



Waste Services Facilities and Infrastructure

Composite Upgrade/Renewal

Capital Funding Request

City Operations | Waste Services

City of Edmonton

Capital Profile: CPP# CM-81-2046, CM-81-2047

Project Number: CP# / OP#

Project Owner: Ellen Tian

Project Sponsor: Michael Labrecque

Version #: 5.0

Date published: October 12, 2018

page intentionally left blank

TABLE OF CONTENTS

Change History	5
Executive Summary	7
Waste Services Infrastructure and Facilities Composite Upgrade/Renewal	7
Background	8
Problem / Opportunity	9
Current Situation	9
Initiative Description	9
Initiative Description	9
Urgency of Need	10
Anticipated Outcomes	10
Scope	10
Out of Scope	11
Critical Success Factors	11
Strategic Alignment	11
Context Analysis	12
Organizational Change Impact	13
Stakeholder Impact	13
Business and Operational Impact	13
Tangible Benefits	14
Intangible Benefits	14
Costs	14
Assumptions	15
Resourcing	15
Key Risk(s) and Mitigation Strategy	15
Conclusion and Recommendations	16
Conclusion	16
Recommendations	16
Project Responsibility and Accountability	16
Implementation Approach	16
Review and Approval Process	17

Appendices

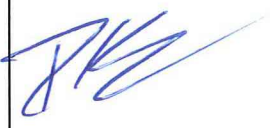



Change History



Version #	Date	Author	Description
1.0	7/25/2018	Herbert Ramos	Version submitted to General Supervisor, Team Lead and Working Group for review
2.0	8/01/2018	Herbert Ramos	Revised version submitted for Directors review
3.0	8/15/2018	Herbert Ramos	Revised version submitted for Branch Manager review
4.0	9/10/2018	Herbert Ramos	Revised version submitted for Branch Manager and Utility Advisor review
5.0	10/12/2018	Herbert Ramos	Revised version submitted for Business Partner review

SUBMITTED BY:

Version #	Submitter Name	Title	Submission Date
5.0	Stephanie Zhang	Team Lead, Business Strategy, Planning & Performance	10/12/2018

REVIEWED BY:

Version #	Reviewer Name and Title	Signature	Signing Date
5.0	Ryan Kos General Supervisor, Business Strategy Planning & Performance		10/12/2018
5.0	Keith Knoblauch Operational Controller, Business Financial Analytics		10/12/2019
5.0	John Felix Director, Sustainable Waste Processing Services		10/12/2019
5.0	Doug Spark		10/12/19

	Acting Director, Waste Collections Services		10/12/2013
5.0	Paul Specht Director, Asset Management Strategy Development		10/12/2013
5.0	Cameron Grayson Director, Business Integration		10/12/2013

APPROVED BY:

Version #	Approver Name and Title	Signature	Signing Date
5.0	Ellen Tian Director, Technical Services		10/12/2013
5.0	Michael Labrecque Branch Manager, Waste Services		10/12/2013

1. Executive Summary

1.1. Waste Services Infrastructure and Facilities Composite Upgrade/Renewal

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, ventilation, air conditioning equipment, fire protection systems, plumbing, electrical distribution, and other building systems. In addition to these facilities, Waste Services owns and operates a series of specialized assets required to meet the branch mandate of efficient and environmentally sound waste management operations, such as those found at the Edmonton Waste Management Centre and Kennedale sites. Where most other city branches operate and sometimes maintain one type of infrastructure (roads for example), Waste Services is responsible for a variety of infrastructure including roads, buildings, material processing equipment, buried utilities and mobile equipment.

In order to deliver sustainable waste management services, maintain optimal service levels, and have an asset management program in place as recommended by the Office of the City Auditor, capital funds are required to carry out capital maintenance, renewal, and upgrade of Waste Services assets. This will result in safer and more reliable facilities and infrastructure while maintaining high levels of customer service. Without this funding in place, facilities and infrastructure will be at increased risk of failure as the waste collection and processing systems age. Emergency situations caused by unforeseen facilities and infrastructure failures will result in expensive unplanned repairs and interruption to operations.

