.2. Challenges

External to the City's authority, the lack of landfill bans in Alberta means that there is no mechanism to ensure that source-separated organics and recycling are kept separate from garbage. Without provincial regulations to prevent this, source-separated organics and recyclables could be landfilled due to the appeal of low landfill tipping fees (compared to processing costs). Research has shown that bans prohibiting organics and recyclable material from entering landfills have been a successful tool in ensuring the success of source separation programs. These regulations are often introduced at the provincial or regional level to ensure that all disposal facilities within a region have the same rules. The City continues to engage with its neighbours to explore regional alignment, as defined by the Edmonton Metropolitan Regional Board's 2019 Metropolitan Region Servicing Plan. This work includes a review of landfill bans on successful waste diversion, establishing common reporting protocols and regional advocacy to the Provincial government for Extended Producer Responsibility legislation. Without adequate control over the destination of waste from communal collection customers, the City cannot ensure that the waste is appropriately processed and diversion goals are achieved.

A Provincial regulation mandating Extended Producer Responsibility (EPR) for PPP and SUP is expected to be published in 2022. This regulation would require importers and producers of PPP and SUP to manage those items at the end of their life and achieve specific outcomes related to recycling. Implementation of the regulation is expected to take approximately two years, with a significant transition period. While EPR regulation will provide some assurance about the management of residential PPP, it is not yet clear how services will be delivered or how

communal collection will be provided. Timelines are also uncertain. Therefore, this challenge currently applies to both organics and recyclables, but may apply only to organics in the future.

Another challenge associated with privatization is that those properties most at risk of losing access to an affordable, equitable service include properties with containers in harder to service areas (e.g. tight areas, low clearance or indoors), properties with high turnover of residents (resulting in more waste and higher rates of contamination) and properties with inconvenient service locations. Some of these properties are the least able to afford to pay more. Furthermore, residents are accustomed to thinking of waste as a City issue and will likely expect the City to resolve problems associated with servicing. However, if collection is privatized, the City would no longer have the ability to address such issues.

As the private sector increases its processing capacity, the diversion rate may not simultaneously increase. Any new facilities will likely be outside the City, due to the size of the site required. As a result, they would not be subject to regulation by City bylaws intended to achieve a higher diversion rate, such as by requiring beneficial end use (e.g. no landfilling of finished product), regulating the quality of the end product, or requiring the facilities to be capable of processing highly contaminated streams.

The *Business Case for Residential Communal Collection* identified that container co-location, volume limits and consistent separation requirements across sectors are critical factors to maximizing diversion. These program elements cannot be guaranteed if the service is privatized. The lack of ability to ensure core components of the previous recommendation means that the alternatives with privatized services will not achieve the same outcomes.

Furthermore, the City has identified the need for dedicated outreach to communal collection customers to maximize participation and improve sorting habits. The City has a Waste Education and Outreach team that is prepared to deliver specialized programs of consistent quality to all customers. The delivery of outreach programs by the City would provide consistency across the sector. Privatizing outreach could lead to fragmented or inconsistent programming, leading to lower participation and increased contamination.

The decision to privatize collection or processing may also delay the implementation schedule. The Waste Strategy and the City Corporate Business Plan commit to commencing the implementation of mandatory source separation for communal customers by 2023. This timing is aligned with recent changes for curbside collection customers (the Edmonton Cart Rollout) and changes planned for the ICI sector. Implementation across sectors on similar timelines allows for consistent educational programs, provides equitable service, closes gaps and ensures resident habits are supported across sectors. If changes to the communal collection program are delayed, the ongoing disparity of services between residential programs may have a negative impact on residents' willingness to participate in the source-separated curbside collection program, and there will also be less rationale for mandatory source separation for the ICI sector.

A delay in implementation may also have a direct impact on current contracts Waste Services has with private operators who collect garbage and recycling from properties receiving communal collection. Contracts for Areas 11 and 13 expire in 2023. While the contracts can be

extended, the uncertainty of the timeline presents operational challenges.

5.3. Opportunities

The privatization of services could provide some opportunities and benefits to Edmontonians. These include:

- Potential for the provision of more flexible services, which could benefit residents and property managers. For example:
    - A more variable collection fleet with vehicles in a range of sizes (smaller sizes may be desirable for compact properties);
    - The ability to offer a wider variety of collection container types, such as underground containers, which may require specialized collection vehicles; and
    - Flexible pricing reflecting service level and cost of service, based on property size, location or quantity of waste generated.
- Increased competition between haulers could increase their efficiency;
- The establishment of relationships between properties and haulers and between haulers and processors could provide haulers with the ability to work with different processors in the region, which could result in reduced travel time and fuel consumption and enable private alternatives to expand the regional capacity for waste processing where investments at the EWMC may otherwise have been required in the future; and
- As a result of increased funding options, the private sector may be able to develop processing capacity more quickly and deploy technologies that have the ability to manage streams with high contamination.

In addition, the privatization of communal waste services could benefit the City by freeing up facility space and other resources to accommodate growth in other operational areas as a result of no longer being required to maintain a fleet or container inventory for communal collection.

5.4. Information from Haulers and Processors

Although it was not feasible to conduct broad public engagement during the development of the business case, Waste Services reached out to various waste collection and processing companies in the region with questionnaires to provide information that would help Waste Services complete its analysis for this business case.

The questionnaire sent to processors asked questions related to current and projected processing capacity for recycling, organics and garbage, the level of contamination accepted, how residuals are managed, how diversion rates are calculated and how diversion could be reported specifically for the communal sector if the service was privatized. Information about the cost for processing contaminated and non-contaminated loads was also requested.

The questionnaire sent to waste haulers gauged their interest in privatizing the waste collection service for communal waste customers in Edmonton and asked questions about their capacity and ability to expand, preferred waste processors (i.e. City of Edmonton or private), how program requirements set by the Utility would be monitored and enforced, how contaminated loads would be noted and managed and how data would be reported to the City. Information about cost structure and how costs might vary for different communal waste customers in Edmonton was also requested.

Very few haulers and processors responded to the voluntary questionnaire. Of the responses received, many were incomplete and some lacked objective details. Therefore, the information could not be used to to complete the analysis in this business case to the extent planned.

Processors mainly noted that, assuming that the City would set strict rules for contamination levels and source separation standards and would have enforcement mechanisms to ensure properties, haulers and processors all adhere to the rules, a privatized collection service would not greatly impact their operations. These rules could be put in place via enforceable bylaws, so that all haulers are competing on a level playing field. Some processors mentioned that having a contract with the City for the provision of organic waste feedstock provides predictability and stability, which allows them to make long-term investments.

The processors did not submit conclusive information about current and future processing capacity for the different waste streams from communal customers. However, responses indicated that securing additional capacity is possible to meet the general demands of waste management (i.e. processing and landfilling) in the region. While a decision by the City of Edmonton to allow the private sector to process organics would help drive new investments, it cannot be assumed that there is appetite for investment in private facilities specifically to service communal collection customers.

Furthermore, information about how processing facilities would record and report diversion rate data for communal collection customers was not submitted and, therefore, could not be included in the analysis of this business case.

Responses from haulers indicated a very strong preference for privatizing waste collection from communal collection customers, but did not elaborate on other sections of the questionnaire. Information on monitoring, enforcement, data reporting and cost was requested via the questionnaire, but was not submitted.

5.5. Private Capacity

A critical part of the contextual analysis for this business case is the capacity of the private sector to deliver all of the services required for communal waste collection. These include collection and hauling, processing, container provision, and education and outreach.

The City has some understanding of the private sector's capacity, based on the existing collection and processing contracts, and the limited information that was provided in response to the questionnaire. All information regarding private capacity that was used in the development of the business case is subject to change, because the private sector could be expected to increase its capacity in response to the result of this business case or other opportunities.

Factors that could impact the development of private capacity, if they occur, include:

- City requirements for the ICI sector to source-separate organics and recycling;
- Potential provincial landfill bans on organics or specific types of recyclables; and
- Provincial Extended Producer Responsibility (EPR) regulation requiring increased recycling of packaging, paper products and single-use plastics.

Factors that could limit the development of private capacity include:

- In its capacity as a utility regulator, the City will set high standards for the contamination rate of finished products; and
- The current policy requiring ICI and residential waste from communal collection customers to be kept separate.

6. Options

Options were developed for each category of service that is provided to communal collection customers:

- Collection;
- Container Provision;
- Processing; and
- Education and Outreach.

The options for each service category are described in Table 6. As shown in the table, the detailed options describe a wide variety of ways the Waste Utility could manage rates, material flow and container provision, in combination with how contracts could be structured between service providers, customers and the City. Condensed options focus strictly on the contractual relationships and were developed when the first round of analysis revealed that many of the details had little impact on the evaluation. The condensed options are presented to make it easier for readers to understand the material differences between options and do not preclude consideration of any of the detailed options. Definitions of the detailed options are provided in Appendix A.

Table 6: Options for Service Categories

Service	Detailed Options	Condensed Options	Condensed Option Code
Collections	Properties contract hauler(s) with regulated rates	Collection contract between property and hauler(s)	C1
	Properties contract hauler(s) with fixed rates		
	Properties contract hauler(s) with submitted rates		
	Properties contract own hauler(s), City or private		
	City contracts hauler(s) for collection	Collection contract between City and hauler(s)	C2
	Status Quo: current contractor/City split for communal waste collection		

Service	Detailed Options	Condensed Options	Condensed Option Code
Processing	Processing at EWMC is not mandatory	Hauler(s) are free to choose their own facilities	P1
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Hauler(s) are required to use the EWMC	P2
	Status Quo: all garbage brought to IPTF at EWMC		
Container Provision	City provides no containers	City provides no containers	CP1
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	City provides containers	CP2
	City provides containers only to properties it collects from		
	Status Quo: City provides waste containers (carts and bins) to all communal collection properties		
Education and Outreach	City provides no education or outreach programs, left to multiple entities	City provides no education or outreach	EO1
	City provides no education or outreach programs, left to single entity		
	City provides education and outreach only to properties it collects from	City provides education and outreach	EO2
	City provides education and outreach only for particular streams (one or two of recycle, organics, garbage)		
	City provides education material, distribution is left to anyone		
	Status Quo: City provides all education and outreach programs		

7. Options Analysis Methodology

The options analysis used a two-stage approach. In the first stage, the detailed options were evaluated against a wide range of criteria. In the second stage, the condensed options were evaluated in terms of their risk and cost.

As described in Section 5.4, and in support of the options analysis, Waste Services requested information from private haulers and waste processors about their current capacity and future plans through a questionnaire. The information collected through these conversations and the questionnaire was used to inform the options analysis as much as possible. However, Administration's ability to quantitatively evaluate options involving privatization was limited due to the lack of information about private sector operators.

7.1. Stage 1 Process and Results

The detailed options presented in Section 6 were evaluated against the criteria in Table 7.

Table 7: Criteria for Stage 1 Analysis

Criteria	Definition
Satisfies Utility Committee Motion	An evaluation of whether or not the proposed option satisfies the Utility Committee motion, with a focus on a fully privately operated service and regulated utility model. The remainder of the motion was considered administrative responsibilities.
Revenue Requirement Impact	A high-level evaluation on the option's impact on the Waste Utility's revenue requirement. These impacts could be caused by stranded costs, reduced ratepayers, etc.
Protection of Communal Waste Customer Interests	A high-level evaluation of the option's impact, specifically to communal collection waste customer interests, in regards to matters such as rate consistency, missed collection, property damage and enforcement of the preservation of these interests.
Diversion Rate Impact	A high-level evaluation of the option's impact on the communal collection diversion rate, specifically for reaching the 90% diversion rate goal.
Enforceability of Program Requirements	A determination of how difficult an option makes enforceability (by the City) of requirements to meet the objectives of the 25-year Waste Strategy and adherence to bylaws, i.e. the ability to hold service providers accountable.
Logistical Complexity	A determination of how much the option increases the logistical and administrative complexity for the City, e.g. routing, reporting program success metrics, tracking GHG emissions, etc.

Each detailed option was evaluated against each criterion on a scale of one to five by a group of subject matter experts within Waste Services in a series of structured workshops. Information received from private haulers and waste processors was also taken into account. Notes and results were recorded transparently and in detail to allow the project team to provide critical feedback and make adjustments as necessary.

Of the 19 detailed options presented in Table 6, 13 needed to be considered independently for each of the three waste streams. This resulted in 45 options across all four service categories and three waste streams. During Stage 1 scoring it became apparent that Processing and Container Provision options would score differently based on which Collections options they were paired with. For this reason, the Processing and Container Provision options for each waste stream were evaluated in the context of each of the six Collections options, resulting in a total of 150 options. For example, the Container Provision option "City provides containers only to properties it collects from" scores differently depending on whether or not the City is involved in providing collection services. Table B1 in Appendix B presents all 150 options and the results of Stage 1 analysis. The scoring of the 150 options revealed that similar options across different streams scored the same; based on those similar scores, options were then combined into groups.

At this stage of the analysis, the status quo groups for each service category scored higher than any of the privatization groups. Within the privatization groups, there was little difference between the options. Nonetheless, the decision was made to conduct a more quantitative analysis of all of the options in Stage 2 which would allow a final recommendation to be made with more confidence.

To proceed to Stage 2, the grouped options were combined into condensed options, which combine options with similar contractual arrangements and intent. Table 6 displays how groups were combined into condensed options.

7.2. Stage 2 Process and Results

The Stage 2 analysis focused on cost, as defined by the Net Present Value (including the cost of stranded assets), and risk. These criteria are defined in Table 8.

Table 8: Criteria for Stage 2 Analysis

Criteria	Definition
Net Present Value (including cost to strand assets)	A detailed evaluation of the expenses and savings that an option incurs over a period of time to present a value based on today's dollar value. The NPVs for this analysis run a duration of 24 years; stranded costs are included in the values where applicable. The NPV analysis only includes costs to the City as the cost of private services to customers could not be estimated.
Risk Register	A detailed evaluation of the risks that implementing an option creates.

