City Operations

Waste Services 2026 Rate Filing

City Operations
Waste Services
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LAND ACKNOWLEDGEMENT

Waste Services acknowledges that our City operates within the traditional land of Treaty 6 Territory, within the Métis homelands and is the home of one of the largest communities of Inuit south of the 60th parallel. We also acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory, as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

EXECUTIVE SUMMARY

The Waste Services utility (the "Utility") is an essential contributor to the City's corporate goals, including the City Plan and Climate Resilience. The City leads by example by focusing on waste reduction activities, waste diversion programs, and supporting and encouraging Edmontonians, businesses and institutions in their waste management practices. Programs developed through a Zero Waste Framework contribute to the City's Corporate Outcomes and the City's waste diversion goals established in the 25-year Waste Strategy.

Waste Services has recently implemented major projects, in alignment with the 25-year Waste Strategy, like the Edmonton Cart Rollout and three-stream apartment and condo collection program, that have contributed to our waste reduction goals and have helped to increase the residential waste diversion rate to 43 per cent in 2024 from 18 per cent in 2020. Continued inflationary pressures and supply chain disruptions have increased operating costs for the Utility, but continuous improvements and efficiencies to the Utility's operations have mitigated any significant impact to utility rates. The provincial Extended Producer Responsibility (EPR) regulation has shifted some operations of the Utility while providing a new source of revenue.

Administration is proposing a total utility rate reduction of three per cent for 2026. The full-year impact of the additional revenue provided by the provincial EPR program in 2026 supports this rate reduction, despite increased pressures on the Utility's revenue requirements including labour, inflation and temporary staff increases. The three per cent reduction lowers the monthly waste utility rate to $42.63 from $43.95 for curbside collection customers with a 240L garbage cart, and to $27.08 from $27.92 for apartment and condo collection customers. These rate reductions allow the Utility to collect a total 2026 revenue requirement of $250.19 million.

Table ES1: Customer Rates - change Summary

Residential Collection Service	2025 Current Monthly Rate	2026 Proposed Monthly Rate	Monthly Decrease ($)	Yearly Decrease ($)
Curbside collection (120L cart)	$38.95	$37.63	($1.32)	($15.84)
Curbside collection (240L cart) *	$43.95	$42.63	($1.32)	($15.84)
Curbside collection (360L cart)	$53.95	$52.63	($1.32)	($15.84)
Apartment and condo collection*	$27.92	$27.08	($0.84)	($10.08)

* Three per cent rate reduction for 240L curbside collection and apartment and condo collection rates. 120L and 360L curbside collections are -$5 / +$10 of 240L rate with varying percentage reductions.

1. INTRODUCTION

The Waste Services utility (the Utility) is an essential part of the City Plan and supports Edmonton's 25-year Waste Strategy. The Utility's goal is to support and encourage Edmontonians, businesses and institutions in their waste management practices. The Utility will support Edmontonians by ensuring utility rates remain stable and consistent, and will lead by example with a strategic focus on waste reduction and diversion.

The Utility continues to implement programs from the 25-year Waste Strategy, provide essential service to Edmontonians while maintaining full cost recovery, and improve the employee and resident experience. The Utility will continue working on the following priorities in 2026:

- Divert over 40 per cent of residential waste from landfill.
- Present the next phase of the Waste Reduction Roadmap for Council approval, continuing efforts to achieve zero per cent growth in per-person residential waste generation.
- Rollout of the source-separation program for approximately 173,000 residential households receiving apartment and condo collection.
- An Industrial, Commercial and Institutional (ICI) sector waste management strategy focused on food and construction and demolition waste.
- Monitor and evaluate participation in the provincial Extended Producer Responsibility program, from a financial, risk and adaptation perspective.

The Utility's operations are continually monitored for improvement, exploring opportunities to deliver services more efficiently and cost effectively through market intelligence and strategic contract renewal, employee engagement and strategic partnerships. In 2025, the Utility improved its cost competitiveness and mitigated risks by bringing former contracted collection services in-house while also engaging in cost-effective service contracts. Waste Services worked closely with Producer Responsibility Organizations (PROs) to execute contracts that helped fully transition Edmonton to the new provincial EPR program while managing corporate risk. The relaunch of a public perception survey provided the Utility with greater insight into resident waste sorting, and will be actioned through new communications and education campaigns in 2026.

Waste Services Utility Fiscal Policy C558C (Appendix C) outlines that the Utility is to be a self-funded enterprise that is financially sustainable over the long term. The Utility should ensure there is a consistent approach year-over-year for the financial planning, budgeting and rate setting. The Utility's guiding principle is to balance the best possible service while incorporating utility rate setting principles in establishing fair customer rates.

2.0 ORGANIZATIONAL STRUCTURE

The organizational structure of Waste Services is fully aligned to the Corporate Business Plan and consists of three sections (Figure 2.1).

Figure 2.1: Waste Services Utility Organizational Structure

Business Integration and Technical Services

Business Integration and Technical Services is responsible for strategic branch initiatives, including the delivery of the 25-year Waste Strategy, and provides oversight for capital projects, day-to-day operations, branch business support and waste education and outreach. This section oversees and coordinates the performance of the branch and its facilities and supports asset and program management, and engineering expertise. Key areas include performance management, analytics, contract management, customer experience, sales and marketing, utility rate filing and billing. This section is also responsible for the Reuse Centre and the Utility's education, outreach and volunteer programs that further resident engagement in sustainable waste practices and waste reduction efforts.

Sustainable Waste Processing

Sustainable Waste Processing receives and sorts residential and non-residential waste at the Edmonton Waste Management Centre (EWMC), a unique collection of advanced processing and research facilities. This integrated site, located on 233 hectares in northeast Edmonton, is designed to handle more than 500,000 tonnes of waste per year. Facilities and operations are either owned and operated by the City or run on a contract basis with private industry partners. The focus of these facilities is to recover valuable resources and to minimize the amount of waste going to landfill. This section is also responsible for landfill management and monitoring the environmental compliance of the Utility.

Waste Collection Services

Waste Collection Services provides safe, efficient and effective waste collection to the residential sector including curbside collection for approximately 273,000 households, and apartment and condo collection for approximately 176,000 households. This section also delivers the Assisted Waste Collection program for residents with mobility restrictions. Residents have access to a number of facilities where various items can be dropped off for recycling or disposal including Eco Stations, Community Recycling Depots and Big Bin Events.

3.0 METHODOLOGY & KEY ASSUMPTIONS

The following subsections provide the methodology and key assumptions for the Waste Services 2026 Rate Filing. The Rate Filing is based on the latest financial forecasts incorporating significant changes up to August 31, 2025. The assumptions used to develop the Rate Filing include forecasts from the City's spring 2025 economic outlook.

Table 3.1: Forecast Housing Starts and Consumer Price Index

	2025	2026	2027
Housing Starts	12,350	11,792	10,950
Consumer Price Index	2.30%	1.90%	1.90%

Table 3.2: Forecast growth in customer base as a result of housing starts

Customer Type	2023 Actual	2024 Actual	2025 Projected	2026 Proposed	2027 Forecast
120L Cart	24,634	26,914	27,187	27,431	27,788
240L Cart	221,773	232,236	243,269	245,449	248,646
360L Cart[1]	2,325	2,452	2,665	2,689	2,724
Transitional Waste Utility Rates	14,785	6,383	135	135	135
Curbside	263,517	267,985	273,256	275,704	279,158
Apartment and Condo	169,491	170,543	176,898	179,420	181,762
Total	**433,008**	**438,528**	**450,154**	**455,124**	**460,920**

The customer counts are based on historical trends and the City's forecast for annual housing starts. The 2024 customer count is the year-end actual, while 2025-2027 are estimated based on a mid-year approach based on housing starts. Transitional Waste Utility Rates includes all classes of customers shifting to curbside collection service from apartment and condo collection service over a five-year period.

- **Regulatory Methodology**

  The revenue requirement and customer rates are based on the forecast costs required by the Utility to provide its services using a cost of service methodology. The methodology and allocations used in determining the revenue requirement are based on a 2023 Cost of Service Study completed by an independent consultant in 2024. The recent Cost of Service

[1] Available only to qualifying households producing home medical waste or with seven or more people in the household.

Study showed costs continue to be appropriately allocated to customer classes, resulting in no changes to rate allocation between the customer classes in this rate filing.

- **Cost of Debt**
  Debt servicing calculations are based on actual Government of Alberta (through the Ministry of Treasury Board and Finance) borrowing rates as of the second quarter of 2025. The borrowing rate used in this rate filing is approximately 4.5 per cent for new long-term debt with a 25-year term (as of June 30, 2025).

Other assumptions include the following:

- Apartment and Condo Collection - The 2026 Rate Filing incorporates continued capital and operating requirements to support the implementation of three-stream waste sorting and collection for apartment and condo buildings, which began in 2023.

- Organics Processing - The 2026 Rate Filing implements the next steps described in the previously-approved City Operations report CO02411 Organics Processing Program Path Forward. Decisions are anticipated in 2026 with regard to the final repurposing of the High Solids Anaerobic Digestion Facility and whether or not to proceed with preparing a business case for an outdoor composting site at the EWMC. The financial impacts of these decisions will likely impact future rate filings.

Customer Counts - The following two tables compare the budget customer counts to the actual/projected customer counts for curbside and apartment and condo collection customers. The tables illustrate the historical customer growth.

Table 3.3: Curbside Customer Counts

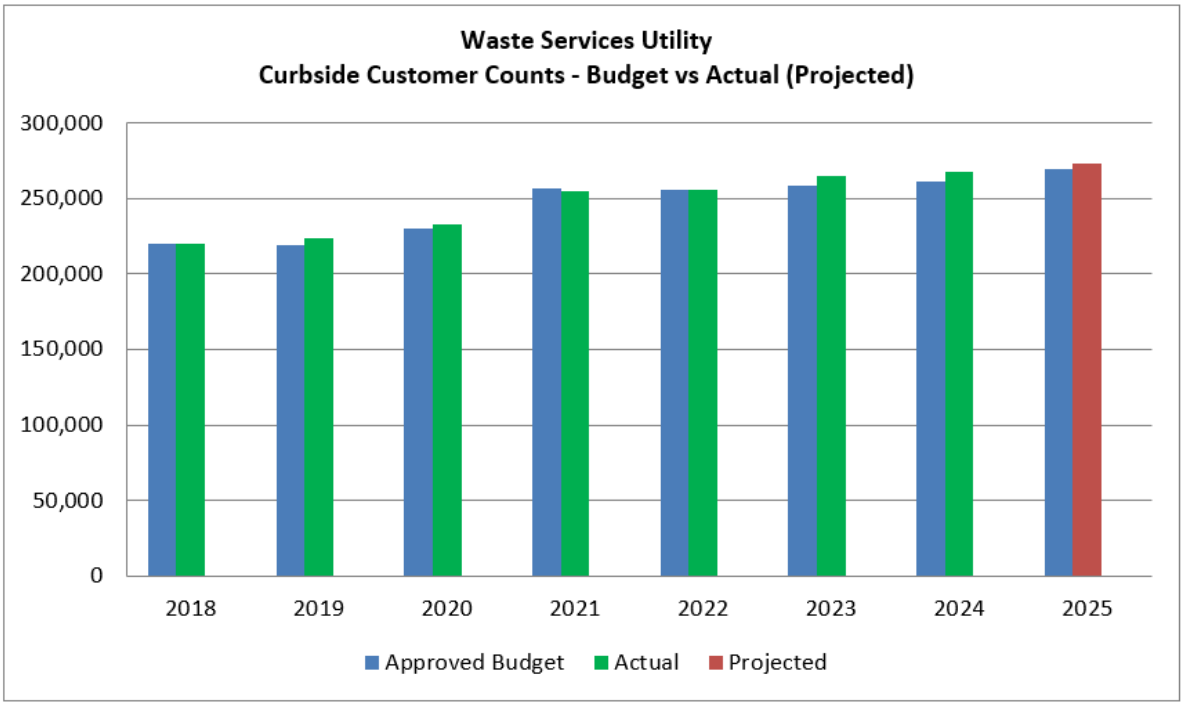
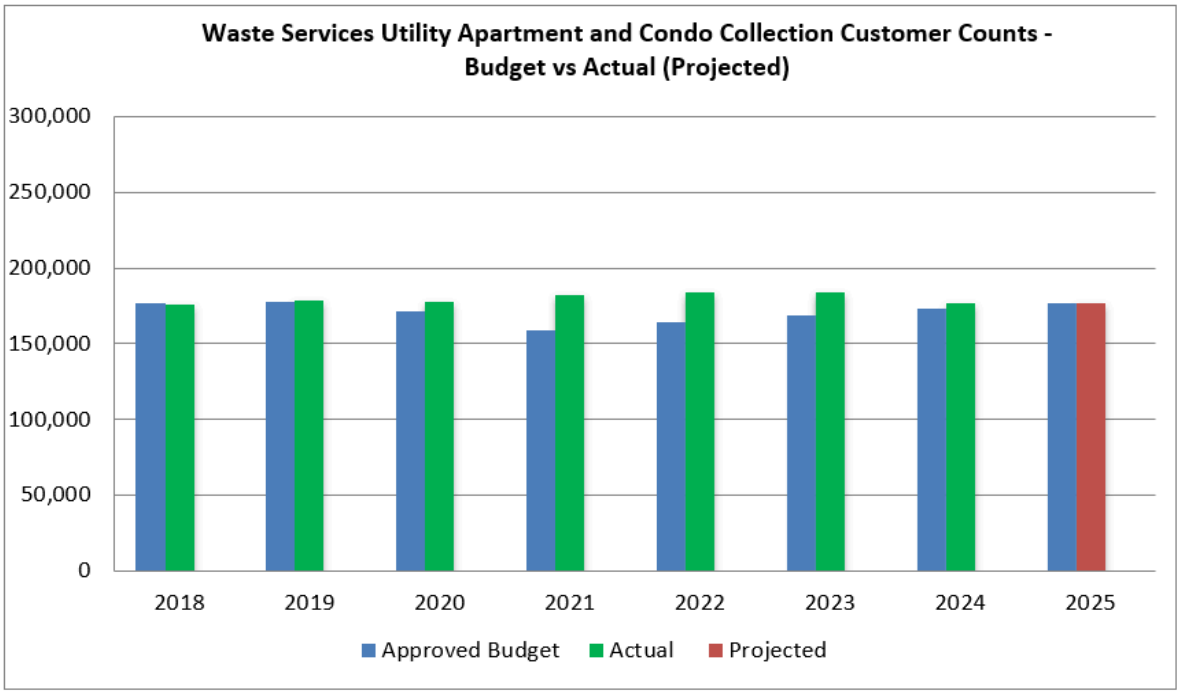


Table 3.4: Apartment and Condo Collection Customer Counts



Extended Producer Responsibility

Extended Producer Responsibility (EPR) is an environmental policy approach under which producers are responsible for their products through to the end of the product life cycle. EPR shifts operational responsibility and the cost of managing product waste from municipalities and ratepayers to producers: manufacturers, brand owners and retailers.

On April 1, 2025, EPR Regulation in Alberta took effect, and the Utility is no longer responsible for collecting or processing recycling and hazardous and special products. This is now the responsibility of producers, and the Utility has signed contracts with Producer Responsibility Organizations (PROs) managing EPR in partnership with producers to continue providing these services to residents.

The implementation of the EPR program added approximately $24 million in net new revenue for the Utility in 2025, allowing for a 10.7 per cent utility rate reduction in 2025. In 2026, additional revenues forecasted due to the EPR program are expected to be $37 million, further offsetting utility rates.

As the collection and processing of these waste streams has shifted into a contractual model within the private sector, the Utility has shifted to accommodate the new framework and continuously evaluates its work to improve and optimize service delivery. Under this new framework, PROs have the ability to select any service provider that aligns with their EPR obligations. Successfully executing this new line of business will necessitate continuous oversight of contractual arrangements to ensure long-term stability, adherence to regulatory compliance requirements, and adapting to a new, competitive service delivery landscape.

The current contracts with PROs encompass both processing and collections services and range in both length and complexity. The Utility's contract for recycling processing ends in 2026, and negotiations are ongoing. The shift to a contractual service delivery model within the private sector has introduced new risks to the Utility. The risk associated with potential contract changes has been incorporated into the 2026 Rate Filing. As contracts shift or end, the Utility will adjust operational service delivery accordingly. The Utility will continue to assess involvement in EPR as it becomes an established provincial program for the best interests of ratepayers and the City.

4.0 OPERATIONAL PERFORMANCE

Key Performance Metrics

GOAL	PERFORMANCE MEASURE	ACTUAL	TARGETS			
		2024 Actual	2025 Target	2025 Projected	2026 Target	2027 Target
Customer Excellence	Curbside Organics & Recyclables Collected[2]	53%	59%	54%	54%	55%
	Kg/Capita Residential Waste Generated	320 kg / capita[3]	385 kg / capita (2020 baseline)	343 kg / capita	385 kg / capita (2020 baseline)	385 kg / capita (2020 baseline)
Operational Excellence	Residential Diversion Rate	43%	40%	41%	40%	40%
	Number of Reportable Environmental Incidents	19	<20	<20	<20	<20
Financial Accountability	Annual Net Income ($M)	$5.94	>$0	$11.64	$5.44	$6.74
	Cash Position ($M)[4]	$65.53	$49.53	$62.14	$47.26	$45.58
	Debt Service Coverage Ratio	2.21	≥ 1.5	1.99	1.69	2.40
	Debt to Net Assets Ratio	60.8%	50 - 70%	57.3%	54.9%	53.5%
	Rate Increases / (Decreases)	0.9%	-10.7%	-10.7%	-3.0%	1.0%
Organizational Excellence	Employee Satisfaction Rate (Glint Survey)[5]	73%	71%	71%	71%	71%
	Number of Proactively Reported Near Miss Incidents	107	118	80	10% more than the previous year	
	Lost Time Frequency Rate (Trailing 12 Months)	1.93	2.21	1.80	<3	<3

[2] This measure will be reviewed internally to ensure it aligns with the implementation of EPR.

[3] This number has been updated from 323 kg/capita in the 2024 Annual Report based on the Summer 2025 Economic Outlook and higher reported population growth in Edmonton.

[4] The utility's cash position includes cash held to fulfill obligations for PAYG Capital and the Clover Bar Landfill liabilities.

[5] Measure is expected to be updated in 2026 based on new corporate methodologies.

5.0 FINANCIAL RATE IMPACTS

The financial rate impacts for the proposed 2026 utility rates, including historical approved rate impacts for 2024 and 2025 and forecasted rate impacts for 2027, are summarized in Schedule 5.0 below. Schedule 5.0 highlights the different utility rate drivers that result in a proposed utility rate reduction of three per cent for 2026 for an average utility ratepayer (as shown on line 11). For context, an average utility ratepayer is defined as a residential customer who is being provided curbside collection through a 240L garbage cart. For this customer type, monthly rates would be reduced to $42.63 per month from $43.95 per month, a decrease of three per cent or $1.32 (Line 9).

The proposed 2026 utility rate reduction of three per cent is primarily due to the impact of EPR being effective for the full calendar year as well as anticipated increased revenues as a result of an increasing customer base. This results in a reduction of the monthly utility rate, for an average customer, by $2.86 (line 7) and $0.87 (line 4) respectively.

This is offset by anticipated increased operating and maintenance costs of $2.03 (line 1). This is primarily due to higher labour costs as a result of recent union contract settlements as well as implementing the project rollout for three-stream collection at apartment and condo buildings.

Also included in the total rate impact is an increase related to net income. Net income, or return on equity, is required to ensure funding and cash balances are available to fund capital expenditures, provide working capital, and manage potential long term business risks (i.e. EPR). Required net income and cash balances are continually monitored by the Utility to ensure the long-term financial sustainability of the Utility in concert with providing fair and equitable utility rates to customers.

More detailed information on related revenues, operating costs and impacts to different utility customer types are outlined in Section 7.0 Utility Revenue Requirement, Section 8: Operations & Maintenance, Section 9: Amortization & Interest Expense, and Section 10 Utility Rate Revenue.

Schedule 5.0		Ref.	2024 Approved	2025 Approved	2026 Proposed	2027 Forecast
Line #						
1	**O&M Impacts**		$ 1.18	$ 1.28	$ 2.03	$ 0.62
2	**Amortization & Interest**		0.68	(0.17)	(0.08)	0.36
	Other Impacts					
3	Non-rate revenue		(0.19)	0.44	0.07	(0.19)
4	Increase Customer Base		(0.83)	(1.33)	(0.87)	(0.55)
5	Net Income		(0.40)	(0.22)	0.40	0.19
	SUBTOTAL		(1.42)	(1.11)	(0.40)	(0.55)
6	**Total Operating Impacts**		$ 0.44	$ (0.00)	$ 1.54	$ 0.43
7	**Extended Producer Responsibility**		-	(5.24)	(2.86)	-
	TOTAL RATE IMPACTS		$ 0.44	$ (5.24)	$ (1.32)	$ 0.43
8	**Existing Rate**		$ 48.75	$ 49.19	$ 43.95	$ 42.63
9	**Total Rate Impact**		0.44	(5.24)	(1.32)	0.43
10	**Revised Rate**	(Sch. 10.0.1 L.8)	$ 49.19	$ 43.95	$ 42.63	$ 43.06
11	**Utility Rate Increase**		0.9%	-10.7%	-3.0%	1.0%

6.0 FINANCIAL INDICATORS

Four financial indicators are used to monitor the financial health of the Utility as per Waste Services Utility Fiscal Policy C558C: Net Income, Cash Position, Debt Service Coverage Ratio and Debt to Net Assets Ratio. These financial indicators are general measures that need to be interpreted collectively to appropriately assess the Utility's long-term financial sustainability. As such, it may be desirable to have higher or lower results on a short-term basis to balance rate setting principles and long-term financial sustainability. In addition to these financial indicators, a general rate setting principle considers that customer rates will be set based on both the short-term and long-term needs of the Utility to ensure they are as stable and consistent, year-over-year, as possible.

Table 6.0 **FINANCIAL INDICATORS** **Line #**	**Actual**	**Approved**	**Projected**	**Proposed**	**Forecast**	
	2024	**2025**	**2025**	**2026**	**2027**	**2028**
1 **Net Income ($M)**	$ 5.94	$ 3.63	$ 11.64	**$ 5.44**	$ 6.74	$ 5.56
2 **Cash Position ($M)**						
Cash Balance (Year-end)	65.53	49.53	62.14	**47.26**	45.58	48.74
Forecast of Cash Requirements						
Long-term Environmental Liability	12.16	8.70	16.59	**7.26**	1.49	6.54
Pay As You Go Capital (next year)	19.28	12.66	17.72	**11.66**	8.37	8.95
Allowance for One Month Working Capital	18.62	18.26	18.55	**19.05**	17.77	18.28
Total Cash Requirements - Target	50.06	39.62	52.86	**37.97**	27.63	33.76
Actual Cash Over (Under) Requirements	$ 15.47	$ 9.91	$ 9.28	**$ 9.30**	$ 17.95	$ 14.98
Target: Cash Over (Under) >= 0	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***
3 **Financing of Capital Investments**						
Debt Service Coverage Ratio	2.21	1.60	1.99	**1.69**	2.40	2.36
Target: Greater than 1.5	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***
4 **Financing of Capital Investments**						
Debt to Net Assets Ratio	60.8%	60.8%	57.3%	**54.9%**	53.5%	53.0%
Target: Between 50% - 70%; balancing cash	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***

General Comments for Financial Indicators

1. Net Income

The proposed and forecasted years all meet the requirement of generating sufficient net income to cover operating expenses, as well as capital expenditures and ongoing landfill liability maintenance costs.

2. Cash Position

The target cash position for the Utility includes cash on hand to meet future Environmental and Asset Retirement Obligation needs, capital funding to meet Pay-As-You-Go (PAYG) cash capital spending for the next year, as well as a general allowance for working capital. The introduction of EPR, by the Province of Alberta, also introduces new factors and complexities that need to be managed due to the contractual arrangements related to executing this line of business. As a result, the Utility's cash position in 2026 and upcoming years is being forecasted to be above target primarily to address the potential increased risk. This will be continued to be assessed at each future rate filing to effectively manage the Utility's cash position while ensuring residential utility rate increases remain low and stable. Other risk issues that will also need to be managed include potential impacts related to asset decommissioning costs for various assets that are in the early planning phase.

3. Debt Service Coverage Ratio

Debt service coverage measures the ability of the Utility to meet its debt servicing obligations using annual revenues. The debt service coverage ratio indicator is achieved when it is greater than 1.5. Based on the anticipated capital financing requirements for the Utility, the ratio is expected to remain above the target of 1.5 and is forecasted to increase in 2027 due to reduced long-term debt repayments combined with higher net income.

4. Debt to Net Assets Ratio

The Debt to Net Assets Ratio measures the extent that the Utility is debt leveraged. The ratio is calculated by taking the outstanding long-term debt over the total net book value for non-contributed assets. The Utility's target is to maintain a ratio between 50 to 70 per cent. Based on the anticipated capital financing requirements for the Utility, the ratio is expected to remain within this band. The debt ratio is forecast to lower in 2027 due to less planned debt issued.

7.0 UTILITY REVENUE REQUIREMENT

(in millions of dollars)

Schedule 7.0 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
	Revenues						
1	Rate Revenue	S.10.0.1 L.28	$ 220.68	$ 200.25	$ 202.24	**$ 198.20**	$ 202.73
2	Projected EPR Revenue	S.3	-	24.00	30.13	**37.04**	26.50
3	Non-Rate Revenue	S.10.1 L.10	24.84	15.29	14.38	**14.95**	15.83
4	**Total Revenues**		245.52	239.54	246.75	**250.19**	245.06
	Costs						
5	Operations and Maintenance	S.8.0 L.14	202.24	195.81	196.58	**204.96**	196.87
6	Amortization of Non-Contributed Assets	S.9.0 L.1	26.65	29.08	28.24	**30.48**	32.24
7	Amortization of Regulatory Asset	S.9.1 L.7	3.91	3.91	3.91	**3.25**	3.25
8	Debt Servicing - Total Interest	S.9.0 L.6	6.79	7.12	6.38	**6.06**	5.96
9	Subtotal		239.58	235.91	235.11	**244.75**	238.32
10	Net Income (Return on Rate Base)	S.13.0.2 L.22	5.94	3.63	11.64	**5.44**	6.74
11	**Total Revenue Requirement**	L.9 + L.10	$ 245.52	$ 239.54	$ 246.75	**$ 250.19**	$ 245.06

The Utility is proposing to collect a total Revenue Requirement of $250.19 million for 2026 (Line 11). The Revenue Requirement is made up of total costs of the Utility to run the business (Line 9), as well as Net Income (Return on Rate Base) (Line 10), which is used to raise cash for required capital funding, Environmental and Asset Retirement Obligation funding and general working capital. References to more detailed variance analyses of proposed 2026 costs and revenues are included in the above table.

The Utility operates on a full cost recovery basis, factoring long-term financial projections and sustainability into its modeling.

8.0 OPERATIONS & MAINTENANCE

(in millions of dollars)

Schedule 8.0 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Personnel	S.8.1 L.4	$ 56.80	$ 58.30	$ 62.55	**$ 66.78**	$ 68.78
2	Materials, Goods & Supplies	S.8.2 L.6	2.91	2.42	2.79	**2.91**	2.96
3	External Services	S.8.3 L.9	83.79	93.47	88.22	**91.70**	81.88
4	Fleet Services	S.8.4 L.3	16.72	17.41	15.58	**17.51**	17.84
5	Shared Services	S.8.5 L.11	10.52	10.29	10.29	**10.38**	10.57
6	Intra-municipal Services	S.8.6 L.8	6.53	5.33	4.72	**5.99**	6.20
7	Utilities	S.8.7 L.5	4.54	4.67	5.16	**5.27**	5.00
8	Landfill Liability Required	S.12.0 L.4	18.19	2.60	5.77	**2.31**	1.50
9	Other Expenses	S.8.9 L.5	3.16	1.65	1.70	**2.47**	2.51
10	TOTAL O&M EXPENSES		203.17	196.15	196.78	**205.31**	197.24
11	Intra-municipal Recoveries	S.8.8 L.4	(0.97)	(0.42)	(0.27)	**(0.42)**	(0.44)
12	Grants		0.04	0.08	0.08	**0.08**	0.08
13	RECOVERIES		(0.93)	(0.34)	(0.20)	**(0.35)**	(0.36)
14	NET Operations & Maintanance	S7.0 L.5	$ 202.24	$ 195.81	$ 196.58	**$ 204.96**	$ 196.87

8.1 PERSONNEL

(in millions of dollars)

Schedule 8.1 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Wages		$ 46.50	$ 46.87	$ 50.64	**$ 54.73**	$ 56.37
2	Overtime		1.28	1.49	1.55	**1.40**	1.44
3	Allowances and Benefits		9.02	9.94	10.36	**10.65**	10.97
4	**TOTAL PERSONNEL**	S.8.0 L.1	$ 56.80	$ 58.30	$ 62.55	**$ 66.78**	$ 68.78

Personnel costs include Wages, Overtime, Employment Allowances and Benefits. The City's Capital and Operating Budget System (COBS) utilizes the City's payroll system as the source for personnel budget wage and benefit rates, providing a reliable and consistent source of information. The Utility estimates its full-time equivalent (FTE) staffing requirements to create the 2026 Proposed budget estimate. A four per cent vacancy rate is applied to arrive at the 2026 Proposed personnel cost.

The Utility is requesting a 0.4 FTE administrative increase to its approved regular permanent full-time complement of 559.6 FTE to 560.0.

Table 8.1: Approved Regular FTE

Proposed FTE Changes in 2026 Rate Filing	FTEs
2025 Approved FTE	**559.6**
Increase to approved FTE	0.4
2026 Proposed FTE	**560.0**

Line 1 - Wages

Projected wages in 2026 are trending higher than approved 2025 wages for multiple reasons, including settlement of union agreements retroactive to 2024 (including wage increases and retroactive pay) as well as increased staffing as outlined below:

- Targeting a 50/50 division of labour between City staff and contractors for both collection services has led to in-sourcing more apartment and condo collection work in northeast Edmonton, requiring more staff.

- Additional staff across the Utility are required for the three-stream apartment and condo collection rollout as it moves into new areas of Edmonton, including waste outreach and operational training employees.

Line 2 - Overtime

Overtime is typically used to respond to peak seasonal waste collection and processing demands using existing Utility staff. Overtime costs are strictly monitored to ensure operational and asset utilization efficiency. Overtime for 2026 Proposed is budgeted using an average of prior years inflated actuals.

Line 3 - Allowances and Benefits

Benefits mainly consist of Local Authorities Pension Plan (LAPP), the Canada Pension Plan, Employment Insurance, Major Medical and Dental Plan, Group Life Insurance and Health Care Spending Accounts. The increase in Allowance and Benefits is mainly due to inflation, in addition to collectively bargained increases to health care benefits. Worker compensation benefit premium costs are also forecast to escalate in 2026 due to more claims being made from the City.

8.2 MATERIALS, GOODS & SUPPLIES

(in millions of dollars)

Schedule 8.2 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Collection Services		$ 0.87	$ 0.69	$ 0.92	**$ 0.70**	$ 0.71
2	Organics		0.04	0.04	0.04	**0.07**	0.07
3	Integrated Processing & Transfer		0.16	0.08	0.12	**0.14**	0.14
4	Haul and Landfill Operations		0.06	0.06	0.06	**0.06**	0.06
5	Other		1.78	1.55	1.66	**1.94**	1.98
6	**TOTAL MATERIALS, GOODS & SUPPLIES**	S8.0 L.2	$ 2.91	$ 2.42	$ 2.79	**$ 2.91**	$ 2.96

Line 5 - Other

Increases in Other costs are primarily related to increases in computer software licence fees related to facility maintenance and workflow automation as well as increased EWMC site operations costs.

8.3 EXTERNAL SERVICES

(in millions of dollars)

Schedule 8.3 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Waste Collection Services		$ 30.17	$ 30.73	$ 30.71	**$ 33.24**	$ 33.45
2	Materials Recovery Facility		9.34	10.13	7.63	**10.17**	-
3	Organics		11.29	14.45	14.26	**6.76**	6.89
4	Integrated Processing & Transfer		11.37	11.72	11.22	**12.44**	12.68
5	Haul and Landfill Operations		11.61	14.03	12.61	**11.70**	11.93
6	Customer Billing Services		5.44	5.45	5.63	**6.03**	6.14
7	Asset Decommissioning		-	1.00	0.36	**5.34**	4.00
8	Other		4.58	5.96	5.80	**6.02**	6.78
9	**TOTAL EXTERNAL SERVICES**	S.8.0 L.3	$ 83.79	$ 93.47	$ 88.21	**$ 91.70**	$ 81.88

Line 1 - Waste Collection Services

Collection Services' external contracts include collection of residential garbage, recycling, food scraps and seasonal yard waste. It also includes apartment and condo collection of residential garbage, recycling and food scraps, as well as costs for contracted equipment, services at the Eco Stations and other Collection Services programs. Other costs include contracted equipment and programs to provide services to Edmontonians.

External services costs have increased due to higher contract costs due to inflation, service delivery requirements, and population growth, which contribute to larger waste volumes to collect and process. Current contracts are adjusted annually using a cost index that includes Consumer Price Index (CPI), fuel and labour to better reflect annual changes in direct operating costs.

Line 2 - Materials Recovery Facility

The Materials Recovery Facility (MRF) sorts and processes recyclables collected through the blue bag, blue bin and Community Recycling Depot programs. The City's contract with the PRO for processing blue bag materials under EPR is currently set to end September 30, 2026. Proposed costs for 2026 include running the MRF and transitioning processing contracts.

Line 3 - Organics

The 2025 contracted organics costs included operations and maintenance for the High Solids Anaerobic Digestion Facility (HSADF) and third-party processing contracts. Costs are projected to

decrease in 2026 as the Utility pursues a new strategic direction for organics processing, moving to off-site third-party processing and away from active anaerobic digestion at the HSADF.

Line 4 - Integrated Processing and Transfer

Feedstock for waste-to-energy applications is prepared at the Refuse Derived Fuel (RDF) Facility, located within the Integrated Processing and Transfer Facility. The utility pays contractually agreed upon fees to third-party processing facilities for the conversion of feedstock into energy. The fees include a tipping fee for the delivery of acceptable feedstock to the facilities. The forecasted increase in 2026 is due to third-party facilities requiring more feedstock from the RDF Facility.

Line 5 - Haul and Landfill Operations

Haul and Landfill Operations represents the internal and contracted out hauling fees for all Utility operations and landfill tipping fees. The projected decrease in 2026 is due to fewer tonnes trucked to landfill, with the RDF Facility running at full capacity, as well as utilizing more internal trucking to haul material to landfill.

Line 6 - Customer Billing Services

The utility has a contract with EPCOR for the provision of customer billing and collection services. A new contract takes effect in 2026, increasing the projected costs from 2025. The Utility works closely with EPCOR to ensure good value from the new contract for residential customers.

Line 7 - Asset Decommissioning

The 2026 Proposed costs are for removal of digester drums at the former Edmonton Composting Facility Aeration Hall building, which was decommissioned in 2020. There are plans for continued work on various asset decommissioning in 2027 and beyond.

Line 8 - Other

Other external services include the apartment and condo collection program, support for waste characterization studies, Waste System Education and Program Management, Engineering Analysis, Administrative Services, Environmental Monitoring and Compliance, and EWMC facilities including the Advanced Energy Research Facility and the Research & Development Facility. 2026 costs increase higher than 2025 Projected due to the waste characterization study and the Industrial, Commercial and Institutional Waste Roadmap.

8.4 FLEET SERVICES

(in millions of dollars)

Schedule 8.4 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Fuel		$ 5.11	$ 5.29	$ 4.77	**$ 4.77**	4.86
2	Direct Charge & Repairs		11.61	12.12	10.81	**12.74**	12.98
3	**TOTAL FLEET SERVICES**	S.8.0 L.4	$ 16.72	$ 17.41	$ 15.58	**$ 17.51**	$ 17.84

Fleet Services are managed by the City on behalf of the Utility. As the client, the Utility bases its maintenance and procurement decisions on data and information from Fleet Services. The City manages the procurement of vehicles and equipment based on communicated requirements from the utility, and also handles the fuel contracts.

As Fleet Services recovers 100 per cent of branch costs, a portion of indirect branch overhead is charged to the Utility. The indirect overhead is allocated through work order fees, vendor work charges and fuel surcharges. The remaining overhead costs are recovered through shop rates on shop labour hours. Indirect overhead includes administration, training, engineering, procurement, safety, client relations, and facility and equipment maintenance. Estimates for Fuel and Direct Charge & Repairs are estimated by Fleet Services in consultation with the Utility and aligned with Fleet Services' four-year operating budget for 2023 to 2026. Estimates were reviewed and updated for the Waste Services 2026 Rate Filing. The increase in Direct Charge & Repairs is the result of higher maintenance on collection vehicles as the fleet ages, with fewer unit repairs being completed under warranty.

Funding for the Utility's vehicle and equipment replacements are incorporated into the Utility's Fleet capital program, as described in Section 11.

8.5 SHARED SERVICES

(in millions of dollars)

Schedule 8.5 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Corporate Allocation (Central Management)		$ 2.09	$ 2.11	$ 2.11	**$ 2.13**	$ 2.17
2	Communications & Public Engagement		1.64	1.66	1.66	**1.68**	1.71
3	Financial Services		1.54	1.56	1.56	**1.57**	1.60
4	Safety		0.51	0.33	0.33	**0.34**	0.34
5	Human Resources		0.94	1.13	1.13	**1.14**	1.16
6	Law		0.35	0.35	0.35	**0.35**	0.36
7	Corporate Procurement and Supply Services		0.50	0.51	0.51	**0.51**	0.52
8	Information Technology		1.48	1.48	1.48	**1.51**	1.53
9	Real Estate & Housing		0.69	0.38	0.38	**0.35**	0.35
10	Service Innovation & Performance		0.78	0.78	0.78	**0.80**	0.81
11	**TOTAL SHARED SERVICES**	S.8.0 L.5	$ 10.52	$ 10.29	$ 10.29	**$ 10.38**	$ 10.57

The City employs a shared services model where support services required for the operations of all City businesses are provided through centralized areas of expertise. This approach takes advantage of efficiencies gained through economies of scale and opportunities to provide more robust systems and services (e.g. technology-related services). Waste Services Utility Fiscal Policy C558C requires that the Utility operate under a full cost approach, requiring the Utility to pay for its portion of shared services.

In March 2021, a third-party consultant conducted a benchmarking study to validate the reasonableness of shared service costs allocated to the Utility. The scope of this study included a review and comparison of cost allocations, methodologies, policies and procedures to evaluate if the shared services costs allocated to the Utility are on par with comparable municipalities. The six most common service categories provided through central services were selected including: Information Technology, Human Resources, Financial Services, Communications, Law (Legal Services) and Procurement. Overall, the study concluded that the shared services costs allocated to the Utility were reasonable and within an acceptable range.

As part of the City's 2023-2026 budget cycle, shared service costs were reviewed and re-evaluated to update cost requirements. The Utility worked with shared service providers to analyse and develop the shared service budget for the 2026 Rate Filing. The 2026 Proposed is higher than 2025 Projected due to inflationary cost increases.

8.6 INTRA-MUNICIPAL SERVICES

(in millions of dollars)

Schedule 8.6 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Communications & Public Engagement		$ 0.70	$ 0.70	$ 0.53	**$ 0.52**	$ 0.53
2	Human Resources		0.19	0.10	0.10	**0.20**	0.21
3	Law		0.34	0.34	0.34	**0.32**	0.33
4	Corporate Procurement and Supply Services		0.33	0.33	0.33	**0.35**	0.36
5	Transportation Operations		0.02	0.07	0.07	**0.04**	0.04
6	Facilities and Landscape Infrastructure		2.32	2.38	2.41	**2.47**	2.51
7	Other		2.65	1.41	0.95	**2.08**	2.22
8	**TOTAL INTRA-MUNICIPAL SERVICES**	S.8.0 L.6	$ 6.53	$ 5.33	$ 4.72	**$ 5.99**	$ 6.20

Intra-Municipal Services are charges for on-demand services provided through other City of Edmonton programs which are not incorporated in shared services charges. They are more variable as they are charged over and above fixed Shared Services costs outlined in Section 8.5. For example, a special project may arise requiring more City support, warranting additional charges to the Utility from the City. These are direct charges for services such as dedicated support for communication and engagement initiatives, on-demand building repairs and maintenance, posting vacant positions to external job websites, fleet support and security services for special events.

Line 1 - Communication & Public Engagement

The 2026 Proposed decrease is due to reduced staff support needed for public engagement.

Line 2 - Human Resources

The increase in direct charges from the 2025 projection is related to costs for Waste Services staffing requirements in 2026.

Line 7 - Other

The increase in the 2026 Other Services budget is directly tied to the discontinuation of the Aggregates Recycling Program. The 2025 Projected includes a one-time positive credit generated by the program's final inventory sale as it wound down. The absence of this temporary credit in 2026 means the budget line reflects the expected, higher net operating expense.

8.7 UTILITIES

(in millions of dollars)

Schedule 8.7 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Power		$ 2.63	$ 2.29	$ 2.77	**$ 2.70**	$ 2.50
2	Natural Gas		1.54	1.93	1.88	**2.10**	2.02
3	Water		0.09	0.09	0.09	**0.09**	0.09
4	Other		0.28	0.36	0.42	**0.36**	0.38
5	**TOTAL UTILITIES**	S.8.0 L.7	$ 4.54	$ 4.67	$ 5.16	**$ 5.27**	$ 5.00

Power, natural gas and water estimates are provided by the City's Urban Planning and Economy department's Economic and Environmental Sustainability branch. Estimates are based on historical consumption and future forecasted rates for current service levels. Service level changes are applied to the estimates to determine the budget numbers for each utility.

8.8 INTRA-MUNICIPAL RECOVERIES

(in millions of dollars)

Schedule 8.8 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Litter Collection Recovery		$ (0.21)	-	-	-	-
2	Landfill Disposal Fees		(0.94)	(0.94)	(0.94)	**(0.94)**	(0.96)
3	Other		0.18	0.52	0.67	**0.52**	0.52
4	**TOTAL INTRA-MUNICIPAL RECOVERIES**	S.8.0 L.11	$ (0.97)	$ (0.42)	$ (0.27)	**$ (0.42)**	$ (0.44)

Intra-Municipal Recoveries are billings to other areas within the City for services provided by the Utility. These recoveries include direct charges such as charges to other City areas for disposal of waste at the EWMC. Effective April 1, 2024, litter collection was transferred to Fleet and Facility Services as part of the City-wide cost and delivery efficiency consolidation project.

Line 3 - Other

The decrease in 2026 is mainly due to a reduction in internal hauling charges as the Coronation Eco Station expansion project is scheduled to shut down the Eco Station in 2026, resulting in less demand for hauling services.

8.9 OTHER EXPENSES

(in millions of dollars)

Schedule 8.9 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Insurance		$ 0.86	$ 0.60	$ 0.60	**$ 0.88**	$ 0.90
2	Bad Debt		1.55	0.92	1.06	**1.35**	1.38
3	Gain/Loss on Disposal of Assets		0.37	-	(0.07)	**-**	-
4	Other		0.38	0.13	0.11	**0.24**	0.24
5	**TOTAL OTHER EXPENSES**	S.8.0 L.9	$ 3.16	$ 1.65	$ 1.70	**$ 2.47**	$ 2.51

Other expenses primarily include insurance premiums associated with waste collection and processing facilities at the EWMC and Eco Stations, bad debt expense related to residential utility billing, and service charges for credit/debit card processing at the EWMC Scalehouse and Eco Stations. The Increase to 2026 Proposed is due to using an updated three-year average of historical costs.

9.0 AMORTIZATION, INTEREST EXPENSE & LONG-TERM DEBT

(in millions of dollars)

Schedule 9.0 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Amortization of Non-Contributed Assets	S.7.0 L.6	$ 26.65	$ 29.08	$ 28.24	**$ 30.48**	$ 32.24
2	Amortization of Contributed Assets		1.18	1.10	1.11	**1.08**	1.08
3	TOTAL AMORTIZATION OF ASSETS		$ 27.84	$ 30.18	$ 29.35	**$ 31.56**	$ 33.32
4	Long-Term Interest - Existing Borrowing		$ 6.79	$ 5.85	$ 6.19	**$ 5.28**	$ 4.57
5	Long-Term Interest - Proposed Borrowing		0.00	1.26	0.19	**0.78**	1.39
6	TOTAL INTEREST EXPENSE	S.7.0 L.8	$ 6.79	$ 7.12	$ 6.38	**$ 6.06**	$ 5.96
7	Long-Term Debt Principal Repayment - Existing Borrowing		$ 21.04	$ 21.49	$ 21.67	**$ 21.56**	$ 13.66
8	Long-Term Debt Principal Repayment - Proposed Borrowing		0.00	0.44	0.02	**0.49**	1.11
9	TOTAL PRINCIPAL REPAYMENTS		$ 21.04	$ 21.93	$ 21.69	**$ 22.04**	$ 14.78
10	Long-Term Debt Balance - Existing Borrowing		$ 180.98	$ 174.55	$ 165.74	**$ 157.92**	$ 159.50
11	Long-Term Debt Balance - Proposed Borrowing		7.02	16.99	13.65	**16.35**	11.91
12	TOTAL LONG-TERM DEBT BALANCE		$ 188.00	$ 191.54	$ 179.39	**$ 174.27**	$ 171.40
13	MID-YEAR LONG-TERM DEBT BALANCE		$ 195.00	$ 194.01	$ 183.70	**$ 176.83**	$ 172.84

Line 1 - Amortization of Non-Contributed Assets

Amortization expense represents the amount of asset life used during a given operating period. The rate of amortization is dependent upon the asset class, each with a predetermined estimated useful life based upon historical experience. The Utility's assets are divided into 46 different classes, with useful lives varying between three and 60 years. Amortization expense is calculated using the straight-line method, which incurs a half-year of expenses in the first and last year of the asset's life.

Increases in amortization are due to upcoming asset commissioning related to vehicle and container purchases, as well as the EWMC Water Distribution System Upgrade, Coronation Eco Station Expansion, Three-stream Communal Collection, Greenhouse Gas Mitigation Energy Transition Portfolio projects, and various EWMC site infrastructure and facilities projects. The majority of existing Waste Services assets are in good operating condition and are not

approaching the end of their asset lifecycle. The Utility also continually reviews assets that are no longer in service and assesses the costs and timing of decommissioning activities which would be attributed as operating expenses separate from amortization.

Line 6 - Total Interest Expense

Interest expense is incurred from Government of Alberta (formerly the Alberta Capital Financing Authority) debentures related to capital projects, as outlined in Section 11.2. Projected rates are based on recent Government of Alberta rates and economic conditions (Section 3.0).

Line 12 - Total Long-Term Debt

Projected Long-Term Debt decreases in 2026 due to total repayments of debt being higher than new debt required for the 2026 Capital Plan, as indicated in Capital Financing Schedule 11.2, Line 2. This is mainly due to the completion of a significant 25-year debt servicing term.

9.1 DEFERRAL ACCOUNT BALANCES

(in millions of dollars)

Schedule 9.1 Line #		Reference	Recovery Period (Years)	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	**Opening Deferral Balance (Regulatory Asset)**			$ 18.24	$ 14.33	$ 14.33	**$ 10.42**	$ 7.18
2	**Deferral Additions During the Year**			-	-	-	**-**	-
	Amortization of Regulatory Asset							
3	2017 Impairment		12	1.31	1.31	1.31	**1.31**	1.31
4	2019 Impairment		8	0.63	0.63	0.63	**0.63**	0.63
5	ECF Deconstruction		8	1.31	1.31	1.31	**1.31**	1.31
6	2020 Impairment		5	0.66	0.66	0.66	**-**	-
7	**Total Amortization of Regulatory Asset**	S7.0 L.7		$ 3.91	$ 3.91	$ 3.91	**$ 3.25**	$ 3.25
8	**Closing Deferral Balance (Regulatory Asset)**			$ 14.33	$ 10.42	$ 10.42	**$ 7.18**	$ 3.93

The deferral account is a rate-regulated accounting mechanism, allowing the Utility to minimize rate volatility for ratepayers by recovering approved cost over a period of time compared to when the costs are actually incurred. This results in the Utility recording a regulatory asset for the deferral account balances, which is amortized over a reasonable time period to allow the Utility to recover costs from ratepayers while ensuring rate stability. The existing deferral account balances are primarily related to asset write-down cost and demolition cost resulting from the structural failure of the Edmonton Composting Facility, which was approved to be deferred and recovered from ratepayers in the Utility's 2019 Rate Filing. There are no additions to the deferral account for the 2026 Rate Filing.

Lines 3-7: Amortization of Regulatory Asset

The amortization of the regulatory asset represents the annual amount of the deferral balance recovered through utility rates. The amortization period used for the regulatory asset closely matches the remaining useful life of the original asset, and in the case of decommissioning costs a reasonable time period was selected that minimizes rate impact while balancing intergenerational equity. On average, the deferral amortization period on the existing balance is approximately nine years with a final expense year of 2031.

10.0 UTILITY RATE REVENUE

Curbside Collection Utility Rate

The following table outlines the proposed cart rates for 2026, forecasts for 2027 and the percentage of curbside collection customers selecting each garbage cart size. A monthly $1.32 decrease in waste utility rates is proposed for all curbside collection customers. The 240L garbage cart size is the default size and was used to determine the base three per cent utility rate decrease.

Table 10A: 2026 Curbside Collection Monthly Utility Rates

Garbage Cart Size (litres)	2024 Approved	2025 Approved	2026 Proposed	2027 Forecast	Customer Adoption *
120L	$44.19	$38.95	$37.63	$38.06	9%
240L	$49.19	$43.95	$42.63	$43.06	90%
360L[6]	$59.19	$53.95	$52.63	$53.06	1%

* Customer Adoption refers to the % of customers that use each size Cart

Apartment and Condo Collection Utility Rate

Most customers in multi-unit households, such as apartments and condominiums, receive apartment and condo collection, where waste is disposed of in shared containers. The rollout of three-stream sorting to apartment and condo collection is in progress, and is projected to be complete in 2027. A three per cent monthly utility rate decrease, or $0.84 per month, for apartment and condo collection is proposed in 2026.

Table 10B: 2026 Apartment and Condo Collection Monthly Utility Rates

2024 Approved	2025 Approved	2026 Proposed	2027 Forecast
$31.25	$27.92	$27.08	$27.35

Transitional Waste Utility Rates

Transitional waste utility rates are used to bridge the impact of rate increases to specific classes of ratepayers moving to curbside collection service from apartment and condo collection service. These rates are typically implemented when properties are more suited for carts, but are receiving apartment and condo collection service. Curbside collection service begins as soon as possible, while

[6] Available only to qualifying households producing home medical waste or with seven or more people in the household.

the transitional waste utility rates are adjusted over a four-year period to reduce rate shock. Ratepayers moving to apartment and condo collection from curbside collection are transferred to the apartment and condo rate whenever feasible, as this would be a rate reduction.

Table 10C: 2026 Transitional Waste Utility Rates

Transitional Waste Utility Rate	2024 Approved	2025 Approved	2026 Proposed	2027 Forecast
Curbside Service Transition Rate Year 1	$34.84	$31.13	$30.19	$30.49
Curbside Service Transition Rate Year 2	$38.43	$34.33	$33.30	$33.63
Curbside Service Transition Rate Year 3	$42.02	$37.54	$36.41	$36.77
Curbside Service Transition Rate Year 4	$45.60	$40.74	$39.52	$39.92

Calculation of Utility Rate Revenue

Schedule 10.0.1 illustrates the Rate Revenue at the existing 2025 Rates (Line 28 = $204.36 million), the percentage change due to the one-time EPR revenue adjustment (-6.4 per cent), the utility rate increase required for services (3.4 per cent) and the net total required to arrive at the 2026 Proposed Rate Revenue of $198.20 million (-3.0 per cent).

Rate Revenues shown on Schedule 10.0.1, Line 28 are carried to the Utility Revenue Requirement Schedule, Line 1 in Section 7.0: Utility Revenue Requirement.

(in millions of dollars)

Summary of Customers, Rates and Revenue

Schedule 10.0.1 Line #		Cross Ref:	Actual 2024	Projected 2025	Rate Filing Proposed 2026 Existing	EPR Adj.	Rate Incr.	Proposed
1	**Curbside Collection**							
2	**120L Cart**							
3	Monthly Avg # Units		26,914	27,187	27,431	27,431	27,431	**27,431**
4	Monthly Rate		$44.19	$38.95	$38.95	-$2.49	$1.17	**$37.63**
5	Annual Revenue ($ M)		$14.27	$12.71	$12.82	-$0.82	$0.39	**$12.39**
6	**240L Cart**							
7	Monthly Avg # Units		232,236	243,269	245,449	245,449	245,449	**245,449**
8	Monthly Rate		$49.19	$43.95	$43.95	-$2.81	$1.49	**$42.63**
9	Annual Revenue ($ M)		$137.08	$128.30	$129.45	-$8.27	$4.39	**$125.56**
10	**360L Cart***							
11	Monthly Avg # Units		2,452	2,665	2,689	2,689	2,689	**2,689**
12	Monthly Rate		$59.19	$53.95	$53.95	-$3.45	$2.13	**$52.63**
13	Annual Revenue ($ M)		$1.74	$1.73	$1.74	-$0.11	$0.07	**$1.70**
14	**Various Transitional Rates**							
15	Monthly Avg # Units		6,383	135	135	135	135	**135**
16	Annual Revenue ($ M)		$3.46	$0.07	$0.07	$0.00	$0.00	**$0.07**
17	**Other ***							
18	Annual Revenue ($ M)		$0.17	$0.17	$0.17	$0.00	$0.00	**$0.17**
19	**Total Curbside Collection**							
20	Monthly Avg # Units		267,985	273,256	275,704	275,704	275,704	**275,704**
21	Annual Revenue ($ M)		$156.73	$142.97	$144.26	-$9.20	$4.84	**$139.89**
22								
23	**Apartment and Condo Collection**							
24	# Units		170,543	176,898	179,420	179,420	179,420	**179,420**
25	Rate		$31.25	$27.92	$27.92	-$1.78	$0.95	**$27.08**
26	Revenue ($ M)		$63.95	$59.27	$60.11	-$3.84	$2.04	**$58.31**
27								
28	**TOTAL REVENUES**	**S.7.0 L.1**	$220.68	$202.24	$204.36	-$13.04	$6.88	**$198.20**
29								
30	**% Rate Increase Over Existing Rates**					-6.4%	3.4%	-3.0%

10.1 NON-RATE REVENUE

(in millions of dollars)

Schedule 10.1 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Program Revenues - Tip Fees		$ 3.20	$ 3.73	$ 3.73	**$ 3.60**	$ 3.67
2	Program Revenues - C&D Waste		0.16	0.21	0.21	**0.17**	0.17
3	Program Revenues - Materials Recovery Facility		2.22	0.52	0.52	**0.40**	1.00
4	Program Revenues - Corporate Facilities Collection		2.02	2.01	2.01	**2.07**	2.11
5	Program Revenues - Eco Stations		3.58	3.38	3.81	**3.66**	3.72
6	Program Revenues - Landfill Gas, Greenhouse Gas		6.12	-	-	-	
7	Program Revenues - Other		3.79	2.68	1.64	**2.53**	2.58
8	Investment Earnings		3.74	2.44	2.44	**2.10**	2.14
9	Grants		-	0.30	0.00	-	-
10	**TOTAL NON-RATE REVENUE**	S7.0 L.3	$ 24.84	$ 15.29	$ 14.38	**$ 14.95**	$ 15.83

Line 1 - Tip Fees Revenue

Tip Fee Revenues are generated from private commercial haulers disposing waste materials at the EWMC. 2026 program revenues have been adjusted for expected volumes.

Line 2 - Construction and Demolition (C&D) Waste Revenue

The Construction and Demolition Waste Facility is operated by a third-party. Revenues are forecasted on royalties received from the third-party operator. The decrease in 2026 Proposed from 2025 Approved is due to using a three-year average of actuals to forecast for 2026.

Line 3 - Materials Recovery Facility Revenue

Materials Recovery Facility revenues from the sale of recyclable materials are highly influenced by both the Canadian commodities market and the US exchange rate. The term of the current EPR processing contract is set to end on October 1, 2026. The Utility is currently in negotiations with the PRO on future utilization of the Materials Recovery Facility. Various scenarios for future operations of the Material Recycling Facility will be reviewed in 2026.

Line 4 - Corporate Facilities Collection Revenue

Corporate Facilities Collection Revenue is obtained solely from waste collection and disposal at City facilities. Billing for this service is done by City's billing provider EPCOR, which is provided to the Utility as revenue and not as an interdepartmental recovery.

Line 5 - Eco Station Revenue

Eco Station revenue updated to reflect expected volume in 2026.

Line 6 - Landfill and Greenhouse Gas Revenue

Landfill and Greenhouse Gas Revenue is generated from the sale of emission reduction credits. The 2024 actual revenue included landfill Greenhouse Gas (GHG) credit revenue for offset credits from 2018 to 2023. Existing landfill and composting offsets projects have reached the end of their crediting period, and there will not be new revenue from GHG offset sales in 2026 or 2027.

Line 7 - Other Program Revenue

Other Program Revenue includes revenues generated from third-parties operating at the EWMC, which includes sharing of third-party sales revenues. 2026 Proposed revenue is higher than 2025 due to rental revenue at the Advanced Energy Research Facility, which did not have any third-party tenants in 2025.

Line 8 - Investment Earnings

Investment earnings include interest payments received on existing cash balances. Interest earned is expected to decrease due to a decrease in the Utility's cash position in 2026.

10.2 CALCULATION OF RATE BASE

(in millions of dollars)

Schedule 10.2 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
	Investments in Tangible Capital Assets						
1	Gross Book Value - Non Contributed		$ 636.84	$ 678.11	$ 669.05	**$ 703.69**	$ 738.95
2	Gross Book Value - Contributed		33.54	33.54	33.54	**33.54**	40.54
3	Gross Book Value - All Assets		670.38	711.65	702.58	**737.22**	779.49
4	Accumulated Depreciation - Non Contributed		327.47	363.09	355.72	**386.19**	418.42
5	Accumulated Depreciation - Contributed		15.17	16.24	16.27	**17.36**	18.44
6	Accumulated Depreciation - All Assets		342.64	379.34	371.99	**403.55**	436.86
7	Net Book Value - Non Contributed		309.37	315.02	313.33	**317.50**	320.53
8	Net Book Value - Contributed		18.37	17.29	17.26	**16.18**	22.10
9	Net Book Value - All Assets		$ 327.74	$ 332.31	$ 330.59	**$ 333.67**	$ 342.63
10	Mid-Year Non-Contributed Assets		309.60	314.94	311.35	**315.41**	319.01
	Cash Flow Requirement						
11	One Month Operations		18.62	18.26	18.55	**19.05**	17.77
12	**RATE BASE AT MID YEAR**	S.10.3 L.1	$ 328.22	$ 333.20	$ 329.90	**$ 334.46**	$ 336.78

10.3 CAPITAL STRUCTURE & RETURN ON RATE BASE

(in millions of dollars)

Schedule 10.3 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	**Mid-Year Rate Base**	S10.2 L.12	$ 328.22	$ 333.20	$ 329.90	**$ 334.46**	$ 336.78
	Mid-Year Capital Structure						
2	Debt		59.4%	56.2%	55.7%	**52.9%**	51.3%
3	Equity		40.6%	43.8%	44.3%	**47.1%**	48.7%
	Cost Rates						
4	Debt	L.6/(L.1xL.2)	3.5%	3.8%	3.5%	**3.4%**	3.5%
5	Equity	L.7/(L.1xL.3)	4.5%	2.5%	8.0%	**3.5%**	4.1%
	Weighted Average Cost of Capital		3.9%	3.2%	5.5%	**3.4%**	3.8%
	Return on Rate Base						
6	Debt	S7.0 L.8	6.79	7.12	6.38	**6.06**	5.96
7	Equity	S7.0 L.10	5.94	3.63	11.64	**5.44**	6.74
	Total Return		$ 12.74	$ 10.74	$ 18.03	**$ 11.50**	$ 12.70

Mid-Year Capital Structure

The Capital Structure is trending towards higher equity due to debenture expiry. In addition, the Utility has had higher spending on fleet replacement assets in this budget cycle, which are selected to be funded with Pay-As-You-Go (cash) due to their lower useful lives.

11.0 CAPITAL BUDGET & FORECAST PLAN

11.1 CAPITAL PROJECT SUMMARY

As part of the 25-year Waste Strategy and business planning process, the Utility has placed greater emphasis on delivering strategic program changes through implementing its capital plan. Aligned with the City's Project Development and Delivery Model (PDDM), a comprehensive program and project management process was developed and is used from project initiation, justification (business case development), prioritization, budget development and expenditure tracking, to project delivery and close-out. Emphasis is placed on ensuring sustainability and growth in assets, and to meet the regulatory requirements through proper program planning and delivery.

The Utility's approved 2023-2026 Capital Budget is $157.9 million, which includes $35.1 million in approved capital expenditures for projects with completion dates beyond 2026 for Coronation Eco Station Expansion, Landfill Gas to Renewable Natural Gas, EWMC Water Distribution Upgrade, and Three-stream Communal Collection. Budgeted expenditures for 2023-2026 total $122.8 million which has been allocated to nine capital profiles. This includes funding for significant, multi-year, key profiles such as Waste Services Facilities, Infrastructure and Process Equipment, Waste Services Fleet Assets, and Three-stream Communal Collection. Schedule 11.1 shows a 2023-2030 total of $265.0 million, including the Utility's $157.9 million 2023-2026 approved budget and $107.1M additional planned capital for infrastructure and equipment composite profiles to be proposed in the 2027-2030 Budget Cycle.

Through PDDM, these projects are being continually assessed throughout their development and design lifecycle, assessing their long-term financial and strategic impacts and if other opportunities exist to reduce capital spending.

The Utility will continue to follow the developed best practices that appropriately balance growth, process efficiency improvements, rehabilitation and regulatory requirements. An asset management philosophy focused on safety, reliability and risk management has been incorporated into future capital planning by implementing a percentage of asset replacement value into the capital plan. This ensures proactive maintenance and repair based on asset condition assessment, safety, security and environmental requirements.

Schedule 11.1 2023-2030 Capital Project Summary[7] (in millions of dollars)

Line #	Schedule 11.1 Capital Projects	Current Budget Cycle 2023	2024	2025	2026	2023-2026 Total	Forecast 2027	2028	2029	2030	2023-2030 Total
	Branch-wide										
1	Waste Services Facilities, Infrastructure & Process Equipment	$ 4.22	$ 7.18	$ 5.69	$ 2.85	$ 19.94	$ 4.00	$ 4.08	$ 4.40	$ 4.25	$ 36.66
2	Waste Services IIS Infrastructure Planning and Design	0.77	0.64	1.05	0.97	3.43	0.60	0.55	0.50	0.35	5.43
3	Waste Services IIS Infrastructure Delivery	4.89	(0.29)	2.08	2.18	8.86	4.70	5.30	5.20	5.02	29.08
4		**9.88**	**7.52**	**8.82**	**5.99**	**32.22**	**9.30**	**9.93**	**10.10**	**9.61**	**71.17**
	Collection Services Facilities										
5	Coronation Eco Station Expansion	-	3.30	0.55	1.77	5.62	4.90	5.75	-	-	16.27
6		-	**3.30**	**0.55**	**1.77**	**5.62**	**4.90**	**5.75**	-	-	**16.27**
	Sustainable Waste Processing Facilities										
7	Materials Recovery Facility (MRF) Renewal	3.59	(0.03)	-	-	3.56	-	-	-	-	3.56
8	Landfill Gas to Renewable Natural Gas (RNG)	-	-	-	-	-	9.68	3.69	-	-	13.37
9	EWMC Water Distribution System Upgrade	-	0.48	0.84	5.57	6.89	4.78	5.59	-	-	17.25
10	Various minor projects	(0.73)	0.02	-	-	(0.71)	-	-	-	-	(0.71)
11		**2.86**	**0.47**	**0.84**	**5.57**	**9.74**	**14.46**	**9.28**	-	-	**33.47**
	Vehicles & Equipment										
12	Waste Containers	1.79	1.67	1.89	1.80	7.15	1.92	1.93	1.95	1.97	14.92
13	Waste Services Fleet Assets	13.10	10.35	15.64	16.50	55.58	8.48	7.82	8.45	10.59	90.92
14	Greenhouse Gas Mitigation Energy Transition	-	-	0.76	1.93	2.69	2.54	2.26	1.85	1.80	11.14
15		**14.89**	**12.02**	**18.29**	**20.22**	**65.42**	**12.94**	**12.01**	**12.25**	**14.36**	**116.97**
	Waste Program Changes										
16	Three-stream Communal Collection	1.79	3.24	3.70	1.08	9.81	0.67	-	-	-	10.48
17		**1.79**	**3.24**	**3.70**	**1.08**	**9.81**	**0.67**	-	-	-	**10.48**
18	Total Recommended Profiles	**29.42**	**26.56**	**32.21**	**34.64**	**122.82**	**42.27**	**36.97**	**22.35**	**23.97**	**248.36**
	Profile Pending Approval										
19	Provision for Future Capital Projects	-	-	-	-	-	-	-	8.25	8.42	16.67
20		**29.42**	**26.56**	**32.21**	**34.64**	**122.82**	**42.27**	**36.97**	**30.60**	**32.39**	**265.04**

To supplement the above capital schedule, a detailed appendix has been prepared to outline the purpose of the capital profile, any scope and timing changes, significant issues, and a completion plan for each profile. The Utility is now including this information in Appendix A to serve as regulatory justification for the capital plan, which also includes a summary and timeline of the historical adjustments that have been approved by Administration & City Council. Original business cases for active profiles are also included in Appendix B.

Line 1 - Waste Services Facilities, Infrastructure & Process Equipment Composite

This composite profile provides capital funding for facility and infrastructure planning and design and project delivery, which is managed internally by the Utility. Projects anticipated to be undertaken in 2026 include, but are not limited to:

- EWMC Cure Site Upgrades
- Kennedale Security Fence

[7] Forecasts in table may include unspent budget carried forward from the 2019-2022 budget cycle.

- Waste Collection Digitization Tablets
- EWMC Fiber Optic Network Upgrade

Lines 2 & 3 - Waste Services Planning and Design and Project Delivery Composite (IIS Managed)

These composite profiles provide capital funding for planning and design and for project delivery for projects managed by Integrated Infrastructure Services (IIS). Projects anticipated to be undertaken in 2026 include, but are not limited to:

- EWMC Site Paving
- Ambleside Eco Station West Egress
- Compost School Refresh

Line 5 - Coronation Eco Station Expansion

This profile was approved by Council in early 2025 and the majority of the project was funded by the cancelled capital profile 15-33-2011 Mayfield Eco Station (NW). This project will upgrade and expand the existing Coronation site to improve site operations and customer experience with land purchased from EPCOR.

Line 8 - Landfill Gas to Renewable Natural Gas

This standalone profile was approved by Council in February 2021 and includes the capital required to collect, process and convert landfill gas into renewable natural gas to manage environmental liabilities associated with the Clover Bar Landfill and generate beneficial byproducts such as renewable natural gas and saleable environmental attributes. The landfill gas collection system is funded through the Utility's landfill liability and is under construction. However, the renewable natural gas conversion project component has been pushed out to 2027-2028, as the Utility will be completing a feasibility study and new business case for Council approval in early 2026.

Line 9 - EWMC Water Distribution System Upgrade

This new standalone profile was approved by Council in late 2024. This project adds or upgrades water system infrastructure at the EWMC, making the system more resilient in the event of fire, improving the environmental compliance of facilities and adding contingency to the overall system.

Lines 12 & 13 - Waste Containers and Waste Services Fleet Assets

These composite profiles provide capital funding for waste containers and mobile equipment. The objective of these profiles is to replace existing assets at the end of their useful lives and provide funding for growth assets to support ongoing operations.

Line 14 - Greenhouse Gas Mitigation Energy Transition Portfolio

This project was approved by Council in late 2024 to transition the Utility's assets to climate resilient infrastructure, reducing GHG emissions and supporting the City's environmental initiatives in alignment with the City's Greenhouse Gas Management Plan 2019-2030 for Civic Operations.

Line 16 - Three-stream Communal Collection

This profile was approved by Council in April 2021 and provides funding for vehicles and containers to support changes to apartment and condo collection for the three-stream separation of waste (garbage, recycling and food scraps).

Line 19 - Provision for Future Capital Projects

Although detailed capital plans for the period 2027 to 2030 have yet to be developed, the Utility anticipates that future additional capital outlays will be required.

11.2 CAPITAL PROJECT FINANCING SUMMARY

(in millions of dollars)

Line #	Schedule 11.2 Source of Financing	Current Budget Cycle 2023	2024	2025	2026	2023-2026 Total	Forecast 2027	2028	2029	2030	2023-2030 Total
1	Self Liquidating Debentures	$ 0.10	$ 11.60	$ 13.08	$ 16.93	$ 41.70	$ 11.92	$ 14.30	$ 21.65	$ 21.45	$ 111.00
2	Pay As You Go Requirement	28.30	14.95	19.13	17.72	80.10	11.66	8.37	8.96	10.94	120.03
3	Existing Cash	-	-	-	-	-	11.70	14.30	-	-	26.00
4	Provincial Grants & Partnership Funding	1.02	-	-	-	1.02	7.00	-	-	-	8.02
	Total Capital Project Financing	$ 29.42	$ 26.56	$ 32.21	$ 34.64	$ 122.82	$ 42.28	$ 36.97	$ 30.60	$ 32.39	$ 265.05

Line 1 - Self Liquidating Debentures

Self Liquidating Debentures are coordinated through the City and drawn from the Government of Alberta (formerly the Alberta Capital Financing Authority) in accordance with the City's Debt Management Fiscal Policy C203D. The cost of debt varies according to economic conditions and length of term (see Section 3.0). Details on debt servicing costs are provided in Section 9.0.

Line 2 - Pay-As-You-Go Requirement

As per Waste Services Utility Fiscal Policy C558C, Pay-As-You-Go (PAYG) requirements are incorporated into the Utility's cash forecast as shown in Section 6.0: Financial Indicators. This term is used to identify the portion of a given capital project which is funded by cash (equity). The PAYG Requirement for the following year is used in calculating a given year's target cash position.

Line 3 - Existing Cash

To ensure long-term financial sustainability while also balancing the ability to charge fair and equitable utility rates, the Utility has the option to finance additional capital project costs, when appropriate, using its current cash on hand to manage its overall cash balance. If this method is employed (as is shown for 2027 and 2028), it will lead to a reduction in future debt issuance and, consequently, a decrease in interest expenses.

Line 4 - Provincial Grants & Partnership

The $7 million grant in 2027 is projected to be received from Emissions Reduction Alberta towards the capital portion of the Landfill Gas to Renewable Natural Gas project.

12.0 LANDFILL CLOSURE & RELATED LIABILITIES

The Utility's landfills include a Class II and Class III landfill, which are currently being prepared for complete closure and reclamation in accordance with the operating approval from Alberta Environment and Protected Areas. The Clover Bar Landfill (Class II) opened in 1975 and was Edmonton's first engineered sanitary landfill, featuring groundwater diversion, leachate treatment and environmental monitoring. The landfill, which lasted 20 years longer than expected due to recycling programs starting in 1988 preserving landfill space, reached full capacity and was closed in August 2009. The Class III landfill, originally established for the 1987 tornado debris, ceased operations in 2008 and was closed in 2022.

Pursuant to the *Alberta Environmental Protection and Enhancement Act*, the Utility is required to fund the closure of the landfill and provide for post-closure care of the site. Closure and post-closure activities include the final cover, landscaping, surface and groundwater monitoring, leachate control, landfill gas management and visual inspection. The minimum period for post-closure care is 25 years after final regulatory closure. The landfill closure and post-closure care plans are based on engineering assessment of current ground conditions, leachate levels, geology, and various other environmental and regulatory conditions.

The costs to close and maintain solid waste landfill sites are based on estimated future expenses, adjusted for inflation and discounted to current dollars. These costs are reported as a liability within the City's financial statements in accordance with Canadian Public Sector Accounting Standards (PSAS). The landfill liability is reviewed at regular intervals to ensure the balance is sufficient with the latest review performed for the 2026 Rate Filing in September 2025. Future events, such as changes to regulatory requirements, and/or changes in ground conditions, leachate levels, etc., may result in changes to the estimated cost and will be recognized prospectively as an adjustment to the reported liability, when applicable.

The following table summarizes the estimated liability and expected disbursements required to complete closure activities.

Schedule 12.0 Line #		Reference	2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast	2028 Forecast
1	Reported Landfill Liability - Opening Balance		$ 53.01	$ 42.71	$ 46.77	**$ 40.40**	$ 26.12	$ 20.36
2	Less: Disbursements During the Year		(24.44)	(13.60)	(12.13)	**(16.59)**	(7.26)	(1.49)
3	Liability Balance after Disbursements		28.58	29.11	34.63	**23.81**	18.86	18.87
4	Liability Increase/(Decrease) Required	S.8.0 L.8	18.19	2.60	5.77	**2.31**	1.50	1.17
5	**Expected Landfill Liability at Year End**		$ 46.77	$ 31.71	$ 40.40	**$ 26.12**	$ 20.36	$ 20.03

The Utility anticipates closure activities such as design and construction of stormwater management, leachate collection, landfill gas collection, final cover, landscaping, etc. to be completed by 2027 for the Class II Clover Bar Landfill. From the time of final regulatory closure, the minimum period for post-closure care is expected to be 25 years, and includes operating and maintenance activities such as (but not limited to) final cover inspection and maintenance, landfill gas collection and flare system maintenance, and leachate monitoring, treatment and disposal. Significant changes to cost estimates in the future may result in an adjustment to the landfill liability and subsequently the annual landfill provision.

The liability for the Clover Bar Landfill closure and post-closure care is reported in the Consolidated Financial Statements of the City of Edmonton as of December 31, 2024 at a value of $46.77 million. An adjustment is required in 2025 to increase the liability by $5.77 million. This increase is primarily associated with higher than previously anticipated costs required to construct the slurry wall and leachate management system. After disbursements of $12.13 million for 2025, the liability is estimated to be $40.40 million by the end of 2025. Post-closure care and maintenance is scheduled to begin in 2028.

The landfill closure costs are funded on an ongoing basis through Utility rates. The annual Revenue Requirement includes net income to raise cash to meet the upcoming future expenditures (as well as other cash needs such as PAYGO capital etc.). The cash balance is monitored and forecasted to ensure we have a sufficient balance to meet the obligations required. See section 6.0 Financial indicators (Line 2) for a breakdown of expected cash requirements.

13.0 SEGMENTED REPORTING - PROGRAM REVENUES & EXPENSES

(in millions of dollars)

WASTE COLLECTION SERVICES

Schedule 13.0.1 Line #		2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Personnel	$ 34.12	$ 35.30	$ 37.46	**$ 39.93**	$ 41.12
2	Materials, Goods & Supplies	1.39	1.22	1.50	**1.33**	1.35
3	External Services	33.76	35.11	35.03	**40.37**	40.33
4	Fleet Services	9.76	9.78	9.22	**10.69**	10.89
5	Intra-municipal Services	1.96	1.96	1.96	**1.96**	1.96
6	Utilities	0.66	0.72	0.52	**0.68**	0.70
7	Other Expenses	1.45	1.57	1.35	**1.88**	1.92
8	SUBTOTAL	83.08	85.65	87.04	**96.83**	98.26
9	Intra-municipal Recoveries	0.34	0.73	0.45	**0.55**	0.55
10	TOTAL O&M EXPENSES	83.43	86.37	87.49	**97.37**	98.81
11	Amortization of Non-Contributed Assets	9.85	11.19	11.16	**12.47**	13.30
12	Debt Interest	1.44	1.93	1.44	**1.58**	1.76
13	TOTAL EXPENSES	94.71	99.49	100.09	**111.42**	113.86
14	Program Revenues	8.24	6.97	7.27	**7.38**	7.52
15	Rate Revenues	86.48	92.52	92.82	**104.04**	106.34
16	**NET INCOME/(NET LOSS)**	-	-	-	-	-

Note: *Program and Rate Revenues sufficient to achieve a net income of zero are transferred from Waste Collection Services to Sustainable Waste Processing. The net income for the Waste Services Utility is wholly contained within Sustainable Waste Processing.*

SUSTAINABLE WASTE PROCESSING

Schedule 13.0.2 Line #		2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Personnel	$ 22.68	$ 22.99	$ 25.09	**$ 26.85**	$ 27.66
2	Materials, Goods & Supplies	1.51	1.20	1.30	**1.58**	1.61
3	External Services	50.04	58.36	53.19	**51.34**	41.55
4	Fleet Services	6.97	7.64	6.35	**6.82**	6.95
5	Shared Services	10.52	10.29	10.29	**10.38**	10.57
6	Intra-municipal Services	4.58	3.37	2.77	**4.03**	4.24
7	Utilities	3.88	3.95	4.63	**4.58**	4.30
8	Landfill Liability Required	18.19	2.60	5.77	**2.31**	1.50
9	Other Expenses	1.75	0.16	0.42	**0.66**	0.67
10	SUBTOTAL	120.12	110.57	109.81	**108.56**	99.05
11	Intra-municipal Recoveries	(1.32)	(1.14)	(0.73)	**(0.97)**	(0.99)
12	TOTAL O&M EXPENSES	118.80	109.42	109.09	**107.59**	98.06
13	Amortization of Non-Contributed Assets	16.81	17.89	17.09	**18.00**	18.93
14	Amortization of Regulatory Asset	3.91	3.91	3.91	**3.25**	3.25
15	Debt Interest	5.35	5.19	4.94	**4.48**	4.20
16	TOTAL EXPENSES	144.87	136.41	135.02	**133.32**	124.45
17	Grant Revenue	0.00	0.30	0.00	**0.00**	0.00
18	Program Revenues	16.60	8.02	7.11	**7.57**	8.31
19	Projected EPR Revenue	0.00	24.00	30.13	**37.04**	26.50
20	Rate Revenues	134.22	107.72	109.42	**94.15**	96.38
21	**NET INCOME/(NET LOSS)**	$ 5.94	$ 3.63	$ 11.64	**$ 5.44**	$ 6.74

Note: *Program and Rate Revenues sufficient to achieve a net income of zero are transferred from Collection Services to Sustainable Waste Processing. The net income for the Waste Services Utility is therefore wholly contained within Sustainable Waste Processing.*

13.1 REVENUES & EXPENSES BY REGULATED AND NON-REGULATED PROGRAM

(in millions of dollars)

REGULATED PROGRAMS

Schedule 13.1.1 Line #		2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Personnel	$ 54.48	$ 57.33	$ 61.48	**$ 65.41**	$ 67.37
2	Materials, Goods & Supplies	2.75	2.38	2.76	**2.87**	2.92
3	External Services	80.98	89.65	85.54	**89.99**	80.31
4	Fleet Services	15.68	16.35	14.52	**16.58**	16.89
5	Shared Services	10.52	10.29	10.29	**10.38**	10.57
6	Intra-municipal Services	6.08	5.32	4.72	**5.98**	6.18
7	Utilities & Others	7.45	6.21	6.74	**7.65**	7.43
8	Landfill Liablity Required	18.19	2.60	5.77	**2.31**	1.50
9	SUBTOTAL	196.12	190.14	191.82	**201.16**	193.16
10	Intra-municipal Recoveries	(0.57)	(0.09)	(0.16)	**(0.71)**	(0.73)
11	O & M EXPENSES	195.56	190.05	191.66	**200.45**	192.44
12	Amortization of Non-Contributed Assets	26.10	28.53	27.71	**29.93**	31.63
13	Amortization of Regulatory Asset	3.91	3.91	3.91	**3.25**	3.25
14	Debt Interest	6.60	6.95	6.17	**5.86**	5.78
15	TOTAL EXPENSES	232.16	229.44	229.44	**239.49**	233.09
16	Grant Revenue	0.00	0.30	0.00	**0.00**	0.00
17	Program Revenues	18.64	8.53	7.96	**9.10**	9.85
18	Projected EPR Revenue	-	24.00	30.13	**37.04**	26.50
19	Rate Revenues	220.69	200.24	202.24	**198.20**	202.73
20	**NET INCOME/(LOSS)**	$ 7.18	$ 3.63	$ 10.89	**$ 4.84**	$ 5.98

Regulated Programs are core activities and services provided by Waste Services that are focused on waste collection, processing, and disposal activities for residential customers (e.g. curbside collection and "self-haul" performed by residential customers to Eco Stations and Community Recycling Depots); and services that the City can provide given rights enabled by the *Municipal Government Act* (i.e., that other providers are not permitted to provide).