This profile requires funding of approximately \$20.5 million for the capital maintenance, renewal, and upgrade of these assets due to new or increased waste streams, safety concerns, and design improvements that increase efficiency of Waste Services' operations.

In order to ensure adequate levels of funding are available for the capital maintenance, renewal, and upgrade of these assets, Waste Services is adopting a new budgeting approach. For the 2019 - 2022 capital budget cycle, Waste Services will allocate capital budget to these activities as a targeted percentage of the asset replacement value, on an annual basis. This approach follows the recommendation from Report Number 131, Budgeting for Facilities Maintenance and Repair Activities¹ stating that the appropriate budget allocation for maintenance and repair of facilities are between two percent and four percent of the aggregate replacement value of those facilities. The recommendation in this report was further supported by the City of Edmonton's Office of the City Auditor in its 2008 Land and Buildings Branch Audit.² This approach informs overall required capital investment in the maintenance, renewal, and upgrade of facilities, and is combined with the implementation of formalized asset condition assessment and preventative maintenance programs. Throughout the four year budget cycle Waste Services will gain expertise in implementing both this method of capital budgeting as well as the asset management function. Funding levels will increase over time as the asset management function matures. Waste Services anticipates achieving a minimum level of funding of two percent within

¹ Budgeting for Facilities maintenance and Repair Activities: report Number 131 (1996) National Academic Press Washington D.C, 1996. <http://www.nap.edu/openbook/N1000085.htm/1html>

² 07206- Land & Buildings Branch Audit, January 21, 2008. Office of the City Auditor

the 2023 - 2026 capital business planning cycle.

2. Background

Waste Services has an extensive infrastructure inventory which include facilities such as Eco Stations, employee workspaces, equipment facilities, administration buildings, waste processing facilities, and research and development facilities. These facilities are equipped with mechanical, electrical, fire protection and other building systems. Infrastructure include the Edmonton Waste Management Centre and Kennedale site utilities, roadways, drainage, communications, transaction data collection hardware and software, and specialized systems like odour monitoring and gate access.

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 the ranking of rehabilitation needs and the allocation of renewal funds across the various infrastructure assets to ensure long-term value. RIMS provides information on the replacement value, average age, and life expectancy and condition of City of Edmonton assets including those of Waste Services.

Throughout the 2019 - 2022 capital budget cycle, Waste Services will continue to improve its understanding of the current asset replacement value and condition of its facilities and infrastructure, through facility condition assessments. In late 2018 to early 2019, Waste Services anticipates using external resources to assist in the verification of data pertaining to assets that are currently being reported through RIMS. This will allow the information captured through the RIMS process to be current and accurate as possible, informing a robust asset management program. The list of assets and replacement values captured through the Annual Infrastructure Inventory, as of December 31, 2016, can be found in Appendix A - Asset Replacement Values.³

As the assets age, their performance declines, thus replacing, rehabilitating and upgrading them are necessary to continue managing waste effectively and efficiently. In addition, carrying out operational improvements will further enhance operational efficiencies within the facilities and infrastructure.

During the 2017 Waste Services Audit, the Office of City Auditor found two areas in Waste Services operations that had deficiencies - lack of documented process to ensure condition assessments give an accurate state of its assets, and the absence of effective formal asset maintenance process. Waste Services took this as an opportunity to build a proactive and integrated approach to asset management by creating an action plan to address the auditor's findings and recommendations, as outlined in the Council Report CR_5486 Administration Response-Waste Services Audit Report⁴. The creation of the Condition Assessment and Data Verification Procedures and the ongoing development of the Asset Management Strategic Framework are the first steps in advancing Waste Services' maturity in affecting a sound asset

³ 2017 Annual Infrastructure Inventory

⁴ City Operations report CR_5486

<http://sirepub.edmonton.ca/sirepub/cache/2/cayj42b2u5l5ytsdqxsux05h4/70608407312018082646874.PDF>

management.

2.1. Problem / Opportunity

As Waste Services focuses on managing its assets effectively, there is an opportunity to adopt a proactive approach to sustain its facilities and infrastructure. This ensures that assets will be well maintained during their useful life and plans for maintenance, rehabilitation, replacement, and upgrading, resulting in an overall improvement in collection and processing efficiencies while reducing lifecycle costs. Projects included in this composite profile 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 opportunities for continuous improvement.