The analysis for Stage 2 evaluated the condensed options. If City Council wishes to proceed with an alternative that includes privatization, further analysis of the privatization options is required in order to develop a recommendation. The analysis for Stage 2 was conducted by subject matter experts within Waste Services.

Note that diversion rate projections are not included as a criterion in the evaluation due to a lack of reliable information about the future capacity of private facilities. The lack of reliable information means that Administration was not able to make reasonable predictions regarding future private facility processing capabilities. For example, no private facilities have been established in the Edmonton region to date that use preprocessing equipment for the organics stream; this technology is only in place at the EWMC. Similarly, there are no private facilities capable of producing refuse derived fuel from residual waste.

As there is currently no private processing equipment in the region that is equivalent in terms of capacity or diversion, many assumptions would be required regarding the type and size of future private processing facilities. These assumptions would greatly impact estimates of the diversion rates for alternatives, including private processing. With the current lack of provincial landfill bans, it is more likely that privatizing processing would lead to a lower diversion rate than keeping processing within the City's control. However, if provincial landfill bans were enacted (which would require significant advocacy by City Council) the private sector would be more likely to develop facility capabilities similar to (or better than) the EWMC. Since private facilities could be better, worse, or equivalent to the facilities at the EWMC in terms of diversion performance, the decision was made to eliminate the estimated diversion rate from the evaluation criteria.

Once the evaluation of the condensed options was conducted, complete "packages" were built, covering the full suite of services. Every possible combination of options was generated, resulting in 16 packages. The packages were examined for logical consistency and packages with options which would not be suitable together were eliminated (e.g. private collection with city container provision). This resulted in 11 packages being eliminated. The five remaining packages are the viable alternatives for the purposes of this business case. Table 9 shows the five viable alternatives. All 16 packages are presented in Appendix C and a detailed list of assumptions for the analysis of this business case can be found in Appendix D.

Table 9: Viable Alternatives

Viable Alternative Number	Viable Alternative Name	Viable Alternative Description	Condensed Options			
1	Full Privatization	All services privatized.	C1	P1	CP1	EO1
2	Privatization with City Processing	Processing and disposal managed by the City, all other services privatized.	C1	P2	CP1	EO1
3	Privatization with City Education	Education and Outreach is managed by the City, all other services privatized.	C1	P1	CP1	EO2
4	Private Collection and Containers	Processing, disposal and Education and Outreach are managed by the City. Collections and Container Provision privatized.	C1	P2	CP1	EO2
5	City Managed Services	All services managed by the City (equivalent to the recommendation in the *Business Case for Residential Communal Collection* attached to CO00581).	C2	P2	CP2	EO2

City Provided
Privately Provided

8. Stakeholder Business and Operational Impacts

The impacts to internal and external stakeholders were evaluated for the initiative. Table 10 identifies the stakeholders and the business and operational impacts associated with them.

Table 10: Stakeholder Impacts

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Waste Services (internal)	• Prepare business case for City Council based on approved alternative, including program details	• Fulfillment of key strategic goals such as diversion from landfill through successful implementation

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
	and public engagement results. • Update Waste Services Bylaw to ensure program expectations are clear. • Modify the Waste Utility as required to privatize services. • Fulfillment of key strategic goals such as diversion from landfill through successful implementation of the new program. • Adjust resource demands to meet the service level and program requirements. • Development of new enforcement strategies for the implementation of program changes. • Reductions in staffing and equipment if privatized.	of the new program. • Adjust resource demands to meet the service level and program requirements. • Development of new enforcement strategies for the implementation of program changes.
Fleet and Facility Services (internal)	• Support for surplus and asset disposal of equipment if services are privatized. • Potential decrease of resources if services are privatized.	• Potential increase in resource demand to support fluctuation in vehicles and equipment needs.
Communications and Engagement Department (internal)	• Change in resource and schedule demands to accommodate program needs. • Depending on the selected alternative, a decrease in resources needed to support Education and Outreach.	• Change in resource and schedule demands to accommodate program needs.

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Executive Leadership Team (internal)	• Support the implementation of the recommendation. • Review progress and provide direction.	• Support the implementation of the recommendation. • Review progress and provide direction.
City Council (internal)	• Review and approve business case including supporting documentation and attachments. • Provide any additional direction to Administration. • Receive and discuss any public feedback directly. • Make recommendations as required including parameters for privatization options, if applicable.	• Review and approve business case including supporting documentation and attachments. • Provide any additional direction to Administration. • Receive and discuss any public feedback directly.
EWMC (internal)	• Adjust operational procedures to match changes in incoming waste from communal customers.	• Adjust operational procedures to match changes in incoming communal sector waste.
Financial Services (internal)	• Review and consult on financial impact of program changes. • Make recommendations as required.	• Review and consult on financial impact of program changes. • Make recommendations as required.
Corporate Procurement and Supply Services (internal)	• Provide resources to meet the project procurement, surplus and asset disposal needs depending on the preferred alternative.	• Provide resources to meet the project procurement needs.
Legal Services (internal)	• Provision of expert legal review of privatizing approved options.	• Provision of expert legal review of program, tender and contract aspects.

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Community Standards and Neighbourhood (internal)	• Work collaboratively with Waste Services to recommend bylaw changes.	• Work collaboratively with Waste Services to recommend bylaw changes.
Urban Planning and Economy (internal)	• Increased involvement in reviewing and approving waste infrastructure in proposed developments if collection and/or container provision services are privatized.	• Potential impact to the Zoning Bylaw to ensure compliance with waste developer standards including enforcement staff capacity and resourcing. • Representation needed for discussion on container aesthetics and screening requirements.
Employee Services (internal)	• Provide support on human resource management needs and layoffs depending on preferred alternative.	• Provide support on human resource management needs.
Open City and Technologies (internal)	• Provide information technology resources as required.	• Provide information technology resources as required.
Waste Services OHS (internal)	• Reduced level of involvement in communal collection.	• Provide resources to review and finalize the project OHS program.
Corporate Enviso (internal)	• Reduced level of involvement in communal collection.	• Provide resources to review and finalize the project Enviso documents.
City of Edmonton Unions (external)	• Work with the City to privatize services that are approved for privatization by City Council. • Work with the City to process staff layoffs as within the rules of the Collective Agreements.	• Ongoing fulfillment and support of working relationships and principles.

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Communal Collection Customers (external)	• Participate in public engagement to provide feedback to City Council before a final decision is made. • Change behaviour and routines to transition to a new program. • Be aware of how the program implementation affects their approach to waste generation and management. • Become involved in finding contracts for privatized services.	• Changes to behaviour and routine required to transition to a new program. • Be aware of how the program implementation affects their approach to waste generation and management.
Property managers of properties receiving Communal Collection: management companies, property owners, property management, and condo boards (external)	• Participate in public engagement to provide feedback to City Council before a final decision is made. • Potential impact to resourcing and time to communicate with City staff regarding program changes. • Potential increase to resourcing and time to communicate with residents regarding program changes. • Potential additional costs should infrastructure changes be required. • Secure contracted services and negotiate contracts if the program is privatized. • Provide data or reports to the City as requested or planned in the future.	• Potential increase to resourcing and time to communicate with City staff regarding program changes. • Potential increase to resourcing and time to communicate with residents regarding program changes. • Potential additional costs should infrastructure changes be required.

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Developers (external)	• Work with private haulers and the City to ensure new developments meet program requirements. • Participate in additional consultation regarding new standards.	• Potential new costs, resources or time needed to adapt new building designs to meet new expectations. • Participate in additional consultation regarding new standards.
Collection Services Contractors (external)	• Impact to fleet and resources depending on the preferred alternative. • Enter into negotiations and sales with properties individually instead of with the City.	• Opportunity to procure contracts and service communal collection customers. • Resource and equipment needs for providing the service to communal collection customers.
Waste Container Manufacturers (external)	• Opportunity to supply and distribute containers to properties and haulers depending on the alternative approved.	• Opportunity to supply and distribute containers to the City.
EPCOR (external)	• Changes required to the billing system used by Waste Services.	• Update the billing system and waste account setup system as required. • Ensure all relevant staff are trained.
Regional Processing Entities (external)	• Compete in the market and enter into contracts with haulers instead of the City depending on the alternative approved. • Ensure the processing requirements meet the objectives of the City. • Invest in capacity based on independent market assessment.	• Adjust capacity needs as required by the municipality. • Adjust technologies and processes as necessary for incoming feedstock.
Alberta	• Review and approve any	• Review and approve any

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
Environment and Parks (external)	approval or amendment to existing approvals for waste processing.	approval or amendment to existing approvals for waste processing.
Current Waste Services Collection Contractors (external)	• Potentially adjust contracts with the City depending on the approved alternative and implementation plan.	• Provide resources to ensure all waste vehicle modifications/purchasing meets the City timeline and requirements.
Local Waste Management Organizations (external)	• Provide input and help the City deliver a successful program. • Work collaboratively with the City in implementing the approved alternative.	• Provide input and help the City deliver a successful program.
Greater Edmonton Region Municipalities (external)	• The approved alternative may impact sector expectations and market conditions for surrounding municipalities and potentially affect program changes proposed by municipalities in the future.	• The proposed program changes will create precedence that may impact sector expectations and market conditions for surrounding municipalities and potentially affect program changes proposed by municipalities in the future.
Groups covered under GBA+ Review (external)	• Added flexibility for container types and vehicles. • Potential difficulty securing access to an affordable, equitable service for harder-to-service properties (e.g. tight areas, low clearance or indoor garbage rooms), properties with high resident turnover (resulting in more waste and higher rates of contamination) and	• All properties have equal access to service at the same cost. • Flexibility unchanged.

Stakeholder Name	Business and Operational Impact associated with Viable Alternatives 1, 2, 3 and 4	Business and Operational Impacts associated with Viable Alternative 5
	properties with inconvenient service locations. Some of these properties are the least able to afford to pay more.	

9. Costs

This section highlights the Capital and Operating savings and costs for the alternatives presented in this business case. It is important to note that only the four service categories listed in this business case were considered for privatization and are included in this analysis. Other services such as Eco Stations, Recycling Depots, Big Bin Events, and landfill management, which are also funded by the utility rate paid for by customers, would remain as-is and are not reflected in this analysis.

9.1. Capital

Alternatives 1, 2, 3 and 4, each involve privatizing one or more service categories related to communal collection (Collections, Processing, Container Provision, and/or Education and Outreach). Capital costs for the acquisition or development of privately funded Collections, Processing, Container Provision and/or Education and Outreach were not included in the capital cost estimates for Alternatives 1 through 4, because accurate information was not available and such costs would not be incurred by the Waste Utility. The only new acquisitions associated with Alternatives 1 through 4 are for light duty vehicles owned by the City, which are required to support program liaison and regulatory efforts to regulate the privatized elements.

The privatization of communal collection-related services would require that the ownership and utilization of associated City assets be reallocated or disposed of. While the disposition of these assets is outside the scope of this business case, assets with contributions from the communal sector but supporting functions of the Waste Utility as a whole would need to be retained so that the Utility can continue to serve its customers in the curbside collection. Assets that solely support the communal collection properties may not be retained, but as there is no established market identified, these assets are also considered a cost to the rest of the Utility as a result of privatization. Should privatization occur, recuperation of these costs would be a future consideration. The capital cost estimates for stranded assets associated with Alternatives 1 through 4 are based on the value of existing City assets that were acquired and/or are still being amortized, partially or fully, with contributions from the communal collection properties, as determined based on cost allocation methodologies outlined in a 2017 Cost of Service Study.

Net Book Values (NBV) of assets that will be stranded for each service are summarized in Table 11 below. The total value of stranded assets across all services related to communal collection is just over $55 million as of the end of 2021. As assets are continually added to and/or retired

from the Waste Utility, this figure will fluctuate from year to year. A high level list of assets which are considered stranded for these categories and their remaining useful life is provided in Appendix E.

Table 11: Net Book Value of Stranded Assets for Each Communal Collection-Related Service as of Year End 2021

Communal Collection Related Service	Value	Key Example of Assets
Collections	$14,256,719	Fully allocated to communal collection properties: Buildings (administration and garage facilities), collection vehicles, light duty vehicles and auxiliary equipment. Partially allocated to communal collection properties: Buildings (general administration, Eco Stations), light duty vehicles and mobile equipment that support community drop-off services.
Processing	$32,841,341	Fully allocated to communal collection properties: None Partially allocated to communal collection properties: (Except assets that are fully dedicated to non-regulated services) all buildings at EWMC (administration, processing, treatment), all EWMC site infrastructure (roads, scalehouse, curesite, laydown), all EWMC mobile equipment, all heavy and light duty vehicles, all processing equipment and all auxiliary equipment.
Container Provision	$2,884,436	Fully allocated to communal collection properties: Heavy and light duty vehicles, containers and replacement parts. Partially allocated to communal collection properties: None
Education and Outreach	$0	None
Loan Repayment	$5,024,467	Includes 3.05% annual interest accrual on capital asset loans and a repayment penalty for repayment of these loans.
Total	**$55,006,963**	

Privatization options that lead to any changes in the Utility's revenue requirement (i.e. additional costs incurred) could result in one or more of the following:

- A rate increase for curbside collection customers (despite there being no change to their service);
- An exit fee charged to properties receiving communal collection;
- Tax subsidy;
- Development of a mechanism to fund shared waste services that are the responsibility of all Edmonton residents; and/or
- Other financial mechanisms to account for additional expenses incurred as a result of privatization.

The scope of this business case does not include making recommendations regarding the best mechanism (or combination of mechanisms) to compensate for additional revenue requirements. Additional analysis and implementation planning will be required should City Council decide that further consideration is warranted for the privatization options.