NON-REGULATED PROGRAMS

Schedule 13.1.2 Line #		2024 Actual	2025 Approved	2025 Projected	2026 Proposed	2027 Forecast
1	Personnel	$ 2.32	$ 0.96	$ 1.07	**$ 1.37**	$ 1.41
2	Materials, Goods & Supplies	0.16	0.04	0.03	**0.04**	0.04
3	External Services	2.82	3.82	2.68	**1.71**	1.57
4	Fleet Services	1.04	1.06	1.06	**0.93**	0.95
5	Intra-municipal Services	0.45	0.00	0.00	**0.01**	0.01
6	Utilities	0.29	0.19	0.19	**0.16**	0.16
7	SUBTOTAL	7.08	6.08	5.03	**4.22**	4.14
8	Intra-municipal Recoveries	(0.40)	(0.33)	(0.11)	**0.29**	0.29
9	TOTAL O&M EXPENSES	6.68	5.75	4.92	**4.51**	4.42
10	Amortization of Non-Contributed Assets	0.55	0.55	0.53	**0.55**	0.60
11	Debt Interest	0.19	0.16	0.22	**0.20**	0.18
12	TOTAL EXPENSES	7.42	6.46	5.66	**5.26**	5.20
13	Program Revenues	6.19	6.46	6.42	**5.85**	5.97
14	**NET INCOME/(NET LOSS)**	$ (1.23)	$ 0.00	$ 0.75	**$ 0.59**	$ 0.77

Non-Regulated Programs include City of Edmonton Corporate Facilities Waste Collection, Construction and Demolition waste service, self-haul of waste to the landfill, and Aggregates recycling and sales.

13.2 REGULATED ACTIVITIES EXPENSE CHANGES

(in millions of dollars)

2026 Regulated Activities Schedule 13.2 Line#		Reference	2025 Projected	Customer Growth	Consumption	Inflation	One Time Expense (Note 1)	Activities No Longer Required (Note 2)	2026 Proposed
1	Personnel		$ 61.48	$ -	$ 2.07	$ 1.86	$ -	$ -	$ 65.41
2	Materials, Goods & Supplies		2.76	0.01	0.05	0.05	-	-	2.87
3	External Services		85.54	0.96	5.86	1.65	4.98	(9.00)	89.99
4	Fleet Services		14.52	-	1.76	0.31	-	-	16.58
5	Shared Services		10.29	-	-	0.09	-	-	10.38
6	Intra-municipal Services		4.72	-	1.26	-	-	-	5.98
7	Landfill Liability Required		5.77	-	(3.46)	-	-	-	2.31
8	Utilities & Other Expenses		6.74	-	0.79	0.12	-	-	7.65
	SUBTOTAL		191.82	0.97	8.33	4.08	4.98	(9.00)	201.16
9	Intra-municipal Recoveries		(0.16)	-	(0.55)	-	-	-	(0.71)
	O & M EXPENSES	13-1-1 L11	$ 191.66	$ 0.97	$ 7.78	$ 4.08	$ 4.98	$ (9.00)	200.45

Line 1 - Personnel

The increase in wages from the 2025 Projected to 2026 Proposed includes inflationary based wage escalations for current staff. Consumption includes increased hiring of temporary staff for collections and operations work as the three-stream apartment and condo collection rollout moves to new areas of Edmonton. Some work in apartment and condo collection work in northeast Edmonton, which was previously contracted out, has been in-sourced and requires more staff. Additional staff are required on the Operational Training and Waste Education and Outreach teams to educate residents and staff on three-stream apartment and condo collection.

Line 2 - Materials, Goods & Supplies

Increased costs are related to customer growth, computer software licence fees, direct material needs to assist in closure of the High Solids Anaerobic Digestion Facility and inflation in 2026.

Line 3 - External Services

One-time costs include the removal of digester drums at the former Edmonton Composting Facility aeration hall building, which was decommissioned in 2020. Activities no longer required include transitioning away from active anaerobic digestion at the High Solids Anaerobic Digestion Facility. Consumption includes additional costs index increase on current contracts and contamination removal for the Coronation Eco Station expansion, third-party facilities requiring more feedstock from the Refuse Derived Fuel Facility, updated contractual rates for

customer billing and costs related to the waste characterization study and ICI Roadmap.

Line 4 - Fleet Services

Consumption costs in 2026 reflect growth in direct charges and repairs due to increased fleet units as a result of taking back more collection services from contractors.

Line 5 - Shared Services

Shared Services costs include an increase for inflation to cover rising costs.

Line 6 - Intra-municipal Services

The increase in consumption cost in 2026 is directly tied to the discontinuation of the Aggregates Recycling Program. The 2025 Projected includes a one-time positive credit generated by the program's final inventory sale as it wound down.

Line 7 - Landfill Liability Required

Consumption costs in 2026 reflect the disbursements to complete closure activities on the Class II and Class III landfill.

Line 8 - Utilities & Other Expenses

Higher consumption is related to expected increase in insurance premiums associated with waste collection and processing facilities and bad debt expenses in 2026.

Line 9 - Intra-municipal Recoveries

Increased net recoveries for transportation of materials for other City departments.

14.0 HISTORICAL TRENDS

(in millions of dollars)

Schedule 14.0 Line #		Reference	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Projected	2026 Proposed	2027 Forecast
1	Operations and Maintenance	S.8.0 L.10	$ 166.72	$ 168.72	$ 185.02	$ 203.17	$ 196.78	**$ 205.31**	$ 197.24
2	Amortization of Non-Contributed Assets	S.9.0 L.1	23.24	25.13	25.71	26.65	28.24	**30.48**	32.23
3	Debt Interest	S.9.0 L.6	8.24	8.29	7.55	6.79	6.38	**6.06**	5.96
4	Intra-municipal Recoveries	S.8.8 L.5	(1.10)	(1.13)	(1.31)	(0.97)	(0.27)	**(0.42)**	(0.44)
5	Grants	S.8.0 L.16	-	0.05	(4.60)	0.04	0.08	**0.08**	0.08
6	Amortization of Regulatory Asset	S.8.0 L13	3.91	3.91	3.91	3.91	3.91	**3.25**	3.25
	TOTAL EXPENSES		201.01	204.97	216.29	239.59	235.11	**244.74**	238.31
7	Non-Rate Revenue	S.7.0 L.3	22.75	16.20	22.18	24.84	14.38	**14.95**	15.83
8	Projected EPR Revenue	S.7.0 L.2	-	-	-	-	30.13	**37.04**	26.50
9	Rate Revenue	S.7.0 L.1	199.15	204.15	215.04	220.68	202.24	**198.20**	202.73
	TOTAL REVENUES		221.90	220.34	237.23	245.52	246.75	**250.18**	245.05
	NET INCOME/(LOSS)	S.13.0.2 L.22	$ 20.89	$ 15.38	$ 20.93	$ 5.93	$ 11.64	**$ 5.44**	$ 6.74

Table 14A: Waste Services Utility Customer Counts

	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Projected	2026 Proposed	2027 Forecast
Curbside	236,304	255,493	263,517	267,985	273,256	**275,704**	**279,158**
Apartment and Condo	182,246	183,843	169,491	170,543	176,898	**179,420**	**181,762**
Total	418,550	439,336	433,008	438,528	450,154	**455,124**	**460,920**

Note: *The table above includes the reclassification of 12,572 customers from Multi-unit (Communal) to Single Unit (Curbside) in 2021.*

All 2019-2024 customer counts shown represent December 31 actual balances. For 2025-2027 forecast purposes, the utility rates are calculated using a phased-in increase to customer counts over a given year to ensure that consistent growth is represented. As a result, mid-year customer counts are used in these calculations.

APPENDIX A: CAPITAL PROFILE UPDATES & ADJUSTMENT HISTORY

Waste Services has prepared the following attachments for initiatives noted under Schedule 11.0: Capital Budget & Forecast Plan. This attachment summarizes updates to the capital profiles and outlines the historical changes approved by City Council and Administration.

APPENDIX B: WASTE SERVICES CAPITAL BUSINESS CASES

For detailed information and justification for each capital initiative in Schedule 11.1, this appendix provides original capital business cases for full disclosure and decision making purposes.

APPENDIX C: WASTE SERVICES FISCAL POLICY C558C

2026 Waste Services Utility Rate Filing
Appendix A - Capital Profile Updates & Adjustment History
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The capital profile summaries consist of two parts: 1) a written summary of profile changes or potential changes since original approval, and 2) a table showing the annual approved supplemental capital budget adjustments (SCBAs) and associated dollar value adjustment to the profile as recorded in the Capital and Operating Budget System (COBS). Please note the language used in COBS in the "Reason for Request" may read as future tense and scope and timelines were as of the proposal year for the budget adjustments. There may also be some inconsistencies on dollar values listed in full or truncated depending on the particular budget adjustment formatting.

2026 Waste Services Utility Rate Filing
Attachment A1.1 - Waste Services Capital Profile Updates
CM-81-2047 Waste Services Facilities & Infrastructure Project Delivery

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.1)	Variance to Approved Budget	Variance Explanation
$19.41	$19.66	$19.94	$0.28	For the fall 2025 SCBA, Waste Services is requesting $0.28 million funding for projects added during the budget cycle. This budget will be transferred from the cancelled Organics Screening & Mixing project.

Profile Description
This composite profile provides capital funding for planning and design and project delivery, which is managed internally by the Utility. In the previous budget cycle, planning and design and project delivery were divided into separate profiles. However, due to the smaller values of these projects, it is more efficient to administer them within one profile while maintaining capacity to track the phased work. The scope of the Facilities, Infrastructure and Process Equipment profile includes the capital renewal and upgrade of existing assets due to new or increased waste streams, safety concerns and design improvements that increase the operational efficiency of the Utility. This also includes implementation of an asset management program to deliver and maintain optimal service levels. Projects are prioritized using a process that identifies and ranks projects based on strategic criteria such as environmental impact, health and safety, and alignment to strategy. All projects managed by IIS (Integrated Infrastructure Services) and some of the larger projects managed by the Utility will follow the Project Development and Delivery Model (PDDM) process.

Scope Changes From Original Business Case
Overall scope has not changed from the original business case, however some projects within the composite may have been shifted or added. For the fall 2025 SCBA, Waste Services is requesting $0.28 million additional funding to cover Site 440 Large Dome Refurbishments and the Kennedale Site Fence/Security Upgrades, projects that were determined during the 2023-2026 budget cycle. This budget would be transferred from the cancelled Organics Screening & Mixing project, so no net new funding will be requested.

Timing Changes From Original Business Case
No anticipated timing changes. Funding for this composite profile will be completed in 2026.

Current or Foreseen Issues
No issues, projects and spend are progressing as expected.

Timing & Plan for Completion
Planning and execution of several facility, processing and infrastructure projects are ongoing. The remainder of the profile is on track for complete spending by the end of 2026.

2026 Waste Services Utility Rate Filing
Attachment A1.2 - Waste Services Capital Profile Historical Adjustments
CM-81-2047 Waste Services Facilities & Infrastructure Project Delivery

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2022	Original Capital Budget 2023-2026	4.23	6.79	5.28	3.11	0.00	**19.41**
2022	Carryforward 2022 Paving Project has a 2022 PO in place that requires these funds. BFA will complete a budget adjustment to transfer approved 'debt' budget to 'R/E' to cover this negative amount	0.25	0.00	0.00	0.00	0.00	**0.25**
2023	2023Carryforward for Waste Services. The capital profiles are ongoing and active.	-0.26	0.26	0.00	0.00	0.00	**0.00**
2024	2024 Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	0.13	-0.13	0.00	0.00	**0.00**
2025 (to be approved)	The 23-81-3060 Organics Screening and Mixing System profile is being cancelled as Waste is completing a new master strategy for organics processing. The funds are proposed to be fully transferred to the following Waste profiles: $4.5M to CM-81-2048 Waste Services Fleet Assets to support vehicle requirements, $0.3M to CM-81-2047 Waste Services Facilities & Infrastructure Project Delivery and $1M to CM-81-0005 Waste Services IIS Infrastructure Planning & Design based on Waste's review of projects to be completed within the current budget cycle.	0.00	0.00	0.00	0.28	0.00	**0.28**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.55	-0.55	0.00	**0.00**
Total		**4.22**	**7.18**	**5.69**	**2.85**	**0.00**	**19.94**

Ref. Sch. 11.1 L.1

2026 Waste Services Utility Rate Filing
Attachment A2.1 - Waste Services Capital Profile Updates
CM-81-0005 Waste Services Infrastructure Planning & Design (IIS)

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.2)	Variance to Approved Budget	Variance Explanation
$2.27	$2.43	$3.43	$1.00	For the fall 2025 SCBA, Waste Services is requesting $1.0 million additional funding required for the Equipment Storage & Maintenance Facility (ESMF) Parts Room project, Residential Transfer Station Upgrades, and additional funding for the Edmonton Waste Management Centre (EWMC) Waste Water Diversion Expansion project

Profile Description
This composite profile supports preliminary planning and design work on Utility Infrastructure capital projects prior to budget approval for projects managed by Integrated Infrastructure Services (IIS). The profile provides a budget to support concept level planning for major capital initiatives in accordance with the City's Project Development and Delivery Model (PDDM), as well as the Capital Governance Policy C591 that was adopted by Council in April 2017. The outcome of this profile is to provide Council with better information regarding the scope, schedule and budget of the proposed capital projects prior to full funding of the project.

Scope Changes From Original Business Case
Overall scope has not changed from the original business case, however some projects within the composite may have been shifted, added, or transferred to their respective standalone profile. In 2024, IIS P&D increased their team resources. This allowed them to take on more projects and sooner in the budget cycle, resulting in increased spending. For the fall 2025 SCBA, Waste Services is requesting $1.0 million additional funding to cover the ESMF Parts Room and the EWMC Waste Water Diversion Expansion, projects that were determined during the budget cycle. This budget will be transferred from the cancelled Organics Screening & Mixing project, so no net new funding will be requested.

Timing Changes From Original Business Case
No anticipated timing changes. Funding for this composite profile will be completed in 2026.

Current or Foreseen Issues
No issues, projects and spend are progressing as expected.

Timing & Plan for Completion
Preliminary planning and design work on Utility Infrastructure capital projects are ongoing. The remainder of the profile is on track for complete spending by the end of 2026.

2026 Waste Services Utility Rate Filing
Attachment A2.2 - Waste Services Capital Profile Historical Adjustments
CM-81-0005 Waste Services Infrastructure Planning & Design (IIS)

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2022	Original Capital Budget 2023-2026	1.07	0.89	0.19	0.12	0.00	**2.27**
2022	2022 Carryforward for IIS - Infrastructure Planning and Design. The capital profiles are ongoing and active.	0.22	0.00	0.00	0.00	0.00	**0.22**
2023	Prior Year Budget Entries to align actuals in standalone profiles and transfer budget from composite profiles due to CP No. relinking.	-0.06	0.00	0.00	0.00	0.00	**-0.06**
2023	2023 Carryforward for IIS - Infrastructure Planning and Design. The capital profiles are ongoing and active.	-0.46	0.46	0.00	0.00	0.00	**0.00**
2024	Prior Year Budget Entries to align actuals in standalone profile and transfer budget from composite profiles due to CP relinking.	0.00	-0.91	0.00	0.00	0.00	**-0.91**
2024	2024 Carryforward for IIS - Infrastructure Planning and Design. The capital profiles are ongoing and active.	0.00	0.19	-0.19	0.00	0.00	**0.00**
2025	IIS Managed Planning and Design profile requires additional budget due to the following: - in 2024, IIS P&D increased their team resources. This allowed them to take on more projects and sooner in the budget cycle, resulting in increased spending. - The MRF Tip Floor Builidng Remediation & Expansion resulted from an unforeseen building code issue. It was added as a new project during the budget cycle, as a high priority. - Coronation Eco Station Upgrades was not budgeted for. This project was initiated due to the decision to upgrade Coronation rather than building a new Mayfield eco station. An additional $1.07M will be drawn from the Waste Containers CM-81-2005 composite's excess budget.	0.00	0.00	1.07	0.00	0.00	**1.07**
2025	The Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrade project has reached Checkpoint 3 of the Project Development & Delivery model. The Business case was approved in Oct 2024 and a new standalone profile is required with a total estimated cost of $17,251,258. Of these costs, $476,071 was incurred in 2024 and prior years under "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" and will be transferred to the standalone in an administrative adjustment. The new funding requested for this profile is $16,775,187 and it will be funded from the "CM-81-2045 Waste Services IIS Infrastructure Delivery" and "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" profiles.	0.00	0.00	-0.34	0.00	0.00	**-0.34**
2025	This administrative adjustment will transfer remaining Retained Earnings budget from "15-33-2011 NW (Mayfield) Eco Station" to "CM-81-0005 Waste Services IIS Infrastructure Planning & Design". This profile requires additional budget to complete P&D for such projects as the MRF Tip Floor Building Remediation & Expansion and the EWMC Waste Water Discharge Expansion.	0.00	0.00	0.17	0.00	0.00	**0.17**
2025 (to be approved)	The 23-81-3060 Organics Screening and Mixing System profile is being cancelled as Waste is completing a new master strategy for organics processing. The funds are proposed to be fully transferred to the following Waste profiles: $4.5M to CM-81-2048 Waste Services Fleet Assets to support vehicle requirements, $0.3M to CM-81-2047 Waste Services Facilities & Infrastructure Project Delivery and $1M to CM-81-0005 Waste Services IIS Infrastructure Planning & Design based on Waste's review of projects to be completed within the current budget cycle.	0.00	0.00	0.00	1.00	0.00	**1.00**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.15	-0.15	0.00	**0.00**
Total		**0.77**	**0.64**	**1.05**	**0.97**	**0.00**	**3.43**

Ref. Sch. 11.1 L.2

2026 Waste Services Utility Rate Filing
Attachment A3.1 - Waste Services Capital Profile Updates
CM-81-2045 Waste Services Project Delivery (IIS)

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.3)	Variance to Approved Budget	Variance Explanation
$20.50	$6.36	$8.86	$2.50	For the fall 2025 SCBA, Waste Services is requesting $2.5 million additional funding required for completion of such projects as the EWMC site paving and Ambleside Eco Station egress.

Profile Description
The composite profile CM-81-2045 provides a level of funding for Waste Services' significant capital infrastructure projects that are intended to be delivered by Integrated Infrastructure Services - Infrastructure Delivery Branch. The approach is consistent with Administration's implementation of the Project Development & Delivery Model (PDDM) as well as the Capital Project Governance Policy C591 that was adopted by Council in April 2017. Projects have been identified and prioritized based on strategic criteria such as environmental impact, health and safety and alignment with the utility's and corporate goals.

Scope Changes From Original Business Case
Overall scope has not changed from the original business case, however some projects and funds within the composite may have been transferred to their respective standalone profile, shifted or added. In 2024, the Business Case for the EWMC Water Distribution System Upgrades project was approved for $17.25 million. $16.78 million was funded from this profile and tranferred to the newly approved standalone profile in an administrative adjustment. For the 2025 fall SCBA, Waste Services is requesting $2.5 million additional funding to complete projects such as EWMC site paving and Ambleside Eco Station egress in this budget cycle which will be funded with excess budget from CM-81-2005 Waste Containers.

Timing Changes From Original Business Case
No anticipated timing changes. Funding for this composite profile will be completed in 2026.

Current or Foreseen Issues
No issues, projects and spend are progressing as expected.

Timing & Plan for Completion
Delivery of several facility and infrastructure projects are ongoing and being lead by IIS project management teams. The remainder of the profile is on track to complete spending by the end of 2026.

2026 Waste Services Utility Rate Filing
Attachment A3.2 - Waste Services Capital Profile Historical Adjustments
CM-81-2045 Waste Services Project Delivery (IIS)

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2022	Original Capital Budget 2023-2026	1.95	7.12	6.33	5.10	0.00	**20.50**
2022	Carryfoward- This profile is on-going and has projects in construction for 2023, described below: Land acquisition budget of $3.15M for Coronation will be carried forward. CP-9556 (EWMC Site Security) - Carry forward $269K of remaining contracted amount that requires comletion in 2023. CP-9530 (HSADF PFRP - Heat Exchanger. Carry forward $750K of committed amount that requires completion in 2023. CP-9938 (EWMC Fire Control Systems Upgrades) - Carry forward remaining $1M (project budget of $1.3M).	6.53	0.00	0.00	0.00	0.00	**6.53**
2022	Carryfoward- This profile is on-going and has projects in construction for 2023. BFA will complete a budget adjustment to transfer approved 'debt' budget to 'R/E' to cover this negative amount.	-1.37	0.00	0.00	0.00	0.00	**-1.37**
2023	2023 Carryforward for IIS - Infrastructure Planning and Design. The capital profiles are ongoing and active.	-2.22	2.22	0.00	0.00	0.00	**0.00**
2024	Transfer Coronation Land purchase to 25-81-2055	0.00	-2.87	0.00	0.00	0.00	**-2.87**
2024	2024 Carryforward for IIS - Infrastructure Delivery. The capital profiles are ongoing and active.	0.00	-6.77	6.77	0.00	0.00	**0.00**
2025	The Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrade project has reached Checkpoint 3 of the Project Development & Delivery model. The Business case was approved in Oct 2024 and a new standalone profile is required with a total estimated cost of $17,251,258. Of these costs, $476,071 was incurred in 2024 and prior years under "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" and will be transferred to the standalone in an administrative adjustment. The new funding requested for this profile is $16,775,187 and it will be funded from the "CM-81-2045 Waste Services IIS Infrastructure Delivery" and "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" profiles.	0.00	0.00	-11.34	-5.10	0.00	**-16.44**
2025 (to be approved)	Excess funds of $2.5M from CM-81-2005 Waste Containers is proposed to be transferred to CM-81-2045 Waste Services IIS Infrastructure Delivery to complete projects such as EWMC site paving and Ambleside Eco Station egress in this budget cycle.	0.00	0.00	0.00	2.50	0.00	**2.50**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.33	-0.33	0.00	**0.00**
Total		**4.89**	**-0.30**	**2.09**	**2.18**	**0.00**	**8.86**

Ref. Sch. 11.1 L.3

2026 Waste Services Utility Rate Filing
Attachment A4.1 - Waste Services Capital Profile Updates
25-81-2055 Coronation Eco Station Expansion

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.5)	Variance to Approved Budget	Variance Explanation
$16.27	**$16.76**	**$16.27**	**-$0.49**	Temporary overstatement due to actuals transfer of the full parcel of Coronation Land, part of which is being purchased by Parks and Roads Services (PARS) with monthly payments from 2025-2027. For the fall 2025 SCBA, $0.49 million will be reduced from the profile budget for the PARS portion of the Coronation land. The $16.27M budget will then match the original approval in early 2025.

Profile Description
This renovation and site expansion project focuses on Coronation Eco Station, one of four existing facilities in Edmonton. The main goals of this project are to reuse the existing complex and implement upgrades regarding site and building efficiency, safety, and interior programming. The overall design language will echo the aesthetics of the other updated Eco Stations, which will strengthen the identity and recognizability of the complexes. The remainider of the Coronation Yard has been purchased from EPCOR, creating an opportunity to partially use the land, facilities and other assets for expansion similar to the improvements made at the Strathcona Eco Station. This also provides an opportunity to redevelop the Coronation site and renovate the existing Coronation Eco Station. This will increase capacity, address operational issues, and improve services and service levels at the current site.

Scope Changes From Original Business Case
No scope changes have been issued, profile was approved by Council in early 2025.

Timing Changes From Original Business Case
No timing changes. The project will commence in the spring of 2026 for completion by summer 2027.

Current or Foreseen Issues
No issues.

Timing & Plan for Completion
Waste Services is reviewing the timing of this project to minimize shutdown and impacts to customer access. Construction is scheduled to start in 2026 with full completion by 2028.

2026 Waste Services Utility Rate Filing
Attachment A4.2 - Waste Services Capital Profile Historical Adjustments
25-81-2055 Coronation Eco Station Expansion

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2024	Prior Year Budget Entries to align actuals in standalone profile and transfer budget from composite profiles due to CP relinking. This includes the Coronation land, of which $0.49 million is being purchased by PARS and does not belong to the Coronation profile, which will be transferred out in the Fall 2025 SCBA	0.00	3.30	0.00	0.00	0.00	**3.30**
2025	The Coronation Eco Station Expansion project has reached Checkpoint 3 of the Project Development & Delivery model. The Business case was approved in March 2025 and a new standalone profile is required with a total estimated cost of $16,270,364. Of these costs, $2,381,487 was incurred in 2024 and prior years under "CM-81-2045 Waste Services IIS Infrastructure Delivery" and "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" profiles and will be transferred to the standalone in an administrative adjustment. The new funding requested for this profile is $13,457,090 and will be funded from "15-33-2011 NW (Mayfield) Eco Station" as the profile is being cancelled and repurposed to expand the existing Coronation Eco Station.	0.00	0.00	0.71	7.75	5.00	**13.46**
2025 (to be approved)	Profile temporarily overstated by $0.49 million since PARS is repaying Waste for their portion of the Coronation site land. This adjustment is proposed to reduce the capital profile since it was overstated during the CP relinking of the full $2.9 million of land purchased (instead of just the $2.4 million of land pertaining to Waste). The $0.49 million to be paid from PARS will be maintained and drawn down in composite CM-81-2045.	0.00	0.00	-0.15	-0.23	-0.10	**-0.49**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.00	-5.75	5.75	**0.00**
		0.00	**3.30**	**0.56**	**1.77**	**10.65**	**16.27**

Ref. Sch. 11.1 L.5

2026 Waste Services Utility Rate Filing
Attachment A5.1 - Waste Services Capital Profile Updates
22-81-2053 Landfill Gas (LFG) to Renewable Natural Gas (RNG)

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.8)	Variance to Approved Budget	Variance Explanation
$16.67	$13.37	$13.37	$0.00	This RNG upgrader project is in the process of being retendered due to restructuring of the project partnership. A feasibility study will be conducted in late 2025 and a new business case will be presented to Utility Committee in spring 2026.

Profile Description
The Landfill Gas to Renewable Natural Gas Project (Project) was developed to look for environmentally sustainable and financially attractive solutions for post-2024 LFG management. The proposed initiative focuses on LFG to RNG upgrade. Fulfillment of this initiative will require the construction of RNG upgrading infrastructure for generation and interjection of RNG into the natural gas network. This project will be the first-of-its-kind project in Alberta to upgrade the LFG to RNG and sell the RNG as a commodity to the local, provincial and/or national market.

Scope Changes From Original Business Case
The Project consistently faced significant schedule delays and financial implications due to public sector due diligence requirements and extensive collaboration among stakeholders. The RNG request for proposal (RFP), released in April 2024, contained estimates and assumptions that caused further delays and exceedance of the total approved budget, requiring new approvals. Increased costs and Project Partner's restructuring led to their withdrawal and the dissolution of the Joint Venture, halting any future RNG RFP negotiations until Joint Venture affairs are settled. Waste Services will determine the new scope and associated budget changes for approval in early 2026.

Timing Changes From Original Business Case
The capital portion of this project was originally expected to be completed by March 31, 2025, however is expected to be delayed until the end of 2027 due to the scope changes described above. The City of Edmonton, as the majority interest holder, is committed to completing the LFG collection system, control building, and flare (landfill liability portions of the project) by March 2026. The City remains supportive of future LFG-to-RNG upgrading but intends to adopt a more systems-oriented approach as the sole project developer with the new target completion date around the end of 2027.

Current or Foreseen Issues
There is a small risk that the grant provider, Emissions Reduction Alberta (ERA), reduces or withdraws the proposed grant funding however Waste Services will ensure this is secured prior to bringing the business case forward to Council.

Timing & Plan for Completion
After completing a feasibility study in fall 2025, Waste Services intends to bring forward an updated business case and associated SCBA for the project in the Spring of 2026 seeking approval of the capital RNG upgrader facility construction. If approved, construction would commence later in 2026 with expected testing and completion by December 2027.

2026 Waste Services Utility Rate Filing
Attachment A5.2 - Waste Services Capital Profile Historical Adjustments
22-81-2053 Landfill Gas (LFG) to Renewable Natural Gas (RNG)

Adjustment Year	*Reason for Request*	2021	2022	2023	2024	2025	2026	Beyond 2026	Total
2021	This new stand alone profile includes the estimated capital required to collect, process and convert landfill gas into renewable natural gas (RNG). A separate capital profile has been included in the 2021 rate filing for rate forecasting purposes however, no funds will be committed until a detailed business case is brought forward for approval in spring 2021.	0.67	10.80	5.20	0.00	0.00	0.00	0.00	**16.67**
2022	The capital profile was originally established with the full $16.67M cost of the facility, however the City funded portion is only $13.37M (70% as per JV agreement with Capital Power). This adjustment aligns the capital profile to the actual amount being funded by Waste Services for its 50% ownership, as the ownership will be shared with Capital Power and therefore should not be reflected in the City's capital profile.	0.00	0.00	-5.30	2.00	0.00	0.00	0.00	**-3.30**
2022	Carryfoward- Project experienced delays and is scheduled to start in 2023.	0.00	-11.47	11.47	0.00	0.00	0.00	0.00	**0.00**
2023	2023Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	0.00	-11.37	11.37	0.00	0.00	0.00	**0.00**
2024	2024 Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	0.00	0.00	-13.37	13.37	0.00	0.00	**0.00**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.00	0.00	-13.37	0.00	13.37	**0.00**
Total		**0.67**	**-0.67**	**0.00**	**0.00**	**0.00**	**0.00**	**13.37**	**13.37**

Ref. Sch. 11.1 L.8

2026 Waste Services Utility Rate Filing
Attachment A6.1 - Waste Services Capital Profile Updates
25-81-2056 EWMC Water Distribution System Upgrade

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.9)	Variance to Approved Budget	Variance Explanation
$17.25	**$17.25**	**$17.25**	**$0.00**	N/A

Profile Description
The Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrade project serves to close the gaps in firewater protection that exist across the site and improve the overall reliability and environmental compliance of the water supply system, which is currently a risk to operations. With new operational demands on the water distribution system compared to its initial installation, this project will allow the site to evaluate, correctly size, and install its process and firewater infrastructure to meet current and future demands while also increasing the reliability of the system with additional site supply lines. Reliability will also be increased by reducing risks associated with line failures at the pressure-reducing valves (PRVs) that currently exist. The scope of this work will increase the site hydrant coverage to comply with design requirements for existing and new assets.

Scope Changes From Original Business Case
No scope changes have been issued, profile was recently approved by Council in late 2024.

Timing Changes From Original Business Case
The original business case anticipated project completion by end of 2027, however completion into 2028 is likely given due to the additional time required to transition the project from Checkpoint 4 to Checkpoint 5. Completing the project in 2028 will have no significant impacts.

Current or Foreseen Issues
No issues.

Timing & Plan for Completion
Project is progressing and is planned for final commissioning in 2028.

2026 Waste Services Utility Rate Filing
Attachment A6.2 - Waste Services Capital Profile Historical Adjustments
25-81-2056 EWMC Water Distribution System Upgrade

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2024	Prior Year Budget Entries to align actuals in standalone profile and transfer budget from composite profiles due to capital project relinking.	0.00	0.48	0.00	0.00	0.00	**0.48**
2025	The Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrade project has reached Checkpoint 3 of the Project Development & Delivery model. The Business case was approved in Oct 2024 and a new standalone profile is required with a total estimated cost of $17,251,258. Of these costs, $476,071 was incurred in 2024 and prior years under "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" and will be transferred to the standalone in an administrative adjustment. The new funding requested for this profile is $16,775,187 and it will be funded from the "CM-81-2045 Waste Services IIS Infrastructure Delivery" and "CM-81-0005 Waste Services IIS Infrastructure Planning & Design" profiles.	0.00	0.00	11.68	5.10	0.00	**16.78**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	-10.27	-0.10	10.36	**0.00**
Total		**0.00**	**0.48**	**1.41**	**5.00**	**10.36**	**17.25**

Ref. Sch. 11.1 L.9

2026 Waste Services Utility Rate Filing
Attachment A7.1 - Waste Services Capital Profile Updates
CM-81-2005 Waste Containers

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.12)	Variance to Approved Budget	Variance Explanation
$16.13	**$12.66**	**$7.15**	**-$5.51**	For the fall 2025 SCBA, Waste Services is proposing to transfer $5.2 million of this excess budget to CM-81-2045 and CM-81-2048 to complete projects & equipment purchases in the current budget cycle. The remaining $0.3 million profile budget excess will be held for contingency.

Profile Description
The Waste Services Waste Container Capital Profile CM-81-2005 recommends funding for the purchase of steel bins (front load, side load, and roll-off waste containers), plastic bins, curbside carts, and associated accessories used in Waste Services' waste collection and drop-off programs. The purchase of waste containers supports Edmonton's urban growth as well as the replacement of waste containers that have reached the end of their service life or are beyond economically feasible repair. This profile will also support the growth of the curbside Source Separated Organics (SSO) program (i.e. curbside carts).

Scope Changes From Original Business Case
Overall scope has not changed from the original business case, however, the original $16.1 million budget presented for the 2023-26 budget cycle has been reduced by $7.2M. This is primarily due to use of in-stock inventory, extension of asset life through refurbishment and conversion of container type, as well as procurement and contract delays. The decisions to reduce the budget by $3.8 million have been recommended and approved at the 2024 and 2025 annual reviews, most of which was transferred to fund the new Greenhouse Gas Mitigation Energy Transition profile. For the 2025 fall SCBA, Waste Services is requesting a further reduction of $5.2 million, proposing these funds be transfered to CM-81-2045 to complete requirements for IIS managed infrastructure projects and CM-81-2048 for Fleet purchases.

Timing Changes From Original Business Case
No anticipated timing changes. Funding for this composite profile will be completed in 2026.

Current or Foreseen Issues
No current issues, however profile spending is dependent on when vendors can produce and deliver container and carts. Projections have been adjusted to reflect realistic deliveries based on timing of orders and past trends.

Timing & Plan for Completion
Review of the Waste Container assets will continue throughout the budget cycle, with plans to spend the remaining budget on the planned for carts (based on growth and replacement) and projected steel bins needs. Waste's Business Integration Technical Services team is working to get a strucutured, more robust inventory system for waste containers to help with budgeting for the forecasting in the next budget cycle.

2026 Waste Services Utility Rate Filing
Attachment A7.2 - Waste Services Capital Profile Historical Adjustments
CM-81-2005 Waste Containers

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2022	Original Capital Budget 2023-2026	3.38	4.02	4.23	4.50	0.00	**16.13**
2022	Carryforward - PO was issued in 2022. A partial amount of the goods were received in 2022. The remaining will be received in Q1 of 2023. BFA will complete a budget adjustment to transfer approved 'debt' budget to 'R/E' to cover this negative amount	0.29	0.00	0.00	0.00	0.00	**0.29**
2023	2023Carryforward for Waste Services. The capital profiles are ongoing and active.	-1.88	1.88	0.00	0.00	0.00	**0.00**
2024	MOTION: That the funding source adjustments in the Waste Containers (CM-81-2005) and Greenhouse Gas Mitigation Energy Transition Portfolio (CM-81-2049) capital profiles, as outlined in Attachment 2 of the November 8, 2024, City Operations report CO02415, be approved.	0.00	-2.69	0.00	0.00	0.00	**-2.69**
2024	2024 Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	-1.54	1.54	0.00	0.00	**0.00**
2025	IIS Managed Planning and Design profile requires additional budget due to the following: - in 2024, IIS P&D increased their team resources. This allowed them to take on more projects and sooner in the budget cycle, resulting in increased spending. - The MRF Tip Floor Builidng Remediation & Expansion resulted from an unforeseen building code issue. It was added as a new project during the budget cycle, as a high priority. - Coronation Eco Station Upgrades was not budgeted for. This project was initiated due to the decision to upgrade Coronation rather than building a new Mayfield eco station. An additional $1.07M will be drawn from the Waste Containers CM-81-2005 composite's excess budget.	0.00	0.00	-1.07	0.00	0.00	**-1.07**
2025 (to be approved)	Excess funds of $2.5M from CM-81-2005 Waste Containers is proposed to be transferred to CM-81-2045 Waste Services IIS Infrastructure Delivery to complete projects such as EWMC site paving and Ambleside Eco Station egress in this budget cycle.	0.00	0.00	0.00	-2.50	0.00	**-2.50**
2025 (to be approved)	Excess funds of $2.7M from CM-81-2005 Waste Containers is proposed to be transferred to CM-81-2048 Waste Services Fleet Assets. This will cover increased contract costs related to loader vehicles and trailers, and will result in no new net funding to the Utility.	0.00	0.00	-2.70	0.00	0.00	**-2.70**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	-0.11	-0.20	0.31	**0.00**
Total		**1.79**	**1.67**	**1.89**	**1.80**	**0.31**	**7.46** *

Ref. Sch. 11.1 L.12

*Note: Current Forecast per Schedule 11.1 L 12 is $7.15 million however the budget is currently holding $0.3 million excess (cashflowed to 2027) which will be maintained for contingency.

2026 Waste Services Utility Rate Filing
Attachment A8.1 - Waste Services Capital Profile Updates
CM-81-2048 Waste Services Fleet Assets

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.13)	Variance to Approved Budget	Variance Explanation
$45.08	$48.38	$55.58	$7.20	For the fall 2025 SCBA, Waste Services is requesting $7.2 million additional funding for the Fleet budget. A major factor contributing to this increase is the additional contract costs for refuse truck bodies and walking floor/end dump trailers that arose during the capital timeline.

Profile Description
This profile supports the replacement of Fleet Assets (Waste Services Vehicles & Equipment). Waste Services fleet consists of self-propelled equipment, heavy-duty trucks, trailers, light trucks and vehicles that suppot ongoing operations. Fleet assets are used to collect, process, recycle and dispose of waste for over 400,000 residential households. Fleet assets physically deteriorate with use and age; timely asset replacement improves the fleet's availability and results in a lower average operating cost per kilometer/hour. Replacement is done by purchasing new units once they reach the end of their useful operating life.

Scope Changes From Original Business Case
In the fall 2025 SCBA, $7.2 million of budget will be proposed to be transferred from two profiles to cover an increase in expected costs to the end of the budget cycle. A major factor contributing to this increase is the additional contract costs for refuse truck bodies and walking floor/end dump trailers, which occurred partway through the capital timeline.

Timing Changes From Original Business Case
No timing changes, all units are expected to be procured within the current budget cycle.

Current or Foreseen Issues
No current issues, however profile spending is dependent on when vendors can produce and deliver equipment. Waste's Asset Management team mitigates this risk by placing orders up to a year in advance.

Timing & Plan for Completion
Waste Services is actively planning next year's equipment requirements based on lifecycle replacement reviews and growth needs. The profile is on track to complete spending by the end of 2026.

2026 Waste Services Utility Rate Filing
Attachment A8.2 - Waste Services Capital Profile Historical Adjustments
CM-81-2048 Waste Services Fleet Assets

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2022	Original Capital Budget 2023-2026	6.73	9.76	9.57	8.18	0.00	**34.25**
2022	The recosting adjustment is required to fund $10.83M of vehicle orders scheduled to arrive in 2023 and 2024. Due to global supply chain issues, vehicle purchases require approximately 12-30 months of lead time, and therefore a pre-approval of 2023-2026 Waste Services Retained Earnings funding is being requested for approval.	5.10	5.73	0.00	0.00	0.00	**10.83**
2022	CFWD - Carryforward is required for vehicle purchases committed and expected to arrive in 2023	3.31	0.00	0.00	0.00	0.00	**3.31**
2022	Cancellation of the Organics Processing Facilities (OPF) project was approved by Council in August 2021. In the Fall 2021 Waste Services (WS) SCBA (Attachment 3 of CO00823), the full $13.8M budget for the profile was released. At year end, it was determined that only the unspent budget should have been released. The excess budget from the WS Vehicles & Equipment and Facilities & Infrastructure composite profiles will be transferred to the OPF profile with this adjustment. This administrative SCBA reconciles the budget & actuals for accounting purposes and is not requesting additional funding.	0.00	0.00	0.00	0.00	0.00	**0.00**
2023	2023Carryforward for Waste Services. The capital profiles are ongoing and active.	-2.04	2.04	0.00	0.00	0.00	**0.00**
2024	2024 Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	-7.19	7.19	0.00	0.00	**0.00**
2025 (to be approved)	Excess funds of $2.7M from CM-81-2005 Waste Containers is proposed to be transferred to CM-81-2048 Waste Services Fleet Assets. This will cover increased contract costs related to loader vehicles and trailers, and will result in no new net funding to the Utility.	0.00	0.00	0.00	2.70	0.00	**2.70**
2025 (to be approved)	The 23-81-3060 Organics Screening and Mixing System profile is being cancelled as Waste is completing a new master strategy for organics processing. The funds are proposed to be fully transferred to the following Waste profiles: $4.5M to CM-81-2048 Waste Services Fleet Assets to support vehicle requirements, $0.3M to CM-81-2047 Waste Services Facilities & Infrastructure Project Delivery and $1M to CM-81-0005 Waste Services IIS Infrastructure Planning & Design based on Waste's review of projects to be completed within the current budget cycle.	0.00	0.00	2.12	2.37	0.00	**4.50**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	-3.24	3.24	0.00	**0.00**
		13.10	**10.35**	**15.64**	**16.50**	**0.00**	**55.58**

Ref. Sch. 11.1 L.13

2026 Waste Services Utility Rate Filing
Attachment A9.1 - Waste Services Capital Profile Updates
CM-81-2049 Greenhouse Gas Mitigation Energy Transition Portfolio

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.14)	Variance to Approved Budget	Variance Explanation
$2.69	**$2.69**	**$2.69**	**$0.00**	N/A

Profile Description
This composite profile serves to transition the Utility's assets to climate resilient infrastructure, reducing greenhouse gas emissions and supporting the City's environmental initiatives in alignment with the City's Greenhouse Gas Management Plan 2019-2030 for Civic Operations. In the current budget cycle, this includes funding for charging infrastructure, building retrofits, and other renewable energy and climate adaptation projects.

Scope Changes From Original Business Case
No scope changes have been issued. This profile was approved by Council in late 2024 as part of the 2025 Utility Rate Filing.

Timing Changes From Original Business Case
No anticipated timing changes. Funding for this composite profile will be completed in 2026.

Current or Foreseen Issues
No issues.

Timing & Plan for Completion
The $2.69 million current profile is expected to be spent by the end of the 2023-2026 budget cycle. A Capital Funding Request will be brought forward for future budget cycles to support ongoing projects.

2026 Waste Services Utility Rate Filing
Attachment A9.2 - Waste Services Capital Profile Historical Adjustments
CM-81-2049 Greenhouse Gas Mitigation Energy Transition Portfolio

Adjustment Year	*Reason for Request*	2023	2024	2025	2026	Beyond 2026	Total
2024	MOTION: That the funding source adjustments in the Waste Containers (CM-81-2005) and Greenhouse Gas Mitigation Energy Transition Portfolio (CM-81-2049) capital profiles, as outlined in Attachment 2 of the November 8, 2024, City Operations report CO02415, be approved.	0.00	0.00	0.76	1.93	0.00	**2.69**
Total		**0.00**	**0.00**	**0.76**	**1.93**	**0.00**	**2.69**

Ref. Sch. 11.1 L.14

2026 Waste Services Utility Rate Filing
Attachment A10.1 - Waste Services Capital Profile Updates
23-81-2054 Three-stream Communal Collection Program

Original Budget	Approved Budget	Current Forecast (Sch 11.1 L.16)	Variance to Approved Budget	Variance Explanation
29.01	**10.49**	**10.49**	**$0.00**	N/A

Profile Description
This profile supports changes to the current waste collection program offered to residences receiving communal collection. Currently, residences on communal collection (typically condos and apartment buildings) receive garbage and recycle collection via large communal bins, with recycling being voluntary (i.e. not all properties have recycling collection). The changes recommended include mandatory three stream separation of waste for all residences receiving communal collection. The three streams are: garbage, recycling, and organics. The associated capital funds include funding for containers, vehicles and associated accessories.

Scope Changes From Original Business Case
The Three-Stream Communal Collection profile was originally established to include initial rollout plus replacement costs over a 20 year period, however the profile should have only been established with the initial rollout program. Replacement costs from 2028 onwards are therefore being reduced from this profile, and the profile completion date will be changed to December, 2027. Replacement cost will be requested in the Waste Services equipment and container composite profiles in future budget cycles. As a result, an supplemental capital budget adjustment was completed in 2023 to reduce the budget by $18.5 million and amend the profile completion date from 2042 to December 2027.

Timing Changes From Original Business Case
An budget adjustment was completed in 2023 to change the profile completion date from 2042 to December 2027. This is related to the scope change described above.

Current or Foreseen Issues
No issues.

Timing & Plan for Completion
Equipment procurements are ongoing and profile is on track to be completed by December 2027. Any replacement costs will be requested in the Waste Services equipment and container composite profiles in future budget cycles.

2026 Waste Services Utility Rate Filing
Attachment A10.2 - Waste Services Capital Profile Historical Adjustments
23-81-2054 Three-stream Communal Collection Program

Adjustment Year	*Reason for Request*	2022	2023	2024	2025	2026	Beyond 2026	Total
2022	Budget Adjustment is requested to fund a new profile for the development of a three-stream source separation service for properties that receive communal collection. This program is necessary to increase source separation of waste and progress towards the 90% waste diversion target.	0.00	7.32	1.53	1.55	0.00	18.61	**29.01**
2022	CFWD - New project is scheduled to start in 2023. The preliminary cost will be offset by the approved 2023 budget.	0.01	-0.01	0.00	0.00	0.00	0.00	**0.00**
2023	2023Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	-5.52	5.52	0.00	0.00	0.00	**0.00**
2023	The Three-Stream Communal Collection profile was originally established to include initial rollout plus replacement costs over a 20 year period, however the profile should have only been established with the initial rollout program. Replacement costs from 2028 onwards are therefore being reduced from this profile, and the profile completion date will be changed to December, 2027. Replacement cost will be requested in the Waste Services equipment and container composite profiles in future budget cycles.	0.00	0.00	0.00	0.00	0.00	-18.51	**-18.51**
2024	2024 Carryforward for Waste Services. The capital profiles are ongoing and active.	0.00	0.00	-3.81	3.81	0.00	0.00	**0.00**
2025	Cashflow for 2026 Rate Filing	0.00	0.00	0.00	-1.65	1.08	0.57	**0.00**
Total		**0.01**	**1.79**	**3.24**	**3.70**	**1.08**	**0.67**	**10.49** *

Ref. Sch. 11.1 L.16

*Note: Schedule 11.1 L.16 will show $10.48 due to 2022 being excluded.

2026 Waste Services Utility Rate Filing
Appendix B - Original Capital Business Cases
Table of Contents

Note: The 2024 business case for CM-81-2049 Greenhouse Gas Mitigation Energy Transition Portfolio is a private attachment and has been excluded from this Appendix.

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Waste Services Facilities, Infrastructure and Process Equipment - Composite

Capital Funding Request

City Operations | Waste Services

City of Edmonton

Capital Profile: CM-81-2047

Project Number: Various

Profile Owner: Krista Berezowski

Profile Sponsor: Denis Jubinville

Version #: 2.0

Date published: August 31, 2022

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Change History

Version #	Date	Author	Description
1.0	08/05/22	Lena Aitken	First draft of the Capital Funding Request
2.0	08/17/22	Lena Aitken	Second draft of Capital Funding Request

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
2.0	Lena Aitken	Senior Project Engineer	August 17, 2022

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.0	**Neil Kjelland** Director, Sustainable Waste Processing	Neil Kjelland	Aug 22, 2022
2.0	**Chris Fowler** Director, Collections Services	Chris Fowler	8/17/22
2.0	**Jodi Goebel** Director, Business Integration	Jodi Goebel	Sept 11, 2022
2.0	**Keith Knoblauch** Operational Controller, Business Financial Analytics	Keith Knoblauch	Sep 09, 2022
2.0	**Crystal Wood** Communications Advisor	Crystal Wood	Aug 19, 2022

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
2.0	**Krista Berezowski** Director, Technical Services		Sept 12, 2022
2.0	**Denis Jubinville** Branch Manager, Waste Services		September 13, 2022

Indigenous Acknowledgement

Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

1. Executive Summary

1.1. Waste Services Facilities, Infrastructure and Process Equipment Composite Upgrade/Renewal

Composite Profile CM-81-2047 provides capital funding for capital renewal, upgrade, and improvement projects for Waste Services valued at less than $5 million. Waste Services assets include a number of facilities such as Eco Stations, employee workspaces, equipment facilities, administration buildings, waste processing facilities, and research and development facilities. These facilities contain heating, cooling, ventilation, fire protection systems, plumbing, electrical distribution, and other building systems. In addition to these systems, Waste Services owns and operates a series of specialized waste processing equipment required to meet the branch mandate of efficient and environmentally sound waste management operations. Waste Services also manages a variety of infrastructure including roads, drainage, and buried utilities for operating industrial processes at the Edmonton Waste Management Centre (EWMC) and other locations in the city.

To deliver sustainable waste management services, maintain optimal service levels, and have a sustainable and efficient asset management program, capital funds are required to carry out capital renewal, growth, modifications, improvements, and upgrades of Waste Services assets. This will result in safer and more reliable assets while maintaining high levels of customer service. Without this funding in place, facilities, process equipment, and infrastructure will be at increased risk of failure as the waste collection and processing systems age. Emergency situations caused by unforeseen failures can result in expensive unplanned repairs, safety issues for staff and public, and interruption to operations.

Waste Services manages these renewal and growth projects in collaboration with its partners such as Integrated Infrastructure Services (IIS), Fleet and Facility Services, and operation and maintenance contractors. This profile contains projects that have high integration with plant operations, are specific to waste processing, or are smaller than the IIS project thresholds, and therefore can be managed effectively by Waste Services. This requires funding of approximately $19.4 million between 2023 and 2026.

To ensure adequate levels of funding are available for this capital profile, Waste Services has adopted a planning and prioritization approach that builds on understanding project drivers (need) and criticality (risk), which is closely aligned with the City's Corporate Risk-based Infrastructure Management System (RIMS) and Capital Budgeting Framework[1]. This approach informs overall required capital investment in the improvement, renewal, and upgrade of the aforementioned assets, and is combined with the implementation of formalized asset condition assessment, preventative maintenance programs, safety and environmental improvements, and process improvement needs.

2. Background

Waste Services has an extensive infrastructure inventory which include facilities such as Eco

[1] Overview of the Budget Planning Processes, August 11, 2021, Budget Planning and Development, Financial and Corporate Services

Stations, employee workspaces, equipment facilities, administration buildings, waste processing facilities, and research and development facilities. These facilities contain mechanical, electrical, fire protection, other building systems, and specialized equipment. Infrastructure includes the Edmonton Waste Management Centre and Kennedale site utilities, roadways, drainage, communications, transaction data collection hardware and software, and specialized systems like odour monitoring.

The asset condition, functionality, expected life cycle, replacement value and other information are updated and tracked in the Corporate Risk-based Infrastructure Management System (RIMS). RIMS is a tool used to assist in ranking rehabilitation needs and allocation of renewal funds across various infrastructure assets to ensure long-term value. RIMS provides information on replacement value, average age, life expectancy and condition of City of Edmonton assets including those of Waste Services.

As of December 2021, the replacement value of Waste Services assets, captured through the Annual Infrastructure Inventory, is about $369 million. (Appendix A - Asset Replacement Values). These assets require regular maintenance, upgrade, renewal, or modification for various reasons such as environmental compliance, safety enhancement, asset renewal/upgrade, process improvement, and strategic and business needs.

Throughout the 2023 - 2026 capital budget cycle, Waste Services will continue to assess asset conditions and criticality, and will implement capital projects to maintain the integrity and efficiency of the system. In addition, the planned projects will allow Waste Services to comply with regulatory requirements and audit recommendations, enhance industrial process safety, and manage its operations to meet the goals of Edmonton's 25-year Waste Strategy.

2.1. Problem / Opportunity

As Waste Services focuses on managing its assets effectively, the Utility has adopted a proactive approach to sustaining its facilities and infrastructure. This ensures that assets will be well maintained during their useful life and plans for rehabilitation, replacement, and upgrading, resulting in an overall improvement in collection and processing efficiencies while reducing life cycle costs. Projects included in this composite profile address a number of Waste Services business needs such as renewal of assets that have reached the end of their useful life, mitigation and elimination of safety and environmental risks and opportunities for continuous improvement.

2.2. Current Situation

Waste Services has implemented proactive and integrated processes for optimizing the value of its fixed assets. These processes reflect internationally recognized asset management standards and practices. Forming a dedicated Asset Management team was a crucial step Waste Services took to solidify this transformation. The goal of this team is to ensure the business' fixed and mobile assets are safe and reliable while providing optimum value to the organization. Tactically, this has been accomplished through updating the business' asset registers followed by analyzing assets' functions and risk profiles to arrive at appropriate maintenance, upgrading, and renewal programming. Projects are proposed based on data and information derived from this process.

To facilitate appropriate project vetting and approval, Waste Services implemented a Branch-wide project initiation, evaluation, prioritization and decision making process. This process identifies and ranks projects based on strategic criteria such as environmental impact, health and safety, and alignment to strategy. Current and future projects can be prioritized, managed and recommended for funding to align with branch and corporate goals, legislation, market demands and customer expectations.

3. Initiative Description

3.1. Initiative Description

The Waste Services Facilities, Infrastructure, and Process Equipment composite profile includes assessment of asset conditions and criticality, and proposes to implement capital projects prioritized to maintain the integrity and efficiency of the system. In addition, the planned projects will allow Waste Services to comply with regulatory requirements, enhance industrial process safety, and manage its operations to meet the goals of Edmonton's 25-year Waste Strategy. The projects planned under this profile are relatively low value, multidisciplinary in nature, primarily industrial focused, and have high integration with plant operations, and therefore will be primarily managed through internal Waste Services engineering consultants, operation and maintenance contractors. Appendix C - List of Projects, shows the projects included in this profile.

3.2. Urgency of Need

During the initial planning process, a robust prioritization methodology was developed by Waste Services that aligns with corporate prioritization methods. The projects identified as critical or very important that cannot be deferred are included in this budget cycle. The risk of deferring these projects include potential asset and system failure, greater fire and safety risks, environmental noncompliance and inability to meet corporate and branch goals (such as diversion).

3.3. Anticipated Outcomes

The anticipated outcome of implementing the proposed projects includes asset integrity, system reliability, efficiency, enhanced safety and regulatory compliance:

Outcome /Deliverables
Better information to make capital investment decisions: Through a structured and integrated process, administration will ensure that projects identified as priorities by Waste Services receive robust evaluation of alternatives and scope identification. This will ensure stable utility rates.
Improved project schedule and budget estimates: Following City and industry best practices, a control budget and schedule is established on the basis of a completed design to ensure realistic expectations that are aligned with the Waste Services Project Management Framework prior to tendering and construction. The Waste Services Project Management Framework aligns with the IIS processes to ensure projects provide value-for-money and

demonstrate sound stewardship
Reliable facilities and infrastructure that enable sustainable waste management in a cost-effective manner.
High levels of customer service are delivered in both efficient and effective ways through leading-edge waste processing facilities that use current and emergent technology to enable high rates of diversion of waste from landfill.

3.4. Scope

The scope of this profile encompasses capital renewal and upgrade work for Waste Services facilities, process equipment, and infrastructure. This includes, but is not limited to, site improvements, new process equipment, changes in existing facilities and infrastructure, upgrades to building systems, and upgrades to the current transaction data collection systems.

3.5. Out of Scope

- Renewal projects exceeding $5 million or growth projects over $2 million are out of scope for this capital funding request. Any projects with a total budget that exceed these corporate thresholds are included within the Waste Services IIS managed profiles.
- Operational repair and maintenance activities.
- Vehicles and equipment. These are included in a separate capital funding request.
- Projects to be managed by Integrated Infrastructure Services.

3.6. Critical Success Factors

Critical success factors include:

- Adherence to asset management and project management frameworks.
- Proper design and documentation, following the corporate engineering practice guidelines.
- Timely execution of projects.
- Proper quality control, functional tests, and commissioning.
- Accurate and sufficient data and cost analyses to support high level budget estimates and informed decision making for the projects.
- Regular check-ins with Waste Services Leadership Team to ensure alignment with strategic direction, City and branch goals.

4. Strategic Alignment

Waste Services is committed to advancing Council's vision and goals. This capital funding request contributes to the overall strategic direction of City Council and goals of policies and corporate strategic documents listed in the table below. This contribution is made by demonstrating leadership in waste management and processing standards, and by increasing diversion of residential and non-residential waste from landfill.

City of Edmonton Environmental Policy C512 [2]	The policy states that "The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services, based on its commitment to: ● prevent pollution; ● continually improve its environmental performance by setting and reviewing environmental objectives and targets; and ● meet or exceed applicable environmental legal requirements and other requirements to which it subscribes."
ConnectEdmonton: Vision 2050[3]	This profile aligns with the City's Vision 2050 strategic plan by ensuring that waste is collected efficiently, processed responsibly, and the amount landfilled is minimized, Edmonton will be a healthy city, urban places will be clean, regional prosperity is increased by building a circular economy, and a low-carbon future is assured.
Waste Services Business Plan 2022-2025[4]	The Business Plan outlines how Waste Services will continue to make transformational impacts through the 25-year Waste Strategy, provide essential services to Edmontonians while maintaining full cost recovery, and improve employee and resident experience to support adaptation of new systems.
25-Year Waste Strategy[5]	Using a Zero Waste Framework, the strategy affirms Waste Services' commitment to 90 per cent diversion of single unit residential waste from landfill. It also brings Edmonton into alignment with internationally-recognized best practices, emphasizing waste prevention and waste reduction, while redesigning services to help all Edmontonians more easily take part in Edmonton's zero waste future.

[2] COE Environmental Policy C512
[3] ConnectEdmonton
[4] Waste Services Business Plan 2022-2025
[5] 25-Year Waste Strategy

Waste Services Utility Fiscal Policy C558B[6]	The purpose of this policy is to: ● Ensure the Waste Services Utility is operated in a manner that reflects City Council's overall vision and philosophical objectives for the Utility. ● Ensure there is a consistent approach year over year for the financial planning, budgeting, and rate setting for the City managed Utility. ● Ensure the Utility is financially sustainable over the long term.
Capital Project Governance Policy C591[7]	Policy C591 stated the City of Edmonton is committed to achieving effective and efficient use of public funds dedicated to capital projects. The Waste Services Project Management Framework was developed to provide guidance and standard processes for project management practices Waste Services uses. The framework aligns with corporate processes outlined in Policy C591, ensuring projects provide value-for-money and demonstrate sound stewardship.

5. Context Analysis

Waste Services has adopted the planning and prioritization approach that builds on understanding project drivers (need) and criticality (risk), which is closely aligned with the City's RIMS and Capital Budgeting Framework[8]. This approach informs overall required capital investment in improvement, renewal, and upgrade of the aforementioned assets, and is combined with implementation of formalized asset condition assessments, preventative maintenance programs, safety and environmental improvements, and process improvement needs. Projects are scored based on Project Driver and Criticality, and are prioritized based on total score (Project driver score * criticality score). Projects that are critical and cannot be deferred to the next budget cycle were prioritized to be initiated this budget cycle.

The annual cash flow projections between 2023-2026 were calculated based on high level cost estimates of each individual project, on the basis of previous project costs, and on experience and judgment. Total annual projections were then checked and validated against the percentage of total asset replacement value and were found to be reasonable.

As of December 2021, Waste Services assets were valued at approximately $369 million, excluding vehicles and equipment (Appendix A). For this budget period, the average annual

[6] Waste Services Utility Fiscal Policy C558B
[7] Capital Project Governance Policy C591
[8] Overview of the Budget Planning Processes, August 11, 2021, Budget Planning and Development, Financial and Corporate Services

funding request for this profile is approximately 1.3% of asset replacement value. In addition, capital projects will also be managed through Integrated Infrastructure Services composite profiles. The combined annual funding request for both profiles is approximately 3.1% of asset value.

A list of required projects was collected from operational areas, including project scope, schedule, risks and estimates. These were evaluated, ranked and prioritized based on strategic and operational criteria, i.e., Project Driver and Project Criticality as outlined in the Waste Services Internal Project Planning and Prioritization Process (Appendix B).

Projects include a variety of process and facility improvements, site improvements, and EWMC site fire protection. Appendix C - List of Projects, shows the projects included in this profile.

Project costs used for requesting and evaluating the projects are high level estimates and will be reviewed and validated through bi-annual re-prioritization exercises for possible adjustments according to Branch priority. Planning, documentation, and approval processes for each individual project follows the approved Waste Services Project Management Framework.

6. Organizational Change Impact

6.1. Stakeholder Impact

Stakeholder Impact
Stakeholder 1: City of Edmonton Waste Services Branch (primary internal)
Minimal impact to staff once upgrades of facilities and infrastructure are ongoing (e.g. relocation during construction/installation)
Stakeholder 2: City Council (primary internal)
Robust capital planning and reporting to enable effective oversight and demonstrate continued alignment to Council Policies and the strategic goals of Edmonton's 25-Year Waste Strategy
Stakeholder 3: Residents (primary external)
Effective and efficient asset management that demonstrates value and enables continued service and utility rate stability.
Stakeholder 4: Contractors within Waste Services facilities (primary external)
Minimal disruption to operations due to construction/installation.
Stakeholder 5: Customers dropping off materials at Waste Services facilities (secondary external)
Strategies to mitigate inconvenience using facilities when dropping off materials.

6.2. Business and Operational Impact

Business & Operational Impact & Description
Human Resources: Waste Services (internal)
Resources and organizational structure will be reviewed to ensure effective delivery of program
Procurement: Corporate Procurement and Supply Services (internal)
Increase in resource demand to provide procurement support
Legal Support: Law Branch (internal)
May require additional resources for legal support, review of contract for non-standard contract terms and conditions as well as review of documents to support procurement for numerous low-value projects

Moving forward, the City of Edmonton is committed to the use of Gender-Based Analysis Plus (GBA+). Waste Services will identify root causes on any issues that may arise, use an evaluation approach, consider inputs from affected stakeholders (e.g. people with disabilities, indigenous people, seniors, etc.), and develop and implement an action plan for safety, diversity and inclusivity issues using GBA+. Waste Services acknowledges that GBA+ is an equity assessment tool that allows for holistic consideration of the need for use, and impact of, this capital funding request and that staff are trained in the GBA+ process.

7. Benefits / Costs

7.1. Tangible Benefits

The following are the tangible benefits of managing assets in a more proactive and integrated way:

- Improved operational efficiency of facilities, infrastructure and process equipment.
- Reduction in safety-related incidents.
- Long term savings due to reduction in repair costs.
- Improved productivity due to better access to facilities and equipment, and increased availability due to reduced down time.

7.2. Intangible Benefits

The following are the intangible benefits of managing assets in a more proactive and integrated manner:

- Increased employee morale due to better working conditions.
- Safer working environment for staff and customers.
- Increased or maintained customer satisfaction.

7.3. Costs

Basis for Calculation of Costs for 2023-2026

Year	2023	2024	2025	2026	2023-2026 Total
Profile Cost (CM-81-2047 - Design and Delivery*)	**$4,234,731**	**$6,787,824**	**$5,275,075**	**$3,111,032**	**$19,408,662**
% of Replacement Value**	1.14%	1.84%	1.43%	0.84%	1.32%

* This profile combines the design and delivery of proposed projects. Because of the nature of the projects under this profile, the majority of the projects will be managed by Waste Services through internal stakeholders such as Facility Maintenance Services, and Facility Operations and Maintenance contractors.

** Percent is based on the 2021 Annual Infrastructure Inventory value of $368.8 million as shown in Appendix A.

Refer to the Financial Analysis Summary[9] and 2023-2026 Waste Services Capital Planning[10] for details.

7.4. Assumptions

- Project estimates are considered Class 5 and are based on conceptual plans with limited information. The accuracy of estimates are within a range of -30% to +50%.[11]
- Pricing may be impacted by the market.
- Asset replacement cost of $368,798,084 (value as of December 2021) was used for the budget period.

8. Resourcing

The projects will be led internally by Waste Services project managers, in collaboration with partners such as Integrated Infrastructure Services, Fleet and Facility Services, operational sections, and operations and maintenance contractors. Waste Services will use corporate processes, such as corporate procurement methods, to complete the design and construction phases.

9. Key Risk(s) and Mitigation Strategy

Risks	Impact	Mitigation Strategy

[9] Financial Analysis Summary
[10] 2023-26 Waste Services Capital Planning
[11] Facility Design & Construction

Global supply chain issue for specialized equipment.	High	Use locally available materials and equipment to specification if possible. Allow sufficient time for equipment supply lead time.
Health and safety issues if numerous small value projects are not implemented on time.	Medium	Prioritize projects and ensure timely implementation.
Changes in processing equipment brought about by future waste initiatives to increase diversion rate.	Medium	Develop asset management strategic plan incorporating required process equipment to address future waste initiatives.

10. Conclusion and Recommendations

10.1. Conclusion

This profile will provide capital funding for capital renewal, upgrade, and improvement projects for Waste Services valued at less than $5 million. This funding will ensure assets provide overall improvement in operating efficiency, effectiveness, safe working conditions and meet environmental compliance. The total funding requested for 2023-2026 is approximately $19.4 million.

10.2. Recommendations

It is recommended this profile be approved to assist Waste Services to meet its commitment to deliver integrated and sustainable waste management services. This will ensure capital renewal and upgrade of assets to address safety concerns, meet environmental compliance and improve operating efficiency.

10.3. Project Responsibility and Accountability

The individual projects within this profile will be led by Waste Services Project Managers, who will be assigned based on their experience and knowledge. They will coordinate with General Supervisors of the respective facilities and infrastructure, operating and maintenance groups, Occupational Health and Safety coordinators, and other stakeholders.

The Project Sponsor is the Branch Manager of Waste Services. The overall capital program is managed by the Director of Technical Services, in collaboration with Sustainable Waste Processing Services, Collection Services, Business Integration, and Financial Services.

11. Implementation Approach

As opportunities for improvement or production issues are identified, assigned project managers for the facilities, infrastructure or system review and develop options for solutions. These are reviewed with operating and maintenance groups and Occupational Health and Safety to determine the most cost effective solution that will resolve the issue.

Solution requirements are incorporated into a public tender. Tenders are evaluated by engineering, operations, and maintenance personnel to choose a vendor that meets the conditions of the tender.

12. Review and Approval Process

The following review and approval process was followed for this capital funding request:

Review Step	Reviewer
Review 1	Team Lead of Technical Services, General Supervisor of Business Integration, General Supervisor of Collection Services, General Supervisors of Sustainable Waste Processing, General Supervisors of Technical Services, and Senior Accountant of Financial Services.
Review 2	Director of Finance, Director of Business Integration, Director of Collection Services, Director of Sustainable Waste Processing, Director of Technical Services (Final Approver) and Senior Communications Advisor.
Review 3	Branch Manager of Waste Services (Final Approver)
Review 4	Utility Advisor
Review 5	Utility Committee report presented

13. Appendices

Appendix A - Asset Replacement Value based on 2021 Annual Infrastructure Inventory
Appendix B - Waste Services Internal Project Planning and Prioritization Process
Appendix C - List of Projects
Appendix D - Financial Analysis Summary

Appendix A: Waste Services Asset Replacement Values (as of 2021)

Waste Services Infrastructure and Facilities

Assets	*Replacement Value (in thousands)*
Edmonton Waste Management Centre (EWMC)	
Environmental Facilities - Landfill Systems	
Secant Wall	$1,254
Leachate Collection System	$4,000
Leachate Storage and Transfer	$2,900
Groundwater Diversion System	$17,400
Monitoring Wells	$700
EWMC Site Common	
Fences, Gates, Security	$400
Open Space	$2,800
Parking Lots	$1,660
Roads	$4,700
Site Equipment	$3,331
Utilities	$5,277
Waste Processing	
Anaerobic Digestion Facility	$65,500
Construction and Demolition Facility	$5,150
Cure Site	$21,300
Integrated Processing and Transfer Facility	$70,709
Materials Recycling Facility	$20,870
Research and Development Equipment	$11,000
Buildings	
Waste Mgmt Control Centre/Admin (Site #100)	$2,359
Waste Mgmt Main Weigh Scales (Site #200)	$211
Waste Mgmt Operations Centre (Site #300)	$2,072
Waste Mgmt Research & Development (Site #310)	$8,821

Miscellaneous Structures (i.e. trailers, quonsets)	$1,579
Waste Mgmt IPTF Admin Building (Site #480)	$3,756
Waste Mgmt Advanced Energy Res. Fac. (Site #306)	$3,776
Waste Mgmt Equip. Storage & Maint. Facility (#320)	$11,104
Waste Mgmt Facility (Site #440)	$19,615
Waste Mgmt Composter Admin Building (Site #500)	$3,077
Total EWMC Replacement Value	$295,323
Collections Services	
Ambleside Eco Station	$7,669
Ambleside Reuse Centre	$1,378
Ambleside Eco Station Kiosks	$115
Coronation Eco Station	$2,361
Strathcona Eco Station	$6,167
Eco Station Storage Garage	$2,202
Kennedale Waste Admin Building	$5,790
Kennedale Waste Transfer Station	$7,748
Kennedale Waste Operations	$10,830
Kennedale Waste Operations Bldg East	$22,609
Kennedale Eco Station	$5,694
Kennedale Reuse Building	$913
Total Collections Replacement Value	$73,475
Total EWMC and Collections Services Replacement Value	$368,798

Source: 2021 Risk-based Infrastructure Management System (RIMS); 2021 Tririga Data

APPENDIX B: Waste Services Internal Project Planning and Prioritization Process

The following outlines the Project Prioritization process:

1. Capital project needs are identified from all sections of the Utility and listed on the 2023-26 Waste Services Capital Planning Sheet.
2. Each project is scored based on the Project Driver and the Project Criticality. See tables 1 and 2 below for details. Total project score for each project is calculated by multiplying the driver and criticality scores.
3. Projects are then prioritized based on the total scores.
4. Projects are recommended based on prioritization with budget estimates.
5. Waste Services Leadership Team (WSLT) reviews and approves the final list.
6. Planning, documentation, and approval process for each individual project follows the approved Waste Services Project Management Framework.
7. Re-prioritization exercises occur on a bi-annual basis for possible adjustments according to Branch priority.

Table 1: Project Driver

Project Driver (score)						
Regulatory / Compliance (5)	Safety / Environmental Enhancement (5)	Asset Renewal/ Upgrade (4)	Business Need / Growth (3)	Strategic / Corporate Goal (3)	Process / Operational Improvement (3)	Other (3)

Table 2: Project Criticality

Project Criticality (score)		
Critical - cannot be deferred (3)	Very Important - cannot be deferred (2)	Can be deferred (1)

Appendix C: List of Projects

The following table shows projects anticipated to be undertaken for this budget cycle:

Project	Description	Project Driver / Objective
Anaerobic Digestion Facility (ADF) Wet Scrubber / Biofilter Plenum Reconfiguration	Upgrade the wet scrubber/biofilters in order to adequately remove ammonia. Examine the legacy ECF infrastructure for ADF suitability.	Meet regulatory requirements
ADF COCCUS/T6 connection	Adding piping infrastructure to connect ADF coccus to T6 to allow for efficient percolate draining.	Process / Operational Improvements: Operational cost savings
ADF Control Room Upgrades	Upgrades to control room HVAC and interior finish.	Safety and environmental enhancement
ADF Fermenter instrumentation and sample ports	Adding flow meters to each fermenter for biogas monitoring.	Process / Operational Improvements
ADF H_2S Scrubber	Addition of H_2S scrubbers required for CHP operation.	Strategic / Corporate goal
ADF Miscellaneous Platforms	Install permanent access platform(s) for more efficient operations and maintenance activities and generate as-built drawings.	Process / Operational Improvements
ADF Percolate System Upgrades	Twinning the piping and/or lift station to enhance percolate system reliability.	Business need / Growth
ADF Probe Insertion Aid	Design and construct a mechanical aid to assist lifting and inserting probe.	Safety and environmental enhancement
ADF Pump House Ventilation	Improvements to pump house ventilation to reduce heat.	Safety and environmental enhancement
ADF Shutdown Rehab	Capital upgrades to be executed during the planned ADF shutdown.	Process / Operational Improvements
ADF to Materials Recovery Facility (MRF) Electrical Connection	Electrically connect the CHPs to the MRF to supply power.	Strategic / Corporate Goal
Advanced Energy Research Facility (AERF) - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Collections - Digitization of trucks	Tablets for collection vehicles operational needs (i.e. inspections, timesheets, vehicle defect forms, etc)	Process / Operational Improvements
Collections - Posse for workflow	Transitioning notification orders from paper to electronic entry using Posse.	Business need / Growth

Coronation Eco Station - 22-81-2055 - Concept planning	Concept planning for Coronation Eco Station expansion	Business need / Growth
Coronation Eco Station - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Coronation Eco station - Groundwater Wells	Installation of nine groundwater wells for environmental monitoring.	Meet regulatory requirements
Cure Site - Tarp Winders Replacement	Replacing the tarp winders at the Gore Site due to end-of-life.	Process / Operational Improvements
Cure Site Concrete Rehab	Rehabilitation of concrete as indicated in condition assessment.	Process / Operational Improvements: Infrastructure improvement
Eco Station Storage Garage - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
EWMC - Groundwater Wells	Abandonment and installation of groundwater monitoring wells at EWMC	Meet regulatory requirements
EWMC - Geoware Upgrades	Upgrade and enhance weigh scale data collection program	Process/Operational Improvement: System requirement
EWMC - SCADA Servers Replacement	SCADA server upgrades due to the age of the equipment. This will improve relative performance, consolidation, management efficiency and reliability	Process / Operational Improvements
Integrated Process and Transfer Facility (IPTF) - Electrical instrumentation and control upgrades	Electrical instrumentation and control upgrades due to age of equipment.	Process / Operational Improvements
IPTF - HVAC Renewal	Upgrades and/or replacement of HVAC units due to inefficient operation.	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
IPTF - Pre-processing Vacuum Engineering and Piping	Design and delivery of a vacuum system for the pre-processing area.	Process / Operational Improvements
IPTF Grizzly Replacements	Replacement of two Grizzly units due to end of life.	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
IPTF Lifting Devices over Trommel Trunnions	Design and deliver permanent devices over IPTF trommels for future maintenance and replacement needs.	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Kennedale East / West locker room expansion	Locker room expansion to accommodate space requirements	Business Need / Growth
Kennedale Eco Station -	Installation of nine groundwater wells for	Meet regulatory requirements

Groundwater Wells	environmental monitoring.	
Kennedale Waste Admin - Roof Replacement	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Kennedale Waste Operations - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Kennedale Waste Transfer Station - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
MRF Infrastructure Rehab	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
North Saskatchewan River erosion control	North Saskatchewan River bank stabilization to prevent erosion adjacent to the Clover Bar Landfill.	Safety/Environmental Enhancement
Clover bar landfill - Cutoff wall	Slurry wall project to block leachate seepage from the Clover Bar landfill into the North Saskatchewan River	Environmental Enhancement
Operations Building - Renewals	Facility rehabilitation/renewal projects identified from building condition assessment reports	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
Organics - Addition of Geoware to Conveyor Scale	Add Geoware connection to the conveyor scale to provide automation	Process / Operational Improvements
Organics Tip Floor Drainage Enhancement	Upgrades to the tip floor drainage to accommodate the SSO burden.	Process / Operational Improvements
Organics Tip Floor Source Capture (Dust)	Design and construct a dust collection system.	Process / Operational Improvements
Organics - IPTF to ADF Conveyor Extension	Conveyor system extension to reduce double handling of material with loaders.	Process / Operational Improvements
Organics/ADF - Electrical instrumentation and control upgrades	Electrical instrumentation and control upgrades.	Process / Operational Improvements
Refuse Derived Fuel (RDF) - 25 KV switchgear replacement	Decommission of the 25 KV switchgear and replace with EPCOR transformer to increase reliability	Process / Operational Improvements
RDF - 2nd Floor Awning	Install an awning over the 2nd floor that leads from the main RDF building to the load out building.	Safety/Environmental Enhancement
RDF - Electrical instrumentation and control upgrades	Electrical instrumentation and control upgrades due to age of equipment.	Process / Operational Improvements

RDF - MCC Room Positive Pressure	Design and installation of a system to create a positive pressure environment in the MCC room.	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
RDF - Dryer Distribution Screws Maintenance Access	Structural modifications to perform maintenance on dryer distribution screws.	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
RDF - Spare motor for Pre-shredder	Purchase of spare motor for pre-shredder (critical spare part)	Asset Renewal/Upgrade: Extend the asset's service life, reduce energy cost and GHG emissions
RDF Boiler Improvement	Improvements to the RDF boiler for emission reduction.	Safety / Environmental Enhancement
RDF Dust Collection Improvements	Phase 2 improvements to increase effectiveness of dust collection, as recommended by specialists.	Process / Operational Improvements
RDF Fire Protection Regulatory Upgrades	Upgrades required in accordance with fire safety standards.	Safety / Environmental Enhancement
RDF Vacuum	Design and delivery of a vacuum system for the RDF area.	Process / Operational Improvements

Projects will be reviewed and validated through bi-annual re-prioritization exercises for possible adjustments according to Branch priority.

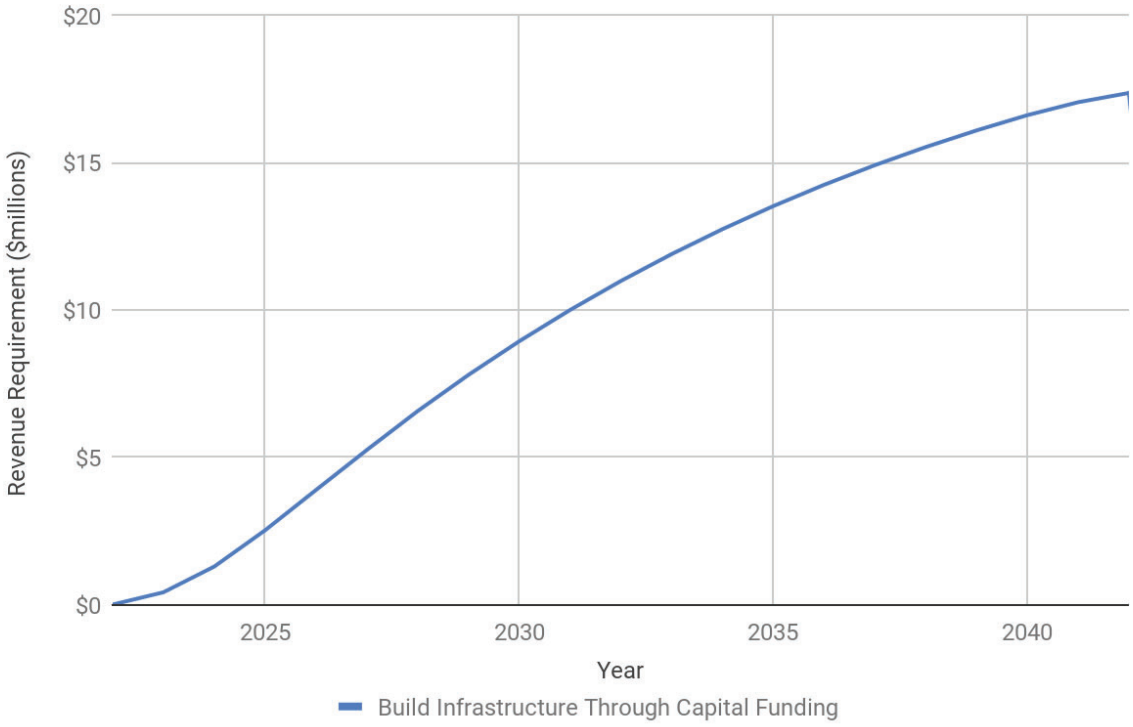
Appendix D: Financial Analysis Summary[12]

Project Title:Waste Services Infrastructure, Facilities, and Process Equipment	Build Infrastructure Through Capital Funding
Total Capital Cost	($19,408,662)
Total Revenues	$0
Total Operating and Maintenance Costs	($4,378,143)
Total Lease Costs	$0
Project Net Inflows (Outflows)	($23,786,805)
WACC Discount Rate	6.28%
Project Cost (Present Value)	($18,038,879)

The following table and graph demonstrate the cumulative present value of the revenues that must be realized through annual rate collection to support the project costs. This includes operating and maintenance costs, interest and amortization expenses over the project lifecycle.