2.2. Current Situation

Following the 2017 audit findings and recommendations as contained in the 2018 Waste Services Audit report, Waste Services developed an action plan to implement a mature, proactive and integrated process geared towards managing its assets in a more effective way. The first step Waste Services took to start this transformation was the completion of the Waste Services Condition Assessment and Data Verification Procedure which outlines the roles, responsibilities and processes to be followed in the collection and processing of information required to determine the state of its infrastructure assets.

Waste Services has 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, the changing demands of the market and the needs of customers.

3. Initiative Description

3.1. Initiative Description

This initiative will ensure an adequate level of funding for capital maintenance, renewal, upgrades, and efficiency improvements is available for Waste Services facilities and infrastructure by allocating a certain percentage of asset replacement value towards these activities on an annual basis. Over the course of the 2019 - 2022 capital budget cycle, Waste Services will continue to build expertise in asset management through focusing on improving processes around facility condition assessments, implementing preventative maintenance programs, and implementing an approach to project prioritization.

Gaining expertise as an asset manager will unfold over time and is reflected in the proposed capital budget as outlined in section 7.5 of this report. The proposed budget is 1.59% of asset replacement value in 2019. This relates to deferred maintenance projects planned for this year. The proposed budget for 2020 is 1.19% of asset replacement value, 1.24% of asset

replacement value in 2021 and 1.22% of asset replacement value in 2022. Waste Services anticipates budgeting for this activity to reach the minimum 2% of asset replacement value target within the 2023 - 2026 capital budget cycle.

Waste Services is currently planning capital maintenance and renewal projects for its assets. These projects, as well as the estimated costs, will be further reviewed and validated to ensure alignment with the long term asset management strategic framework and plans that are being developed by Waste Services.

3.2. Urgency of Need

The need to effectively manage Waste Services' assets is of high priority to achieve its commitment of providing sustainable waste management services. This is also to address the issues raised in the auditor's report calling for Waste Services to manage its assets, including a sound maintenance program, in a more effective way. To carry out its commitment, assets must be managed for their entire life cycle including the provision of funds to acquire, maintain, operate, rehabilitate and replace them. The proper management of assets is fundamental to Waste Services operations, and will help to ensure continued delivery of uninterrupted services, and the optimal level of capital investment required to sustain reliable assets. Spending on this profile will be spread out over the four-year period based on priority, cost savings, safety factors, legislation compliance and other branch requirements.

3.3. Anticipated Outcomes

Effective asset management will ensure that Waste Services has the resources to achieve its objectives by aligning its vision, mission and strategic plan with daily activities to achieve its 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 projects identified as priorities by Waste Services receive robust evaluation of alternatives and scope identification.
Improved project schedule and budget estimates: Following industry best practices, a control budget and schedule is established on the basis of a completed design to ensure realistic expectations are aligned with Asset Management Plan prior to tendering and construction.
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.

3.4. Scope

The scope of this profile encompasses capital maintenance, renewal, and upgrade work for

Waste Services facilities and infrastructure. This is including but 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 are out of scope for this capital funding request. For any renewal project with a total budget that meets this threshold, a separate capital funding request will be prepared.
- Operational maintenance activities.
- Vehicles and equipment. These are included in the Waste Services Vehicles and Equipment Business Case (Profile Number CM-81-2048 Composite).
- Projects to be managed by Integrated Infrastructure Services. These are included in the Waste Services Planning and Design-Composite (Profile Number CM-81-0005) and Waste Services Project Delivery (IIS Managed) Composite (Profile Number CM-81-2045).

3.6. Critical Success Factors

Critical success factors include:

- Adherence to asset management framework and plan
- Proper design and programming of space to meet the needs
- Timely execution of projects
- Regular check-ins with the Waste Services Leadership team to ensure alignment with the strategic direction and branch goals
- Accurate and sufficient data and cost analyses to support high level budget estimate and informed decision makings for the projects

4. Strategic Alignment

Waste Services is committed to advancing Council’s vision and goals. Council’s Strategic Plan and the Corporate Business Plan will provide a blueprint to coordinate activities and efforts between the goals and the corporation to make an impact towards achieving the vision. As these are developed, Waste Services will work collaboratively to ensure the strategic direction of the Branch is in alignment with that of the department, corporation, Council and citizens.