Alternative 5 requires more new acquisitions, but avoids capital costs associated with stranding existing assets. Capital costs for Alternative 5 include the purchase of collection vehicles, containers (both carts and bins), as well as their corresponding replacement parts, contingency and inflation.

9.2. Operating

For the privatization alternatives (Alternatives 1, 2, 3, and 4), the following operating costs and savings were considered:

- Full time equivalent (FTE) positions fully dedicated to communal services would be eliminated if the service in question were privatized. The elimination of these positions will result in costs avoided/savings.
- Personnel in roles that support the overall Waste Utility (i.e. not dedicated to communal services) are considered partially stranded, as the elimination of these positions would negatively impact the services provided to curbside collection customers. Contributions from communal services for these positions, estimated based on cost allocations outlined in a 2017 Cost of Service Study, are therefore included in the analysis as costs to the Waste Utility if privatization were to occur.
- Other avoided costs include the elimination of collection contracts, fuel and maintenance for the collections fleet.
- Other personnel costs include the addition of FTEs associated with:
    - Liaison with and utility rate collection from private service providers;
    - Waste bylaw enforcement with respect to communal collections level of service; and
    - Tracking and enforcing progress towards waste diversion goals.

It should be noted that the savings or avoided costs listed above would be realized by the Waste Utility as a direct result of the removal of the service from the utility rate. In order for communal collection ratepayers to realize a saving in the total cost to maintain the current level of service offered, the removed service would have to be available to these customers at a cost equivalent to or less than the savings from the Waste Utility. A summary of personnel costs

allocated to communal services is provided in Appendix F.

Table 12 shows the annual operating costs and savings for each communal collection-related service, unadjusted for inflation. Positive values indicate savings while negative values indicate costs.

Table 12: Annual Operating Costs and Savings Summary
for Privatizing Each Communal Sector-Related Service

Costs/Savings (Unadjusted for Inflation)	Collections	Processing	Container Provision	Education
Personnel Savings[7]	$2,438,502	$0	$344,800	$0
Personnel Costs (Stranded Resources)[8]	($2,428,462)	($5,495,005)	$0	($525,227)
Other Savings[9] (Avoided Costs)	$5,797,229	$0	$0	$0
Additional Personnel Costs (Enforcement Program Support and Liaison)	($1,450,431)	($236,072)	$0	$0
Total	**$4,356,838**	**($5,731,077)**	**$344,800**	**($525,227)**

Operating costs for Alternative 5 have been adapted from the *Business Case for Residential Communal Collection* presented in 2021. This ensures the costs reflect mandatory co-location and voluntary chute closure, as recommended. Adjustments have been made to the inflation and debt to equity ratios rates, as well as fuel costs to reflect the latest forecasting and business planning figures.

9.3. Net Present Value (NPV) for Alternatives

The total costs (i.e. revenue requirement to the Waste Utility) in Net Present Value for Alternatives 1 through 5 are summarized in Table 13 and 14 below. These costs are not presented in the same table as they are not like-for-like comparisons in terms of the services included in the cost estimate. The costs associated with privatized services are not included in this analysis, because the responses received from private haulers and processors in the region did not contain sufficient information to enable development of complete cost estimates for privatized services. As a result, the analysis could not evaluate the cost impact to residents (i.e. there is no reasonable way to estimate the additional fees that customers would need to pay private operator(s) in order to maintain all of the services that they currently receive).

[7] Resources that are fully dedicated to communal services.
[8] Resources that are partially dedicated to communal services.
[9] Includes collection contracts, fuel expenses and maintenance

Table 13: NPV Analysis for Costs and Avoided Costs to the Waste Utility for Alternatives 1 Through 4

Cost Category	Alternative 1 (Full Privatization)	Alternative 2 (Privatization with City Processing)	Alternative 3 (Privatization with City Education)	Alternative 4 (Private Collection and Containers)
Capital Cost (Procurement)[10]	($1,717,276)	($1,609,946)	($1,717,276)	($1,609,946)
Avoided Costs[11]	$264,244,689	$264,244,689	$264,244,689	$264,244,689
Operating, Maintenance and Lease Costs[12]	($62,998,917)	($54,525,980)	($100,258,717)	($91,785,318)
Stranded Capital Costs[13]	($55,006,963)	($18,563,961)	($55,006,963)	($18,563,961)
Stranded Operating Costs[14]	($260,184,614)	($90,961,332)	($244,009,796)	($74,786,515)
Net Present Value	($85,363,470)	$44,547,632	($98,565,041)	$31,346,060

Table 14: NPV Analysis for Costs and Avoided Costs for Alternative 5

Cost Category	Alternative 5 (City Managed Services)
Capital Cost (Procurement)[15]	($29,010,706)
Avoided Costs	$0
Operating, Maintenance and Lease Costs[16]	($93,548,052)
Stranded Capital Costs	$0
Stranded Operating Costs	$0
Net Present Value	($71,499,083)

[10] Includes light duty vehicles.
[11] Includes elimination of fuel and maintenance cost and fully dedicated personnel.
[12] Includes additional staff for enforcement and waste characterization studies.
[13] Includes buildings, vehicles, containers and equipment.
[14] Includes partially dedicated personnel.
[15] Includes vehicles and containers.
[16] Includes new positions, education material, waste characterization studies and collection contracts.

While Alternatives 2 and 4 result in the lowest cost to the Waste Utility and offer savings over a 24-year project life, communal customers will not fully realize these savings, as they will still need to cover the cost of privatized services. For example, the net savings presented in Alternatives 4 equals $31.3 million. These savings will be distributed over approximately 167,000 communal customer accounts (as of 2021) over 24 years. In other words, the privatization of collections and container provisions services alternative will result in a "savings" of $187.70 per account over 24 years, or $0.65 per account per month (based on the current number of customer accounts). When compared to Alternative 5 (-$1.49), the "savings" equals $2.14 per account per month. That means that the average communal collection customer would only benefit from the change in service delivery model if collections and container provisions services can be secured for under $2.14/customer/month, for 24 years. The number of accounts is expected to increase substantially over that period, based on the City's preferred development patterns as described in the City Plan, meaning that savings per unit will decrease.

Figure 1 illustrates the services provided by the City for each alternative and the difference in NPV per unit per month between Alternatives 1 through 4 and Alternative 5. The white segments in the figure are excluded from the cost estimate and represent services residents would need to obtain from the private sector and pay for separately (i.e. not provided by the City). The services that are not provided by the City would need to be obtained from the private sector by communal collection customers and represent an unknown cost. Alternatives 1 and 3 result in increased costs to the Waste Utility (largely based on the shared assets and personnel associated with processing services required to service curbside collection customers), while communal collection customers receive fewer services and will be required to pay directly for private services. Alternatives 2 and 4 result in decreased costs to the Waste Utility, but the decrease is likely to be less than the cost of securing the missing services from the private sector for the average communal service customer.

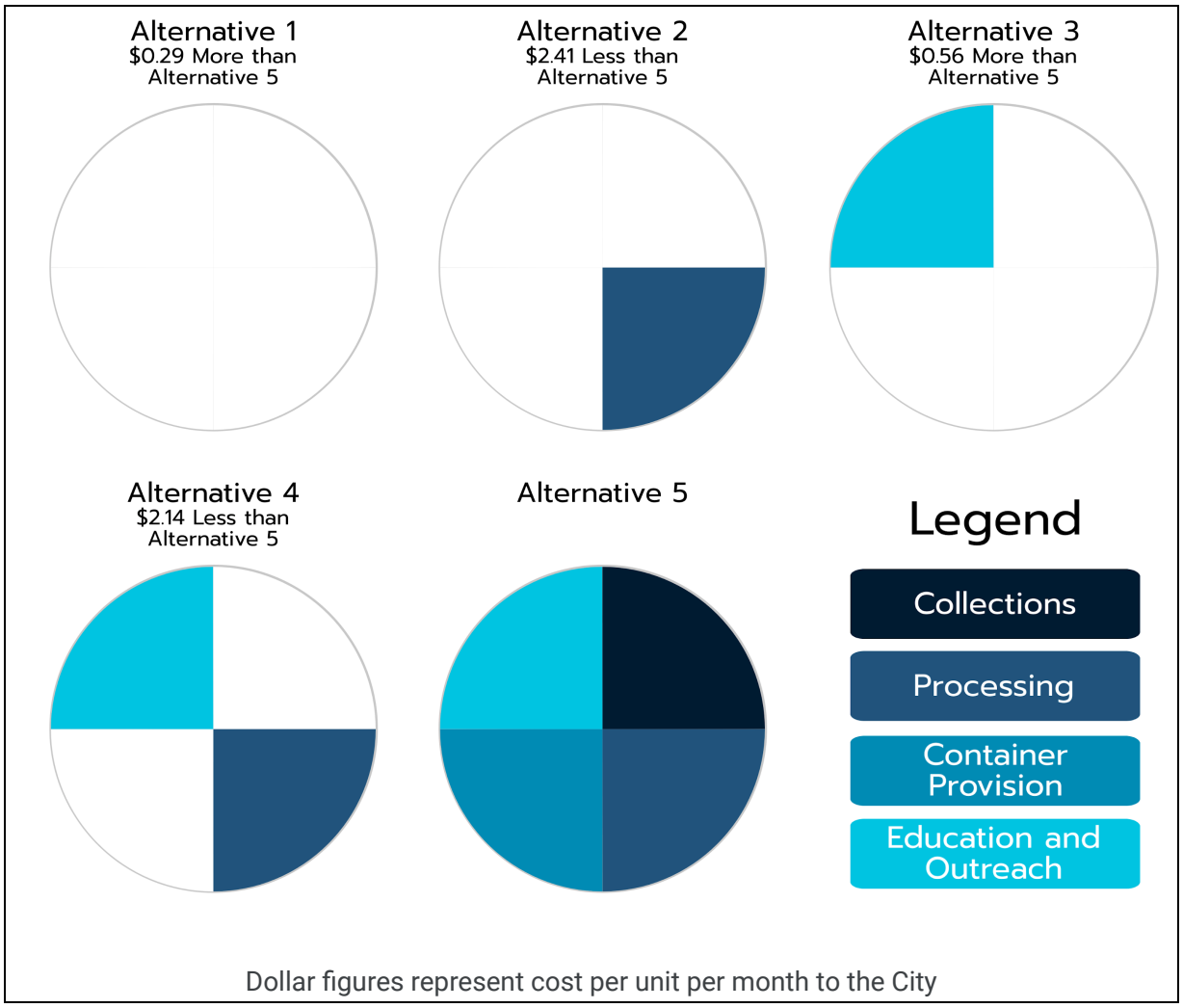

Figure 1: Comparison of Service and Cost per Unit per Month to the City

Appendix G and H provide the detailed alternative cost comparison summary and a comparison of revenue requirements for the alternatives respectively.

9.4. Staff and Fleet Impacts

Table 15 below shows the number of new staff and additional fleet requirements for all of the alternatives. The numbers for Alternatives 1 through 4 do not account for positions that could be eliminated due to privatization of a specific service. Rather, it represents the additional FTEs needed to manage and implement the specific alternative. The numbers for Alternative 5 include collection staff and fleet required to support collection of waste from the areas serviced by City crews (but not contractor serviced areas). It also includes education and outreach, GIS mapping and customer support staff required to support all areas of the City (regardless of collection crews). The numbers for Alternative 5 reflect needs that are in addition to what is already included in today's program, but do not reflect how existing resources may be shifted to prioritize the delivery of a new program. If the recommended alternative is approved, the rate

impact of a new program will be presented in the 2023 Waste Services Utility Rate Filing. A summary of the net staffing impact, reflecting an effort to realign existing resources based on an assessment of the systems impact of an approved program change, would be presented at the same time.

Alternatives 1, 2, 3 and 4 would require staff to support the enforcement and management of the program. The numbers below do not reflect how existing resources may be reallocated to support delivery of a new program and are estimated at the level of analysis completed to date. If privatization is preferred by City Council, Administration would provide an updated list of staff and fleet requirements at a later date.

Table 15: New FTE and Additional Fleet Requirements for Viable Alternatives

Category	Alternative 1 (Full Privatization)	Alternative 2 (Privatization with City Processing)	Alternative 3 (Privatization with City Education)	Alternative 4 (Private Collection and Containers)	Alternative 5 (City Managed Services)
Permanent and seasonal FTEs	11	9	20	18	30
Temporary FTEs for implementation	0	0	13	13	14
Additional fleet requirements including spare ratio	9	8	9	8	12

10. Risk Scores

A comprehensive risk register was developed to assess the risks for each option. Each option was assigned a risk score on the basis of the risks identified and that score carried forward into the packaged alternatives.

The total risk scores avoided are presented in Table 16. Risk registers showing a list of high risks, impacted stakeholders and their scores are available in Appendix I. Risk scores are based on risk impacts before mitigation strategies are in place. Upon a decision from City Council regarding the preferred Alternative, mitigation strategies will be developed for the risks associated with the approved alternative.

The Risk Score reflects the risk avoided by an alternative. This approach was used to maintain consistency with the other scores where a higher percentage represents better performance. A

risk analysis was completed to determine each alternative's risk potential and actual risk. The risk score is based on the difference between the risk potential and actual risk. For example, the risks associated with Alternative 1 had a potential score of 1,625 (if all risks had maximum likelihood and impact). The actual risk associated with Alternative 1 had a score of 736 (based on expected likelihood and impact). The avoided risk is therefore 889. The score is the ratio of the avoided risk to potential risk, where more risk being avoided results in a higher score. Table 16 and Figure 2 provide a summary of the Risk Avoided Score.

Table 16: Risk Avoided Score for Viable Alternatives

Categories of Risk Avoided	Alternative 1 (Full Privatization)	Alternative 2 (Privatization with City Processing)	Alternative 3 (Privatization with City Education)	Alternative 4 (Private Collection and Containers)	Alternative 5 (City Managed Services)
Collection	286	286	286	286	391
Processing	303	372	303	372	372
Container Provision	167	167	167	167	236
Education and Outreach	133	133	249	249	249
Total Risk Avoided	**889**	**958**	**1,005**	**1,074**	**1,248**
Total Possible Risk	1,625	1,625	1,625	1,625	1,625
Risk Score[17]	**55%**	**59%**	**62%**	**66%**	**77%**

[17] Higher values indicate the Alternative presents less risk.