[12]Waste Services Infrastructure,Facilities and Process Improvement Financial Analysis

Infrastructure, Facilities, and Process Equipment
Cumulative Present Value of Revenue Requirement



Year	Calendar Year	Build Infrastructure Through Capital Funding
0	2022	$0
1	2023	$417,577
2	2024	$1,289,656
3	2025	$2,520,451
4	2026	$3,885,860
5	2027	$5,243,449
6	2028	$6,563,761
7	2029	$7,792,403
8	2030	$8,934,828
9	2031	$9,996,169
10	2032	$10,981,262
11	2033	$11,894,655
12	2034	$12,740,632
13	2035	$13,523,228
14	2036	$14,246,239
15	2037	$14,913,239

16	2038	$15,527,594
17	2039	$16,092,473
18	2040	$16,610,859
19	2041	$17,050,354
20	2042	$17,365,448
21	2043	$0
22	2044	$0
23	2045	$0
24	2046	$0
25	2047	$0

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Waste Services IIS Infrastructure Planning and Design Composite - Capital Funding Request

City Operations | Waste Services

City of Edmonton

Capital Profile: CPP# CM-81-0005

Project Number: CP# / OP# Various

Profile Owner: Krista Berezowski

Profile Sponsor: Denis Jubinville

Version #: 2.0

Date published: August 31, 2022

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Change History

Version #	Date	Author	Description
1.0	08/05/22	Lena Aitken	First draft of the Capital Funding Request
2.0	08/17/22	Lena Aitken	Second draft of the Capital Funding Request

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
2.0	Lena Aitken	Senior Project Engineer	August 17, 2022

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.0	**Keith Knoblauch** Operational Controller, Business Financial Analytics	Keith Knoblauch	Sep 10, 2022
2.0	**Jodi Goebel** Director, Business Integration	Jodi Goebel	Sept 11, 2022
2.0	**Neil Kjelland** Director, Sustainable Waste Processing	Neil Kjelland	Aug 22, 2022
2.0	**Chris Fowler** Director, Collections Services	Chris Fowler	9/12/22
2.0	**Crystal Wood** Communications Advisor	Crystal Wood	Aug 19, 2022
2.0	**Shannon Fitzsimmons** Director of Facility Planning		2022-09-14

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
3.0	**Krista Berezowski** Director, Technical Services		Sept 12, 2022
3.0	**Denis Jubinville** Branch Manager, Waste Services		Sept 15, 2022

Indigenous Acknowledgement

Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

1. Executive Summary

1.1. Waste Services IIS Infrastructure Planning and Design Composite Renewal

Composite profile CM-81-0005 supports the preliminary planning and design work completed by the Integrated Infrastructure Services (IIS) Infrastructure Planning and Design Branch for Waste Services capital projects. The Waste Services capital projects within this profile are aligned with the projects in composite profile CM-81-2045 (Waste Services IIS Infrastructure Delivery).

The approach followed for the preliminary planning and design work is consistent with Administration's implementation of the Project Development & Delivery Model (PDDM) as well as the Capital Project Governance Policy C591[1] approved by the Council in April 2017. The outcome of this profile is to provide Council with better information regarding the scope, schedule and budget of the proposed capital projects prior to full funding of the project.

Adherence to both the PDDM process as well as Policy C591 will ensure sufficient information is prepared in advance of the Capital budget process to support informed investment decisions, provide adequate resources for planning and design to ensure appropriate level of planning and design is incorporated into budget submissions for the Utility Rate Filing and provide an overall framework to guide the management of Waste Services' capital projects.

This Capital Funding Request establishes funding prioritization for Waste Services projects anticipated to enter the project planning stage, checkpoints 1, 2 and 3 (as described below), of the PDDM. This gated approach for capital projects is to ensure that projects are properly developed before they are funded for delivery.

While approval of this profile is necessary to determine the Waste Services capital budget and utility rates, approval of this profile does not indicate final budget or funding approval for any specific capital project.

The four year capital projection for this profile is approximately $2.73 million. A high-level list of projects is listed in Appendix B.

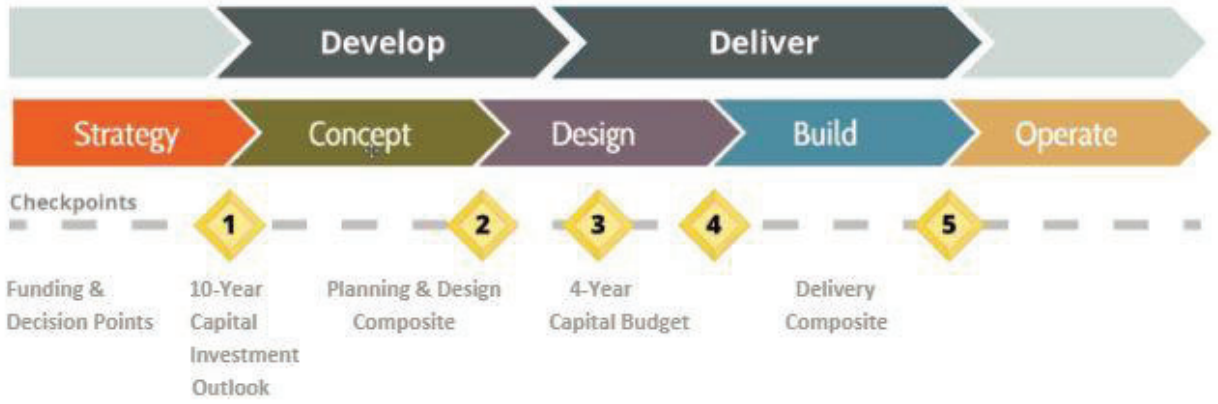
2. Background

In 2016, the IIS Transformation program developed the PDDM which was endorsed by Council in 2017. The PDDM is a framework to manage capital infrastructure projects and represents best practices in project management from industry and comparable municipalities. It aims to achieve the following outcomes[2]:

(1) Better information to make capital investment decisions.
(2) Improved project schedule and budget estimates through increased level of design to ensure realistic expectations are set prior to project tendering and construction.
(3) Systematic evaluation of projects against the initial project business case and scope.

[1] https://www.edmonton.ca/documents/PoliciesDirectives/C591.pdf
[2] Integrated Infrastructure Services report CR_4120

The PDDM flow chart is as below:



IIS delivers Waste Services capital projects using the PDDM process.

2.1. Problem / Opportunity

The current Council-directed approach will assist Waste Services in the management of capital projects in alignment with the PDDM process. The PDDM process offers a gated system where the budget for comprehensive planning and design can be released in advance and once complete, decisions can be made regarding investments pertaining to the delivery of the projects rather than releasing the project budget as a whole upfront. Without the additional details from a comprehensive planning and design process, the project estimates contained high-value contingencies and the accuracy of the schedule and budget estimates varied significantly. Following the PDDM process will mitigate this risk and improve project and budget management practices for Waste Services.

Projects included in this composite profile will address a number of Waste Services business needs such as the renewal of assets that have reached the end of their useful life, mitigation and elimination of safety and environmental risks and the need and opportunity for growth and continuous improvement.

2.2. Current Situation

Waste Services started using the PDDM model under the direction of Council in 2017. Under this, funding for the project design and planning will be released to IIS prior to the delivery of the project to ensure on-time and on-budget completion of the capital projects for Waste Services. Waste Services will continue to follow this process in the future.

3. Initiative Description

3.1. Initiative Description

This capital profile supports preliminary planning and design work on Waste Services infrastructure capital projects prior to budget approval. This approach is consistent with

Administration's implementation of the PDDM as well as the Capital Governance Policy approved by Council in 2017. Separate funding for the construction and delivery component of the projects (after Checkpoint 3) is under the Waste Services IIS Infrastructure Delivery composite CM-81-2045.

Funding in the profile will be used to support preliminary planning and design work for Waste Services capital initiatives planned for delivery between 2023 and 2026. These projects include, but are not limited to:

- Waste Water Discharge Expansion
- North Saskatchewan River (NSR) Erosion Control
- Cure Site Pad B, C and G Resurfacing
- Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrades
- EWMC Site Paving
- Organics Transformer yard grading/drainage
- Organics Tip Floor Cupola
- Organics Staff Facilities Upgrades
- Organics Tip Floor Source Capture
- Organics Tip Floor Drainage Enhancement
- Integrated Process and Transfer Facility (IPTF) - Additional Metal Removal System
- Residential Transfer Station (RTS) Pad and Buildings Upgrades
- Compost School Refresh
- Kennedale Entrance Gates

For further details, please refer to project descriptions in Appendix B.

A list of required projects was submitted by the operational areas to Technical Services, indicating the project scope, schedule, risks and estimates. These were evaluated, ranked and prioritized based on the strategic and operational criteria (i.e. Project Driver and the Project Criticality) set by Technical Services. Appendix A - Waste Services Internal Project Planning and Prioritization Process outlines the prioritization process.

3.2. Urgency of Need

To adhere with the PDDM approach, preliminary planning and design should be completed on projects prior to the project's budget being approved in its entirety. This composite profile funds this work for Waste Services, ensuring Administration can provide Utility Committee with better information regarding the scope, schedule and budget prior to approving and funding the entire project.

3.3. Anticipated Outcomes

In alignment with the PDDM approach, Waste Services will achieve the Utility’s goals through working with IIS to effectively manage the planning and design of capital projects. Waste Services envisions the following outcomes:

Outcomes / Deliverables
Better information to make capital investment decisions: Through a structured and integrated process, administration will ensure that projects identified as priorities by Waste Services receive robust evaluation of alternatives and scope identification. Through the PDDM process, project maturity is regularly assessed to ensure that projects are ready to advance to the next stage of development.
Improved project schedule and budget estimates based on enhanced design details: Early investment of capital design resources allows sufficient lead time allocated on planning of the projects, thus decreasing the possibility of project scope and budget changes. Completing design work early in a project life cycle allows the greatest ability to impact overall project outcomes.
Reliable facilities and infrastructure that enable sustainable waste management in a cost-effective manner.
High levels of customer service delivered in both an efficient and effective way through leading-edge waste processing facilities that use current and emergent technology to enable high rates of diversion of waste from landfill.
Facilities that can be operated in a safe manner, protecting employees, customers and contractors.

3.4. Scope

The scope of this Capital Funding Request includes the concept and schematic design of the PDDM approach which includes Checkpoint 1 (Project initiation), Checkpoint 2 (Authorization for Design Expenditure) and Checkpoint 3 (Approval for Capital Expenditure) documentation and review for all Capital projects being managed by IIS on behalf of Waste Services.

Checkpoint 1: Projects are reviewed for readiness to begin the design process and approve funding for concept planning. This stage includes assessment of the project for maturity, appropriate definition of scope and priority.[3]

Checkpoint 2: This checkpoint is to establish readiness of the project to complete the Concept Phase and begin to develop the project to an appropriate level of maturity to request capital funding. Once concept planning is complete, the project will be evaluated for priority to receive additional design funding for Development Design. Project must be at an appropriate maturity level and the scope must be confirmed.[4]

Checkpoint 3: This checkpoint is to verify the project has reached an appropriate level of maturity to request capital funding. Projects will be taken to a level of design that will yield more reliable estimates before being put forward for prioritization and inclusion in the Capital Budget.

[3] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-1
[4] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-2

This is often to a Class 3 (- 15% to +20%) during Design Development. The project must be developed enough to move forward and the scope must be reviewed[5]

During Checkpoint 3, the project budget has been approved (led by the IIS Planning and Design Project Manager) and the transfer from the Planning and Design Branch to Delivery Branch occurs.

3.5. Out of Scope

The project delivery phase of the PDDM is out of the scope for this Capital Funding Request. This typically includes Checkpoint 4 (Authorization for Construction expenditure) and Checkpoint 5 (Authorization for closeout) of the PDDM as these seek approval in a separate Capital Funding Request (CM-81-2045, Waste Services IIS Infrastructure Delivery).

3.6. Critical Success Factors

Critical success factors include:

- Efficient, consistent and accurate communication between Waste Services and IIS.
- Regular check-ins with the Waste Services Leadership Team to align with the strategic direction and the Utility's goals.
- Accurate and sufficient data and cost analyses to support high level budget estimates and informed decision making for the projects.
- On time, on budget delivery of capital projects within the PDDM.

4. Strategic Alignment

This initiative contributes to the overall City of Edmonton strategic direction and to corporate and departmental business plans, including Connect Edmonton: Vision 2050. This contribution is made by demonstrating leadership in waste management and processing standards, and by increasing the diversion of residential and non-residential waste from landfill. Below are strategies, business plans and policies that support this project:

[5] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-3

City of Edmonton Environmental Policy C512	**POLICY STATEMENT:** The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services, based on its commitment to: (a) prevent pollution (b) continually improve its environmental performance by setting and reviewing environmental objectives and targets (c) meet or exceed applicable environmental legal requirements and other requirements to which it subscribes
Connect Edmonton: Vision 2050	This project aligns with the City's Vision 2050 strategic plan in that by ensuring that organic/food waste is collected, processed responsibly, and the amount landfilled is minimized, Edmonton will be a healthy city, urban places will be clean, regional prosperity is increased by building a circular economy, and a low-carbon future is assured.
Waste Services Business Plan 2022-2025	The Business Plan outlines how Waste Services will continue to make transformational impacts through the 25-year Waste Strategy, provide essential service to Edmontonians while maintaining full cost recovery, and improve the employee and resident experience to support adaptation of new systems.
25-Year Waste Strategy	"The strategy adopts a broader lens to transform the system with new focus on efforts which will emphasize waste reduction in addition to affirming a commitment to 90% diversion of single-unit residential waste from landfill."
Waste Services Utility Fiscal Policy C558B	"Customer rates will promote the efficient use of resources and be set to achieve broader social, economic, and environmental goals."

Integrated Infrastructure Services (IIS) Vision and Mission Statements	"We inspire trust among citizens and Council in our commitment and ability to deliver quality infrastructure." We are in the business of: ● bringing ideas to reality ● innovation and excellence ● assembling expertise ● building legacy infrastructure ● helping citizens have a better life in Edmonton ● Building a Great City

5. Context Analysis

Requested funding for project planning and design work for capital projects is consistent with Administration's implementation of the PDDM as well as the Capital Governance Policy approved by Council in 2017.

6. Organizational Change Impact

Waste Services staff, reporting through the Technical Services section, work closely with IIS to plan and design capital projects. This Capital Funding Request represents the continuation of current business practice, so no additional organizational change impact is expected.

6.1. Stakeholder Impact

Stakeholder Impact
Stakeholder 1: City of Edmonton Waste Services Branch (primary internal)
1. Well-defined and consistent process in alignment with rest of the City 2. Enhanced consultation, recommendation and approval for Planning and Design checkpoints for Waste Services Projects managed by IIS as part of a project team
Stakeholder 2: Integrated Infrastructure Services *(primary internal)*
1. Enhanced Project Management for approved capital projects using input from Waste Services 2. Improved process for capital funding for projects in the composite profile for Waste Services
Stakeholder 3: City Council *(primary internal)*
1. Increased transparency, accuracy, reliability of project schedule and budget estimates

2. Ability to provide political direction and have access to accurate project information
Stakeholder 4: City of Edmonton public (secondary external)
1. Maintenance of stable/low utility rate through the effective delivery of capital projects 2. Minimal disruption to service levels through the delivery process

6.2. Business and Operational Impact

The table below identifies the business and operational impacts for continuing to follow the PDDM model as recommended by Waste Services.

Business & Operational Impact & Description
Waste Services *(primary internal)*
● More planning required from Waste Services-allocated resources to support completing Checkpoint 1 requirements and supporting Checkpoint 2 and Checkpoint 3 documents preparation
Integrated Infrastructure Services - Infrastructure Planning & Design *(primary internal)*
● More planning required from the allocated resources to support Checkpoint 1 transition and complete the conceptual and schematic design, as well as Checkpoint 2 and Checkpoint 3 documents preparation

Moving forward, the City of Edmonton is committed to the use of Gender-Based Analysis Plus (GBA+). Waste Services will identify root causes on any issues that may arise, use an evaluation approach, consider the inputs from affected stakeholders (e.g. people with disabilities, indigenous people, seniors, etc.), and develop and implement an action plan for safety, diversity and inclusivity issues using GBA+. Waste Services acknowledges that GBA+ is an equity assessment tool that allows for holistic consideration of the need for use, and impact of, this Capital Funding Request and that staff are trained in the GBA+ process.

7. Benefits / Costs

7.1. Tangible Benefits

The following tangible benefits are expected to be realized by following this approach:

- Improved operational efficiency of facilities, infrastructure and process equipment.
- Reduction in safety-related incidents.
- Long term savings due to process and operational improvements.
- Meet or exceed environment compliance requirements.

7.2. Intangible Benefits

The following intangible benefits will be realized by following the new approach:

- Improved efficiency in project management.
- Increased adherence to budget and schedule estimates.
- Improved ability to forecast capital expenditure thus allowing for more certainty in utility rates for the budget cycle.
- Structured process to evaluate readiness, scope and prioritization.
- Increased project accountability, awareness and controls.
- Closer integration of City departments.
- Better opportunities to make major changes in project scope if problems are identified during the early planning and design phases.
- Closer integration of City departments.

7.3. Costs

REQUEST	2023	2024	2025	2026	TOTAL PROFILE BUDGET
Capital Budget Request	$1,074,675	$890,419	$187,630	$120,710	**$2,273,434**

The list of projects under this profile for 2023-2026 budget cycle is attached in Appendix B.

Please refer to Appendix C for the Financial Analysis Summary. However, please note the table and graph demonstrating the revenue requirement related to these capital costs are included in the Waste Services IIS Infrastructure Delivery Capital Funding Request under Appendix C. This graph **includes both** Planning and Design and Project Delivery to show the full impact of the projects.

7.4. Assumptions

- Projects in this composite profile have allocated budget amounts that are based on high-level estimates. The actual costs of the approved capital projects in this composite profile may vary once the preliminary planning stage is completed by IIS.

- All of the proposed projects in this composite profile have been prioritized based on the approval of Waste Services' proposed program changes that are pending decisions of Utility Committee and Council.

8. Resourcing

Early investment in design by IIS will require reallocation of capital funding to planning and design efforts prior to project-specific approval from Waste Services. There is no expected additional resourcing impact on Waste Services FTE.

9. Key Risk(s) and Mitigation Strategy

RISK(S)	IMPACT	MITIGATION STRATEGY
Extended project planning time required due to additional inter-departmental coordination	Medium	• Clarify and implement mutual expectations between IIS and Waste Services • Work with IIS to fast track projects requiring Alberta Environment and Parks approval to meet the regulatory timelines
Project scope may change and a revised preliminary planning and design plan is required to ensure project deliverables are met	Medium	• Rework the scope and design to fit the intended outcome • Enhanced project communication between IIS and Waste Services • Increased collaboration and shared decision making between IIS and Waste Services.
Scope is not fully developed during Strategy phase and requirements are not fully developed for Planning & Design or Delivery phases	Medium	• Scope is revisited during Planning & Design phase to ensure that all requirements are understood and documented. Requirements that are missed in Planning & Design phase would likely have a severe or higher impact during delivery
Projects may not get approved after spending resources on concept planning and design	Low	• Re-work the scope and designs to fit Councils expectations or cancel the project based on Council's decision
Projects may not proceed or may be delayed due to other Branch priorities	Low	• Keep project team updated on branch priorities • Constantly checking the branch strategy and project alignment with the Branch goals • Change of project schedule and

		deliverables
Projects may be canceled if the project planning and design does not meet the intended outcome	Low	• Rework the scope and design to fit the intended outcome • Enhanced project communication between IIS and Waste Services • Increased collaboration and shared decision-making between IIS and Waste Services

10. Conclusion and Recommendations

10.1. Conclusion

This Capital Funding Request evaluated the overall capital budget for preliminary planning and design work completed by IIS Infrastructure Planning and Design Branch for Waste Services for the budget period 2023-2026. Funds are required for planning and design to adhere to the PDDM, improve project schedule adherence, and improve budget estimates through an increased level of design. The four-year capital projection for this profile is approximately $2.73 million.

10.2. Recommendations

Waste Services recommends continuing to follow the PDDM and approve funds for the project planning and design phase for all capital projects managed by IIS. This will lead to better information to make capital investment decisions, and improved project schedule and budget estimates before full budget approval is received.

10.3. Project Responsibility and Accountability

The Project Sponsor and budget owner for all approved capital projects in this composite profile is the Branch Manager of Waste Services. The overall capital program is managed by the Director of Technical Services. Individual projects are led by Project Managers that report to the General Supervisors of Technical Services.

11. Implementation Approach

IIS will complete the planning and design phase for the respective projects listed in Appendix B for Waste Services. The respective project managers from Waste Services and IIS will be responsible for accurate spending of these funds and timely completion of the projects. The estimated completion of the planning and design phase for the projects for the 2023-2026 budget cycle is four years. This profile also requests funding for projects that will be delivered in the 2027-2030 budget cycle. The planning and design for all the listed projects will be completed by 2026.

12. Review and Approval Process

The following review and approval process was followed for this Capital Funding Request:

Review Step	Reviewer
Review 1	Team Lead of Technical Services, General Supervisor of Business Integration Integration, General Supervisor of CS, General Supervisors of SWPS, General Supervisors of Technical Services, Program Manager of IIS P&D, General Supervisor of IIS P&D, General Supervisor of IIS OSPD, and Senior Accountant of Financial Services.
Review 2	Director of Finance, Director of Business Integration, Director of Technical Services (Final Approver), Director of SWPS, Director of CS, Director of IIS P&D, and Senior Communications Advisor.
Review 3	Branch Manager Waste Services (Final Approver)
Review 4	Utility Advisor
Review 5	Utility Committee report presented

13. Appendices

Appendix A: Waste Services Internal Project Planning and Prioritization Process

Appendix B: Waste Services (IIS Managed) Planning & Design Project Descriptions - 2023-2026

Appendix C: Financial Analysis Summary - Waste Services (IIS Managed) Planning & Design composite profile

Appendix A: Waste Services Internal Project Planning and Prioritization Process

The following outlines the Project Prioritization process:

1. Capital project needs are identified from all sections of the Utility and listed on the 2023-26 Waste Services Capital Planning Sheet.
2. Each project is scored based on the Project Driver and the Project Criticality. See tables 1 and 2 below for details. Total project score for each project is calculated by multiplying the driver and criticality scores.
3. Projects are then prioritized based on the total scores.
4. Projects are recommended based on prioritization with budget estimates.
5. Waste Services Leadership Team (WSLT) reviews and approves the final list.
6. Planning, documentation, and approval process for each individual project follows the approved Waste Services Project Management Framework.
7. Re-prioritization exercises occur on a bi-annual basis for possible adjustments according to Branch priority.

Table 1: Project Driver

Project Driver (score)						
Regulatory / Compliance (5)	Safety / Environmental Enhancement (5)	Asset Renewal/Upgrade (4)	Business Need / Growth (3)	Strategic / Corporate Goal (3)	Process / Operational Improvement (3)	Other (3)

Table 2: Project Criticality

Project Criticality (score)		
Critical - cannot be deferred (3)	Very Important - cannot be deferred (2)	Can be deferred (1)

Appendix B: Waste Services (IIS Managed) Delivery Project Descriptions - 2023-2026

The following table shows projects anticipated to be undertaken for this budget cycle:

Project	Description	Project Driver / Objective
Waste Water Discharge Expansion	Design and construction of a pump station and associated gathering infrastructure to connect the EWMC groundwater diversion system and sanitary infrastructure to the EPCOR wastewater treatment plant.	Regulatory/Compliance
North Saskatchewan River (NSR) Erosion Control	Design and construction of North Saskatchewan River bank stabilization to reduce erosion and slope stability issues adjacent to the Clover Bar Landfill.	Safety/Environmental Enhancement
Cure Site Pad B, C and G Resurfacing	The project supports the renewal of the existing cure site. The current site is approaching the end of its life cycle and major capital renewal work needs to be done with regard to the site liner and site drainage.	Asset Renewal/Upgrade
EWMC Water Distribution System Upgrades	Implementation of recommended water distribution upgrades to meet fire flow and operational requirements at the EWMC.	Safety/Environmental Enhancement
EWMC Site Paving	Project supports new paving requirements throughout the EWMC.	Asset Renewal/Upgrade
Organics Transformer yard grading	Project supports civil design and construction to allow for adequate drainage in an area with high voltage electrical equipment.	Safety/Environmental Enhancement
Organics Tip Floor Cupola	Project supports modification to the Organics tip floor building allowing for proper and safe removal of the trommel screen from its drum without removing the entire trommel from its location in the process.	Asset Renewal/Upgrade
Organics Staff Facilities Upgrades	Needs analysis for ADF/Organics office, locker room and control room space, and staff walkways. Project delivery to be included.	Asset Renewal/Upgrade: Improving the staff facilities for the ADF.

Organics Tip Floor Source Capture	Needs analysis and implementation of dust collection in order to meet environmental requirements.	Safety/Environmental Enhancement
Organics Tip Floor Drainage Enhancement	Project supports needs analysis and modification to the OrganicsTip Floor to allow for adequate drainage.	Business Need/Growth
IPTF - Additional metal removal system	Project will deal with the analysis of current metal removal and improvement options	Process/Ops Improvement
RTS pad and buildings upgrade	Project supports the upgrade and replacement of aging RTS buildings	Asset Renewal/Upgrade
Compost School Refresh	Develop and implement a master plan for scaled improvements to Compost School, located beside the John Janzen Nature Centre (7000 143 St NW).	Strategic / Corporate Goal
Kennedale Entrance Gates	Replacement of manual gates with automated gates to provide adequate security at the Kennedale Waste Collections Site.	Safety/Environmental Enhancement

Appendix C: Costs - Financial Analysis Summary (Waste Services Planning and Design Composite Profile)[6]:

Project Title: IIS Planning & Design	Planning & Design
Total Capital Cost	($2,273,434)
Total Revenues	$0
Total Operating and Maintenance Costs	$0
Total Lease Costs	$0
Project Net Inflows (Outflows)	($2,273,434)
WACC Discount Rate	6.28%
Project Cost (Present Value)	($1,929,345)

Notes: Planning and Design costs have been added to the Waste Services IIS PDDM Delivery Capital Funding Request costs for revenue requirement calculation purposes in order to demonstrate the full project spending. **Please refer to Appendix C of the Waste Services IIS PDDM Delivery Capital Funding Request for the resulting analysis.**

Capital projects within this profile are presented at a concept level and as such, associated operating and maintenance costs are not identified at this time. These costs for each project will be considered and included in the individual business cases at Checkpoint 3.

[6] IIS Planning & Design Profile - Business Case 2023-26 - Fin Analysis v05.31.22

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Waste Services IIS Infrastructure Delivery Composite Capital Funding Request

City Operations | Waste Services

City of Edmonton

Capital Profile: CPP# CM-81-2045

Project Number: CP# / OP# Various

Profile Owner: Krista Berezowski

Profile Sponsor: Denis Jubinville

Version #: 2.0

Date published: August 31, 2022

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TABLE OF CONTENTS

Change History

Version #	Date	Author	Description
1.0	08/05/2022	Lena Aitken	First draft
2.0	08/17/2022	Lena Aitken	Second draft

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
2.0	Lena Aitken	Senior Project Engineer	August 17, 2022

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.0	**Keith Knoblauch** Operational Controller, Business Financial Analytics	Keith Knoblauch	Sep 09, 2022
2.0	**Jodi Goebel** Director, Business Integration	Jodi Goebel	Sept 11, 2022
2.0	**Neil Kjelland** Director, Sustainable Waste Processing	Neil Kjelland	Aug 22, 2022
2.0	**Chris Fowler** Director, Collections Services	Chris Fowler	9/14/22
2.0	**Crystal Wood** Communications Advisor	Crystal Wood	Aug 19, 2022
2.0	**Jesse Banford** Director of Facility Delivery	Jesse Banford	September 9, 2022
2.0	**Sam ElMohtar** Director of Transportation Delivery	S. El Mohtar	September 13, 2022
2.0	**Nicole Wolfe** Director of Open Space Delivery		September 14, 2022

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
2.0	**Krista Berezowski** Director, Technical Services		Sept 12, 2022
2.0	**Denis Jubinville** Branch Manager, Waste Services		September 15, 2022

Indigenous Acknowledgement

Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

1. Executive Summary

1.1. Waste Services IIS Infrastructure Delivery Composite Renewal

Composite profile CM-81-2045 provides funding for Waste Services capital projects intended to be delivered by Integrated Infrastructure Services (IIS) - Infrastructure Delivery Branch in the 2023-2026 capital budget cycle. The projects within this profile are aligned with the projects in composite profile CM-81-0005 (Waste Services IIS Infrastructure Planning and Design). The approach is consistent with the Administration's implementation of the Project Development & Delivery Model (PDDM) as well as the Capital Project Governance Policy C591[1] approved by Council in April 2017.

Adherence to both the PDDM process and Policy C591 will ensure sufficient information is prepared in advance of the capital budget process to support informed investment decisions, provide adequate resources to ensure an appropriate level of planning and design is incorporated into budget submissions, and provide an overall framework to guide management of Waste Services' capital projects.

The outcome of this profile is to provide funding for the project delivery stage, checkpoints 3, 4 and 5 (as described below), of the PDDM. The checkpoint system provides strategic controls on budget and schedule. The PDDM is a gated process (using checkpoints) for capital projects to ensure that projects are properly developed before they are funded for delivery.

While approval of this profile is necessary to determine the Waste Services capital budget and utility rates, approval of this profile does not indicate final budget or funding approval for any specific capital project.

This Capital Funding Request provides information at a design development level that pertains to the budget for projects anticipated to be delivered during the 2023-2026 budget cycle. Details of the individual projects listed in this profile, including budget and scheduling, will be further communicated once the project has reached checkpoint 3 and a detailed business case has been developed for approval from Utility Committee and Council.

The four-year capital projection for this profile is approximately $20.5 million. A high-level list of projects is listed in Appendix B.

2. Background

In 2016, the IIS Transformation program developed the PDDM which was endorsed by Council in 2017. The PDDM is a framework to manage capital infrastructure projects and represents best practices in project management from industry and comparable municipalities. It aims to achieve the following outcomes[2]:

(1) Better information to make capital investment decisions.
(2) Improved project schedule and budget estimates through increased level of design to ensure realistic expectations are set prior to project tendering and construction.
(3) Systematic evaluation of projects against the initial project business case and scope.

[1] https://www.edmonton.ca/documents/PoliciesDirectives/C591.pdf
[2] Integrated Infrastructure Services Report CR_4120

The PDDM flow chart is as below:

2.1. Problem / Opportunity

The current council-directed approach directs IIS to assist Waste Services in the management of capital projects in alignment with the PDDM process.

Projects included in this composite profile will address a number of Waste Services business needs such as the renewal of assets that have reached the end of their useful life, mitigation and elimination of safety and environmental risks and the need and opportunity for growth and continuous improvement.

2.2. Current Situation

Waste Services began utilizing the PDDM under the direction of Council in 2017. Under this model, funding for project delivery is budgeted in a composite profile consisting of concept estimates for projects expected to be undertaken in the capital budget cycle.

While IIS will manage the projects, Waste Services will provide subject-matter expertise as part of a project team to inform work at all checkpoints throughout the PDDM process. Waste Services will continue to follow this approach in the future.

3. Initiative Description

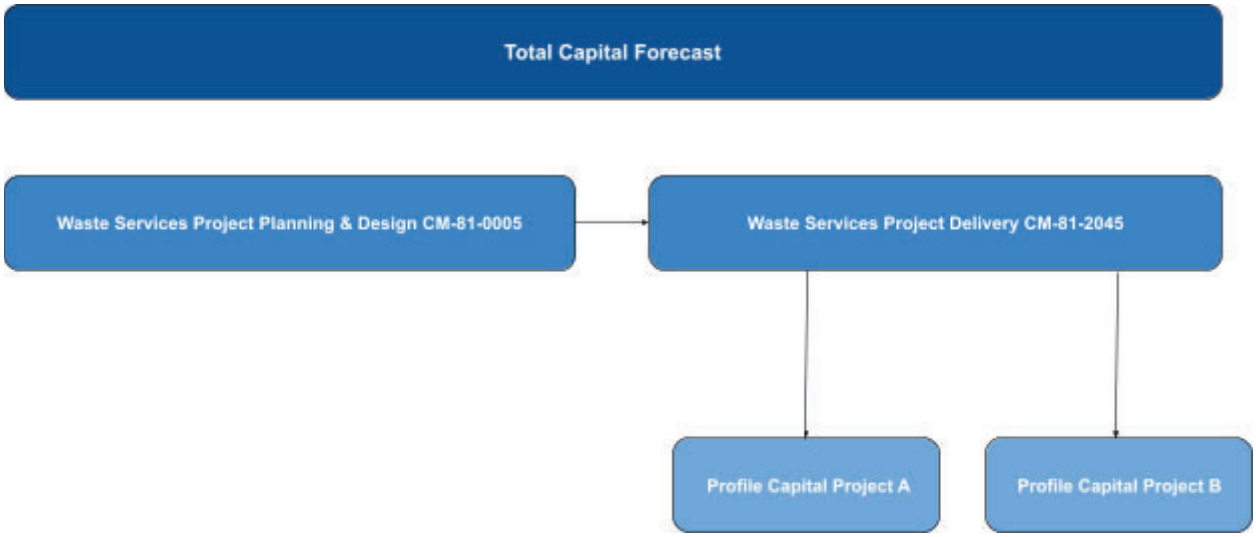
3.1. Initiative Description

This capital profile establishes the 2023-2026 budget for Waste Services capital projects anticipated to reach the third checkpoint in the PDDM. Separate funding for the planning and design component of the projects is under the Waste Services IIS Infrastructure Delivery composite CM-81-0005.

In accordance with Corporate thresholds, renewal projects over $5 million and growth projects over $2 million will be transferred to standalone profiles. Once a capital project exceeding these thresholds reaches Checkpoint 3, a detailed project-specific business case will be developed and brought to Utility Committee and Council for approval of the capital expenditure. This approval will result in a capital budget adjustment that transfers budget from this composite profile to the newly created standalone profile. Until this transaction occurs, no funds are

authorized to be spent on the delivery of the capital project. Projects under the stated thresholds will remain in and be funded from the composite profile, and will follow Council approved approval processes.

This approach is consistent with Administration's implementation of the PDDM as well as the Capital Governance Policy C591 adopted by Council in 2017.



Funding in the profile will be used to support project delivery work for Waste Services' capital initiatives anticipated to be delivered in the 2023-2026 budget cycle, including but not limited to:

- Waste Water Discharge Expansion
- North Saskatchewan River (NSR) Erosion Control
- Cure Site Pad B, C and G Resurfacing
- Edmonton Waste Management Centre (EWMC) Water Distribution System Upgrades
- EWMC Site Paving
- Organics Transformer yard grading/drainage
- Organics Tip Floor Cupola
- Organics Staff Facilities Upgrades
- Organics Tip Floor Source Capture
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- Integrated Process and Transfer Facility (IPTF) - Additional Metal Removal System
- Residential Transfer Station (RTS) Pad and Buildings Upgrades
- Compost School Refresh
- Kennedale Entrance Gates

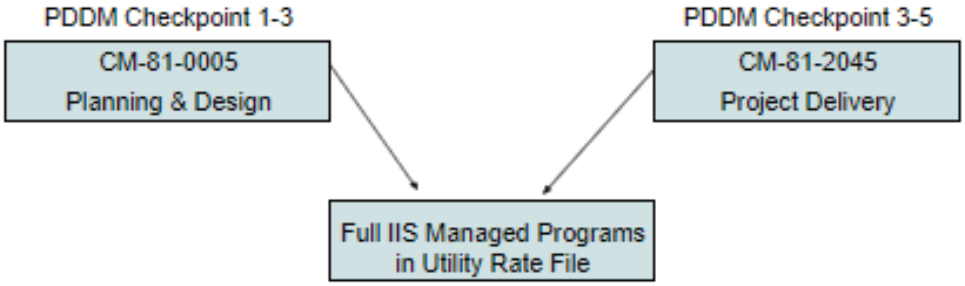
For further details, please refer to project descriptions in Appendix B.

A list of required projects was submitted by the operational areas to Technical Services, indicating the project scope, schedule, risks and estimates. These were evaluated, ranked and prioritized based on the strategic and operational criteria (i.e. Project Driver and the Project Criticality) set by Technical Services. Appendix A - Waste Services Internal Project Planning and Prioritization Process outlines the prioritization process.

3.2. Urgency of Need

Effective delivery of capital projects is essential for Waste Services to achieve its commitment to providing quality sustainable waste management services to the City of Edmonton and to meet the changing needs of its customers. Projects anticipated to reach the third checkpoint in the PDDM process in this budget cycle were identified and prioritized based on strategic criteria such as environmental impact, health and safety and alignment with Branch and Corporate goals. Delivery of these concept-level projects within this profile will be fundamental to Utility operations and will help ensure continued delivery of sustainable waste collection and processing services.

As Waste Services capital budget is supported by the utility rate, business cases for both the planning and delivery phases of approved capital projects within the PDDM are required. This allows funding to be allocated to their respective composite profiles (shown below) and determine the utility rates required to support the capital budget. While approval for funding in this profile is necessary to determine capital budget and utility rates, approved funding for this profile does not indicate final budget or funding for any specific capital project.



3.3. Anticipated Outcomes

In alignment with the PDDM, Waste Services will achieve the Utility's goals through working with IIS to effectively manage the delivery of capital projects. Waste Services envisions the following outcomes:

Outcomes / Deliverables
Better information to make capital investment decisions: Through a structured and integrated process, Administration will ensure that projects identified as priorities by Waste Services receive robust evaluation of alternatives and scope identification. Through the PDDM, project maturity is regularly assessed to ensure that projects are ready to advance to the next stage of development.
Improved project schedule and budget estimates based on enhanced design details: Early investment of capital design resources allows sufficient lead time allocated on planning of the projects, thus decreasing the possibility of project scope and budget changes. Completing design work early in a project life cycle allows the greatest ability to impact overall project outcomes. Following industry best practices, a control budget and schedule will be established on the basis of a completed design to ensure realistic expectations are set prior to tendering and construction.

Systematic evaluation of project delivery against project business case and scope: Advanced project management tools support the proposed checkpoint model. Regular project status reporting and standardized documentation will further advance a system of project management accountability that builds trust in the project team's ability to effectively deliver on capital projects.
Reliable facilities and infrastructure that enable sustainable waste management in a cost-effective manner.
High levels of customer service delivered in both an efficient and effective way through leading-edge waste processing facilities that use current and emergent technology to enable high rates of diversion of waste from landfill.
Facilities that can be operated in a safe manner, protecting employees, customers and contractors.

3.4. Scope

The scope of this Capital Funding Request includes the detailed design, construction and project closeout stages, as outlined in Checkpoint 3 (Authorization for Capital Expenditure), Checkpoint 4 (Authorization for Construction expenditure), and Checkpoint 5 (Authorization for closeout) for all Capital projects led by IIS.

Checkpoint 3: This checkpoint is to verify the project has reached an appropriate level of maturity to request capital funding. Projects will be taken to a level of design that will yield more reliable estimates before being put forward for prioritization and inclusion in the Capital Budget. This is often to a Class 3 (-15% to +20%) during Design Development. The project must be developed enough to move forward and the scope must be reviewed[3].

During Checkpoint 3, the project budget has been approved (led by the IIS Planning and Design Project Manager) and the transfer from the Planning and Design Branch to Delivery Branch occurs.

Checkpoint 4: Final check before the project goes to tender, to verify the project is ready to be tendered and develop a refined control budget. This will include an assessment of readiness and a final scope review. If the project is within the approved scope, schedule, and budget, an Internal Control Budget, Control Schedule and Authorization for Expenditure will result. If it is not, it will either be forwarded for a Change Request or will be sent back for revision. Approved projects are authorized to spend up to their control budget levels[4].

Checkpoint 5: This checkpoint is to verify the project is ready for final closeout. Closeout will ensure the scope has been met satisfactorily and all closeout activities are complete[5].

3.5. Out of Scope

The project planning and design phase of the PDDM is out of scope for this Capital Funding

[3] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-3
[4] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-4
[5] Source: https://sites.google.com/a/edmonton.ca/pmrg/pddm/checkpoint-5

Request. The planning and design phases include Checkpoint 1 (Project initiation) and Checkpoint 2 (Authorization for Design Expenditure) and are included in a separate Capital Funding Request (CM-81-0005, Waste Services IIS Infrastructure Planning and Design).

3.6. Critical Success Factors

Critical success factors include:

- Efficient, consistent and accurate communication between Waste Services and IIS.
- Regular check-ins with the Waste Services Leadership Team to align with the strategic direction and the Utility's goals.
- Accurate and sufficient data and cost analyses to support high level budget estimates and informed decision making for the projects.
- On time, on budget delivery of capital projects within the PDDM.

4. Strategic Alignment

This initiative contributes to the overall City of Edmonton strategic direction and to corporate and departmental business plans, including Connect Edmonton: Vision 2050. This contribution is made by demonstrating leadership in waste management and processing standards, and by increasing the diversion of residential and non-residential waste from landfill. Below are strategies, business plans and policies that support this project:

City of Edmonton Environmental Policy C512	**POLICY STATEMENT:** The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services, based on its commitment to: (a) prevent pollution; (b) continually improve its environmental performance by setting and reviewing environmental objectives and targets; and (c) meet or exceed applicable environmental legal requirements and other requirements to which it subscribes.
Connect Edmonton: Vision 2050	This project aligns with the City's Vision 2050 strategic plan in that by ensuring that organic/food waste is collected, processed responsibly, and the amount landfilled is minimized, Edmonton will be a healthy city, urban places will be clean, regional prosperity is increased by building a circular economy, and a low carbon future is assured.

Waste Services Business Plan 2022-2025	The Business Plan outlines how Waste Services will continue to make transformational impacts through the 25-year Waste Strategy, provide essential service to Edmontonians while maintaining full cost recovery, and improve the employee and resident experience to support adaptation of new systems.
25 Year Waste Strategy	"The strategy adopts a broader lens to transform the system with new focus on efforts which will emphasize waste reduction in addition to affirming a commitment to 90% diversion of single unit residential waste from landfill." This project will help expand the City's organic waste processing capabilities and contribute to the 25 Year Waste Strategy's goal of diverting 90% of waste from landfill.
Waste Services Utility Fiscal Policy C558B	"Customer rates will promote the efficient use of resources and be set to achieve broader social, economic, and environmental goals."
Integrated Infrastructure Services (IIS) Vision and Mission Statements	"We inspire trust among citizens and Council in our commitment and ability to deliver quality infrastructure." We are in the business of: ● bringing ideas to reality ● innovation and excellence ● assembling expertise ● building legacy infrastructure ● helping citizens have a better life in Edmonton ● Building a Great City

5. Context Analysis

Requested funding for project delivery for capital projects is consistent with Administration's implementation of the PDDM as well as the Capital Project Governance Policy C591 that was approved by Council in 2017.

6. Organizational Change Impact

Waste Services staff, reporting through the Technical Services section, work closely with IIS as part of a project team to plan, develop and deliver approved capital projects. No change to organization is expected.

6.1. Stakeholder Impact

Stakeholder Impact
Stakeholder 1: City of Edmonton Waste Services Branch (primary internal)
1. Well-defined and consistent process in alignment with the rest of the City

2. Enhanced consultation, recommendation and approval for Delivery checkpoints for Waste Services projects managed by IIS as part of a project team
Stakeholder 2: Integrated Infrastructure Services (primary internal)
1. Enhanced Project Management role for approved capital projects using input from Waste Services 2. Improved process for capital funding for projects in the composite profile for Waste Services
Stakeholder 3: City Council (primary internal)
1. Increased transparency, accuracy, reliability of project schedule and budget estimates 2. Ability to provide political direction and have access to accurate project information
Stakeholder 4: City of Edmonton public (secondary external)
1. Maintenance of stable/low utility rate through the effective delivery of capital projects 2. Minimal disruption to service levels through the delivery process

6.2. Business and Operational Impact

The table below identifies the business and operational impacts for continuing to follow as recommended by Waste Services.

Business & Operational Impact & Description
Waste Services (Internal)
● Longer process with the addition of multiple checkpoints. ● Dedicated project management resources as part of a project team.
Integrated Infrastructure Services, Infrastructure Delivery (internal)
● Allocated resources (Project Management team) for the detailed design, construction and project closeout. Checkpoint 3/4/5 documents

Moving forward, the City of Edmonton is committed to the use of Gender-Based Analysis Plus (GBA+). Waste Services will identify root causes on any issues that may arise, use an evaluation approach, consider the inputs from affected stakeholders (e.g. people with disabilities, indigenous people, seniors, etc.), and develop and implement an action plan for safety, diversity and inclusivity issues using GBA+. Waste Services acknowledges that GBA+ is an equity assessment tool that allows for holistic consideration of the need for use, and impact of, this Capital Funding Request and that staff are trained in the GBA+ process.

7. Benefits / Costs

7.1. Tangible Benefits

The following tangible benefits will be realized by following this approach:

- Improved operational efficiency of facilities, infrastructure and process equipment.
- Reduction in safety-related incidents.
- Long term savings due to process and operational improvements.
- Meet or exceed environment compliance requirements.

7.2. Intangible Benefits

The following intangible benefits will be realized by following this approach:

- Improved efficiency in project management.
- Increased adherence to budget and schedule estimates.
- Improved ability to forecast capital expenditure thus allowing for more certainty in utility rates for the budget cycle.
- Structured process to evaluate readiness, scope and prioritization.
- Increased project accountability, awareness and controls.
- Closer integration of City departments.

7.3. Costs

REQUEST	2023	2024	2025	2026	TOTAL PROFILE BUDGET
Capital Budget Request	$1,950,330	$7,123,355	$6,325,801	$5,102,751	**$20,502,237**

Note that the above costs do not include planning and design, which are requested in a separate Capital Funding Request (Waste Services IIS Infrastructure Planning and Design Composite Capital Funding Request). For a listing of the projects included under the above estimates, please refer to Appendix B.

Please refer to Appendix C for the Financial Analysis Summary. The table and graph demonstrating the revenue requirement related to these capital costs **include both** planning and design and project delivery to show the full impact of the projects.

7.4. Assumptions

- Projects in this composite profile have allocated budget amounts that are based on high-level project estimates. The actual costs of the approved capital projects may vary once the design stage is completed by IIS.
- All of the proposed projects in this composite profile have been prioritized based on the approval of Waste Services proposed program changes pending decision of Utility Committee and Council.
- Projects listed in this Capital Funding Request are at a concept level only. The individual

project details, budget and schedule will be outlined in a full business case to be presented to Utility Committee and Council for funding.

- Projects within this profile will only proceed with approved funding available for the planning and design phase under composite CM-81-0005.

8. Resourcing

All capital projects in this composite profile will be managed by the Infrastructure Delivery Branch within IIS. Where outside resources are required, the tender process and external vendor relationship will be managed by IIS. Subject-matter expertise will be contributed by Waste Services and Engineering Services to the project teams; there will be no addition to the current approved Waste Services FTE complement.

9. Key Risk(s) and Mitigation Strategy

RISK(S)	IMPACT	MITIGATION STRATEGY
Projects scheduled for delivery may be changed or canceled after the checkpoint 3 business case if the project planning and design does not meet the intended outcome.	Low	• Enhanced project communication between IIS and Waste Services at Planning and Development level; increased collaboration and shared decision-making between IIS and Waste Services.
Emerging priorities may cause delays for projects scheduled to proceed to delivery stage	Low	• Profile project list is concept level only, allowing for allocation changes, however in order to foster continuity of information, project team will be informed of updated Branch priorities • Waste Services and IIS through project teams will have regular meetings to ensure integration and implementation of planned projects as well as responding to emergent projects.

10. Conclusion and Recommendations

10.1. Conclusion

This capital funding request outlines the overall capital budget requirement for capital projects anticipated to move into the Project Delivery phase of the PDDM for the 2023-2026 budget cycle. These capital projects are proposed to receive a budget under the composite profile, Waste Services Project Delivery (IIS Managed) CM-81-2045, for a total capital budget of approximately $20.5 million.

Projects moving into the delivery phase will be allocated budget through a detailed project level

business case and a formal Checkpoint 3 request pending approval from Utility Committee and Council. In accordance with Corporate thresholds, renewal projects over $5 million and growth projects over $2 million will be transferred to standalone profiles. Projects under these thresholds will remain in the composite profile. Adherence with the PDDM is expected to improve project schedule adherence and improve budget estimates through an increased level of design to ensure realistic expectations are set prior to project tendering and construction.

10.2. Recommendations

Waste Services recommends continuing to follow the PDDM and approve funds for the project delivery phase for capital projects managed by IIS. This will lead to control on the project scope, schedule, budget and delivery in alignment with IIS PDDM.

10.3. Project Responsibility and Accountability

The project sponsor and budget owner for all approved capital projects in this composite profile is the Branch Manager of Waste Services. The delivery of capital projects within this composite and all standalone profiles will be overseen by the Branch Manager of Infrastructure Delivery, IIS. Individual projects are led by Project Managers within Infrastructure Delivery.

11. Implementation Approach

This composite capital profile (CM-81-2045) sets the 2023-2026 capital budget for Waste Services for capital projects that are anticipated to reach the third checkpoint in the PDDM process within the budget cycle. Once a capital project reaches Checkpoint 3, a detailed project-specific business case will be developed and brought to Utility Committee and Council for approval.

This approval will result in a capital budget adjustment that transfers budget from this profile to the newly created standalone profile.

From that point, respective project managers from IIS will use approved funds in the standalone profiles for project execution, which will be governed by the gated project management system within the PDDM.

12. Review and Approval Process

The following review and approval process was followed for this business case:

Review Step	Reviewer
Review 1	Team Lead of Technical Services, General Supervisor of Business Integration Integration, General Supervisor of CS, General Supervisors of SWPS, General Supervisors of Technical Services, Program Manager of IIS FID, General Supervisor of IIS FID, and Senior Accountant of Financial Services
Review 2	Director of Finance, Director of Business Integration, Director of CS, Director of Technical Services (Final Approver), Director of SWPS, and Director of IIS FID

Review 3	Branch Manager Waste Services (Final Approver)
Review 4	Utility Advisor
Review 5	Utility Committee report presented

13. Appendices

Appendix A: Waste Services Internal Project Planning and Prioritization Process

Appendix B: Waste Services (IIS Managed) Delivery Project Descriptions - 2023-2026

Appendix C: Financial Analysis Summary - Waste Services (IIS Managed) Delivery composite profile

Appendix A: Waste Services Internal Project Planning and Prioritization Process

The following outlines the Project Prioritization process:

1. Capital project needs are identified from all sections of the Utility and listed on the 2023-26 Waste Services Capital Planning Sheet.
2. Each project is scored based on the Project Driver and the Project Criticality. See tables 1 and 2 below for details. Total project score for each project is calculated by multiplying the driver and criticality scores.
3. Projects are then prioritized based on the total scores.
4. Projects are recommended based on prioritization with budget estimates.
5. Waste Services Leadership Team (WSLT) reviews and approves the final list.
6. Planning, documentation, and approval process for each individual project follows the approved Waste Services Project Management Framework.
7. Re-prioritization exercises occur on a bi-annual basis for possible adjustments according to Branch priority.

Table 1: Project Driver

Project Driver (score)						
Regulatory / Compliance (5)	Safety / Environmental Enhancement (5)	Asset Renewal/Upgrade (4)	Business Need / Growth (3)	Strategic / Corporate Goal (3)	Process / Operational Improvement (3)	Other (3)

Table 2: Project Criticality

Project Criticality (score)		
Critical - cannot be deferred (3)	Very Important - cannot be deferred (2)	Can be deferred (1)

Appendix B: Waste Services (IIS Managed) Delivery Project Descriptions - 2023-2026

The following table shows projects anticipated to be undertaken for this budget cycle:

Project	Description	Project Driver / Objective
Waste Water Discharge Expansion	Design and construction of a pump station and associated gathering infrastructure to connect the EWMC groundwater diversion system and sanitary infrastructure to the EPCOR wastewater treatment plant.	Regulatory/Compliance
North Saskatchewan River (NSR) Erosion Control	Design and construction of North Saskatchewan River bank stabilization to reduce erosion and slope stability issues adjacent to the Clover Bar Landfill.	Safety/Environmental Enhancement
Cure Site Pad B, C and G Resurfacing	The project supports the renewal of the existing cure site. The current site is approaching the end of its life cycle and major capital renewal work needs to be done with regard to the site liner and site drainage.	Asset Renewal/Upgrade
EWMC Water Distribution System Upgrades	Implementation of recommended water distribution upgrades to meet fire flow and operational requirements at the EWMC.	Safety/Environmental Enhancement
EWMC Site Paving	Project supports new paving requirements throughout the EWMC.	Asset Renewal/Upgrade
Organics Transformer Yard Grading	Project supports civil design and construction to allow for adequate drainage in an area with high voltage electrical equipment.	Safety/Environmental Enhancement
OrganicsTip Floor Cupola	Project supports modification to the Organics tip floor building allowing for proper and safe removal of the trommel screen from its drum without removing the entire trommel from its location in the process.	Asset Renewal/Upgrade
Organics Staff Facilities Upgrades	Needs analysis for ADF/Organics office, locker room and control room space, and staff walkways. Project delivery to be included.	Asset Renewal/Upgrade: Improving the staff facilities for the ADF.
Organics Tip Floor Source Capture	Needs analysis and implementation of dust collection in order to meet environmental requirements.	Safety/Environmental Enhancement

Organics Tip Floor Drainage Enhancement	Project supports needs analysis and modification to the Organics Tip Floor to allow for adequate drainage.	Business Need/Growth
IPTF - Additional metal removal system	Project will deal with the analysis of current metal removal and improvement options	Process/Ops Improvement
RTS pad and buildings upgrade	Project supports the upgrade and replacement of aging RTS buildings	Asset Renewal/Upgrade
Compost School Refresh	Develop and implement a master plan for scaled improvements to Compost School, located beside the John Janzen Nature Centre (7000 143 St NW).	Strategic / Corporate Goal
Kennedale Entrance Gates	Replacement of manual gates with automated gates to provide adequate security at the Kennedale Waste Collections Site.	Safety/Environmental Enhancement

Appendix C: Financial Analysis Summary - Waste Services (IIS Managed) Design and Delivery composite profiles

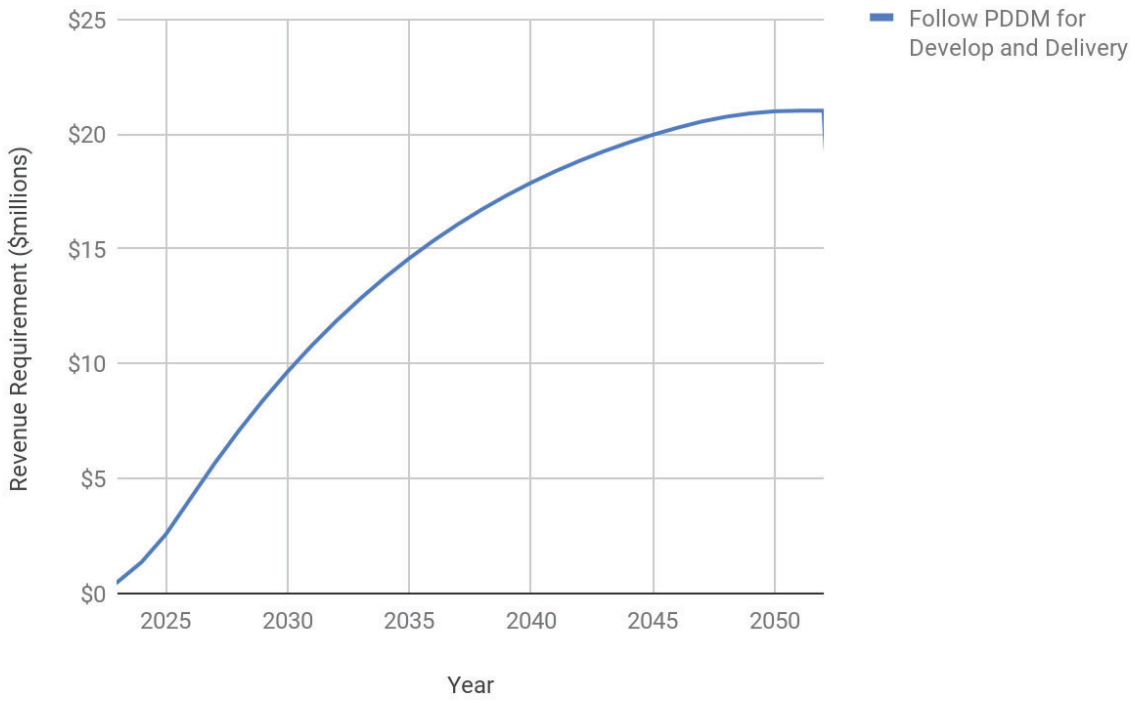
Project Title: IIS Project Delivery	Follow PDDM for Design and Delivery
Total Capital Cost	($20,502,238)
Total Revenues	$0
Total Operating and Maintenance Costs	$0
Total Lease Costs	$0
Project Net Inflows (Outflows)	($20,502,238)
WACC Discount Rate	6.28%
Project Costs (Present Value)	($16,382,962)

Note: Capital projects within this profile are presented at a concept level and as such, associated operating and maintenance costs are not identified at this time. These costs for each project will be considered and included in the individual business cases at Checkpoint 3.

The following table and graph demonstrate the cumulative present value of the revenues that must be realized through annual rate collection to support the project costs. This includes interest and amortization expenses over the project lifecycle. Please note that these costs **include** the IIS managed Planning and Design in order to demonstrate the full project spending for revenue requirement calculation purposes.

Project Title: IIS Planning & Design and Project Delivery

Cumulative Present Value of Revenue Requirement



Year	Calendar Year	Follow PDDM for Develop and Delivery
0	2022	$0
1	2023	$464,644
2	2024	$1,340,801
3	2025	$2,554,621
4	2026	$4,099,414
5	2027	$5,641,775
6	2028	$7,075,872
7	2029	$8,408,254
8	2030	$9,645,081
9	2031	$10,792,148
10	2032	$11,854,908
11	2033	$12,838,487

12	2034	$13,747,711
13	2035	$14,587,116
14	2036	$15,360,971
15	2037	$16,073,292
16	2038	$16,727,854
17	2039	$17,328,210
18	2040	$17,877,701
19	2041	$18,379,470
20	2042	$18,836,471
21	2043	$19,251,485
22	2044	$19,627,127
23	2045	$19,965,855
24	2046	$20,269,981
25	2047	$20,541,681
26	2048	$20,750,185
27	2049	$20,897,523
28	2050	$20,987,530
29	2051	$21,012,147
30	2052	$21,012,147

City of Edmonton
15th floor, Edmonton Tower
10111 - 104 Avenue NW
Edmonton, AB T5J 0J4

edmonton.ca

Coronation Eco Station Expansion Business Case

City Operations | Waste Services

City of Edmonton

Capital Profile: CM-81-0005

Project Number: CP-010693

Project Sponsor: Krista Berezowski, Director, Business Integration and Technical Services, Waste Services

Version #: 1.2

Date published: February 11, 2025

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Change History

Version #	Date	Author	Description
1.0	Nov 27, 2024	Ron Tupas, Program Manager, FPD	Initial Draft
1.1	Jan 22, 2025	Ron Tupas, Program Manager, FPD, Andrew Waddell, Branch Report Writer, WS BMO	Review Draft
1.2	Feb 11, 2025	Ron Tupas, Program Manager, FPD, Andrew Waddell, Branch Report Writer, WS BMO	Final

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
1.1	Ron Tupas	Program Manager, FPD, IIS	Jan 22, 2025
1.1	Andrew Waddell	Branch Report Writer, WS BMO, WS	Jan 22, 2025
1.1	Lena Aitken	General Supervisor, Operational Planning & Project Delivery, WS	Jan 22, 2025
1.2	Lena Aitken	General Supervisor, Operational Planning & Project Delivery, WS	Feb 11, 2025

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
1.2	Rob Pitzel, Finance Manager, Business and Financial Analytics, FCS	Rob Pitzel	Feb 11, 2025
1.2	Stephen Cheung, Finance Director, Utilities & Land Development, FCS		Feb. 13, 2025

1.2	Ryan Kos, General Supervisor, Business Strategy, Planning & Performance, BITS, WS		Feb 11, 2025
1.2	Denise Chang-Yen, Senior Environmental Engineer, UPE	Denise Chang-Yen	02/11/2025
1.2	Andy Garrod Eco Station Supervisor, Waste Collection Services, WS	Andy Garrod	02/12/2025
1.2	Doug Sheremeta Supervisor, Eco Station Program, Waste Collections Services, WS	Doug Sheremeta	02/13/2025
1.2	Tony Colangelo General Supervisor, Waste Collection Services, WS		12 February 2025
1.2	Chris Fowler, Director, Waste Collection Services, WS		2/12/25
1.2	Trevor Jarvis, Supervisor, FPD, IIS	TREVOR JARVIS	02/12/2025
1.2	Susan Meunier, Director, FPD, IIS	Susan Meunier	02/11/2025
1.2	Jack Ashton, General Supervisor, FID, IIS	Jack Ashton.	02/12/2025
1.2	Jesse Banford, Director, FID, IIS	Jesse Banford	2025-02-12

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
1.2	Krista Berezowski, Director, BITS, Waste Services	Krista Berezowski	2025-02-18
1.2	Pascale Ladouceur, Branch Manager, Infrastructure Planning & Design		2025-02-13

1.2	Jason Meliefste, Branch Manager, Infrastructure Delivery		2025-02-18
1.2	Denis Jubinville, Branch Manager, Waste Services		Feb 20, 2025

1. Executive Summary

1.1. Coronation Eco Station Expansion

Eco Stations are waste drop-off facilities owned and operated by the City of Edmonton Waste Services Utility allowing residents to safely dispose of Household Hazardous Waste (HHW), recyclables and bulky waste. One of Edmonton's four Eco Stations, the Coronation Eco Station, primarily serves west and northwest Edmonton. It is the smallest, only non-modernized Eco Station in Edmonton. The existing Coronation site footprint limits operational and service levels which result in inconsistent and lower standards of service delivery levels compared to the other Eco Stations. Furthermore, the current state of Coronation is not able to meet anticipated future demands.

To address these issues, Development Design for the expansion of the Coronation Eco Station was prepared. This design is analyzed in this business case in full detail and compared against the status quo of not executing this expansion.

The findings from the analyses presented in this business case confirms that expanding the existing Coronation Eco Station provides a worthwhile investment and value to improve services compared to the status quo of not expanding the current site. It aligns with the City's sustainability goals and strategic direction, and it serves to address all current service operational constraints and issues identified with the current Coronation Eco Station, which will improve service to residents, reduce vehicle lineups and wait times, enhance worker safety, increase operational capacity, and fulfill administrative requirements.

It is recommended that this initiative proceeds to the next project phase, the Deliver phase, and that the Deliver phase budget of $13.5 million is approved. Upon approval, project delivery of the Deliver phase will commence in 2025 with expected project completion in Q2 2027.

2. Profile Background

Eco Stations provide environmentally sound handling and disposal of Household Hazardous Waste (HHW), preventing this type of waste from entering the residential waste streams or sewer systems. They also provide residents with recycling and yard waste drop-off bins, Reuse Centre donation drop-off, and large and bulky item disposal. Waste Services owns and operates four Eco Stations, among which Coronation is the smallest and second-oldest facility, primarily serving west and northwest Edmonton. Strathcona Eco Station, the oldest Eco Station, was modernized in 2018 to meet demand and better serve customers. Ambleside and Kennedale Eco Stations, as the largest and newest Eco Stations, provide residents with additional services, including free compost and mulch pick-up.

The Coronation Eco Station operates on the Coronation Yard at 11440 143 Street NW. The site was converted from a transfer station to an Eco Station in 2000 with the addition of the HHW handling building at a 1.7 acre footprint, occupying approximately 35 percent of the Coronation

Yard. The remaining 65 per cent was owned and operated by EPCOR after the former Drainage Services utility was transferred to EPCOR in 2016. Despite being the smallest Eco Station, the number of users increased from 84,161 in 2021 to 101,294 users in 2024. On average, Coronation Eco Station received approximately 21 percent of total Eco Station users from 2021 to 2024, but this facility has not been sufficiently renovated or upgraded to accommodate future projected demand.

Table 1: *Comparison of City of Edmonton's Eco Stations.*

Facility	Area Serviced	Size (acres)	Year Opened	Last Renovated
Strathcona	South	1.8	1995	2018
Coronation	West	1.7	2000	Not renovated
Ambleside	Southwest	9.6	2009	Not renovated
Kennedale	Northeast	10.0	2015	Not renovated

In 2014, a business case to replace the existing Coronation Eco Station was approved in Northwest Eco Station - Profile 15-33-2011 (Appendix A). Subsequently, Council approved the profile for $19.8 million to secure the land for Waste Services and to fund detailed design and further analysis to relocate the facility to Mayfield. This land was purchased for $5.8 million in 2015.

During the approval process, it was explained that construction of a Mayfield Eco Station would be delayed until the impact of the new Kennedale Eco Station (opened in 2015) was fully assessed. Administration learned in 2021 that EPCOR was planning to sell their portion of land adjacent to the Coronation Eco Station. If the land were to be sold to a third-party, there was a risk of significant operational and access disruptions to Coronation Eco Station. In City Operations report CO00837 Eco Station Update, Waste Services received Council approval to purchase the adjacent land and consider how the purchase of this land could impact the Eco Station business case. In 2022, the remainder of the Coronation Yard owned by EPCOR became available for acquisition, and was purchased by the Waste Services Utility in 2023.

This opened the potential option to expand the Coronation site instead of constructing the Mayfield Eco Station, and Administration committed to conducting a review and analysis of three options:

1. maintain current operations at the Coronation Eco Station without change or improvement
2. expand and renovate the existing Coronation Eco Station site
3. decommission Coronation and build a new Mayfield Eco Station on land purchased by the Waste Services Utility in 2015.

A comprehensive Planning Report was then prepared and finalized on March 20, 2023, and it was presented as a study of the Coronation Eco Station reviewing its ability to continue serving Edmontonians into the future. The study compares the opportunities to maintain, modernize, and improve the current Coronation site (11440 143 St NW) versus building a new facility on a

greenfield site located in the Edmiston Industrial area, colloquially referred to as Mayfield (17803 114 Ave NW). A full and extensive analysis of both sites, including site, operational, sustainability and cost analyses, are described in detail along with several developed alternative concept designs.

This Planning Report provided the basis of the Options Analysis Business Case, submitted March 31, 2023, which analyzes these options in full detail. While both sites offered viable concept alternatives, the recommendation in the Options Analysis Business Case is to expand the Coronation Eco Station as opposed to developing the Mayfield site. A July 14, 2023 memo was shared to Council, which notified Council of Administration's decision and basis to accept this recommendation as well as inform Council of the intent to commence work to deliver the renovation and expansion of Coronation Eco Station.

Efforts were then placed on executing the Develop (Planning & Design) phase of this project by completing Development Design using the recommended Coronation Site Expansion concept presented in the March 20, 2023 planning report as the design basis. This has culminated in the Development Design Report for Coronation Eco Station Expansion finalized on Oct. 16, 2024. Project and financial information, analysis, and details presented in this business case are based on information provided by this report.

This business case provides an analysis of the expansion of the Coronation Eco Station based on the completed Development Design Report compared against the status quo.

2.1. Problem / Opportunity

Problem

Coronation Eco Station has not undergone major renovation since its initial construction. Due to constraints of the existing Coronation site footprint, service delivery levels are inadequate and inconsistent compared to the other larger Eco Stations, and the Coronation Eco Station is not able to meet anticipated future demands in its current state.

The number of staff working at Coronation vary seasonally. Up to 11 staff work in winter months, while up to 25 staff work during expanded summer hours to accommodate increased visitors. The following issues have been identified and contribute to operational concerns and service constraints:

1. Vehicle access and egress to Coronation is only accessible through a short common drivelane from 143 Street, leading to vehicle back-ups at peak hours and on busy days.
2. Incoming and outgoing traffic cross each other leading to safety risks, operational and public traffic pass each other with a small turning radius and limited visibility and turning radii for vehicles in the outdoor waste drop-off area.
3. The overall size of the site constrains the number of customers that can be served, and waste processing equipment that is used on-site is undersized for its purpose.
4. The facility has only one garage bay that is being used simultaneously for vehicle storage and maintenance, and storage of white goods (e.g. refrigerators, washing

machines and other large domestic appliances).
5. Due to the small waste drop-off area, the capacity to receive waste and accommodate additional drop-off bins is restricted.
6. HHW handling buildings are mostly used for waste storage due to lack of appropriate storage facilities on-site.
7. Due to the repurposed history of the building, drainage and road pavement improvements are required.
8. Insufficient administration area (e.g., congested restrooms and inadequate number of showers and lockers for employees).
9. Limited staff parking stalls due to historical sharing of the Coronation Yard site.

Opportunity

The remaining 65 percent of Coronation Yard has been purchased from EPCOR, creating an opportunity to partially use the land, facilities and other assets for expansion similar to the improvements made at the Strathcona Eco Station. This also provides an opportunity to redevelop the Coronation site and renovate the existing Coronation Eco Station. This will increase capacity, address operational issues, and improve services and service levels at the current site without the need to develop or build at a new location, which would have required a significantly larger capital investment.

Furthermore, this project provides the opportunity to positively contribute towards meeting sustainability, energy efficiency, and carbon emission goals established in the 25-year Waste Strategy and The City Plan.

2.2. Current Situation

Built in 2000 on a 1.7 acre footprint, the Coronation Eco Station is the smallest, second-oldest and only non-modernized Eco Station, primarily serving west and northwest Edmonton. It currently has a maximum of 25 staff working at this location. The facility is located between 114 and 115 Avenue and east of 143 Street. It is adjacent to the City's Road Maintenance Fleet Facility from the west and a scrap car recycling business from the south. A decommissioned railroad runs along the western boundary of the Eco Station and the Coronation Yard site.

Due to limited space in both the Eco Station buildings and the broader site area, the operational team is restricted from effectively managing the current demand for services. The number of available waste drop-off bins cannot be increased without creating additional issues for staff and visitors. Because fewer drop-off bins are available, more bin pickups are scheduled to compensate for the lack of capacity. This consequently results in relatively higher operating costs compared to Kennedale, Ambleside or Strathcona Eco Stations, which are larger or were more recently renovated to better accommodate the increased service delivery needs of residents and the needs of staff. These identified operational issues, outlined above in 2.1, ultimately hinder alignment with the sustainability goals established in the 25-year Waste Strategy and The City Plan.

3. Profile/Initiative Description

3.1. Initiative Description

Meeting the City's corporate outcomes, climate resilience goals and projected growth as laid out in The City Plan requires an appropriate investment in waste drop-off facilities. In section 2.1 of this business case, several operational limitations have been identified with the current Coronation Eco Station, which deters the City's waste reduction goals and limits the provision of adequate service and capacity to a growing population.

This renovation and site expansion project focuses on Coronation Eco Station, one of four existing facilities in the city. The main goals of this project are to reuse the existing complex and implement upgrades regarding site and building efficiency, safety, and interior programming. The overall design language will echo the aesthetics of the other updated Eco Stations, which will strengthen the identity and recognizability of the complexes.

3.2. Initiative Justification

Redevelopment and expansion of Coronation Eco Station will improve service delivery and allow Waste Services to provide consistent service levels similar to the other Eco Stations in the City, providing equitable levels of waste drop-off service to Edmontonians regardless of where they live.

This initiative serves to address all current service operational constraints and issues identified with the current Coronation Eco Station, which will improve service to residents, reduce vehicle lineups and wait times, enhance worker safety, and fulfill administrative requirements. Furthermore, it aligns with City sustainability goals, outlined in the 25-year Waste Strategy and The City Plan, and ultimately with the City's strategic direction as outlined in section 4.

3.3. Urgency of Need

The current operational and service issues cannot be resolved with the existing footprint. Until these issues are resolved, constraints on operations and service levels will continue, and consequently, service levels will continue to be below what is standard for other Eco Stations in the City. The implementation of this initiative will be the culmination of over ten years of planning, analysis, and assessment. The sooner the initiative is implemented, the sooner the benefits are realized from this initiative.

3.4. Anticipated Outcomes

Assuming that all project goals and objectives are met at the completion of the project, the anticipated outcomes include:

- improved vehicle access and egress to the site
- improved flow of site traffic and reduced safety risks associated with constrained vehicle movement and limited visibility
- improved site drainage, facilities, and other site infrastructure
- increased operational capacity for receiving, storing, transferring, and handling of waste materials
- increased operational efficiency due to increased operational space and improved facilities and infrastructure
- enhanced customer experience
- modernized and sufficient administrative and staff amenities & facilities
- extension of infrastructure asset life and utilization
- more climate-resilient infrastructure contributing to corporate greenhouse gas emission reduction targets

3.5. Scope

To execute this initiative, the current project scope for the delivery phase of the project upon approval of Project Development and Delivery Model Checkpoint 3 includes:

- Detailed design of Coronation Eco Station Expansion using the final Development Design report as the design basis.

- Design work scope includes:
  - Architectural
  - Engineering disciplines including, but not limited to: structural, mechanical, electrical, civil, geotechnical

- Project management scope includes:
  - Scope management
  - Schedule management
  - Cost management
  - Quality management
  - Risk management
  - Communication & stakeholder management
  - Procurement & contract management
  - Change management
  - Resource management
  - Health, safety & environmental management

- Delivery phase work includes:
  - Detailed cost estimate as the design progresses.
  - Detailed delivery phasing and schedule considering current operation at Coronation Eco Station and potential temporary operation interruption.
  - Project delivery and construction.
  - Project procurement of both engineering and construction services.
  - Attainment of all permits required for construction.

- Execution of a quality control program which includes, but is not limited to, regular inspections, verifications, reporting and testing to ensure specifications are met.
- Commissioning of all installed equipment.
- Project handover, including final acceptance certificate, warranty, operation and maintenance manual and project close-out.
- Warranty related issues.

3.6. Out of Scope

The following are **not** included in scope:

- Operations and maintenance (excluding warranty related items)
- Environmental Liabilities
- Any building and facility not included in the Development Design (e.g. north building)
- Commercial and industrial hazardous waste management
- New or amended permits from Alberta Environment and Protected Areas
- Condition and environmental liability of any former EPCOR facilities not included in the proposed expansion footprint

3.7. Critical Success Factors

The following list identifies items that contribute to the successful realization of the initiative, along with their respective success measures in accordance with the City of Edmonton's Project Development and Delivery Model.

Checkpoint 3 - Readiness Criteria and Handover Package	• Plan and Check Approval by Project Manager and Direct Supervisor • Approval by Project Sponsor
Checkpoint 4 - Detailed Design Drawings, Construction Estimate and Bid Documents	• Review and acceptance by Project team • Meets technical requirements as outlined in the Consultant Manual • Meets CoE Technical Standards and Drawing, Document, and Authentication Standards and APEGA practice standards • Project Sponsor approval
Constructability Review/Contractor	• RFP and Award of Services: Review and acceptance by Project team.

Procurement/Construction Contractor Agreements	• Note: A phased approach for the construction may be necessary.
Deficiency List	• Review and acceptance by Project team
Construction Completion Certificate/Final Acceptance Certificate	• Review and acceptance by Project team
Manuals and Operating Instructions	• Review and acceptance by Project team
Warranty	• Warranty terms and conditions specified; with review and acceptance by Project team • Review and acceptance by Project team
As-Built Record Drawings	• Meets technical requirements as outlined in the Consultant Manual • Meets CoE Technical Standards and Drawing, Document, and Authentication Standards and APEGA practice standards
Checkpoint 5 - Readiness Criteria and Handover Package	• Plan and Check Approval by Project Manager and Direct Supervisor • Approval by Project Sponsor

4. Strategic Alignment

This project is aligned with and in support of the following City of Edmonton policies shown in Table 2.

Table 2. *List of Project Aligned COE Policies.*

City of Edmonton Policy	Project Impact
The City Plan	Improving the condition of Eco Stations meets the Greener As We Grow Big City Move goal, meeting the needs of a growing population and the future environmental impact of two million Edmontonians. Effectively monitoring and efficiently collecting the volumes of waste dropped off at Eco Stations helps the City measure the success of The City Plan

	and whether its environmental targets are being met.
ConnectEdmonton	The Climate Resilience goal of ConnectEdmonton establishes the City's need to react to the challenges of climate change and preserve our environment. Responsible management of HHW, improving conditions of Waste Services facilities, and enhancing infrastructure climate resiliency help address this strategic goal.
Waste Services Utility Fiscal Policy C558C	Identifying cost-effective opportunities to improve the facility condition of Eco Stations can improve the delivery of services and user satisfaction. By doing so in a fiscally responsible manner, Waste Services provides value for ratepayers and preserves the long-term financial viability of the Utility.
City of Edmonton Environmental Policy C512	Providing affordable, accessible and equitable waste drop-off services in Edmonton helps stakeholders commit to the shared responsibility all residents, businesses and the City all have in managing waste. Responsibly managing HHW and environmental liabilities minimizes the long-term impact of waste generation and disposal and promotes intergenerational equality.
Climate Resilience Policy C627	Increasing waste diversion through drop-off services minimizes waste sent to landfill and associated greenhouse gas emissions. The GHG impact of renovating, improving, and enhancing the climate resiliency of City facilities and infrastructure is factored into the options analysis for this project and the City's overall emissions.
Infrastructure Asset Management Policy C598	Waste Services is appropriately managing the condition of its facilities and assessing the range of impacts its facilities have on relevant stakeholders. The challenges and opportunities of each alternative to meet the full lifecycle of each facility are thoughtfully considered.
25-year Waste Strategy	The 25-year Waste Strategy prioritizes waste reduction and diversion through program development and change. Providing Edmontonians with accessible, efficient drop-off services helps ensure waste is properly sorted, allowing the City to appropriately collect, process and divert waste from landfill.
Waste Reduction Roadmap '24	The Waste Reduction Roadmap is a work plan that identifies opportunities and actions to reduce waste at the source. The Roadmap advocated for provincial Extended Producer

	Responsibility (EPR) regulation and implementation, which was realized. The impacts of EPR will affect Eco Station operations, which should contribute to improved waste reduction and diversion.
Waste Services Climate Action Plan	The Waste Services Climate Action Plan identifies opportunities to reduce emissions in assets and infrastructure. Considering greener options such as, generating renewable energy at Coronation to power operations, will reduce dependence on carbon-intensive fuel sources.