This profile also aligns with the new strategic goals of the City of Edmonton outlined below:

Healthy City	Urban Places	Regional Prosperity	Climate Resilience
Edmonton is a neighbourly city with community and personal wellness that embodies and promotes equity for all Edmontonians.	Edmonton neighbourhoods are more vibrant as density increases, where people and businesses thrive and where housing and mobility options are plentiful.	Edmonton grows prosperity for our Metro Region by driving innovation, competitiveness and relevance for our businesses at the local and global level.	Edmonton is a city transitioning to a low- carbon future, has clean air and water and is adapting to a changing climate.

--	--	--	--

In addition to this overarching corporate alignment structure, individual projects approved within this composite profile will align with the City of Edmonton’s Waste Management Policy C527 and Waste Management Utility Fiscal Policy C558A. This profile also aligns with Waste Services integrated 25-year strategic outlook that will help to ensure Edmontonians receive maximum economic and environmental benefits while minimizing the cost increases of managing solid waste.

5. Context Analysis

In Report Number 131, Budgeting for Facilities Maintenance and Repair Activities, a guideline was established based on an earlier study from 1990 by the Building Research Board’s (BRB) Committee entitled *Committing to the Cost of Ownership: Maintenance and Repair of Public Buildings*⁵, stating “An appropriate budget allocation for routine M&R (maintenance and repair) for a substantial inventory of facilities will typically be in the range of two to four percent of the aggregate current replacement value of those facilities (excluding land and major associated infrastructure). In the absence of specific information upon which to base the M&R budget, this funding level should be used as an absolute minimum value. Where neglect of maintenance has caused a backlog of needed repairs to accumulate, spending must exceed this minimum level until the backlog has been eliminated.” The same guideline was also referenced in the 2008 Land and Buildings Branch Audit conducted by Edmonton’s Office of the City Auditor.⁶

For this profile, the above guideline was used to allocate funds for Waste Services to maintain its assets in safe and good working condition. This process is used when a detailed analysis of maintenance and long term renewal needs are not available. Over the next years, Waste Services would develop a program which can forecast in a more accurate manner, the financial resources required in a specific period to minimize the life cycle costs while maximizing operational effectiveness.

In addition, to determine the replacement values of the assets, information captured in Annual Infrastructure Inventory was used. As of December 2016, Waste Services assets were valued at approximately \$392 million, excluding vehicles and equipment. For this budget period, the allocation of funding level in 2022 is at 1.22 percent of replacement value, funding levels will increase over time as the asset management function matures. Waste Services anticipates achieving a minimum level of funding of two percent within the 2023-2026 capital business planning cycle. Appendix A lists the asset replacement values.

A number of projects have been initially identified for this profile. A Project Intake Request Form (PIRF) was submitted by the project managers to Technical Services, indicating the project

⁵ Budgeting for Facilities maintenance and Repair Activities: report Number 131 (1996) National Academic Press Washington D.C, 1996. <http://www.nap.edu/openbook/N1000085.htm/1html>

⁶ 07206- Land & Buildings Branch Audit, January 21, 2008. Office of the City Auditor

scope, justifications, schedules, risks and estimates. These were then evaluated, ranked and prioritized based on the strategic and operational criteria set by the Technical Services. Appendix B - Waste Services Internal Project Intake Request Process outlines the PIRF process and criteria. Examples of projects include GORE Rebuild and Improvement, Paving and Site Improvement, and EWMC Site Fire Protection. Appendix C - List of Projects, shows the projects included in this profile. As the project costs used for requesting and evaluating the projects are estimates, they will be reviewed and validated in the early part of the budget period to assess the alignment with the long term asset strategic framework and plan that are being developed by Waste Services.