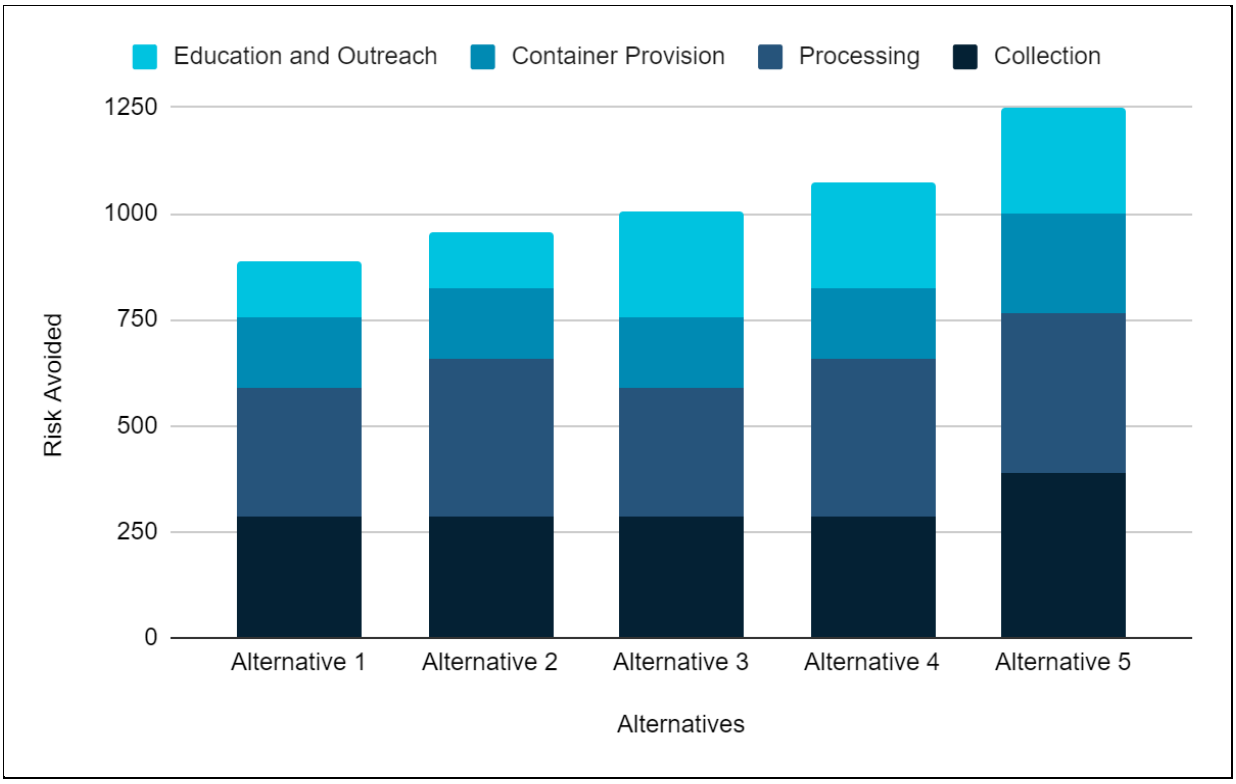

Figure 2: Risk Avoided for Viable Alternatives

11. Environmental Impact

11.1. Diversion

While diversion rate was not used as a criterion for the formal scoring of the alternatives, it is still useful to consider qualitatively what the diversion rate impacts of each alternative are likely to be and why.

Since three-stream source separation would be mandated in all scenarios, the diversion rate for all alternatives considered is driven primarily by the Processing service, rather than Collection, Container Provision or Education and Outreach. While these other services may impact diversion, the largest differences are expected to be the result of differences in processing.

In the short-term, alternatives in which the City manages processing (Alternatives 2, 4 and 5) are likely to achieve higher diversion rates, because the City has existing facilities and contracts with private processors that can achieve high diversion rates and handle contaminated streams. The City can also increase diversion by producing refuse derived fuel (RDF) from residual waste.

Alternatives in which the City provides Education and Outreach are also likely to achieve higher diversion rates in the short-term, because of the City's existing education and outreach services and experience.

In the long-term, the differences in diversion rates are harder to predict. Administration does not have the information necessary to know what the private sector can achieve. The private sector has a profit motive that is not present in the public sector, and as such, construction and operation of capital-intensive preprocessing and RDF facilities may not be attractive. Administration anticipates that upcoming municipal regulations to require source separation by ICI waste generators, as committed to in the 25-year Waste Strategy, may spur the development of private processing facilities. Assuming those facilities are built and operating at full capacity, their diversion rate can be assessed more accurately. By the time those facilities are constructed, provincial EPR regulations are likely to have transferred responsibility for managing packaging and paper products and single-use plastics to producers, meaning that the private sector will have a regulated duty to achieve specific levels of recycling.

Administration found (through the questionnaire sent to regional processors) that there may be facilities coming online in the future. As there is currently no call for private processing capacity for residential waste, it can be assumed that these facilities are being designed to process waste from the ICI sector. If processing remains under Waste Services, whether through current or planned facilities at the EWMC or through regional partners (similar to arrangements recently established for organics generated by curbside collection customers), the City of Edmonton would be able to continue to invest in, or support the investment by local processors in, facilities that support the City's waste diversion goals. This is more likely to foster innovation that leads to improved diversion rates down the road as the performance of these facilities matures.

Unless stricter environmental regulations are introduced at a provincial or regional level (e.g. a landfill ban on organics), investments in new processing facilities are less likely to occur without the City's involvement as landfilling is the more cost-efficient means of disposal.

11.2. GHG Emissions

A benefit of Collections not being privatized is that transportation-related greenhouse gases (GHGs) and other pollutant emissions are minimized, as centrally-coordinated collection is more efficient than having multiple service providers on the same collection route. Reducing GHG emissions is a key initiative for the City of Edmonton. The City is also an active participant in the Capital Region Air Quality Management Framework, which addresses pollutants that impact air quality at a more local level. Transportation planning in the region plays a key role in the management of engine exhaust-related emissions. While quantifying the benefits of emissions reductions is outside the scope of this business case, the environmental benefits of streamlining collections to be under a single service provider are clear.

12. Identification of Preferred Alternative and Recommendation

12.1. Preferred Alternative

The preferred alternative is Alternative 5 (City Managed Services) because it has the highest total score in Stage 1, presents the lowest risk and has an acceptable NPV. Readers are reminded that the NPVs presented for Alternatives 1, 2, 3 and 4 do not include costs for the service elements that are privatized, therefore their NPVs cannot be compared directly with the NPV for Alternative 5.

Alternative 5 is also the only Alternative for which a diversion rate can be estimated. There is currently not sufficient private processing capacity to manage all of the recycling and organics generated by communal collection customers. This means that the diversion rate for any Alternative with private processing could not be estimated, but is likely to fall short of the rate that can be achieved with Alternative 5, at least until such time as private sector investments in suitable processing capacity can be achieved.

In addition, Administration expects that if some or all of the services are privatized, the program elements highlighted in the *Business Case for Residential Communal Collection* would change. Enforceability, although accounted for from a resource and staffing perspective, would look different in reality and be less effective, resulting in an overall change in the program and its results.

12.2. Recommendations

Administration recommends that the recommendations in Table 17 be approved.

The recommendations are adapted from the *Business Case for Residential Communal Collection*. They address the logistics of the program, the enforcement of the program through planning and development mechanisms, along with continuous improvement through regular program review and advocacy for provincial policies that will support diversion across sectors. Making only one major change to services at a time is preferred to minimize disruption and increase the likelihood of a successful transition to a three-stream collection program.

Table 17: Recommended Alternative and Associated Actions

Recommendations
1. Mandatory co-location and voluntary chute closure (presented as Alternative 2 in the *Business Case for Residential Communal Collection* and as Alternative 5 in this business case); 2. Enforceable developer standards: Waste Services' comprehensive developer standards will be completed and referenced to the Zoning and Waste Bylaws to ensure all new properties comply; 3. Regular program review: Waste Services will introduce provisions to review the program every six to nine years to evaluate program success in achieving diversion and contamination rate targets. This timing would align with the regular waste characterization studies, which are planned for every three years. Among other aspects, this review will include a review of volume allocations, container types, and the effectiveness of regulatory and enforcement measures to ensure that the solutions remain relevant and effective as Edmonton grows and changes (this review would be in addition to the continuous improvement that is achieved through ongoing performance management activities and the annual business planning cycle); and 4. Landfill bans: Waste Services recommends that City Council advocate for landfill bans for recyclables and organic waste to be implemented at a provincial level.

If the privatization of services is preferred at this time or considered in the future, attention must be given to the impact of privatization on the diversion rate, affordability, accessibility and dependability of service, as described in the City's Waste Management Policy. Priority should be given to privatizing services that positively impact these parameters. Reducing total waste generation and increasing the diversion rate are City Council's primary goals for Waste Services. Privatizing collection service is not expected to have any impact on waste reduction or the diversion rate. Cost savings from privatizing collection service are also expected to be minimal on a system-wide basis. As a Utility, Waste Services cannot make a profit. Some properties are easier and less expensive to collect from, and some properties are more challenging and cost more to service. If the collection service was privatized, some properties might be able to obtain collection services at a cost lower than the City's cost, but this is not expected to be consistent across the City. The highest amount of savings communal customers would experience is $2.41 per month, as outlined in Figure 1 in Section 9.3. However, the communal customer would have to reacquire collection service, container provision and an adequate education program for less than $2.41 to truly experience savings. It is unlikely that these services could be re-acquired for this amount, and therefore there is little apparent cost advantage of privatizing collection on a City-wide basis.

If City Council deems that a privatization alternative warrants further consideration, City Council would need to provide additional instructions. After receiving those instructions from City Council, Administration would prepare further analysis as described in Section 13.2 and present recommendations to City Council in the future. The specific instructions that would be required relate to the following:

- Whether the implementation of the three-stream source-separated program should be paused until a final decision is made, or if Waste Services should continue to manage the transition to three-stream collection (as described in Section 13.1) while undertaking additional analysis of privatization; and
- Whether a fully private model with limited regulation (i.e. a permit system that is unable to regulate the rate, as described in Section 5.1) and limited scope for an accountability framework, or a franchise model that establishes a new, parallel waste utility is preferred. Under a franchise model, a new waste utility would operate alongside, but separate from, the current Waste Utility.

13. Implementation Approach

Two approaches to implementation are presented below. The first approach is if the recommended Alternative is approved by Council. The second approach is if City Council approves further work in support of developing a privatization Alternative.

13.1. Recommended Alternative (Alternative 5)

The following implementation approach is adapted from the *Business Case for Residential Communal Collection* presented in 2021.

Preparation will begin in 2022, so that three-stream collection can commence in late 2023 or early 2024. Implementing source separation for properties receiving communal collection requires more time and resources than the curbside program, as the City will need to work with property managers and/or condo boards at each property to make decisions regarding container

type, size, placement and collection frequency.

Changes to communal collection will be implemented in phases. Each phase is expected to include approximately 100 properties and will take approximately six weeks. During this period, the properties will be provided with new containers and education materials. Phases will be determined by geographic area, beginning with areas currently serviced by City crews. Property assessments will start in 2022 or early 2023 to prepare for the first phases of rollout, and will continue as a parallel process during the phased implementation.

The City will advise properties which containers have been determined to be optimal for their property. This approach to phased notification will provide properties with as much time as possible to plan for changes and engage with the City about modifying the assigned containers. Providing a long notice period to properties was one of the requests made by property managers during the engagement activities. A deadline will be set for properties to approach the City requesting changes to their containers.

The approach to education and outreach will be as described in the *Business Case for Residential Communal Collection*.

13.2. Privatization Alternative

If City Council directs Administration to pursue privatizing or franchising some or all of the services, additional work will be required before making any final decisions. Depending on the direction, the following work may be required:

- The development of accurate cost estimates for collection from a range of property types. This will require active participation of private haulers;
- The development of accurate cost estimates for private processing for a range of contamination scenarios. This will require active participation of private processors;
- Comprehensive public engagement with communal collection customers, represented by property managers, condo boards and residents. This will let City Council hear directly from impacted Edmontonians and enable the development of a social score, which can be used in the evaluation of options;
- Analysis of timing of privatization, with a goal of minimizing stranded costs while proceeding with source separation close to the original timeline;
- An updated list of stranded costs, impacted positions and options for funding stranded costs;
- Developing a mechanism to fund shared waste services that are the responsibility of all Edmonton residents;
- Drafting a reporting mechanism for data sharing; and
- Drafting an accountability framework, including enforcement mechanisms, that is appropriate for privatizing or franchising selected services, for City Council to review.

Once this work is completed, a final decision can be made and an implementation approach can be developed.

13.3. Additional Implementation Steps

The following steps were identified for the successful implementation of the recommended alternative in the *Business Case for Residential Communal Collection*. Many of the steps would still be necessary if one of the privatization alternatives presented in this business case was selected.