5. Context Analysis

5.1. Eco Station Program

In 2025, the Eco Station program will be in its 30th year of operation. It has successfully attracted visitors to its services, seeing over nine million customers since the first Eco Station opened in 1995. With this continued success combined with the city's projected population growth, the Eco Stations are expected to see an increase in intake volume and service demand. As shown in Figure 1 below, a steady increase in Eco Station visitors has been recorded, accelerating in 2021 after the Edmonton Cart Rollout was introduced. Visits from customers have increased approximately 22 per cent from 2021 to 2024, reaching 473,978 in 2024.

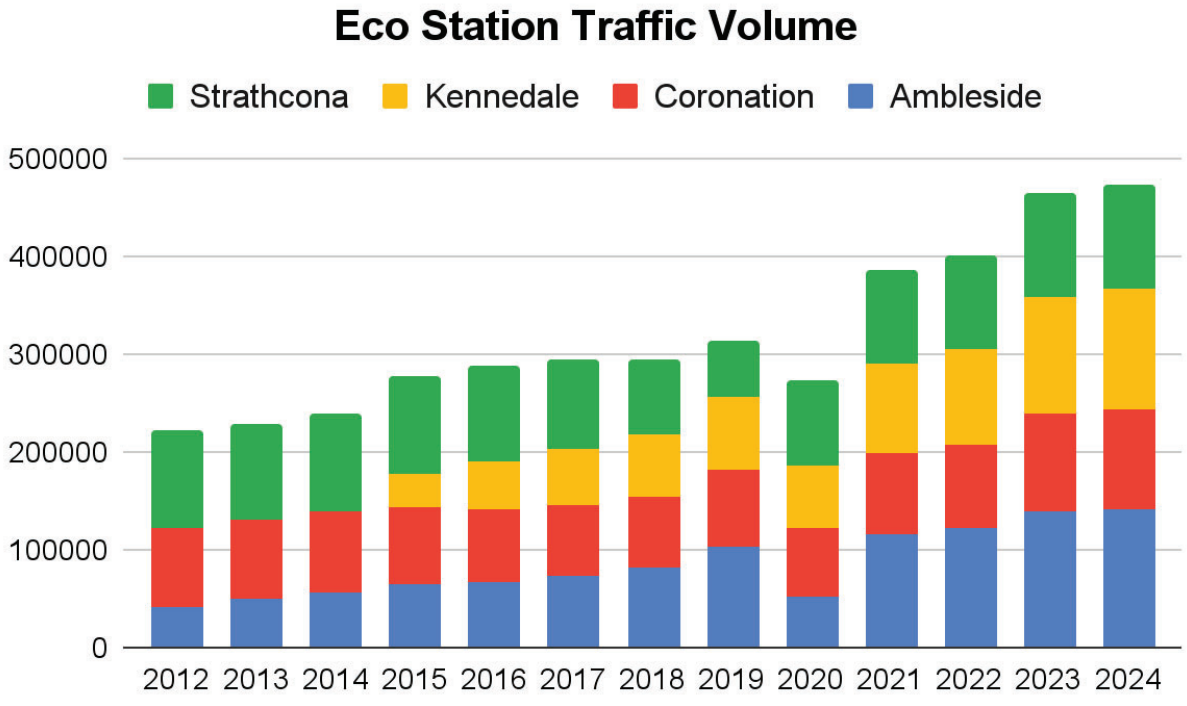


Figure 1. *Annual number of visitors to Eco Stations by vehicle count. Strathcona underwent renovations in 2018 and 2019, while Ambleside was used as a drive-through COVID-19 testing site for approximately four months in 2020.*

Previous studies in the Eco Station program indicate that smaller sites are able to facilitate up to 300 vehicles per day before negatively impacting service levels and safe operating conditions. In 2005 there were 20 days with over 300 cars; in 2013 there were 155 days. During summer Eco Station hours, Coronation now averages 350 cars per day. This increase has resulted in the following issues:

- lineups backing into public roadways (143 Street)
- unloading zones and staging areas consistently occupied during peak times
- safety issues because of congestion and customers unable to enter the site during peak times

5.2. Regulated Extended Producer Responsibility Systems[1]

Extended Producer Responsibility (EPR) shifts the physical and financial burden of collecting, sorting, processing and recycling waste to product producers and away from local governments and taxpayers.

Alberta's new EPR regulation will focus on two systems:

1. Single-use products, packaging and printed paper products (PPP)[2].
2. Hazardous and special products (HSP)[3]

Producers will be fully responsible (financially and operationally) for the collection and management of their designated products after consumer use. Producers will deliver collection services and be liable for achieving performance standards on their respective system, and are able to join or create producer responsibility organizations (PROs) to manage their materials. Producers will also be responsible for educating Albertans on the new systems. Producers are aware of their obligations and the transition to EPR[4].

The EPR regulation came into force on November 30, 2022. The Alberta Recycling Management Authority (ARMA) has been granted new oversight functions. Producers were required to provide verification of collection and management plans to ARMA by April 1, 2024. EPR systems for PPP and HSP will be operational by April 1, 2025.

Waste Services expects minor operational impact to the Eco Station program as a result of EPR implementation. Eco Stations currently collect, sort and dispose of recycling and HSP through the regulated utility program. Upon the City of Edmonton registering as an EPR-participating community, Waste Services has been negotiating with Producer Responsibility Organizations to establish contracts for services provided by the City for recycling and HSP at the Eco Stations.

[1] Information is adapted from the Government of Alberta's Regulated EPR Systems.
[2] Materials from the industrial, commercial and institutional sector are excluded.
[3] Hazardous and special products include batteries, corrosive products, corrosive product containers, flammable products, flammable product containers, pesticides, pesticide containers, toxic products, and toxic product containers limited to consumer sizes typically found in retail stores.
[4] Extended Producer Responsibility Information for Producers and Albertans.

These negotiations have progressed well and EPR compensation is expected to help offset the ongoing utility funding required to operate and maintain the Eco Stations.

6. Alternatives

The recommended exterior and interior concept option was chosen based on operational analysis and has undergone development through the Development Design process, which is presented as the design basis for this alternative. Opportunities to reduce capital investment and save costs on Coronation Eco Station's expansion are included for consideration. A status quo alternative is included as a comparison.

Two alternatives are identified as:

- **Alternative 0: Status quo**
  - No expansion or major improvements.
  - Renewal only based on life cycle management and condition assessment.
  - Operational issues at Coronation Eco Station and strategies to mitigate them, including increased drop-off bin pickups and Big Bin Events, have been ongoing. As these are not sustainable long-term solutions for the facility itself, continued mitigation efforts are not considered to be a viable option.

- **Alternative 1: Expansion of the current Coronation Eco Station**.
  - Alternative concept designs for four exterior site options and two interior options were developed and analyzed.
  - Exterior site expansion into the space in the north parking area of the site and the spur railroad on the west edge, made available from acquisition of the site.
  - Interior design concept options include renovation of the currently vacated second floor of the existing building, and two garage bays (storage warehouse).
  - The resulting site area is 10,528 m^2 and the building area is 1,928 m^2.

Figures 2 and 3 depict the aerial view of the Coronation Eco Station site in 2023 prior to purchasing the EPCOR portion of the site (Figure 2) and after the purchase and amalgamation of the EPCOR area with the Coronation yard (Figure 3). Figure 4 shows the design layout for the proposed expanded Coronation Eco Station.

A high-level comparison of two preferred alternatives is provided in Table 3. The major advantages and disadvantages are shown in Table 4.

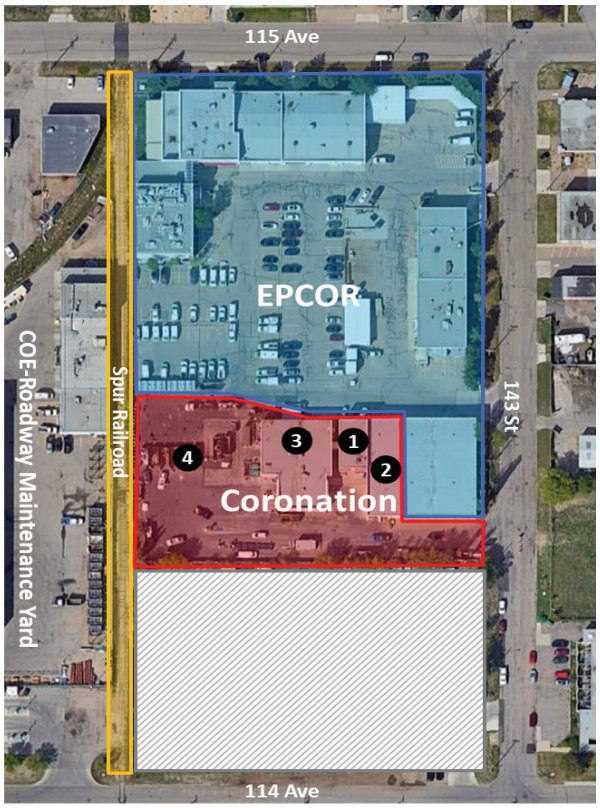


Figure 2: *Coronation Yard Site pre-amalgamation (1: Admin Building, 2: Garage Bay, 3: HHW Handling Building, 4: Drop-off Area).*

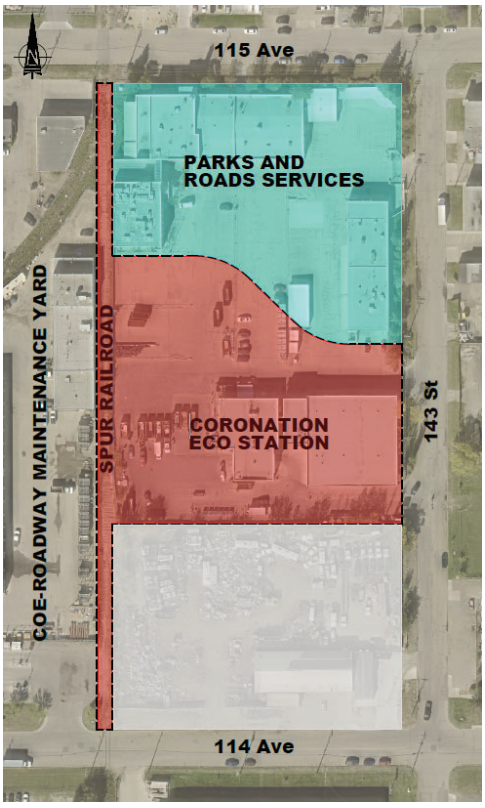


Figure 3: *Coronation Yard Site post-amalgamation.*

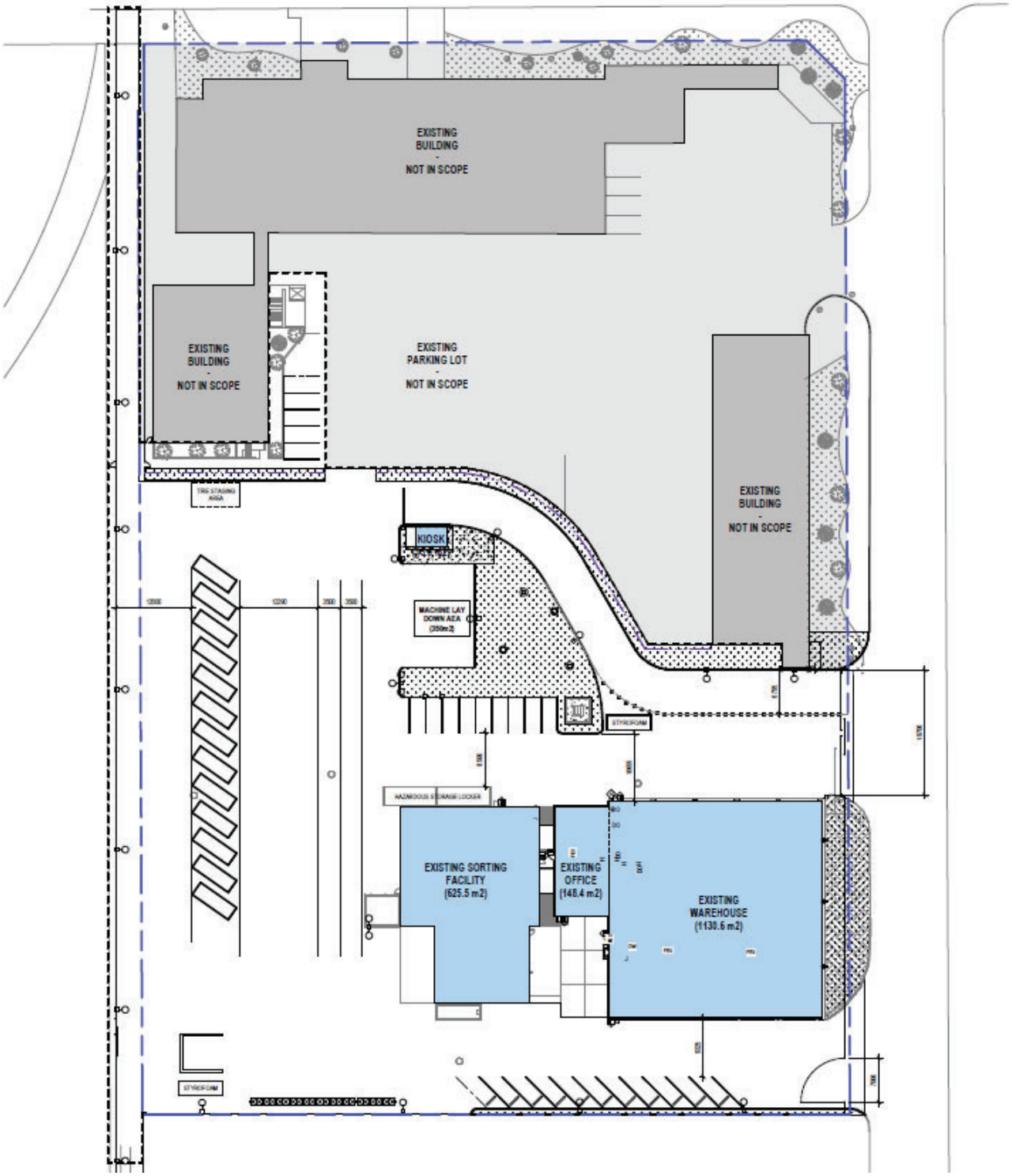


Figure 4. *Development Design layout of the expanded Coronation Eco Station.*

Table 3: *High-level Comparison of Current vs. Expanded Coronation Site.*

Site Features	Current Coronation Site	Expanded Coronation Site	Change from current site
Number of Large Bins	13	18	38%
Recycling Depot Bins	17	17	0%
Compost Distribution Area	No	Yes	Can be included
Reuse Centre (or Area)	No	No	No
Staff Parking Stalls	13	20	54%
Vehicle Lineup Capacity (m)	60	85	42%
Building Area (sq. m)	1,063	1,928	81%
Site Area (sq. m)	6,819	10,053	47%
Hardscape Area[1] (sq. m)	4,550	7,400	63%
Softscape Area[2] (sq. m)	130	981	655%

Notes:
1. Hardscape area: Buildings and paved area or other areas used for operational purposes.
2. Softscape area: Living horticulture on site including mulch, grasses, bushes and other plant life.

Table 4: *Summary of Advantages and Disadvantages of Alternatives.*

Option	Advantages	Disadvantages
Alternative 0: Status Quo	• no immediate capital costs • no operational disruption to Edmontonians • preserves existing service delivery	• service levels continue to be constrained below standard for other Eco Stations • does not address current high safety risks & challenges • does not address current operational and service issues • does not meet future capacity needs • does not strategically align with COE policies • greater likelihood of emergent capital costs to address existing facility deficiencies
Alternative 1: Coronation Expansion	• increased operational space resulting in safer and efficient operation • increased site and queuing capacity that will meet current and future area needs • reduced safety risk resulting from improved operational site and public visitor traffic flow • improved customer experience with shorter processing and wait times during peak hours • current facility is established in the community • majority of current facility deficiencies will be addressed • improves service levels to more comparable levels relative to other existing Eco Stations • extends lifecycle of facility • improved sustainability • less carbon embodied in buildings • strategically aligns with COE policies	• expansion is limited in the future, has some compromises on accessibility • environmental liability and risk associated with the existing Coronation building/site condition may lead to risks if selling or decommissioning existing Coronation Eco Station at end of life • operational and revenue disruption during site renovation

7. Organizational Change Impact

7.1. Stakeholder Impact

Table 5 summarizes the key stakeholders and the change impact of each alternative.

Table 5: *Organizational Change Impact.*

Impact & Description	Alternative 0 Status Quo	Alternative 1 Coronation Expansion
Stakeholder 1: City of Edmonton, Waste Services, Collection Services		
Impact 1: Negative short-term impacts on existing Eco Station Program (facility capacity and operation)	Low	Medium
Impact 2: Negative short-term impacts on revenue	Low	Medium
Impact 3: Positive impacts on Eco Station Program	Low	High
Impact 4: Positive impacts on long-term program revenue	Low	High
Impact 5: Negative long-term impact from operational & service constraints	High	Low
Impact 6: Negative long-term impacts from increased safety risks due to constrained space for operational activities	High	Low
Stakeholder 2: City Council (Internal)		
Impact 1: Review and provide direction and feedback	Low	Low
Stakeholder 3: City Residents (External)		
Impact 1: Negative short-term impact on public	Medium	Medium
Impact 2: Positive impact on improved site safety and reduced queuing and waiting time	Low	High
Stakeholder 4: Business and Operational: Environment & Protected Areas/ARMA (External)		
Impact 1: Impact from permitting and approval	Low	Low

8. Cost Benefits

8.1. Cost Analysis

Table 6 summarizes the preliminary financial analysis comparing the status quo to the site expansion alternative, based on a 40-year life cycle. Total Revenue and Total Operating and Maintenance Costs are calculated based on the change from the status quo.

Table 6: *Financial Comparison of Alternatives ($millions)*

Financial Summary	Alternative 0 - Status Quo	Capital Construction Only Alternative 1 - Coronation Expansion		Comments
	40-Y Analysis	40-Y Analysis	Net Change	
Capital Project Costs				
2023-2024 Land Purchase and Planning & Design (A)	($2.8)	($2.8)	$0	Sunk costs pre-approved under composite profiles (per Section 11.2)
2025-2026 Project Delivery (B)	$0	($13.5)	($13.5)	Proposed budget adjustment
Total Projected Capital (C=A+B)	**($2.8)**	**($16.3)**	**($13.5)**	
Cost Impacts				
2025-2026 Project Delivery (B)	0	($13.5)	($13.5)	Proposed budget adjustment per above
Total Revenues	$58.5	$59.4	$0.9	User fee revenue only
Total Operating and Maintenance Costs	($175.9)	($184.9)	($9.0)	Increase due to additional bin maintenance
Project Net Inflows (Outflows)	**($117.4)**	**($139.0)**	**($21.6)**	
Weighted Average Cost of Capital (WACC) Discount Rate	6.20%	6.20%	6.20%	

Net Present Value based on status quo	**($35.8)**	**($49.6)**	**($13.8)**	

The presented net present value calculations are for information only to show the impacts of the proposed capital budget adjustment compared to the status quo.

As highlighted in this business case, the expansion of the Coronation Eco Station is proposed to address current and future service level needs. Benefits of the expansion are further outlined in Section 3.4 Anticipated Outcomes.

It is important to note that Eco Stations are funded by utility rate revenues. The utility rate revenue required is effectively reduced by the user fees that are collected. The amount of user fees to be charged is a conscious decision as use of Eco Stations for disposal is highly price elastic. Historically, higher user fees being charged at the Eco Stations generally has led to more illegal dumping in and around the City. To maximize proper environmental outcomes, user fee pricing is set accordingly.

Financial Utility Rate Impact

In comparison to status quo, the estimated incremental utility rate impact of Alternative 1's Coronation Eco Station Expansion is outlined below:

Annual Incremental Net Impact ($Millions) 2026-2030 5 year average	
Debt Interest	$(0.65)
Amortization	$(0.30)
Operating & Maintenance	$(0.16)
Revenues	$0.01
Total	**$(1.10)**

Based on the 2025 Waste Services utility monthly rate of $43.95 for a 240L garbage cart, the Coronation Eco Station Expansion would result in a 0.55 per cent increase, or approximately $0.24 per month. For further analysis of the revenue requirement comparison for the alternatives, please refer to Appendix B.

8.2. Cost Assumptions

Alternative 1 - Expansion of Coronation Eco Station

- No incremental operational costs from status quo (except for additional bin maintenance) due to expansion mainly affecting outdoor areas
- No change in personnel
- The Eco Station site will be expanded for traffic flows and increased bin capacity, however, the existing building facility will remain the same square footage, and internal renovation will accommodate larger change rooms and amenities areas.
- Coronation Eco Station expenses will remain the same as the 2024 operating budget
- Additional five bins for larger footprint have been added to internal hauling costs
- Class 3 cost estimate accuracy (-15% to +20%). The Delivery phase funding adjustment of $13.5 million includes the +20 per cent variance.

9. Resourcing

Table 7: *The resource impact during implementation of Coronation Expansion.*

Resource Impact during Implementation	Alternative 1 Coronation Expansion
Waste Services	Medium
Project Management & Maintenance	High
Financial & Corporate Services	Medium
Procurement	Medium

10. Key Risk(s) and Mitigation Strategy

A comprehensive risk register was developed for this initiative, in both the Concept stage and the Planning and Design stage. Risks (prior to the mitigation strategies) and their mitigation strategies are summarized below:

Table 8: *Summary of Major Risks and Mitigation Strategy.*

Event/Risk Factor	Risk Rating (Score)	Mitigation Strategy (Response)
Operational disruption from construction activity.	High	Mitigate - Closure to site for a set period is expected Waste Services. Construction schedule planning to occur between Waste Services and IIS to determine least disruptive schedule, which is closure during low winter period of service demand typically between October and March.
Design contains inadequate or non-compliance to design standards (i.e. Consultant Manual, COE policies).	Medium	Mitigate - Technical reviews conducted by IIS Engineering Services include check for compliance with design standards.
Negative public perception and public access is reduced due to renovation.	Medium	Mitigate - Planned construction closures will be communicated to the public in advance. Alternate locations for residents to drop off waste will be included in communications.
Unplanned additional costs incurred during renovation / construction due to discovery of asbestos and managing potentially contaminated soil from rail right-of-way.	Medium	Mitigate - Recommended plan provided by Environmental Engineering Services is to excavate top 0.5 m of rail right-of-way, treating and disposing of it as potentially contaminated soil. Hazmat investigation in progress with abatement recommendations and estimated cost to be determined. Info to be included as part of the contractor tender package.

11. Conclusion and Recommendations

11.1. Recommendations

The findings from the analyses presented in this business case confirms that expanding the existing Coronation Eco Station provides a worthwhile investment and value to improve services compared to the status quo of not expanding the current site.

Service levels, customer experience, and operational efficiency will increase to levels

comparable with the other Eco Stations in the City while safety risks will decrease. It aligns with the City's sustainability goals and strategic direction, and it serves to address all current service operational constraints and issues identified with the current Coronation Eco Station, which will improve service to residents, reduce vehicle lineups and wait times, enhance worker safety, and fulfill administrative requirements. These goals are accomplished at a total capital investment of $16.3 million, which includes costs already expended on the purchase of land at Coronation Yard and preliminary planning and design.

It is recommended that this full initiative is approved to proceed to the next project phase, the Delivery phase, and that the Delivery phase budget adjustment of $13.5 million is approved. If approved, Waste Services will bring forward the budget adjustment to transfer $13.5 million funding for Delivery at the May 2025 Spring Supplemental Capital Budget Adjustment (SCBA) for City Council approval. Once approved, historical actuals will be administratively transferred to the standalone profile to reflect the full $16.3 million project budget. As the existing budget will be transferred from approved profiles to fund the expansion, no net new capital budget will be requested, as outlined in the following section.

11.2. Capital Profile Funding Transfers

The new standalone profile for the Coronation Eco Station expansion will be funded by transfers from the following approved profiles:

Table 9: *List of Profile Support Funding*

Project Phase	Amount	Supported by Profile
Delivery Phase (Checkpoint #3-5)	$13.5 million	Funding will be transferred from 15-33-2011 Mayfield Eco Station to a standalone profile
2023 Land Purchase from EPCOR	$2.4 million	CM-81-2045 - Waste Services IIS Infrastructure Project Delivery
Develop Phase (Planning and Design, Checkpoint #1-3)	$0.4 million	CM-81-0005 - Waste Services IIS Planning & Design
Total Capital Profile	**$16.3 million**	

11.3. Project Responsibility and Accountability

Waste Services - Business Integration & Technical Services is the project sponsor and Waste Services - Collection Services is the project owner. Integrated Infrastructure Services is the Project Manager to complete the Deliver phase in accordance with all City of Edmonton

policies, with Collection Services and Business Integration & Technical Services providing project support. Project management documentation for this project provides the granular detail for the project team, roles, and responsibilities.

12. Implementation Strategy

Upon approval of this business case, the next implementation stages are as follows:

- Seek SCBA approval for funding transfer from 15-33-2011 Mayfield Eco Station to a standalone profile
- IIS Infrastructure Delivery responsible for project management and leading Delivery Phase of the Coronation Eco Station Expansion project under the newly created standalone profile following the established Project Development and Delivery Model
- IIS Facility Planning Design and Engineering Services and Waste Services to provide project support as needed

13. Review and Approval Process

This Business Case was drafted by the Program Manager/Lead Planning & Design Project Manager in Integrated Infrastructure Services - Facility Planning and Design together with Waste Services representatives (including but not limited to Waste Services Branch Manager's Office, Collection Services, Business Integration & Technical Services, Financial and Corporate Services).

This Business Case will be:

- Reviewed by key project team members
- Circulated for Director review and approval
- Submitted for Waste Services Branch Manager, IIS Branch Managers' review and approval

A Council Report will be:

- Presented to Utility Committee for recommendation to City Council for approval

If approved, a supplemental capital budget adjustment will be brought forward for City Council approval in May 2025 as described in Section 11.1.

14. Appendices

APPENDIX A

Financial Services and Utilities **Waste Management Utility**

Business Case

Northwest Eco Station - Profile 15-33-2011

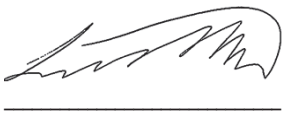
Approvals	Name	Signature	Date
Branch Manager	Leo Girard		09/15/14
Director	Trent Tompkins		09/15/14

Table of Contents

Section 1

Executive Summary

The NW Eco Station Profile # 15-33-2011 provides funding for the construction of an Eco Station in northwest Edmonton to replace the existing Coronation Eco Station.

The completion of this Eco Station supports Waste Management Policy C527, Environmental Policy C512, The Way We Green, The Way We Live, Waste Management Strategic Plan Update 2008, and Waste Management Utility 2015-2018 Business Plan.

There are currently three Eco Stations in operation, with the Kennedale Eco Station expected to be operational in early 2015. The four stations are located as follows:

1. Strathcona Eco Station (South Edmonton) – opened 1995
2. Coronation Eco Station (West Edmonton) – opened 2000
3. Ambleside Eco Station (SW Edmonton) – opened 2009
4. Kennedale Eco Station (NE Edmonton) – opening 2015

Eco Stations provide a drop-off point for residents to safely dispose of household hazardous waste (HHW), recyclables and bulky wastes. HHW that cannot be reused or recycled is sent to Swan Hills Waste Treatment Centre for disposal and general refuse that cannot be reused or recycled is sent to landfill. Reasonable and easy access to an appropriate disposal facility helps to reduce the potential for illegal dumping and helps residents manage their HHW responsibly. Responsible management of HHW helps to keep it out of the garbage stream and maintain compost quality, and protects sanitary and storm sewer water quality.

Given the age of the Coronation Eco Station and the traffic congestion, particularly in the summer months, expansion to the existing site or a new site is required to effectively serve the public.

Alternatives identified in this Business Case include:

Alternative 1: Approve NW Eco
Alternative 2: Renovate or expand on existing site
Alternative 3: Extended hours at existing sites

Following a comprehensive analysis of the options, Alternative 1, approve NW Eco Station is recommended. The opportunity to secure a site that can accommodate Eco Station operations and manage public demand while meeting regulatory compliance is key to improving service levels. With Kennedale Eco Station soon to open it will be prudent to assess the impact on Coronation and determine if construction of the NW Eco Station could be delayed, but the acquisition of an operating site should be completed within the current planning period to mitigate the risk of cost escalation to the Utility.

Section
2 Background

Problem / Opportunity

Operations at the Coronation Eco Station are congested, leading to long wait times and traffic lineups. With increasing population and service demands, redevelopment on a larger site, along with the relocation to the northwest quadrant of the City on a site currently held by Land Enterprise, would offer enhanced services to north and northwest residents. This capital profile seeks to secure the land for Waste Management and funding to facilitate detailed design and further analysis of the program at Coronation.

Current Situation

The Eco Station Program is a second generation program, progressing from the annual 3-day Toxic Round-up Events to permanent drop-off facilities open throughout the year. The program has evolved to capture not only HHW, but also recyclables and bulky waste generated by households. Much of the material received is reused or recycled. HHW materials that cannot be reused or recycled are sent to Swan Hills Waste Treatment Centre for disposal and general refuse that cannot be reused or recycled is sent to landfill.

- 1995 - first Eco Station opened at 99 Street and 51 Avenue (Strathcona)
- 2000 - second Eco Station opened at 143 Street and 114 Avenue (Coronation)
- 2009 - third Eco Station opened in at 14710 Ellerslie Road SW (Ambleside)
- 2015 – Opening of Kennedale Eco Station to serve northeast Edmonton
- 2020 – proposed opening of NW Eco Station

Eco Stations preserve and sustain our environment by providing environmentally sound handling and disposal of HHW. HHW is kept from entering compost, landfills and sewer systems. An average of 5,655 tonnes of HHW is handled annually and sorted into 55 different material streams.

Revenues are generated from tipping fees for disposal of garbage. Tipping fees are not applied to recyclables and HHW. Tipping fees are not set to recover the full cost of the Eco Station Program but rather to encourage the proper disposal of HHW and to reduce littering by facilitating the proper disposal of large waste items at reasonable cost.

The Coronation Eco Station operates on a shared site with Drainage Design and Construction at 143 Street and 114 Avenue owned by Corporate Properties. The site was converted from a transfer station to an Eco Station in 2000 with the addition of the HHW handling building. The site averages 80,000 users per year delivering waste and recyclables while operating within a 1.7 acre footprint.

Operations at the current site are congested, leading to long wait times in the summer and traffic lineups which negatively impact neighbouring businesses and City operations. The current site does not have the space to

offer a Reuse Area, where household items that are still in good condition may be dropped off for reuse by other residents. In addition, space at the site is limited and does not allow for two lane access to more effectively service customers, as implemented at Kennedale and Ambleside.

Section 3

Profile Description

Initiative Description

The construction of an Eco Station in northwest Edmonton to replace the existing Coronation Eco Station will meet the demand for drop-off services for HHW, recycling and bulky waste in the expanding north and northwest areas of the City. This business case establishes the need to expand the current Coronation Eco Station and/or relocate the facility. This preliminary report contains rough estimates for the project based on experience gained through the Ambleside and Kennedale Eco Stations, with funding request in the current 2015-2018 capital budget to secure the land acquisition and provide for detailed design of the facility.

Scope

Timeframe: 2015 to 2020 for planning, land acquisition (if required), design, and construction

Department/Organization: Waste Management Utility

Function: Eco Stations provide a comprehensive drop-off service for household hazardous waste, recycling, bulky waste, and a reuse area with two-lane access.

Technology: N/A

Cost Forecast:

ACTIVITY	ESTIMATED COST ($'000S)
Preliminary Design including Land	$ 6,000
Detailed Design and Construction	13,700
% for Art	100
Total Project Budget	**$19,800**

Out of Scope

- Commercial and industrial hazardous waste
- Decommissioning of the existing Coronation Eco Station

Section 4

Profile Justification

Initiative Justifications

Continued growth in Eco Station use and residential growth in the City exceed the capacity of the Eco Station program. An expanded NW Eco Station will improve service delivery to residents, reduce wait times, enhance worker safety and provide additional services not available at the current Coronation location.

Anticipated Outcomes

Outcome/Deliverable	Estimated Completion
Maintain a high level of customer service	98% satisfaction rating
Manage HHW and bulky item disposal	Increase users by 5% annually as an indicator for appropriate disposal of household hazardous wastes
Recover 30-40% of direct operating costs	After 2 years of operations

Urgency of Need:

The Kennedale Eco Station will open in 2015 to serve the northeast area of the City and is anticipated to temporarily relieve some of the pressure at the Strathcona and Coronation Eco Stations, providing the time necessary for review and study. While both of these Eco Stations require attention, an opportunity to move the solution for the Coronation Eco Station ahead is currently available.

The development of the NW Eco Station is contingent upon securing an appropriate site that meets all regulatory and municipal planning requirements. The City of Edmonton currently has a property that appears to meet all current requirements and is projected to be surplus. Securing this property for the Waste Management Utility allows the Utility to time the actual construction with customer demand over the next few years. In accordance with the City's policy regarding land transfer pricing between the City and Utilities, it is apparent that purchase of the land at this time would limit the risk of future price escalation for the Utility.

Critical Success Factors:

Approval in principle for this capital project by the Utility Committee and City Council will facilitate the land requirement pending further planning and construction. Included in this proposed plan is the payment for the land at fair market value over a four-year period. The City of Edmonton Land Enterprises would have to agree to this payment structure as identified.

Section 5

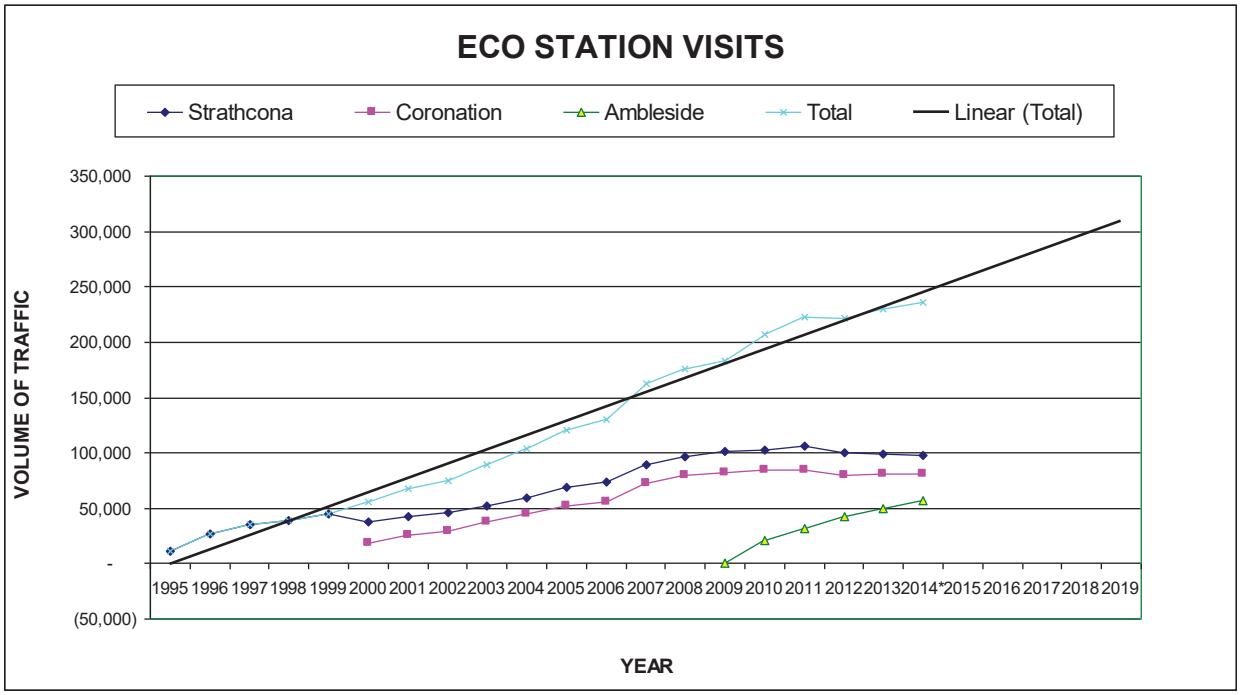
Strategic Alignment

Goal from Business Plan	Level of Impact	Explanation (if required)
City of Edmonton Waste Management Policy C527	High	Four main Corporate Outcomes addressed by the delivery of the NW Eco Station profile are: 1. Edmonton strives to be a leader in environmental advocacy, stewardship, preservation, and conservation. 2. Divert 90% of the residential waste stream from landfill. 3. Divert commercial, institutional, construction and demolition wastes for reuses and recycling. 4. Provide an affordable waste management system.
The Way We Green (Approved by City Council July 2011)	High	**Goal**: Edmonton generates zero waste. **Objective 8.1** The amount of waste generated by Edmontonians on a per capita basis is continually decreasing. **STRATEGIC ACTIONS:** The City of Edmonton: 8.1.1 Uses incentives, education and partnerships to increase Edmontonians' participation in waste reduction through grasscycling, composting, reuse and consumption habits. 8.1.3 Uses incentive, education and partnerships to increase the non-residential sector's participation in waste reduction.
The Way We Green (Approved by City Council July 2011)	High	**Goal**: Edmonton generates zero waste. **Objective 8.2** Edmonton's residential and non-residential waste is diverted from landfill. **STRATEGIC ACTIONS:** The City of Edmonton: 8.2.1 Establishes, implements, and maintains a Solid Waste Management Strategy aimed at diverting residential and non-residential waste from landfill and reducing the amount of waste that is produced by Edmontonians. 8.2.4 Provides collection and processing services to businesses to influence the private sector waste companies to recycle more non-residential waste.

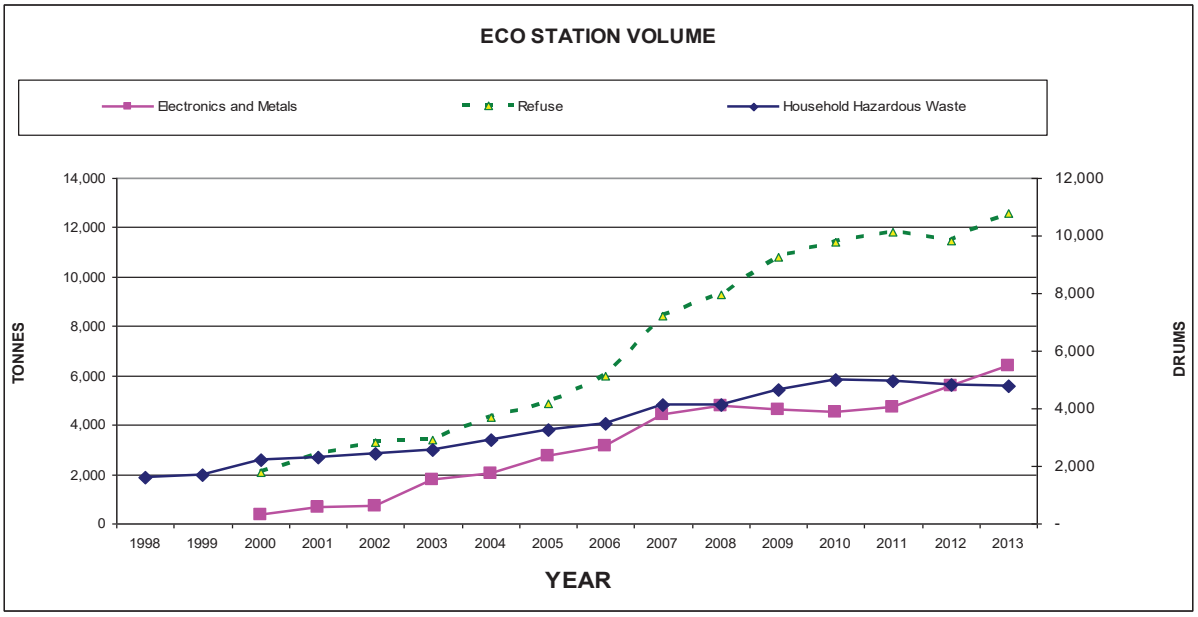
Goal from Business Plan	Level of Impact	Explanation (if required)
Waste Management Utility 2015 - 2018 Business Plan	High	**Strategic Goal**: 2. Process waste to recover resources and increase diversion rates for both residential and non-residential waste. 5. Engage the citizens of Edmonton and facilitate their full participation in waste reduction, reuse and recycling.
The Way We Live (Approved by City Council 2010)	Medium	**Goal 6**: Edmonton is a sustainable city **Objective 6.2** The City of Edmonton is an environmentally sustainable society. **STRATEGIC POLICY DIRECTIONS**: The City of Edmonton 6.2.4 Builds on the City's leadership role in environmental best practices.
City of Edmonton Environmental Policy C512	Low	The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services, based on its commitment to: (a) prevent pollution, (b) continually improve its environmental performance by setting and reviewing environmental objectives and targets, and (c) meet or exceed applicable environmental legal requirements and other requirements to which it subscribes.
Waste Management Utility Fiscal Policy C558	High	The Utility is to be operated in a manner that balances the desire to provide the best service at the lowest cost (public utility) while employing private sector approaches to encourage innovation and using a cost structure that sends the proper price signal to the customers(private utility).

Section 6 Context Analysis / Environmental Scan

The Eco Station program is unique in its operation and service model. Traffic has grown significantly, reaching two million customers (since 1995) in 2013. With this success has come increased volume and demand for services.



The customer growth forecast is based on a linear growth pattern, although the City is currently experiencing a faster growth rate. The next graph breaks down the material volume received through the Eco Station Program.



The traffic volume graph demonstrates that the Strathcona (1.8 acres) and Coronation (1.7 acres) Eco Stations have been operating beyond capacity for several years. Customer visits to these Eco Stations have increased from 55,782 in 2000 to 180,000 in 2013 and levelled off since, as the physical capacities of these sites are reached. Previous studies in the Eco Station program indicate that smaller sites are able to facilitate up to 300 vehicles per day before negatively impacting service levels and safe operating conditions. In 2005 there were 20 days with over 300 cars; in 2013 there were 155 days. The period from May through November now averages 350 cars per day. This increase has resulted in the following issues:

- customer visits increase from an average 15 minutes to 35 minutes
- lineups backing into public roadways
- unloading zones and staging areas consistently occupied during peak times
- safety issues because of congestion and customers unable to enter site during peak times

To improve safety and customer service, the following have been implemented:

- restructuring and increasing operational hours during peak periods
- increasing on-site labour resources to address additional volume and materials
- revising site layout to maximize disposal area
- requesting contractors to provide after-hours services
- redirecting traffic to Ambleside Eco Station or the EWMC.

The Ambleside (9.6 acres) and Kennedale (10.0 acres) Eco Stations reflect the current model of service delivery that optimizes convenience and safety, and promotes waste diversion through the Reuse Area. The increased operating area provides:

- improved vehicle movement and more efficient operations in a safer environment for both customers and staff
- two entrance kiosks to relieve congestion during peak time, with the ability to line up to 25 vehicles on-site
- the ability to handle increased maximum vehicle size of up to 3 tonnes and trailers
- a reuse area for household and larger items
- an unloading area that allows for more bins and a greater variety of material separation to reduce processing and disposal costs (yard waste/construction and demolition material/refuse).
- space to process appliances with freon and fluorescent bulbs to reduce contract costs and generate revenue
- integrated operations with other City services to provide one stop service
- staging areas for other section operations such as multi-family containers
- ability to operate specialized waste handling equipment to maximize roll-off load weight and reduce hauling contract expenses.

The Waste Management Utility attempted to purchase adjacent property to the Coronation site in 2011; however, after negotiations and a phase 1 environmental assessment it was rejected because the property would require significant remediation and represented an unknown liability to the City.

Section 7 Alternatives

Option Description	Advantages	Disadvantages	Further Consideration
1. Approve NW Eco Station relocation.	Enhanced services and improved operating conditions for staff and residents	Additional capital expense versus existing operation	Yes
2. Renovate existing Coronation site	Does not require land purchase, current location is well recognized, albeit congested	Does not address existing or future traffic and space issues	Yes
3. Increase operating hours to accommodate user demand	Utilizes existing infrastructure, reduced capital requirement	Increases operating costs, does not address site issues or negative traffic impacts	Partially implemented but does not address operating space
4. Do nothing	Maintain current operating and capital expense	Negatively impacts customer service and safe operations. Potentially increased disposal of hazardous waste mixed with household wastes	No, actions are required to improve current operating conditions
5. Increase Big Bin Events to manage materials	No additional capital required, local services	Cannot accept HHW, limited locations that can safely accommodate program. Locations are typically private property and not consistent.	No, Big bins are a complementary program, not a replacement.
Open additional NW location	Enhanced services to residents, reduces delay time, improved access	Additional operating and debt servicing costs	Not at this time

To further investigate the options identified in Section 7, the Waste Management Utility considered **three short list alternatives:**

Alternative 1: Approve the relocation and expansion of the NW Eco Station in principle
Alternative 2: Renovate Existing site
Alternative 3: Increase operating hours

Discussion on Alternative Review:

Alternative 1: Approve

Implementing this alternative would mean that the Waste Management Utility would secure a suitable site that is currently held by Land Enterprise and plan for future construction to coincide with projected customer growth.

Alternative 2: Renovate Existing Site

Waste Management Utility is not the owner of the Coronation site and is operating the building through rent payments to the City. Renovating the existing site will likely require significant changes/demolition of the existing building (with multiple tenants) and will likely trigger the request for the Utility to purchase the site prior to renovation. While this option can improve some of the efficiency, it remains significantly undersized for the current program delivery model.

Alternative 3: Increase Operating hours.

This option involves increasing the weekly operating hours to distribute traffic volume. Currently, during peak periods, the Station increases operations from 40 hours per week to 60 hours per week (based on 6-day operation). There is a possibility to increase to 70 hours per week by operating on Sunday as well. While this option can increase the volume of traffic assuming customer visits are distributed, it does not provide the enhanced benefits noted earlier for a larger site.

Section 8 Organizational Change Impacts

The table below lists the key stakeholders and the impacts the service has on these stakeholders.

Impact & Description	Alternative 1 (NW Eco)	Alternative 2 (Renovate)	Alternative 3 (Operating Hours)
Stakeholder 1: City of Edmonton Waste Management Utility (Internal/External)			
Impact 1 – Increase in operating costs for existing services	Yes	Yes	Yes
Impact 2 – Negative impacts on existing Eco Station Program	No	No	No
Impact 3 – Increased source segregated recyclables for waste diversion instead of landfill mixed wastes	Yes	No	No
Stakeholder 2: City Council (Internal)			
Impact 1 – Provide direction and feedback to residents	Low	Medium	Medium
Stakeholder 3: City Residents			
Impact 1 – Reduced wait times and delays	Yes	Minimal	Minimal
Business and Operational: Transportation Operations (Internal)			
Impact 1 – Resources expended to collect improperly disposed waste items along City roadways	Low	Medium	Medium
Business and Operational: Alberta Environment/Alberta Recycling Management Authority (External)			
Impact 1 – Funding for HHW disposal and E-waste	No	No	No

From an Organizational Change Impact perspective, Alternative 1 (construction of a new NW Eco Station) has the potential to offer the highest level of positive impacts as follows:

- provides source segregation for the Utility, increasing diversion rate
- improved customer service by reducing wait time
- provides the potential reduction for waste items left along city roadways
- potential reduction in hauling costs to Ryley as a greater amount of waste is diverted from landfill.

Section 9

Cost/Benefit Analysis

The following table summarizes the financial analysis of the alternatives from a preliminary perspective, using design and construction cost experiences from the Ambleside and Kennedale Eco Station. If the project is approved in principle, the Waste Management Utility will secure the land and proceed with preliminary design and costing, and a more in-depth financial analysis will be performed to finalize project scope and costing.

The 2014 operating budget at Coronation Eco Station is $1,820,196. The financial review of alternatives compares estimated additional operating impacts.

Assumptions:

1 No inflation has been applied to costs based on actual year in which it is expended.
2 The site is acquired at current fair market value, with payment terms over 4 years.
3 The cash required to fund the balance of the capital costs will be through Retained Earnings in future years.
4 Potential cost savings through increased diversion and reudction in distant hauling has not been included.

	Alternative 1	Alternative 2	Alternative 3
Capital costs	19,800	7,800	-
Financing	(7,800)	(7,800)	-
Cash Required in 2019-2020	12,000	-	-
Annual Interest & Principle	560	560	-
Annual Depreciation	690	330	-
[1]Change in additional FTEs	240	100	500
Change in operating costs	150	70	10
Less: change in revenues	(700)	(200)	-
Net Cost of Operations (annual)	940	860	510
Estimated # of customers served	150,000	100,000	80,000

[1] Assumes that if hours were extended to Coronation, it would need to be extended to all sites.

Financial Evaluation of Alternatives

While Alternative 1 has the highest net cost of operations on an annual basis, it also has the highest number of potential customers served. If these projections hold true, the incremental cost per customer for option 1 is actually the lowest among the three alternatives. Alternative 3 has the lowest financial impact and may be implemented as customer demand increases but does not provide the benefits of additional working area, material separation, safety and reuse options a larger site can provide.

Section
10 Resourcing

The following table summarizes the resource demand during implementation of the different alternatives.

Resource Impact during Implementation

	Alternative 1	Alternative 2	Alternative 3
Waste Management Staff	Medium	Medium	Low
Project Management & Maintenance	High	High	None
Financial Services Staff	Medium	Medium	Low
Procurement Staff	High	High	None

Section 11 Key Risks and Mitigating Strategies

The risks and mitigating strategies for alternatives are summarized below:

Project Risk Assessment	Alternative 1 (Approve NW Eco)		Alternative 2 (Renovate)		Alternative 3 (Extend Hours)	
	Probability	**Impact**	**Probability**	**Impact**	**Probability**	**Impact**
Risk 1- Land costs could escalate	Medium	Low	Medium	High	Medium	Low
Risk 1 General Mitigation Strategy	*Work with Land Enterprises to accurately assess and possibly secure property as early as possible to guarantee cost*					
Risk 2 – Development/construction costs could escalate	Medium	Medium	Low	Medium	Medium	Low
Risk 2 General Mitigation Strategy	*Use appropriate project management strategies to control costs as well as consider extended operation at existing site*					
Risk 3 – Alberta Environment declines Industrial Approval Application	Low	Low	Low	Medium	Low	Low
Risk 3 General Mitigation Strategy	*Work with regulator and site neighbours to address operating concerns or direct impacts*					

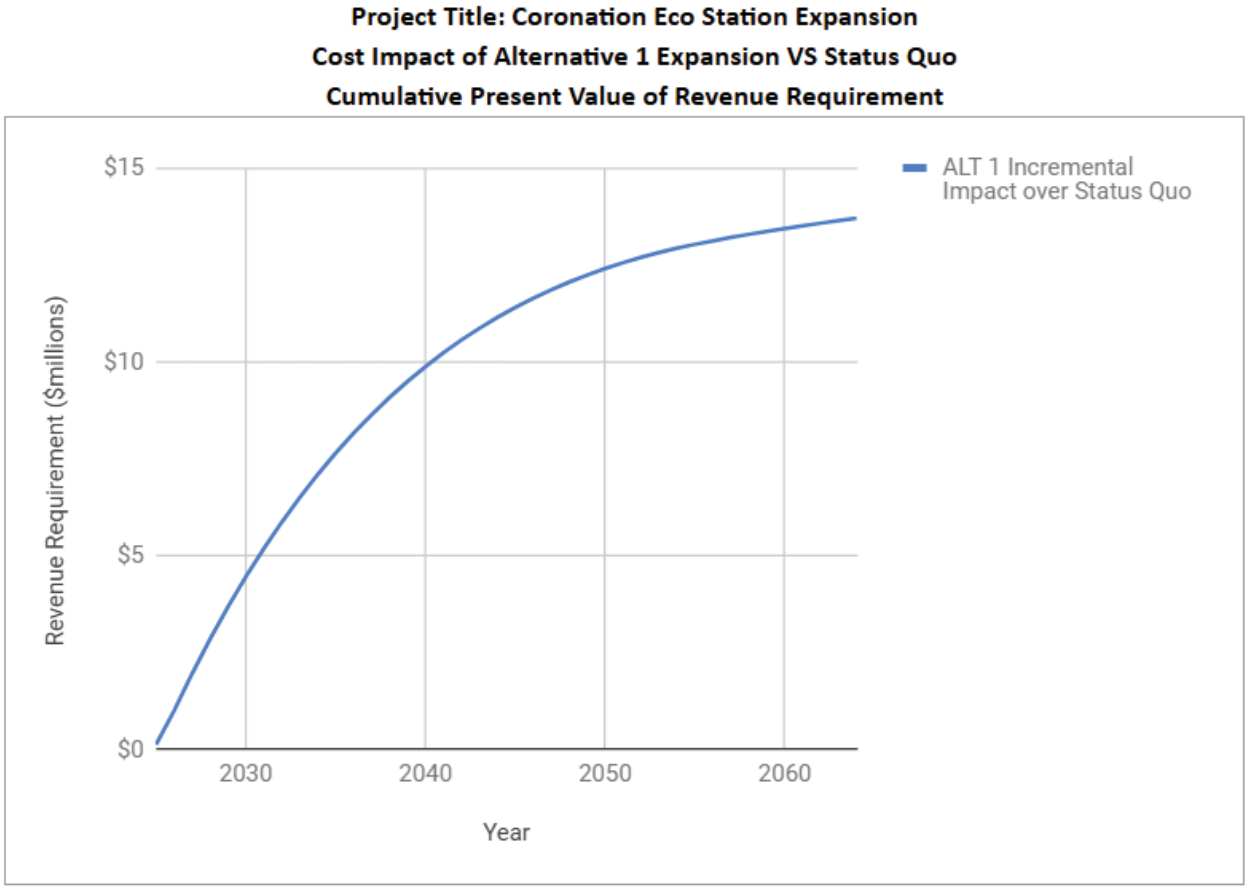
Section 12 Conclusions & Recommendations

Based on the preceding analyses, Alternative 1, approval in principle of the NW Eco Station is recommended. The opportunity to secure a site that can accommodate Eco Station operations and manage public demand while meeting regulatory compliance is key to improving service levels. With Kennedale Eco Station soon to open it will be prudent to assess the impact to Coronation and determine if construction of the NW Eco Station could be delayed, but the acquisition of an operating site should be completed within the current planning period.

Appendix B: Financial Utility Revenue Requirement

The following graph and table demonstrate the cumulative present value of the additional revenues that must be realized through annual rate collection to support the site expansion. This includes additional net Operating & Maintenance costs, interest and amortization expenses over the project lifecycle, which are included in the Revenue Requirement.

Alternative 0, status quo, would be the horizontal base line at $0, whereas the Alternative 1 investment results in a total incremental Revenue Requirement collection from utility ratepayers of $13.7 million over a 40-year period (in 2025 dollars).



Cumulative Present Value of Revenue Requirement

		Alternatives
Year	Calendar Year	ALT 1 Incremental Impact over Status Quo
1	2025	$0.1
2	2026	$1.0
3	2027	$2.0
4	2028	$2.8
5	2029	$3.7
6	2030	$4.5
7	2031	$5.2
8	2032	$5.9
9	2033	$6.5
10	2034	$7.1
11	2035	$7.6
12	2036	$8.2
13	2037	$8.6
14	2038	$9.1
15	2039	$9.5
16	2040	$9.9
17	2041	$10.2
18	2042	$10.6
19	2043	$10.9
20	2044	$11.1
21	2045	$11.4
22	2046	$11.6
23	2047	$11.9
24	2048	$12.1
25	2049	$12.2
26	2050	$12.4
27	2051	$12.6
28	2052	$12.7
29	2053	$12.8
30	2054	$12.9
31	2055	$13.0
32	2056	$13.1
33	2057	$13.2
34	2058	$13.3
35	2059	$13.4
36	2060	$13.4
37	2061	$13.5
38	2062	$13.6
39	2063	$13.6
40	2064	$13.7

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Landfill Gas (LFG) to Renewable Natural Gas (RNG) Business Case

City Operations | Waste Services

City of Edmonton

Capital Profile: 22-81-2053 Landfill Gas to Renewable Natural Gas

Project Owner: Ellen Tian

Project Sponsor: Michael Labrecque

Version #: 2.0

Date published: February 5, 2021

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1. Executive Summary

In accordance with Section 4.8 of the *Environmental Protection and Enhancement Act* Approval #47140-02-00, Waste Services (WS) is obligated to manage environmental liabilities associated with Landfill Gas (LFG) generated through decomposition of the organic waste at the Clover Bar Landfill. Since 2005, the LFG has been managed by Capital Power (CP) through an existing agreement that expires in 2024. This agreement allows Capital Power to convert the collected LFG to electricity and sell it on the energy market for its own benefit, and share 30% of the greenhouse gas credit with the City of Edmonton. It is estimated that the LFG generated will be of sufficient quality and quantity to allow it to be used as a commodity until at least 2048.

In 2018, WS initiated an internal review of the LFG management practice and systems. The existing LFG collection system was found to be significantly deteriorated and in need of a substantial upgrade to meet the minimum environmental obligation of flaring the gas until 2048. The cost of the upgrade was estimated to be $7.3 million which is part of the closure activities required to fulfill the environmental obligations. In 2019 the Clover Bar Landfill Closure Liability Fund was increased accordingly to meet all the identified deficiencies.

A feasibility study confirmed that among all market ready technologies, upgrading the LFG to Renewable Natural Gas (RNG) and selling it as a commodity was the most viable option. The technology is well-established with low construction and operational risks. The project was therefore initiated and included in the current WS capital program.

Subsequently, in late 2019, Emissions Reduction Alberta (ERA) introduced a "Natural Gas Challenge" grant competition. WS embraced this opportunity, using the LFG to RNG project, and successfully secured a $10 million grant in Spring 2020, which included a condition that the City partners with CP to jointly construct and operate the facility. To ensure financial viability for all Edmontonians, WS worked with a consultant to develop project financial and risk modelling to evaluate options with or without a partnership with Capital Power. In total, 30 scenarios were modeled. Of these scenarios, the top three underwent further detailed analysis and comparison in this business case.

As a result of the detailed analysis, Waste Services recommends Alternative 2 be approved for capital funding. Alternative 2 is a shared ownership model for the LFG to RNG initiative. The ownership of the entire upgrader would be split between Capital Power and the City. This alternative has the following key impacts:

- Total capital funding requirement: $2.7 million
- Estimated project NPV: $18.1 million
- Estimated project completion date: 2023

2. Background

2.1. Current Situation

Waste Services (WS) owns and manages the environmental liabilities associated with the Clover Bar Class II Landfill (CBLF) under the *Environmental Protection and Enhancement Act* Approval #47140-02-00 (Approval). The CBLF was developed in 1978 and reached full capacity and was closed in August, 2009. Pursuant to the *Alberta Environmental Protection and Enhancement Act*, the Utility is required to fund the closure of its landfill site and provide for post-closure care of the site. Closure and post-closure activities include the final clay cover, landscaping, surface and groundwater monitoring, leachate control, landfill gas management and visual inspection. The minimum period for post-closure care is 25 years and the landfill closure and post-closure care plans are based on engineering assessment of current ground conditions, leachate levels, geology, and various other environmental and regulatory conditions. The level of landfill gas has been modeled in Figure 1 below:

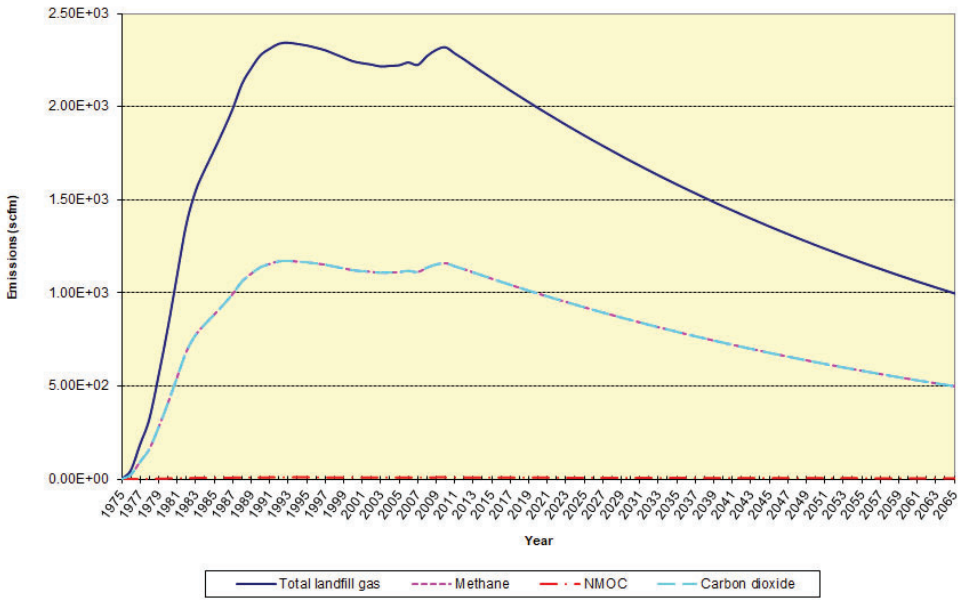


Figure 1. Landfill Gas Production Prediction

A landfill gas collection system has been in place since 1992, and is currently owned and managed by Capital Power under a collaboration contract, until 2024. To prepare for the City to take back control of the LFG obligation and management as soon as the existing contract expires, WS completed a condition assessment, which confirmed that the system requires complete upgrades in order to meet the minimum environmental obligations under the

Environmental Protection and Enhancement Act. This means the City will need to invest $7.3 million to upgrade the landfill gas collection as well as the flare system, by 2024. This work has been captured in the Clover Bar Landfill Liability, through an increase to the landfill liability in 2019.

Under the current operational conditions, the landfill gas collection system also generates greenhouse gas (GHG) offset compliance credits. The GHG offset credit agreement with CP (different from the collaboration agreement) is valid until August 2023. GHG offset compliance credits are those that have been generated and quantified by voluntary project developer under Technology Innovation and Emissions Reduction (TIER) regulation using Alberta-approved methodologies called quantification protocols, and subsequently verified by a third party in accordance with the Standards for Validation, Verification and Audit.

2.2. Opportunity

The technology to convert LFG to renewable natural gas (RNG) is mature as evidenced by many successful projects fully operational globally (please see USEPA RNG Project Map[1]) . The government commitment to greenhouse gas emission reduction has created a high demand on the "green" energy market. The demand has been further enhanced by more and more responsible energy consumers who voluntarily purchase green energy. To fully leverage City owned LFG resource and invest in a capital project that generates revenue creates a unique investment opportunity that also fits well with the City's strategic direction.

The expiration of the existing contractual agreements in 2024, along with the expiry of the GHG compliance offset credit agreement in 2023, results in an opportunity to improve the beneficial use of the landfill gas post 2024 while continuing to manage the environmental liability associated with the approval to operate CBLF. In the spring of 2020, Waste Services secured a $10 million grant from Emissions Reduction Alberta (ERA) to upgrade the LFG to renewable natural gas. A key stipulation of the $10 million grant is for the City to partner with the current LFG collection system operator, Capital Power.

RNG is a form of non-fossil carbon-neutral energy that is interchangeable with conventional natural gas, can be injected into the natural gas distribution system, and reduces the amount of conventional natural gas by replacing it with gas from a renewable source. From a recent engineering study by Jacobs (2018) on the quantity and flow rate of available LFG, it is estimated that the CBLF could produce an average of 245,000 GJ per year of RNG, for at least another 20 years (Fig 1). Based on expectations of the RNG market, this opportunity will add annual revenue to the Utility of $3 million. An overview of the RNG market can be found in section 5, Context Analysis.

[1] https://www.epa.gov/lmop/renewable-natural-gas#rngmap

3. Initiative Description

3.1. Initiative Description

The Landfill Gas to Renewable Natural Gas Project (Project) was developed to look for environmentally sustainable and financially attractive solutions for post-2024 LFG management. The proposed initiative focuses on LFG to RNG upgrade. Fulfillment of this initiative will require the construction of RNG upgrading infrastructure for generation and interjection of RNG into the natural gas network. This project will be the first-of-its-kind project in Alberta to upgrade the LFG to RNG and sell the RNG as a commodity to the local, provincial and/or national market.

While there are several market-ready technologies available for the upgrading of LFG to RNG, this project will use the pressure swing adsorption method for the following reasons:

1. It is proven, mature and reliable;
2. It demonstrates high conversion yield (up to 98% of methane is conserved during LFG to RNG conversion);
3. It is well suited for the quality of LFG found in Clover Bar Landfill;
4. It has a lower life cycle cost when compared to other existing upgrading technologies; and
5. It generates low residual waste by-products which are mostly inert in nature (spent adsorbing media).

A simplified process flow diagram exhibiting this initiative is presented below.

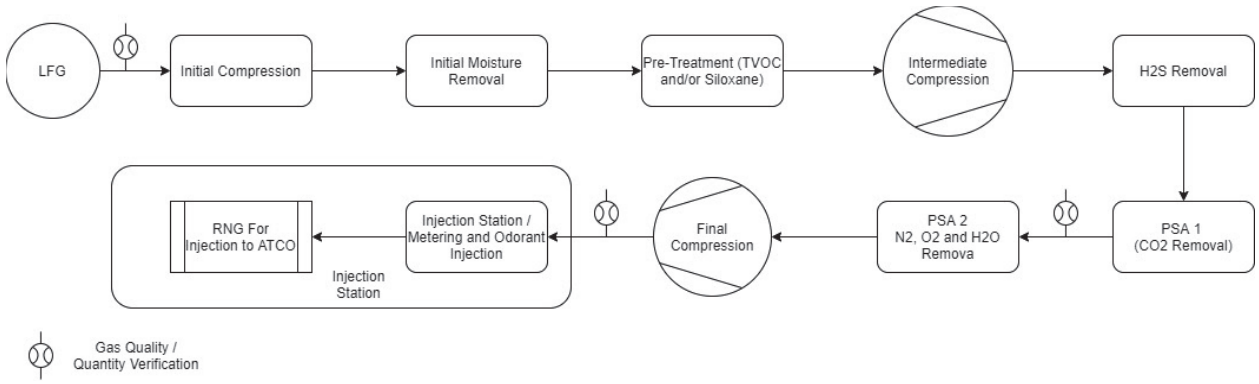


Figure 2. LFG to RNG Conversion Flow Diagram

Collected LFG is directed to a gas conditioning system where major impurities such as water, siloxane, ammonia, and H_2S are removed from the stream. Conditioned gas is then fed into a pressure swing adsorption (PSA) upgrading unit consisting of a series of vertical towers where

one-half of the towers operate at high pressure and the other half operate at low pressure. These vessels are connected by a complex network of piping and valves to switch the gas flow between the towers. Each tower is filled with an adsorption medium through which the gas permeates. As the gas flows from one vessel to another one, it swings from a high to a low-pressure environment. When in a high-pressure environment the CO_2 and the other impurities are adsorbed and then released to the ambient at low pressure. The exit gas stream is at least 95% clean methane in its composition that is suitable for use as RNG. Gaseous impurities such as ammonia and H_2S are adsorbed on adsorption media. Condensate is collected and disposed of at the Wastewater Treatment Plant, or equivalent licensed facility. Adsorption media when enriched is replaced with the old media being regenerated or disposed of at a licensed facility (typically class 2 landfill).

The entire LFG to RNG upgrading system comes pre-fabricated. A footprint of a typical LFG to RNG upgrading facility is approximately 3,600 m^2. Within this footprint, there are both (i) LFG conditioning and removal of impurities module (ii) a module for LFG upgrading to produce RNG of pipeline quality, (iii) a flare, and (iv) injection station. Appropriate land meeting these requirements has been identified at the Edmonton Waste Management Centre (EWMC) along with adequate utility supplies.

3.2. Urgency of Need

The following major activity deadlines presented below influence the urgency of this initiative:

Activity	**Due Date**
Execution of contribution agreement with ERA	March 2021
CBLF closure (start)	May 2021
LFG collection system and flare construction (start)	September 2021
LFG to RNG project completion	September 2023
CBLF closure (end)	December 2023
Expiration of existing LFG management arrangement between WS and CP	September 2024

Over the next three years, there will be major activities around CBLF with a direct influence on this Project. The first is the final closure of the landfill and its transition into post-closure monitoring and management. The construction of closure activities is slated for the second

quarter of 2021. Concurrent construction of collection system upgrades is planned as it will result in reduced cost of this undertaking by eliminating repetitive ground disturbance works as well as double payment for mobilization and demobilization activities.

Furthermore, the $10 million grant provided by Emissions Reduction Alberta requires the grant holder to implement the project before September 2023, which is three years from the date of the grant award. Any extension to this schedule may jeopardize the receipt of the grant which is a significant offset to overall project costs.

Finally, the existing LFG management arrangement with Capital Power will last until August 2024 after which the control over LFG will be transferred to Waste Services. Although WS has the first right of refusal to purchase the existing LFG management infrastructure, it is not known what the fair price of that infrastructure would be. Also, the feasibility of purchasing this infrastructure is questionable given its condition and required minimum time horizon for its post-closure liability service.

Starting the planning, design and upgrading of the landfill gas collection system, and a flare station are mandatory activities in order to meet the minimum regulatory requirement. Also to embrace the opportunity to convert the collected landfill gas to renewable natural gas and sell it on the market as a commodity will give the project significant financial benefits.

3.3. Anticipated Outcomes

The anticipated outcomes of this project, with the assumption that all milestones will be achieved on time to commission the LFG to the RNG facility, are:

- A fully functional LFG to RNG upgrading facility with the capacity to convert 1,700 m^3/hr of LFG to 850 m^3/hr of highly demanded RNG that can be consumed locally, provincially, and nationally and used to offset fossil fuel demand;
- Positive environmental stewardship in the abatement of GHG emissions; and
- Greater return on investment at a lower carbon footprint.

3.4. Scope

The following are in-scope for the project:

- Project development (pre-design):
    - Review and evaluate project partnership opportunities;
    - Secure approvals and funding, execute partnership agreement to meet the funding condition;
    - Complete LFG resource assessment (LFG characterization).

- Design, permits, and approvals:
    - Design LFG collection and conveyance system with the goal to recover 75% of theoretically generated LFG and in accordance with LFG resource assessment
    - Design high efficiency enclosed flare compound and tie in of collection system to the flare
    - Design RNG upgrading technology based on qualitative and quantitative characteristics of the LFG
    - Complete hazard and operability study
    - Secure local, provincial, and federal permits (as applicable) and approvals for each design
    - Prepare the tender package for each design
    - Negotiate off-take agreement

- Construction:
    - Construction of LFG collection and conveyance system
        - Replacement of all existing low or no flow vertical wells
        - Installation of additional wells to cover the entire landfill
        - Replacement of wellheads to enable future wellfield balancing
        - Landscape restoration
    - Construction of high-efficiency flare compound
        - Construction of LFG conditioning infrastructure
        - Construction of LFG blower station
        - Construction of flare pad
        - Installation of Flare
        - Tie-in of LFG collection field to Flare
    - Construction of LFG to RNG upgrader
        - Procurement of LFG to RNG upgrader
        - installation of LFG to RNG upgrader
        - Tie-in of LFG to RNG upgrader to Flare

- Commissioning:
    - Commissioning of collection system and the Flare
    - Commissioning of LFG to RNG upgrader

3.5. Out of Scope

Items that are specifically excluded from the initiative are:

- Design, construction, and commissioning of RNG injection station and compound
- Tie-in of RNG injection station to LFG to RNG upgrader
- Operation and maintenance of RNG injection station

With the RNG injection station being a regulated facility it will be designed, constructed, owned, and operated by ATCO as part of natural gas distribution and transmission system infrastructure. Waste Services is working closely with ATCO to ensure the RNG injection station is completed as required for this project.

3.6. Critical Success Factors

Critical success factors include:

- Design and construct an effective and efficient system for collection of LFG and its upgrading to RNG
- Ensure that the project achieves its technical and environmental objectives
- Maximize the economic benefits to the City of Edmonton
- Minimize or control the environmental liability risk
- Execute the project on schedule
- Ensure that all stakeholders' interest and concerns are considered and addressed

The following list identifies items that contribute to the successful realization of the initiative, along with their respective success measures for this project.

Deliverable	Acceptance Criteria
Capital Funding Request & Partnership Agreement Approval	Recommendation approved by the Utility Committee and City Council on the capital funding of the LFG to RNG project and the partnership agreement with CP and ERA. **Outcome**: Pending Utility Committee and City Council's approval of the Capital Funding Request & Partnership Agreement Approval
Partnership Agreement Signed	WS and CP sign an official partnership agreement to build the new LFG to the RNG facility. WS and ERA sign contribution agreement **Outcome:** Able to begin project development of the LFG to RNG facility.

Design, permits and approvals developed	Procure the professional services to design the LFG collection system upgrade, flare compound, and LFG to RNG Upgrader either by WS, CP or jointly. Concurrently WS and CP engage with local, provincial, and federal regulators to secure permits (e.g. building permit) and approvals (e.g. River Valley Bylaw, Environmental Protection and Enhancement Act). **Outcome:** Complete engineering design package with drawings and specifications with approvals, permits, and registrations in place ready for the procurement of construction services. Procurement of LFG to RNG upgrading technology
Construction	Procure construction services to complete the construction of the LFG collection system, flare compound, and assemble the LFG to RNG upgrader either by WS, CP or jointly. Coordination with the in-flight landfill closure and capping project led by IIS. ATCO completes the construction of the RNG injection station. **Outcome:** Completed on time and on budget construction of the LFG collection system and flare compound. LFG to RNG upgrader is delivered on-site and assembled in its compound. ATCO completes the construction of the RNG injection station.
Off-take agreement secured	WS engages with a professional broker to find the best price for its 70% share of generated RNG and locks into an off-take agreement as appropriate. **Outcome:** All terms and conditions of the off-take agreement are reviewed and accepted by WS and the buyer. The off-take agreement is executed.

4. Strategic Alignment

Waste Services Business Plan 2021-2024

Consistent and Stable Rates

Waste Services' 2021 Rate Filing indicates a 0% rate increase over the next two years. Moving beyond 2023, Waste Services will continue to deliver on the high diversion policy while maintaining consistent and stable rates. Strategic initiatives needed to increase waste diversion will increase costs, over and above the cost of landfilling. In order to convert on the Utility's policy objective of maintaining consistent and stable rates alternate revenue sources are required.

Waste Services has started shaping a strategy to monetize waste byproducts and optimize assets to generate revenue. More recent developments and future expectations in the Renewable Natural Gas market have created opportunities. Waste Services is in a position to leverage through the output of the Clover Bar Landfill as well as the Anaerobic Digester, scheduled to be operational in Q2 2021. While maintaining a low risk profile, this initiative is projected to generate net revenue to the Utility which will deliver against the goal of maintaining consistent and stable rates. The recommended alternative is expected to reduce overall utility rate increases by approximately 1% starting in 2025.

Environmental Management

The City of Edmonton Waste Services has an environmental and financial obligation to manage the liability of the Clover Bar Landfill. At a minimum, the output must be captured and flared, creating a cost to the Utility with no revenue.

The City Plan

The City Plan has two goals that are addressed by this project. By investing in technology that focuses on renewable energy generation, Edmonton will be a healthy city, progress towards a low carbon future and continue toward its path of Climate Resilience.

Community Energy Transition Strategy

The Community Energy Transition Strategy is Edmonton's plan to address and mitigate climate change through the reduction of greenhouse gas emissions, increasing energy efficiency and promoting renewable energy systems. As an integral component of building a climate resilient Edmonton, the report recommends that the City pursue a hierarchical investment approach, summarized as follows:

1. Avoid wasteful energy and carbon-intensive practices and/or purchasing or construction of new assets

2. Reduce emissions by improving energy efficiency
3. Replace high carbon energy sources with low carbon sources, and;
4. Offset by taking actions to reduce GHG emissions in one place by offsetting emissions that occur elsewhere

The LFG to RNG project supports this approach. Investing in the proposed Project will result in a reduction of the overall GHG emissions from the CBLF added benefit of producing renewable energy.

The Greenhouse Gas Management Plan for Civic Operations 2019-2030
The Greenhouse Gas Management Plan for Civic Operations was approved by Council in 2018 with a specific pathway identified to reduce civic operations emission by 50% below 2005 levels by 2030. The emissions from LFG were identified as 11% of the civic operations GHG emissions by Asset Type in 2016. Although this LFG to RNG project will not decrease the amount of LFG produced it will increase the capacity in the province to support the sale and transfer of RNG as a market commodity. Although not specifically required to meet the 50% emissions reduction target, the Greenhouse Gas Management Plan for Civic Operations identified procurment of RNG by the City for its operations as a potential pathway forward for future emissions reductions. This project's resulting development and participation in the provincial RNG market will strengthen the City's capacity to meet its GHG reduction goals through RNG procurement if deemed appropriate at a future date.

5. Context Analysis

Historically the energy content of LFG was predominantly used to produce electricity or for space heating. Electricity production from LFG was a proven and mature technology that used the same principles as internal combustion engines used in vehicles. Over time, changes in the energy sector landscape gave way to alternative technologies to use the energy content of LFG.

Today, multiple facilities across Canada (e.g. Hartland Landfill in Victoria and Delta landfill in Vancouver) are drifting away from LFG to electricity production in favour of other beneficial use of LFG, mainly RNG production. RNG is appealing because it provides the same or higher level of environmental amenities and a significantly higher revenue stream compared with traditional energy from fossil fuels.

Currently, RNG can be sold in one of three markets. As shown in Figure 1 each of these markets has its own price model for the RNG. These markets are:

- Voluntary market: in this market, companies or public utilities purchase fuel from renewable sources to meet voluntary climate or sustainability goals.
- Low Carbon Fuel Standards (LCFS) market - the market is available in several

jurisdictions such as BC in Canada, California and Oregon in the US. The market exists because transportation fuel suppliers are required to reduce the carbon intensity of their fuels. They can buy credits generated by RNG and other clean fuel projects to achieve their carbon intensity targets. Credits are expressed in tCO2e and value is directly related to carbon intensity of RNG.

- Renewable Identification Number (RIN) market is a long standing US Renewable Fuel Standard (RFS) market that allows renewable fuels to generate credits (RINs) used by transportation fuel suppliers to meet biofuels quotas that are differentiated by ethanol, advanced and cellulosic biofuels.

Canadian Clean Fuel Standard Market is expected to be another significant market. Currently this market is in the development stage pending approval of Clean Fuel Standards Regulations (CFSR) which covers all fossil fuels used in Canada, but separates requirements for liquid, gaseous and solid fossil fuels. The final regulations for liquid fuels are planned for publication in the Canada Gazette, Part I by early 2021. Draft regulations for the gaseous and solid fuel classes are targeted for publication in the Canada Gazette, Part I in mid-2021 with final regulations in 2022 and their enforcement in 2023. When enforced, the CFSR will apply broadly to primary fuel suppliers of all types and allow the market to function in a similar manner to the Low Carbon Fuel Standards market in BC but with Canada-wide scope.