6. Organizational Change Impact

6.1. Stakeholder Impact

Stakeholder Requirement
Stakeholder 1: City of Edmonton Waste Services Branch (primary internal)
Minimal impact to the staff once upgrade of facilities and infrastructure are ongoing (example relocating some to give way to construction/installation)
Stakeholder 2: City Council (primary internal)
Utility rates for Waste Services have a financial impact on citizens, which may result in citizen complaints to Council.
Stakeholder 3: Residents (primary external)
Utility rates for Waste Services have a financial impact on citizens, which may result in citizen complaints to Council.
Stakeholder 4: Contractors within Waste Services facilities (primary external)
Minimal disruption in operation brought about by construction/installation
Stakeholder 5: Customers dropping off materials at Waste Services facilities (secondary external)
Inconvenience in going to facilities when they need to drop off materials.

6.2. Business and Operational Impact

Business & Operational Impact & Description
Human Resources: Waste Services (internal)
The development of Asset Management Strategic Framework might entail realignment of personnel to complete the scheduled work
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

6.3. Tangible Benefits

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

- Improved operational efficiency of infrastructure and facilities
- 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.

6.4. Intangible Benefits

Intangible benefits of managing assets in a more proactive and integrated are anticipated to be:

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

6.5. Costs

Basis for Calculation of Costs for 2019-2022

	2019	2020	2021	2022
Replacement Values of Facilities and Infrastructure, \$*	391,536,885	391,536,885	391,536,885	391,536,885
Profile Cost (CM-81-2046 and CM-81-2047)	6,225,000	4,667,807	4,835,995	4,766,130
% of Replacement Value	1.59	1.19	1.24	1.22

* Replacement values were based on the 2017 Annual Infrastructure Inventory

For 2019, Waste Services will continue with the ongoing projects and align with the audit's recommendation of effective asset management. Budget allocations, based on the percentage of replacement values, will ramp up after this budget period.

Total Facilities and Infrastructure Projects

Profile	2019	2020	2021	2022	2019-2022 Total
Facilities and Infrastructure Planning & Design (CM-81-2046), \$	622,500	466,781	483,599	476,613	2,049,493
Facilities and Infrastructure Project Delivery (CM-81-2047), \$	5,602,500	4,201,026	4,352,396	4,289,517	18,445,439
Total Cost, \$ ⁷	6,225,000	4,667,807	4,835,995	4,766,130	20,494,932

6.6. Assumptions

- Pricing may be impacted by market
- Asset replacement cost of \$391,536,885 (value as of 2016) was used for the budget period

7. Resourcing

The projects will be led internally by Waste Services project managers in Operations and Technical Services. Once designs and equipment specifications have been finalized, these will be issued for public tender, and the authorized project managers will manage and administer the contractors during the construction/installation phase.

8. Key Risk(s) and Mitigation Strategy

Risks	Impact	Mitigation Strategy
Higher project costs due to imposition of higher US tariff	Medium	lock in prices prior to effectivity of new imposition source required parts and

⁷ Ratio of 10% allocated to planning & design and 90% allocated to delivery.

		equipment outside US
Procurement delay for specialized equipment	Medium	start early looking for vendors to supply the specialized equipment
Health 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

9. Conclusion and Recommendations

9.1. Conclusion

This profile will provide capital funding for capital maintenance, renewal, upgrade, and improvement projects for the Waste Services valued at less than \$5 million. This funding will ensure assets provide overall improvement in operating efficiency and effectiveness, and safe working conditions.

9.2. Recommendations

It is recommended that this profile be approved to assist Waste Services to meet its commitment of delivering sustainable waste management services. This would ensure capital maintenance, renewal, and upgrade of the assets due to new or increased waste streams, safety concerns, and design improvements that increase efficiency of Waste Services' operations.

9.3. Project Responsibility and Accountability

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

The Project Sponsor is the Branch Manager of Waste Services. The overall capital program is jointly managed by Directors of Technical Services, Sustainable Waste Processing Services, Waste Collection Services and Asset Management Strategy Development.

10. Implementation Approach

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

The solution requirements are incorporated into a public tender. The tenders are evaluated by engineering, operations, and maintenance personnel to choose a vendor for award meeting the conditions of the tender.