- **Variable Pricing Details:** Waste Services will continue working on the details of a variable pricing program and present it at a later date. Variable pricing is currently part of the curbside collection program, allowing rates to be set based on the size of container at a property;
- **Excess Waste Program:** Waste Services will continue working on an excess waste program that would charge properties for additional service above and beyond the allocated amount of waste collected as part of the regular service standard;
- **Stakeholder Working Groups:** Waste Services will evaluate and consider the creation of a stakeholder working group consisting of property managers and condo board members during the implementation phase. Stakeholder working groups can contribute to better stakeholder relationships, collaboratively work towards informing further program iterations and overcoming implementation challenges;
- **Illegal Dumping:** Although planning and funding an illegal dumping strategy was not in scope for this business case, it was identified by many stakeholders as one of the primary concerns for properties with communal collection. As illegal dumping has a scope beyond the communal collection program, Waste Services will consider conducting further study of potential programs to reduce illegal dumping, with particular attention to managing the impacts and associated costs to properties that receive communal collection, and make recommendations at a future date;
- **Bin Aesthetics:** Waste Services will investigate options to improve the aesthetics of front load bins and work with Development Services to determine if changes to current screening requirements would be possible and under what conditions;
- **Regular Waste Characterization Studies:** Waste Services will conduct regular and frequent waste characterization studies and audits to ensure updated data is available to measure progress against program success measures. These studies will look at contamination levels in all the streams and will assist with benchmarking and education planning; and
- **Communal versus Curbside Collection:** Waste Services will develop a protocol to assess the type of service (communal versus curbside) offered to multi-unit properties. Where possible, depending on property layout and operational logistics, curbside collection will be prioritized over communal collection to achieve the policy objectives outlined in the Waste Strategy.

13.4. Project Responsibility and Accountability for Implementation

The Waste Services communal collection program is sponsored by the Branch Manager of Waste Services. The program oversight and implementation is provided by the Director of Waste

Strategy and Director of Collection Services. Once implementation is complete, the ongoing oversight will be provided by the Director of Collection Services.

14. Review and Approval Process

Information to complete the business case was gathered and analyzed by a dedicated team which included subject matter experts from Waste Services under the supervision of the Director of Waste Strategy and the Waste Services Leadership Team.

Table 18 shows the review and approval process which was followed for this business case.

Table 18: Business Case Review and Approval Process

Review Step	Reviewer
Review 1	• Project working team and the Director of Waste Strategy.
Review 2	• Director of Business Integration (Waste Services); • Director of Collection Services (Waste Services); • Director of Sustainable Waste Processing (Waste Services); • Director of Technical Services (Waste Services); • General Supervisor Business Strategy, Planning & Performance (Waste Services); • Finance Manager (Waste Services); • Strategic Coordinator (Waste Services); • Research, Engagement and Communications; • Legal Services; and • Branch Manager of Waste Services.
Review 3	• City Operations Deputy City Manager.
Review 4	• Office of the City Clerk.
Review 5	• Office of the City Manager.

14.1. Business Case Sign Off

The business case will be approved (signed and dated) by the Branch Manager of Waste Services in addition to Directors of Waste Strategy, Collection Services, Technical Services, Sustainable Waste Processing Services and Business Integration, as well as the Finance Manager for Waste Services. Final approval will be received from the City Operations Deputy City Manager, Office of the City Clerk, and the office of the City Manager prior to submission to Utility Committee and City Council.

Appendices

Appendix A - Definitions of the Details Options
Appendix B - Detailed Results of Stage 1 Analysis
Appendix C - Detailed Package Combinations
Appendix D - Assumptions for Alternatives
Appendix E - List of Stranded Assets and Remaining Life
Appendix F - Summary of Personnel Costs Allocated to the Communal Service
Appendix G - Detailed Alternative Cost Comparison Summary
Appendix H - Comparison of Revenue Requirement for Alternatives
Appendix I - Risk Registers for High Risks

Appendix A - Definitions of the Details Options

The definitions of the detailed options used in Stage 1 are outlined in Table A1 below.

Table A1: Detailed Options and Definitions for Stage 1

Service	Detailed Options	Definition
Collections	Properties contract hauler(s) with regulated rates	Contract is between the property and hauler. The collection portion of the rate is negotiated (with an upper limit in place by the City to keep it regulated); all other aspects of the rate are regulated (processing, drop-off, etc.). City crews are not a collection option for properties.
	Properties contract hauler(s) with fixed rates	Contract is between the property and hauler. The entire rate is regulated. City forces are not a collection option for properties (ie. every property is charged the same rate, but has the option of choosing a service provider).
	Properties contract hauler(s) with submitted rates	City forces are not a collection option for properties. Haulers will each submit their own collection rate to the City for approval; each Hauler's approved rate will apply Citywide. Regardless of where the property is, the approved rate will be charged. All other aspects of the rate are regulated.
	Properties contract own hauler(s), City or private	Contract is between the property and hauler. A property can choose to contract with the City or another hauler for collection. The collection portion of the rate is negotiated (with an upper limit in place by the City to keep it regulated); all other aspects of the rate are regulated.
	City contracts hauler(s) for collection	Collection of the entire City is contracted to one or several entities. Contract is between the City and hauler(s). Entire rate is regulated (ie. Status Quo without City forces).
	Status Quo: current contractor/City split for communal waste collection	Current collection model. Contract is between the City and haulers, with roughly 50% of units collected by the City and 50% by its contractors. Always consists of a combination of both City and Contractor forces.
Processing	Processing at EWMC is not mandatory	All communal waste collected in the City of Edmonton will not be required to be brought to the EWMC. Communal ratepayers will no longer pay processing fees in their regulated rates and a tip fee will be charged to communal collection haulers that decide to use the EWMC.
	Processing includes EWMC up to tonnage	Curbside waste will be prioritized at the EWMC for processing; excess capacity will be allocated for communal waste up to the processing cap for facilities. After capacity is met, communal waste will be sent

Service	Detailed Options	Definition
	requirements then excludes EWMC	to another processing facility of the City's choosing. City maintains a contract with third-party processors and processing is part of the utility rate.
	Status Quo: all garbage brought to IPTF at EWMC	The current processing model for communal waste. All waste is required to be brought to the EWMC. Investments in additional processing capacity to be made as required and/or waste to be distributed to other facilities and processing partners. Decisions are managed by Waste Services.
Container Provision	City provides no containers	The City of Edmonton provides no collection containers whatsoever. This includes through contractors acting on the City's behalf.
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	The City of Edmonton will only provide bins and carts to properties, and any specialty containers other than this will be provided by other entities.
	City provides containers only to properties it collects from	The City of Edmonton provides collection containers to properties that it collects from.
	Status Quo: City provides waste containers (carts and bins) to all communal collection properties	Current provision model, where the City of Edmonton supplies all bins and carts to communal collection properties regardless of who is contracted to collect waste.
Education and Outreach	City provides no education or outreach programs, left to multiple entities	The City is not responsible for the provision of any education related to waste, and education and outreach is left to other multiple entities.
	City provides no education or outreach programs, left to single entity	The City is not responsible for the provision of any education related to waste, and education and outreach is left to another single entity.
	City provides education and	The City is responsible for education and outreach to properties it is responsible to collect from, and all other properties will be excluded

Service	Detailed Options	Definition
	outreach only to properties it collects from	from the City's responsibility for education and outreach.
	City provides education and outreach only to particular streams (one or two of garbage, recycle, organics)	The City will provide education and outreach for up to two of the collection streams: Garbage, Recycle, Organics. This option is likely in the instance that one or two streams are privatized.
	City provides education material, distribution is left to anyone	The City is responsible for designing and creating education materials and then shares these materials online. The distribution of these materials is left to whomever wishes to use them.
	Status Quo: City provides all education and outreach programs	Current education model, where the City provides all education and outreach for the entire communal customer base regardless of stream or collector.

Appendix B - Detailed Results of Stage 1 Analysis

The total score for the detailed options evaluated in Stage 1 are presented in Table B1 below. Option performance is judged by comparing the score to other options within the same service.

Table B1: Stage 1 Total Scores

Stream	Option	Sub-Option	Total Score
Collections			
Garbage	Properties contract hauler(s) with regulated rates	N/A	14
	Properties contract hauler(s) with fixed rates	N/A	14.5
	Properties contract hauler(s) with submitted rates	N/A	15.5
	Properties contract own hauler(s), City or private	N/A	15.5
	City contracts hauler(s) for collection	N/A	16.5
	Status quo: current 70/30 (contractor/City) split for communal garbage collection	N/A	18
Recycle	Properties contract hauler(s) with regulated rates	N/A	14
	Properties contract hauler(s) with fixed rates	N/A	14.5
	Properties contract hauler(s) with submitted rates	N/A	15.5
	Properties contract own hauler(s), City or private	N/A	15.5
	City contracts hauler(s) for collection	N/A	15
	Status quo: current 50/50 (contractor/City) split for communal recycle collection	N/A	18
Organics	Properties contract hauler(s) with regulated rates	N/A	15
	Properties contract hauler(s) with fixed rates	N/A	15.5
	Properties contract hauler(s) with submitted rates	N/A	16.5

Stream	Option	Sub-Option	Total Score
	Properties contract own hauler(s), City or private	N/A	15.5
	City contracts hauler(s) for collection	N/A	16
	Status quo: proposed 50/50 (contractor/City) split for communal organics collection	N/A	18
Processing			
Garbage	Processing at EWMC is not mandatory	Properties contract hauler(s) with regulated rates	14
	Processing at EWMC is not mandatory	Properties contract hauler(s) with fixed rates	14
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with submitted rates	14
	Processing at EWMC is not mandatory	Properties contract own hauler(s), City or private	15
	Processing at EWMC is not mandatory	City contracts hauler(s) for collection	20
	Processing at EWMC is not mandatory	Status quo: current 70/30 (contractor/City) split for communal garbage collection	20
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with regulated rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with fixed rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with submitted rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract own hauler(s), City or private	17
	Processing includes EWMC up to tonnage requirements then excludes EWMC	City contracts hauler(s) for collection	17.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Status quo: current 70/30 (contractor/City) split for communal garbage collection	17.5
	Status quo: all garbage brought to IPTF at EWMC	Properties contract hauler(s) with regulated rates	16.5
	Status quo: all garbage brought to IPTF at EWMC	Properties contract hauler(s) with fixed rates	16.5

Stream	Option	Sub-Option	Total Score
	Status quo: all garbage brought to IPTF at EWMC	Properties contract hauler(s) with submitted rates	16.5
	Status quo: all garbage brought to IPTF at EWMC	Properties contract own hauler(s), City or private	17
	Status quo: all garbage brought to IPTF at EWMC	City contracts hauler(s) for collection	18
	Status quo: all garbage brought to IPTF at EWMC	Status quo: current 70/30 (contractor/City) split for communal garbage collection	18
Recycle	Processing at EWMC is not mandatory	Properties contract hauler(s) with regulated rates	14
	Processing at EWMC is not mandatory	Properties contract hauler(s) with fixed rates	14
	Processing at EWMC is not mandatory	Properties contract hauler(s) with submitted rates	14
	Processing at EWMC is not mandatory	Properties contract own hauler(s), City or private	15
	Processing at EWMC is not mandatory	City contracts hauler(s) for collection	18
	Processing at EWMC is not mandatory	Status quo: current 50/50 (contactor/City) split for communal recycle collection	19
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with regulated rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with fixed rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with submitted rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract own hauler(s), City or private	17
	Processing includes EWMC up to tonnage requirements then excludes EWMC	City contracts hauler(s) for collection	17.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Status quo: current 50/50 (contactor/City) split for communal recycle collection	17.5
	Status quo: most recycling brought to MRF at EWMC	Properties contract hauler(s) with regulated rates	16.5
	Status quo: most recycling brought to	Properties contract hauler(s) with fixed	16.5

Stream	Option	Sub-Option	Total Score
	MRF at EWMC	rates	
	Status quo: most recycling brought to MRF at EWMC	Properties contract hauler(s) with submitted rates	16.5
	Status quo: most recycling brought to MRF at EWMC	Properties contract own hauler(s), City or private	17
	Status quo: most recycling brought to MRF at EWMC	City contracts hauler(s) for collection	18
	Status quo: most recycling brought to MRF at EWMC	Status quo: current 50/50 (contactor/City) split for communal recycle collection	18
Organics	Processing at EWMC is not mandatory	Properties contract hauler(s) with regulated rates	14
	Processing at EWMC is not mandatory	Properties contract hauler(s) with fixed rates	14
	Processing at EWMC is not mandatory	Properties contract hauler(s) with submitted rates	14
	Processing at EWMC is not mandatory	Properties contract own hauler(s), City or private	15
	Processing at EWMC is not mandatory	City contracts hauler(s) for collection	18
	Processing at EWMC is not mandatory	Status quo: proposed 50/50 (contractor/City) split for communal organics collection	19
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with regulated rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with fixed rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract hauler(s) with submitted rates	16.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Properties contract own hauler(s), City or private	17
	Processing includes EWMC up to tonnage requirements then excludes EWMC	City contracts hauler(s) for collection	17.5
	Processing includes EWMC up to tonnage requirements then excludes EWMC	Status quo: proposed 50/50 (contractor/City) split for communal organics collection	17.5
	Status quo: all organics brought to EWMC & excess processed via regional	Properties contract hauler(s) with regulated rates	16.5

Stream	Option	Sub-Option	Total Score
	partners		
	Status quo: all organics brought to EWMC & excess processed via regional partners	Properties contract hauler(s) with fixed rates	16.5
	Status quo: all organics brought to EWMC & excess processed via regional partners	Properties contract hauler(s) with submitted rates	16.5
	Status quo: all organics brought to EWMC & excess processed via regional partners	Properties contract own hauler(s), City or private	17
	Status quo: all organics brought to EWMC & excess processed via regional partners	City contracts hauler(s) for collection	18
	Status quo: all organics brought to EWMC & excess processed via regional partners	Status quo: proposed 50/50 (contractor/City) split for communal organics collection	18
Container Provisions			
Garbage	City provides no containers	Properties contract hauler(s) with regulated rates	16
	City provides no containers	Properties contract hauler(s) with fixed rates	16
	City provides no containers	Properties contract hauler(s) with submitted rates	16
	City provides no containers	Properties contract own hauler(s), City or private	15.5
	City provides no containers	City contracts hauler(s) for collection	16
	City provides no containers	Status quo: current 70/30 (contractor/City) split for communal garbage collection	16
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract hauler(s) with regulated rates	15
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract hauler(s) with fixed rates	15
	City provides only status quo containers (bins/carts) but not specialty containers	Properties contract hauler(s) with submitted rates	15