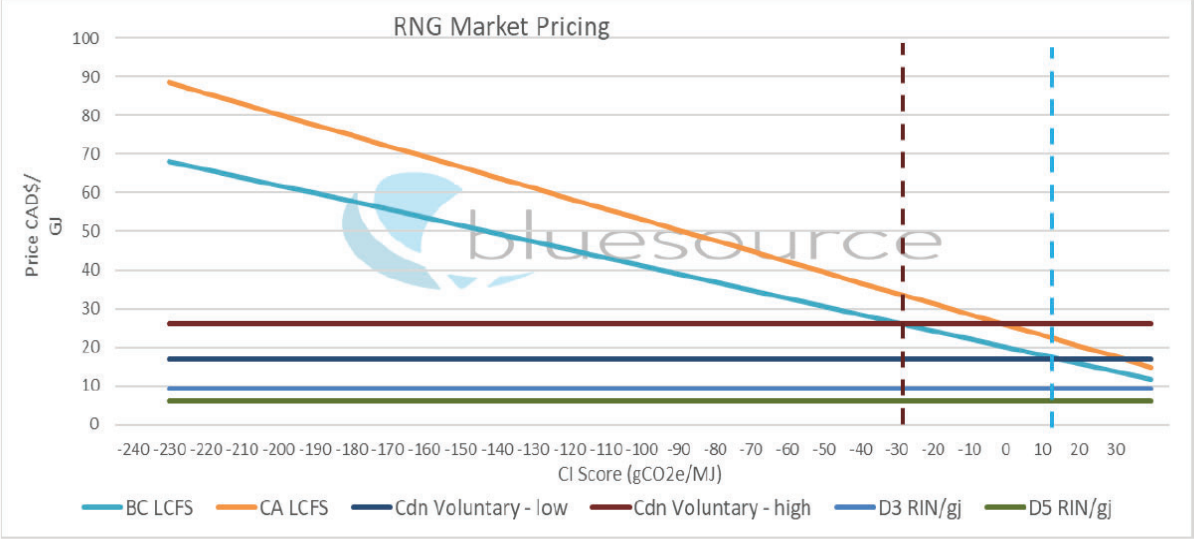


Figure 3: RNG Market Pricing in Different Markets (Bluesource LLC, 2020)[2]

[2] Bluesource LLC (2020), Unlocking Higher Value - Accessing LCFS Markets, Building Biogas Better - Webinar Series, Canadian Biogas Association, November 18, 2020.

As of 2020 the average price for RNG in Canada varies between $16 to $30 per GJ (see Cdn voluntary high and Cdn voluntary low curves in Figure 1) with most buyers locking into a 10 year off-take contract with producers at an average price of $18/GJ. Furthermore, the recently announced Federal Carbon Pricing Policy that is expected to increase the cost of GHG emissions to $170/tonne by 2030 (as opposed to $30/tonne in 2020) will naturally increase the price of carbon neutral RNG. Therefore, with the associated environmental attributes on the rise, the market value of RNG is expected to remain significantly higher than fossil fuel-based natural gas. This makes RNG highly marketable and supports the financial return that can define project success. In order to be conservative, and to align with assumptions from the recent OPF business case (CR_7991), for the purpose of this business case, we are assuming the price per GJ of RNG to be $16.

This trend of increased demand and low supply is expected to continue for the foreseeable future. For example, FortisBC, a major player in this sector, has committed to achieving a 10% zero-carbon fuel supply in its natural gas network by 2030, and 30% by 2050 through the injection and blending of RNG and green-hydrogen (produced using renewable energy and electrolysis to split water). According to Figure 4, FortisBC currently produces approximately 0.5 petajoules (PJ) of RNG, where they estimate they will need to source at least 30 PJ by 2030, and their internal capacity is limited to 12 PJ. This leaves the utility searching for another 18 PJ RNG from elsewhere in Canada and North America. Recently, the British Columbia Utilities Commission (BCUC) has granted approval to "RNG out of province arrangements" under Fortis for projects outside of BC as well. For Alberta this has resulted in Fortis purchasing RNG from a biogas producing facility in Lethbridge.

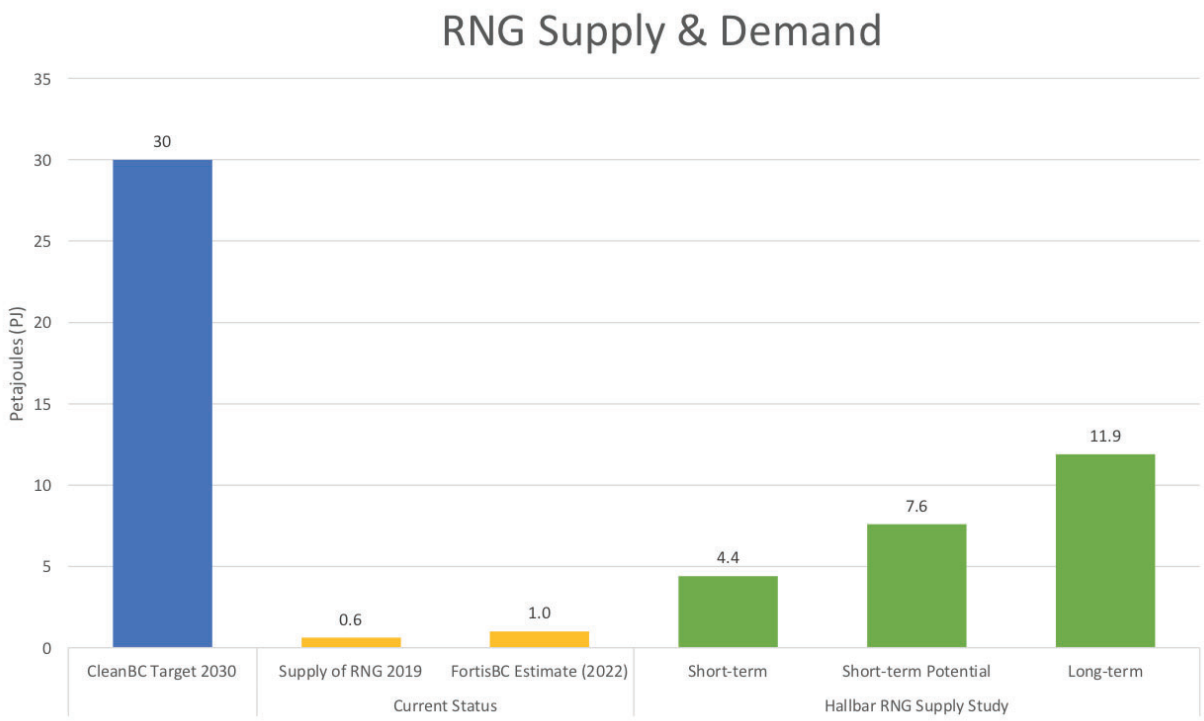


Figure 4. RNG Supply and Demand

Finally, policy trends such as GHG emissions regulations and the coming Canada Clean Fuel Standard are becoming more stringent. Potential RNG off-takers include not only utilities but industrial clients looking to reduce GHG emissions from on-site use of natural gas as well. The increased interest across the RNG market is an indicator of increased market potential and enhanced growth of this market across Alberta and Canada.

There is a local natural gas distribution pipeline running through the City's EWMC property, owned and operated by ATCO. ATCO has provided a letter of support to Waste Services for the Project as well as a letter confirming acceptance of RNG in the natural gas distribution pipeline. ATCO's confirmation of pipeline access is dependent on the produced RNG meeting ATCO specifications for injection. In order to meet these specifications, an Injection Station that will monitor and inject the produced RNG into the pipeline is targeted to be commissioned in Q3 of 2023.

6. Alternatives

Prior to the development of the Business Case, Waste Services did preliminary work around the best technology to pursue for biogas-to-energy. The two options considered were biogas-to-electricity or biogas-to-RNG. The Edmonton Composting Facility (ECF) Business Case (CR_6669) presented on February 1, 2019 looked at both technologies for biogas-to-energy in detail. In the ECF business case, RNG generation came in with a much more favorable NPV compared to Electricity (22% more favorable when comparing NPV of RNG to Electricity). RNG also provided greater GHG emission offset (tonne CO2e) by roughly 460k. The analysis done then is still relevant and applicable to this business case. In addition, CP shared operating data on their existing LFG-to-electricity facility that is used for the CBLF and confirmed that electricity generation is no longer an attractive business solution. Instead, CP also proposed RNG generation in their business case development. Based on all the preliminary work, WS decided early on to focus on LFG-to-RNG as the preferred technology to pursue. In the alternatives below, LFG-to-electricity has not been presented as an alternative for this reason. Rather, the focus is on how to best develop options to provide the best recommendation focused on RNG.

With RNG decided as the preferred technology, WS consulted with EHAN Engineering on a detailed analysis of options available for a LFG to RNG project. The analysis is based on the City's objective to attain the highest value for controlling the gas liability and maximizing the City's financial gain while minimizing its risk exposure. The evaluation looked at a range of options from (i) full funding by the City to (ii) leveraging the $10 million grant from ERA with condition to partner with CP in various capacities, to (iii) partner with any third party by open competition without receiving the ERA grant. The rationale for exploring scenario (ii) distinctly from scenario (iii) is that a key stipulation of the $10 million grant from ERA is for the City to partner with the current landfill gas collection system operator, CP.

A detailed financial analysis on ten options under three scenarios (a total of 30 variations) was conducted followed by detailed sensitivity analysis. The analysis showed that partnership with a competitively procured third party, other than CP, is not financially attractive and therefore all related options were discarded. The more financially viable options involve partnering with CP and receiving the $10 million grant.

WS has since conducted multiple rounds of commercial negotiations with CP and settled on a Memorandum of Understanding (MOU) with Key Terms. This final arrangement provided a higher rate of return to the City with shared project risks. This requires WS to form a shared ownership agreement with CP so that initial investment, maintenance and operation, and profit are all properly split as per the MOU terms and conditions. This is the Alternative 2 presented below.

WS is presenting the following three alternatives for consideration: (i) the status quo option (no LFG-to-energy plant), (ii) shared ownership and capital investment between the City and CP, and (iii) full ownership by the City. All alternatives were analyzed based on a 16-year project life.

Alternative 1: Status Quo (No RNG Facility)
The Status Quo alternative foregoes building a LFG-to-RNG facility. The facility is not mandatory for WS to meet its environmental liabilities associated with CBLF. As such, this alternative provides analysis on what the O&M cost and NPV are compared to building a LFG-to-RNG facility. This analysis is provided as comparison purposes for alternatives 2 and 3. The key impacts of this alternative are as follows:

- Negative NPV of $2.4 million
- No annual revenue
- O&M cost totalling approximately $4.4 million

The Status Quo option outlines the required costs associated with managing the Collection and Flare system to collect and dispose of the LFG and is already considered in the Waste Services landfill liability. No revenue and GHG credit is generated as part of this alternative.

Alternative 1 is not recommended due to the negative NPV compared to Alternatives 2 and 3.

Alternative 2: Proceed with RNG Project, contractual arrangement with Capital Power
Alternative 2 includes a shared ownership model for the LFG to RNG initiative. The ownership of the upgrader would be split between Capital Power and the City. The key impacts of this alternative relative to the status quo are as follows:

- $16.7 million in total capital cost, with $14 million funded externally ($10 million from ERA grant and $4 million from CP)
- Positive NPV of $18.1 million (likely scenario)
- 70% of revenue is retained by the City
- Average annual revenue of $3 million, totalling $47.7 million over the life of the project
- Average annual O&M cost of $0.7 million, totalling $10.6 million over the life of the project
- Creation of additional full-time jobs (management and operator level)

Alternative 2 will split the ownership of the LFG to RNG plant between the City and CP (50% City and 50% CP including a bargain purchase option for the City for $1). The City will contribute 70% of the Collection, Flare and the LFG to the RNG plant O&M cost, while CP will contribute the remaining 30%. Based on the commercial negotiations and MOU with CP, a joint

venture with CP will require minimal capital investment by Waste Services of $2.7 million out of the required $16.7 million. Project risk will be mitigated by reducing the up front capital investment by partnering with CP on this project. In addition, Alternative 2 has the highest NPV as it benefits from the $10 million ERA grant (receipt of the grant is conditional upon entering into a partnership with CP for this project). Sensitivity analysis was completed on the pricing of RNG under Alternative 2. This project has a break even NPV at an RNG price of $3.41/GJ, 21% of the price expected under current market conditions.

Alternative 2 is the recommended alternative.

Alternative 3: Proceed with RNG Project; Solo Venture (Fully City Funded)
The third alternative involves full capital investment by the City to maintain maximum strategic independence, operational control, and business flexibility. The key impacts of this alternative are as follows:

- City invests $16.7 million in capital cost. Therefore, the project is 100% owned, managed and operated by the City of Edmonton (maximum control).
- Positive NPV of $15.1 million.
- Average annual revenue of $4.3 million, with $68.1 million total revenue over the life of the project.
- Average annual O&M cost of $0.9 million ($15.1 million over the 16 year life of the project)
- City carries all operation and market risks

The Solo Venture will provide maximum control and risk for the City. The trade-off for this option is that no ERA grant will be available as part of the condition for the grant is a partnership with CP.

Alternative 3 is not recommended due to upfront capital cost requirements and project's lower NPV when compared to Alternative 2, as well as the City bears all the risks.

Alternative Comparison

Appendix A highlights the alternatives financial analysis summary. Based on the financial summary and the alternatives review above, the following table provides a high level summary that will determine the best alternative. All figures represent the WS portion of the project. For each comparison element, the one highlighted in green is the most favorable option.

Comparison Element	Status Quo	Alternative 2	Alternative 3
Net Present Value	-$2.4 million	$18.1 million	$15.1 million
Revenue %	0%	70%	100%
O&M Cost %	100%	70%	100%
Cost of Capital	$0	$2.7 million	$16.7 million
Year Investment is Paid Back	N/A	2025	2029
The Overall Most Favorable Alternative			**Alternative 2**

In addition, a comparison was made between Alternative 2 and Alternative 3 based on the RNG Price and the corresponding NPV value of each alternative. Alternative 2 is more favorable when RNG price is below $21/GJ, with Alternative 3 only being more favorable above that price. Based on the industry projected low and high range of RNG, Alternative 2 carries less risk based on the potential fluctuation in RNG price.

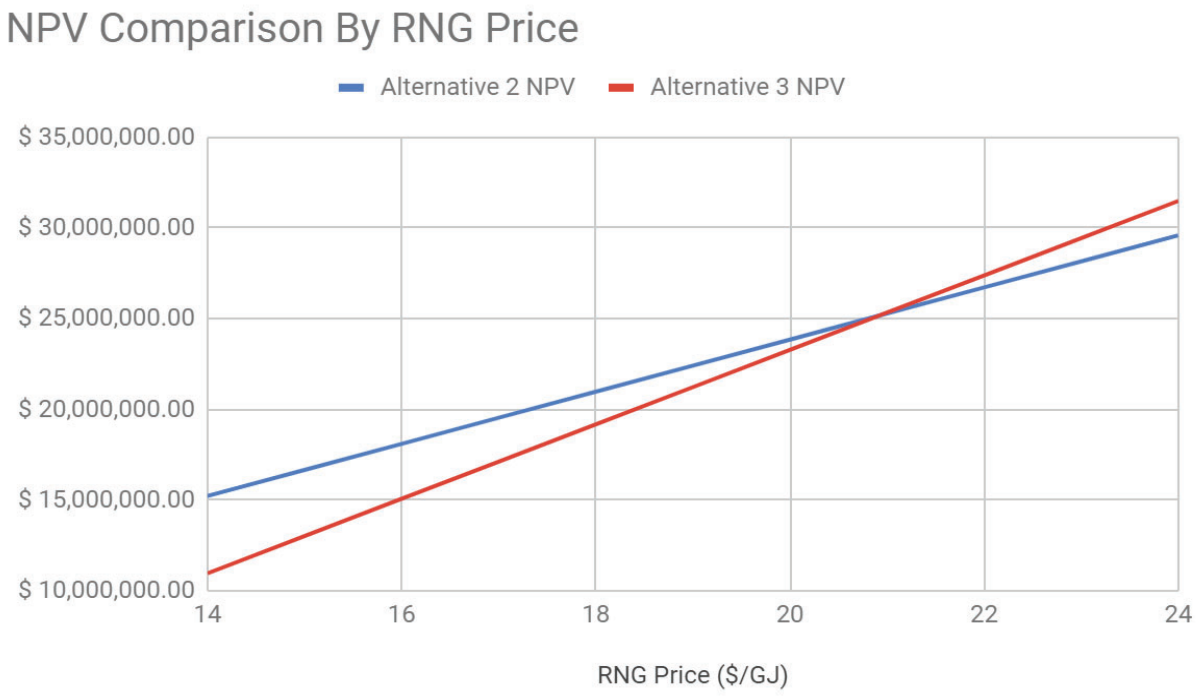


Figure 5. NPV Comparison by RNG Price

7. Organizational Change Impact

7.1. Stakeholder Impact

The following table lists all interested parties that may be impacted by the initiative.

Stakeholder	City Relationship	Type of Impact	Business Requirements
Waste Services	Internal	Direct	Business requirement is to ensure environmental liabilities associated with the CBLF are managed and risks are mitigated through the development of the LFG to RNG facility.
Capital Power	External	Direct	Business requirement is to generate revenue through the commission of the LFG to RNG plant.
ATCO	External	Direct	Business requirements are to receive RNG at Receipt Station that meets ATCO's specifications.
Residential Ratepayers	Exernal	Indirect	Business requirements are to reduce the amount of GHG produced by the City and to avoid increasing the utility rate.

7.2. Business and Operational Impact

The Business & Operational Impact table is to provide a list of all business and operational impacts for each stakeholder.

Stakeholder	Business and Operational Impacts
Waste Services Capital project strategic business partner and engineering support	Operational impact: staff will ensure design, implementation, commissioning of facility on target. Technology impact: how to support for successful integration of the new equipments/systems
Waste Services	Legal impact: Fulfilling the City's legal obligations in managing and mitigating LFG emission from CBLF; Financial impact: new source of revenue from generation of RNG which is a high demand commodity
Capital Power	Human Resource impact: staff needed to operate and maintain the new plant; Operational impact: staff will have to be trained to operate the new plant.
ATCO	Operational impact: new process created to receive RNG from plant.
Residential Ratepayers	Financial impact: the project will help achieve the Utility's goal of low and stable rate increases considering the additional revenue generation projections associated with this project.

8. Expected Benefits

8.1. Tangible Benefits

- Reduce 149.5K tCO2e per year of GHG emission;
- Remove by 2040 approximately 2.5M tCO2e from the global carbon cycle;
- Approximate revenue of $3 million per year from RNG annually with estimated net profit of approximately $2.1 million to offset the utility rate collected from each household in the City of Edmonton.
- Enables future RNG production/injection at the EWMC, for example from the existing high solids anaerobic digestion facility and future organic processing facility.
- Generate a valuable product that can be bought by companies working to achieve emissions reduction targets or compliance targets.

8.2. Intangible Benefits

- Support the carbon market and circular economy in Alberta;
- Build innovation and GHG reduction capacity in Alberta.

8.3. Costs

Capital Costs

The total estimated capital cost of the in-scope work is $16.7 million and is based on a conservative project development estimates, including 20% contingency. The breakdown is as follows:

Phase	Cost (million)
Project development (pre-design)	$0. 78
Design, permits and approvals	$0. 95
Construction	$14. 87
Commissioning	$0.06
Total	$16.7

The proposed capital cost will be offset by the $10 million grant provided by ERA. The remaining $6.7 million will be split between Capital Power and the City of Edmonton corresponding to Capital Power providing $4 million, and the City of Edmonton providing the remaining $2.7 million. The $2.7 million investment by the WS is expected to be incurred as follows by year (million):

Phase/Year	2021	2022	2023	Total
Project development (pre-design)	$0.54			$0.54
Design, permits and approvals	$0.13			$0.13
Construction		$0.80	$1.19	$1.99
Commissioning			$0.03	$0.03
Total	**$0.67**	**$0.80**	**$1.20**	**$2.66**

It is expected that 50% of the construction on the LFG collection and conveyance system and high efficiency flare compound will be completed in 2021 with the remaining 50% to be completed in 2022. The construction of the LFG to RNG plant will be completed at 40% in 2022 with the remainder completed in 2023 at which time the project will be fully operational.

Operating Costs

The ongoing operating costs are associated with electrical power for operations, ongoing maintenance costs, and a brokerage fee to ATCO based on the volume of total energy flow. The cost for the City will be dependent on the chosen alternative for the Business Case. With the recommended approach of Alternative 2, the total operating costs are to be split at 30% by CP and 70% by WS. The operating and maintenance costs are estimated at $660,000 annually. The brokerage fee is for access to the distribution system and is estimated at approximately $100,000 per year based on the projected total energy flow and fixed daily fee from operations.

8.4. Assumptions

Assumptions used in Energy Flow Calculations

- LFG is 50% methane by its composition
- LFG methane calorific value is 38 MJ/m^3
- LFG flow rate (m^3/hr) is 60% of Estimated LFG generation (m^3/hr)
- LFG to RNG upgrader is operational 90% of its time
- LFG to RNG methane conversion efficiency in upgrader is 95%

Assumptions used in Cash Flow Calculations

- RNG market value is $16 / GJ and is fixed over the Project term
- Methane GHG global warming potential is 25 times that of CO2
- GHG voluntary credits value is $5 / tonne
- Baseline condition for GHG is venting off LFG directly to the atmosphere
- Revenue generation start date is September 1, 2024
- NPV calculations use a WACC of 5.1%

9. Resourcing

City of Edmonton will provide overall direction, guidance, and approval for the development, design, and construction of the project. Throughout this project, Waste Services will lead and contribute to the project team. WS will also have full budgetary control on this project and be the official recipient of the ERA grant. Other members of the project team may include other Waste Services representatives, or other stakeholders as necessary. Contract management will be led by Waste Services staff.

Special Resources

The following special resources are available to the project:

Technical Services, Waste Services:
Waste Services Technical Services in-house engineering review is available for: process, electrical, and mechanical disciplines, as well as project management support.

Financial and Corporate Services, Legal Services and Corporate Procurement & Supply Services
Provide legal support and development of terms and conditions to WS and CP joint partnership.

Operations Resources

Per the above, it is expected that Waste Services will provide resources to participate in the project team. The project team resources will come from the Technical Services section.

10. Key Risk(s) and Mitigation Strategy

A comprehensive risk register was developed for this initiative, documenting project and alternative specific risks in detail (see Appendix C). Alternative 2 and 3 have similar risks, but due to the joint venture in Alternative 2 (resulting in a lower up front capital investment by the City), the risk rating is different. The table below highlights key common risks and the difference in risk rating between the 2 alternatives.

Key Risks - Risk Rating Comparison Between Alternatives 2 and 3

Event/Risk Factor	Alternative 2 - Risk Rating Score	Alternative 3 - Risk Rating Score	Mitigation Strategy (Response)
Overlap with the Landfill Capping project. This could result in delays of one or both projects.	Medium	Medium	Enhanced planning and communication between the two projects. Build in project controls and risk management in both projects.
Unforeseen issues with building codes, environmental permitting, site planning and aesthetic considerations. Resulting in delay or increased cost to the project	Medium	Medium	City will take responsibility for obtaining all applicable permitting and approvals. This risk will not be transferred to the contractor. Proper design and planning are in place to help mitigate any potential issues. The project budget includes $1M for permits and approvals. Also the schedule allows up to 1.5 years for securing all permits.
Produced RNG not meeting pipeline injection specifications (high impurity content). Resulting in reduced quantity of RNG able to be sold off to the market.	Low	Medium	Review specifications for pipeline quality gas with LFG-to-RNG technology supplier and ensure the design output exceeds the pipeline requirements Include in design of collection system the ability to control LFG quality Enhance operational planning; continuous LFG well-field balancing to ensure good quality of collected gas Additional sampling of LFG

Variations in regulation between utility companies, RNG project developer and environmental permitting for RNG facilities	Low	Medium	The City's Project Manager will ensure effective communication and understanding of the RNG requirements for the off-taker, for environmental permitting, and for the Project, and that the Project aligns with all.
RNG price is lower than current forecast, resulting in lost revenue once the facility is built.	Low	Medium	Conduct sensitivity analysis of market price for RNG. Review market forecast and determine threshold for minimum revenue requirement in order to recover cost for the project.
Changes to GHG regulations. Resulting in negative change affecting carbon price and industrial activities	Low	Low	Incorporate sensitivity analysis in project planning; lock into long term contract with RNG buyer
The project is planned from 2021-2023. Due to the duration of the project, capital expenditure can increase as a result of unforeseen market condition change in price of goods and services.	Low	Medium	Project budget was estimated by a professional consultant based on execution of previous similar projects. 20% contingency is factored into the proposed budget for unforeseen situations. For the LFG-to-RNG plant the price was derived for the worst case condition. Both WS and CP agreed to cover up to 10% of project cost exceedance at 70/30 split and 50/50 thereafter provided CP is actively managing the project delivery.
Construction activities interfering with the operation of existing CP LFG facility, resulting in breach of existing agreement with CP.	Low	Medium	Enhance project planning, design and communication with CP and other affected stakeholders

Changes to strategic partners that result in compromised commitment in delivering and operating the facility.	Low	N/A	Develop and sign a binding agreement for the duration of project
Failure in delivering the project within the 2023 timeline. Resulting in potential issues with agreement with Capital Power or ERA.	Low	N/A	Enhance project management and execution through additional internal and external resourcing and senior management buy in.
Waste Service has not created a Joint Venture (JV) similar to this one. Resulting in accepting potentially unfavourable terms due to unforeseen scenarios.	Low	N/A	Retain external counsel to assist WS in drafting and reviewing the terms and conditions of JV that are favourable to the WS

11. Conclusion and Recommendations

11.1. Conclusion

To deliver this project for the construction of the Landfill Gas to Renewable Natural Gas facilities, a total capital investment of $16.7 million is required. By entering a partnership with CP, the true required capital funding for the City of Edmonton is $2.7 million. Accomplishing this project will further translate in the following for the WS:

- Improved and upgraded infrastructure to manage LFG liability of the CBLF in the post-closure period of 2023 - 2048;
- Significant reduction in environmental risks due to LFG management system failure;
- Net positive cash flow to business area over project's lifespan;
- Ability to accommodate additional RNG from the existing high solids anaerobic digestion facility (HSADF) and future organic processing facility (OPF).

11.2. Recommendations

It is recommended that this Business Case is approved and authorized following Alternative 2 for Capital Expenditure (Funding Approval) of $2.7 million within the 2019-2022 budget. The approval of this Business Case will enter the project to the Delivery Phase in 2021-2023.

11.3. Project Responsibility and Accountability

The project sponsor is accountable for the project and ensures that the objectives of the project are achieved and in compliance with all City of Edmonton policies, procedures, and directives.

Project Role	Name and Title	Roles and Responsibilities
Strategy Business Partner	Ellen Tian, Director - Technical Services, Waste Services; Pulat Isobaev, Senior Environmental Engineer, Technical Services, Waste Services;	A designated role that identifies and justifies a business need in alignment with the organization's strategic goals (defines the problem and measures of success). Strategy BP is responsible for developing a condensed business case for the project and championing the project. A BP can include the role of both Strategy and Operate BP for a project. • Responsible for the Development of the Condensed Strategy Business Case that supports the long-term needs, functional requirements, project goals, and objectives. • Approval of significant changes to scope, budget, and schedule in conjunction with the IIS Project Sponsor. • Participates in development and approves the project charter. • Participates in concept and development design reviews to ensure the project meets the Strategy, project goals, and objectives including operational requirements. • Participates in lessons learned and risk registry. • Responsible for communications and updates to their Section, Branch, and Department as required.
WS Project Owner/Sponsor - Delivery (Process Equipment)	Ellen Tian, Director, Technical Services, Waste Services	Delegates authority and accountability to the Project Manager. The Project Owner/Sponsor provides direction, financial resources, and supports the project objectives. • Ensures objectives are achieved as per City policy and joint venture agreement with Capital Power. • Ensure changes to scope, budget and schedule are approved as required. • Approves key deliverables (eg. Project Charter, Project Management Plan).
WS Project Manager - Delivery (Process	Pulat Isobaev, Senior Environmental	A designated project role given the delegated accountability, authority, and responsibility to achieve the project objectives. The Project Manager is responsible for delivery of the project,

Equipment)	Engineer, Technical Services, Waste Services	which includes duties related to management, communications, reporting, review, and approval. The Project Manager is the Agent of the WS Project Sponsor and the Business Partners. • Acts as lead project manager to achieve the project goals and objectives as defined in the Project Charter and addenda during the delivery phase • Accountable and responsible for all project management activities, acts as the project lead through delivery phase • Leads the project team to accomplish the planned deliverables to fulfill the project requirements and ensures all reviews and approvals are complete (outlined in Facility Project Responsibility Matrix). • Manages, tracks, and reports project budget and milestones through detailed plans and schedules to ensure the project is on budget, on schedule, and within the defined scope and quality. • Adheres to the Project Management methodology, policies, processes, and core requirements, guiding the expectations for each project knowledge excellence (outlined in the Facility Project Classification). • Coordinates the distributions and reviews of Business Partners, other IIS sections, and identified project stakeholders to ensure a collaborative, effective, and efficient delivery of the project. • Ensures project development complies with all applicable policies, codes, and regulations. • Responsible for development of project related Council Reports, responses to Executive Leadership Team, and Council with support from the project team. • Responsible for the Public Engagement and Communication requirements, responding to citizen and stakeholder inquiries, and following applicable policies, procedures, and processes. • Responsible to ensure Occupational Health and Safety requirements, procedures, and objectives are integrated in all project activities and deliverables. • Acts as the Contract Manager and manages consultant(s) in conjunction with Project Architect, CPSS, and Law as required, following all City procurement and contract management requirements, policies, and procedures. • Leads the development and documentation of project lessons learned and risk register. • Leads the transition of the project to operations

Subject Matter Experts IIS Engineering Services, Law, etc.		• Reviews designs to ensure planning and design meets functional requirements, project goals, and objectives. • Provides input and supports reviews of key deliverables. • Attends meetings as required. • Ensures all applicable policies, procedures, and processes are followed based on Subject Matter Expertise. • May be a member of the Project Team or provide support as required.
Senior Buyer (CPSS)	Lindsey Martin, Senior Buyer, CPSS Linda Houle, Procurement Lawyer	• Assists with the procurement of services. • Refers to the roles and responsibilities of the Senior Buyer as defined by Corporate Procurement and Supply Services.
Contract Management & Procurement Unit	Jason Haverstock Linda Houle, William Johnston	• Assists with the procurement of services. • Provides contract management oversight and management reporting.
Prime Consultant - Concept	TBD	• Interprets the intent of the project to complete schematic design and leads the design process with the Project Team. • Production of all concept and schematic design requirements. • Supports Communication and Public Engagement requirements and Operational Impact Plan. • Resource of the Project Team. • Works with the major equipment vendor(s) to provide a design for an engineered process system.
Prime Consultant - Detailed Design	TBD	• Interprets the intent of the project to finalize schematic design and leads the design process with the Project Team. • Production of all schematic and detailed design requirements. • Supports Communication and Public Engagement requirements and Operational Impact Plan. • Resource of the Project Team. • Works with the major equipment vendor(s) to provide a

		design for an engineered process system. • Supports the construction with field inspections, and repsponding to RFIs. • Leads the commissioning of the process, in conjunction with the major equipment vendor(s).
Construction Manager	TBD	• Becomes involved during the design period and provides construction expertise and input to the design. • In conjunction with the Consultant, develops work packages for construction and tenders these out to sub-contractors. • Manages sub-contractors during the construction period. • Takes over management of the major equipment contracts and logistics, off-loading, storage, and insurance of equipment during the construction period. • Resource of the Project Team.
Key Project Team	Waste Services: Ellen Tian Pulat Isobaev Ibrahim Karidio Capital Power: John Howell James Renouf	Project Team works with the Project Manager to successfully deliver project goals, objectives, and deliverables. The membership may evolve through the project phases with key representatives from the Business Partners, Architect, FID Project Manager, Consultant, Contractor, and others as required. • WS and CP Project Managers jointly chair and lead the Project Team meetings and work with the Project Team to successfully deliver the project outputs in concept. • Supports or completes project deliverables and responsibilities as defined by the Project Manager.

12. Implementation Approach

The entire project (except equipment manufacturing) will be implemented in Edmonton within existing EWMC site boundaries. To implement the proposed alternative, Utility Committee

Recommendation and City Council Approval for the funding of $2.7M under the following arrangement is required to keep the project on schedule slated for completion in 2023:

Financial Contributor	**Amount ($)**
Waste Services	2.7 million
Capital Power	4.0 million
Emissions Reduction Alberta	10.0 million
Total	16.7 million

The implementation strategy is to execute the work through partnering with CP on the following arrangement:

Project Component	Waste Services share (%)	Capital Power share (%)
LFG collection system ownership	100	0
Flare ownership	100	0
RNG Plant ownership	50	50
O&M expenditure	70	30
Revenue	70	30

To execute this initiative on time, schedule and budget WS will partner with CP. As such, CP, under supervision of WS will engage with producers of RNG plants and is required to procure in accordance with all City procurement and contract management requirements, policies and procedures to get the best deal for the plant. CP will further supervise delivery and commissioning of the plant. Given the type of contract that will be procured, Waste Services staff will be responsible for contract management. Waste Services will also specifically manage the process equipment replacement and upgrades portion of the project. IIS will continue to have a support role throughout this project.

13. Review and Approval Process

This Business Case is drafted by the Lead Project Manager in the Technical Services Section within Waste Services with input from internal representatives (Business Integration team, Finance team etc.).

This Business Case will be:

- Reviewed by key project team members
- Circulated for Directors review and approval
- Submitted for Waste Services Branch Manager review and approval

A City Council Report will be:

- Presented to Utility Committee for recommendation to the City Council for approval

13.1. Business Case Sign-off

The business case will be approved (signed and dated) by the Program Sponsor, Directors of Technical Services and Business Integration. The final approval will be received from the Waste Services Branch Manager prior to submission to the Utility Committee and the Council.

14. Appendices

The following pages identify suggested Value Management tools and reports to be incorporated into an actual business case

Appendix A: Detailed Alternative Comparison Summary:

Waste Services Vehicle & Equipment (2019-2022)	Alternative 1 Status Quo	Alternative 2	Alternative 2 Net Change from Status Quo	Alternative 3	Alternative 3 Net Change from Status Quo
Total Capital Cost	$0	($2,658,333)	($2,658,333)	($16,658,333)	($16,658,333)
Total Revenues	$0	$47,673,260	$47,673,260	$68,104,657	$68,104,657
Total Operating and Maintenance Costs	($4,436,566)	($10,599,465)	-$6,162,899	($15,142,093)	-$10,705,527
Total Lease Costs	$0	$0	$0	$0	$0
Project Net Inflows (Outflows)	($4,436,566)	$34,415,461	$38,852,027	$36,304,231	$40,740,796
WACC Discount Rate	5.11%	5.11%	0.00%	5.11%	0.00%
Net Present Value	($2,398,173)	$18,098,024	$20,496,197	$15,066,587	$17,464,760
IRR	N/A	50.19%	N/A	16.20%	N/A

Appendix B: Costs - Financial Measures (Landfill Gas to Renewable Natural Gas Conversion):

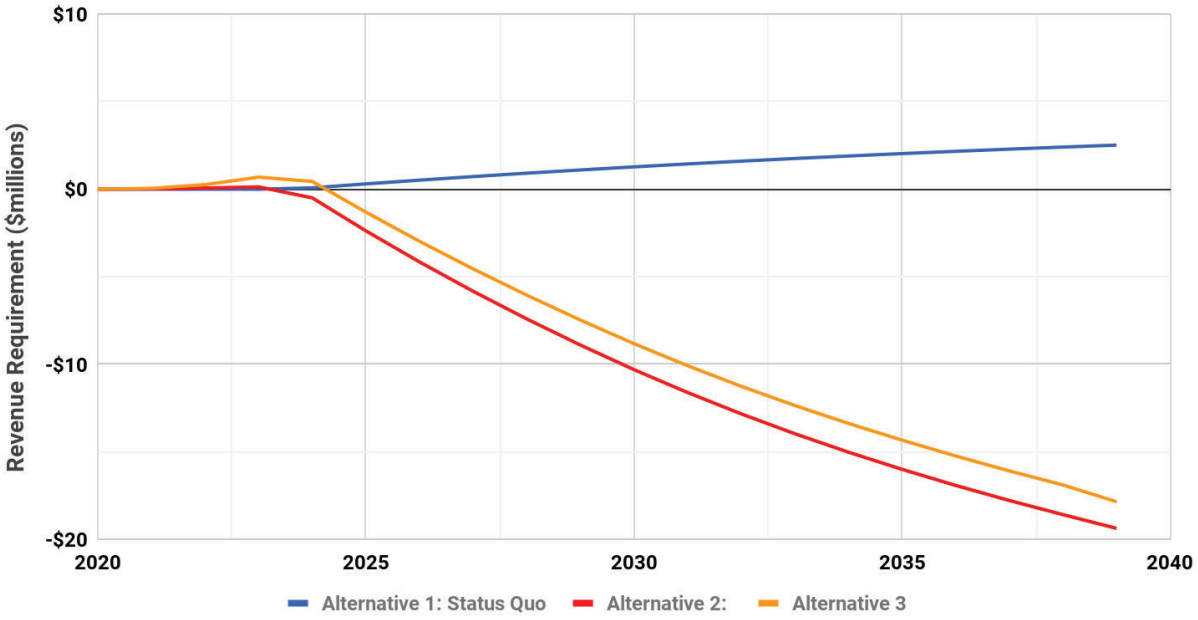
Cost Comparison and Revenue Requirement

	Alternatives		
Reference	Alternative 1: Status Quo	Alternative 2:	Alternative 3
Base Year	2020	2020	2020
In-Service Year	2024	2024	2024
Cumulative Revenue Requirement (from base year)	Alternative 1: Status Quo	Alternative 2:	Alternative 3
CPV @ 2024	79,010	(493,226)	444,973
CPV @ 2029	1,102,051	(8,901,207)	(7,472,850)
CPV @ 2034	1,899,369	(15,023,549)	(13,380,423)
CPV @ 2039	2,520,768	(19,377,009)	(17,854,453)
Capital Cost Summary (Base Year Dollars)	Alternative 1: Status Quo	Alternative 2:	Alternative 3
Equipment	0	1,409,907	11,591,914
Building			
Other (engineering/PM/etc)	0	689,915	1,452,819
Total base costs	**0**	**2,099,822**	**13,044,733**
Contingency	0	419,964	2,608,947
Inflation	0	138,546	1,004,653
Total Capital	**0**	**2,658,333**	**16,658,333**
Inflation (compounded each year)	3.10%		
Contingency	20.00%		
Analysis is based on 16 years to capture the full life cycle costs of the assets			

Revenue Requirement Summary (Cumulative Present Value)

Calendar Year	Alternative 1: Status Quo	Alternative 2:	Alternative 3
2020	$0	$0	$0
2021	$0	$24,396	$50,667
2022	$0	$66,543	$261,879
2023	$0	$133,633	$690,029
2024	$79,010	-$493,226	$444,973
2025	$304,511	-$2,377,011	-$1,309,862
2026	$519,045	-$4,153,566	-$2,973,456
2027	$723,146	-$5,829,741	-$4,552,357
2028	$917,320	-$7,410,436	-$6,050,484
2029	$1,102,051	-$8,901,207	-$7,472,850
2030	$1,277,798	-$10,307,121	-$8,823,913
2031	$1,444,997	-$11,616,307	-$10,084,072
2032	$1,604,065	-$12,834,911	-$11,259,596
2033	$1,755,397	-$13,968,853	-$12,356,556
2034	$1,899,369	-$15,023,549	-$13,380,423
2035	$2,036,339	-$16,004,131	-$14,336,375
2036	$2,166,648	-$16,923,581	-$15,240,909
2037	$2,290,619	-$17,784,741	-$16,095,520
2038	$2,408,561	-$18,590,345	-$16,896,893
2039	$2,520,768	-$19,377,009	-$17,854,453

Cumulative Present Value Revenue Requirement Chart



Appendix C: Key Risk(s) and Mitigating Strategy

Alternative 2 Risks

Risk Description	Current Risk Controls	Likelihood	Impact	Risk Score	Residual Risk Rating
Unforeseen issues with building codes, environmental permitting, site planning and aesthetic considerations. Resulting in delay or increased cost to the project	City will take responsibility for obtaining all applicable permitting and approvals. This risk will not be transferred to the contractor. Proper design and planning are in place to help mitigate any potential issues. The project budget includes $1M for permits and approvals. Also the schedule allows up to 1.5 years for securing all permits.	2	4	8	Medium
Overlap with the Landfill Capping project. This could result in delays of one or both projects.	Enhanced planning and communication between the two projects. Build in project controls and risk management in both projects.	3	3	9	Medium
Waste Service has not created a Joint Venture (JV) similar to this one. Resulting in accepting potentially unfavourable terms due to unforeseen scenarios.	Retain external counsel to assist WS in drafting and reviewing the terms and conditions of JV that are favourable to the WS	2	3	6	Low
Produced RNG not meeting pipeline injection specifications (high impurity content). Resulting in reduced quantity of RNG able to be sold off to market.	Review specifications for pipeline quality gas with LFG-to-RNG technology supplier and ensure the design output exceeds the pipeline requirements Include in design of collection system the ability to control LFG quality Enhance operational planning; continuous LFG well-field balancing to ensure good quality of collected gas Additional sampling of LFG	2	3	6	Low
Variations in regulation between utility companies, RNG project developer and environmental permitting for RNG facilities	The City's Project Manager will ensure effective communication and understanding of the RNG requirements for the off-taker, for environmental permitting, and for the Project, and that the Project aligns will all.	2	3	6	Low

Failure in delivering the project within the 2023 timeline. Resulting in potential issues with agreement with Capital Power or ERA.	Enhance project management and execution through additional internal and external resourcing and senior management's buy in.	3	2	6	Low
RNG price is lower than current forecast, resulting in lost revenue once facility is built.	Conduct sensitivity analysis of market price for RNG. Review market forecast and determine threshold for minimum revenue requirement in order to recover cost for the project.	2	3	6	Low
Changes to GHG regulations. Resulting in negative change affecting carbon price and industrial activities	Incorporate sensitivity analysis in project planning; lock into long term contract with RNG buyer	2	3	6	Low
The project is planned from 2021-2023. Due to the duration of the project, capital expenditure can increase as a result of unforeseen market condition change in price of goods and services.	Project budget was estimated by a professional consultant based on execution of previous similar projects. 20% contingency is factored in to the proposed budget for unforeseen situations. For the LFG-to-RNG plant the price was derived for the worst case condition. Both WS and CP agreed to cover any project cost exceedance at 70/30 split	2	3	6	Low
Construction activities interfering with the operation of existing CP LFG facility. Resulting in breech of existing agreement with CP.	Enhance project planning, design and communication with CP and other affected stakeholders	2	3	6	Low
Changes to strategic partners that result in compromised commitment in delivering and operating the facility.	Develop and sign a binding agreement for the duration of project	2	3	6	Low
Due to the duration of the project, scope change may occur from advancement in City, Environmental, or Technology requirements.	Adequate scope preparation and multi-level review during early design stage.	2	2	4	Low
Carbon offsets to sell to the voluntary market not being approved by the Registry. Resulting in RNG unable to be sold.	Investigate the policies of Carbon Registries, explore alternative markets and consider the worst case scenario in planning the project. City to work closely with AEP on determination of recognition of offsets within Alberta.	2	2	4	Low

Fluctuating LFG quality and quantities from theoretical estimates completed by consultant. Resulting in not meeting expected quota to buyer	Use conservative LFG quantitative and qualitative data in feasibility analysis Complete in-situ confirmation of LFG through experimental well installation. This may increase OPEX costs. Measurement of LFG quality and quantity on at least a monthly basis during operation to assess fluctuation and degradation in flow. Balance collection system wellfield for maximum collection of LFG with acceptable quality and elimination of LFG with unacceptable quality Include an option to RNG upgrader to redirect / recirculate LFG flow rates to meet qualitative aspects of RNG.	2	2	4	Low
Project payback periods can be prolonged if the RNG sale price is significantly lower than predictions	Start discussions with off-takers earlier in the project. Explore additional markets (local, inter-provincial, national, international)	2	3	6	Low

Alternative 3 Risks

Risk Description	Current Risk Controls	Likelihood	Impact	Risk Score	Residual Risk Rating
Project payback periods can be prolonged and result in negative internal rates of return if unable to secure premium long-term contract with off-takers.	Start discussions with off--takers earlier in project. Explore additional markets (local, inter-provincial, national, international)	2	4	8	Medium
Overlap with the Landfill Capping project. This could result in delays of one or both projects.	Enhanced planning and communication between the two projects. Build in project controls and risk management in both projects.	3	3	9	Medium
Produced RNG not meeting pipeline injection specifications (high impurity content). Resulting in reduced quantity of RNG able to be sold off to market.	Review specifications for pipeline quality gas with LFG-to-RNG technology supplier and ensure the design output exceeds the pipeline requirements Include in design of collection system the ability to control LFG quality Enhance operational planning; continuous LFG well-field balancing to ensure good quality of collected gas Additional sampling of LFG	2	4	8	Medium
Due to the duration of the project, scope change may occur from advancement in City, Environmental, or Technology requirements.	Adequate scope preparation and multi-level review during early design stage.	2	4	8	Medium
Unforeseen issues with building codes, environmental permitting, site planning and aesthetic considerations. Resulting in delay or increased cost to the project	Proper design and planning are in place to help mitigate any potential issues. The project budget includes $1M for permits and approvals. Also the schedule allows up to 1.5 years for securing all permits.	2	4	8	Medium
Variations in regulation between utility companies, RNG project developer and environmental permitting for RNG facilities	The City's Project Manager will ensure effective communication and understanding of the RNG requirements for the off-taker, for environmental permitting, and for the Project, and that the Project aligns will all.	2	4	8	Medium

Carbon offsets to sell to voluntary market not being approved by Registry.	Investigate the policies of Carbon Registries, explore alternative markets and consider the worst case scenario in planning the project. City to work closely with AEP on determination of recognition of offsets within Alberta.	2	4	8	Medium
The project is planned from 2021-2023. Due to the duration of the project, capital expenditure can increase as a result of unforeseen market condition change in price of goods and services.	If selected as the preferred option going forward for the project, timely procurement of a contractor for the construction of the facility will be critical to ensure expected expenditures are planned and allocated for successful project implementation.	2	4	8	Medium
Changes to GHG regulations. Resulting in negative change affecting carbon price and industrial activities	Incorporate sensitivity analysis in project planning; lock into long term contract with RNG buyer	2	3	6	Low
RNG price is lower than current forecast, resulting in lost revenue once facility is built.	Conduct sensitivity analysis of market price for RNG. Review market forecast and determine threshold for minimum revenue requirement in order to recover cost for the project.	2	4	8	Medium
Construction activities interfering the operation of existing CP LFG facility. Resulting in breech of existing agreement with CP.	Pay penalties, enhance project planning, design and communication with CP and other affected stakeholders	2	4	8	Medium
Changes to strategic partners that result in compromised commitment in delivering and operating the facility.	Develop and sign a binding agreement for the duration of project	2	3	6	Low
Fluctuating LFG quality and quantities. Resulting in not meeting expected quota to buyer	Measurement of LFG quality and quantity on at least a monthly basis to assess fluctuation and degradation in flow. Additional LFG sampling efforts required in order to minimize risk to the City. If the City is unable to meet the RNG volumes, they can be fined as per the secured off-take agreement. This may increase CAPEX costs. RNG upgrader has built in capacity to turn down LFG flows.	2	4	8	Medium

City of Edmonton
15th floor, Edmonton Tower
10111 - 104 Avenue NW
Edmonton, AB T5J 0J4

edmonton.ca

Edmonton Waste Management Centre (EWMC)
Water Distribution System Upgrade
Business Case

City Operations | Waste Services
City of Edmonton

Capital Profile: CPP#: CM-81-0005
Project Number: CP#: CP-10250

Project Sponsor: Krista Berezowski, Director, BITS, WS

Version #: 1.1
Date published: September 9, 2024

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TABLE OF CONTENTS

Change History

Version #	Date	Author	Description
1.0	6/3/2024	Ramsey Hajar	Initial Draft
1.1	9/9/2024	Lena Aitken	Updated Draft

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
1.0	Ramsey Hajar	Project Manager, OSPD, IIS	August 14, 2024
1.1	Lena Aitken	Acting General Supervisor, OPPD, BITS, Waste Services	September 9, 2024

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
1.1	Lena Aitken, Acting General Supervisor, OPPD, BITS, Waste Services	DocuSigned by: Lena Aitken 605AB71545A14AF...	September 10, 2024
1.1	Troy Sumner, General Supervisor, Asset Management, BITS, Waste Services	DocuSigned by: Troy Sumner E930601D17234B4...	September 11, 2024
1.1	Ryan Kos, General Supervisor, BSPP, BITS, Waste Services	DocuSigned by: Ryan Kos 64BE716E720243B...	September 11, 2024
1.1	Andre Joseph, Director, SWP, Waste Services	DocuSigned by: 1ACBF36C74B645C...	September 11, 2024
1.1	Geoff Smith, General Supervisor, OSPD, IIS	DocuSigned by: Geoff Smith C1FEB715405C459...	September 10, 2024
1.1	Andrew Kwan, General Supervisor, NOSID, IIS	DocuSigned by: ABDDA75A7140414...	September 10, 2024

1.1	Suzanne Young, Director, OSPD, IIS	DocuSigned by: B5B803AB10A7443...	September 11, 2024
1.1	Steve Schmidt A/Director, NOSID, IIS	DocuSigned by: Steve Schmidt D0CFBF20FBBC4E5...	September 11, 2024

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
1.1	Krista Berezowski, Director, BITS, Waste Services	DocuSigned by: Krista Berezowski B676CA5A92F44C7...	September 11, 2024
1.1	Denis Jubinville, Branch Manager, Waste Services	DocuSigned by: 4790F0A16C44451...	September 11, 2024

1. Executive Summary

1.1. Initiative Name

The Edmonton Waste Management Centre (EWMC) is a unique collection of waste processing facilities in northeast Edmonton owned and operated by the Waste Services branch and their partners. The facility's existing water distribution system consists of pipes of 150, 200 and 250 mm diameters, water mains, and fire hydrants. EPCOR owns some of the water mains, including a 400 mm main (as the primary supplier), and a 200 mm main and some of the fire hydrants. There are two additional water mains of 200 mm and 250 mm that supply water, respectively, via a north pressure reducing valve (owned by EPCOR) and a south north pressure reducing valve (owned by EWMC). The water is supplied by the Strathcona County water distribution system via the primary 400 mm main (EWMC Existing Water Distribution Map).

The City of Edmonton's Waste Services retained Stantec Consulting Ltd. (Stantec) to provide engineering services to develop and calibrate the existing water distribution system model for the EWMC. Initially, the purpose was to assess the system performance to meet water demand needs for a new anaerobic digestion facility (ADF) that had been approved in 2019, as well as for anticipated increasing demand from other EWMC facilities. The City did not proceed with the new ADF, however, it was best practice to continue with the development of a new water model to ensure all current and future water needs were met.

The EWMC Water Distribution System Analysis report as produced by Stantec in May 2022 assessed the current system and recommended upgrades needed to adequately serve the current and future needs of the EWMC.

The Project Condensed Business Case was approved by the Waste Services Leadership team on September 19, 2022 for the approval of the preliminary planning and design work prior to the Delivery Budget Request and Approval at Checkpoint #4. The planning and design work (Concept Design Validation and Development Design) has been completed by the Building Great Neighbourhoods Branch in the Integrated Infrastructure Services (IIS) Department. The project has appropriate information incorporated into the budget and schedule to support the Waste Services Leadership Team's investment decisions regarding delivery of the project.

The objective of this business case is to ensure that the water distribution system pipes are adequately sized to meet the process water for the various facilities including the IPTF, MRF, and organics facility, as well as fire flow demand requirements. The EWMC also plans to extend water services to the Residential Transfer Station (RTS), the Landfill Gas Management Facility

to be located near the Materials Recovery Facility (MRF) and the proposed water fill station at the Operations Building.

To determine the capacity and effectiveness of the existing process water and fire water supply for EWMC's industrial operation, the project assessed:

1. The existing water distribution system in terms of the fire flow requirements specified by EPCOR Design and Construction Standards - Volume 4, Water and water demand at EWMC's facilities, and
2. The necessary upgrades for the existing water distribution system to ensure that fire flow and process water demand requirements for the existing and anticipated growth in water demands are met.

The design included water distribution system model development/updates, system performance analysis, system upgrade requirements, and overall design for the EWMC site.

The purpose of this project is to upgrade and ensure that the water distribution system pipes are adequately sized to meet the process water and fire flow demand requirements for the existing and anticipated growth in water demands. Identified in design, the system upgrades and expansion will include approximately 3,227 m of new water mains including upsizing of 172 m of existing water mains. Also, a total of 20 additional fire hydrants are required to meet the 300 L/s fire flow, required by the EPCOR's Design and Construction Standards.

Consultant Opinion of Probable Costs (Construction Only)

Upgrade / Priority	Segments	Upgrade Description	Cost	Remark
1	1,2	Install new/upsize water mains to strengthen the distribution system in the northeast including 9 new hydrants.	$5,259,615	Improves fire hydrant coverage and fire protection for the Electric and Electronic Recycling Facility (EERF) and Construction & Demolition (C&D) Facility.
2	7	Install new water main to improve hydrant coverage for EERF material storage including one new hydrant	$1,316,713	Improves fire hydrant coverage and fire protection for EERF stockpile. Reduces length of unlooped section of new supply line to RTS.
3	3	Install new 250 mm dia. water mains at Domes for two new hydrants and the second supply line for the former Waste-to-Biofuels Facility.	$1,372,932	Improves the available fire flows and hydrant coverage to the Domes. Prevents water supply interruption to Site 460 water supply mains for a future facility.
4	9	Install new supply line in the southeast corner of the EWMC site	$3,488,185	Improves reliability water supply to EWMC and increases

		from the 400 mm water main on Aurum Road.		fire water supply to the southeast part of the distribution system
5	5	Install new hydrant near the Scale and Fueling Facility	$325,528	Improves fire hydrant coverage and provides an accessible hydrant for the fueling facility.
6	8	Install fire hydrants on existing water mains (total 3 hydrants)	$211,076	Improves fire hydrant coverage utilizing existing water mains
7	5	Install 200 mm dia. water main and the proposed truck fill station.	$557,447	Properly regulated fill station is required for billing processes
8	7	Install new 250 mm dia. water main to service existing RTS and proposed Landfill Gas Management Facility including 4 hydrants	$1,999,871	To provide water service and fire protection to the existing residential transfer station and fire protection to the proposed Landfill Gas Management Facility
Total Scenario 2 Costs (Construction Only)			$14,531,367	
*Class III Landfill Alignment with C&D hydrants (Construction Only)			$15,180,655	
Total Delivery [Checkpoint 4 -5] Costs Inclusive of Project Overheads			$16,438,729	

Project Delivery Costs: $16.44 Million
Project Planning and Design Costs: $812,529

- Total capital funding requirement: $17.25 Million (Class 3, -20% to +30%)
- Estimated project completion date: 2026
- Amortization period: 40 years

2. Profile Background

2.1. Problem / Opportunity

In 2021, Waste Services retained Stantec to provide engineering services to develop and calibrate the existing water distribution system model for the EWMC. The previous water distribution system model was developed for the site in 2013, and with the current and anticipated future needs at the EWMC, it was determined a new model was required to ensure all water needs are met. The study's objective was to ensure that the water distribution system pipes are adequately sized to meet the process water and fire flow demand requirements for the existing and future water demands. Based on these analyses, it was determined that the 300 L/s fire flow requirement could not be met, and system upgrading is required to ensure adequate and reliable water supply is available to all EWMC sites and facilities.

This project can close the gaps in firewater protection that exist across the site and improve the overall reliability of the water supply system, which is currently a risk to operations and has been demonstrated on multiple occasions in recent years. With new operational demands on the water distribution system compared to its initial installation, this project will allow the site to evaluate, correctly size, and install its process and firewater infrastructure to meet current and future demands while also increasing the reliability of the system with additional site supply lines. Reliability will also be increased by reducing risks associated with line failures at the pressure-reducing valves (PRVs) that currently exist. The scope of this work will increase the site hydrant coverage to comply with design requirements for existing and new assets.

2.2. Current Situation

The existing water distribution system has insufficient capacity to provide the required fire flows at several EWMC facilities and locations, as per the EPCOR design standards. Specifically, fire flows above 150 L/s (i.e. 225 L/s and 300 L/s) cannot be met within the existing system. As well, recently constructed and planned for assets require water servicing including fire protection. The existing system also has insufficient fire hydrant coverage as per the EPCOR design standards.

The reliability of the existing system is below expectations as bypass lines are undersized and one line cannot supply the site with adequate water in the event of an emergency.

The EWMC is supplied by a 400 mm water main from the Strathcona County water distribution system. There are two water mains from the 400m supply line, a 200 mm (south supply line) and a 250 mm (north supply line), that supply water to the EWMC site. The existing water distribution system is shown on Figure 1.

Both of these supply lines have a pressure reducing valve (PRV) installed which regulates pressures within the EWMC service area. Both of the PRVs are installed in concrete vaults (manholes). The configuration of these valves is as follows:

- The south PRV installed on the 200 mm line is owned by EPCOR. This PRV consists of a primary 150 mm PRV and a secondary 75 mm PRV installed in parallel. The secondary valve is assumed normally closed and opened during maintenance of the primary valve. The pressure setting of the primary valve is 517 kPa (75 psi).

- The north PRV installed on the 250 mm line is owned by the EWMC. This PRV consists of a primary 150 mm PRV and a secondary 40 mm PRV installed in parallel. The secondary valve is assumed normally closed and opened during maintenance of the primary valve. The pressure setting of the primary valve is 538 kPa (78 psi).

The following sections provide analysis for a supply line disruption either due to a PRV blockage or maintenance or due to a break in one of the supply lines.

A) SOUTH SUPPLY LINE INTERRUPTION

A south supply line disruption analysis was completed for the existing distribution system for

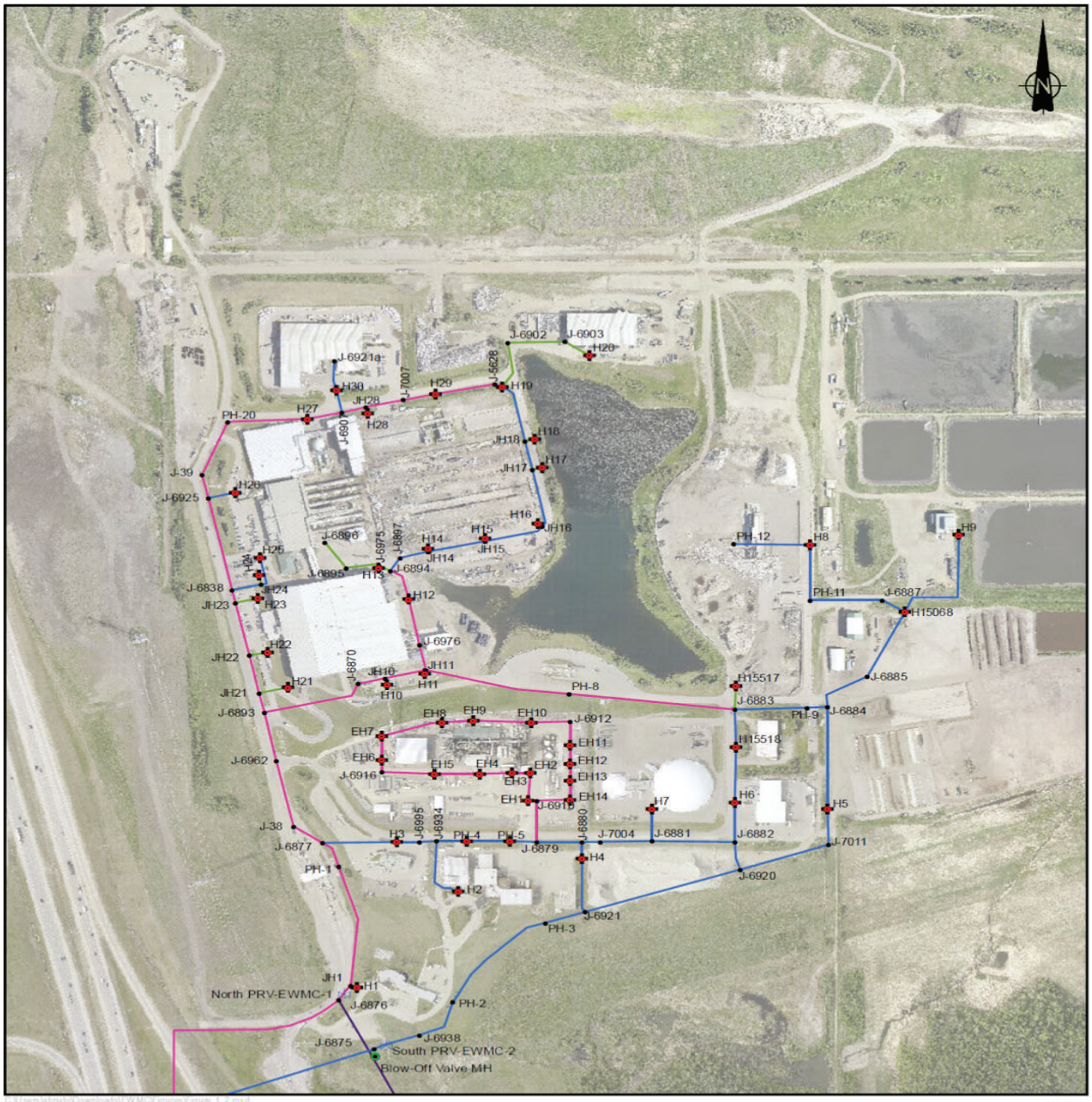
the MDD plus fire flow and includes 200 L/s emergency process water demand for the Site 460 operational block plus 300 L/s fire flow. When analyzing this scenario, the model fails as the system generates negative pressure under the base MDD condition and fire flow cannot be simulated with the minimum required residual pressure of 140 kPa. The model simulation results indicate that with only the 250 mm line supplying water to the EMWC, the base MDD requirement cannot be met and as a result the fire flow cannot be simulated at any of the node locations.

B) NORTH SUPPLY LINE INTERRUPTION

The north supply line disruption analysis was completed for the existing distribution system for the MDD plus fire flow and includes 200 L/s emergency process water demand for the Site 460 operational block plus 300 L/s fire flow. When analyzing this scenario, the model fails as the system generates negative pressure under the base MDD condition and fire flow cannot be simulated with the minimum required residual pressure of 140 kPa. The model simulation results indicate that with only the 200 mm line supplying water to the EWMC, the base MDD requirement cannot be met and as a result the fire flow cannot be simulated at any of the node locations.

With the proposed upgrades outlined in the Stantec Preliminary Design Report (May 2024), the fire flow and process water demands can be met.

Figure 1 - Existing EWMC Water Distribution System



Revised: 2024-05-17 By: abnabi

May 2024
Project No. 110100135

Stantec

400-10220 103 Avenue NW
Edmonton AB
www.stantec.com

Legend

- PRV
- Existing Hydrant
- Model Node and Number
- Blow-Off Valve MH

Existing Pipe Diameter

- 150 mm
- 200 mm
- 250 mm
- 400 mm

Client/Project

Edmonton

Integrated Infrastructure Services
Water Distribution System Upgrades

Figure No.
1.2

Title
Existing Water Distribution System Layout

3. Profile/Initiative Description

Waste Services has the ability to size and plan and update the water distribution system to ensure that the water supply system is adequately sized to meet the process water and fire flow demand requirements for current operations and future site plans.

This initiative will also improve site water supply reliability and increase functionality by increasing supply capability and extending water mains across the site.

3.1. Initiative Description

Update the Water Distribution System Design for EWMC and install/upgrade process and firewater supply assets to improve sizing, coverage, and reliability of site water supply.

3.2. Initiative Justification

The water distribution system has not been updated since its installation. The site operation model, design codes as well as operational and reliability concerns warrant a system review. This project will upgrade and improve the site water distribution infrastructure to meet the current and projected needs of the site users, improve monitoring and reliability of site water supply, and increase the level of firewater protection for existing assets. It will also address the water supply requirements for future assets at the EWMC.

3.3. Urgency of Need

Current Project Progressing Stage:
This project was initiated to IIS in September 2022. The project consultant was subsequently procured to complete the concept and design development in 2024. Construction Management Services would be procured in Q4 of 2024 to support pre-construction and facilitate the delivery of this project upon receiving the approval of the Delivery Phase Budget at Checkpoint #4.

Urgency of Need:
Checkpoint #4 readiness approval is dependent on the funding approval. Target project completion is Q4 2026 with the assumption that all remaining milestones of the project management will be achieved on time.

Facilities within the EWMC are seeing higher instances of fire events due to electronics and batteries not being sorted out from residential waste streams. Inadequate fire water flows add risk to assets and infrastructure in the event of fires. The EWMC does have fire water flow infrastructure in place, however, the consultant analyses determined current fire water flows are below updated EPCOR design standards and lack contingency. If a major fire were to occur

(eg. multiple facilities at one time), the current fire water flows would be inadequate.

With one supply line to the EWMC, there is an increase in risk to the reliability of the water supply to the site. As well, inadequate water supply limits future growth and development of EWMC facilities.

3.4. Anticipated Outcomes

This project would design and deliver "Scenario 2" to install a new 300 mm supply line to increase site water reliability. It would also install the nine upgrades outlined in the Preliminary Design Report. The project outcome will upgrade the site coverage of process and firewater to cover all operational blocks and meet firewater design codes. The project would improve operational efficiency by installing a truck fill station and reduce cross contamination associated with improper filling protocol using fire hydrants and improve water usage reconciliation. The project would also improve reliability by upgrading the PRV reliability, bypass lines, and protections that exist at each water supply main coming into the EWMC.

The purpose of this project is to upgrade and ensure that the water distribution system pipes are adequately sized to meet the process water and fire flow demand requirements for the existing and anticipated growth in water demands. Identified in design, the system upgrades and expansion will include approximately 3,227 m of new water mains including upsizing of 172 m of existing water mains. Also, a total of 20 additional fire hydrants are required to meet the 300 L/s fire flow, required by the EPCOR's Design and Construction Standards.

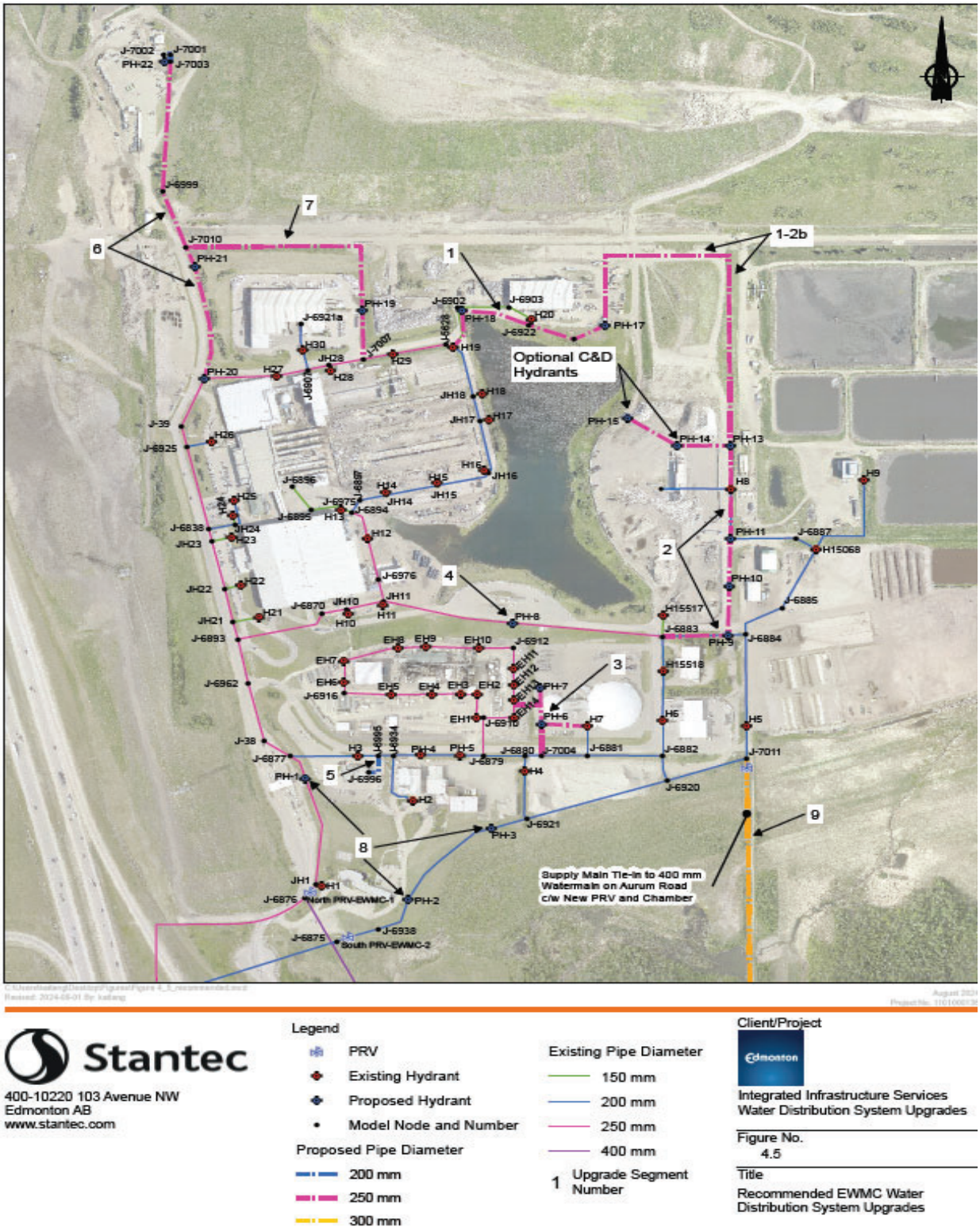
3.5. Scope

The following table (and Figure 2) outlines the project scope elements for the EWMC water distribution system upgrade.

Priority	Segment / Upgrade #	Upgrade Description	Hydrants	Water Main Upgrade Length (m)	Class III OPC
1	1-1	EERF and C&D Loop	2	290	$1,487,780
1	1-2a	EERF and C&D Loop Option A – C&D Alignment	3	350	$2,081,775
1	1-2b	EERF and C&D Loop Option B – Class III Landfill Alignment	0	540	$1,848,378
		Optional C&D Hydrants	2	150	$882,685
1	2	C&D Alignment Upgrades	4	450	$1,690,060
2	7	Material Recovery Facility Water Main Loop	1	430	$1,316,713
3	3	Domes Water Main Upgrades	2	235	$1,372,932
4	9	New Water Supply Main (300mm) and PRV Chamber	0	595	$3,488,185
5	4	Scale and Fuel Facility Hydrant Upgrade	1	35	$325,528
6	8	Existing Water Main Hydrant Upgrades	3	0	$211,076
7	5	Truck Fill Station and Supply Main	0	40	$557,447
8	6	Residential Transfer Station Water Main Loop	4	565	$1,999,871
Totals		**Option A – C&D Alignment**			$14,531,367
		Option B – Class III Landfill Alignment			$14,297,970
		Option B with C&D Hydrant			$15,180,655

Note: Option B with landfill alignment and optional hydrants are preferred in addition to the main water supply upgrades.

Figure 2 - Recommended EWMC Water Distribution System Upgrades



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Legend

- PRV
- Existing Hydrant
- Proposed Hydrant
- Model Node and Number

Proposed Pipe Diameter

- 200 mm
- 250 mm
- 300 mm

Existing Pipe Diameter

- 150 mm
- 200 mm
- 250 mm
- 400 mm

1 Upgrade Segment Number

Client/Project
Integrated Infrastructure Services
Water Distribution System Upgrades

Figure No.
4.5

Title
Recommended EWMC Water Distribution System Upgrades

New Vault:

- Power to be fed from the Leachate Storage and Transfer Facility (LSTF). Specific panel to

be determined in Detailed Design.
- Controls to be fed from the LSTF. The new vault will consist of a new remote cabinet adjacent to the vault and will go back to the LSTF via a new fiber optic cable. Exact details to be developed in detailed design.
- Network architecture drawings for the LSTF to be provided by Waste Services.

Existing North and South Vaults:
- Power to be fed from the existing Administration Building electrical room. Panel availability for spare breakers was confirmed and will be detailed during detailed design.
- Controls to be fed from a new PLC Cabinet constructed inside the Administration Building. A change order is currently in progress to detail out the scope of this work. This was noted for preliminary design, and will be further developed during detailed design.
- Controls adjacent to each existing vault will have a new remote cabinet to collect the signals and bring them back to the new Administration Building PLC via fiber optic. Fiber optic was suggested due to the relative distances from each vault to the electrical room.
- In a meeting with Waste Services and Cybertech (Waste Services' preferred Control Systems Integrator), the City specified they would prefer a 5069L306 Rockwell CompactLogix PLC installed. The City also noted that Modbus/TCP is the preferred protocol.
- Network architecture drawings for the Administration Building to be provided by Waste Services.

Truck fill station:
- Power to be fed from the existing electrical room in the Operations Building.
- Controls for the vendor control panel (truck fill panel) to go back to the existing network rack outside of the electrical room. Further confirmation is required with the City during detailed design to verify if this network rack is strictly for City IT / Security infrastructure or if there is also a confirmed connection to the Plant SCADA from this location.
- Network architecture drawings for the Operations Building to be provided by Waste Services.
- The truck fill station is planned to be a turnkey vendor package.

3.6. Out of Scope

- Indoor installation or replacement of water distribution equipment inside the existing facilities except items to be specified by the detailed design.
- Addition of water consumption points/valves to the existing water distribution of each facility.
- Operation and maintenance of extended water distribution, excluding warranty related items.
- Creation/Amendments for Strathcona County/EPCOR/City of Edmonton contracts and agreements for ownership and supply criteria.
- End use agreements with third party users across EWMC regarding process or firewater

supply.

3.7. Critical Success Factors

Critical success factors include:

- Water distribution infrastructure that provides adequate process water to current and future sites throughout the EWMC.
- Water distribution infrastructure throughout the EWMC that meets the fire flow requirements specified by EPCOR Design and Construction Standards - Volume 4.
- Water distribution infrastructure that increases the reliability of the water system and the EWMC.

4. Strategic Alignment

4.1. Related Departmental Plan

25-year Waste Strategy	The 25-year Waste Strategy, approved by City Council in September 2019, brings Edmonton into alignment with internationally-recognized best practices, puts more emphasis on waste prevention and waste reduction, and redesigns our services to help all Edmontonians play a bigger role in Edmonton's zero waste future. Waste Services provides leadership and strategy to advance the goals in the 25-year Waste Strategy, and supports residents as they sort and manage their waste in and out of the home. The goals of the 25-year Waste Strategy require effective waste processing, and ensuring the proper distribution of water to the EWMC is needed for optimal function of facilities.
Waste Services Utility Fiscal Policy C558C	Waste Services Utility Fiscal Policy C558C ensures that the Utility provides equitable, cost-effective utility rates to its customers. The Utility Rate Setting principle identifies the need to provide effective service while considering the long-term impact of utility infrastructure and how its maintenance will be incorporated into waste utility rates.
Waste Services 2022-2025 Business Plan	Properly managing and processing waste through the HSADF is aligned with the Waste Services 2022-2025 Business Plan objective of Manage the Corporation: Stable and Consistent Rate Increases. Through improving the condition of and mitigating risk to our assets and processing facilities, Waste Services can minimize rate increases to ratepayers.

4.2. Corporate Goals/Council Outcomes

The City Plan	Waste Services supports the Climate Resilience strategic goal in the ConnectEdmonton Strategic Plan and the Greener As We Grow goal in The City Plan. This business case contributes to Waste Services' impact through mitigating the effect of climate change on City operations. Greenhouse gases emitted from landfills and waste processing negatively affect emissions released through municipalities. Through investment in the water distribution system at the EWMC, Waste Services can effectively process waste and minimize GHG emissions.
ConnectEdmonton	Waste Services supports the Climate Resilience strategic goal in the ConnectEdmonton Strategic Plan and the Greener As We Grow goal in The City Plan. This business case contributes to Waste Services' impact through mitigating the effect of climate change on City operations. The EWMC is an essential part of the City's waste reduction and diversion efforts, and making the complex more resilient to the impacts of climate change will provide contingency and uninterrupted service.
Climate Resilience Policy C627A	Through the installation of emissions-reducing technologies at the EWMC, Waste Services can achieve meaningful changes to our corporate greenhouse gas emissions (as identified in 3. d. i. under Climate Resilience Commitments) and reduce the environmental impact of Waste Services facilities. Improving the reliability and water flows at the EWMC will protect continuity of service.
Infrastructure Asset Management Policy C598	Assets used at the EWMC help process and divert waste from landfill, supporting the corporate goals of Climate Resilience and Greener As We Grow. Making the EWMC more resilient to climate change and service disruption will allow for the City's current waste processing assets to continue being incorporated into long-term business strategies and plans.

5. Context Analysis

Reviewing the existing water distribution system has led to recommendations for the necessary upgrades to the EWMC water distribution system to ensure that fire flow and process water demand requirements are met, including for future growth. This aligns with industry best practices, including alignment with the EPCOR Design and Construction Standards, helping to ensure fire risks are mitigated.

Climate change resilience and mitigation are increasingly important considerations for all public and private sector organizations. The City of Edmonton's corporate strategies, including The City Plan, call for ensuring public buildings and infrastructure are sustainable and

resilient[1]. EPCOR's Environment and Climate Change Strategy includes objectives on making utility infrastructure more resilient.

6. Alternatives

The water distribution system upgrading requirements were analyzed based on the maximum day demand plus 300 L/s fire flow requirements for the extended system. The maximum day demand includes 31.9 L/s of demand for future facilities at Site 460 and co-composter locations and 16.8 L/s demand for the extended system which includes new water mains to service the Landfill Gas Management Facility, the RTS and the truck fill station. The following existing system upgrade scenarios have been analyzed:

- Upgrade Scenario 1 – This scenario includes upgrades recommended in the May 2022 study, featuring a new 250 mm diameter supply main.
- Upgrade Scenario 2 – This scenario is the same as Scenario 1, increasing the 250 mm supply main diameter to 300 mm.

For the above scenario analyses, the required 300 L/s fire flow was analyzed, and the findings are summarized in the following sections.

UPGRADE SCENARIO 1 – PREVIOUS STUDY RECOMMENDED UPGRADES

The total required MDD plus 300 L/s fire flow for the EWMC under full operation of facilities is 350.8 L/s for the extended system. The following are the key findings of the existing water distribution system analysis:

- The fire flow analysis was completed without velocity constraints and only at locations requiring 300 L/s.
- The upgraded system for Scenario 1 meets the MDD plus 300 L/s fire flow demand with the minimum residual pressure of 140 kPa at all node locations along the main distribution system requiring 300 L/s fire flow. The 300 L/s fire flow requirement is generally not met by hydrants serviced by hydrant leads and dead-end pipes, these locations are not required to meet the full fire flow requirement due to hydrant capacity limitations.
- The maximum simulated velocity and location varies depending on the simulated fire flow location and maximum available fire flow amount at that location. The maximum simulated velocities and locations are summarized in the Preliminary Design Report and range from 2.97 m/s to 17.0 m/s, with the higher velocities (>6.0 m/s) occurring in the fire hydrant leads and deadend pipes. Note for this scenario, the maximum available fire flow ranges from 171 L/s to 300 L/s with most nodes having available fire flows greater than 300 L/s .

UPGRADE SCENARIO 2 – UPSIZED SUPPLY LINE

[1] City of Edmonton. The City Plan, page 61

Under this scenario, the new supply line is upsized to 300 mm from 250 mm diameter in Scenario 1. The analysis was completed with the same boundary conditions as Scenario 1. The following are the key findings of the upgraded water distribution system analysis:

- The fire flow analysis was completed without velocity constraints and only at locations requiring 300 L/s.
- The upgraded system for Scenario 2 also meets the MDD plus 300 L/s fire flow demand with the minimum residual pressure of 140 kPa at all node locations along the main distribution system requiring 300 L/s fire flow. The 300 L/s fire flow requirement is generally not met by hydrants serviced by hydrant leads and dead-end pipes, these locations are not required to meet the full fire flow requirement due to hydrant capacity limitations.
- The maximum simulated velocity and location varies depending on the simulated fire flow location and maximum available fire flow amount at that location. The maximum simulated velocities and locations are summarized in Table B19 in Appendix B of the Preliminary Design Report and range from 2.76 m/s to 17.0 m/s, with the higher velocities (>6.0 m/s) occurring in the fire hydrant leads and dead end pipes. Note for this scenario, the maximum available fire flow ranges from 173 L/s to 300 L/s with most nodes exceeding the 300 L/s available fire flow.