11. Review and Approval Process

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

Review Step	Reviewer
Review 1	Team Lead and General Supervisor of Business Strategy, Planning and Performance, Working Group, and General Supervisors of Technical Services
Review 2	Operational Controller of Business Financial Analytics, Director of Business Integration, Director of Sustainable Waste Processing Services, Director of Waste Collections Services, Director of Asset Management Strategy Development, Director of Technical Services, and Branch Manager of Waste Services
Review 3	Deputy City Manager of City Operations
Review 4	Communications
Review 5	Utility Advisor
Review 6	Utility Committee report presented

12. Appendices

- Appendix A - Asset Replacement Value based on 2017 Annual Infrastructure Inventory
- Appendix B - Waste Services Internal Project Intake Request (PIRF) Process
- Appendix C - List of Projects
- Appendix D - Financial Analysis Summary

Appendix A: Waste Services Asset Replacement Values (as of December 2016)

Waste Services Infrastructure and Facilities	
Assets	Replacement Value (as of December 2016)
Edmonton Waste Management Centre (EWMC)	
Clover Bar Pumphouse	\$3,500,000
Clover Bar Diversion System	\$13,200,000
Clover Bar Boreholes	\$1,352,258
EWMC Roads and Utilities	\$11,111,197
Cure Site	\$10,500,000
Gore Site	\$7,875,000
Scale and Fuel Facility	\$981,620
Site Equipment	\$1,736,774
Land Improvements	\$2,856,724
Edmonton Composting Facility	\$95,696,361
Equipment Storage and Maintenance Facility	\$6,630,372
Site 440	\$9,725,589
Integrated Processing and Transfer Facility	\$88,401,751
Leachate Plant	\$5,838,360
Materials Recovery Facility	\$15,899,561
Construction & Demolition Facility	\$6,608,574
Minor Facilities	\$3,810,809
Operations Building	\$1,542,874
Scale House	\$2,632,560
Research and Development Facility	\$4,506,071
Advanced Energy Research Facility	\$14,119,554
Main Admin Building	\$4,365,000
Minor Temp Facilities	\$722,032

Total EMMC Replacement Value	\$313,613,041
Collections Services	
Coronation Eco Station	\$2,110,336
Strathcona Eco Station	\$5,861,608
Ambleside Eco Station	\$18,480,953
Kennedale Eco Station	\$12,767,734
Kennedale Waste East	\$15,287,472
Kennedale Waste West	\$13,067,691
Kennedale Transfer Station	\$9,948,050
Total Collections Replacement Value	\$77,523,844
Central Operations Replacement Value	\$400,000
Total EMMC, Collections and Central Operations Replacement Value	\$391,536,885
Collections Containers	\$17,820,710
Collections Vehicles	\$25,570,437
Specialized Vehicles	\$3,161,053
Waste Processing Vehicles	\$32,016,758
Grand Total	\$470,105,843

Appendix B: Waste Services Internal Project Intake Request Form Process (PIRF)

The following list outlines the PIRF process:

1. Business needs are identified for all branch areas and a Project Intake Request Form (PIRF) is created for each proposed project for planning and design or delivery within budget cycle years (2019-2022)
2. Each PIRF is categorized as one of the following: High Priority Major Projects, Operational Efficiency Improvements, and Asset Management (Renewal).
3. Projects for each category is then evaluated based on defined strategic and operational criteria and assigned a score.
4. Projects are then prioritized within each category based on criteria score.
5. Budget is allocated to each category, with each category being assigned a percentage of the total budget:
 - a. 92.5% to High priority Major Projects, 2.5% to Operational Efficiency Improvements, and 5% to Asset Management (Renewal)
6. Projects are recommended based on prioritization with budget estimates.
7. Waste Services Leadership Team review and approve the final list. Waste Services Leadership Team can adjust the project list according to the Branch priority.

The following table shows a sample scoring criteria for projects within the PIRF process

Strategic Criteria (50 pts)				Operational Criteria (50 pts)				
Legislated, Mandated, or Required by Law (20)	Health and Safety (15)	Energy and Climate (5)	Council Mandate (10)	Project Coordination (10)	Organization Impact (10)	Change in Demand (10)	Level of Service (10)	Strategic Risk (10)