Stream	Option	Sub-Option	Total Score
	(underground, etc.)		
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract own hauler(s), City or private	15.5
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	City contracts hauler(s) for collection	16
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Status quo: current 70/30 (contractor/City) split for communal garbage collection	17
	City provides containers only to properties it collects from	Properties contract hauler(s) with regulated rates	16
	City provides containers only to properties it collects from	Properties contract hauler(s) with fixed rates	16
	City provides containers only to properties it collects from	Properties contract hauler(s) with submitted rates	16
	City provides containers only to properties it collects from	Properties contract own hauler(s), City or private	13.5
	City provides containers only to properties it collects from	City contracts hauler(s) for collection	18
	City provides containers only to properties it collects from	Status quo: current 70/30 (contractor/City) split for communal garbage collection	18
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with regulated rates	15.5
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with fixed rates	15.5
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with submitted rates	15.5
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract own hauler(s), City or private	16
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	City contracts hauler(s) for collection	18

Stream	Option	Sub-Option	Total Score
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Status quo: current 70/30 (contractor/City) split for communal garbage collection	18
Recycle	City provides no containers	Properties contract hauler(s) with regulated rates	16
	City provides no containers	Properties contract hauler(s) with fixed rates	16
	City provides no containers	Properties contract hauler(s) with submitted rates	16
	City provides no containers	Properties contract own hauler(s), City or private	15.5
	City provides no containers	City contracts hauler(s) for collection	16
	City provides no containers	Status quo: current 50/50 (contactor/City) split for communal recycle collection	16
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	Properties contract hauler(s) with regulated rates	15
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	Properties contract hauler(s) with fixed rates	15
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	Properties contract hauler(s) with submitted rates	15
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	Properties contract own hauler(s), City or private	15.5
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	City contracts hauler(s) for collection	16
	City provides only status quo containers (bins) but not specialty containers (underground, etc.)	Status quo: current 50/50 (contactor/City) split for communal recycle collection	17
	City provides containers only to properties it collects from	Properties contract hauler(s) with regulated rates	14
	City provides containers only to properties it collects from	Properties contract hauler(s) with fixed rates	14

Stream	Option	Sub-Option	Total Score
	City provides containers only to properties it collects from	Properties contract hauler(s) with submitted rates	14
	City provides containers only to properties it collects from	Properties contract own hauler(s), City or private	13.5
	City provides containers only to properties it collects from	City contracts hauler(s) for collection	18
	City provides containers only to properties it collects from	Status quo: current 50/50 (contactor/City) split for communal recycle collection	18
	Status quo: City provides waste containers (bins) to all communal collection properties	Properties contract hauler(s) with regulated rates	15.5
	Status quo: City provides waste containers (bins) to all communal collection properties	Properties contract hauler(s) with fixed rates	15.5
	Status quo: City provides waste containers (bins) to all communal collection properties	Properties contract hauler(s) with submitted rates	15.5
	Status quo: City provides waste containers (bins) to all communal collection properties	Properties contract own hauler(s), City or private	16
	Status quo: City provides waste containers (bins) to all communal collection properties	City contracts hauler(s) for collection	18
	Status quo: City provides waste containers (bins) to all communal collection properties	Status quo: current 50/50 (contactor/City) split for communal recycle collection	18
Organics	City provides no containers	Properties contract hauler(s) with regulated rates	16
	City provides no containers	Properties contract hauler(s) with fixed rates	16
	City provides no containers	Properties contract hauler(s) with submitted rates	16
	City provides no containers	Properties contract own hauler(s), City or private	15.5
	City provides no containers	City contracts hauler(s) for collection	16
	City provides no containers	Status quo: proposed 50/50 (contractor/City) split for communal	16

Stream	Option	Sub-Option	Total Score
		organics collection	
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract hauler(s) with regulated rates	15
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract hauler(s) with fixed rates	15
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract hauler(s) with submitted rates	15
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Properties contract own hauler(s), City or private	15.5
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	City contracts hauler(s) for collection	16
	City provides only status quo containers (bins/carts) but not specialty containers (underground, etc.)	Status quo: proposed 50/50 (contractor/City) split for communal organics collection	17
	City provides containers only to properties it collects from	Properties contract hauler(s) with regulated rates	14
	City provides containers only to properties it collects from	Properties contract hauler(s) with fixed rates	14
	City provides containers only to properties it collects from	Properties contract hauler(s) with submitted rates	14
	City provides containers only to properties it collects from	Properties contract own hauler(s), City or private	13.5
	City provides containers only to properties it collects from	City contracts hauler(s) for collection	18
	City provides containers only to properties it collects from	Status quo: proposed 50/50 (contractor/city) split for communal organics collection	18
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with regulated rates	15.5
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with fixed rates	15.5

Stream	Option	Sub-Option	Total Score
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract hauler(s) with submitted rates	15.5
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Properties contract own hauler(s), City or private	16
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	City contracts hauler(s) for collection	18
	Status quo: City provides waste containers (carts and bins) to all communal collection properties	Status quo: proposed 50/50 (contractor/city) split for communal organics collection	18
Education and Outreach			
All Streams	City provides no education or outreach programs, left to multiple entities.	N/A	11
	City provides no education or outreach programs, left to a single entity.	N/A	12.75
	City provides education and outreach only to properties it collects from	N/A	9.5
	City provides education material, distribution is left to anyone	N/A	10.5
	City provides education and outreach only to particular streams (one or two of garbage, recycle, organics)	N/A	15
	Status quo: City currently provides all education and outreach programs	N/A	18

Appendix C - Detailed Package Combinations

Table C1 shows all 16 package combinations and the rationale as to why some were eliminated from the list of viable alternatives.

Table C1: Package Combinations

#	Packages				Elimination Rationale	Package Number	Package Name
1	C1	P1	CP1	EO1	Identified as a viable alternative.	1	Full Privatization
2	C1	P1	CP2	EO1	City would not provide containers to properties it does not collect from and has no contractual relationship with hauler due to logistical complexity.	-	-
3	C1	P2	CP1	EO1	Identified as a viable alternative.	2	Privatization with City Processing
4	C1	P2	CP2	EO1	City would not provide containers to properties it does not collect from and has no contractual relationship with hauler due to logistical complexity.	-	-
5	C2	P1	CP1	EO1	If the City is a collector, it would bring waste to the EWMC for processing. Also, it would not be reasonable to provide collection services without containers (logistical challenges, resident interest, etc.)	-	-
6	C2	P1	CP2	EO1	If the City is a collector, it would bring waste to the EWMC for processing.	-	-
7	C2	P2	CP1	EO1	The City would not provide collection services without containers (logistical challenges, resident interest, etc.)	-	-
8	C2	P2	CP2	EO1	The City would not provide collection service, processing service and containers and rely on others for education.	-	-
9	C1	P1	CP1	EO2	Identified as a viable alternative.	3	Privatization with City Education

#	Packages				Elimination Rationale	Package Number	Package Name
10	C1	P1	CP2	EO2	City would not provide containers to properties it does not collect from and has no contractual relationship with hauler due to logistical complexity.	-	-
11	C1	P2	CP1	EO2	Identified as a viable alternative.	4	Private Collection
12	C1	P2	CP2	EO2	City would not provide containers to properties it does not collect from and has no contractual relationship with hauler due to logistical complexity.	-	-
13	C2	P1	CP1	EO2	If the City is a collector, it would bring waste to the EWMC for processing. Also, it would not be reasonable to provide collection services without containers (logistical challenges, resident interest, etc.)	-	-
14	C2	P1	CP2	EO2	If the City is a collector, it would bring waste to the EWMC for processing.	-	-
15	C2	P2	CP1	EO2	It would not be reasonable to provide collection services without containers (logistical challenges, resident interest, etc.)	-	-
16	C2	P2	CP2	EO2	Identified as a viable alternative.	5	City Managed Services

Appendix D - Assumptions for Alternatives

Table D1 lists the assumptions used in the cost analysis of Alternatives 1 through 4.

Table D1: Alternatives 1 through 4 Assumptions for Cost Analysis

#	Assumption
1	Enforcement scope excludes vehicle weights and includes enforcement of regulations related to properties, haulers and processors.
2	No impact on the volume of public inquiries due to privatization.
3	In situations where assets are required for privatized services, all existing assets are stranded and new assets are acquired for ease of calculation (e.g. light duty vehicles).
4	Stranded costs analysis based on an asset list provided by Financial Services, accurate to year-end 2020. The list of assets is assumed to be accurate and complete as of this date. Operating and Maintenance (O&M) costs associated with these assets are not within the scope of the analysis for simplicity (e.g. cost of utilities for stranded buildings).
5	The asset list allocates a percentage of each asset funded by the communal customer base, based on ratios applied by a 2017 Cost of Service Study. The percentage allocation to the communal customer base and thus each asset value associated with the communal service is assumed to be representative.
6	The asset list includes entries financed by third parties and assets inherited by Waste Services. These assets are excluded from cost analysis and are assumed to have no net cost to the Utility.
7	Stranded costs analysis using the communal collection asset list is based on the 2022 Net Book Value (NBV) of assets and remaining life expectancy. It is assumed these values are accurate for assets considered and contingency is removed for assets.
8	The collection contracts are assumed to be terminated and would not result in any termination penalties. It is also assumed the contractors associated with these contracts do not allege damages or in any way pursue a lawsuit with the City of Edmonton, resulting in additional costs.
9	Contingencies for stranded and eliminated personnel are removed.
10	Fuel and maintenance cost savings are projected using 2021 year-end actuals for the communal collection fleet from Fleet and Facility Services' Facts, Analytics and Strategic Technology (FAST) tool for data management.
11	A 39.5% Collections/60.5% Processing split was assessed to stranded communal service personnel that did not explicitly belong to one of the four service categories (Processing, Collection, Container Provision, Education and Outreach). This ratio is based on O&M cost allocations indicated in a 2017 Cost of Service Study.

#	Assumption
12	With a few exceptions, personnel assigned to the category in Assumption #15 include Branch Administration, Business Strategy, Business Integration, Safety/OHS, Workforce Development, BPCO (Business Performance and Central Operations) Collections, as these areas both support Collections and Processing. Exceptions are Waste Call Centre (Waste Hotline), Community Relations, Reuse Centre and Compost Programs, as these services/programs are more appropriately categorized under Education and Outreach.
13	It is assumed the average age of the communal collection fleet remains consistent, which equates to an unchanging maintenance and fuel savings year after year in privatized collection options (C1).
14	The privatization of processing services is expected not to impact existing processing contracts and is assumed to result in no net cost to the Waste Utility. The savings/expenses accrued due to loss of feedstock is negated as these contracts are volume based. Any preferential rates from more feedstock are not factored in.
15	Waste characterization studies are assumed to be required regardless of whether or not services are privatized. Cost for the study has been factored into the EO1/EO2 options.
16	The annual compounded inflation rate is calculated and averaged to 2.1% which is the 2022 CPI rate from the 2022 Rate Filing.
17	The weighted average cost of capital (WACC) is calculated to be 5.217% as of 2022.
18	Personnel that are considered stranded are assumed to be consistent throughout the cost analysis period of 24 years. Further analysis and planning to reflect workforce consolidation is required based on decisions with respect to which alternative to pursue.
19	The loans on the capital stranded assets are assumed to be repaid in full in 2022. This creates repayment penalties incurred. Additionally, there is one year of interest accrued for the capital loans, averaged to be 3.05%.
20	Capital stranded assets are assumed to not be salvageable. In reality, salvaging of these assets would reduce the amount of stranded capital.

Table D2 lists the assumptions used in the cost analysis of Alternative 5.

Table D2: Alternative 5 Assumptions for Cost Analysis

#	Assumption
1	Cart lifespan is 12 years (less than the Single-Unit Waste Set-out business case due to the shared nature of communal containers).
2	Organics carts are assumed to be coloured for costing purposes (similar to the curbside program).

#	Assumption
3	An extra supply of 20% has been approximated to account for inaccuracies in unit count, property count, and properties with space restrictions and differing container needs. The 20% was taken from the Association for the Advancement of Cost Engineering (AACE International) guidelines for a Class 3 estimate.
4	Service frequency is assumed to be weekly for all streams and hard volume limits are imposed (no extra lifts).
5	Volume allocation, assuming no contamination, is calculated to be: Garbage = 0.09 yd^3 / week / unit Recycle = 0.20 yd^3 / week / unit Organics = 0.03 yd^3 / week / unit
6	Densities from the U.S. Environmental Protection Agency (converted to metric units) are taken as: (Garbage) Mixed Multi-unit Solid Waste (Uncompacted) = 43.09 kg / yd^3 (Recycle) Mixed Single Stream Recycle (Uncompacted) = 23.133 kg / yd^3 (Organics) Food Scraps = 210.01 kg / yd^3 (Organics) Mixed Yard Waste = 113.398 kg / yd^3
7	Organics container size volume allocation is based on a 90% capture rate (by weight), resulting in a total allocation of 0.0276 yd^3 / week / unit.
8	Recycling container size volume allocation is based on a 90% capture rate (by weight), resulting in a total allocation of 0.185 yd^3 / week / unit.
9	Garbage volume container size allocation is based on: 52% of organics to be in the garbage stream by weight to account for improper sorting. 15% of recycling to be in the garbage stream by weight to account for improper sorting and to not significantly increase the volume of the garbage allocation. This results in the garbage container size to be increased by 23% above the 0.09 yd^3 / week / unit allocation, resulting in a total allocation of 0.125 yd^3 / week / unit.
10	Based on current in-field percentages, 20% of bins require casters. Only medium duty casters are used and no front load bin over 4 yd^3 in size will have casters.
11	None of the front load bins will be refurbishable due to end of life wear and tear.
12	Every unit will be given one food scraps pail. After the first initial purchase of food scraps pails, new purchases equate to 2% expected growth rate and a 5% surplus.
13	All front load bins are assumed to be flat top and not slanted-top (“cathedral style”) for costing purposes.
14	The number of 240L carts needed is assumed to be 25% of the 360L carts. The two different sizes will be used based on property space limitations.