Overall, the model results for Scenario 1 and Scenario 2 are very similar with minor improvements in terms of velocity reduction for a few pipes and a slightly higher available fire flow rate at several locations for Scenario 2.

SUMMARY OF UPGRADE SCENARIO ANALYSIS

Scenarios 1 and 2 have new supply lines, 250 mm and 300 mm diameter, respectively. As the new supply line is expected to be difficult to construct, a 300 mm diameter supply line was considered to avoid potential future upgrade requirements should the future demands be greater than currently allowed for. Furthermore, the cost difference for installation of a 250 mm versus 300 mm diameter main is relatively minor. From a hydraulic perspective, the larger supply main provides slightly better performance under the 300 L/s fire requirements. Initially, the EWMC demand is expected to be relatively low except when the truck fill station is being utilized. For periods when the truck fill station is not being utilized, some parts of the distribution system may become stagnant and could result in water quality issues.

The water quality concerns within the PRV chamber can be addressed to some degree through utilization of the secondary PRV valves on the smaller mains in the PRV stations. A more detailed analysis of secondary PRVs will be completed during subsequent design stages once the new supply line PRV station design is confirmed to ensure adequate water circulation.

6.1 Scenario Costs

Scenario	Upgrade Description	Pipe (m)	Fee (Construction Only)
1	Recommended Upgrades with 250 mm Supply Line	2990	$14,712,259
2	Recommended Upgrades with 300 mm Supply Line	2990	$15,180,655

Considering the above findings, it is recommended to proceed with Scenario 2 as it meets all current servicing requirements. This scenario has increased provision for future demand increase with minimal cost offset even though at present there are no plans for any significant expansion of operations. Also, if required in future, significant additional supply can be attained by upsizing the existing 200 mm supply line.

7. Organizational Change Impact

7.1. Stakeholder Impact

The table below lists the key project stakeholders and the impacts this initiative has on these stakeholders.

Stakeholder	City Relationship	Type of Impact	Business Impacts & Requirements
Waste Services	Internal	Direct	• Optimized site water and fire flow volumes. • Capital resources for executing initiative. • Ongoing current budget resources for system maintenance and monitoring. • Expects the project to be completed on time and on budget while meeting allproject goals and objectives. • Permitting and billing (Truck fill station)
Integrated Infrastructure Services (IIS)	Internal	Direct	• Expects project scope to be defined fully and accurately. • Adequate funding is approved to complete the project. • Project schedule is realistic and accurate.
Other City Departments	Internal	Indirect	• Incremental Corporate Services (Finance, FMS) and Sustainable Development one time support for initiative execution and ongoing facility O&M. • Testing and maintenance of new assets (hydrants, lines, vaults PRVs) • Sufficient resourcing of above to provide support required.
EPCOR (Maintenance)	External	Indirect	• Infrastructure upgrades and modifications are easy to operate and maintain.

7.2. Business and Operational Impact

The approval of this capital profile means dedicating Integrated Infrastructure Services (IIS) resources to this project, recognizing that this can have operational impacts to other City capital projects.

This development will not require the recruitment of additional operating personnel within Waste Services. Maintenance and monitoring plans for the new infrastructure will need to be added to the asset management program. Water distribution to the EWMC will continue during this project upgrade and little impact to operations will occur during the transition. This will be achieved through the use of a phased approach to build to reduce impacts to site activity.

8. Cost Benefits

8.1. Tangible Benefits

The following are key tangible benefits associated with the completion of this project:

Increased fire flows to facilities at the EWMC:

- The project's recommendations will increase the fire flows to meet the requirements specified by EPCOR’s Design and Construction Standards, aligning with best practices for fire safety.
- Due to the increase in batteries in the waste stream, the frequency and severity of fire events has increased significantly. The upgraded fire system, including 20 additional fire hydrants and additional fire flow will help reduce the risk of significant damage due to fires.

Increased reliability of water services:

- The installation of an additional water supply line increases the reliability of water supply to the EWMC. Currently, with one water main service, the site risks losing water supply when service disruptions occur to the existing water main and/or associated PRVs.
- The upgraded system includes supply for future demands helping to avoid further upgrades in the near future.

Truck Fill Station:

- Improve operational efficiency by installing a truck fill station and reduce cross contamination associated with improper filling protocol using fire hydrants and improve water usage reconciliation.

8.2. Intangible Benefits

Corporate/Branch Goals:

- Improvements to the EWMC's water distribution system would indirectly support waste diversion goals, as they would make waste diversion facilities more resilient to fire and climate change impacts.
- Making waste diversion facilities more resilient would extend the life of City assets, keeping the costs of managing the City's asset inventory stable.
- Adequate fire flows and water distribution may also enhance the health and safety of EWMC workers and facility visitors.

8.3. Costs

Operating Costs

The operating costs for the new assets are mainly associated with electrical power to operate the new equipment and building, and ongoing maintenance costs for the new assets. There is no requirement for more operating labour.

Capital Cost

The estimated capital cost for the current scope is $17.25M (excluding GST), financed within the Waste Services 2023-26 capital budgets. Among which, $812,529 is estimated spending through 2024 to continue the design. In 2025 and 2026, the bulk of the spending will be for the construction and commissioning. This is based on a Class 3 Cost Estimate with a cost accuracy of -20% to +30%.

The project costs include:

Year	Total Profile Budget
2024	$812,529
2025	$10,000,000
2026	$6,438,729
Total	$17.25M

8.4. Cost Assumptions

Following are a list of assumptions made during the formation of this Business Case that may have an impact on the success of the project.

- Funding will be adequate to achieve the objectives outlined;
- Consultants will complete the Detailed Design, Construction support and Post

Construction support successfully;
- All necessary background information will be available to the team;
- All consultants and contractors will be able to meet deadlines;
- Construction Manager and the contractor(s) will have the capacity to complete the project on schedule and are qualified and experienced in this type of work.
- Permits/licenses, regulatory agreement, and approvals will be granted.
- All affected civic departments approve and support the deliverables;
- Scope will not increase over the Checkpoint #3-5 of the project;
- All stakeholders understand impact relationships between project scope, budget, schedule, and quality and may require compromise on some parameters; and
- Project resource requirements as identified in the Resourcing Section are available.

9. Resourcing

Following the Project Development and Delivery Model (PDDM), the project is being led through Development and Delivery phases by Open Space Planning and Design (OSPD) and Neighbourhood and Open Space Infrastructure Delivery (NOSID) sections within IIS Department. A lead Project Manager has been assigned and has completed the project management work for the Development phase from OSPD; a support Project Manager has been assigned from NOSID.

Subject to Utility Committee and City Council approval of the Delivery Phase Budget at the Checkpoint #3, the project management roles will be switched with OSPD becoming support and NOSID leading. Other project personnel have been/will be assigned to support the Project Managers as necessary. Program Managers and Supervisors from both sections are overseeing the project and involved as necessary. Project Managers provide reporting through the Project Management Information System (e-Builder system) and regular meetings during the design and construction periods.

Through each phase, the Strategy Business Partner (Waste Services, Technical Services) and the Operating Business Partner (Waste Services, EPCOR) have had/will have representatives that are part of the project team and the Design Technical Review Team. Other members of the project team may include other IIS or Waste Services representatives (including the maintenance contractor), or other stakeholders as necessary.

The design Consultant is responsible for the design from concept development through commissioning. The Construction Management Services (CM) will assist the City in managing the equipment vendor contracts through the detailed design and construction periods. The equipment will be specified by the Consultant and procured through CM. The Vendor(s) will provide engineering information in order for the Consultant to complete the detailed design. The Construction Manager will manage the Vendor through the commissioning and performance testing period.

The Construction Manager will also provide construction expertise through the development phase and act as a general contractor for the construction phase. After Checkpoint #3, the Construction Manager will tender work packages for the trades construction and manage subcontractors performing the work. The Construction Manager will assume responsibility for the equipment Vendor contracts through the construction period.

Special Resources

The following special resources are available to the project:

Engineering Services, IIS:
Resources available to review engineering design associated with facility scope.

Business Integration & Technical Services (BITS), Waste Services:
Waste Services BITS in-house engineering review is available for: process, electrical, and mechanical disciplines. Project management support is also available from the Operational Planning and Project Delivery team within BITS

EPCOR
Will support review through the Water Modeling group.

Fire protection Services:
Regular reviews of scope and design from City of Edmonton Fire Protection Engineers.

Operations Resources

Per the above, it is expected that Waste Services will provide resources to participate in the project team through the delivery phases.

10. Key Risk(s) and Mitigation Strategy

Event/Risk Factor	Risk Rating (Score) [Low, Medium, High, Extreme]	Mitigation Strategy (Response)
Delivery Phase funding can't be utilized to procure water service infrastructure prior to the Funding Approval at Checkpoint #4 may result in the project delay to meet Waste Services original expected completion date of Q4 2026.	High	Accept this potential risk for both project cost and schedule. Progressing the Detailed Design prior to CP4 approval. Working with the contractor (once hired) on options for construction

		methods to help advance the project.
Delays in procurement of equipment and construction contractor may result in a delay of project delivery.	Medium	Utilize IIS existing Standing Arrangement for Consultant and CM procurement. Identify long lead items and work into project critical path for the schedule. Long Lead items are directly being tracked throughout design by consultant.
Phased Approached to build to reduce impacts to site activity	Medium	Work will be taking place across site
Impact of contaminated soil and environmental/regulatory approval requirements	Medium	Conduct environmental reviews and site assessments to determine any soil impacts. Ensure regulatory screening and checklist is completed internally and by design consultant.
Required site utility connection/disconnect due to 3rd party operators. Change/delay of schedule as timelines for utility companies' services are unpredictable.	Medium	Onboard 3rd party utility providers as project stakeholders and create an outage schedule or window that works for providers and project.
Water Outage during the build phase increases the fire protection risks.	Medium	As per fire code, have a backup firewater supply system in place for the designated site outage.
Potential change of Business Partner leadership may result in affecting project requirements.	Medium	Ensure all project documents are current and shared.
Capital effect on operations may result in the requirements of more personnel and more training	Medium	Include in the Consultant’s scope to identify operational and maintenance requirements.
Not sufficient delivery phase budget may result in adjustment in the project scope and project schedule delay	Medium	Project Delivery Phase is funded via Composite profile and funding is embedded in the utility rate filing. Finalize budget requirements by Checkpoint #3.

11. Conclusion and Recommendations

11.1. Conclusion

Scenarios 1 and 2 include new supply lines, 250 mm and 300 mm diameter, respectively. As the new supply line is expected to be difficult to construct, a 300 mm diameter supply line was considered to avoid potential future upgrade requirements should the future demands be greater than currently allowed for. Furthermore, the cost difference for installation of a 250 mm versus 300 mm diameter main is relatively minor. From a hydraulic perspective, the larger supply main provides slightly better performance under the 300 L/s fire requirements. Initially, the EWMC demand is expected to be relatively low except when the truck fill station is being utilized. For periods when the truck fill station is not being utilized, some parts of the distribution system may become stagnant and could result in water quality issues.

Considering the above findings, it is recommended to proceed with Scenario 2 as it meets all current servicing requirements. This scenario includes a significant provision for future demand increase at minimal cost requirement, even though at present there are no plans for any significant expansion of operations. Also, if required in future, significant additional supply can be attained by upsizing the existing 200 mm supply line.

11.2. Recommendations

It is recommended to proceed with Scenario 2 as it meets all current servicing requirements. This scenario also includes a significant provision for future demand increase at minimal cost offest although at present there are no plans for any significant expansion of operations. Also, if required in future, significant additional supply can be attained by upsizing the existing 200 mm supply line.

11.3. Composite Profiles

	Amount	**Supported by Profile**
Planning and Design Phase	$812,529	CM-81-0005
Delivery Phase (Checkpoint #4-5) Budget	$16,438,729	Funding will be transferred from CM-81-2045 to Standalone Profile (TBD)

The project was funded from profile CM-81-0005 for the Planning & Design phase. The five million threshold for renewal projects requires this project to become a stand-alone profile.

A new standalone profile of $16.44 million will be requested in the Spring 2025 Waste Services Supplementary Capital Budget Adjustment (SCBA), by transferring budget from composite profile CM-81-2045 to progress this project through the delivery phase upon approval of this business case.

11.4. Project Responsibility and Accountability

Project Role	Name and Title	Roles and Responsibilities
Strategy Business Partner	Emran Rashed Project Engineer, BITS, WS Lena Aitken, Acting General Supervisor, BITS, WS Krista Berezowski, Director, BITS, WS	A designated role that identifies and justifies a business need in alignment with the organization's strategic goals (defines the problem and measures of success). Strategy BP is responsible for developing a condensed business case for the project and championing the project. A BP can include the role of both Strategy and Operate BP for a project. ● Responsible for the Development of the Condensed Strategy Business Case that supports the long-term needs, functional requirements, project goals, and objectives. ● Leads the completion of PDDM Checkpoint 1 with support from IIS as outlined in Strategy Transition Checkpoint 1 Overview. ● Approval of significant changes to scope, budget, and schedule in conjunction with the IIS Project Sponsor. ● Participates in development and approves the project charter. ● Participates in concept and development design reviews to ensure the project meets the Strategy, project goals, and objectives including operational requirements. ● Participates in lessons learned and risk registry. ● Responsible for communications and updates to their Section, Branch, and Department as required.
Operate Business Partner	Andre Joseph, Director, SWP, WS	A designated project role that participates in identifying and justifying a business need with Strategy BP in alignment with the organization's strategic goals. An Operate BP may also identify and justify a business need to provide on-going, day-to-day programs and service delivery (an "operational" strategy). The Operate BP will benefit from the output and receive the asset to operate, use, and/or maintain. A BP can include the role of both a Strategy and Operate BP for a project. ● Approval of significant changes to scope, budget, and schedule in conjunction with the IIS Project Sponsor. ● Participates in development and approves the project charter. ● Participates in concept and development design reviews to ensure the project meets the Strategy, project goals, and objectives including operational requirements. ● Participates in lessons learned and risk registry. ● Responsible for communications and updates to their Section, Branch, and Department as required.

IIS Project Sponsor - Planning and Design	Suzanne Young Director - Open Spaces Planning and Design, Building Great Neighbourhoods	A designated project role within IIS with the delegated authority and accountability to the Project Manager. The IIS Project Sponsor provides direction, financial resources, and supports the project objectives. ● Ensures objectives are achieved through the PDDM for Planning and Design up to the end of Checkpoint #3. ● Ensure changes to scope, budget and schedule are approved as required. ● Approves key deliverables (eg. Project Charter, Project Management Plan).
IIS Project Manager - Planning and Design	Ramsey Hajar, Project Manager, Open Space Planning and Design, Building Great Neighbourhoods	A designated project role given the delegated accountability, authority, and responsibility to achieve the project objectives. The Project Manager is responsible for planning and designing the project, which includes duties related to management, communications, reporting, review, and approval. The Project Manager is the Agent of the IIS Project Sponsor and the Business Partners. ● Accountable and responsible for all project management activities, acts as the project lead through planning and design up to the end of Checkpoint #3. ● Leads the project team to accomplish the planned deliverables to fulfill the project requirements and ensures all reviews and approvals are complete (outlined in Facility Project Responsibility Matrix). ● Manages, tracks, and reports project budget and milestones through detailed plans and scheduled to ensure the project is on budget, on schedule, and within the defined scope and quality. ● Adheres to the Project Management methodology, policies, processes, and core requirements, guiding the expectations for each project knowledge excellence (outlined in the Facility Project Classification). ● Coordinates the distributions and reviews of Business Partners, other IIS sections, and identified project stakeholders to ensure a collaborative, effective, and efficient delivery of the project. ● Ensures project development complies with all applicable policies, codes, and regulations. ● Responsible for development of project related Council Reports, responses to Executive Leadership Team, and Council with support from the project team. ● Responsible for the Public Engagement and Communication requirements, responding to citizen and stakeholder inquiries, and following applicable policies, procedures, and processes. ● Responsible to ensure Occupational Health and Safety requirements, procedures, and objectives are integrated in all project activities and deliverables. ● Acts as the Contract Manager and manages consultant(s) in conjunction with Project Engineers, CPSS, and Law as required, following all procurement and contract management requirements, policies, and procedures.

		• Leads the development and documentation of project lessons learned and risk register. • Leads the transition of the project to Facility Infrastructure Delivery at the end of Checkpoint #3. • Acts as support for the Delivery lead Project Manager, following Checkpoint #3, to achieve the project goals and objectives as defined in the Project Charter and addenda during the planning and design phase up to the end of Checkpoint #5.
IIS Project Sponsor - Delivery	Steve Schmidt - Acting Director, Neighbourhoods Open Space Infrastructure Delivery	A designated project role within IIS with the delegated authority and accountability to the Project Manager. The IIS Project Sponsor provides direction, financial resources, and supports the project objectives. • Ensures objectives are achieved through the PDDM for Delivery Phase up to the end of Checkpoint #5. • Ensure changes to scope, budget and schedule are approved as required. • Approves key deliverables (eg. Project Charter, Project Management Plan).
IIS Project Manager - Delivery	Sam Malayang, Project Manager, Neighbourhoods Open Space Infrastructure Delivery	A designated project role given the delegated accountability, authority, and responsibility to achieve the project objectives. The Project Manager is responsible for delivery of the project, which includes duties related to management, communications, reporting, review, and approval. The Project Manager is the Agent of the IIS Project Sponsor and the Business Partners. • Acts as lead project manager to achieve the project goals and objectives as defined in the Project Charter and addenda during the delivery phase up to the end of Checkpoint #5 • Accountable and responsible for all project management activities, acts as the project lead through delivery phase up to the end of Checkpoint #5. • Leads the project team to accomplish the planned deliverables to fulfill the project requirements and ensures all reviews and approvals are complete (outlined in Facility Project Responsibility Matrix). • Manages, tracks, and reports project budget and milestones through detailed plans and scheduled to ensure the project is on budget, on schedule, and within the defined scope and quality. • Adheres to the Project Management methodology, policies, processes, and core requirements, guiding the expectations for each project knowledge excellence (outlined in the Facility Project Classification).

		• Coordinates the distributions and reviews of Business Partners, other IIS sections, and identified project stakeholders to ensure a collaborative, effective, and efficient delivery of the project. • Ensures project development complies with all applicable policies, codes, and regulations. • Responsible for development of project related Council Reports, responses to Executive Leadership Team, and Council with support from the project team. • Responsible for the Public Engagement and Communication requirements, responding to citizen and stakeholder inquiries, and following applicable policies, procedures, and processes. • Responsible to ensure Occupational Health and Safety requirements, procedures, and objectives are integrated in all project activities and deliverables. • Acts as the Contract Manager and manages consultant(s) in conjunction with Project Engineers, CPSS, and Law as required, following all procurement and contract management requirements, policies, and procedures. • Leads the development and documentation of project lessons learned and risk register. • Leads the transition of the project to operations at the end of Checkpoint #5.
Subject Matter Experts IIS Engineering Services (PRT Team is not involved with this project), Law, etc.	Matthew Gavreau Mechanical Engineer, Facility Engineering, Infrastructure Planning and Design Filip Dundur Manager Water Modeling Kael Griswold Fire Protection Engineer, Fire Rescue Services	• Reviews designs to ensure planning and design meets functional requirements, project goals, and objectives. • Provides input and supports reviews of key deliverables. • Attends meetings as required. • Engineering Services as outlined in Base Services Guidelines for Facility Projects - Level of Involvement and Budgeting for Engineering Services. • Ensures all applicable policies, procedures, and processes are followed based on Subject Matter Expertise. • May be a member of the Project Team or provide support as required.
Prime Consultant	Suchit Kaila, Project Manager, Stantec	• Interprets the intent of the project to complete schematic design and leads the design process with the Project Team. • Production of all concept, schematic, and detailed design requirements. • Supports Communication and Public Engagement requirements and Operational Impact Plan.

		• Resource of the Project Team. • Works with the major equipment vendor(s) to provide a design for an engineered process system. • Supports the construction with field inspections, and repsponding to RFIs. • Leads the commissioning of the process, in conjunction with the major equipment vendor(s).
Construction Manager	TBD	• Becomes involved during the design period and provides construction expertise and input to the design. • In conjunction with the Consultant, develops work packages for construction and tenders these out to sub-contractors. • Manages sub-contractors during the construction period. • Takes over management of the major equipment contracts and logistics, off-loading, storage, and insurance of equipment during the construction period. • Resource of the Project Team.
Key Project Team	Travis Ciezki, Senior Plant Engineer, Asset Management, BITS, WS Ammar Lahham, Senior Electrical Engineer, Asset Management, BITS, WS Troy Sumner, General Supervisor, Asset Management, BITS, WS	Project Team works with the Project Manager to successfully deliver project goals, objectives, and deliverables. The membership may evolve through the project phases with key representatives from the Business Partners, Engineering resources, OSID Project Manager, Consultant, Contractor, and others as required. Supports or completes project deliverables and responsibilities as defined by the Project Manager.

12. Implementation Strategy

To implement the proposed alternative, the Utility Committee and City Council Approval for $16.44 M is required at the Checkpoint #3 to maintain the project schedule.

13. Review and Approval Process

This Business Case is drafted by the Lead Project Manager from IIS and reviewed by the Technical Services Section within Waste Services with input from internal representatives (Asset Management, Finance team etc.).

This Business Case will be:

- Reviewed by key project team members
- Circulated for Directors review and approval
- Submitted for Waste Services Branch Manager review and approval

A City Council Report will be:

- Presented to Utility Committee for recommendation to City Council for approval.

13.1. Business Case Sign Off

The business case will be approved (signed and dated) by the Program Sponsor, Director of Business Integration and Technical Services, and Director of Sustainable Waste Processing. The final approval will be received from the Waste Services Branch Manager prior to submission to the Utility Committee and the Council.

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Waste Services Waste Containers Composite Capital Funding Request 2023-2026

City Operations | Waste Services

City of Edmonton

Capital Profile: CPP#: CM-81-2005

Project Number: CP# / OP#: TBD

Profile Owner: Krista Berezowski

Profile Sponsor: Denis Jubinville

Version #: 2.0

Date published: August 31, 2022

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Change History

Version #	Date	Author	Description
1.0	08/17/22	Lena Aitken	First Draft
2.0	08/31/22	Lena Aitken	Second Draft

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
2.0	Lena Aitken	Senior Project Engineer	August 31, 2022

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.0	**Neil Kjelland** Director, Sustainable Waste Processing	Neil Kjelland	Sep 12, 2022
2.0	**Chris Fowler** Director, Collections Services	Chris Fowler	Sept 2, 2022
2.0	**Jodi Goebel** Director, Business Integration	Jodi Goebel	Sept 9, 2022
2.0	**Keith Knoblauch** Operational Controller, Business Financial Analytics	Keith Knoblauch	Sep 13, 2022
2.0	**Crystal Wood** Communications Advisor	Crystal Wood	Aug 31, 2022

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
2.0	**Krista Berezowski** Director, Technical Services		Sept 13, 2022
2.0	**Denis Jubinville** Branch Manager, Waste Services		Sept 15, 2022

Indigenous Acknowledgement

Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

Executive Summary

1.1. Waste Services Waste Container Composite

The Waste Services Waste Container Capital Profile CM-81-2005 recommends funding for the purchase of steel bins (front load, side load, and roll-off waste containers), litter baskets, plastic bins, curbside carts, and associated accessories used in Waste Services' waste collection and drop-off programs. The purchase of waste containers supports Edmonton's urban growth as well as the replacement of waste containers that have reached the end of their service life or are beyond economically feasible repair. This profile will also support the growth of the curbside Source Separated Organics (SSO) program (i.e. curbside carts).

The four-year total capital projection is approximately $16.1 million.

2. Background

Waste Services has an inventory of over 540,000 waste containers (bins and carts) that requires replacement at the end of life cycle. Table 1 provides a breakdown of the container types. In addition, new containers are required to meet the growth demands for various waste collection and drop-off programs across the City. Waste containers for both replacement and growth need to be purchased on a regular basis to maintain an adequate inventory and availability of stock to meet demand.

2.1. Problem / Opportunity

As Waste Services plans for future growth and replacement of older or damaged waste containers, there is an opportunity to adopt a proactive, long-term purchase planning approach to mitigate external risk factors. Waste containers are subject to significant purchase risk, including global supply chain risks, uncertainty in the price of raw materials (steel, plastics, etc.) to build containers, and potential for changes to existing international trade agreements. Access to the required capital through the capital planning horizon enables mitigation of these risks and a level of certainty in the planning and purchase of waste containers.

2.2. Current Situation

Waste Services provides waste collection and drop-off services in Edmonton. Part of this service includes the provision of waste containers, which are used to temporarily store garbage, food scraps, or recycling waste at various locations such as residences, Eco-Stations, Recycling Depots, the Edmonton Waste Management Centre (EWMC), etc. Waste Services currently has the following container asset inventory, inclusive of those currently in use and in storage:

Table 1: Waste Container Inventory

Waste Containers Type	Approximate total number of bins and carts (in use and in storage), as of August 2022[1]	Programs
Steel Bins (front load, side load, roll-off containers)	11,500	Multi-Family refuse and recycling collection programs, Community recycling depot, Eco Stations, Big bin events, and EWMC
Litter Baskets	1900	Public Space Waste Container Program
Plastic Bins	270	Multi-family refuse and recycling programs
Curbside carts (for example Green and Black Carts)	530,000	Curbside Collection Program (started in 2019. Has 530,000 in inventory as of 2022)

Waste Services operates a waste container maintenance program that receives containers for service, minor repairs, replacement of parts and accessories, and painting when required. Older containers that are deemed to be structurally sound are repaired to extend their service life. Containers that are severely damaged or have structural failures require replacement. Waste containers have an average expected asset life of 15 years. The average age of the existing waste containers, except the curbside carts recently put into service through the Edmonton Cart Rollout, will be 13 years at the end of 2022. Regular repairs is considered to be an operating expense and is not included in the scope of this capital funding request.

3. Initiative Description

3.1. Initiative Description

The purchase of new waste containers and associated accessories is required for continued waste collection in Edmonton. The City owns different types of waste containers for various collection and drop-off services as listed in Table 1. New waste containers are required for the replacement of in-service containers that have either reached the end of their useful life (capital expense) or are damaged beyond economically feasible repair (operating expense), and also for new developments throughout the budget cycle.

Containers are purchased each year to ensure an even expenditure pattern and maintain the desired service level of containers. The expected outcome is to continue to provide efficient

[1] Waste Container Inventory

collection service to Edmontonians in a safe, environmentally and economically sustainable manner.

The $16.1 million requested in this profile considers forecasted demand for replacement and planned urban growth, including impacts related to global supply chain issues and resulting increases in commodity pricing. It also includes approximately $4.6 million of curbside containers that were previously included under the Source Separated Organics standalone profile in 2019-2022.

3.2. Urgency of Need

Waste Services retains a limited quantity of new containers in stock to meet urgent demands and ensure uninterrupted operation, however, this capital funding profile is used to purchase the required inventory to account for forecasted growth and lifecycle replacement of container assets.

Without support for this composite profile, container availability would be severely undersupplied leading to negative impacts on the environment and Waste Services programs and targets. The Utility would also experience higher risk of failure and maintenance costs of existing containers beyond their useful lives, leading to inefficiencies in waste collection services and potential safety issues. It is critical that this profile is approved to ensure continuity of container and accessory replacement and availability of stock.

3.3. Anticipated Outcomes

The anticipated outcomes of the purchase of new waste containers include asset integrity, system reliability, efficiency, and enhanced safety:

Outcomes / Deliverables
Maintain high levels of customer service and realize process efficiencies through the use of sector-appropriate waste containers.
Maintain an adequate inventory of waste containers to meet the service demands for growth and replacement of containers at or near the end of their life cycle.
Capitalize on opportunities to reduce operational costs.

3.4. Scope

The scope of this business case includes the purchase of waste containers for both replacement of inventory stock and forecasted growth in the 2023-2026 capital budget cycle. Included in this are the following types of waste containers:

1. Front load steel containers
2. Front load plastic containers
3. Side load steel containers
4. Roll-off steel containers

5. Litter baskets
6. Curbside carts

3.5. Out of Scope

The following containers are out of scope for this business case:

1. Private sector containers
2. Edmonton Transit Services waste containers/baskets
3. Parks and Roads Services waste containers/baskets
4. Eco Station containers which are provided by on-site contractors
5. Additional waste containers required for the source separation collection program for multi-unit residents receiving communal bin collection. These containers needed in 2023-2026 will be included in a separate stand-alone profile.

3.6. Critical Success Factors

Critical success factors include:

- Timely acquisition of required containers to ensure an adequate stock of waste containers and maintain existing service levels.
- Timely procurement process to mitigate risks associated with purchase of waste containers. The majority of containers are fabricated metal or plastic products, which are directly impacted by local labour rates, global metal/plastic prices, global supply chain challenges, and global trade tariffs.
- Adherence to container maintenance program plan.

4. Strategic Alignment

Waste Services is committed to advancing Council's vision and goals. This capital funding request contributes to the overall strategic direction of City Council and the goals and policies of the corporate strategic documents listed in the table below. This contribution is made by demonstrating leadership in waste management and waste collection standards, and by increasing the diversion of residential and non-residential waste from landfill.

City of Edmonton Environmental Policy C512 [2]	**POLICY STATEMENT:** The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services, based on its commitment to: (a) prevent pollution; (b) continually improve its environmental performance by setting and reviewing environmental objectives and targets; and (c) meet or exceed applicable environmental legal requirements and other requirements to which it subscribes.
Connect Edmonton: Vision 2050[3]	This project aligns with the City's Vision 2050 strategic plan in that, along with other Waste Services initiatives, waste is collected, processed responsibly, and the amount landfilled is minimized. Edmonton will be a healthy city, urban places will be clean, regional prosperity is increased by contributing to a circular economy, and a low carbon future is assured.
Waste Services Business Plan 2022-2025[4]	The Business Plan outlines how Waste Services will continue to make transformational impacts through the 25-Year Waste Strategy, provide essential service to Edmontonians while maintaining full cost recovery, and improve the employee and resident experience to support adaptation of new systems.
25-Year Waste Strategy[5]	"The strategy adopts a broader lens to transform the system with new focus on efforts which will emphasize waste reduction in addition to affirming a commitment to 90% diversion of single unit residential waste from landfill." This project will enable the efficient collection of waste, while supporting the City's organic waste processing capabilities and contribute to the 25-Year Waste Strategy's goal of diverting 90% of waste from landfill.

[2] COE Environmental Policy C512
[3] ConnectEdmonton
[4] Waste Services Business Plan 2022-2025
[5] 25-Year Waste Strategy

Waste Services Utility Fiscal Policy C558B[6]	"Customer rates will promote the efficient use of resources and be set to achieve broader social, economic, and environmental goals." This project will help to achieve broader social, economic, and environmental goals by enabling the efficient collection of waste.

5. Context Analysis

The City of Edmonton is unique in its approach to multi-unit waste services in North America. In the majority of Canadian municipalities, multi-unit residential waste is treated as Industrial, Commercial and Institutional (ICI) Waste and collection services are provided by the private sector. The City of Edmonton includes multi-unit waste residences in its residential collection program and administers the distribution of containers to collect waste from various streams (namely garbage and recycling) for all multi-unit residential building sites. The collection work is split between the City forces and contracted forces under the Waste Services' administration.

City Council approved a demonstration Cart rollout project in late 2018 and approved Waste Services' 25-year strategy in October 2019. Changes to the waste container profile to support these decisions are listed below:

- In 2019, Waste Services provided 16,000 garbage and food scraps carts to 8,000 homes for demonstration of the new curbside collection program, which separated food scraps and yard waste from garbage at the curb for increased diversion from landfills. In 2021, this new curbside collection program was expanded to all curbside collection units. As of August 2022, over 250,000 single-unit and multi-unit residents are receiving the program with 530,000 City owned curbside carts. The 16,000 carts purchased in the demonstration phase in 2019 were funded from the Waste Container profile. The 500,000+ carts purchased in 2021 and 2022 were funded in the standalone Cart Rollout profile 20-81-2041. The Cart Rollout project will be completed in 2022, and from 2023, additional carts required for new homes (growth) will be included in the Waste Container profile.
- Waste Services has started winding down the commercial collection from late 2019. Waste containers will no longer be purchased for this discontinued program.

In April 2022, City Council approved a business case for Residential Communal Collection to implement three stream mandatory source separation for all multi-unit properties receiving communal collection. All additional waste containers required for implementing this project will be included in a standalone profile for this project, which is expected to be completed in 2028.

Waste Services currently operates a container maintenance program where slightly damaged containers are repaired to working condition. Under this program, residents or Waste Services collection crews report the presence of damaged waste containers. The reported damage is inspected by Waste Services or a contractor and container repairs are carried out by a container maintenance crew. If the container maintenance crew can not repair the container on-site, it is

[6] Waste Services Utility Fiscal Policy C558B

replaced and brought back to the yard for further assessment. If the damage is too extensive and deemed not economically feasible to repair, the container is salvaged for any usable items and scrapped or recycled. Container accessories are serviced on an as-needed basis.

6. Organizational Change Impact

6.1. Stakeholder Impact

Stakeholder Impact
Stakeholder 1: City of Edmonton Waste Services Branch (primary internal)
Maintain adequate container inventory to enable growth and replacement of containers at or near the end of service life or beyond economically feasible repair.
Stakeholder 2: Single-unit and multi-unit residents (primary external)
Maintain service levels for residential waste collection.
Stakeholder 3: Waste Containers Contractors (external)
Maintain service levels and decrease service disruption.

6.2. Business and Operational Impact

Business & Operational Impact & Description
Human Resources: Waste Services (Internal)
Resources and organizational structure will be reviewed to ensure effective delivery of program
Procurement: Corporate Procurement and Supply Services (internal)
Increase in resource demand to provide procurement support
Legal Support: Law Branch (internal)
May require additional resources for legal support, review of contract for non-standard contract terms and conditions as well as review of documents to support procurement

The 25-year Waste Strategy recognizes the importance of customer service and support being integral to the Strategy's success. The learnings from adoption of the Edmonton Cart Rollout will continue to ensure that Waste Services programs are responsive and adjusted as required. More work is being done to understand how customers interact with the various services and

ensure support and education programs, including new digital programs, are responsive to customer needs.

Moving forward, the City of Edmonton is committed to the use of Gender-Based Analysis Plus (GBA+). Waste Services will identify root causes on any issues that may arise, use an evaluation approach, consider the inputs from affected stakeholders (e.g. people with disabilities, indigenous people, seniors, etc.), and develop and implement an action plan for safety, diversity and inclusivity issues using GBA+. Waste Services acknowledges that GBA+ is an equity assessment tool that allows for holistic consideration of the need for use, and impact of, this capital funding request and that staff are trained in the GBA+ process.

7. Benefits / Costs

7.1. Tangible Benefits

The following tangible benefits are anticipated to be realized:

- Adequate waste container stock to meet service demands of growth
- Adequate waste container stock to replace containers at or near end of service life
- Predictable purchase pattern

7.2. Intangible Benefits

The following intangible benefits are anticipated to be realized:

- Mitigated purchase risks through ability to plan for purchases of waste containers and a predictable purchase pattern
- Better inventory management practices in place to enhance business area's accountability

7.3. Costs

The financial costs for the 2023-2026 budget cycle are based on forecasted demand for steel and plastic bins, litter baskets, curbside carts and accessories.

Year	2023 ($)	2024 ($)	2025 ($)	2026 ($)	2023-2026 Total ($)
Capital Funding Requested	$3,382,704	$4,015,709	$4,232,036	$4,500,760	**$16,131,209**
Operating Cost	$285,850	$331,993	$365,142	$396,142	**$1,379,128**

For further details of the capital required in this request, please refer to Appendix B for a breakdown of container type and budget.

7.4. Assumptions

- Costs are based on market available prices.
- Pricing may be impacted by market and commodity prices, like steel and plastics. Based on the latest contractor quotes, this has influenced the rate of escalation incorporated into the estimates above, ranging from 2.35% for plastic bins to an initial hike of 32% for steel bins.
- All containers have a 15-year useful life.
- Forecasted annual demands of the containers during the 2023-26 budget cycle have been estimated by needs assessment performed by Waste Services. The primary factors considered for the needs assessment are - lifecycle replacement, growth, operational needs, and program changes.

8. Resourcing

Corporate procurement methods will be used to purchase required waste containers and associated accessories.

9. Key Risk(s) and Mitigation Strategy

RISK	IMPACT	MITIGATION STRATEGY
Escalation in container pricing	Medium	• Open and transparent competitive tendering process to attain lowest feasible cost for replacement
Limited numbers of manufacturing companies to provide containers	Medium	• Work with Corporate Procurement and Supply Services to optimize tendering strategies to ensure specifications and timelines are managed
Delay in issuing tender and getting contract signed	Medium	• Work with Corporate Procurement and Supply Services to optimize tendering strategies to ensure specifications and timelines are managed

10. Conclusion and Recommendations

10.1. Conclusion

This profile will provide capital funding for the purchase of new and replacement waste containers and associated accessories to ensure Waste Service has an adequate supply through 2023-2026. This funding will ensure waste containers are available to enable and

support growth as well as the replacement of waste containers that have reached the end of their service life.

10.2. Recommendations

It is recommended that this profile with funding of $16.1 million be approved to assist Waste Services to meet its commitment of delivering integrated and sustainable waste management services.

10.3. Project Responsibility and Accountability

The Project Sponsor is the Branch Manager of Waste Services. The overall capital program is managed by the Director of Technical Services, in collaboration with Sustainable Waste Processing Services, Collection Services, Business Integration and Waste Strategy, and Financial Services.

11. Implementation Approach

When containers are required and funding is secured, purchases of new containers are made through existing contracts. Containers will be purchased on time to maintain the inventory needed to provide current and future demands.

The General Supervisor of Collection Services, reporting to the Director of Collection Services, is responsible for inspection, maintenance and procurement of containers. Waste Services is currently working on improving its inventory management system to incorporate best industry practices for tracking, managing and reporting on waste containers in the future. This will enable the branch to purchase containers on time and maintain an appropriate level of inventory. This will also help Waste Services to measure the performance of the container program by measuring if adequate inventory is in place and the timeliness of container inspection and the procurement process.

12. Review and Approval Process

The following review and approval process was followed for this capital funding request:

Review Step	Reviewer
Review 1	Team Lead of Technical Services, General Supervisor of Business Integration, General Supervisor of Collection Services, General Supervisors of Sustainable Waste Processing, General Supervisors of Technical Services, and Senior Accountant of Financial Services.
Review 2	Director of Finance, Director of Business Integration, Director of Collection Services, Director of Sustainable Waste Processing, Director of Technical Services (Final Approver) and Senior Communications Advisor.

Review 3	Branch Manager Waste Services (Final Approver)
Review 4	Utility Advisor
Review 5	Utility Committee report presented

13. Appendices

Appendix A: Financial Analysis Summary

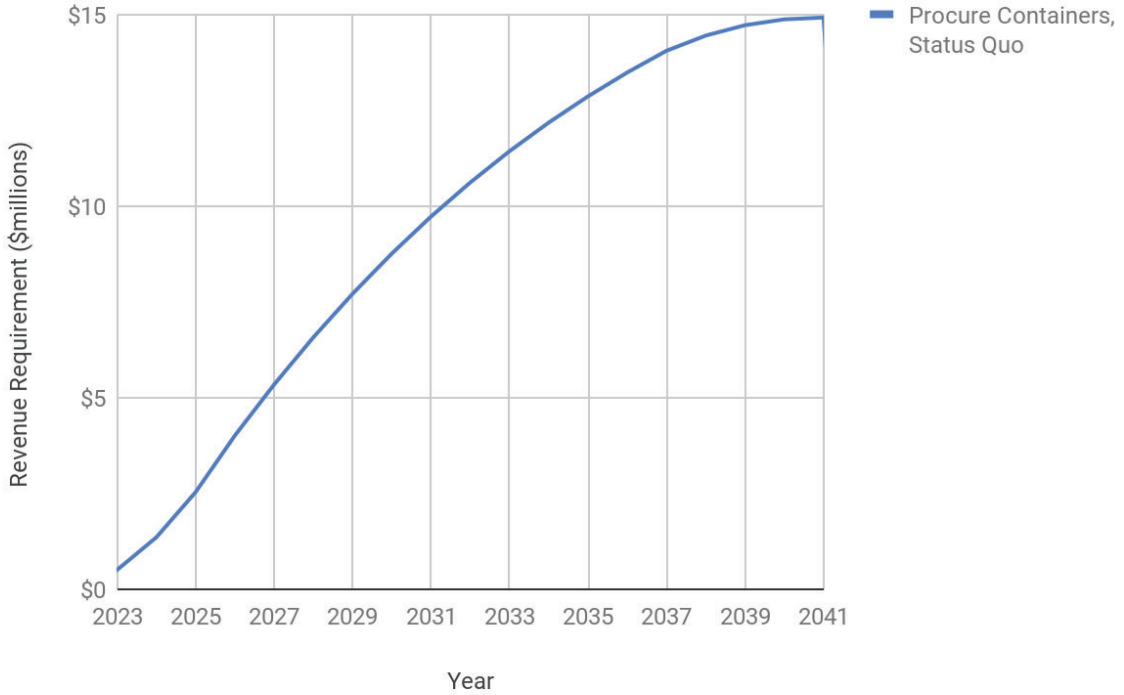
Appendix B: Waste Container Type and Budget

Appendix A: Financial Analysis Summary

Project Title: Waste Services Containers	Procure Containers, Status Quo
Total Capital Cost	($16,131,209)
Total Revenues	$0
Total Operating and Maintenance Costs	($3,557,910)
Total Lease Costs	$0
Project Net Inflows (Outflows)	($19,689,118)
WACC Discount Rate	6.28%
Project Cost (Present Value)	(15,221,104)

The following table and graph demonstrate the cumulative present value of the revenues that must be realized through annual rate collection to support the project costs. This includes operating and maintenance costs, interest and amortization expenses over the project lifecycle.

Project Title: Waste Services Containers
Cumulative Present Value of Revenue Requirement



Year	Calendar Year	Procure Containers, Status Quo
0	2022	$0
1	2023	$493,705
2	2024	$1,344,918
3	2025	$2,523,269
4	2026	$3,999,859
5	2027	$5,332,205
6	2028	$6,564,458
7	2029	$7,702,723
8	2030	$8,752,740
9	2031	$9,719,910
10	2032	$10,609,314
11	2033	$11,425,730
12	2034	$12,173,653
13	2035	$12,857,310
14	2036	$13,480,676
15	2037	$14,047,492
16	2038	$14,443,932
17	2039	$14,714,385
18	2040	$14,867,066
19	2041	$14,914,248

***Note:** calculation up to 2041 as last year of budget cycle is 2026 + 15 years useful life

Appendix B: Waste Container Type and Budget

Waste Container Type	Justification & Basis for Budget Estimates	2023 Estimate	2024 Estimate	2025 Estimate	2026 Estimate	Total
Steel Bins (Includes front load bins, side load bins, roll off containers)	Life cycle replacement and Growth	$2,354,504	$2,529,193	$2,655,653	$2,788,436	**$10,327,786**
Litter Baskets	Life cycle replacement and Growth	$36,715	$40,387	$41,336	$42,308	**$160,746**
Plastic Front Load Bins	Life cycle replacement and Growth	$35,260	$300,735	$246,242	$252,028	**$834,265**
Curbside Carts	Primarily growth	$937,330	$1,079,983	$1,221,857	$1,349,467	**$4,588,637**
Accessories (casters, lids, liners etc)	As required	$18,895	$65,411	$66,948	$68,521	**$219,775**
TOTAL		**$3,382,704**	**$4,015,709**	**$4,232,036**	**$4,500,760**	**$16,131,209**

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Waste Services Fleet Assets - Composite

Capital Funding Request

City Operations | Waste Services

City of Edmonton

Capital Profile: CM-81-2048 Composite

Project Number: CP# / Various

Profile Owner: Krista Berezowski

Profile Sponsor: Denis Jubinville

Version #: 2.0

Date published: August 05 2022

TABLE OF CONTENTS

Change History

Version #	Date	Author	Description
1.0	08/05/22	Spencer de Klerk	First draft of Capital Funding Request
2.0	08/16/22	Spencer de Klerk	Second draft of Capital Funding Request

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Signature	Submission Date
2.0	**Spencer de Klerk** Manager, Process Maintenance Operations & Fleet	Spencer de Klerk	August 16, 2022

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.0	**Keith Knoblauch** Operational Controller, Business Financial Analytics		Aug 24, 2022
2.0	**Jodi Goebel** Director, Business Integration	Jodi Goebel	August 30, 2022
2.0	**Neil Kjelland** Director, Sustainable Waste Processing	Neil Kjelland	Aug 22, 2022
2.0	**Chris Fowler** Director, Collections Services	Chris Fowler	Aug 17, 2022

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
2.0	**Krista Berezowski** Director, Technical Services		September 9, 2022
2.0	**Denis Jubinville** Branch Manager, Waste Services		September 12, 2022

Indigenous Acknowledgement

Edmonton is located within Treaty 6 Territory and within the Métis homelands and Métis Nation of Alberta Region 4. We acknowledge this land as the traditional territories of many First Nations such as the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux) and Niitsitapi (Blackfoot).

The City of Edmonton owes its strength and vibrancy to these lands and the diverse Indigenous peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Edmonton home.

Together we call upon all our collective honoured traditions and spirits to work in building a great city for today and future generations.

1. Executive Summary

1.1. Waste Services Fleet Assets Composite Renewal

Composite profile CM-81-2048 supports the replacement of Fleet Assets (Waste Services Vehicles & Equipment). The approach followed by this profile closely aligns with Edmonton's 25-year Waste Strategy that outlines how the City demonstrates leadership and encourages residents, businesses and institutions to actively participate in better managing their waste and ultimately reducing the amount of waste generated in Edmonton.

With a net replacement value of approximately $95.1 million, the Waste Services fleet consists of self-propelled equipment, heavy-duty trucks, trailers, light trucks and vehicles. Fleet assets are used to collect, process, recycle and dispose of waste for over 400,000 residential households. Fleet assets physically deteriorate with use and age; timely asset replacement improves the fleet's availability and results in a lower average operating cost per kilometer/hour. Replacement is done by purchasing new units once they reach the end of their useful operating life.

Waste Services requires approximately $45.1M for the next four-year capital budget cycle to replace fleet assets at the end of their useful lives, of which $34.3M is requested in this Funding Request and $10.8M was pre-approved in September 2022 to ensure orders will arrive in 2023-2024 when required. The level of funding requested will enable Waste Services to continue to meet its commitment to provide sustainable waste management services and align with Edmonton's 25-year Waste Strategy[1].

2. Background

2.1. Problem / Opportunity

As fleet assets near or reach end of life, they deteriorate (Appendix A) and need to be replaced to meet Waste Services' commitment to providing sustainable waste management services to residents. In this capital funding request, customers' additional needs for the next four years can be met with the replacement of fleet assets as scheduled (Appendix B).

The four-year capital plan for the Waste Services fleet, funded through utility rates, identifies 152 assets required for replacement. The level of funding requested will enable Waste Services to continue to meet its commitment to provide sustainable waste management services aligned with Edmonton's 25-year Waste Strategy.

2.2. Current Situation

Waste Services use fleet assets to collect and process waste (garbage, organics and recyclables); these assets have an operating life of five to ten years. Replacing fleet assets

[1] Waste Services 25-year Waste Strategy

ensures higher availability, lower maintenance cost and newer technology that meets the latest emission and fuel efficiency standards. Fleet assets are maintained by in-scope City of Edmonton employees at the Edmonton Waste Management Centre (EWMC) and Kennedale Garage. Fleet assets may require unplanned capital refurbishment based on use and condition; this is done to extend the asset's operating life when deemed economically viable.

Waste Services tracks the performance of fleet assets continuously; one key metric is fleet availability, which generally quantifies the probability that fleet assets are in operational condition. Availability targets for the Waste Fleet are based on equipment class; as of July 2022, overall availability was 84% (Appendix C).

Current inventory of Waste Fleet Assets

Vehicle Type	Count	Operating Life	Criticality	Availability	WS Target
Tandem Collection Trucks	79	10	**High**	78.5%	75%
Midsize Collection Trucks	22	10	**High**	86.4%	75%
Rear Load Collection Trucks	11	9	**High**	75.6%	75%
Front Load Collection Trucks	18	9	**High**	80.6%	75%
Truck - Recycling (Pendpac)	4	8	**High**	63%	75%
Roll-off Trucks	6	9	**Medium**	85.9%	75%
Telescoping Loader	1	10	**Medium**	93.2%	80%
Long Haul Tractors	23	6	**High**	77.1%	80%
Long Haul Trailers	54	8	**High**	85.6%	85%
Wheel Loaders	14	5	**High**	85.1%	85%
Excavators	3	6	**High**	92.5%	80%
Forklifts	5	10	**Medium**	94.8%	80%
Skid steer	7	10	**Medium**	88.9%	80%
Light Vehicles	60	10	**Medium**	94.9%	80%
Other (screeners, turners)	92	Varies	**Varies**	89.9%	80%

3. Initiative Description

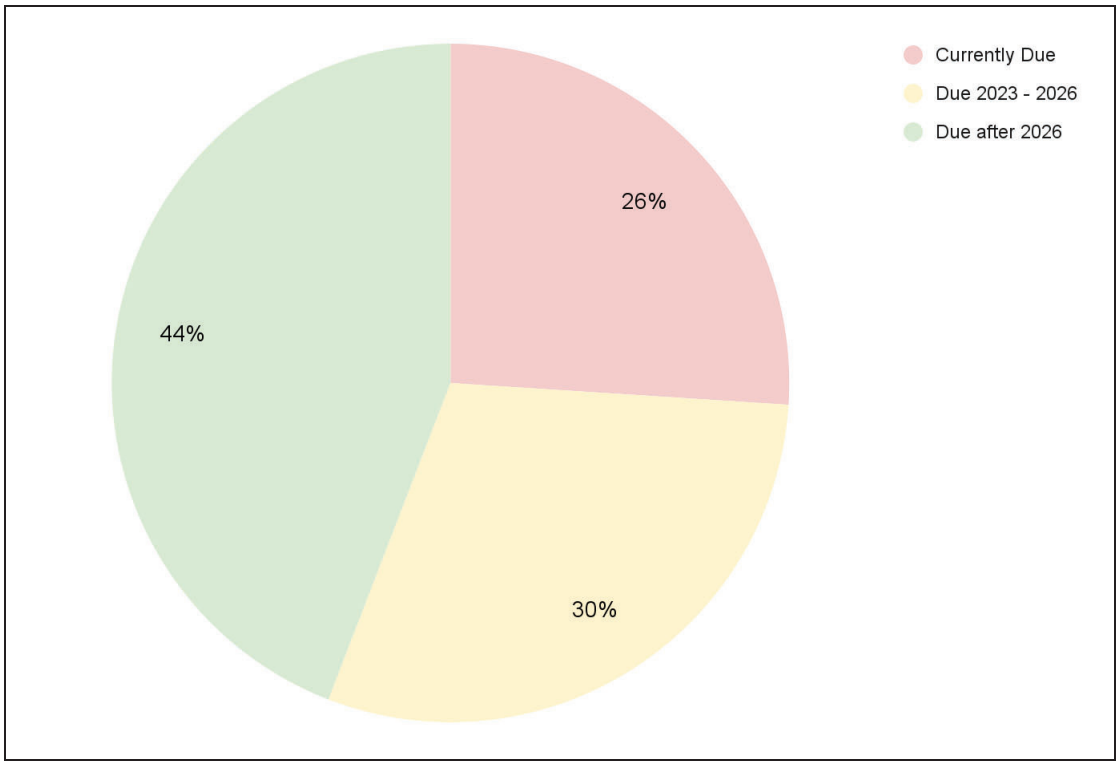
3.1. Initiative Description

This capital funding request will ensure adequate funding is available to replace Waste Services Fleet Assets as prescribed by Fleet and Facility Services; funding is outlined in the Fleet Assets (Waste Services Vehicles and Equipment) capital profile CM-81-2048.

3.2. Urgency of Need

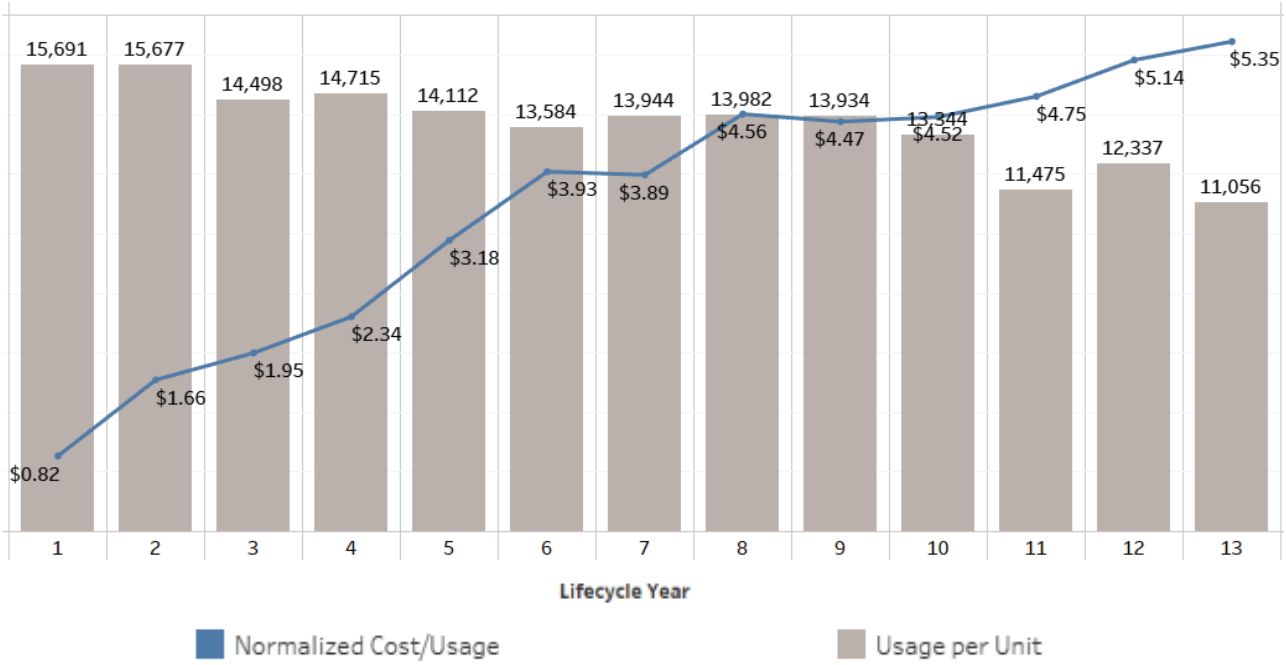
73.9% of Waste Services fleet assets are within their useful operating life. If capital funding is not approved and fleet assets are not replaced, only 44.1% of the fleet will remain within its useful operating life by year-end 2026.

Replacement Status of Waste Fleet (July 2022)



Historical data indicates if fleet assets are not replaced within or at the end of their useful operating life, maintenance and fuel costs increase while levels of service decline. For example, in the chart below for the curbside tandem fleet, the trucks past the 10-year life cycle cost an average of $59,022 per year. The first three years of operation cost an average of $22,387 per year. For 10 trucks operating past their 10-year lifecycle, it would cost the City an additional $366k annually to operate.

Average Annual Kilometers per Truck and Job Cost/Kilometer - Capital Work Excluded



3.3. Anticipated Outcomes

Effective asset management will ensure Waste Services have the resources to achieve objectives by aligning vision, mission and strategy with daily activities to achieve goals. Waste Services envisions the following outcomes:

Outcome/Deliverables
Better information to make capital investment decisions: Through a structured and integrated process, administration will ensure that fleet acquisitions identified as a high priority to Waste Services receive a robust evaluation of alternatives and scope identification.
Improved replacement schedules and budget estimates: Fleet and Facility Services owns a variety of competitive long-term service agreements; this enables acquisitions to be done efficiently with prices that are locked in.
High levels of customer service are delivered in efficient and effective ways through leading-edge waste self-propelled equipment that uses current and emergent technology to enable high rates of diversion of waste from landfill.
Reliable fleet assets that will deliver cost-effective, sustainable waste management.

3.4. Scope

This profile is required to provide the funding for the replacement of fleet assets required for the daily operations of the Waste Collections and Sustainable Waste Processing Services; assets include but are not limited to;

- Equipment Self Propelled (loaders, compost turners, skid-steers, screeners)
- Heavy Trucks/Vans (refuse trucks, long haul tractors)
- Light Trucks/Vans (pickup trucks, sanding trucks, crane trucks)
- Trailers (walking floor trailers, end-dump trailers, utility trailers)
- Attachments (forks, buckets, sweeper, arms)

3.5. Out of Scope

- Fleet assets previously approved by Council (SCBA & Communal Collections Project)
- Fixed assets (Processing & Infrastructure)
- Waste bins and containers
- Light duty vehicles leased by Corporate Procurement and Supply Services
- New initiatives to increase diversion rates (e.g., Waste to Energy)
- Climate change initiatives (e.g., pilot projects)
- Operational maintenance activities

3.6. Critical Success Factors

- Adherence to the asset management framework and fleet asset replacement program
- Proper design and maintenance programming for fleet assets
- Availability of resources to support the replacement program
- Accurate and sufficient data to make informed decisions

4. Strategic Alignment

Waste Services is committed to advancing Council's vision and goals. This capital funding request contributes to the overall strategic direction of City Council and goals of the policies and corporate strategic documents listed in the table below. This contribution is made by demonstrating leadership in waste management and processing standards and increasing the diversion of residential and non-residential waste from landfill.

City of Edmonton Environmental Policy C512 [2]	The policy states, "The City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment. The City of Edmonton will exercise environmental stewardship of its operations, products and services based on its commitment to a) prevent pollution; b) continually improve its environmental performance by setting and reviewing environmental objectives and targets, and c) meet or exceed applicable environmental legal requirements and other requirements to which it subscribes."
ConnectEdmonton: Vision 2050[3]	This profile supports the City's Vision 2050 strategic plan goal that waste is collected efficiently, processed responsibly, and the amount landfilled is minimized. Edmonton will be a healthy city, urban places will be clean, regional prosperity is increased by building a circular economy, and a low-carbon future is assured.
Waste Services Business Plan 2022-2025[4]	The Business Plan outlines how Waste Services will continue to make transformational impacts through the 25-Year Waste Strategy, provide essential services to Edmontonians while maintaining full cost recovery, and improve the employee and resident experience to support the adaptation of new systems.
25-Year Waste Strategy[5]	Using a Zero Waste Framework, the strategy affirms Waste Services' commitment to a 90 per cent diversion of single-unit residential waste from landfill. It also aligns Edmonton with internationally-recognized best practices, putting more emphasis on waste prevention and waste reduction while redesigning services to help all Edmontonians more easily take part in Edmonton's zero-waste future.

[2] COE Environmental Policy C512
[3] ConnectEdmonton
[4] WS Business Plan 2022-2025
[5] 25 Year Waste Strategy

Waste Services Utility Fiscal Policy C558B[6]	The purpose of this policy is to: ● Ensure that the Waste Services Utility is operated in a manner that reflects City Council's overall vision and philosophical objectives for the Utility. ● Ensure a consistent approach year-over-year for the financial planning, budgeting, and rate setting for the City managed Utility. ● Ensure that the Utility is financially sustainable over the long term.
Capital Project Governance Policy C591[7]	Policy C591 states that the City of Edmonton is committed to achieving effective and efficient use of public funds for capital projects.

5. Context Analysis

The current model for fleet asset replacement (Appendix B) is based on life-cycle analysis completed by Fleet and Facility Services and Waste Services Asset Management. Fleet and Facility Services currently maintains 392 fleet assets for Waste Services (out of roughly 3,600 across the corporation) and advises on unit condition towards the end of its prescribed life cycle and potential options for replacement. Fleet and Facility Services acquire and dispose of assets scheduled for replacement.

Owning and replacing mobile assets at the end of their useful life is standard practice in most large municipalities. An alternative to this approach, leasing fleet assets, was explored in 2018 by Fleet Services; the findings concluded that it would cost rate-payers approximately 35% more and take work away from in-scope City of Edmonton employees. This alternative has not been further explored due to the significant cost implications. Centralized management of the fleet is standard practice for large municipalities.

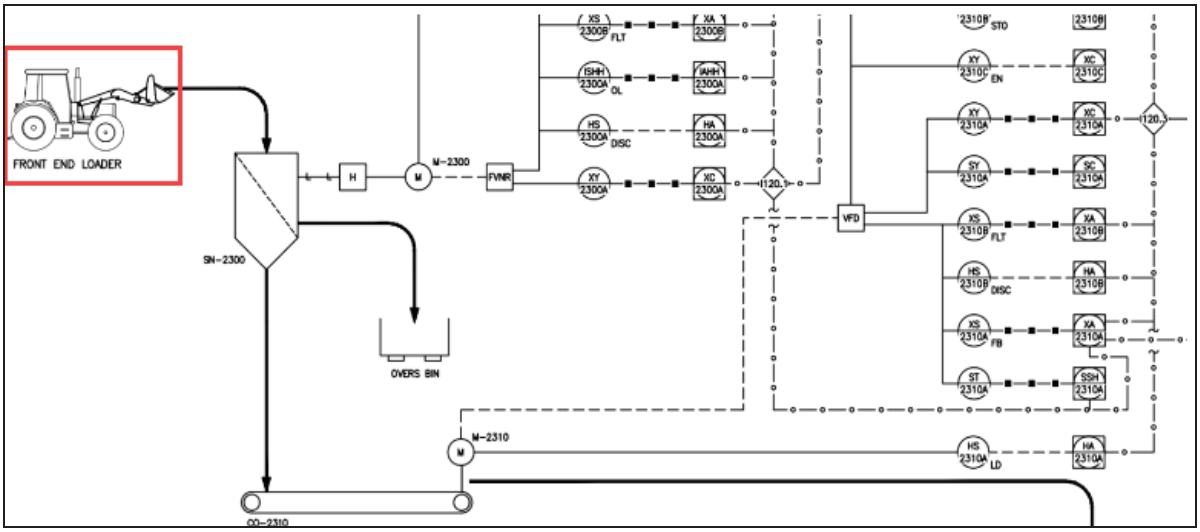
Edmonton's 25-year Waste Strategy defines a path of ambitious, transformational change toward a zero-waste future. A critical element of that path is the target of 90 per cent waste diversion across all sectors in Edmonton; reaching that target requires the implementation of three-stream source separation in every sector. Alternatives for Communal collections were explored in a business case and submitted to the Utility Committee in April 2022; it was decided that the risks associated with privatizing the program outweighed the benefits. Collection Services will leverage existing contracts in a 50/50 split for Communal and Curbside collections to keep the market competitive and offer rate-payers the best value for their money.

Sustainable Waste Processing is similar to most bulk material handling operations, requiring a large contingent of self-propelled equipment like excavators, front-wheel loaders and skid-steers to transfer material into various processing streams. For waste that cannot be diverted and requires long-haul transfer to landfill, the City will continue to leverage existing contracts using

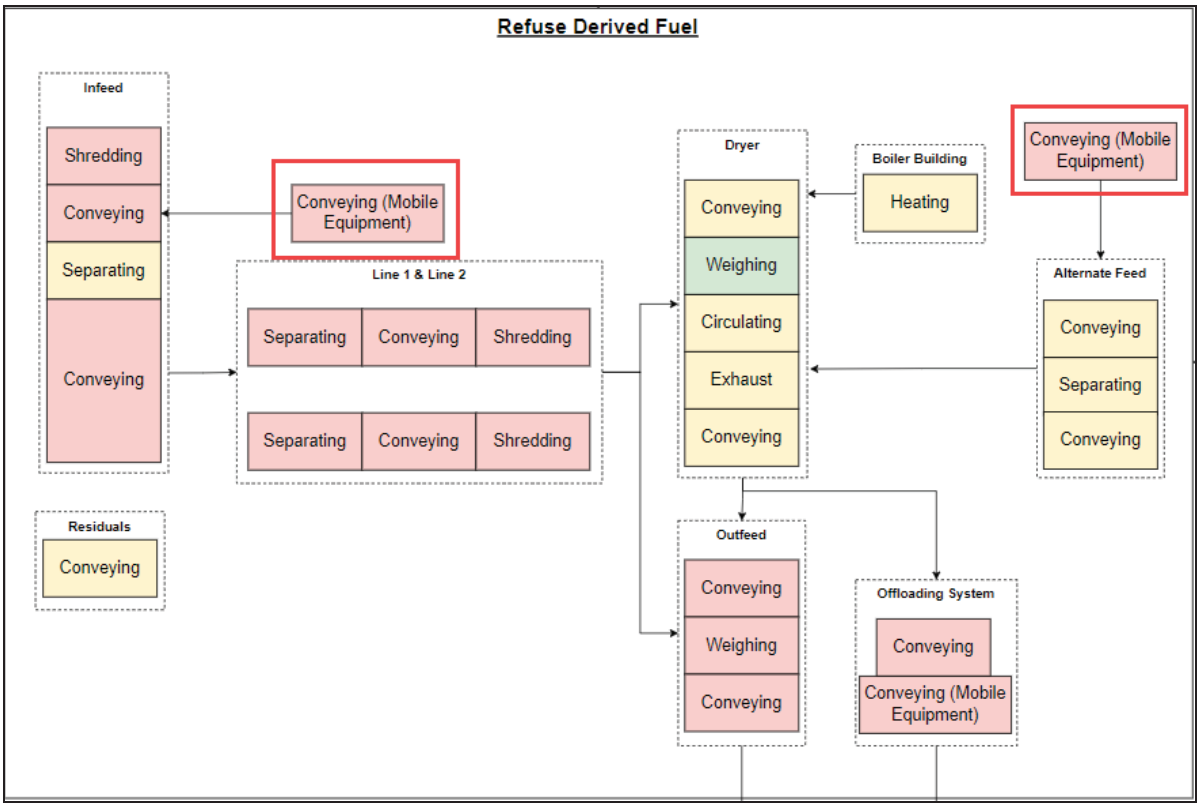
[6] Waste Services Utility Fiscal Policy C558B
[7] Capital Project Governance Policy C591

Contractor-owner long-haul tractors and City-owned walking floor trailers to deal with peak demand if in-house resources are not available.

Process Flow Diagram - RDF (showing dependency on mobile equipment)



Functional Block Diagram - RDF (showing dependency on mobile equipment)



6. Organizational Change Impact

6.1. Stakeholder Impact

Stakeholder Impact
Stakeholder 1: City of Edmonton Waste Services Branch *(primary internal)*
Equipment downtime and maintenance fees will be reduced if assets are replaced on schedule. The branch will also realize enhanced levels of service.
Stakeholder 2: City of Edmonton Fleet and Facility Services (*primary internal*)
Unplanned maintenance will be reduced if fleet assets are replaced on schedule, leading to enhanced preventive maintenance practices.
Stakeholder 3: City Council & Utility Committee *(primary internal)*
Utility rates for Waste Services have a financial impact on citizens, which may result in citizen complaints to Council.
Stakeholder 4: Residents (primary external)
Utility rates for Waste Services have a financial impact on residents, which may result in citizen complaints to Council.
Stakeholder 5: Developers (secondary external)
Ensure that Waste Services can meet the demand for the collection and processing of waste and recyclables as the City grows.
Stakeholder 6: Commercial Customers (secondary external)
Limit commercial hauling waste rates/fees to increase the costs for waste services.

6.2. Business and Operational Impact

Business & Operational Impact
Human Resources: Waste Services (internal)
Existing resources are sufficient to deliver the program.

Human Resources: Fleet and Facility Services (internal)
Growth units will require additional maintenance resources; this is accounted for in the operational budget. Existing engineering resources within the department should be able to deliver the replacement schedule.
Procurement: Corporate Procurement and Supply Services (internal)
Procurement support will occasionally be required to create new service agreements.
Legal Support: Law Branch (internal)
Legal support will occasionally be required to review contract terms and conditions to support the procurement of numerous fleet acquisitions.

Moving forward, the City of Edmonton is committed to the use of Gender-Based Analysis Plus (GBA+). Waste Services will identify root causes of any issues that may arise, use an evaluation approach, consider the inputs from affected stakeholders (e.g. people with disabilities, indigenous people, seniors, etc.), and develop and implement an action plan for safety, diversity and inclusivity issues using GBA+. Waste Services acknowledges that GBA+ is an equity assessment tool that allows for a holistic consideration of the need for use and impact of this capital funding request and that staff are trained in the GBA+ process.

7. Cost Benefits

7.1. Tangible Benefits

The following tangible benefits are anticipated to be realized:

- Higher availability and service levels
- Significant savings in fuel and repair costs
- Reduced liability
- Higher resale values
- Improved safety due to less manual labour
- Reduction in greenhouse gas emissions

7.2. Intangible Benefits

The following intangible benefits are anticipated to be realized:

- Higher levels of employee satisfaction
- Higher levels of customer satisfaction
- Higher brand recognition

7.3. Costs[8]

Year	2023 ($)	2024 ($)	2025 ($)	2026 ($)	2023-2026 Total ($)
Funding Requested	$6,734,630	$9,763,187	$9,569,115	$8,180,861	**$34,247,793**
Pre-approved Funding *	$5,100,000	$5,730,000	-	-	**$10,830,000**
Total Capital Profile	**$11,834,630**	**$15,493,187**	**$9,569,115**	**$8,180,861**	**$45,077,793**
Incremental Operational Costs	**$276,026**	**-$774,588**	**-$369,312**	**-$552,309**	**-$1,420,183**

*Funding of $10,830,000 was pre-approved in September 2022 in CO01381 Waste Services Supplemental Capital Budget Adjustment Council Report. This allowed the Utility to commence procurement for vehicles in late 2022 to ensure delivery in 2023 and 2024 to meet capital and operating needs for this budget cycle. Please see Appendix D for listing of units included in the advanced approval.

7.4. Assumptions

- Inflation for the budget period is assumed at 2.35% as per the average Corporate assumption for 2023-2026.
- Fleet asset useful operating life is assumed to be five to ten years.
- Number of units to purchase was provided by Waste Services and reviewed by Fleet and Facility Services.
- Incremental operational costs are projected using an aging model, which translates into an expected cost for each life-cycle year. Only units listed within the overall plan were factored into the estimate. No inflationary assumptions were applied.
- Incremental operational costs are expected to translate into cost savings due to reduced maintenance costs on existing units and minimal operating costs for new units.

8. Resourcing

No additional resources are required for the implementation of this request. The Program Manager of Process Maintenance Operations and Fleet will act as the customer liaison for Fleet Asset acquisitions on behalf of Waste Services. A Fleet Project Engineer will develop equipment specifications and purchasing documents to work directly with suppliers.

[8]2023-26 WS Capital Planning Sheet

9. Key Risk(s) and Mitigation Strategy

Risks	Impact	Mitigation Strategy
Capital funding request is not approved	High	Retain existing assets and increase operating budget
Fleet assets are not replaced on schedule due to long delivery times	High	Long-term procurement plan focusing on ordering units with sufficient lead times
New fleet assets do not meet required service levels (design issues)	High	Fleet engineering resources will review the design and function of new acquisitions
Maintenance backlog (supply chain delays)	Medium	Stringent warranty clauses with a spare part strategy for critical assets will be implemented

10. Conclusion and Recommendations

10.1. Conclusion

Fleet asset replacement, as scheduled, will ensure vehicle availability, reliability, and safety. Approving this Capital Funding Request will authorize $34.3M of fleet replacement for the 2023-2026 budget cycle.

10.2. Recommendations

Approve capital funding for this profile as it closely aligns with Edmonton's 25-year Waste Strategy that ensures Edmontonians receive maximum environmental benefits while minimizing the cost increases of managing solid waste. Approval of this Capital Funding Request will authorize $34,247,793 retained earnings funding for vehicles and equipment (which does not include the $10,830,000 already approved in September 2022).

10.3. Project Responsibility and Accountability

Procurement will be initiated internally by the Waste Services Asset Management team in Technical Services. Fleet and Facility Services are accountable for executing the replacement program identified within this composite profile. The Director of Technical Services manages the capital program, and the Branch Manager of Waste Services is the project sponsor.

11. Implementation Approach

Scheduled replacement of Fleet assets

Year	2023	2024	2025	2026	2023 - 2026 Total
Requested Replacements	28	32	32	37	129
Pre-Approved Replacements	12	11	-	-	23
Total Fleet Replacements	**41**	**43**	**32**	**37**	**152**

When funding is secured, vehicles will be purchased through Fleet and Facility Services. Acquisition plans and schedules are developed in collaboration with Waste Services, Fleet and Facility Services, and Corporate Procurement and Supply Services. Proposals from suppliers are evaluated by cross-functional teams consisting of engineers, buyers, operators, and maintainers, considering pricing, specifications, reliability, customer references and warranty. Corporate Delegation of Authority/Expenditure Authority Limits are followed in the procurement approval, contract management and payment lifecycle.

After fleet assets are acquired, they are catalogued into corporate Fleet Asset Information systems, Asset Works (M5) and Fleet Analytics & Strategic Technology (FAST). Maintenance programming and execution is governed by Fleet and Facility Services. Performance measures are tracked in M5 and FAST to substantiate decisions on equipment inventory and projected maintenance ratios to ensure service delivery standards are maintained. Fleet and Facility Services dispose of assets that are past their useful operating life and no longer feasible to retain.

12. Review and Approval Process

The following review and approval process was followed for this capital funding request:

Review Step	Reviewer
Review 1	Team Lead of Technical Services, General Supervisor of Business Integration, General Supervisor of Collection Services, General Supervisors of Sustainable Waste Processing, General Supervisors of Technical Services, and Senior Accountant of Financial Services.
Review 2	Director of Finance, Director of Business Integration, Director of Collection Services, Director of Sustainable Waste Processing, Communications, and Director of Technical Services.
Review 3	Branch Manager of Waste Services (Final Approver)
Review 4	Utility Advisor
Review 5	Utility Committee report presented

13. Appendices

Appendix A: Deteriorated Fleet Assets

It's common to have transmission and differential failures on self-propelled equipment and heavy-duty trucks past or near its EUL. A single repair can range between $50,000 and $75,000, leaving a unit out of service for up to 6 to 8 weeks.

Figure 1: The torque converter input bearing showing the heat-affected area.

Figure 2: Metal debris from inside the torque converter housing.

Figure 3: Metal contamination inside the transmission.

Figure 4: Damage inside the transmission oil pump.

Appendix B: Replacement Schedule

The following list does not include $10.8M for units pre-approved in 2022 for the 2023-2026 budget cycle. These units are listed in Appendix D.

Equipment Description	Section	Estimated Cost / Unit	Qty	Estimated Total
2023 Deliveries				
Truck - Tandem Side Loading (Body)	Collections	$200,000	7	$1,400,000
Truck - Single Side Loading (Body)	Collections	$160,000	4	$640,000
Truck - Haul All	Collections	$185,000	1	$185,000
Light Vehicle Truck	Collections / SWP	$85,000	5	$425,000
Light Plant	SWP	$35,000	4	$140,000
Mobile Crane	SWP	$200,000	1	$200,000
Manlift	SWP	$125,000	2	$250,000
Trailer End Dump	SWP	$180,000	4	$720,000
Trailer Walking Floor	SWP	$230,000	6	$1,380,000
Trommel Screener	SWP	$430,000	1	$430,000
Truck - Fifth Wheel	SWP	$230,000	3	$690,000
Tool Cat	SWP	$120,000	1	$120,000
Inflation on above units				$154,630

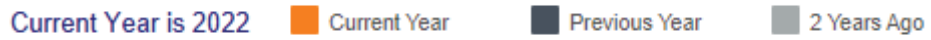
Subtotal 2023 Deliveries				**$6,734,630**
2024 Deliveries				
Truck - Tandem Side Loading (Chassis)	Collections	$200,000	7	$1,400,000
Truck - Single Side Loading (Chassis)	Collections	$160,000	4	$640,000
Truck - Tandem Side Loading (Body)	Collections	$200,000	7	$1,400,000
Truck - Single Side Loading (Body)	Collections	$160,000	4	$640,000
Truck - Crane	Collections	$110,000	1	$110,000
Truck - Bin Carrier	Collections	$220,000	1	$220,000
Light Vehicle Truck	SWP	$85,000	6	$510,000
Excavator	SWP	$800,000	1	$800,000
Wheel Loader (Large)	SWP	$800,000	1	$800,000
Wheel Loader (Small)	SWP	$500,000	1	$500,000
Trailer - Walking Floor	SWP	$230,000	6	$1,380,000
Truck - Fifth Wheel	SWP	$230,000	4	$920,000
Inflation on above units				$443,187
Subtotal 2024 Deliveries				**$9,763,187**
2025 Deliveries				
Truck - Tandem Side Loading (Chassis)	Collections	$200,000	7	$1,400,000

Truck - Single Side Loading (Chassis)	Collections	$160,000	4	$640,000
Truck - Tandem Side Loading (Body)	Collections	$200,000	9	$1,800,000
Truck - Single Side Loading (Body)	Collections	$160,000	3	$480,000
Skid-steer	Collections	$125,000	1	$125,000
Loader - Telescoping	Collections	$280,000	1	$280,000
Truck - Front Loading	Collections	$450,000	2	$900,000
Light Vehicle Truck	Collections / SWP	$85,000	10	$850,000
Wheel Loader (Large)	SWP	$800,000	1	$800,000
Wheel Loader (Small)	SWP	$500,000	1	$500,000
Trailer - Walking Floor	SWP	$230,000	5	$1,150,000
Inflation on above units				$644,115
Subtotal 2025 Deliveries				**$9,569,115**

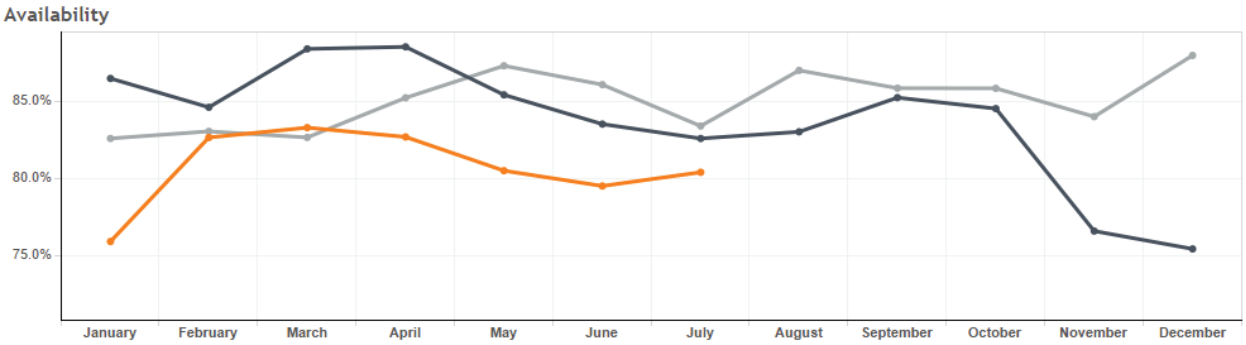
2026 Deliveries				
Truck - Tandem Side Loading (Chassis)	Collections	$200,000	9	$1,800,000
Truck - Single Side Loading (Chassis)	Collections	$160,000	3	$480,000
Excavator	SWP	$800,000	1	$800,000

Forklift	Collections	$100,000	1	$100,000
Truck - Recycling (Pendpac)	Collections	$390,000	1	$390,000
Truck - Roll Off	Collections	$270,000	2	$540,000
Light Vehicle Truck	Collections / SWP	$85,000	8	$680,000
Trailer - Flat Deck	SWP	$125,000	3	$375,000
Truck - Water	SWP	$450,000	1	$450,000
Trailer - Walking Floor	SWP	$230,000	4	$920,000
Truck - Fifth Wheel	SWP	$230,000	4	$920,000
Inflation on above units				$725,861
Subtotal 2026 Deliveries				**$8,180,861**
TOTAL APPROVAL REQUIRED *(with Inflation)*				**$34,247,793**

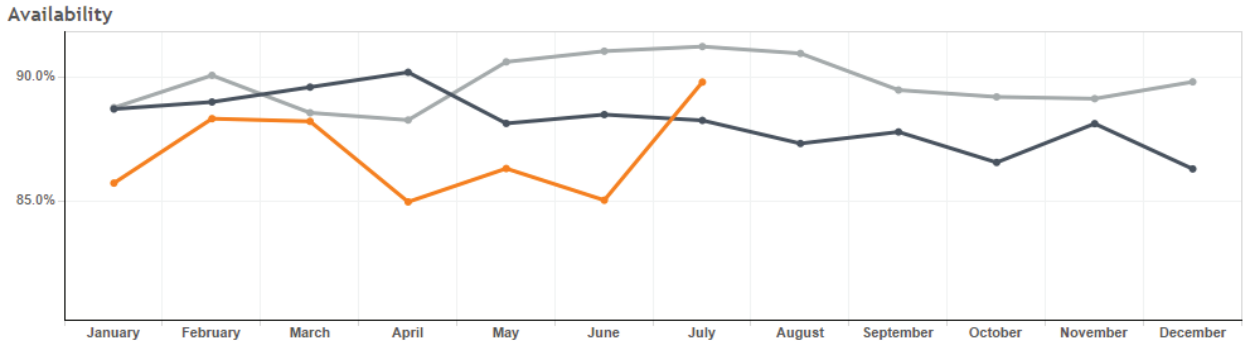
Appendix C: Availability Trends 2020 - 2022



Collections Availability



Process and Disposal Availability



Appendix D: Advanced Commitments

The following units received 2023-2026 budget pre-approval in September 2022 in the CO01381 Waste Services Supplemental Capital Budget Adjustment Council Report to ensure the units could be procured and delivered for 2023 and 2024 replacement requirements.