Appendix C: List of Projects

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

Project	Description	Objective
GORE Rebuild and Improvement	Engineering assessment and report. Refinish gore pad with pony walls.	Efficiency improvement
Transformer Drainage Improvement	Engineering assessment of drainage post-ADF	Address risk of potential flooding
Paving and Site Improvement	Improvement of site and roadways	Provide safe and efficient working conditions
Aggregate Scale System Improvements	Complete fibre runs, add Geoware system, an inbound scale and video cameras to the Aggregate sites to improve control and oversight.	Efficiency improvement
Access Platform to the Vecobelt-IPTF/RDF	Install permanent access platform(s) and generate as-built drawings.	Efficiency improvement
C-110 Bunker and Platform - IPTF Pre Processing	Install new bunker, ladder and platform and generate as-built drawings of each.	Housekeeping and maintenance access improvement
C-211 Bunker	Install new bunker, at the end of the C211 conveyor and generate as-built drawings.	Housekeeping improvement
C&D PLC Connection to Historian	Connect the C&D to the Site Historian	Better reporting
C-100 Platform to Upper Sort Room-IPTF Pre Processing	Connect new stair and catwalk and generate as-built drawings.	Efficiency improvement
C-1200 Platform - IPTF/RDF	Install new hatches, platform extension and generate as-built drawings.	Makes it much safer to unplug the chute

Catwalk between C-900 and C-1000, Tail End Access Platform at 901	Build new platform and catwalk connection and generate as-built drawings.	Better access
Catwalks to connect Weigh Belt to Planned Stairwell-IPTF/RDF	Connect catwalks and stairs and generate as-built drawings.	Efficiency improvement
Connect Platforms on C-407 and Connection to C-402 and Stairs	Connect platforms and stair for easy access	Efficiency improvement
Dry Belt Spooling Tool	Install equipment for spooling of the dryer belt.	Efficiency improvement
Dust Collector Abort Gate Automation-IPTF/RDF	Replace mechanical gate with automated one - RDF old dust collector.	Efficiency improvement
EWMC Control Communication Enhancement	Install SCADA communication system between the plants/sites.	Efficiency improvement
Install Bin Moving System on RDF Heavies Bin	Install a bin moving system on the heavies bin outside the RDF, just like the systems that are in Pre Processing	Efficiency improvement
IPTF 3rd Floor Locker Room	Build additional locker room at the IPTF to increase capacity	Increase locker room capacity for COE staff and contract employees at IPTF
IPTF Lifting Devices over Trommel Trunnions	Install lifting devices (monorails or lifting davits)	Efficiency improvement
IPTF Pre-Sort Metal Detection/Removal	Install a metal detector that can detect larger pieces of metal so that they can be removed manually	Efficiency improvement
IPTF Tunnel Pit Covers	Install the existing tunnel pit covers above the pits, so that they can easily be lowered as required.	Efficiency improvement
Motor Control Centre (MCC) Room Positive Pressure	Pressurize the rooms the IPTF MCC	Minimize dust infiltration into the MCC rooms

Modifications Required to Perform Maintenance on Dryer Distribution Screws	Modify structure, remove monorail, and generate as-built drawings	Efficiency improvement
Narrowing of Tunnel Exit Door	Narrow the opening of the tunnels exit and install roll up doors	Efficiency improvement
Percolate Line to T-6	Install connection between percolate tank at the ADF and return line to biosolids lagoon	Efficiency improvement and cost reduction
Platform for 3-Way Valve Area - IPTF/RDF	Install platform and generate as-built drawings	Efficiency improvement
Platform for C-2012 Motor Access-IPTF/RDF	Install platform and ladder	Efficiency improvement
Platform for New Dust Collector Abort Gate	Install platform for new dust collector abort gate	Efficiency improvement
Platform for Wind Sifter in Alternate Feed-IPTF/RDF	Installation of platform on the new alternate feed system	Better access
Pre-Processing Vacuum Engg & Piping-IPTF/Prepro	Place vacuum piping stations for the Pre Processing area	Efficiency improvement
Preprocessing Electrical Arc Flash Study Improvement	Conduct Arc Flash Study for PreProcessing which will evaluate the electrical system	Efficiency improvement
RDF Dust Collector Upgrade	Upgrade conveyors and generate drawings	Efficiency improvement
RDF Plant PLC Cabinet Upgrade	Rebuild the PLC cabinet and update the PLC wiring diagram	Efficiency improvement
RDF Vacuum System	Install movable industrial type vacuum cleaner and two separate vertical stacks to access the required cleaning area	Efficiency improvement