#	Assumption
15	No more than four organics carts can be placed in a single “collection area” at a property. If five or more carts are required, a 2 yd^3 bin shall be allocated instead. It is assumed a property limit of 15 organics carts will satisfy all “collection areas” that a property requires.
16	No more than seven garbage carts per property are allowed, which services up to a potential seven "collection areas". These are for special cases where a frequency reduction for current garbage bins would be too low, or space is a primary concern. This is to ensure that existing front load bins are used as often as possible instead of replacing them with carts. This limit is separate from the organics cart limit of 15 outlined in Assumption 15.
17	The lifespan of new vehicles has been averaged to eight years instead of 10, to allot for reduced life expectancy due to dedicated organics collection.
18	Downtime for all collection vehicles is calculated at 15% based on historical data.
19	City contractor cost for servicing organics front load bins is assumed to be higher than the cost of servicing recycle and garbage front load bins. This is based on data from existing curbside program contracts.
20	The contractor organics cart (240L and 360L) servicing costs follow the same cost progression as garbage carts.
21	Contractor collection costs are a calculation of additional new cubic yards, based on an average of current rates across all service areas. The reduction in garbage contractor costs is due to an overall reduction in allocation.
22	Implementation will take four years to complete and will start in 2022.
23	For costing purposes, the growth rate of the communal customer base has been set to 2% per year.
24	Chute closure will have no impact on capital or operating cost estimations.
25	The communal Waste Bylaw will be updated in time for full program implementation. Costs and resources required for bylaw implementation are excluded from analysis.
26	Staffing and resource additions will be adequate to maintain the program during and after implementation.
27	The annual compounded inflation rate is calculated and averaged to 2.1% which is the 2022 CPI rate from the 2022 Rate Filing.
28	The weighted average cost of capital (WACC) is calculated to be 5.217% as of 2022.

Table D3 lists the general assumptions used in the analysis of this business case.

Table D3: General Assumptions for Business Case Analysis

#	Assumption
1	Three source-separated streams (garbage, recycle, organics) are collected from all communal properties.
2	Volume limits and allocations set by the City through its role as Utility Regulator are enforced. Mandatory co-location is assumed to be adhered to.
3	Transportation of waste from communal properties to the final processing and disposal facilities are included in the collection charges.
4	ICI waste is not collected or mixed with waste from residents receiving communal collection.
5	Scoring in Stage 1 analysis assumes processing facilities act in good faith at all times and process all materials in accordance with bylaws and regulations regardless of the City's ability to enforce its bylaws over facilities that are located outside its jurisdiction.
6	In Stage 1 analysis, it is assumed that processing facilities will have adequate capacity for all waste from the communal customer base.
7	In Stage 1 analysis, processing facilities are assumed to have equivalent technology and buildings (MRF, RDF, etc.).

Appendix E - List of Stranded Assets and Remaining Life

A summary list of assets which are considered stranded for the processing service category are provided in Table E1.

Table E1: Summary of Stranded Capital Assets for Processing

Remaining Useful Life after 2021 in Years	Building/Facilities	Equip't - Auxiliary	Equip't - Bins	Equip't - Fleet Vehicles	Equip't - Light Duty Vehicles	Equip't - Mobile Equip't	Equip't - Processing	Total
0	$941,443	$0		$0	$0	$0		$941,443
1	$0	$0		$0	$0	$0		$0
2	$30,927	$5,225		$2,657	$3,944	$25,912	$8,452	$77,116
3	$218,652	$14,492	$6,798		$2,528		$10,614	$253,084
4	$38,196	$27,187	$2,404	$209,934		$10,588		$288,308
5	$266,789			$72,014	$8	$4,406		$343,216
6	$450,909	$18,764		$404,764	$418	$1,820		$876,677
7	$154,355		$1,625		$15,015	$22,913	$82,033	$275,941
8	$1,480,403						$107,989	$1,588,392
9	$260,515	$23,637					$812,940	$1,097,091
10	$448,751	$3,951	$8,557				$3,290	$464,549
11	$1,081,270	$751,039					$62,534	$1,894,843
12	$63,971	$105,743					$185,885	$355,600
13	$844,062	$14,131		$52,188		$19,174	$3,182,592	$4,112,147
14	$1,366,913	$15,100				$52,545	$222,744	$1,657,302
15	$573,992	$112,603					$196,380	$882,975
16	$358,380	$1,704					$83,212	$443,297
17	$145,555	$7,950					$583,143	$736,648
18	$147,413	$86,065					$92,230	$325,708
19	$321,746	$46,632					$91,509	$459,886
20	$555,185							$555,185
21	$246,349	$1,339						$247,688
22	$766,468							$766,468
23	$341,280							$341,280
24	$125,506	$7,415						$132,920
25	$164,530							$164,530
26	$240,478							$240,478
27	$560,097	$115,702						$675,800
28	$177,087							$177,087
29	$482,096	$6,873					$403,608	$892,576
30	$450,646							$450,646
31	$10,189							$10,189
32	$3,182							$3,182

Remaining Useful Life after 2021 in Years	Building/Facilities	Equip't - Auxiliary	Equip't - Bins	Equip't - Fleet Vehicles	Equip't - Light Duty Vehicles	Equip't - Mobile Equip't	Equip't - Processing	Total
34	$407,167							$407,167
37	$176,694							$176,694
39	$4,063,805							$4,063,805
41	$8,095							$8,095
42	$191,279							$191,279
47	$4,972							$4,972
48	$4,752,179							$4,752,179
49	$281,746							$281,746
50	$417,882							$417,882
51	$327,710							$327,710
52	$2,936							$2,936
54	$184,780							$184,780
56	$196,315							$196,315
57	$93,527							$93,527
Total	$24,426,422	$1,365,552	$19,384	$741,556	$21,914	$137,359	$6,129,154	$32,841,341

A summary list of assets which are considered stranded for the collection service category are provided in Table E2.

Table E2: Summary of Stranded Capital Assets for Collections

Remaining Useful Life after 2021 in Years	Building/Facilities	Equip't	Equip't - Auxiliary	Equip't - Bins	Equip't - Fleet Vehicles	Equip't - Light Duty Vehicles	Equip't - Mobile Equip't	Total
0	$3,554,937	$0		$0	$0	$0		$3,554,937
1	$0	$0	$0		$0			$0
2		$19,662	$7,799	$1,800	$36,326		$5,282	$70,869
3	$36,231				$5,901			$42,132
5	$16,258					$130,974		$147,233
6	$24,420			$79,489			$6,239	$110,147
7	$24,160			$1,722			$10,841	$36,722
8	$469,522				$1,227,467			$1,696,989
9	$126,203		$13,719	$34,406				$174,328
10	$3,559							$3,559
11	$61,900							$61,900
12	$18,354							$18,354
13	$57,173						$14,544	$71,717
14	$1,148,629		$219,123					$1,367,752
15	$61,566			$8,162				$69,728
16	$1,956,106							$1,956,106

Remaining Useful Life after 2021 in Years	Building/Facilities	Equip't	Equip't - Auxiliary	Equip't - Bins	Equip't - Fleet Vehicles	Equip't - Light Duty Vehicles	Equip't - Mobile Equip't	Total
17	$92,114							$92,114
18	$350,187							$350,187
19	$640,981							$640,981
20	$604,661							$604,661
23	$186,542							$186,542
24	$21,555							$21,555
25	$187,249		$61,902					$249,151
28	$176,801							$176,801
38	$106,920							$106,920
48	$533,137							$533,137
51	$168,116							$168,116
54	$645,971							$645,971
60	$1,098,111							$1,098,111
Total	$12,371,363	$19,662	$302,543	$125,578	$1,269,694	$130,974	$36,906	$14,256,719

A summary list of assets which are considered stranded for the container provisions service category are provided in Table E3.

Table E3: Summary of Stranded Capital Assets for Container Provisions

Remaining Useful Life after 2021 in Years	Equip't - Auxiliary	Equip't - Bins	Equip't - Fleet Vehicles	Total
0			$0	$0
1		$0	$0	$0
3		$23,213		$23,213
4		$130,357		$130,357
5		$284,217		$284,217
6	$7,469			$7,469
7		$457,629		$457,629
8		$545,869	$76,573	$622,442
10		$525,849		$525,849
11		$499,847		$499,847
13		$200,319		$200,319
14		$133,094		$133,094
Total	$7,469	$2,800,394	$76,573	$2,884,436

Appendix F - Summary of Personnel Costs Allocated to the Communal Service

Table F1 shows a summary of personnel costs allocated exclusively to the communal service.

Table F1: Personnel Costs Allocated Exclusively to the Communal Service

Service Area	Bin Maintenance	Collections	Total
Total Cost	$334,801	$2,438,502	$2,783,303

Table F2 shows a summary of personnel costs allocated partially to the communal service.

Table F2: Personnel Costs Allocated Partially to the Communal Service

Service Area	Collections	Education	Processing	Split[18]	Total
Total Cost	$1,910,484	$525,227	$4,701,646	$1,311,337	$8,448,694

[18] A 39.5% Collections / 60.5% Processing split was assessed to stranded communal sector personnel that did not explicitly belong to one of the four service categories (Processing, Collection, Container Provision, Education and Outreach). This ratio is based on O&M cost allocations indicated in a 2017 Cost of Service Study.

Appendix G - Detailed Alternative Cost Comparison Summary

Table G1: Cost Comparison and Revenue Requirements for Program Alternatives

Base Year	2022	2022	2022	2022	2022
Cumulative Revenue Requirement (from base year)	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
CPV @ Year 5	$66,433,900	($2,235,563)	$75,219,572	$6,550,109	$28,794,648
CPV @ Year 10	$74,373,412	($17,026,169)	$84,478,902	($6,920,679)	$43,840,718
CPV @ Year 15	$81,125,545	($29,819,512)	$93,697,527	($17,247,530)	$57,026,297
CPV @ Year 20	$86,709,771	($41,040,547)	$100,115,452	($27,634,866)	$68,173,380
CPV @ Year 25	$89,693,709	($46,987,156)	$103,584,007	($33,096,859)	$73,724,343
Capital Cost Summary (Base Year Dollars)	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Equipment	$1,280,000	$1,200,000	$1,280,000	$1,200,000	$18,944,144
Buildings	$0	$0	$0	$0	$0
Other (engineering/PM, etc.)	$0	$0	$0	$0	$1,965,523
Total Base Costs	**$1,280,000**	**$1,200,000**	**$1,280,000**	**$1,200,000**	**$20,909,666**
Contingency	$256,000	$240,000	$256,000	$240,000	$4,181,933
Inflation	$181,276	$169,946	$181,276	$169,946	$3,919,107
Total Capital	**$1,717,276**	**$1,609,946**	**$1,717,276**	**$1,609,946**	**$29,010,706**
Economic Assumptions					
Inflation (compounded each year)					2.10%
Contingency based on Association for the Advancement of Cost Engineering (AACE International) guidelines for a Class 3 estimate					20.00%
Analysis is based on 24 years to capture the full life cycle costs of the assets					
Assumes borrowing required at 55% (based on current Waste Utility split) at 4%					

Table G2: Alternative Cost Summary

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total Capital Cost	($1,717,276)	($1,609,946)	($1,717,276)	($1,609,946)	($29,010,706)
Total Costs Avoided	$264,244,689	$264,244,689	$264,244,689	$264,244,689	$0
Total O&M Costs	($62,998,917)	($54,525,980)	($99,016,717)	($90,543,781)	($92,306,052)
Total Lease Costs	$0	$0	($1,242,000)	($1,242,000)	($1,242,000)
Total Stranded Capital Costs	($55,006,963)	($18,563,961)	($55,006,963)	($18,563,961)	$0
Total Stranded Operating Costs	($260,184,614)	($90,961,332)	($244,009,796)	($74,786,515)	$0
Project Net Inflows (Outflows)	($115,663,080)	$98,583,470	($136,748,063)	$77,498,487	($122,558,758)
WACC Discount Rate	5.22%	5.22%	5.22%	5.22%	5.22%
Net Present Value	($85,363,470)	$44,547,632	($98,565,041)	$31,346,060	($71,499,083)

Table G3: Alternative Cost Comparison Summary

	Alternative 1 Net Change from Alternative 5	Alternative 2 Net Change from Alternative 5	Alternative 3 Net Change from Alternative 5	Alternative 4 Net Change from Alternative 5
Total Capital Cost	$27,293,431	$27,400,761	$27,293,431	$27,400,761
Total Costs Avoided	$264,244,689	$264,244,689	$264,244,689	$264,244,689
Total O&M Costs	$29,307,135	$37,780,072	-$6,710,665	$1,762,271
Total Lease Costs	$1,242,000	$1,242,000	$0	$0
Total Stranded Capital Costs	-$55,006,963	-$18,563,961	-$55,006,963	-$18,563,961
Total Stranded Operating Costs	-$260,184,614	-$90,961,332	-$244,009,796	-$74,786,515
Project Net Inflows (Outflows)	$6,895,679	$221,142,228	-$14,189,304	$200,057,245
Net Present Value	-$13,864,386	$116,046,715	-$27,065,958	$102,845,144

