Waste Management Strategy Update

Recommendation:

That Utility Committee recommend to the March 20, 2018, City Council meeting:

1. That Administration review the scope and assumptions of the residential waste diversion metric, as outlined in the February 9, 2018, Office of the City Auditor report CR_5555 (Waste Services Audit) and return to Utility Committee by June 2018 with a recommendation on the diversion calculation methodology.

2. That the removal of grass, leaf and yard waste from the waste stream effective September 4, 2018, and that alternate disposal options for leaf and yard waste be made available effective September 4, 2018, be approved, and that Administration report to Utility Committee on the details of the program in June 2018.

3. That a source-separated organics program for organic waste processing and collection, with planned implementation starting in Fall 2020 for the units receiving curbside collection, be approved.

4. That Waste Services engage citizens on the implementation of potential additional waste diversion programs, report citizen feedback and input to Utility Committee in October 2018, and factor citizen feedback and input into the implementation of any additional waste diversion programs.

5. That Waste Services report to Utility Committee in June 2019 with further recommendations on the Waste Strategy and corresponding amendments to Waste Management Policy C527.

Executive Summary

This report provides City Council with an update to the Waste Management Strategy that addresses strategic and operational gaps and recommends program changes that will better align the City with the goal of diverting 90 percent of residential waste from landfills.

Attachment 1 provides details surrounding changes to Waste Services' programs that are required to begin to move closer towards the 90 percent residential waste diversion goal, specifically the implementation of a source separated organics program, and the removal of grass clippings, leaf and yard waste from the residential waste stream. The report recommends developing and implementing a communications and citizen outreach plan to inform citizens of these changes, and to support successful implementation using recent citizen research and ongoing consultation.

Attachment 1 also outlines potential future additional best-practice initiatives that will bolster the diversion rate, but which require further citizen engagement. These potential additional initiatives include utilizing clear bags for residential waste, limiting the volume of waste permitted for residential set out, and introducing a textile recycling program.

In addition to the recommended program changes described in this report, there are many elements to the overall waste management strategy that are under review, including the City Auditor's most recent recommendations. This report provides recommendations specific to the residential element of the strategy. Waste Services has initiated concurrent work on other elements of the strategy. These will be brought back to Utility Committee in June, 2019. More specifically, Waste Services is investigating strategic approaches to the following:

- Waste diversion in the non-residential sector;
- Waste prevention and reduction initiatives;
- Collaboration with regional partners; and
- Extension of waste diversion strategies into the multi-unit sector including targeted communication and education programs.

Report

Background

Edmonton's Waste Management Strategy was first established in 1992 (Attachment 2) and most recently updated in 2008 (Attachment 3). Waste Services has evolved in the past twenty-five years and continues to seek improvement.

The goal of diverting 90 percent of residential waste from landfill has previously been endorsed in Waste Management Policy C527 and also in the City of Edmonton's overall Environmental Strategic Plan (*The Way We Green*). Edmonton is currently faced with a large gap between the current residential diversion rate and the 90 percent goal. Edmonton's residential diversion rate as of 2016 is 52 percent. As outlined in the 2018 - 2020 Business Plan, current planned and approved operational adjustments (including bringing the Anaerobic Digestion Facility and Waste-to-Biofuels

Facility on stream) are anticipated to position the City to achieve a projected diversion rate of approximately 72 percent.

The gap between the projected diversion rate and the 90 percent goal is best addressed by aligning Edmonton's household waste collection system with current best practices for municipal waste. The updated strategic plan (Attachment 1) identifies program changes necessary to move us closer to our goal of 90 percent residential waste diversion. It also outlines an approach for communicating these potential changes to residents.

The journey towards 90 percent residential waste diversion

On February 9, 2018, Audit Committee received a report from the Office of the City Auditor with a number of recommendations to improve the management and oversight of the Waste Services Branch. One of the recommendations referenced the calculation methodology behind the Residential Waste Diversion Rate. Administration will review the calculation methodology, align it with standard municipal methodologies, where applicable, and bring the updated calculation methodology back to Utility Committee in June, 2018.

Notwithstanding the Residential Waste Diversion Rate calculation currently under review, Administration believes that there is a path to achieve the 90 percent residential waste diversion goal. The City's investment in Edmonton's Waste Management system, including the processing facilities at the Waste Management Centre, the extensive network of Recycling Depots and ECO Stations, and industry leading investment in waste-to-biofuel technology means that the infrastructure and conditions will be in place to make the 90 percent goal attainable. However, getting to 90 percent cannot be achieved with the status quo system. It requires focus on the entire waste stream, including diversion and sortation activities undertaken at the household level.