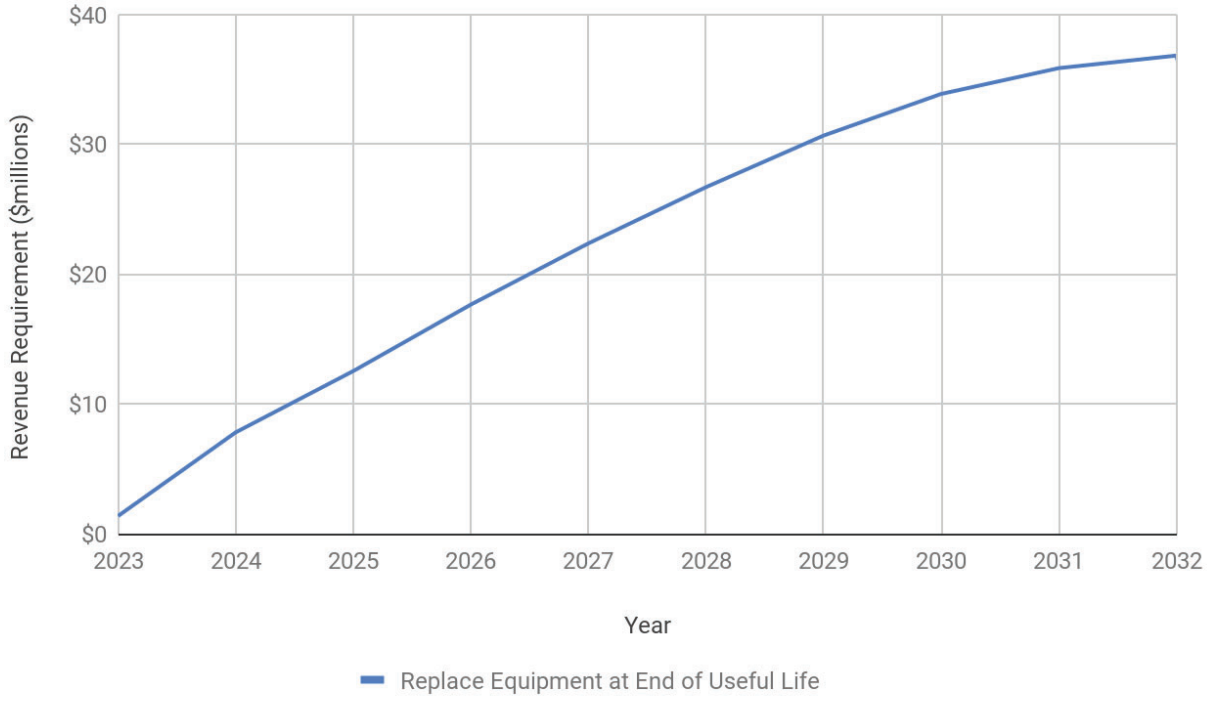
Equipment Description	Section	Estimated Cost / Unit	Qty	Estimated Total
2023 Deliveries				
Loader - Front End	SWP	$725,000	2	$1,450,000
Truck - Front Loading	Collections	$450,000	3	$1,350,000
Compost Turner	SWP	$850,000	1	$850,000
Truck - Roll Off	Collections	$270,000	3	$810,000
Truck - Hook Lift	SWP	$220,000	2	$440,000
Truck - Dump	SWP	$200,000	1	$200,000
Subtotal 2023 Deliveries				$5,100,000
2024 Deliveries				
Truck - Front Loading	Collections	$450,000	11	$4,950,000
Truck - Recycling (Pendpac)	Collections	$390,000	2	$780,000
Subtotal 2024 Deliveries				$5,730,000
TOTAL PREVIOUSLY APPROVED				**$10,830,000**

Appendix E: Financial Analysis Summary

Project Title: Fleet Assets Capital Funding Request	Replace Equipment at End of Useful Life
Total Capital Cost	($45,077,793)
Total Revenues	$0
Total Operating and Maintenance Savings	$1,420,183
Total Lease Costs	$0
Project Net Inflows (Outflows)	($43,657,610)
WACC Discount Rate	6.28%
Project Cost (Present Value)	($38,070,145)

The following table and graph demonstrate the cumulative present value of the revenues that must be realized through annual rate collection to support the project costs. This includes operating and maintenance costs, interest and amortization expenses over the project lifecycle.

Project Title: Vehicle and Equipment Capital Funding Request
Cumulative Present Value of Revenue Requirement



Year	Calendar Year	Replace Equipment at End of Useful Life
1	2023	$1,370,775
2	2024	$7,808,566
3	2025	$12,528,423
4	2026	$17,647,884
5	2027	$22,359,825
6	2028	$26,689,260
7	2029	$30,659,715
8	2030	$33,865,696
9	2031	$35,851,779
10	2032	$36,818,286

City of Edmonton
5th Floor Century Place
9803 102A Ave NW
Edmonton, AB T5J 3A3

edmonton.ca

Business Case for Residential Communal Collection

Mandatory Source Separation

(Formerly: Multi-unit Program)

City Operations | Waste Services

City of Edmonton

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Table of Contents

Change History

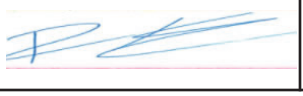
Version #	Date	Author	Description
0.0	February 26, 2020	Alison Abbink	Creation of the document for drafting.
1.0	March 26, 2021	Alison Abbink	Major revisions based on team feedback.
2.0	April 16, 2021	Alison Abbink	Major revisions based on team feedback and addition of cost information.
2.1	April 20, 2021	Alison Abbink	Clarity added on diversion rate calculation.
2.2	May 4, 2021	Alison Abbink	Minor edits based on reviewer feedback.
2.3	May 13, 2021	Kristen Wagner (IMC)	Edits for readability, consistency, clarity.
2.4	May 17, 2021	Vahid Rashidi	Final edits after IMC and Development Services review.
2.5	May 27, 2021	Kim Petrin	Edits to 10.5.1: - minor edits in vocabulary. - addition of the last paragraph in section 10.5.1.

Document Approval

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
2.4	Vahid Rashidi	Senior Project Engineer	May 17, 2021

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
2.4	Tony Colangelo, Supervisor Multi-unit and Waste Drop-off Services, WS, City Ops		May 18, 2021
2.4	Ryan Kos, General Supervisor Business Strategy, Planning and Performance, WS, City Ops		May 18, 2021

2.4	Sarah Wilmot, Senior Integrated Waste Policy Planner, WS, City Ops		May 17, 2021
2.4	William Johnston, Barrister and Solicitor, Legal Services, FCS	Will Johnston	May 17, 2021

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
2.4	Mordecai Baba, Acting Director, Collection Services, WS, City Ops		May 17, 2021
2.4	Chris Fowler, Acting Director, Waste Strategy, WS, City Ops		May 18, 2021
2.4	Ellen Tian, Director, Technical Services, WS, City Ops		May 17, 2021
2.4	Neil Kjelland, Director, Sustainable Waste Processing, WS, City Ops	Neil Kjelland	May 20, 2021
2.4	Jodi Goebel, Acting Director, Business Integration, WS, City Ops		May 17, 2021
2.4	Santosh Appukuttan, Finance Manager, WS, City Ops	Santosh Appukuttan	May 19, 2021
2.4	Michael Labrecque, Branch Manager, Waste Services, City Ops		May 21, 2021
2.5	Kim Petrin, Branch Manager, Development Services, UPE		May 26, 2021

1. Executive Summary

Currently, the communal collection program collects two streams: commingled garbage and recycling. The program uses front load bins (bins that are serviced with front load vehicles) that are shared by residents of multi-unit properties. This program is provided to apartment and condo properties that cannot be serviced by curbside collection. Participation in recycling collection is voluntary at the property level. The garbage and recycling collected is processed at the Edmonton Waste Management Center (EWMC), where streams can be mechanically sorted and a portion is diverted from landfill.

The current approach, which requires processing large amounts of unsorted waste, has limited the effectiveness and efficiency of the waste processing facilities. Although the City's waste processing infrastructure includes a Refuse Derived Fuel (RDF) Facility, which is able to divert residual waste, the production of RDF is not meant to replace actions that achieve diversion through more sustainable processes such as composting, anaerobic digestion and recycling. As outlined in Edmonton's 25-year Comprehensive Waste Management Strategy (Waste Strategy)[1], and in alignment with the internationally accepted solid waste management hierarchy, waste systems should prioritize waste reduction, reuse, and recycling and composting above materials recovery in order to operate efficiently.

Most recently, the diversion rate for the sector dropped from 14 percent (in 2019) to nine percent (in 2020), largely as a result of negative impacts resulting from the closure of the Edmonton Composting Facility and the COVID-19 pandemic. Without consideration for the additional diversion that can be achieved from the production of Refuse Derived Fuel, or the additional diversion that is expected to be achieved through the options contemplated in this business case, waste diversion from the sector is expected to increase over the coming years to a projected total of 41 percent (as a result of system improvements including processing facility enhancements and investments in additional processing capacity) but to then stagnate without changes to the collection program.

Continuing the status quo service will not achieve the City's strategic goals, particularly the goal of 90 percent diversion across all sectors set in Edmonton's 25-year Waste Strategy. Substantive program changes are required to align the communal collection program in support of this goal.

Program components that are critical to achieving a high diversion rate were identified through comprehensive research. These components address the many challenges unique to the communal collection program, such as anonymity, space constraints and less convenient access to disposal for specific waste streams. These components include source separation of waste streams; convenient, equal access to containers for all waste streams; and targeted, sustained

[1] CR_5829 Waste Strategy - Comprehensive Waste Management Strategy 2019

education. Communal collection customers have not historically received targeted educational support to overcome these challenges. Residents that receive curbside collection have benefited from enhanced education and outreach.

Transitioning to a three stream source separated collection program is a key starting point to addressing challenges, capitalizing on opportunities and making meaningful progress toward the goals of the Waste Strategy.

Table 1 highlights the recommendations being made by Waste Service:

Table 1: Recommended Alternative Summary

Recommended Program	
Source separation of three streams	Mandatory
Colocation of waste containers	Mandatory
Chute closures	Voluntary
Potential diversion increase	16%
Costs and Net Present Value (NPV)	$29.2M Capital $91.0M Operating & Maintenance $-67.6M NPV

With a capital cost of $29 million, and operating and maintenance cost of $91 million over the life span of the project, the recommended alternative is anticipated to add an additional 16 percent to the projected diversion rate, moving the communal collection program closer to the 90 percent diversion target and addressing a performance gap that would be difficult or impossible to close with processing improvements alone. The recommended alternative also received the highest level of support from both residents and property managers through two phases of public engagement.

In addition to the recommended alternative for the program, Waste Services is proposing that City Council endorse the implementation of enforceable developer standards for new buildings, and a regular program review. Waste Services is also requesting that City Council advocate for landfill disposal bans at a provincial level. While these items require endorsement from Council, additional funding is not requested as they can be accomplished within the current budget.

If approved, implementation for the program will be phased. Property evaluations will begin in

2022, with rollout commencing in 2023 in multiple phases that are expected to continue for approximately four years.

Once proposed program changes have been approved by City Council, work can commence on updating the Waste Services Bylaw 18590 to align with the program requirements. Bylaw recommendations are expected to follow at a later date for review by City Council.

2. Background

For more than 25 years, Waste Services has sought to continually evolve the City of Edmonton's waste management practices to reduce environmental impacts and achieve financial stability. This commitment to sustainability has been recently reaffirmed by the City of Edmonton's Strategic Plan: Connect Edmonton[2], which sets out four goals: Healthy City, Urban Places, Regional Prosperity, and Climate Resilience. It has also been reaffirmed by the City Plan[3] Outcome 1.4: Edmontonians demonstrate shared leadership as stewards of the environment.

By connecting to those key strategic documents the Waste Strategy sets the City on a path of significant change to the way that waste is perceived and managed. This path begins by reaffirming the goal of 90 percent waste diversion from landfill across all sectors and adopting a zero waste framework, and will continue as the City develops and implements programs to require source separation of recyclables, food scraps and yard waste, and takes on new initiatives to reduce waste generation.

The Waste Strategy outlines how consistent requirements for source separation, supported by comprehensive educational campaigns and regulatory measures, will help to achieve the diversion rate goal set by City Council. An updated timeline to implement source separation across all sectors, citywide, was developed in response to the impacts of the COVID-19 pandemic and is depicted in Figure 1.

[2] Connect(ed) Edmonton - Edmonton's Strategic Plan 2019 - 2028

[3] Charter Bylaw 20000 - Edmonton City Plan 2020

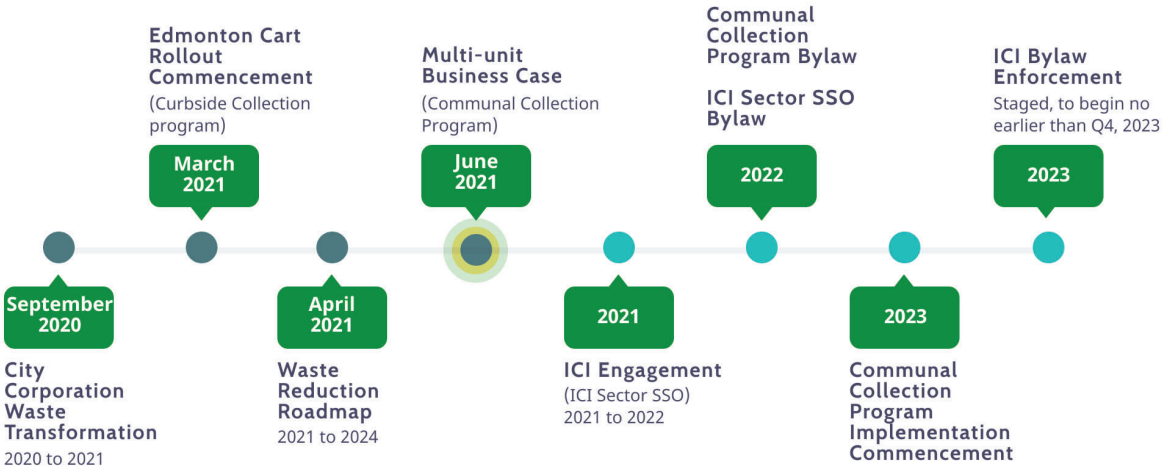


Figure 1: Waste Strategy Implementation Timeline

Following the launch of the cart-based system for the curbside collection program (the Edmonton Cart Rollout) and the approval of Edmonton's first Waste Reduction Roadmap (Roadmap'24) in May 2021, the City is ramping up the next steps for source separation in the communal collection program and Industrial, Commercial and Institutional (ICI) sector.

2.1. Current Situation

2.1.1. Sector Classification and Billing Structure

The City of Edmonton provides waste collection and processing services to multi-unit residents receiving communal collection under a municipal utility model. This means that all units receiving the service pay the same utility fee, receive service from the City, and do not have the ability to choose a different service provider or a different level of service. In addition to paying for the cost of waste collection and disposal, rate payers contribute to the costs of Eco Stations, Community Recycling Depots, waste education programs, management of the City's closed former landfills, and the operations of the Edmonton Waste Management Centre. The utility model also enables long-term investments in assets to support responsible waste management and aggressive waste diversion targets, along with the associated debt and amortization costs of advanced waste diversion facilities like the City's Materials Recovery Facility (MRF), High Solids Anaerobic Digestion Facility (HSADF) and Refuse Derived Fuel (RDF) Facility. This ensures all residents of Edmonton have access to the same services, pay for the shared responsibility of the closed landfills, and share in achieving the City's waste diversion objectives.

When City Council approved the Waste Strategy, it also approved changes to the Waste Services Bylaw 18590[4] which made changes to the utility rate structure. Previously, residents living in single unit properties were classified as "single unit residential" and those living in a multi-unit

[4] CR_6362 Waste Bylaw - Summary of Proposed Bylaw Changes 2019

property were classified as “multi-unit residential.” The rate paid by a resident was based on the type of dwelling they resided in, not the collection program they received. This meant that some multi-unit residents receiving curbside service (a higher cost service) paid the lower rate associated with communal collection. The updated bylaw aligns utility rates with the type of service received rather than the dwelling type. Now, residents pay either a cart collection rate (i.e. curbside collection program) or a bin collection rate (i.e. communal collection program), depending on the service they receive. Multi-unit properties that receive curbside collection have begun to transition to the new classification and are included in the Edmonton Cart Rollout.

An effort has been made to move away from using “single unit” and “multi-unit” terminology throughout this business case, where possible, since waste services and utility rates are no longer associated with dwelling type. Instead, the terminology is focused on the collection programs provided to residents: curbside collection and communal collection. Curbside collection refers to the collection of individual containers either at a front street or back alley location. Each household is responsible for setting out waste in containers that are allocated on an individual basis. Communal collection refers to the service that is provided through the use of shared containers located in an indoor waste room or outdoor location. Containers for communal collection are allocated at a building level rather than on an individual basis. This business case is focused on the communal collection program.

2.1.2. Collection Approach

Currently properties that receive communal collection (such as apartments and condos) can have waste collected in two streams: garbage and recycling. Front load bins are used for both streams in the majority of cases (a small number of properties have recycling collected in blue bags that are placed in a central location, without a bin). Participation in recycling is voluntary, and as a result, approximately 36 percent of properties (representing 16 percent of units) do not have a recycling bin. The estimated number of multi-unit properties receiving communal garbage and communal recycling collection is shown in Figure 2. Front load bins are shown in Figures 3 and 4.

Figure 2: Current Multi-unit Site Breakdown for Garbage and Recycling Collection

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

Residents set out all household garbage, including compostable material such as food scraps, in the garbage bins. For properties with recycling bins, residents can place all recyclable materials in the recycling bin. Residents of properties without recycling bins may choose to drop off their recyclable materials at a Community Recycling Depot.

Due to the variation in building sizes and infrastructure, bins ranging in size from two to eight cubic yards are provided by the City. This allows the service to be tailored to best meet the needs of each property. Collection of garbage and recycling is done by the City or the City's contractors.

Figure 3: Collection of a Recycling Bin

Figure 4: Communal Bins - Recycling (left) and Garbage (right)

2.1.3. Processing of Communal Collection Program Waste

Currently garbage from the communal collection program is taken to the EWMC for processing. Residential garbage arriving at the EWMC is mechanically sorted at the Pre-Processing Facility (PPF) inside the Integrated Processing and Transfer Facility (IPTF) and sent to other facilities for further processing. Since the closure of the Edmonton Composting Facility (ECF) aeration hall in 2019, a limited quantity of organic waste has been sent for processing at the High Solids Anaerobic Digestion Facility (HSADF) and the Cure Site. Additional capacity to process organic waste is currently being provided by third party composters in the region. Similarly, another portion of the waste that has been pre-processed can be processed into Refuse Derived Fuel (RDF).

Recycling from both curbside and communal collection programs arrives at the EWMC at the MRF for sorting. After being sorted into streams, the material can then be sold to recycling markets. A facility renewal project to increase the processing capacity and performance of the MRF was approved in October 2020[5].

2.1.4. Diversion Rate

It is estimated that approximately nine percent of communal collection waste was diverted from landfill in 2020. This figure is based on the total volume of waste that was recovered out of the total volume of waste generated by residents and 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 Community Recycling Depots. Based on recent analysis of multiple municipalities, as much as 40 percent of communal garbage is organic waste (i.e. food scraps) and an estimated further 32 percent is recyclable material. These numbers are in addition to the recycling that is already collected separately through the City's voluntary recycling program.

A Diversion Rate Calculation for the communal collection program is available as a separate document presented with this business case (Attachment 5).

2.1.5. Education and Outreach

Currently, Waste Services has limited educational resources specific to the communal collection program. Online resources include a web page with information about the service. Print resources include a brochure entitled *Your Guide to Waste and Recycling* (which was initially designed for English Language Learners).

Residents have also been invited to take advantage of other educational events and tools that are offered to all Edmontonians, such as the tours of the Edmonton Waste Management Centre, the *WasteWise* mobile app, and a printable *What Goes Where* poster. Currently, Waste Services does not have any in-person educational programs specifically targeting communal collection

[5] CO00057 Material Recovery Facility (MRF) Renewal Business Case Report 2020

and there are currently no dedicated education staff to support communal collection customers.

2.1.6. Regulatory Requirements

Waste Bylaw 18590 was revised in 2019 to align with leading municipal best practice to support a waste program designed to achieve high diversion targets. Two best practices are establishing mandatory source separation of waste streams and setting volume limits. The revision in 2019 did not introduce regulatory requirements related to volume limits or mandatory three stream source separation for residents receiving communal collection. Those best practices are reflected in the sections of the bylaw related to curbside collection.

The bylaw currently supports the proposed changes in this business case, but further revisions will be required to bring it into full alignment.

Currently, developer guidelines, which describe the size and location of waste management facilities as well as vehicle access requirements for new multi-unit properties, are presented by Waste Services during the permitting phase of a new development, and must be reflected in the Comprehensive Site Plan required by Clause 13.5 of Edmonton Zoning Bylaw 12800[6]. As the Zoning Bylaw is updated, ongoing alignment with the Waste Bylaw and updated Waste Design Standards, along with enhanced procedures to ensure standards are reflected in completed developments, will be required to provide clarity to developers and require best practices for waste management to be incorporated into all new buildings.

2.2. Planning and Growth

The City Plan[7] provides an outlook for the growth and evolution of the City. As the City continues to grow from one million to two million residents, a substantial increase in growth in medium to high density dwellings such as apartments and mixed use properties is anticipated. Steady growth in high density residential development is expected over the next ten years, followed by more intense increases in subsequent years. The City Plan anticipates that a total of 280,000 medium density and 220,000 high density dwellings will be required in order to accommodate two million residents.

The City Plan estimates that medium and high density dwellings will account for 59 percent of all dwellings city-wide with at least 50 percent of net new units added through infill. This growth will influence how programs and services will need to evolve to keep up with demands, and will play a large role in how waste is collected in the City. It will become increasingly important for design and development standards to become enforceable and consistently utilized for new developments while allowing for flexibility and innovation in response to emerging needs, to ensure that this growth is aligned with best practices and service standards.

[6] Edmonton Zoning Bylaw 12800 2017
[7] Charter Bylaw 20000 - Edmonton City Plan 2020

3. Challenges and Opportunities

3.1. Diversion

In 2020 the diversion rate for the portion of the residential sector that receives communal collection services dipped to nine percent. This rate includes collections and processing, as well as waste drop off programs. This decrease in diversion is largely a result of negative impacts resulting from the COVID-19 pandemic and the closure of the ECF aeration hall. Over the coming years this diversion rate is expected to increase as a result of processing facility enhancements and investments in additional processing capacity to reach a projected total of 41 percent, even without changes to collection.

This diversion forecast, and others presented throughout this business case, does not include the diversion that can be achieved by processing mixed waste into Refuse Derived Fuel (RDF), since the intended feedstock for the City's RDF process is municipal solid waste that cannot be recycled or composted. The diversion impact of RDF was removed from the calculations presented in order to clearly show the impact of source separation of waste for the communal collection program. The diversion potential of RDF should be seen as an adding value to both the curbside and communal collection programs, by achieving diversion of residual waste that has traditionally been sent to landfill. As recycling and composting are higher than recovery (including RDF) on the internationally accepted solid waste management hierarchy, the City's waste system emphasizes diversion anchored in source separation before relying on recovery solutions. Without changes to how waste is collected, the diversion rate will stagnate and continue to fall short of the target of 90 percent diversion from landfill, even when diversion from RDF processing is considered.

Calculations and analysis indicate that as much as 72 percent of the material that is currently collected as garbage through communal collection could be diverted through a source separation program. Furthermore, the current recycling stream has a contamination rate of about 22 percent, indicating that waste sorting behaviour can be improved[8]. These two challenges, in conjunction with the 90 percent diversion target across all sectors, present a significant opportunity to manage waste from communal collection customers in a more environmentally sustainable way.

As identified in the 2019 Single Unit Waste Set-out business case[9], the current method of collecting and processing a stream of commingled garbage that contains organic waste reduces the effectiveness of processing facilities and the value of the end products such as compost and RDF, contributing to a lower diversion rate.

Waste that enters the City's pre-processing facility is mechanically sorted by size, rather than

[8] City of Edmonton Four-Season Waste Composition Study 2016
[9] CR_7173 Single Unit Waste Set-out Business Case 2019

type. The waste that is less than three inches in size is classified as organic waste and is sent for processing. However, a significant amount of non-organic materials (such as plastic and glass) is small enough to be mixed in with this stream. This has historically resulted in a lower quality compost which is not suitable for landscaping and horticulture. This limits the uses for and marketability of the product.

A parallel challenge exists with sorting material to be used as feedstock for RDF. RDF relies on a dry waste feedstock for optimum efficiency in the waste to biofuels facility. The mechanical sorting for RDF targets larger waste materials, but there is no effective way to remove relatively wet organic material (such as food scraps). To date, approximately 18 to 20 percent of the waste used to produce RDF consists of wet organic material. As a result, Waste Services invested in additional processing and drying equipment to reduce the moisture content of this waste. Production can be improved if the moisture content of the incoming material is reduced (i.e. by reducing the amount of organic waste in the garbage stream).

City Council's decision to require source separation of food scraps and yard waste in the curbside collection program begins to address the issues described above for waste that originates from the curbside collection program. These improvements will result in an increased diversion rate and reduce the quantity of garbage that arrives at the IPTF, allowing the facility to operate more effectively. However, should the communal collection program continue to set out unseparated waste, the program will be unable to reach the established diversion target.

3.2. Commitment to Cross Sector Consistency

In addition to the opportunity to improve diversion, changes to the communal collection program will help to make requirements for waste sorting consistent across all sectors, as envisioned by the Waste Strategy. Consistency will reinforce changes and support enhanced performance system-wide. Consistent expectations for sorting food scraps, yard waste and recyclable materials at home (regardless of dwelling type), work, school and in the community help to reinforce concepts communicated through educational programs and encourage the formation of responsible waste habits. The growth expected in the number of properties serviced by communal collection presents an opportunity to focus on this sector. The City has an opportunity to leverage its position as the utility provider of residential waste collection service to ensure service consistency that ultimately supports the City's environmental objectives.

Changes to the communal collection service also provide an opportunity to improve educational programs that target communal collection customers. Historically, residents who receive communal collection were provided with fewer, more passive educational resources, compared to the targeted and more abundant educational offerings for residents receiving curbside collection. Significant changes to the communal collection program will require a corresponding level of educational support.

The current program, supported by the Waste Bylaw, only sets parameters for communal garbage collection and optional communal recycling collection, whereas the curbside collection program requires source separation of three streams. Once the program has been updated, revisions will be made to the bylaw to align with the new program requirements.

The City also has the opportunity to better leverage the development process for new properties to ensure that developer standards for waste are reflected in new developments as the city grows. These standards clearly outline minimum expectations for properties across the sector. Current Zoning Bylaw 12800 is undergoing a multi-year, comprehensive overhaul. Revising the Waste Bylaw and the Zoning Bylaw in tandem will allow for deeper integration and collaboration between internal stakeholders, and support the development of aligned regulations, standards and procedures to achieve the intended outcomes of the Waste Strategy, alongside those of the City Plan and other key strategic policies and initiatives.

3.3. Additional Challenges

Communal waste collection differs from curbside waste collection in many ways including a need for more flexible servicing due to space constraints and anonymity of the users. Compared with properties receiving curbside collection, resident turnover in properties with communal collection has a higher impact to service participation and compliance, as large numbers of people may move in a single month.

Properties receiving communal collection tend to have more variety in building size and type. This means there is a need for flexibility in terms of the types and sizes of containers used and service frequency. Where homes receiving curbside collection can be serviced by one type of container (with variations in size to incentivize waste reduction and proper waste sorting), one type does not fit most in the context of communal collection.

Communal waste areas can be located indoors (e.g. garbage rooms on the ground floor of buildings or in underground parking garages) or outdoors (e.g. in parking lots), and properties may also have chutes that allow residents to dispose of waste on the same floor as their dwelling. This variety in infrastructure requires staff to assist properties with allocating space for waste collection containers. The variety also compounds the challenge of providing equally convenient access to containers for all waste streams. Equal access is a fundamental component of successful waste sorting.

Residents who receive communal collection do not always have a direct relationship with the impacts of how they set out their waste. This is a result of two factors: a level of anonymity that is created by many residents sharing a container, and the fact that many residents do not pay the utility rate directly because it is incorporated into rent or monthly condo fees. This lack of a direct relationship can pose challenges to participation in diversion programs and can give rise to higher contamination rates.

In some properties, outdoor communal bins create an opportunity for illegal dumping. Illegal dumping can include disposing of items that don't belong in the waste stream in the bins (e.g. furniture, car batteries) or placing furniture and other prohibited materials next to the garbage and recycling bins, and can include opportunistic dumping by those who are not site residents. Although an illegal dumping strategy is outside the scope of this business case, changes to the service may provide ways to mitigate the impacts of illegal dumping. For example, container and lid size or shape may reduce disposal of bulky items that are problematic when received at processing facilities at the EWMC, and changes to the location may deter people from placing items next to bins.

Based on information gathered during research and Public Engagement, residents of communal collection properties typically move more often than residents in single unit dwellings, and tend to represent a wider variety of cultural backgrounds and languages. Educational programs must therefore address challenges associated with high turnover rates and diverse backgrounds. Ensuring residents have adequate information and support requires more resources and effort from educational staff. Having a robust educational program with resources dedicated to residents of communal collection properties can also impact the behaviour of residents in the curbside collection program in the long term, as people may transition between property types interchangeably over time. This is especially true if the behavioural expectations are similar in both programs.

Overall, the communal collection program presents a more complex situation than the curbside collection program and will require a unique approach to ensure the success of the Waste Strategy.

4. Initiative

4.1. Initiative Description

The alternatives presented in this business case would significantly change the way that residents that receive communal collection sort and set out their waste. These changes include moving from a program that provides garbage collection with voluntary recycling to a program that requires the separation of waste into three streams, and the creation of a targeted education and outreach program to support both residents receiving communal collection and property managers.

The streams proposed for collection are aligned with the three primary streams provided to curbside collection customers:

Garbage - Sorting waste into three streams will inevitably reduce the amount of residual waste, or garbage, set out. As a result, some properties will be able to use smaller containers for this stream. Appropriately sized containers will be provided to every property (with the exception of

compactors which are procured, maintained and replaced by the property owner to reduce the required collection frequency and/or building footprint required for waste collection from large scale multi-unit sites). Limits on the volume of garbage collected will also be introduced, to match expectations of customers receiving curbside collection service, and to incentivize residents to sort and reduce their waste.

Recycling - Recyclable materials make up a large volume of the waste that is generated by residents receiving communal collection service. The alternatives examined in this business case are based on mandatory collection of recycling to increase the recovery of recyclable materials. Suitable containers will be provided to every property.

Food Scraps - The separate collection of food scraps will also be mandatory. This stream will be new to all properties receiving communal collection, and suitable containers will be provided to every property. Containers may also be topped up with yard waste, as is permitted for residents who receive curbside collection service.

A targeted education and outreach program is proposed to ensure residents and property managers are informed of the changes and supported through both the initial program change and the pursuit of targets for program performance.

The impact of the selected alternative will be monitored and evaluated at regular intervals. Additional changes may be made to ensure the program continuously improves and adjusts.

4.2. Urgency of Need

The Waste Strategy and the Corporate Business Plan commit to implementing mandatory source separation in the multi-unit sector (communal collection program) by 2023. This timing is aligned with changes currently underway for curbside collection customers (the Edmonton Cart Rollout) and 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. The success of source separation programs in both residential programs will increase the success of source separation in the ICI sector.

If changes are not made to the communal collection program starting in 2023, 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, which will negatively impact the diversion rate in the curbside program. There will also be less rationale for mandatory source separation for the ICI sector.

It will take time to realize the impact of changes to the communal service. By starting to make changes now, Waste Services will be better positioned to achieve the goals of the 25-year Waste Strategy.

4.3. Anticipated Outcomes

Waste Services anticipates the following outcomes as a result of the implementation of the proposed program:

- A decrease in the amount of garbage set out by residents, impacting container size and/or frequency of collection.
- More compliance with collection rules and increased participation in sorting as a result of clear and consistent expectations, enforcement, outreach and education.
- Harmonized expectations across residential sectors, which may lead to an increased diversion rate in both programs, as residents move fluidly between housing types.
- Equity for residents between the curbside and communal collection programs.
- Cleaner feedstock for organic processing facilities, resulting in an increase in processing efficiency and 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 pre-processing at the IPTF due to a reduction in the volume of garbage.
- Improved production of 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.
- Improved responsiveness to the needs and constraints of complex developments, including mixed-use sites, where innovative design approaches are required to achieve serviceability and program outcomes without compromising city building outcomes.

An estimated increase in the projected diversion rate of approximately four to 16 percent, is expected as a result of these outcomes, depending on the approved alternative. This is based on assumptions that waste sorting and diversion facilities at the EWMC are fully functional and have sufficient capacity to process the incoming waste, end markets for all recyclable commodities are available, participation in waste drop off programs remains constant, and education programs are effective at changing residents' habits.

4.4. Scope

Table 2 describes the scope for this business case.

Table 2: In Scope Items

Component	In Scope
Customers	• All residential properties which are currently being serviced or will be serviced in the future by communal garbage collection. This includes the residential units in buildings that contain commercial units.

Method of Separating Food Scraps and Recyclables	• Collection and processing of three streams of source separated waste: garbage, food scraps and recycling. • Collection and processing of two streams of source separated waste: garbage and recycling.
Collection	• Identification of preferred containers for recycling. • Identification of preferred containers for garbage. • Identification of preferred containers for food scraps. • Impact of colocation of collection containers or disposal points (i.e. ensuring residents have access to all three streams in the same space) on capture and contamination rates.
Financial	• Capital and operating budgets to support the program changes. • Net Present Value (NPV) analysis. • Revenue Requirement (RR) analysis.
Implementation	• A high level implementation plan. • Introduction of regular waste characterization studies to support regular data collection and measurement.
Strategic	• Analysis of the impact of waste chute closures on capture and contamination rates. • The need for mandatory developer standards addressing the design of waste spaces in new multi-unit properties.
Education and Outreach	• Development and delivery of education and outreach programs and strategies specific to the communal collection program as part of the initial program launch, as well as ongoing support.

4.5. Out of Scope

Table 3 describes the items that are managed separately and that are out of scope for this business case.

Table 3: Out of Scope Items

Component	Out of Scope
Customers	• All residential units that are in scope of the Edmonton Cart Rollout project. • Non-residential customers, including commercial units in mixed use properties.
Collection	• Changes to waste drop off programs such as Eco Stations, Community Recycling Depots, the Reuse Centre, and the Residential Transfer Station.

	• Analysis of the cost of collection performed by City crews and contractors. • Analysis of the percentage of collection performed by City crews and contractors.
Implementation	A detailed implementation plan for the recommended options including: • Educational plan, tactics and materials for residents and property managers. • Staff training requirements. • Updates to the billing system, if needed. • Collection contract procurement. • The procurement process for any private processors or technology providers. • The details of the implementation phases (timing, number of dwelling units per phase, etc.).
Processing	• Changes to processing infrastructure including contracts, equipment and resources. • Organics processing facility business case or approval.
Utility Model	• Analysis for the deregulation of communal collection.
Strategic	• Solutions for on site management of organic waste for multi-unit properties. • Solutions for waste reduction for multi-unit properties. • Updates to the Waste Management Policy C527. • Diversion rate calculation methodology for communal collection and proposed methods for measuring the diversion (presented separately at the same time of this business case).
Regulatory	• Updates to the Waste Services Bylaw 18590 (to follow at a later date based on the alternative approved by City Council).

4.6. Critical Success Factors

The following critical success factors have been identified:

- Completion of comprehensive research and analysis during program development to support and identify best practices and evidence of mandatory three stream source separation being effective in other jurisdictions with similar goals, and application of lessons learned from those jurisdictions.
- Effective engagement with stakeholders and residents to learn about local conditions, potential barriers to program implementation, and associated solutions.
- Risk identification and management to mitigate the risks during program planning and implementation.
- Continued City Council endorsement of the Waste Strategy and its associated goals and

programs.
- City Council and corporate leadership endorsement of the proposed program changes.
- City Council approval of funding for the proposed program changes.
- Resident and property manager participation and adoption of program changes.
- Sufficient processing capacity, either at the EWMC or third party facilities, for the expected quantity of food scraps and recycling.
- The successful implementation of the Edmonton Cart Rollout program. The Edmonton Cart Rollout will create momentum that will aid in implementation of an equivalent program for communal collection.
- Sufficient time for educational program planning as well as adequate resourcing to implement.

5. Strategic Alignment

The transition of the communal collection program to mandatory three stream separation is rooted in the Waste Strategy, which was approved by City Council in September 2019. The goals in the Waste Strategy are aligned with City Council's Strategic Goal of Climate Resilience set out in ConnectEdmonton[10].

This business case is aligned with City Plan[11] Outcome 1.4: Edmontonians demonstrate shared leadership as stewards of the environment. Intention 1.4.1 of the City Plan is to support Edmontonians' transition to a low carbon future in their daily lives and Direction 1.41.4 is to avoid waste at its source, improve diversion rates, and reuse and recover resources. The implementation of mandatory waste sorting, and mechanisms to incentivize waste reduction among communal collection customers is clearly aligned with the directions of the City Plan.

The Waste Strategy also aligns directly with the Environmental Protection aspect of the Corporate Business Plan[12], supporting the commitment of minimizing the environmental impact of Edmontonians' daily living through sustainable waste management practices, including the implementation of the Source Separated Organics program. This allows for the collection of organic waste separately from residential garbage to then be processed into compost[13].

The proposed changes to the communal collection program are critical to the City's ability to achieve these goals and commitments. The program changes will allow Waste Services to contribute directly to the delivery of excellent services through more efficient and effective waste collection, and reduce the impact on the environment through source separation and waste processing.

[10] Connect(ed) Edmonton - Edmonton's Strategic Plan 2019 - 2028
[11] Charter Bylaw 20000 - Edmonton City Plan 2020
[12] City of Edmonton Corporate Business Plan 2019 - 2022
[13] City of Edmonton Corporate Business Plan 2019 - 2022

This business case also aligns with the goals of the Revised Community Energy Transition Strategy approved by City Council on April 19, 2021. The Revised Community Energy Transition Strategy includes interconnected pathways of transformative change to reach Edmonton's Climate Resilience goal of a low carbon city. Pathway 1 calls for a renewable and resilient energy transition, and one associated goal is for Edmonton to use waste as a resource. The collection of source separated streams of waste enables the potential expansion of processing methods that provide opportunities to maximize the production of zero emissions energy and resources from waste, such as anaerobic digestion. In addition, source separation of recycling and food scraps will reduce the City of Edmonton's carbon footprint; recycling uses less energy and fewer resources than production using virgin materials; and keeping food scraps out of landfills reduces methane production.

Finally, this business case is also strategically aligned with a number of other distinct but related initiatives that are currently under development as part of the implementation of the Waste Strategy such as the Waste Reduction Roadmap, the Edmonton Cart Rollout, and the ICI waste source separation strategy. Discussion is also underway with the provincial government regarding the introduction of an Extended Producer Responsibility (EPR) Framework for Alberta. If implemented, producers will be responsible for the end of life treatment of their products. The implementation of a mandatory recycling collection by the City is anticipated to align with these efforts. While these initiatives are outside the scope of this project, their outcomes will impact its overall success, and collectively contribute to achieving the ultimate goal of 90 percent diversion.

6. Context Analysis

6.1. Comprehensive Research

Comprehensive research was undertaken by Waste Services to seek out and validate potential program components that would meet the City's current and future needs. The findings also provided a basis for the public engagement activities.

The research examined the current practices of jurisdictions in Canada and internationally. An effort was made to discover learnings from those municipalities that have long-standing programs, uncover successful approaches, understand sector best practices, and explore innovation. In addition, the research identified future-facing strategic goals, considerations for the evolution of programs, and program maturation milestones.

The research pulled from five types of information:

- Jurisdictional scans: A scan of publicly available online data was conducted for 49 municipalities across Canada, the United States, Europe, Australia and Asia.
- Interviews with government representatives: 14 municipalities were directly engaged via phone interviews and email correspondence in Canada, the United States, and Europe. These municipalities were chosen because they represent a similar future-state

for Edmonton with three stream collection.
- Interviews with industry representatives: 10 industry groups such as waste associations, haulers, and processing companies were directly engaged via phone interviews and email correspondence.
- Literature review: A review of 73 publicly available documents such as municipal educational materials, policies, non-government organization (NGO) reports, case studies, strategic documents, peer reviewed and comparative studies, pilot reports, and regional and municipal reports.
- Behavioural science studies: A review of research focusing on the impact of program design on resident behaviours.

In addition, the project team undertook a high level feasibility study of centralized waste processing as an alternative to source separation, using existing Waste Services infrastructure.

The research results were organized into the following categories:
- Methods of collection,
- Resident supports such as educational and outreach tools,
- Supports for property managers,
- Regulatory mechanisms for a successful program, and
- Financial mechanisms for a successful program.

6.1.1. Key Findings

A number of key findings were distilled from the research. These findings inform the options analysis process of this business case. A full Summary of Findings is available as a separate document presented with this business case (Attachment 2).

Complexities of Communal Collection
Recurring challenges to communal collection were identified, including a high level of anonymity, a wide range of building types and infrastructure needs, high rates of resident turnover, illegal and opportunistic dumping, and access challenges for residents, especially in large properties.

Many municipalities find that communal collection requires a more dedicated and sustained effort to support successful behaviour change. This may result in the creation of dedicated customer service or multi-functional support teams.

Due to the more complex nature of this type of program, the diversion rate for communal collection programs among municipalities with the most mature programs is in the range of between 20 and 30 percent[14]. While establishing a new program can result in an immediate increase in diversion, program maturity takes time to achieve. Even municipalities with mature programs have a goal to increase their diversion rate. The most successful municipalities have

[14] Multi-unit specific, not combined residential.

had programs in place for the longest time, including sufficient time for generational turnover.

Common Approaches to Waste Separation in Communal Collection Programs
Most jurisdictions examined have determined that it is preferable to focus on source separation, rather than depend on processing of mixed waste to achieve diversion. Source separation is mandatory in an increasing number of jurisdictions that have high diversion goals. The impact of separation being mandatory is discussed further in the next subsection.

Not only is source separation of waste into three streams achievable, many jurisdictions examined during the research provide separate regular collection of up to five streams (e.g. glass, plastic and metal containers, paper and cardboard, food scraps and garbage).

There is a common perception that a lack of space prevents a large number of properties from being able to participate in multi-stream waste collection programs. Based on the municipalities examined, the vast majority of properties are able to participate in the program and do not encounter barriers related to space limitations.

Mandatory Programs and Clear Standards
Mandatory programs were both the most common and the most preferred approach among municipalities examined. Mandatory programs not only reinforce norms and standardize the requirements from building to building but also increase participation. These benefits were noted even in the municipalities that did not directly service the sector.

As an extension of this finding, the most successful programs in the municipalities examined have consistent sorting requirements enforced in all spheres of life such as home, work and school.

In addition to providing mandatory service, other elements of successful programs can be made mandatory. One example is providing equally convenient access to containers for all waste streams, and integrating this into building design. Many municipalities in North America consider colocating waste streams as a best practice. Colocation prioritizes equal convenience and access to all waste streams by siting container locations together, and can be achieved by establishing enforceable developer standards. Some North American municipalities have begun including colocation in their standards which in turn are enforceable with bylaws and ordinances. This emphasis on a user centric program design moves the focus of waste management from being an “out of sight, out of mind” issue to becoming embedded in building design and a recognized process that contributes to sustainability.

How Communal Waste is Collected
Owing to the diversity of building stock the research revealed that municipalities commonly used more than one, and sometimes up to five, distinct methods of collection to ensure that service can be provided to all building types and sizes.

Flexibility in container offerings was key to meeting the needs of the properties and residents. Many municipalities opt to utilize the smallest container size required while still ensuring adequate waste storage. This flexibility helps municipalities "right size" combinations of containers to suit the layout of each property. Smaller containers may also help decrease opportunities for illegal dumping and additional contamination.

Underground containers are becoming more common in Europe as a method of providing convenient access while working with above ground space constraints and aesthetics of the streetscape design. However, the styles of underground collection utilized in Europe are not commonly available in North America. So while this technology has been successful in the European jurisdictions researched, it requires further investigation and reviews of applications in North America to determine suitability for Edmonton.

The Role of Education and Outreach
All the sources examined emphasized the importance of supporting the establishment of new behaviours in both residents and property management. The research showed that education and a convenient, well planned program should work hand in hand to achieve success.

Education in the multi-unit sector requires a more sustained effort compared to the single unit sector, because of the challenges associated with higher resident turnover. Dedicated teams that provide logistical help to building managers (e.g. identifying optimal container types and locations) as well as educational information for managers and residents are critical to the success of a mandatory source separation program. Teams need to work consistently on developing relationships with property managers because strong relationships with property managers are considered as valuable to program success as having well-supported residents.

6.2. Regulated Utility Model

The regulated utility model presents an advantage that ensures all residents and property managers are provided with the same high standard of service and educational support regardless of dwelling type. The research has demonstrated that municipalities achieve the most success in increasing waste diversion through source separation when expectations are clear and consistently enforced across all sectors. Consistent expectations for sorting in all spheres of life help to solidify the formation of positive and responsible waste habits.

This consistency is more difficult to achieve and enforce where properties can enter into their own agreements with service providers. Municipalities interviewed during the research highlighted how non-regulated service introduces the possibility of disparity. The regulated model delivers specific benefits related to service equity, long-term planning and financing, and the design and implementation of consistent standards and incentives to support strategic policy objectives. These benefits are particularly relevant as the City implements the Waste Strategy, with new facilities and programs coming online and the diversion forecast expected to trend sharply upward as part of the ongoing transformation of the waste management system.

7. High Level Options

The research revealed a variety of components that can be used in a communal source separation program. The components were grouped into six categories, as described below. An explanation of the evaluation process is provided in Section 8, and the findings are discussed in Section 10.

7.1. Method of Separating Food Scraps and Recyclables

Two primary approaches were identified:

- **Source Separation:** The majority of the research pointed to a three (or more) stream source separated waste collection program, similar to the expectations in place for the curbside program.
- **Centralized Processing:** One jurisdiction researched uses an approach that is conceptually similar to Edmonton's current system. Waste is collected in two streams (garbage and recycling), with centralized processing facilities used to separate organics for further diversion.

7.2. Method of Collection

A wide variety of collection methods were identified for communal collection programs. These methods included mobile collection depots, waste drop off sites, a range of above ground containers such as carts and bins, as well as underground containers and pneumatic collection systems.

7.3. Resident Support

A number of resident focused support mechanisms were identified, such as the provision of in-unit containers (such as kitchen catchers or totes), ambassador programs and a range of educational and outreach campaign components.

7.4. Property Management Relationship

Supports for property management were catalogued separately from resident supports to account for the difference in needs. Property manager supports included a range of educational materials, toolkits and customer service approaches such as stakeholder working groups and dedicated customer service teams.

7.5. Financial Mechanisms

A small number of financial incentives were identified, including the possibility of rate reduction for streams with low contamination, variable rates based on volume of waste set out, and credits that could be used to encourage desired waste behaviour.

7.6. Regulatory Mechanisms

A range of regulatory mechanisms were also found. Regulations can be used to control how space for waste is designed in new properties (developer standards), ease of access to all three stream disposal points (colocation), the role of chutes (chute closure regulations), and to set volume limits.

8. Options Analysis Methodology

8.1. Overview of Analysis Approach

The approach that was taken to evaluate options for the communal collection program was iterative and integrated feedback from public engagement activities after each phase of analysis. As shown in Figure 5, public engagement was interwoven between rounds of analysis to ensure that the recommendations were well aligned from multiple perspectives.

Figure 5: Overall Options Analysis Methodology and Process

The options considered for the communal collection program were evaluated individually, to help give the program flexibility to address the variety of needs in communal collection.

A three step process (outlined in Figure 6) was used to narrow down potential options for this business case. The process ensured that the analysis was done in a consultative and structured environment. Notes and results were recorded transparently and in detail to allow the project team to provide critical feedback and make adjustments as necessary. Results from each phase of analysis are included as Appendices to this document.

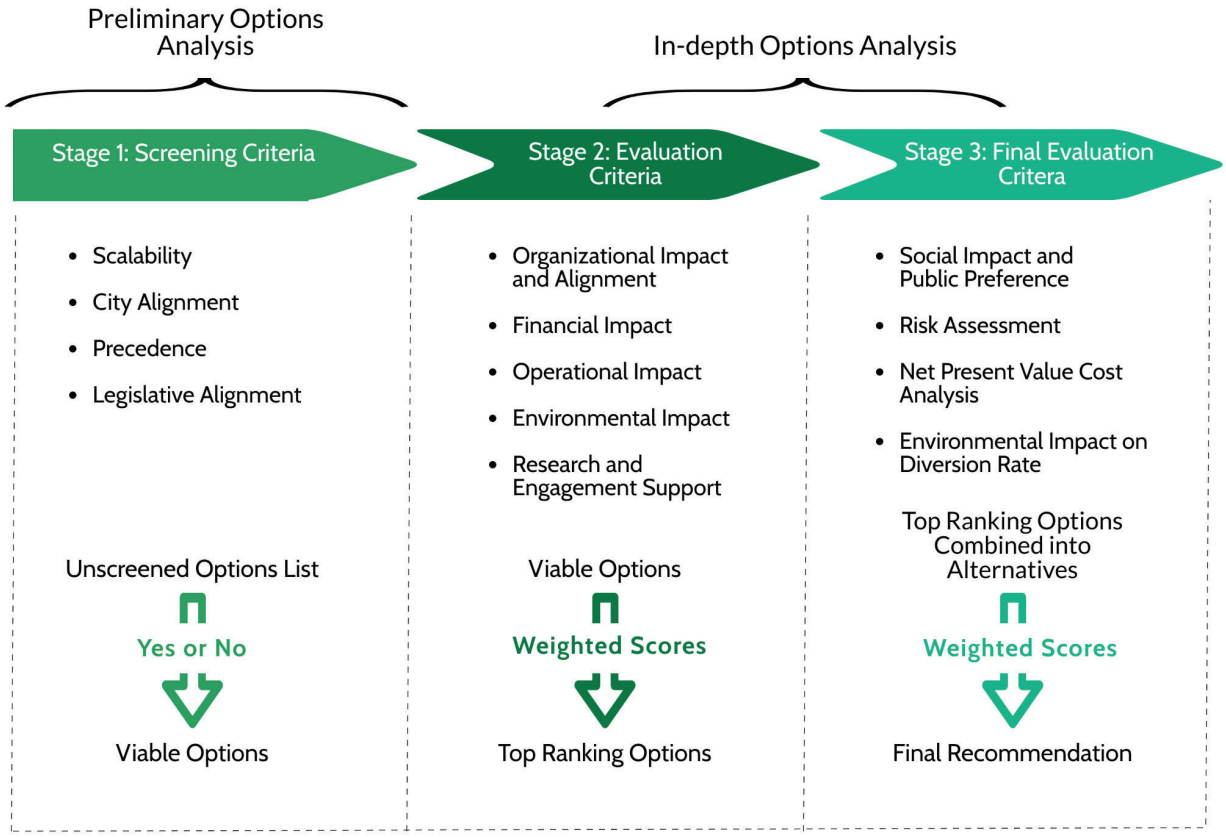


Figure 6: Business Case Option Analysis Steps and Evaluation Criteria

8.2. Options Analysis Stages

8.2.1. Stage One - Screening Criteria

The first stage of the evaluation addressed options identified from the research, and sought to eliminate options that would not work in Edmonton. High level criteria were applied, focusing on strategic/regulatory alignment and operational feasibility. An option which failed one or more of the Stage One criteria was considered non-viable. Eliminated options were not carried forward to public engagement or further stages of the options analysis process.

Criteria for Stage One evaluation were:

- **Scalability** - the ability for the option to adjust to meet population growth forecasts and adapt to program changes.
- **City Alignment** - alignment with corporate and branch goals and outcomes.
- **Precedence** - whether or not the waste industry has established the option for residential collection.
- **Legislative Alignment** - alignment with policy or legislation from higher levels of government.

After the non-viable options were screened out, Phase One of public engagement was conducted. Phase One was designed to learn about stakeholders' needs, barriers and potential solutions for source separation. Stakeholders were asked to participate in the engagement process in an *Advise* capacity along the City of Edmonton's Public Engagement Spectrum. Participants were invited to share feedback and perspectives considered for policies, programs, projects, or services. Stakeholders were organized into three primary groups: managers (property managers, condo board members, and developers), service providers (waste haulers and processors), and residents.

The focus of manager and service provider engagement was to gain feedback on the options that passed through the Stage One analysis; this feedback was then used in Stage Two evaluation. Managers and service providers participated in one of three identical online workshops and a unique Engaged Edmonton web page where they could learn about the topics of program rollout, collection containers, regulatory requirements and incentives, education and outreach, and program success measurements. The Engaged Edmonton site also allowed stakeholders to ask questions of the project team and contribute to peer-to-peer discussion. There were a total of 767 site visitors to the Engaged Edmonton page and 20 active participants who left a combined total of 61 comments and four questions for the project team. A total of 67 managers and service providers participated in the three online workshops.

A total of 52 residents were engaged through eight focus groups and ten one-on-one interviews in Phase One. The engagements were designed to learn about potential barriers to this program and solutions to those barriers.

Two stream waste collection and the utilization of processing-only options to separate food scraps were eliminated based on Stage One criteria. Still, additional evaluation was conducted in Stage One and Two to ensure these options were eliminated only after a complete and comprehensive review.

Results for Stage One of evaluation are available in more detail in Appendix A.

8.2.2. Stage Two - Evaluation Criteria

The second stage of evaluation utilized a more comprehensive criteria list to further analyze the benefit and impact of the remaining options. In contrast to the Stage One evaluation, which used yes/no answers, the Stage Two evaluation used a scoring scale to indicate the level of compliance with each criteria. The criteria used in Stage Two are presented in Table 4.

In addition to the criteria presented in Table 4, the impact on diversion was used as a criteria only to assess two stream versus three stream source separation. All other options fall under one of these two overarching options.

Table 4: Stage Two Evaluation Criteria

Organizational Impact and Alignment
Alignment with corporate/branch goals and outcomes Evaluates how well the option reflects the priorities outlined in Waste Services and City of Edmonton documents such as the Waste Strategy and City Plan.
Alignment of expectation of residents between curbside and communal collection programs Considers the option's ability to maintain consistency across programs with regards to sorting and waste behaviour.
Impact to the City's ability to deliver existing programs and services Scoring represents the option's effects on the City of Edmonton's ability to provide existing services (e.g. traffic safety, road services, etc.) but excluding Waste Services.
Financial Impact
Impact on capital cost Scores represent the high level estimate of an option's capital cost compared to the current state. This can best be described as the difference between current state and future state.
Impact on net operating cost Scores represent the high level estimate of an option's impact on operating expenses compared to the current state. Net operating costs include revenue other than rate revenue (i.e. program revenue such as revenue from compost sales).
Operational Impact
Impact on operational productivity, operating efficiency and capacity Scores an option's ability to increase collection effectiveness and efficiency, and on the operational capacity of Waste Services (i.e. how many dwelling units can be serviced in a day).
Impact on operational reliability and flexibility Refers to the option's ability to avoid downtime or time lost due to risks like equipment failure. Flexibility refers to the option's ability to adapt to problems regarding reliability.
Operational adaptability Grades an option's ability to be maintained in a period of time, and over time to adapt to the changing needs of the properties in the communal collection program, such as densification and development.
Occupational health and safety Scores an option's impact on incidents and lost-time injuries.
Impact on feedstock quality and illegal dumping Scores an option's impact on waste product quality (i.e. the perceived quality/contamination of recycling and organics before it is processed), or reduction to illegal dumping. For the "Processing" options category: Scores an option's impact on the quality of waste

exiting the equipment after being treated. This is applicable to the stream of waste that the option is designed to process.
Research and Engagement Support
Resident engagement support Scores an option's support among residents from engagement sessions occurring during Phase One of Public Engagement (focus groups and interviews).
Property managers and service provider engagement support Scores an option's support among stakeholders from engagement sessions during Phase One of Public Engagement (workshops, Engaged Edmonton website, one-on-one interviews).
Research support Scores an option's support among sources from the research (jurisdictional scan, interviews with government and industry representatives, literature reviews, behavioural science studies).

After each option was scored using the criteria listed above, sensitivity analysis was conducted to determine how the ranking of each option might shift as a result of the level of emphasis placed on each category. This tested potential bias and ensured that the options selected for detailed analysis in Stage Three were based on a robust score. Each option was ranked according to its score under each sensitivity scenario. The rankings across all sensitivity scenarios were averaged to calculate the overall ranking of each option. Options with the highest average ranking in Stage Two were deemed as the most suitable options to help build the program alternatives and move forward to Stage Three.

Once the second stage of evaluation was completed, a final phase of public engagement was conducted to gather additional information to further refine and narrow down program options. Stakeholders participated in the engagement process in a *Refine* capacity along the City of Edmonton's Public Engagement Spectrum, which includes inviting stakeholders to adapt and adjust approaches to policies, programs, projects, or services. Participants were provided with more information about potential options and were asked to provide feedback on how those options would work for properties with communal collection in Edmonton. Property managers and condo board members were asked to complete a survey; a total of 239 stakeholders completed this survey. An Engaged Edmonton page was used to provide property managers, condo board members, developers and service providers with more information about the program and gather input through a forum as well as a question and answer tool that allowed these stakeholder groups to ask questions of the project team.

A separate survey was developed to reach residents living in properties with communal waste collection. The survey was promoted to residents through social media and was distributed to the Edmonton Insight Community, which is an online citizen panel of Edmontonians who provide feedback on a variety of programs and policies. A total of 2,896 residents completed

this survey.

Results for Stage Two of evaluation and sensitivity analysis are available in more detail in Appendix B.

8.2.3. Stage Three - Final Evaluation Criteria

In the final stage of evaluation, four complete packages of options were created and evaluated as the program alternatives. These alternatives were evaluated using a triple bottom line approach, plus a risk assessment. The package with the highest weighted score is the recommended alternative in this business case.

The following criteria were used for the Stage Three evaluation:

- **Social Impact and Public Preference -** This criteria category evaluated the preferences of both residents and property managers based on the Phase Two Public Engagement results. Feedback from residents and managers was considered independently and scored on a scale of one to five; a score of one meant that there was no support for an item and a score of five meant that there was very high support. The scores were then added together to provide the raw social score for the package.
- **Environmental Impact on Diversion Rate -** This criteria category considered the estimated increase in the diversion rate that each alternative was expected to achieve. Increases in diversion due to Refused Drive Fuel production were not included in this assessment, reflecting the City's commitment to the zero waste framework that prioritizes recycling and organics processing over energy recovery. Alternatives with higher estimated diversion rates scored higher.
- **Net Present Value (NPV) and Cost Analysis -** Scoring in this category was calculated based on a 24 year financial model that considered the forecasted operating and capital expenses related to implementation of the alternative. The period selected for the NPV analysis was based on the shortest common period of the expected life cycle of the assets. Once scored, options with lower NPV values received higher scores relative to options with higher NPV values.
- **Risk Assessment -** This criteria category evaluated the risks unique to each alternative. Unique risks were identified and scored based on likelihood and impact. The "total possible risk" for each package was calculated by assigning the maximum likelihood and maximum impact to each risk and taking the sum of risk scores. The "actual total risk" for each package was calculated by taking the sum of individual risks. The risk score of each alternative was then determined by calculating the risk avoided, which is the difference between the actual total risk and the total possible risk. Common risks between all alternatives were scored separately in the same manner but excluded from the overall risk score as the impact would be equal for each package of alternatives.

The scoring for Stage Three packages was based on equal weighting of all criteria. Results for Stage Three of evaluation are available in more detail in Appendix C.

9. Summary of Public Engagement Results

As described in the previous section, two public engagement phases were interwoven between rounds of options analysis. This ensured that the feedback received was integrated into the analysis, and that stakeholders were provided with the latest analysis. The What We Heard Reports for both Phase One and Phase Two of Public Engagement are available in separate documents presented with this business case (Attachments 3 and 4).

9.1. Phase One

Feedback gathered during Phase One of public engagement was used to determine the engagement scores in the Stage One options analysis. Phase One of public engagement found that residents want supports to increase their participation; these supports could include being provided with food scraps pails and ongoing education that teaches them how to sort their waste, why it is important, and the impact their efforts have. Convenience and access to all streams of containers were identified as paramount when it came to overcoming barriers, including easily accessible collection containers and colocation of waste streams. Property managers similarly want focused supports, and identified that the customer service relationship between themselves and the City is a critical component of a successful program. Specifically, collaborative support from the City will be important to overcome challenges with space, infrastructure challenges and site logistics. Developers and property managers also identified the need for developer standards for new properties to be established and enforced to ensure that waste is incorporated into building designs and to make colocation of collection containers possible.

9.2. Phase Two

Phase Two of public engagement focused on residents and managers. For the purpose of this phase of engagement, managers refers to property managers, condo board members and those in equivalent roles.

Based on the final public engagement results, residents communicated that a variety of tactics would be necessary to support the diverse needs of the sector, and that it was particularly important to have step by step guides demonstrating how to sort food scraps properly and a food scraps pail to use in their kitchens. Residents also felt that clean and well lit communal waste areas, and waste containers being located next to each other in the same common area, were both very important factors to help with proper sorting. Managers agreed that colocation of communal containers is important for resident convenience and compliance, however many were concerned that limited space in communal waste areas may limit their ability to place communal containers beside each other.

The majority of managers felt that one or more of the collection container options presented (e.g. front load bins or carts) would work for their properties. However, many managers were

still quite concerned about lack of space for more collection containers onsite and requested one-on-one discussions with the City to find a solution that does not require expensive infrastructure changes. Some managers also expressed hope for grants or rebates to help with the cost of infrastructure changes, and some would like to participate in working groups to help shape the evolution of the program.

Both residents and managers had a strong preference for keeping chutes open. Rather than closing chutes, they preferred to find ways to work with chutes to achieve three stream collection at properties. Two options that received support were 1) prioritizing convenient disposal of food scraps by modifying chutes to accept food scraps only and adding containers for recycling and garbage in communal waste areas, or 2) adding recycling and food scraps containers near garbage chutes on each floor.

Both residents and managers shared concerns about tenants not sorting their waste properly and felt that there would be challenges with enforcing waste sorting in multi-unit properties. Residents and managers also shared concerns about potential increased costs and new fees. Many survey respondents from both the manager and resident groups were also concerned with mess, smell, insects and animals.

In addition, residents stated that regularly receiving information about the results of waste sorting efforts would help motivate them to sort their waste properly; managers similarly felt that regularly receiving information about the percentage of waste not sent to landfill, or the contamination rate in different waste streams would help them monitor the impacts of the program.

10. Viable Alternatives

The methodology presented in Section 8 was used to identify preferred options and generate the alternatives presented in this business case. The results of the analysis are described in detail below.

10.1. Method of Separating Food Scraps and Recyclables

The current method of collecting garbage and recycling as two streams of waste was evaluated as an alternative to a three stream source separated collection program. This method was ruled out as an option in Stage Two. Although it is generally accepted that making enhancements to the processing facilities at the EWMC may result in increased diversion, it was clear from the research that the most effective way to achieve cleaner streams (with higher value end uses) is through source separation. It was determined that maintaining a two stream approach would prevent the City from further progressing towards the strategic goal of 90 percent diversion from landfill. Furthermore, since both the Corporate Business Plan and the Waste Strategy commit to a source separation program, continuing the status quo would be a departure from the approved direction.

Three stream source separated collection is, therefore, recommended for inclusion in all alternatives and forms the basis upon which the alternative packages are proposed.

10.2. Method of Collection

Based on the Stage Two analysis, a range of collection containers were included in the final consideration for each waste stream. A range of container types and sizes will need to be used to ensure diversion programs can meet infrastructure, space and access limitations presented by the diverse building stock. The following subsections provide details about the container types and sizes that were included in the alternatives.

10.2.1. Front Load Bins

Front load bins are the primary type of container currently used to provide communal collection service. These bins range in size from two to eight cubic yards and are currently used for both recycling and garbage. These containers scored favourably in Stage Two and were included in the recommended alternatives.

10.2.2. Carts

Carts are currently being distributed to residents receiving curbside collection service. Carts are available in a smaller range of sizes than front load bins, typically 120 litres, 240 litres and 360 litres.

Carts scored well when considered for the collection of garbage and food scraps. There is an opportunity to operate efficiently by integrating curbside and communal collection services where possible. If carts can be used for communal collection of garbage and food scraps, then trucks that are collecting carts from a given neighbourhood can service both curbside and communal collection customers. This will result in efficiencies, which in turn will result in a more stable rate for the utility rate payer, reduced collection vehicle traffic, decreased impact to neighbourhoods, infrastructure and the environment. Carts for garbage and food scraps collection have been included in all alternatives.

Despite their high score when used to collect garbage and organics, carts did not score high for the collection of recycling, and were not considered for the recycling stream in the final alternatives. As noted earlier, recyclable materials are bulky in nature and make up a large portion of communal collection waste. Given the relatively small size of carts (up to 360 litres), they would fill quickly and may not be large enough to fit multiple bulky items such as large cardboard boxes. It was determined that other methods of collection such as front load bins would be more appropriate; larger containers means that the size of the container does not become a barrier or deterrent to recycling. In addition, front load bins are available in a range of sizes, meaning that it is still possible to ensure right-sizing for each property.

Furthermore, as recycling carts are not currently offered as part of the curbside collection

program, there is no opportunity for integrated collection services. Offering recycling carts to communal collection customers would require a dedicated fleet. This specialized service would be very costly with no notable benefits.

Carts for the recycling stream are, therefore, not recommended at this time for inclusion in the alternatives. If carts are used for curbside recycling collection in the future, they may become a viable alternative for smaller communal collection sites.

10.2.3. Roll-off Compactors and Manual Collection

Despite their lower score in the Stage Two options analysis, roll-off compactors for garbage and recycling, and manual (bag) collection of recycling were not eliminated from further consideration. These methods will continue to be used to address specific building situations. It should be noted that bag collection is not preferred and efforts will be made to limit its application. Waste Services currently uses roll-off compactors for certain properties with 250 or more units; manual collection of recycling is used in circumstances where space is a limiting factor for front load bins. As these methods of collection are already accounted for in the current operating budget and resource availability, the impact of these methods on the business case was considered negligible.

Both roll-off compactors and manual collection of recycling will continue to be available, but will not be included in the alternatives presented in this business case.

10.2.4. Underground Collection

Underground containers are available in multiple styles. For the Stage Two analysis, two categories of underground containers were assessed separately: those that require specialized equipment, and those that can be serviced with standard front load vehicles. Although underground containers that require specialized equipment did not score favourably in Stage Two, underground containers that can be serviced with front load vehicles did. However, further analysis of the cost and logistics determined that this method of collection offers few benefits compared to front load bins.

Underground containers offer the same or less capacity as front load bins, while occupying a similar footprint and with significantly higher capital costs. The containers pose additional risks and are less adaptable to change as underground infrastructure is more permanent and less forgiving should containers need to be adjusted to meet future building needs or program changes. Furthermore, the ownership model would be very complex and would require significant study to find a solution.

The advantages of underground containers appear to be limited to improved aesthetics. This means that these containers typically do not require enclosures or screens to improve aesthetics, saving money and space on private property.

Waste Services acknowledges that the future may bring new styles of underground containers that have the potential to provide better value for money and will continue to review and evaluate technologies as part of the regularly scheduled program review to determine their suitability for Edmonton.

Based on these findings, underground collection was not included in the alternatives for this business case.

10.3. Volume Allocation and Container Sizes

Extensive analysis was completed to determine a volume allocation per unit receiving communal collection. The analysis used waste composition data from multi-unit sites in Edmonton, data from the curbside program, as well as waste composition data and allocation formulas from other municipalities. The result is volume and tonnage allocations for each stream.

It was determined that the recycling stream would require the highest volume allocation per unit and would therefore require larger containers, while garbage and food scraps would require smaller containers.

For the food scraps stream, carts and smaller front load bins were preferred as food scraps are dense, resulting in heavier weights for a given volume. Based on the density, bins measuring two cubic yards are the largest container that will be used for food scraps collection. As a result, multiple front load bins measuring two cubic yards may be required to meet the volume allocation for a specific property.

For the garbage stream both carts and bins can be used, based on the size of the property. In general once source separation is implemented, removing both recycling and food scraps from the garbage stream may result in smaller garbage containers being suitable.

The number and size of containers for each stream will be calculated based on the volume allocation per unit per stream and the number of units per building. Waste Services will utilize a range of container sizes to ensure “right-sizing” occurs for each building. Right-sizing will aid with concerns regarding smell or pests in food scraps containers as well as providing flexibility to fit space concerns of a particular site.

While capacity allocated for the food scraps and recycling streams are based on the expected volume through the allocation formula, the total capacity for the garbage stream includes an allowance of some additional capacity to assist with adaptation to the program.

While there is a preference to use the smallest container size possible to provide location flexibility, there is also a threshold at which a large number of carts would be inefficient for collection and require more space for storage than a front load bin of equivalent volume. At

that threshold, a front load bin would be preferred.

Table 5 shows the container types and sizes that have been included in all alternatives:

Table 5: Recommended Containers and Sizes for Each Collection Stream

Waste Stream	Container Style and Size
Garbage	240L Cart 360L Cart 2, 3, 4, 6, 8 yd^3 Front load bins
Recycling	2, 3, 4, 6, 8 yd^3 Front load bins
Food Scraps	240L Cart 360L Cart 2 yd^3 Front load bins

10.4. Resident and Property Manager Supports

Research and engagement have both shown that education and other supports should be top of mind when a mandatory source separation program is designed and implemented. Without effective and ongoing education, programs are less likely to reach their full potential. This section discusses the resident and property manager supports for the proposed communal collection program.

10.4.1. Resident Supports

Annual marketing and communications campaigns, ongoing education, and in-unit containers were the resident support components that scored favourably in the Stage Two analysis, and were further analyzed in Stage Three.

Throughout the research and analysis it became clear that a targeted and sustained effort would be required to overcome challenges such as resident turnover and anonymity. Without ongoing education it is expected that adoption and participation rates will peak a few months after rollout and decline over the following years, resulting in an increase in contamination and a further stagnation of the diversion rate.

There was particularly strong support in all phases of public engagement for ongoing education programs, indicating that both residents and property managers felt like this dedicated and targeted education approach is critical to ensuring residents are informed and engaged.

A high level of awareness and education will be achieved by delivering ongoing and targeted campaigns. This includes a comprehensive mix of digital and traditional marketing tactics such as outdoor advertising, digital communications, multimedia assets, print resources, a strong

web presence with downloadable resources and in-person interactions through outreach activities. Targeted campaigns will allow more face to face interactions with residents to further educate, answer questions and attempt to overcome any accessibility and/or language barriers.

To compliment the above, the provision of food scraps pails will be an important tool to encourage positive behaviors and participation. A desire to receive food scraps pails was heard through Phase One of Public Engagement. Food scraps pails were provided to all curbside collection customers as well.

While there was some interest expressed during public engagement in having an ambassador program, residents did not communicate a corresponding interest in becoming an ambassador themselves. The research showed that some municipalities use these programs to aid with shifting waste behaviours at a building level, but at this time there is a lack of supporting data to show the efficacy of such programs. Further work is required to determine how effective this type of program would be. An ambassador program is not recommended at this time.

Based on this analysis, ongoing education, annual targeted campaigns, and the provision of food scraps pails have been included as resident supports in all alternatives.

10.4.2. Property Management Supports

Effective and ongoing support for property managers also scored very high in Stage Two analysis. In particular, managers requested ongoing communications and updates, City-developed resources, and materials that they could share with residents. Providing these supports to property managers would help to facilitate a positive relationship between property managers and the City.

Property managers are a vital link to ensuring that residents have the necessary information to be able to participate. Resources such as a toolkit (consisting of brochures, posters, door hangers, newsletters, etc.), access to dedicated customer support, and ongoing education will build their capacity to support waste programs. Building resources similarly would include materials that property managers could distribute to their residents, display in properties or request on their residents' behalf.

Another component which scored favourably in Stage Two was the creation of a stakeholder working group. Working groups can be used to help prepare for and implement mandatory waste sorting programs. These groups provide a way for stakeholders to give ongoing input into a project and can help build a constructive relationship between the City and stakeholders. The establishment of a stakeholder working group could be facilitated over the next few years and, while recommended, would not require any additional funding and is therefore not included in the evaluation of the alternatives at this time.

Based on this analysis, sustained and effective support for property managers via educational

resources, printed materials, and staff resources are very important and have been included in the alternatives.

10.5. Regulatory Mechanisms

The research shows that a successful mandatory source separation program for communal collection must be accompanied by a variety of regulatory tools to support program success.

10.5.1. Enforceable Developer Standards

Ensuring the enforceability of developer standards was the highest scoring regulatory mechanism. Developer design standards will be needed to set out criteria for new buildings related to the design of indoor and outdoor waste sorting and storage areas, acceptable applications of chutes, access criteria for collection vehicles, and may also address the mandatory separation of commercial and residential waste in mixed-use properties.

Mandatory separation of commercial and residential waste in mixed-use properties became standard practice for Waste Services when Waste Services stopped providing collection services to the commercial sector. As commercial tenants and residents are not serviced by the same collector, it is not recommended at this time to allow waste to be stored or collected together. This practice can lead to one building user group being responsible for the management of the other building users' waste. If commercial tenants use residential containers, the residential containers will not have sufficient capacity for the residential waste.

Research also reflects the beneficial impact of separate storage and collection of waste from different sectors on the overall participation, compliance and diversion from both sectors. As such, and with consideration for the challenges that shared containers present to the City's policy not to provide commercial waste collection services, it was determined that Waste Services should continue to require separate waste storage areas for each building user group. Understanding the potential impacts of this separation requirement, Waste Services will continue to work with internal stakeholders and the development sector to ensure that design guidelines clearly outline best practices for the separate collection and storage of residential and commercial waste in a manner that does not compromise city building outcomes.

From the analysis it is clear that for developer standards to be successful, they must be enforceable through bylaw. This ensures that residents have equivalent service across different building styles. Enforceable developer standards were also supported by stakeholders in Phase One of Public Engagement.

This business case recommends that no changes be made to the current requirement for mandatory separation of residential and ICI waste in mixed-use buildings. Mandatory separation along with other enforceable developer standards such as the design of waste areas and access criteria are recommended for all alternatives.

It is recognized that work with both internal and external stakeholders in developing design standards is required. The effectiveness of the developer standards and its role in making the mandatory three stream source separation program successful will be realized if the City works with designers, builders, developers and property managers to create mutually beneficial solutions that can be flexible and adaptable to support a well designed City as well as a successful source separation program.

10.5.2. Colocation of Waste Streams

The research and engagement show how important it is for residents to have equally convenient access to all waste streams to encourage participation in sorting and decrease contamination. Equal access to all streams, referred to in this business case as colocation, means that residents would have the same access to dispose of all three streams. In most cases, this means that containers for garbage, recycling and food scraps need to be placed next to each other in the same area or room. In other cases, this may mean that properties with garbage chutes require a mechanism to allow for the disposal of the other streams near the chute location on every floor. Colocation is in contrast to placing a garbage container or having garbage chute access in one location, with food scraps and recycling containers elsewhere.

Due to the operational, financial and significant strategic impacts of colocation, both mandatory and voluntary colocation were included in the alternatives.

10.5.3. Chute Closures

Waste chutes are constructed in some multi-unit properties to make disposing of waste more convenient for residents. Most chutes are for garbage disposal only, forcing residents who wish to dispose of recyclables to go to the recycling container, typically on the main floor, parking lot, or underground parkade of a building. The remote location of the recycling containers is a barrier to recycling, in contrast to the on-floor facility for disposing of garbage, and the lack of convenience associated with disposing of recyclables often leads to poor waste sorting behaviour.

Based on the Stage Two options analysis, closing chutes scored high due to enhanced collector safety and reduced contamination of waste streams. Residents indicated in Phase One of Public Engagement that maintaining chutes would provide easy opportunities to avoid doing “the right thing”.

In light of this discussion and the impact chutes can have on resident behaviour, both mandatory and voluntary chute closures were included in the Stage Three analysis.

10.5.4. Volume Limits and an Excess Waste Program

Setting volume limits and providing an excess waste program scored well in Stage Two. Volume limits would be based on the allocation formula that determines the container volume needed

for each waste stream at every property. Volume limits provide motivation to residents and property managers to participate in source separated waste programs and work towards reducing waste. As the curbside program has also adopted volume limits based on cart size, it would be equitable to have similar expectations for the communal collection program.

While volume limits are seen as an important success factor for source separation, it was determined that some properties may require additional service. An excess waste program could be developed to provide additional service. An excess waste program for communal collection is more complex than for the curbside program as it impacts all residents of a building. The cost and details of the program need to be equitable while still encouraging residents to comply with source separation.

The alternatives in this business case are based on the premise that volume limits will be enforced. Waste Services will continue working on details and logistics of an excess waste program, which will be presented at a later date. Details on volume allocations can be found in Tables D1 and D2 in Appendix D.

10.6. Financial Mechanisms

Financial mechanisms are often used as an incentive to encourage good waste sorting behaviour. A variety of financial mechanisms were considered, including rate reductions (applied on a regular basis and awarded based on waste sorting behaviour), one time credits (fixed discounts or incentives for displaying ideal waste behaviour), and variable pricing (the rate paid is dependent on the amount of waste discarded or size of container used). The variable pricing option scored favourably in Stage Two and was selected for further consideration. Variable pricing is equivalent to the pricing model used in the curbside collection program.