Appendix H - Comparison of Revenue Requirement for Alternatives

Table H1: Annual Cost Revenue Requirement Summary

Year	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2022	$57,212,948	$14,986,016	$60,847,925	$18,620,993	$7,150,229
2023	$2,029,638	-$3,876,600	$3,506,785	-$2,399,453	$4,928,148
2024	$2,061,930	-$3,967,141	$3,566,164	-$2,462,906	$5,456,708
2025	$2,347,739	-$3,806,742	$4,130,701	-$2,023,781	$5,674,799
2026	$2,128,480	-$4,154,044	$2,978,958	-$3,303,566	$4,847,521
2027	$2,162,763	-$4,250,491	$2,373,486	-$4,039,768	$4,132,304
2028	$2,464,296	-$4,082,431	$3,013,889	-$3,532,838	$4,496,733
2029	$2,233,411	-$4,449,590	$2,523,278	-$4,159,723	$4,266,592
2030	$2,269,803	-$4,552,332	$2,566,725	-$4,255,410	$4,678,458
2031	$2,588,060	-$4,376,128	$3,172,397	-$3,791,791	$4,912,661
2032	$2,344,790	-$4,764,433	$2,584,733	-$4,524,490	$4,190,480
2033	$2,383,414	-$4,873,887	$2,629,985	-$4,627,315	$4,058,535
2034	$2,752,452	-$4,658,095	$4,020,897	-$3,389,650	$5,133,246
2035	$2,504,040	-$5,061,368	$3,496,105	-$4,069,303	$5,086,069
2036	$2,545,546	-$5,177,491	$3,558,466	-$4,164,571	$5,396,413
2037	$2,901,049	-$4,982,925	$4,246,244	-$3,637,730	$6,012,134
2038	$2,631,088	-$5,417,200	$2,915,392	-$5,132,896	$5,503,692
2039	$2,675,158	-$5,540,893	$2,968,018	-$5,248,033	$5,550,256
2040	$3,050,847	-$5,336,487	$3,766,503	-$4,620,832	$5,744,114
2041	$2,765,977	-$5,796,236	$3,161,743	-$5,400,469	$5,459,513
2042	$2,812,761	-$5,927,999	$3,219,806	-$5,520,954	$5,509,624

Year	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2043	$3,209,922	-$5,713,133	$3,976,831	-$4,946,223	$5,780,765
2044	$2,909,169	-$6,200,006	$3,250,687	-$5,858,488	$5,162,196
2045	$2,958,828	-$6,340,373	$3,311,373	-$5,987,827	$5,002,798
2046	$39,553	$37,081	$39,553	$37,081	$768,128
2047	$0	$0	$0	$0	$348,767

Table H2: Cumulative Present Value Revenue Requirement Summary

Year	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2022	$57,212,948	$14,986,016	$60,847,925	$18,620,993	$7,150,229
2023	$59,141,949	$11,301,631	$64,180,832	$16,340,514	$11,834,023
2024	$61,004,474	$7,718,145	$67,402,119	$14,115,790	$16,763,024
2025	$63,020,018	$4,450,042	$70,948,342	$12,378,366	$21,634,861
2026	$64,756,722	$1,060,606	$73,378,982	$9,682,867	$25,590,130
2027	$66,433,900	-$2,235,563	$75,219,572	$6,550,109	$28,794,648
2028	$68,250,158	-$5,244,433	$77,440,895	$3,946,305	$32,108,870
2029	$69,814,628	-$8,361,302	$79,208,413	$1,032,483	$35,097,552
2030	$71,325,754	-$11,392,028	$80,917,215	-$1,800,566	$38,212,246
2031	$72,963,328	-$14,160,988	$82,924,525	-$4,199,792	$41,320,694
2032	$74,373,412	-$17,026,169	$84,478,902	-$6,920,679	$43,840,718
2033	$75,735,654	-$19,811,844	$85,982,073	-$9,565,425	$46,160,377
2034	$77,230,818	-$22,342,175	$88,166,271	-$11,406,722	$48,948,816
2035	$78,523,597	-$24,955,245	$89,971,231	-$13,507,612	$51,574,638
2036	$79,772,643	-$27,495,729	$91,717,294	-$15,551,078	$54,222,543
2037	$81,125,545	-$29,819,512	$93,697,527	-$17,247,530	$57,026,297

Year	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2038	$82,291,712	-$32,220,557	$94,989,705	-$19,522,564	$59,465,677
2039	$83,418,621	-$34,554,656	$96,239,981	-$21,733,296	$61,803,720
2040	$84,640,066	-$36,691,186	$97,747,948	-$23,583,304	$64,103,448
2041	$85,692,551	-$38,896,719	$98,951,027	-$25,638,244	$66,180,855
2042	$86,709,771	-$41,040,547	$100,115,452	-$27,634,866	$68,173,380
2043	$87,813,062	-$43,004,224	$101,482,340	-$29,334,946	$70,160,303
2044	$88,763,401	-$45,029,583	$102,544,243	-$31,248,741	$71,846,640
2045	$89,682,038	-$46,998,098	$103,572,335	-$33,107,800	$73,399,874
2046	$89,693,709	-$46,987,156	$103,584,007	-$33,096,859	$73,626,532
2047	$0	$0	$0	$0	$73,724,343

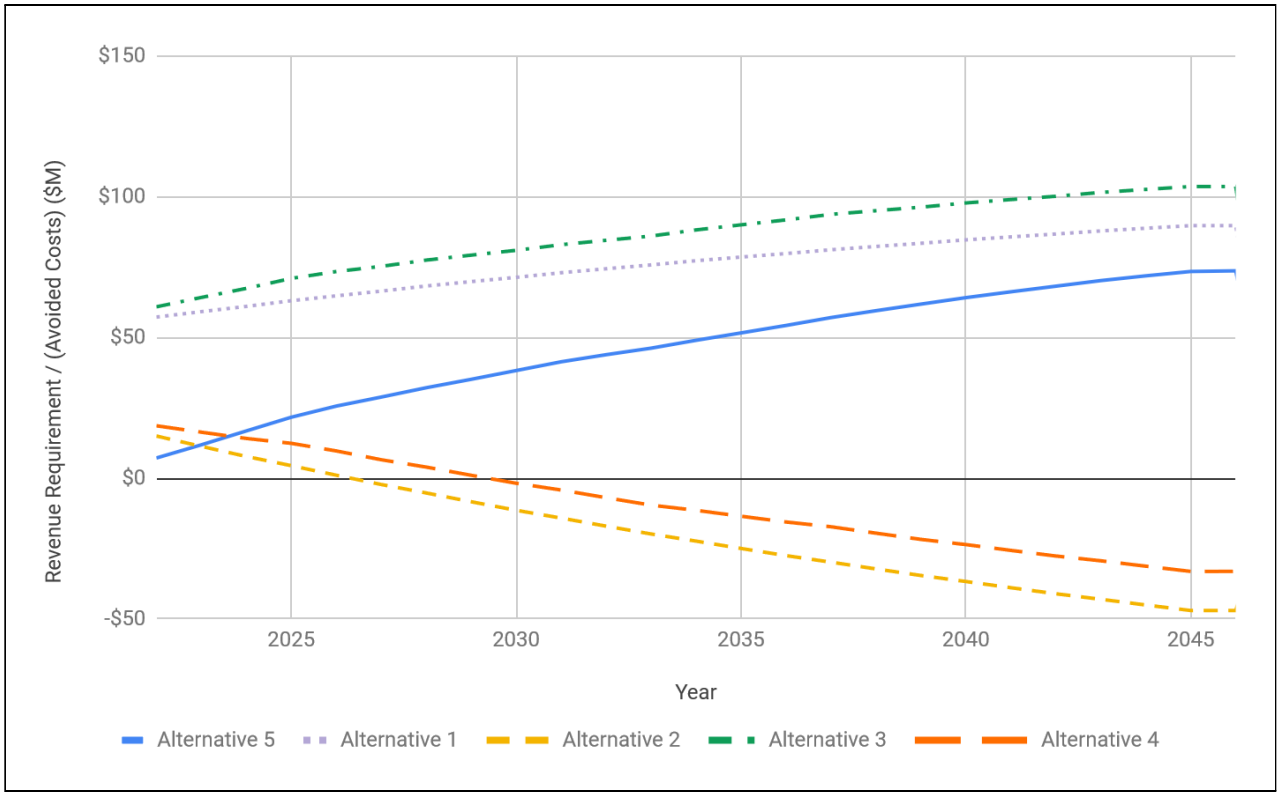

Figure H1: Cumulative Present Value of Revenue Requirement for Program Alternatives

Appendix I - Risk Registers for High Risks

The risk scores presented are calculated by multiplying the risk likelihood by the impact it causes. Risk scores are based on risk impacts before mitigation strategies are in place. Upon a decision from City Council, mitigation strategies will be developed for the risks associated with the approved alternative.

Table I1 shows high risks pertaining to the condensed Collection options C1 and C2.

Table I1: High Risks for Condensed Collection Options

Risk	Stakeholder(s) Impacted	C1- Collection contract between property and haulers	C2 - Collection contract between City and haulers
		Score	Score
Collection costs will rise once the City eliminates collection assets. The City will no longer act as a balance for the service. Competition in the market will act as some measure of control against this. This could impact properties differently based on size and location.	• Properties • Residents	High	Medium
The inability to enforce missed collections, property damage charges, enforce required service levels and other issues related to the collector/collection. Properties may have less negotiating power than the City.	• Properties • City of Edmonton	High	Low
The City will be less efficient and lose competitiveness if it is expected to collect from properties that cannot secure other contracts (e.g. properties that are far from processing sites or difficult to service, etc.).	• City of Edmonton • Residents	High	Negligible
The inability to enforce waste room tidiness, co-location of streams, etc. (all items related to the responsibility of the property manager).	• The Strategy Goals • Residents	High	Medium

Risk	Stakeholder(s) Impacted	C1- Collection contract between property and haulers	C2 - Collection contract between City and haulers
		Score	Score
Multiple haulers will be collecting from the same properties/areas due to properties having contracts with different haulers increasing GHG emissions and traffic.	• The Environment • Residents • The City of Edmonton	High	Low
The inability to influence the reduction of GHG emissions created by collection vehicles due to lack of control over the number and type of vehicles.	• City of Edmonton	High	Medium
Lack of flexibility in servicing options (e.g. type of containers, vehicle sizes, etc.).	• Properties • Residents	Low	High
More vehicles operating above the allowable weight limits in order to minimize trips causing safety concerns and excess wear and tear.	• Residents • City of Edmonton	High	Medium

Table I2 shows high risks pertaining to the condensed Processing options P1 and P2.

Table I2: High Risks for Condensed Processing Options

Risk	Stakeholder Impacted	P1- Haulers are free to choose their own facilities	P2 - Haulers are required to use the EWMC
		Score	Score
The need to create private processing facilities for organic waste has not been created yet, so there may initially be insufficient processing capacity.	• City of Edmonton • The Strategy Goals • The Environment	Medium	High
The City will have an inability to enforce private processing facilities to adhere to regulations set by the City (lack of resources, lack of authority).	• City of Edmonton • The Strategy Goals • The Environment	Extreme	Medium
Feedstock limitations, processing inability due to technology, or unwillingness will lead to regional organics processing facilities not meeting the targets outlined by the City of Edmonton.	• City of Edmonton • The Strategy Goals • The Environment	High	Medium
Lack of monitoring, enforcement, methodology, or the mixing of waste would lead to inconsistent and obscure data from regional processing facilities, creating an unclear diversion rate.	• City of Edmonton • The Strategy Goals	High	Medium
Processing facilities outside of City limits are not bound by municipal rules and bylaws.	• City of Edmonton • The Strategy Goals • The Environment	Extreme	Medium
The established bylaws by the City surrounding processing rules are not effective.	• City of Edmonton • The Strategy Goals	Extreme	Low

Table I3 shows high risks pertaining to the condensed Container Provision options CP1 and CP2.

Table I3: High Risks for Condensed Container Provision Options

Risk	Stakeholder Impacted	CP1- City provides no containers	CP2 - City provides containers
		Score	Score
In order to maximize asset value, containers will be used past their lifespan. The City will not be able to monitor container conditions. Containers could degrade to the point they are unsafe, unsightly and leak waste into the surrounding area. Containers in this state are less likely to be used correctly and would attract negative attention.	• Properties • Residents • Collectors	High	Low
Inconsistent colors and shapes of containers being provided by different haulers. This would make education efforts more difficult and residents would need to re-learn their waste program every time they move.	• Properties • Residents • Educators	High	Negligible
Container provider incurs cost for container damage (logistics, customer service, the container repair costs itself) due to damages from unknown sources. The provider would need to pay for the damages regardless of the source of damage.	• City of Edmonton • Container Providers • Residents	High	High

Table I4 shows high risks pertaining to the condensed Education and Outreach options EO1 and EO2.

Table I4: High Risks for Condensed Education and Outreach Options

Risk	Stakeholder Impacted	EO1- City provides no education and outreach	EO2 - City provides education and outreach
		Score	Score
If a variety of different haulers are supplying service to buildings, there would be a differing range of education standards. No central source of information, no consistency for communication methods.	• Residents • The Strategy Goals	High	Medium
There would not be incentive for properties to receive targeted outreach and properties struggling with specific aspects of the program will not receive the nudge they need to resolve those struggles.	• Residents • The Strategy Goals and Outcomes	High	Medium
Mechanisms don't exist for education providers with data to intervene at the property level.	• Residents • The Education Provider • The Strategy Goals and Outcomes	High	Medium
No coordinated rollout program, or proper utilization of change management best practices for the communal service could result in inconsistent adoption and/or participation in the program.	• Properties • Residents • The City of Edmonton • Strategy Goals and Outcomes	High	Medium
The education provider may not necessarily be the same entity as the collection service provider, resulting in education material that is too generic to be effective.	• The Education Provider • The Service Provider • Residents • The City of Edmonton • Strategy Goals and Outcomes	High	High

Risk	Stakeholder Impacted	EO1- City provides no education and outreach	EO2 - City provides education and outreach
		Score	Score
Differing education providers may result in a lack of equity between the curbside and communal service resident experiences, resulting in frustration with the program.	• Residents • The City of Edmonton	High	Medium