Spray Foam of Lower Maintenance Shop , Ventilation & Fume Extraction	Apply spray foam to common wall with RDF, install an air handling unit and fume extraction for welding area.	This will result in a cleaner, healthier environment for the mechanics working in the shop. At present, it can be very dusty
Steel Rack with Davit Arm and Electric Hoist	Build a rack that holds steel plate and davit arm with hoist for loading and unloading the rack.	A steel rack keeps the area neater and safer. A hoist and davit arm is the safest way to load or unload the rack.
VHS Tape Removal in RDF	Design and install equipment over the weigh belt that will remove VHS tape from the RDF	Efficiency improvement
Vibration Analysis Equipment	Purchase vibration analysis equipment and use it to collect data from our stationary equipment	Vibration analysis can predict failures before they happen, so that repairs can be scheduled and reliability improved
EWMC Site Fire Protection	Address issues identified by consultant in their review of Waste Services operations with respect to fire risks	Address fire risks issues identified by consultant
RDF Surge Bin	Design, fabricate, and install surge bin into existing RDF Dryer system	Provide more efficient operation within RDF and ensure required feed is provided to Enerkem
North Download Building Renovation (to host ADF Scrubbers	Construct, draft engineering drawings, and refurbish building equipment, as needed.	Efficiency Improvement
Site 440 Repurposing	Correct all structural deficiencies listed in consultant's report	Efficiency improvement
EWMC Geoware Upgrade	Upgrade and enhance weight scale data collection program	System requirement
Waste Screen Bypass	Install equipment so RDF mix can bypass the waste screens to line 2, but not line 1	Allow bypass of the waste screen to go to line 1, or line2 or both at the same time.
Additional Asset Management Projects	Facility rehabilitation/renewal projects identified from building condition assessment reports	Extend the assets service life, reduce energy cost and GHG emissions

Appendix D: Financial Analysis Summary

Financial Analysis:

Waste Services Facilities and Infrastructure (2019-2022)	ALTERNATIVE 1- Build Through Capital Funding
Total Capital Cost	(\$20,494,932)
Total Revenues	\$0
Total Operating and Maintenance Costs	(\$2,962,500)
Total Lease Costs	\$0
Project Net Inflows (Outflows)	(\$23,457,432)
WACC Discount Rate	5.41%
Net Present Value	(\$19,056,039)

Reference	Alternative ALTERNATIVE 1- Build Through Capital Funding
Base Year	2018
In-Service Year	Various

Cumulative Revenue Requirement (from base year)	ALTERNATIVE 1- Build Through Capital Funding
CPV @ Yr 5	6,489,785
CPV @ Yr 10	13,463,060
CPV @ Yr 15	18,078,735

Capital Cost Summary (Base Year Dollars)	ALTERNATIVE 1- Build Through Capital Funding
Major Project	\$3,380,000
Efficiency Improvement	\$12,289,932
Committed ongoing work	\$2,755,000
Asset Management (Renewal)	\$2,070,000
Other (engineering/PM/etc)	\$0
Total base costs	\$20,494,932

Add: contingency, inflation

Contingency	0
Inflation	0
Total Capital	\$20,494,932

Note: contingency and inflation are included in the above base figures

**Infrastructure and Facilities 2019 - 2022 Cost Impact
Cumulative Present Value of Revenue Requirement**

Revenue Requirement Summary (CUMULATIVE PRESENT VALUE)

Year	Calendar Year	Alternatives
		ALTERNATIVE 1- Build Through Capital Funding
0	2018	\$0
1	2019	\$596,674
2	2020	\$1,643,643
3	2021	\$3,047,838
4	2022	\$4,762,887
5	2023	\$6,489,785
6	2024	\$8,097,567
7	2025	\$9,592,760
8	2026	\$10,981,549
9	2027	\$12,269,797
10	2028	\$13,463,060
11	2029	\$14,566,604
12	2030	\$15,585,418
13	2031	\$16,524,230
14	2032	\$17,387,522
15	2033	\$18,078,735

Infrastructure and Facilities 2019 - 2022 Cost Impact Cumulative Present Value of Revenue Requirement