10.6.1. Variable Pricing

A variable rate structure would be based on the quantity of garbage set out for collection, taking into consideration the size of the garbage container and the frequency of collection. It is proposed that properties receiving communal collection would have the opportunity to reduce the amount of their utility bill based on a demonstrated ability to reduce garbage.

Variable pricing could apply to any of the alternatives in this business case. The details and exact cost structure of a variable pricing model is not included in this business case but would be determined as part of a utility rate approval in the future once the program implementation is underway.

11. Program Alternatives

Based on the information detailed above, packages of components were developed and analyzed as the Stage Three analysis. Each package is an alternative. As described previously, two stream

collection was eliminated in Stage Two, and it is for this reason that none of the alternatives include the status quo.

There were two primary drivers influencing the final scoring of the alternatives: whether colocation was mandatory or voluntary, and whether chute closure was mandatory or voluntary. The effect of these drivers on the presentation of the alternatives is explained below.

All alternatives were based on a 24 year life cycle. The total resources required for all alternatives have been included in the financial analysis and are a mix of permanent and temporary FTEs. In all alternatives the requirement for inspectors, education and outreach, GIS mapping, and customer support staff are the same.

A detailed list of assumptions for all alternatives can be found in Appendix D.

11.1. Colocation

Mandatory colocation prioritizes equal convenience and access to all waste streams. Alternatives featuring mandatory colocation garnered a higher social score as residents prefer the convenience and colocation is projected to result in a higher diversion potential, lower contamination and more significant behaviour change.

While both mandatory and voluntary colocation alternatives will use the same types of containers, it is expected that for the alternatives that feature mandatory colocation there will be a higher number of containers overall, and more smaller containers. As a result, more collection staff are required to service the program, resulting in a slightly higher cost than voluntary colocation.

If colocation is voluntary, properties will receive the same total allocation of waste container volume. However, since there is no requirement for containers for different streams to be located next to each other, fewer larger containers would be required per property. As a result, fewer collection staff are required to service the sector. While fewer containers results in a slightly lower overall cost, it is anticipated that since residents may not have equal access to all three streams, participation rates will be lower, contamination rates will be higher, and the diversion potential will be lower. These factors increase the risk that the City may not be able to achieve its diversion goal. This also carries an additional risk that residents and property managers would perceive the distribution of fewer containers as a lower level of service from the City. While voluntary colocation was slightly preferred by property managers (compared to mandatory colocation), it was considerably less preferred by residents, resulting in a lower social score for alternatives without mandatory colocation.

11.2. Chute Closure

Mandatory chute closure would mean that all buildings in the City of Edmonton that currently have garbage chutes would be required to close them. During public engagement, residents

identified that the convenience offered by chutes could tempt residents to sidestep program requirements, resulting in higher contamination and lower participation. Although mandating chute closure is therefore expected to result in a marginally higher diversion rate, it would also be difficult to enforce and could create accessibility challenges for some residents.

Currently, only about seven percent of properties and 17 percent of units have access to chutes in Edmonton. This means that the incremental increase in diversion resulting from mandatory chute closure is limited. Mandating chute closure would require significant effort and would result in frustration for residents of those buildings. This approach received very low support from residents and property managers, and also had a less favourable risk score.

Voluntary chute closure is a collaborative approach that involves assisting properties to close chutes where there is desire. This approach therefore carries less risk. Based on research findings, ongoing operation of chutes does not preclude colocation.

Chute closure was assumed to not have a financial impact on the City and therefore the approach to chute closure did not change the cost of the alternatives. There is also no difference in staff requirement.

The alternatives presented in Table 6 represent combinations of these primary drivers.

Table 6: Comparison of Alternatives

Parameter	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Chute Closures	Mandatory	Voluntary	Mandatory	Voluntary
Colocation	Mandatory	Mandatory	Voluntary	Voluntary
Potential Diversion Increase	16%	16%	5%	4%
Costs and NPV	$29.2M Capital $91.0M Operating & Maintenance $-67.6M NPV	$29.2M Capital $91.0M Operating & Maintenance $-67.6M NPV	$25.8M Capital $81.9M Operating & Maintenance $-60.4M NPV	$25.8M Capital $81.9M Operating & Maintenance $-60.4M NPV
Total Score	**69**	**78**	**62**	**71**

As described in Section 8, the total score for each alternative in Table 6 is calculated based on four equally weighted criteria. A higher score is desirable for all the criteria:

- A **social score** reflecting resident and property manager preferences elicited during Public Engagement.

- An **environmental score** based on the potential of each alternative to increase the projected diversion rate.
- A **net present value score** based on the combined capital, and operating and maintenance costs over a period of 24 years.
- A **risk score** that reflects risk avoided in each alternative.

The breakdown of the total score for each alternative (showing the contributions of each criteria) is presented in Figure 7.

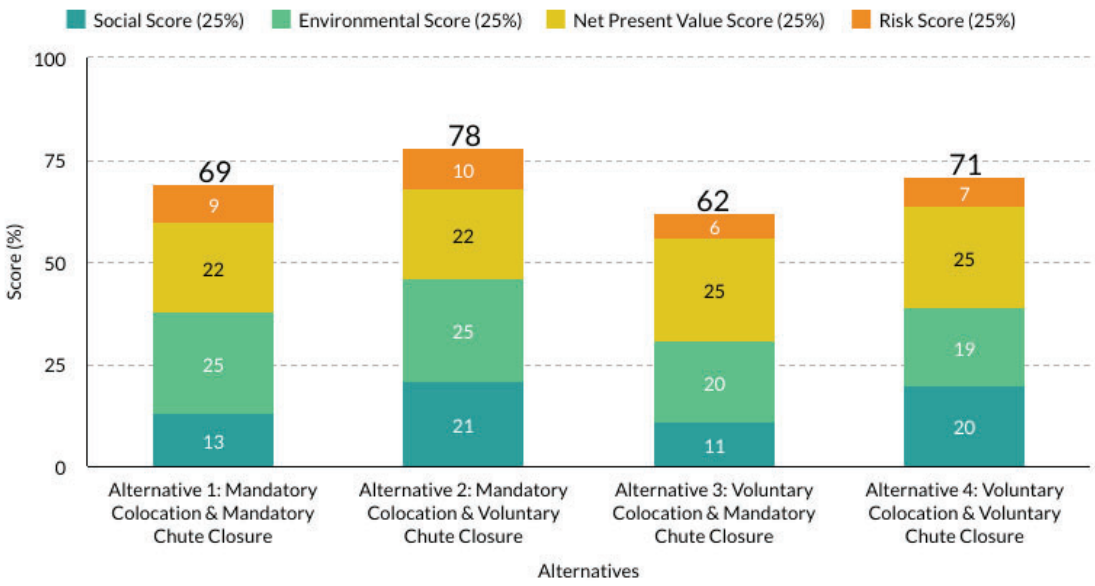


Figure 7: Stage Three Analysis Alternative Scoring Breakdown by Criteria

11.3. Summary of Alternatives

11.3.1. Alternative 1

As a result of mandatory colocation, the diversion potential for this alternative was higher than those without mandatory colocation. Colocation is anticipated to increase the projected diversion rate by as much as 16 percent. The cost of Alternative 1 is slightly higher than alternatives without mandatory colocation, at $29.2 million in capital costs and $91.0 million in operating and maintenance costs, with a negative NPV of $67.6 million. This alternative is anticipated to incur the most significant resistance from residents and property managers, as infrastructure changes may be required to close chutes and to find ways to colocate waste streams elsewhere on the property. This challenge lowered both the social preference score and created a less favourable risk score.

Alternative 1 is not recommended due to a low social score and less favourable risk score

when compared to Alternative 2.

11.3.2. Alternative 2

Alternative 2 differs from Alternative 1 by making chute closures voluntary. Alternative 2 received the highest social score as a result of having the most support from both residents and property managers. As with Alternative 1, mandatory colocation is anticipated to increase the projected diversion rate by as much as 16 percent, and results in $29.2 million in capital costs and $91.0 million in operating and maintenance costs, with a negative NPV of $67.6 million. The combined effect of mandatory colocation and voluntary chute closures results in Alternative 2 having the most favourable risk score, which contributes to Alternative 2 having the highest overall score.

Alternative 2 is the recommended alternative.

11.3.3. Alternative 3

Alternative 3 represents a combination of voluntary colocation and mandatory chute closure. Voluntary colocation results in a lower diversion potential than mandatory colocation and the anticipated increase to the projected diversion rate is only five percent. The impact of voluntary colocation is slightly mitigated by mandatory chute closure, which puts all streams in properties with chutes on equal ground in terms of convenience and access. This means that residents in properties with chutes will need to bring all three streams of their waste to the central waste sorting area(s). As colocation is not mandated, waste set out areas will not necessarily have containers for all the three streams. One stream may be easier to access than others due to the container locations. This would be particularly difficult for residents with physical limitations.

Due to the fact that colocation is voluntary, fewer containers will be required, so the cost is lower at $25.8 million in capital costs, $81.9 million in operating and maintenance costs, and a negative NPV of $60.4 million.

Mandatory chute closures resulted in the lowest social preference score of all alternatives, as well as the least favourable risk score. Alternative 3 has the lowest overall score of all the alternatives.

Alternative 3 is not recommended due to the low scoring in multiple criteria categories.

11.3.4. Alternative 4

Alternative 4 is a combination of voluntary colocation and voluntary chute closure. This alternative has the lowest diversion potential of all alternatives, offering only a four percent increase to the projected diversion rate. As residents and property managers prefer to maintain chutes, Alternative 4 received a relatively high social score. While voluntary colocation poses

risks to the achievement of the diversion target, voluntary chute closure mitigates other risks, giving Alternative 4 a more favourable risk score than Alternative 3. Voluntary colocation has a lower cost of $25.8 million in capital costs, $81.9 million in operating and maintenance costs with a negative NPV of $60.4 million.

Alternative 4 is the second highest scoring alternative overall, with a similar score to Alternative 1.

Alternative 4 is not recommended due to the low diversion potential.

11.4. Diversion Comparison

In 2020, the diversion rate was nine percent including collections and processing as well as waste drop off programs. Table 7 below provides a comparison of the projected diversion rates for each alternative once the program has reached maturity, as well as the projected rate without the proposed program changes. As noted in Section 6, while some increase in diversion can be realized immediately after full implementation of the program, it takes time for a program to mature and for residents to form lasting waste habits. Achievement of program maturity will depend on a number of factors such as the City's ability to provide processing capacity, educational programs, and time, which together will result in a shift in resident waste behaviours, increased capture rates, decreased contamination and ultimately higher diversion.

As noted earlier, the projected diversion rates in this business case exclude potential diversion from Refuse Derived Fuel (RDF).

Table 7: Comparison of Diversion Rate Contribution of Alternatives to the Total Diversion Rate

Program Alternative	Projected Diversion Rate at Maturity
Without proposed program changes	41%
Alternative 1	57%
Alternative 2	57%
Alternative 3	46%
Alternative 4	45%

11.5. Staff and Fleet Impacts

Table 8 below shows the number of staff and the fleet requirements for all four alternatives. The total numbers include collection staff and fleet required to support collection of waste from the

areas serviced by City crews (but not to contractor serviced areas) as well as education and outreach, GIS mapping, and customer support staff required to support all areas of the City (regardless of collection crews). The numbers below reflect needs that are in addition to what is already included in the status quo program, but do not reflect how existing resources may be shifted to prioritize the delivery of a new program. Costs for both City and contractor resources are identified later in this business case. The rate impact of a new program, which is expected to be mitigated or entirely addressed within the utility rate increases forecast in the Waste Services 2021 Utility Rate Filing, will be presented in the 2022 Utility Rate Filing pending a program decision by City Council. 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.

Voluntary colocation requires fewer collection staff to service properties, reducing the total permanent and seasonal staff for those alternatives. However, the shorter implementation period means additional education staff are required to target more properties in a short period of time. Further information about the implementation plan is provided later in this business case.

Table 8: Comparison of Resourcing and Fleet

Category	Mandatory Colocation (Alternative 1 and Alternative 2)	Voluntary Colocation (Alternative 3 and Alternative 4)
Permanent and Seasonal FTEs	30	24
Temporary FTEs for implementation	14	25
Additional fleet requirements including spare ratio	12	8

12. Organizational Change Impact

12.1. Stakeholder Requirement, Business and Operational Impacts

The impacts to stakeholders, both internal and external, were evaluated for the initiative. Tables 9 and 10 identify the stakeholders, their requirements and the business and operational impacts associated with them. Primary stakeholders are more directly impacted by the initiative, whereas secondary stakeholders are more indirectly impacted. The stakeholders, their requirements and the impacts on them were determined to be equivalent for all four alternatives.

Table 9: Primary Stakeholders

Stakeholder Name	Stakeholder Requirement	Business and Operational Impact
Waste Services Branch (internal)	• To implement a communal waste collection program that separates food scraps and recycling from garbage in order to meet strategic goals on a corporate and branch level. • To develop and implement sector-specific educational and outreach programming to support implementation and ongoing program progress. • To develop regulatory requirements to support program requirements.	• Fulfillment of key strategic goals such as diversion from landfill through successful implementation of the new program. • Increased resource demands to meet the service level and program objectives. • Increased capital and operating costs. • Development of new enforcement strategies for the implementation of the program changes.
Fleet and Facility Services Branch (internal)	• Collaboration and consultation regarding project scheduling, purchase and maintenance of collection vehicles and equipment to meet the program requirements for all streams of collection.	• Potential increase in resource demand to support acquisition and maintenance of current and any new vehicles and equipment.
Communications and Engagement Department (internal)	• Effective collaboration with Waste Services and other key stakeholders to develop effective, high quality communication and outreach plans including briefing any internal stakeholders such as 311. • Support the implementation of said plans with resources.	• Increased resource and schedule demands to accommodate phased implementation.
Executive Leadership Team (internal)	• To receive timely, high quality information to support well-informed decisions that support and align with key corporate and strategic goals and	• Project outcome and business case review and approval.

	outcomes.	
City Council (internal)	• To receive transparent and comprehensive information from administration to support decision-making.	• Review and approval of business case including any supporting documentation and attachments. • Provision of any additional direction to Administration (Waste Services). • Receive and discuss any public feedback directly.
City of Edmonton unions (external)	• To ensure transparent communication and collaboration with Waste Services in accordance with 'Working Relationship Agreement' principles.	• Ongoing fulfillment and support of working relationships and principles.
Multi-unit residents (external)	• To be consulted and informed throughout the project life cycle. • To know that the proposed program considers resident needs and barriers. • To receive clear and effective communication regarding program changes and how to participate. • To receive support before, during and after implementation on an ongoing basis. • To be able to provide feedback.	• Changes to behaviour and routine required to transition to a new program. • Increased need for targeted and sustained education. • Ongoing support.
Multi-unit building management including: management companies, building owners, property site management, and	• To be consulted and informed throughout the project life cycle. • To know that the proposed program considers resident and manager needs and takes barriers to successful participation into consideration.	• 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

condo boards (external)	• To know that the proposed program was designed with an awareness of the need to limit stressors such as illegal dumping and cleanliness. • To be confident that the proposed program reflects their needs and was designed to limit additional costs that could impact their business model. • To receive clear and effective communication regarding program changes and how to participate. • To receive supports before, during and after implementation on an ongoing basis. • To collaborate with Waste Services to make any required changes to collection locations and containers to support implementation.	program changes. • Potential additional cost should infrastructure changes be required.
Multi-unit developers	• That proposed requirements be clearly explained. • To be informed and consulted throughout the project life cycle. • Consistency in application of standards from the City.	• Potential new costs, resources or time needed to adapt new building designs to meet new expectations. • Additional consultation regarding new standards.
Collection Services contractors (external)	• To be informed of the project requirements in order to be able to effectively bid on any upcoming contracts (which may include acquiring equipment to deliver new services). • To have clarity regarding scope of work and program expectations.	• Opportunity to bid and work for the City. • Resource and equipment needs for providing the service to the City.
Waste container vendors (external)	• To be informed of changes to contracts and/or have	• Opportunity to bid on any container supply and

	adequate notice to bid on new contracts as required.	potential distribution.
EPCOR (external)	• Consultation, information and collaboration to ensure any changes required in the billing system and waste account setup are communicated adequately to EPCOR and all relevant staff are trained.	• To update the billing system and waste account setup system as required. • Ensure all relevant staff are trained.

Table 10: Secondary Stakeholders

Stakeholder Name	Stakeholder Requirement	Business and Operational Impact
Financial Services Branch (internal)	• To ensure financial transparency in the allocation of the proposed budget and to ensure Waste Services meets its obligations under the Waste Management Utility Fiscal Policy.	• Review and consult on financial impact to program changes. • Make recommendations as required.
Corporate Procurement and Supply Services Branch (internal)	• Consultation and information from Waste Services regarding procurement needs to support proposed program changes.	• Provide resources to meet the project procurement needs.
Legal Services (internal)	• To be consulted regarding legal impacts of any or all components of the proposed program to manage risk.	• Provision of expert legal review of program, tender and contract aspects.
Community Standards and Neighbourhood Branch (internal)	• To be consulted on all regulatory changes to communal collection programs to ensure enforceability of proposed changes.	• To work collaboratively with Waste Services to recommend changes to Waste Bylaw 18590.
Urban Planning	• To be involved in setting	• Potential impact to Zoning

and Economy (internal)	developer standards and site requirements for new properties and incorporating them into bylaws. • To work jointly with Waste Services on the issue of container aesthetics and screening requirements.	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)	• To be kept up to date on human resource management needs such as recruiting.	• To provide resources on human resource management needs.
Open City and Technologies (internal)	• To be communicated adequately with about IT needs.	• To provide IT resources.
Waste Services OHS (internal)	• To ensure the project aligns with all OHS Acts, Codes, Regulations and the COE OHS Policies, Procedures and Directives.	• To provide resources to review and finalize the project OHS program.
Alberta Environment and Parks (external)	• To ensure the program change meets all requirements under Alberta Environmental Protection and Enhancement Act.	• To review and approve any approval or amendment to existing approvals.
Media	• To be informed of the project decisions and progress and be provided with information as required.	• To provide resources on reporting the project decisions and progress.
Corporate Enviso	• To ensure the project aligns with the Corporate Enviso requirements.	• To provide resources to review and finalize the project Enviso documents.
Current Waste Services collection contractors	• To be communicated adequately on the needs for vehicle modifications/purchasing.	• To provide resources to ensure all garbage truck modifications/purchasing meets the City timeline and requirements.

Local waste management organizations	• To be informed of the project decisions and progress.	• To provide input and assist the City in ensuring a successful program.
Greater Edmonton region municipalities	• To be informed of project decisions and outcomes. • To be consulted or informed of changes that may impact regional waste management programs or market conditions.	• 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.

13. Summary of Cost and Benefits

This section identifies overall benefits and costs incurred to realize the recommended alternative.

13.1. Expected Benefits

The benefits described in Table 11 are expected to result from the recommended alternative.

Table 11: Expected Benefits

Tangible Benefits	Intangible Benefits
Increase of 16 percent to projected diversion rate.	Equity for residents between services.
Higher quality end products for market.	Program is more aligned with best practices found in other jurisdictions.
Reduction of GHG from reduced landfilling of organics and increased recycling.	Collateral benefit of improved results in other programs (such as curbside collection) as a result of harmonized expectations.
Improved relationship with residents and property managers as a result of the support and resources provided by the City.	

13.2. Costs

13.2.1. Capital Costs

This financial requirement includes the purchase of collection vehicles, containers (both carts

and bins), as well as their corresponding replacement parts, contingency, and inflation.

The capital costs are summarized for the life of the project for the recommended alternative in Table 12 below.

Table 12: Capital Cost Summary for Alternative 2

Item	Alternative 2
Fleet Related Capital Costs	$10,170,000
Container Related Capital Costs	$10,739,537
Contingency	$4,181,907
Inflation	$4,106,682
Total	**$29,198,126**

The capital costs for the recommended alternative are presented in Figure 8. These costs are presented by category by business cycle.

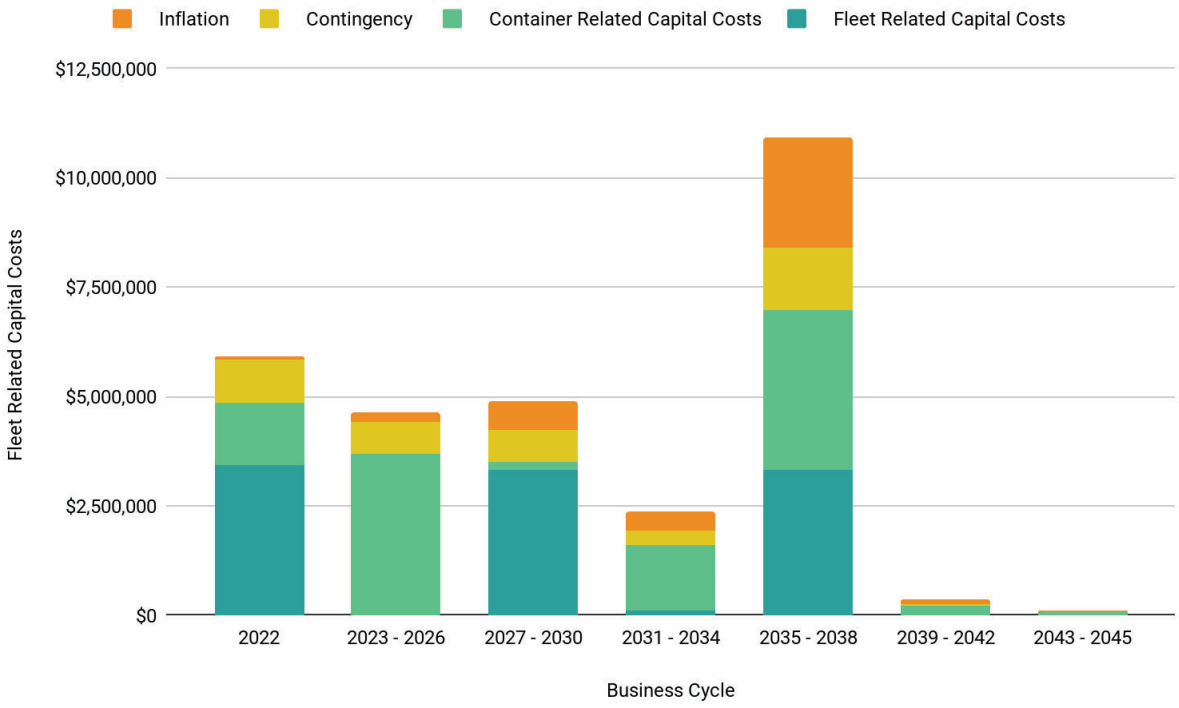


Figure 8: Capital Cost Breakdown by Category for a Four Year Business Cycle

13.2.2. Operating and Maintenance Costs

This financial requirement includes operational costs for the collection of all the streams

(including estimated contractor cost), routing, container maintenance, waste inspectors, costs for a comprehensive education and outreach program, costs for the initial rollout, costs for waste characterization studies every three years, costs for fleet maintenance, supply costs, inflation, and a contingency estimate.

The operating costs are summarized for the life of the project (24 years) for the recommended alternative in Table 13.

Table 13: Operating and Maintenance Cost Summary for Alternative 2

Item	Alternative 2
Operations	$31,970,814
Education and Outreach	$21,690,571
Fleet	$5,073,679
Rollout Materials	$694,314
Supplies	$1,288,755
Waste Characterization Studies	$1,600,000
Contingency	$12,463,627
Inflation	$16,184,392
Total	**$90,966,152**

The operating costs by category by year are presented in Figure 9.

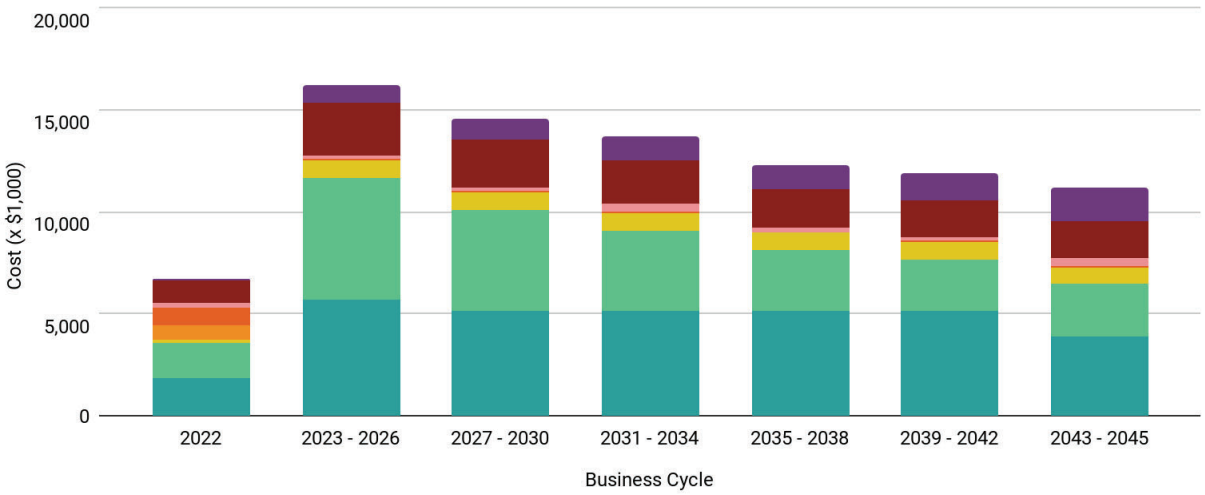


Figure 9: Operating Cost Breakdown by Category for a Four Year Business Cycle

Appendix E, F and G provide a detailed alternative cost comparison summary, a comparison of revenue requirements for the alternatives, and the annual operating and maintenance costs of the recommended Alternative respectively.

14. Key Risks and Mitigating Strategies

A comprehensive risk register was developed for this initiative. High impact risks for the communal collection program are summarized in Table 14, together with associated mitigation strategies. The risk impacts outlined in the table below are based on risk scores before the mitigation strategies for the program are in place.

Table 14: High Impact Risks and Mitigation Strategies for the Recommended Alternative

Risks	Mitigation Strategy
Improvements to waste sorting and set out behaviours are less than anticipated.	• Set achievable expectations and assumptions from the beginning. • Monitor behaviour and review the program regularly to ensure program expectations are aligned with communication and education tools. • Implement diverse and targeted educational tactics during implementation and on an ongoing basis to ensure residents have support they need to properly sort their waste, and in turn, help reduce contamination. • Work with customer support and bylaw teams to inform residents and property managers of issues with compliance. • Work with collections and bylaw teams regarding enforcement tactics. • Ensure the bylaw is updated with clear language.
Internal accounting platform (SAP Ariba) causes delays in the tendering process.	• Ensure CPSS is aware of project expectations and timelines. • Raise any concerns with leadership to ensure full support. • Give enough time to CPSS for the recruitment process.

Inadequate capacity to process separated waste streams (organics and recycling).	• Secure third party capacity for processing. • Regularly monitor tonnage and volume projections and compare with actual values to improve accuracy of predictive models.
Delays in administrative processes or difficulty in meeting needs of internal stakeholders due to the civic election. An unpredictable political climate resulting in the bylaw amendment not being approved on time.	• Begin working on bylaw amendments as soon as possible. • Include all stakeholders from the beginning to ensure everyone's concerns are captured. • Communicate early and often with City Council to ensure they are up to date and informed about the program.
Difficulty in enforcing the new developer standards in new properties if standards are not part of Zoning Bylaw.	• Work closely with the Zoning Bylaw renewal team to ensure they are informed of the necessity of enforceable developer standards.
Infrastructure changes may be required in some multi-unit properties to accommodate three streams.	• Provide as much time as reasonably possible to allow the site to make changes or find solutions to accommodate colocation of three streams. • Provide different styles and sizes of containers to help minimize the need for infrastructure changes.
Properties may expect the City to pay for (or contribute to) the cost of infrastructure changes required to accommodate three stream collection.	• Ensure expectations and program direction is clear from the beginning to remove any misconceptions. • Work with properties to try to find solutions to avoid infrastructure changes.

15. Gender Based Analysis Plus (GBA+) Considerations and Recommendations

GBA+ (Gender-Based Analysis Plus) is a process to examine and address how policies, programs and services impact diverse individuals and groups. Multiple identity factors, including age, race, ability, education, ethnicity, geography, health, language, class, sex, and gender need to be considered to improve planning and decision-making. By using a GBA+ lens, diverse perspectives, experiences, and needs are taken into account to create services that serve everyone.

Through all phases of work the project team looked at the nuanced approaches needed and already being taken in other municipalities to provide a successful program to service

multi-unit properties while considering the diverse needs of residents. Research examined other jurisdictions to find key program components influencing the experiences of residents in multi-unit properties. Two phases of engagement gathered feedback regarding anticipated barriers to participation and how to overcome them. The options analysis process sought to align approaches across the curbside and communal collection services, to ensure equity in experience and level of service, while utilizing feedback from the engagement to influence how options were scored and promoted for consideration.

The following considerations were included in the analysis:

- **Cultural and language considerations -** The use of icons, images and less text in educational materials was identified as a way to effectively offer education and outreach to program customers.
- **Socio-economic considerations -** Understanding that the actual or perceived cost of the program is a burden on residents and building management, a commitment was made to offer the same opportunities and service levels across the sector, regardless of socio-econonomic status.
- **Accessibility and convenience -** A user-centred program design addressing how residents access their waste collection areas resulted in consideration of distance travelled to collection areas and the influence of building infrastructure on program design.

Waste Services recognizes that after the major changes to the program have been established, the program will need to continue to be evaluated for enhancements to ensure that it continues to meet the changing needs of stakeholders in the multi-unit sector.

16. Conclusion and Recommendation

16.1. Conclusion

This business case and the supporting analysis demonstrate the need to transition the communal collection program to mandatory source separation of recycling and food scraps. Although introducing a mandatory source separation program in properties with communal collection is more challenging than an equivalent program for curbside collection, research and engagement have shown that it is possible. This change will favourably impact the diversion rate and will create equal expectations for residents in both sectors.

Waste Services recommends enforceable developer standards to ensure all new properties in Edmonton are designed and built to accommodate three stream separation and collection. Regular program review and advocating for landfill disposal bans are also recommended for endorsement by City Council.

Waste Services recognizes that change to the communal collection program will take time and require extensive communication and education to achieve high success rates. The changes

recommended herein are not expected to cause a steep increase to the diversion rate in a short period of time. Instead, this recommendation will help increase waste diversion over time as residents adapt and become comfortable with this new way of managing waste. The change to three stream collection is key to the overall success of the 25-year Waste Strategy.

16.2. Recommendation

Alternative 2 (mandatory colocation and voluntary chute closure) provides the most favourable results and is recommended for implementation. The recommended alternative has a capital cost of $29 million and an operating and maintenance cost of $91.0 million.

While Alternative 1 and Alternative 4 received the next highest total scores, they represent two contrasting scenarios: all mandatory or all voluntary. Although Alternative 1 scored higher from an environmental perspective and carried slightly less risk overall, there is significantly less support from a social standpoint compared to Alternative 4. Alternative 4 has significantly more support from a social perspective, which is countered by a lower diversion rate potential and a less favourable score for risk.

16.3. Additional Recommendations

Waste Services recommends the following additional items be added to all alternatives to form a complete program. These items do not carry additional resource requirements beyond the status quo, and therefore were not included in the financial analysis of the alternatives, but are presented here for consideration and endorsement by City Council.

A. **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.
B. **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 the regulatory and enforcement measures in this business case to ensure that the solutions remain relevant and effective as Edmonton grows and changes.
C. **Landfill Disposal Bans -** Research has shown that landfill disposal 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 the success of landfill bans on successful waste diversion, establishing common reporting protocols,

and regional advocacy to the Provincial government for extended producer responsibility legislation. Waste Services recommends that City Council advocate for disposal bans to be implemented on a provincial level.

17. Project Responsibility and Accountability

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.

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.

18. Implementation Approach

The implementation of the new communal collection program is dependent on public education and outreach efforts, the availability of sufficient processing capacity for organics and recycling, allowing sufficient time for properties to prepare their sites for three stream collection, an update of the Waste Bylaw, and securing the resources identified in this business case.

A high level implementation timeline for the communal collection program is outlined in Figure 10.

18.1. Recommended Timeline for Mandatory Colocation

Should City Council select the recommended alternative, it is anticipated that preparation for the new service will begin in 2022 so three stream collection can commence in 2023. Rollout will be phased over a period of four years. The sequence for operational implementation and education program implementation is described in more detail below.

The timeline allows sufficient time for properties to make infrastructure changes if desired and ensures the City is learning and adapting as the program is rolled out. It also provides the opportunity to build strong relationships with property managers and condo boards along the way. 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 site to make decisions regarding container type, size, placement and collection frequency.

18.1.1. Operational Implementation

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. Phases will be determined by geographic area, beginning with areas currently serviced by City crews. Property assessments will start in 2022 to prepare for the first phases of rollout, and will continue as a parallel process during the phased implementation.

Starting in 2022, the City will advise properties which containers have been determined to be optimal for their site. This approach to phased notification will provide properties with as much time as possible to plan for changes and correspond 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 regarding any requests for changes to their containers.

18.1.2. Education and Outreach Implementation

The implementation of the proposed communal collection program includes a comprehensive education and outreach strategy. This education strategy is focused on supporting residents and property managers through the transition and on an ongoing basis. This approach will build awareness, provide the tools and support necessary for residents to successfully participate in the program, and help residents adapt to the change in the long term.

Education and outreach tactics will include, but are not limited to:

- Awareness campaigns that will help residents anticipate, understand and prepare for the change. Campaigns will use a variety of approaches, including materials mailed directly to residents, campaign videos and ads on City media channels. This will help to initiate adoption of the new program.
- An educational "welcome" package, which provides residents with the tools they need to immediately begin participating in the program, including an in-unit food scraps pail, an educational brochure outlining the program, a *What Goes Where* poster for in-unit use, and signage and posters for the building to ensure clear and consistent messaging.
- Direct outreach to all residents to introduce the program. This will involve door-to-door canvassing that will use behaviour change tools typical of Community Based Social Marketing practices. These tools have been proven to positively impact behaviour change and include identifying barriers and highlighting benefits of the desired behaviour to residents, asking residents to make commitments (both private and public) to try the new system, and a gift (the food scraps pail), to increase feelings of reciprocity.
- Digital educational resources, including the *WasteWise* app, information on the City website, and educational videos designed to help residents adapt to the program.
- Virtual education sessions for both residents and property managers, to create awareness of the program, answer questions and point residents and property managers to other available resources.
- An annual newsletter sent to each home receiving the communal collection service to

provide information about the progress of the program as a whole, highlighting residents' successes and where performance could be improved, and to encourage continued participation in the program.

Since the implementation is planned to take place over a period of several years, tactics and methods will be evaluated and improved continuously throughout the implementation. As well, learnings from the education and outreach associated with the Edmonton Cart Rollout will be applied during the implementation of the new communal collection program.

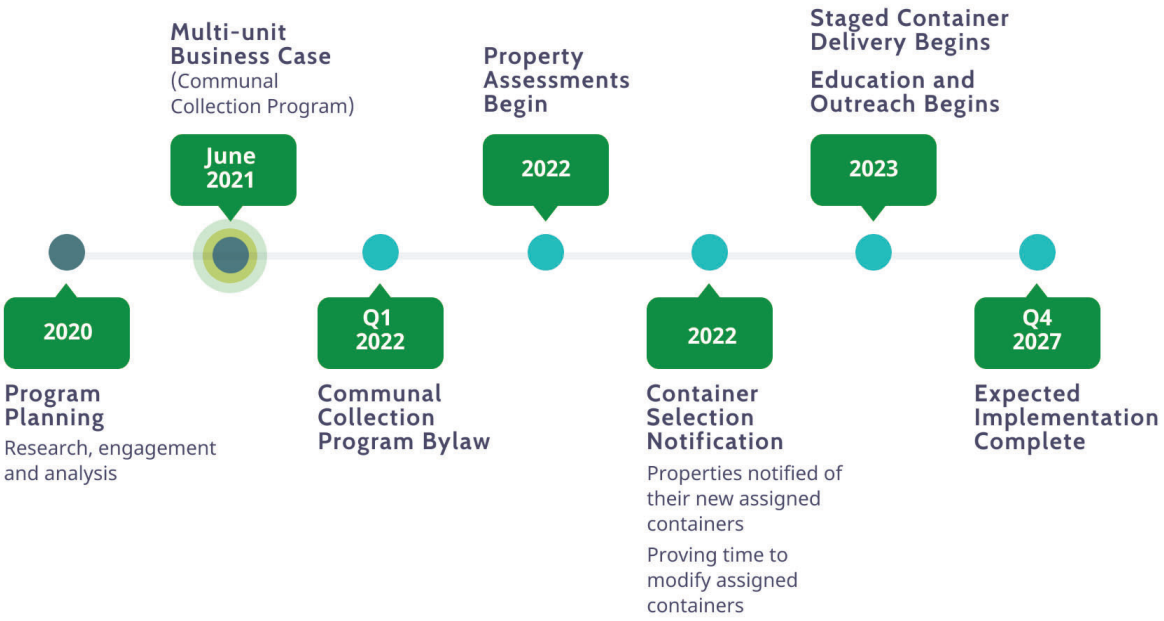


Figure 10: Implementation Timeline for the Recommended Waste Services Program

18.2. Alternative Timeline for Voluntary Colocation

Should Council select an alternative that is not recommended, the implementation timeline could vary. For Alternative 3 and Alternative 4, implementation is expected to take up to two-and-half years to complete. The sequence of steps would be the same, but as voluntary colocation requires distribution of fewer containers, it will not take as long. This expedited timeline means that additional educational staff are required; this difference has been reflected in the cost of the alternatives. Alternative 1 has the same implementation requirements as Alternative 2, the recommended alternative.

18.3. Bylaw Updates

Major changes to the Waste Services Bylaw were introduced together with the recommendations in the Single Unit Waste Set-out Business Case in 2019. These changes did not include updates related to the communal collection program.

Waste Services Bylaw 18590 will require further updates to ensure alignment with the recommendations presented in this business case. Waste Services will initiate an amendment to the current Waste Services Bylaw 18590 following approval of this business case. The bylaw amendment is planned to be presented for approval to Council in the first quarter of 2022. Bylaw changes will be a collaborative effort involving internal stakeholders such as the Community Standards Branch.

18.4. Performance Management

Waste Services will measure the effectiveness and efficiency of the program throughout implementation by assessing the results of performance measures such as:

- Overall communal program diversion rate.
- Stream-specific diversion from landfill.
- Gross tonnes of material collected from food scraps, garbage and recycling.
- Contamination rate in the waste streams.
- Total operating cost per tonne.
- Number of properties serviced.
- Number of properties transitioned per phase (until rollout complete).
- Overall residential customer satisfaction with the communal collection program.
- Overall property management satisfaction with the communal collection program.
- Number of properties using the excess waste program.
- Number of properties taking advantage of the variable rate program due to lower garbage generation.

The most appropriate measures for managing performance on an ongoing basis, once determined, will be embedded in the Enterprise Performance Management (EPM) scorecards of the Waste Services branch for regular review through the City's established EPM framework.

18.5. Critical Dependencies Impacting Timeline

Multiple factors and decisions could impact the timeline for the proposed program changes including, but not limited to, the following possibilities:

- Delay to Council approval of proposed program changes in June 2021 will impact the implementation timing.
- Delay to Council approval of forthcoming amendments to the Waste Services Bylaw.

18.6. Additional Implementation Steps

In addition to the rollout and the education and outreach programs that would be implemented, Waste Services will include the following in the implementation phase:

- **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 future programs to reduce illegal dumping, 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 the Development Services branch 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 success against program success measures. These studies will look at contamination levels in all the streams and will help for benchmarking and education planning.
- **Communal versus Curbside Collection -** Where possible, depending on building layout and operational logistics, Waste Services will prioritize curbside collection over communal collection to achieve the policy objectives outlined in the Waste Strategy.

19. Review and Approval Process

Table 15 shows the review and approval process was followed for this business case:

Table 15: Business Case Review and Approval Process

Review Step	Reviewer
Review 1	• Project working team and Waste Strategy Director.
Review 2	• Branch Manager of Waste Services, • Branch Manager of Development Services, • 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), • Operational Controller with Business Financial Analytics (Waste Services), • Branch Strategic Coordinator (Waste Services), and • Legal Services.
Review 3	• Deputy City Manager.
Review 4	• Utility Advisor and City Manager.
Review 5	• Utility Committee report presented.

19.1. Business Case Sign Off

The business case will be approved (signed and dated) by the Branch Managers of Waste Services and Development Services in addition to Directors of Waste Strategy, Collection Services, Technical Services, Sustainable Waste Processing Services, and Business Integration as well as the Operational Controller in Waste Services. The final approval will be received from the Deputy City Manager prior to submission to the Utility Committee and City Council.

Appendices

Appendix A - Stage One Options Analysis Results
Appendix B - Stage Two Options Analysis Results and Sensitivity Analysis Methodology
Appendix C - Stage Three Options Analysis Results and Scoring Methodology
Appendix D - Assumptions for Alternatives
Appendix E - Detailed Alternative Cost Comparison Summary
Appendix F - Comparison of Revenue Requirements for Alternatives
Appendix G - Annual Operating and Maintenance Costs

Appendix A - Stage One Options Analysis Results

Table A1: Stage One Options Analysis Results

Stage One Options Analysis Results			
Category and Option	Advance to Stage Two Options Analysis		
Containers	**Garbage**	**Recycle**	**Organics**
Carts	Yes	Yes	Yes
Front Load Bin	Yes	Yes	Yes
Underground Containers	Yes	Yes	Yes
Bags	No	Yes	No
Roll-off Compactors	Yes	Yes	No
Pneumatic Collection	No	No	No
Mobile Collection	No	No	No
Front Load Bin Compactor	Yes	Yes	No
Waste Drop Off (Exclusively)	No	No	No
Education Relationships		**Residents**	**Stakeholders**
No Education Program		No	No
Education Program		Yes	Yes
No Outreach Program		No	No
Outreach Program		Yes	Yes
Financial Mechanisms			
No Rate Reduction			Yes
Rate Reduction			Yes
No Bill Credits			Yes
Bill Credits			Yes
Variable Pricing Rate Structure			Yes

Fixed Pricing Rate Structure	Yes
Processing	
Pre-processing improvements to the IPTF	Yes
Organic Press	Yes
Waste to Energy Facility	No
No Improvements (Status Quo)	Yes
Developer Standards	
No Developer Standards and Requirements	No
Voluntary Developer Standards and Requirements	Yes
Mandatory Developer Standards and Requirements	Yes
Collections	
Two Stream Waste Collection (Garbage and Recycle)	Yes
Three Stream Waste Collection (Garbage, Recycle and Food Scraps)	Yes
Regulatory Programs	
No Chute Closure	Yes
Voluntary Chute Closure	Yes
Mandatory Chute Closure	Yes
No Colocation	Yes
Voluntary Colocation	Yes
Mandatory Colocation	Yes
Volume Limits Excluding an Excess Waste Program	Yes
Volume Limits Including an Excess Waste Program	Yes

Appendix B - Stage Two Options Analysis Results and Sensitivity Analysis Methodology

Table B1: Stage Two Options Analysis Results

Stage Two Options Analysis Results	
Option Category and Type	Sensitivity Rank Average
Collections	
Two Stream Collection (Garbage and Recycle)	1.80
Three Stream Collection (Garbage, Recycle, and Food Scraps)	1.20
Garbage Collection Containers	
Carts	3.40
Front Load Bins	2.40
Underground (Front Load Truck Unloaded)	1.60
Roll-off Compactor	6.00
Front Load Bin Compactor	4.60
Underground (Crane Unloaded)	6.00
Underground (European-Style)	4.00
Recycling Collection Containers	
Carts	4.80
Front Load Bins	2.00
Underground (Front Load Truck Unloaded)	2.20
Roll-off Compactor	6.20
Front Load Bin Compactor	4.20
Underground (Crane Unloaded)	5.60
Underground (European-Style)	3.60
Bags	7.40
Food Scraps Collection Containers	

Carts	1.00
Front Load Bins	2.40
Underground (Crane Unloaded)	3.80
Underground (European-Style)	2.80
Resident Relationships	
Make Operational Information Public	4.60
In-unit Food Scraps Containers	3.20
In-unit Recycle Containers	4.20
Ambassador Program	5.00
Annual Education Campaigns	1.80
Ongoing Education	2.20
Property Manager Relationships	
Property Manager Resources	3.80
Building Resources (Posters, etc.)	3.00
Voluntary New Tenant Orientation	4.00
Targeted Workshops	6.20
Dedicated Staff for Multi-unit Customer Service	1.80
System Feedback / Report Cards	6.40
Stakeholder Working Teams	2.80
Financial Mechanisms	
No Rate Reduction	3.80
Rate Reduction	2.80
No One-time Bill Credits	3.80
One-time Bill Credits	5.20
Variable Pricing Rate Structure	1.80
Fixed Pricing Rate Structure	3.40

Processing Improvements	
No Improvements (Maintain Status Quo)	2.80
Organic Press	2.00
IPTF Pre-processing Improvements	1.20
Developer Standards	
Developer Standards with Bylaw Enforcement	1.20
Developer Standards Not Enforceable by Bylaw	2.60
Mandatory Separation of ICI and Residential Waste in New Buildings	2.60
Voluntary Separation of ICI and Residential Waste in New Buildings	3.60
Regulatory Programs	
No Chute Closure	7.00
Voluntary Chute Closure	3.00
Mandatory Chute Closure	3.40
No Colocation	8.00
Voluntary Colocation	4.00
Mandatory Colocation	1.60
Volume Limits without an Excess Waste Program	5.00
Volume Limits with an Excess Waste Program	4.00

Table B2: Example of Sensitivity Analysis Methodology

Stage Two Sensitivity Analysis Example								
Criteria Being Analyzed (with % of bias)	Evaluation Criteria Weighting Percentages				Option Score and Rank			
	Criteria 1	Criteria 2	Criteria 3	Criteria 4	3.454	-0.182	2.273	-0.727
Criteria 2: 0.00%	27.27%	**0.00%**	45.45%	27.27%	1	3	2	4
						↑	↓	
					3.842	3.501	3.500	1.922
Criteria 2: 71.07%	7.89%	**71.07%**	13.15%	7.89%	1	2	3	4
					↓	↑		
					3.882	3.883	3.628	2.196
Criteria 2: 78.44%	5.88%	**78.44%**	9.80%	5.88%	2	1	3	4

In the Sensitivity Analysis example above, four options are being evaluated against Criteria 2. The central columns show the weight assigned to each of the four criteria. The columns to the right are the corresponding rank of each option.

In the first row of the analysis, the weighting for Criteria 2 is set to zero percent, and the option ranks are recorded.

The percent weighting of Criteria 2 was then increased until a rank change occurred in the options. In the example above, a rank change occurred when Criteria 2 reached 71.07% (second row of the analysis above). When Criteria 2 was weighted at 71.07%, the option that had been ranked third moved up to rank second, and the option ranked second dropped to rank third.

The last row shows another rank change when Criteria 2 reached a weight of 78.44%. In this example, the ranking remains constant regardless of how much additional weight is added to Criteria 2 after 78.44%.

This methodology was followed for every option and every criteria in Stage Two analysis to reach the final average rank for each option. An option with a higher sensitivity rank average is preferred.

Appendix C - Stage Three Options Analysis Results and Scoring Methodology

The Total Weighted Score of the Stage Three analysis is summarized in Table C1 below. The Total Weighted Score is calculated by input from four equally weighted (25% each) criteria.

Table C1: Stage Three Options Analysis Results

Stage Three Options Analysis Results					
Alternative	**Social Impact / Public Preference Score**	**Environ-mental Score**	**Net Present Value Score**	**Risk Score**	**Total Weighted Score**
Weighting	**25%**	**25%**	**25%**	**25%**	**100%**
Alternative 1	50%	100%	88%	36%	**69%**
Alternative 2	85%	100%	88%	38%	**78%**
Alternative 3	45%	78%	100%	26%	**62%**
Alternative 4	80%	76%	100%	27%	**71%**

Social Impact / Public Preference Score

The Social Impact / Preference Score is the total resident score out of ten, plus the total property manager score out of ten, divided by a possible overall total of 20 points. For example, Alternative 2 has 17 points out of 20, equalling 85%. Table C2 provides a summary of the Social Impact / Public Preference Score.

Table C2: Social Impact / Public Preference Scoring Summary

Social Impact / Public Preference (25.00% Weighting)			
Alternative	Social Impact / Public Preference Scores		Criteria Score
Alternative 1: Mandatory Colocation & Mandatory Chute Closure	**Resident Score (Maximum 5 for Each)**		50%
	Mandatory Colocation 4	Mandatory Chute Closure 2	
	Property Manager Score (Maximum 5 for Each)		

	Mandatory Colocation 3	Mandatory Chute Closure 1	
Alternative 2: Mandatory Colocation & Voluntary Chute Closure	**Resident Score (Maximum 5 for Each)**		85%
	Mandatory Colocation 4	Voluntary Chute Closure 5	
	Property Manager Score (Maximum 5 for Each)		
	Mandatory Colocation 3	Voluntary Chute Closure 5	
Alternative 3: Voluntary Colocation & Mandatory Chute Closure	**Resident Score (Maximum 5 for Each)**		45%
	Voluntary Colocation 4	Mandatory Chute Closure 2	
	Property Manager Score (Maximum 5 for Each)		
	Voluntary Colocation 3	Mandatory Chute Closure 1	
Alternative 4: Voluntary Colocation & Voluntary Chute Closure	**Resident Score (Maximum 5 for Each)**		80%
	Voluntary Colocation 4	Voluntary Chute Closure 2	
	Property Manager Score (Maximum 5 for Each)		
	Voluntary Colocation 3	Voluntary Chute Closure 1	

Environmental Score

The Environmental Score is calculated with reference to the alternative with the highest projected diversion at program maturity. Program maturity refers to a period of time where ideal sorting behavior has been established and the program is fully implemented. Every alternative's score is a ratio of its own projected diversion compared to the highest projected diversion rate. For example, Alternative 1 and Alternative 2 have the same highest projected diversion rate (51%), so they score 100%. Alternative 3 has a projected diversion rate of 40%, which is 78% of the highest projected diversion rate (40% / 51% = 78%). The score for Alternative 4 is calculated the same way. Table C3 provides a summary of the environmental scores. All of the diversion rates are compared against the projected diversion rate if no alternatives were implemented. These diversion rates are estimated based on the proposed

changes to the collection aspect of the program and supporting educational programming. As this business case does not propose changes to other programs such as waste drop off, additional diversion from services such as Community Recycling Depots or Eco Stations is not included in the Alternative or Status Quo estimates, but are included in overall diversion rate totals (approximately 6%). Lastly, these diversion rates also exclude contributions from the RDF facility at the EWMC.

Table C3: Environmental Scoring Summary

Environmental (25.00% Weighting)		
Explanation of Diversion Rate	Predicted Diversion Rate (Collections and Processing Only, Excluding RDF)	Criteria Score
Alternative 1: Mandatory Colocation & Mandatory Chute Closure		
Alternative Diversion Rate at Maturity	**51%**	**100%**
Projected Status Quo Diversion Rate	35%	
Overall Increase in Diversion at Maturity	16%	
Alternative 2: Mandatory Colocation & Voluntary Chute Closure		
Alternative Diversion Rate at Maturity	**51%**	**100%**
Projected Status Quo Diversion Rate	35%	
Overall Increase in Diversion at Maturity	16%	
Alternative 3: Voluntary Colocation & Mandatory Chute Closure		
Alternative Diversion Rate at Maturity	**40%**	**78%**
Projected Status Quo Diversion Rate	35%	
Overall Increase in Diversion	5%	

at Maturity		
Alternative 4: Voluntary Colocation & Voluntary Chute Closure		
Alternative Diversion Rate at Maturity	**39%**	**76%**
Projected Status Quo Diversion Rate	35%	
Overall Increase in Diversion at Maturity	4%	

Net Present Value Score

Each alternative is scored for Net Present Value based on the percent difference compared to the highest NPV subtracted from a perfect score (100%). To demonstrate, Alternative 3 and Alternative 4 have the highest NPV (i.e. the least costly alternative), thus the score is 100%. Alternative 1 and Alternative 2 are $7.25M more expensive than Alternative 3 and Alternative 4. $7.25M / $60.38M = 12% summarizes the percent difference calculation, and 100% - 12% gives the NPV Score of 88%. A mathematical summary can be seen below. Table C4 provides a summary of the NPV scores.

$$\frac{\$60.38M}{\$60.38M} - \frac{\$67.63M - \$60.38M}{\$60.38M} = 0.87998 = 88\%$$

Table C4: Net Present Value Scoring Summary

Net Present Value (NPV) (25.00% Weighting)		
Alternative	Net Present Value	Criteria Score
Alternative 1: Mandatory Colocation & Mandatory Chute Closure	Net Present Value: -$67,630,915.92	88%
Alternative 2: Mandatory Colocation & Voluntary Chute Closure	Net Present Value: -$67,630,915.92	88%
Alternative 3: Voluntary Colocation & Mandatory Chute Closure	Net Present Value: -$60,383,543.18	100%
Alternative 4:		100%

Voluntary Colocation & Voluntary Chute Closure	Net Present Value: -$60,383,543.18	

Risk Score

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 70 (if all risks had maximum likelihood and impact). The actual risk associated with Alternative 1 had a score of 45 (based on expected likelihood and impact). The avoided risk is therefore 25. The score is the ratio of the avoided risk to potential risk, where more risk being avoided results in a higher score. Table C5 provides a summary of the Risk Score.

Table C5: Risk Scoring Summary

Risk (25.00% Weighting)			
Alternative	Risk Score		Criteria Score
Alternative 1: Mandatory Colocation & Mandatory Chute Closure	Total Risk Avoided: Total Score Possible:	25 70	36%
Alternative 2: Mandatory Colocation & Voluntary Chute Closure	Total Risk Avoided: Total Score Possible:	23 60	38%
Alternative 3: Voluntary Colocation & Mandatory Chute Closure	Total Risk Avoided: Total Score Possible:	18 70	26%
Alternative 4: Voluntary Colocation & Voluntary Chute Closure	Total Risk Avoided: Total Score Possible:	12 45	27%

Appendix D - Assumptions for Alternatives

Table D1: Assumptions list for Alternatives 1 and 2 - Mandatory Colocation

Assumptions for Alternative 1 and Alternative 2 - Mandatory Colocation	
1	Cart lifespan is 12 years (less than the Single Unit Waste Set-out Business Case) due to the shared nature of multi-unit containers. FLB lifespan is set to 12 years for recycling and garbage containers. Food scraps FLB lifespan are set to 6 years to account for the corrosive nature of organic waste.
2	Food scraps carts are assumed to be coloured for cost purposes (similar to the curbside program).
3	An extra supply of 20% has been approximated to account for inaccuracies in unit count, site count, and properties with space restrictions and differing container needs. The 20% was taken from the ACEE 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 per unit, assuming no contamination, is calculated to be: Garbage = 0.09 yd^3 / week Recycling = 0.20 yd^3 / week Food Scraps = 0.03 yd^3 / week
6	Densities from EPA[15] (converted to metric) taken as: Mixed Multi-unit Solid Waste (Uncompacted) = 43.09 kg / yd^3 (aka Garbage) Mixed Single Stream Recycle (Uncompacted) = 23.13 kg / yd^3 (aka Recycling) Food Scraps = 210.01 kg / yd^3 Mixed Yard Waste = 113.40 kg / yd^3 (added to the Food Scraps stream)
7	Food scraps container size volume allocation is based on a 90% capture rate (by weight), resulting in a total allocation of 0.0276 yd^3 / week per unit.
8	Recycling container size volume allocation is based on a 90% capture rate (by weight), resulting in total allocation of 0.185 yd^3 / week per unit.
9	Garbage volume container size allocation is based on: • 52% of food scraps 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 allocation, resulting in a total allocation of 0.125 yd^3 / week per unit.

[15] EPA Density Document 2016

10	Based on current in-field percentages, 20% of the bins require casters. Only medium duty casters are used, and no FLB over 4 yd^3 in size will have casters.
11	No FLB are refurbishable due to end of life wear and tear.
12	Every unit will be given 1 food scraps pail. After the first initial purchase of food scraps pails, new purchases will equate a 2% expected growth rate and a 5% surplus.
13	The requirements for garbage FLB can be met by existing inventory.
14	The largest container to be used for food scraps is a 2 yd^3 front load bin.
15	Cart and FLB replacement part quantity is set to match the surplus, a similar assumption to the Single Unit Waste Set-out Business Case.
16	None of the FLB are assumed to be "Cathedral Style.”
17	The number of 240L carts is assumed to be 25% of the 360L carts. The two different sizes will be used based on building space limitations.
18	No more than 4 food scraps carts can be placed in a single "collection area" at a property. If 5 or more carts are needed, a 2 yd^3 bin shall be allocated instead. It is assumed a property limit of 15 food scraps carts will satisfy all "collection areas" that a property requires.
19	No more than 7 garbage carts per property are allowed, which services up to a potential 7 "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 FLB are used as often as possible instead of replacing them with carts. This limit is separate from the food scraps cart limit of 15 outlined in Assumption 18.
20	Lifespan of new trucks has been averaged to 8 years instead of 10, to allot for reduced life expectancy due to dedicated organics collection.
21	Downtime for all collection vehicles is calculated at 15% based on historical data.
22	City contractor cost for servicing food scraps FLB is assumed to be higher than the cost of servicing recycling and garbage FLB. This is based on data from the existing curbside program.
23	The contractor food scraps cart 240L and 360L servicing cost follows the same cost progression as garbage carts.
24	Contractor collection costs are the current average cost multiplied by the new additional allocation.
25	Contractor collection costs are set to 100% of status quo for the first year of implementation, as city-side rollout will occur first. The costs are then adjusted as implementation is completed.

26	Implementation will take 4 years to complete.
27	For costing purposes, the growth rate has been set to 2% per year.
28	Chute closure will have no impact to capital or operating cost.
29	For diversion rate calculations, it is assumed that processing facilities have adequate capacity to process all incoming garbage, recycle and food scraps.
30	Is it assumed that contamination for Alternative 1 and Alternative 2 will be 10% for both food scraps and recycle collection, for diversion calculations. This is attributed to colocation.
31	Chute closure is assumed to have no impact on diversion in Alternative 1 and Alternative 2.
32	The Multi-unit Waste Bylaw will be updated in time for full program implementation. Costs and resources required for Bylaw updates have not been included in the analysis.
33	Staffing and resource additions will be adequate to maintain the program during and after implementation.
34	The annual compounded inflation rate is calculated and averaged to be 1.96% based on City Economist data over the project period from 2021 to 2046.
35	The diversion rates predicted in the Stage Three analysis are “mature” program predictions, and can be seen as an end state scenario for each alternative.

Table D2: Assumptions List for Alternatives 3 and 4 - Voluntary Colocation

Assumptions for Alternative 3 and Alternative 4 - Voluntary Colocation	
1	Cart lifespan is 12 years (less than the Single Unit Waste Set-out Business Case) due to the shared nature of multi-unit containers. FLB lifespan is set to 12 years for recycling and garbage containers. Food scraps FLB lifespan are set to 6 years to account for the corrosive, damaging nature of organic waste.
2	Food scraps carts are assumed to be coloured for cost purposes (similar to the curbside program).
3	An extra supply of 20% has been approximated to account for inaccuracies in unit count, site count, and properties with space restrictions and differing container needs. The 20% was taken from the ACEE 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 per unit, assuming no contamination, is calculated to be: Garbage = 0.09 yd^3 / week Recycling = 0.20 yd^3 / week Food Scraps = 0.03 yd^3 / week
6	Densities from EPA[16] (converted to metric) taken as: Mixed Multi-unit Solid Waste (Uncompacted) = 43.09 kg / yd^3 (aka Garbage) Mixed Single Stream Recycle (Uncompacted) = 23.13 kg / yd^3 (aka Recycling) Food Scraps = 210.01 kg / yd^3 Mixed Yard Waste = 113.40 kg / yd^3 (added to the Food Scraps stream)
7	Food scraps container size volume allocation is based on a 90% capture rate, resulting in a total allocation of 0.0276 yd^3 / week per unit.
8	Recycling container size volume allocation is based on a 90% capture rate, resulting in total allocation of 0.185 yd^3 / week per unit.
9	Garbage volume container size allocation is based on: ● 52% of food scraps 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 allocation, resulting in a total allocation of 0.125 yd^3 / week per unit.
10	Based on current in-field percentages, 20% of the bins require casters. Only medium duty casters are used, and no FLB over 4 yd^3 in size will have casters.
11	No FLB are refurbishable due to end of life wear and tear.
12	Every unit will be given 1 food scraps pail. After the first initial purchase of food scraps pails, new purchases will equate a 2% expected growth rate and a 5% surplus.
13	The requirements for garbage FLB can be met by existing inventory.
14	The largest container to be used for food scraps is a 2 yd^3 front load bin.
15	Cart and FLB replacement part quantity is set to match the surplus, a similar assumption to the Single Unit Waste Set-out Business Case.
16	None of the FLB are assumed to be "Cathedral Style."
17	The number of 240L carts is assumed to be 25% of the 360L carts. The two different sizes will be used based on building space limitations.
18	Recycling FLB are included for the properties that currently do not have recycling service.

[16] EPA Density Document 2016

19	No more than 4 carts can be placed in a single collection area at a site. If 5 or more carts are needed, a 2 yd^3 FLB is preferable due to the fact the footprint of 5 carts is more than one 2 yd^3 FLB.
20	Lifespan of new trucks has been averaged to 8 years instead of 10, to allot for reduced life expectancy due to dedicated organics collection.
21	Downtime for all collection vehicles is calculated at 15% based on historical data.
22	City contractor cost for servicing food scraps FLB is assumed to be higher than the cost of servicing recycling and garbage FLB. This is based on data from the existing curbside program.
23	Contractor collection costs are the current average cost multiplied by the new additional allocation.
24	The contractor food scraps cart 240L and 360L servicing cost follows the same cost progression as garbage carts.
25	Contractor collection costs are set to 100% of status quo for the first year of implementation, as city-side rollout will occur first. The costs are then adjusted as implementation is completed.
26	Implementation will take 2 years to complete.
27	For costing purposes, the growth rate has been set to 2% per year.
28	Chute closure will have no impact to capital or operating cost.
28	For diversion rate calculations, it is assumed that processing facilities have adequate capacity to process all incoming garbage, recycle and food scraps.
29	Is it assumed that contamination for: ● Alternative 3 will be 56.28% for recycle and 68.78% for food scraps collection assuming that with mandatory chute closure, properties with chutes will follow the same contamination as Alternative 1 and Alternative 2 (10%). Buildings without chutes will follow contamination outlined below for Alternative 4. ● Alternative 4 will be 71.50% for recycle and 84.00% for food scraps collection based on composition studies from other municipalities who also have voluntary colocation and voluntary chute closure.
30	Chute closure is assumed to have no impact on diversion in Alternative 1 and Alternative 2.
31	The Multi-unit Waste Bylaw will be updated in time for full program implementation. Costs and resources required for Bylaw updates have not been included in the analysis.

32	Staffing and resource additions will be adequate to maintain the program during and after implementation.
33	The annual compounded inflation rate is calculated and averaged to be 1.96% based on City Economist data over the project period from 2021 to 2046.
34	The diversion rates predicted in Stage 3 analysis are “mature” program predictions, and can be seen as an end state scenario for each alternative.

Appendix E - Detailed Alternative Cost Comparison Summary

Table E1: Cost Comparison and Revenue Requirements for Program Alternatives

Cost Comparison & Revenue Requirement		
	Alternatives	
Reference	**Voluntary Colocation**	**Mandatory Colocation**
Base Year	2021	2021
In-service Year	2022	2022
Cumulative Revenue Requirement (from base year)	**Voluntary Colocation**	**Mandatory Colocation**
CPV @ Year 5	$22,024,746	$24,555,811
CPV @ Year 10	$35,122,719	$39,529,164
CPV @ Year 15	$47,202,026	$51,721,468
CPV @ Year 20	$57,247,418	$63,000,595
CPV @ Year 25	$62,783,437	$69,957,002
CPV @ Year 30	$62,891,716	$70,086,105
CPV @ Year 35	$62,891,716	$70,087,362
Capital Cost Summary (Base Year Dollars)	**Voluntary Colocation**	**Mandatory Colocation**
Equipment	$16,252,147	$18,944,014
Building	$0	$0
Other (engineering/PM, etc.)	$2,133,904	$1,965,523
Total Base Costs	**$18,386,050**	**$20,909,537**
Contingency	$3,677,210	$4,181,907
Inflation	$3,721,430	$4,106,682
Total Capital	**$25,784,691**	**$29,198,126**

Economic Assumptions	
Inflation (compounded each year)	1.96%
Contingency	20.00%
Analysis is based on 35 years to capture the full life cycle costs of the assets.	
Assumes borrowing required at 84% (based on current Utility split) at 3.80%.	

Table E2: Alternative Cost Comparison Summary

Alternative Cost Comparison Summary			
Waste Services Vehicle & Equipment (2019 - 2022)	**Voluntary Colocation**	**Mandatory Colocation**	**Net Change**
Total Capital Cost	($25,784,691)	($29,198,126)	-$3,413,435
Total Revenues	$0	$0	$0
Total Operating and Maintenance Costs	($81,891,043)	($90,966,152)	-$9,075,109
Project Net Inflows (Outflows)	($107,675,733.72)	($120,164,277.71)	-$12,488,544
WACC Discount Rate	5.21%	5.21%	0.00%
Net Present Value	($60,383,543)	($67,630,916)	-$7,247,373

Appendix F - Comparison of Revenue Requirement for Alternatives

Table F1: Annual Cost Revenue Requirement Summary

Revenue Requirement Summary (Annual Costs)		
	Alternatives	
Calendar Year	**Voluntary Colocation**	**Mandatory Colocation**
2022	$8,109,713	$7,234,481
2023	$6,127,119	$4,974,144
2024	$3,494,209	$5,507,765
2025	$3,754,500	$5,725,237
2026	$3,502,270	$4,877,711
2027	$3,505,270	$4,145,149
2028	$4,777,900	$4,504,408
2029	$4,343,816	$4,263,001
2030	$3,260,417	$4,686,733
2031	$3,668,133	$4,907,894
2032	$3,410,498	$4,168,191
2033	$3,435,939	$4,025,467
2034	$6,023,450	$5,102,216
2035	$6,274,940	$5,052,044
2036	$4,426,515	$5,359,984
2037	$4,477,931	$5,971,653
2038	$4,312,260	$5,472,708
2039	$4,539,895	$5,503,118
2040	$6,103,546	$5,681,994

2041	$5,784,618	$5,387,215
2042	$4,320,093	$5,425,276
2043	$4,467,952	$5,680,789
2044	$4,155,226	$5,053,432
2045	$3,972,369	$4,882,541
2046	$431,766	$769,644
2047	$311,338	$348,463
2048	$99,102	$54,285
2049	$0	$45,665
2050	$0	$31,483
2051	$0	$18,596
2052	$0	$6,065

Table F2: Cumulative Present Value Revenue Requirement Summary

Revenue Requirement Summary (Cumulative Present Value)		
	Alternatives	
Calendar Year	**Voluntary Colocation**	**Mandatory Colocation**
2022	$7,708,120	$6,876,230
2023	$13,243,435	$11,369,932
2024	$16,243,825	$16,099,313
2025	$19,308,074	$20,771,986
2026	$22,024,746	$24,555,811
2027	$24,609,262	$27,612,125
2028	$27,957,667	$30,768,863
2029	$30,851,112	$33,608,476

2030	$32,915,351	$36,575,746
2031	$35,122,719	$39,529,164
2032	$37,073,420	$41,913,242
2033	$38,941,352	$44,101,669
2034	$42,053,814	$46,738,107
2035	$45,135,663	$49,219,347
2036	$47,202,026	$51,721,468
2037	$49,188,876	$54,371,079
2038	$51,007,469	$56,679,064
2039	$52,827,251	$58,884,947
2040	$55,152,658	$61,049,745
2041	$57,247,418	$63,000,595
2042	$58,734,365	$64,867,939
2043	$60,196,051	$66,726,404
2044	$61,488,113	$68,297,761
2045	$62,662,148	$69,740,798
2046	$62,783,437	$69,957,002
2047	$62,866,566	$70,050,043
2048	$62,891,716	$70,063,820
2049	$62,891,716	$70,074,835
2050	$62,891,716	$70,082,053
2051	$62,891,716	$70,086,105
2052	$62,891,716	$70,087,362

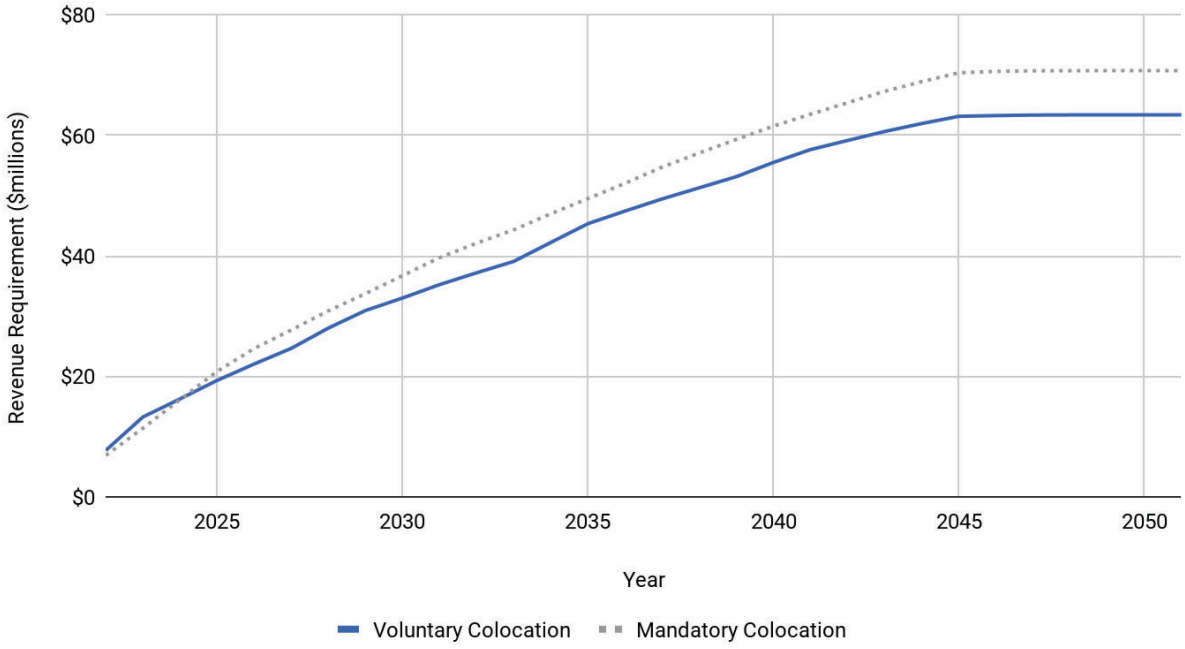


Figure F1: Cumulative Present Value of Revenue Requirement for Program Alternatives

Appendix G - Annual Operating and Maintenance Costs

Table G1 provides the annual operating and maintenance costs for the recommended Alternative.

Table G1: Annual Operating and Maintenance Costs for Alternative 2

Year	O&M Costs	Year	O&M Costs
2022	$6,723,767	2034	$4,174,480
2023	$4,020,672	2035	$3,947,372
2024	$4,358,771	2036	$4,019,204
2025	$4,382,952	2037	$4,403,103
2026	$3,481,905	2038	$3,397,170
2027	$2,784,152	2039	$3,460,630
2028	$3,170,684	2040	$3,937,468
2029	$2,953,683	2041	$3,676,041
2030	$3,006,885	2042	$3,745,342
2031	$3,343,041	2043	$4,161,456
2032	$3,044,538	2044	$3,800,071
2033	$3,100,119	2045	$3,872,649

Council Policy

Waste Services Utility Fiscal Policy

Program Impacted	Financial Sustainability *The City of Edmonton's resilient financial position enables both current and long-term service delivery and growth.*
Number	C558C
Date of Approval	July 3, 2024
Approval History	December 9, 2020 (C558B) September 23, 2014 (C558A) June 1, 2011 (C558)
Next Scheduled Review	July 2028

Statement

I. The purpose of this policy is to:

A. Ensure that the Utility is financially sustainable over the long term and remains a self-funded enterprise.

B. Ensure that there is a consistent approach year over year for the financial planning, budgeting and rate setting for the City of Edmonton managed Utility.

II. Guiding Principles

A. The Utility is to be operated in a manner that balances the best possible service at the lowest cost (public utility) while incorporating utility rate-setting principles in establishing customer rates.

III. Operating Principles

A. The Utility is exempt from a Local Access Fee as the Utility does not have exclusive rights to the waste collection and disposal market, nor does it have exclusive use of the roadways.

B. The Utility is exempt from Dividend payment to the City of Edmonton.

C. Similar to private utilities, the Utility will account for the cost of service under a full cost accounting approach.

D. Where government grants are not provided for the exclusive use of the Utility, access to government grants requires the completion of a business case that takes into account the overall needs of the community. The allocation of grant funding to the Utility will be based on prioritization of all City of Edmonton capital projects through the City of Edmonton's Capital Budget Process.

E. For Utility provision of non-regulated services and where such services require significant capital investment and/or have net operating costs, a business case is to be prepared to inform funding decisions to be made by City Council.

F. The Utility is to contribute towards achieving the goals of The City Plan.

IV. Utility Rate Setting Principles:

A. Customer rates will be set based on both the short-term and long-term needs of the Utility to ensure they are as stable and predictable year-over-year as possible.

B. Customer rates will be understandable, practical and cost-effective to implement.

C. Customer rates will be based on the forecasted cost of providing Utility services and will fairly apportion the cost of service among different customer classes.

D. Customer rates may be set either annually or for a period of up to four years at a time.

E. Customer rates will promote the efficient use of resources and be set to achieve broader social, economic and environmental goals.

F. Cost for services received from or provided to related parties will be accounted for under the full cost accounting approach.

V. Debt Financing Principles:

A. Debt financing is only permitted for capital expenditures. Debt will not be utilized to finance operating expenditures.

B. The Utility will follow the City of Edmonton's process for debt issuance in accordance with Debt Management Fiscal Policy C203D, including the term of debt and will be consolidated with City of Edmonton debt in determining the City of Edmonton's position relative to the debt servicing limits within the policy and debt limitations arising from legislation.

C. Debt financing will be considered for Capital Expenditures in:

1. projects with long-term benefits;
2. major rehabilitation or upgrade of existing assets; and
3. emerging capital requirements to support Utility priorities and strategic plans.

D. Debt financing will be utilized in an appropriate manner to balance long-term financial sustainability and intergenerational equity for Utility customers.

VI. Financial Indicators

A. Financial indicators are general measures that will need to be interpreted collectively to appropriately assess the Utility's long-term financial sustainability. As such, it may be desirable to have higher or lower results on a short-term basis to balance rate setting principles and long-term financial sustainability.

1. Net Income

a) The Utility is to generate sufficient revenue to cover annual operating costs, including debt repayment, generally resulting in a positive net income, to support sufficient retained earnings and long-term financial sustainability, including capital growth and renewal needs.

2. Cash Position

a) The minimum cash position required will need to be sufficient to cover:

(1) Pay As You Go funding for forecasted capital expenditures as identified in the Capital Plan.

(2) Long-term environmental liability requirements.

(3) Working capital requirements with an allowance for operating risk.

b) The management of the Utility's cash position is the responsibility of Administration, taking into consideration many variables including, but not limited to, current borrowing rates, current and future cash requirements, and the planned capital financing structure (including Pay As You Go funding requirements).

c) Where the Utility's cash position is insufficient to meet cash flow requirements, the Utility may borrow from the City of Edmonton on a short-term basis, with interest being paid by the Utility at an interest rate that compensates the City of Edmonton reflecting the Fund Balance where the cash was drawn.

3. Debt Service Coverage Ratio

a) The Debt Service Coverage Ratio measures the ability of the Utility to meet its debt servicing obligations using annual revenues and is calculated as follows:

$$\text{Debt Service Coverage Ratio} = \frac{\text{Annual Net Operating Income (Net Income excluding interest expense \& Depreciation/Non-Cash Items)}}{\text{Annual Total Debt Servicing (Principal + Interest)}}$$

b) The minimum baseline target is recommended to be 1.5. Meeting the baseline will ensure that the Utility is earning enough to cover annual debt servicing costs.

4. Debt to Net Assets Ratio

a) The Debt to Net Assets Ratio measures the extent that the Utility is debt leveraged and is calculated as follows:

$$\text{Debt to Net Assets Ratio (Non-Contributed)} = \frac{\text{Total Long-Term Debt for Non-Contributed Capital Assets}}{\text{Net Book Value of Capital Assets (Non-Contributed)}}$$

b) The Utility will aim to maintain a Debt to Net Assets Ratio between 50 and 70 percent by balancing long-term financial sustainability with intergenerational equity.

VII. Financial Planning

A. Budget and financial planning will incorporate industry best practices and will follow the general principles of budget, long-range planning and management of capital assets as established by the City of Edmonton, and in accordance with Public Sector Accounting Standards.

B. The Utility will prepare four-year business plans aligned with the Corporate budgeting and planning process, which will be used to support the Utility's rate filings.

C. The Utility Committee shall recommend to City Council the customer rates for the upcoming year(s), based on a 10-year planning horizon with budgets that are prepared based on current year forecast, business plan implementation and financial sustainability.

VIII. Definitions

Cash Flow - the ability of the Utility to meet its financial obligations as payments are due.

Capital Assets - tangible capital assets of the Utility meeting the requirements defined under Public Sector Accounting Standard PS3150.

Capital Plan - a four-year plan for funding capital infrastructure approved by City Council.

Debt Service Coverage Ratio - a measure of the annual available cash flow for debt servicing of interest and principal payments.

Debt Servicing - annual required debt repayments including interest and principal.

Debt to Net Assets Ratio - a measure of the extent to which the Utility is financing its net assets through debt.

Dividend - an amount that is payable to the City of Edmonton from the actual net income of the Utility, payable in the following year.

Financial Indicators - a set of financial measures that provide signals on the financial health of the Utility.

Financial Sustainability - financial sustainability is achieved when all targets set for the Financial Indicators (as recommended by Utility Committee and approved by City Council) are attained.

Full Cost Accounting - shall include cost allocation for services provided by the City of Edmonton and may include administration costs, and other shared services such as communications, human resources, information technology, legal, procurement, customer support, fleet, financial services, facility maintenance, custodial services, real estate and general corporate overhead.

Net Assets - net book value of the Utility's non-contributed capital assets**.**

Net Book Value - acquisition costs or original cost of capital assets minus their accumulated depreciation.

Non-regulated Activities - activities that are not essential to the provision of core services by the Utility. Examples may include commercial waste collection, disposal of commercial waste, construction and demolition waste, and other services to the City of Edmonton.

Pay As You Go - the amount of cash required to implement the Capital Plan; annual amount to be funded from operating revenues.

Rate Revenue - revenues generated through monthly customer rates.

Retained Earnings - accumulated net operating surpluses of the Utility used to support long-term financial sustainability of the Utility, including managing operating risks, long-term liabilities, and capital growth and renewal needs.

Regulated Activities - activities that are core to the services provided by the Utility. Residential curbside collection and the disposal of residential waste (including Eco Stations, Big Bin Events, etc.) are regulated activities of the Utility.

Related Parties - all departments, branches and enterprises of the City of Edmonton that are subject to common control, joint control or significant influence by City Council or management.

Utility - refers to the Waste Services Utility, a self-funded operation that provides collection and disposal of residential waste at rates regulated by City Council, as well as other Non-regulated Activities.

IX. References

Debt Management Fiscal Policy C203D
Public Sector Accounting Standard PS3150