Administration has undertaken significant work to investigate the program changes required to meet the 90 percent goal, including:

- Identifying the components of a successful waste diversion program, supported by the Federation of Canadian Municipalities research (Attachment 4)
    - Convenient options
    - Engagement & education
    - Policy & enforcement

- Implementing a City-led municipal best practice review including:
    - Literature review
    - Operational review
    - Municipality research

    - Phone interviews with Canadian municipality waste management departments
    - Detailed diversion rate analysis
    - Consideration of recommendations from the February 9, 2018 Audit Report

- Conducting Public Opinion Research
    - Waste Services conducted public opinion research in January, 2018 to gather information regarding residents' responsiveness to potential changes to waste programs and services. This market research was conducted by a combination of phone surveys and in-person focus groups (Attachment 5).

Why approve source separated organics (SSO) as a program for organics processing and organics collection?

A source separated organics (SSO) program is a system where households segregate compostable materials, such as food waste, and set them out for collection separately from their garbage. Typically, organic materials are collected separately, either in a cart for single unit residences and in a bin for multi-unit residences, and then processed into compost.

Administration recommends the implementation of an SSO program beginning in fall, 2020. The program and timing of implementation are recommended for the following reasons:

- SSO is a best practice within jurisdictions that have achieved high diversion rates.
- An SSO program is expected to increase the residential waste diversion rate by approximately six percentage points by increasing the effectiveness of the organic waste materials process, thereby reducing the amount of organics being landfilled.
- An SSO program will result in higher quality compost.
- An SSO program will result in a higher quality refuse derived fuel at less cost for use in the waste to biofuels process.
- The current structural issue with the roof of the Aeration Hall Building is accelerating an investment decision on the asset. The implementation of an SSO program, along with removing grass, leaf and yard waste from the waste stream, will significantly reduce the demand for future organics processing capacity. Projecting the processing requirements and capacity will support the development of a future facility, tailored to the needs of the City both in size and technology.
- Starting implementation of SSO in fall, 2020 will allow sufficient time to understand and refine program implications prior to launch.

Remove grass, leaf and yard waste from the waste stream and provide alternative seasonal options for leaf and yard waste beginning September 4, 2018

Removing grass clippings and yard waste from the waste stream is anticipated to further increase the residential diversion rate by approximately three percentage points. Grass clippings and yard waste are two organics streams resulting in two different waste diversion programs. Residents will be asked to leave grass clippings on their lawn. Yard waste, including leaves, tree trimmings, and garden waste, will be set out for seasonal collection, or could be dropped off at ECO Stations or Big Bin Events. Administration recommends that grass clippings and yard waste be removed from residential garbage for the following reasons:

- Many jurisdictions ban grass from curbside pick-up as clippings can be left on the lawn. Leaving clippings on the lawn, or “grasscycling,” provides a tremendous benefit to the soil by adding nutrients like nitrogen, phosphorus, and potassium.
- Grasscycling also reduces the need to water, reduces reliance on chemical fertilizer, and eliminates the need to rake and bag grass clippings.
- The removal of grass and yard waste results in a higher quality fuel for the waste-to-biofuels facility.
- The City of Edmonton’s Go Bagless campaign has promoted grasscycling as a voluntary program since 2011. Public education and promotional efforts have gained significant attention with 58 percent of households surveyed (2017) reporting that they leave grass clippings on the lawn all or most of the time.
- Removing grass clippings from the waste stream will result in significantly less waste material requiring curbside collection and processing.
- Separating yard waste will allow Waste Services to process the material using alternative processes which are more economical than the current aerobic process.
- Yard waste is typically generated in the spring or fall as part of residents’ yard cleanup. This material will no longer be part of regular collection cycles. Instead, residents will be encouraged to set out yard waste seasonally in the spring and/or fall for collection.

Leaf and yard waste collection schedules will be published annually for all neighbourhoods. Outside of specified collection times, residents will be permitted to drop off yard waste at Eco Stations.

Potential Impact of Implementing Recommendations 2 and 3 on the Organic Waste Processing Facilities at the Edmonton Waste Management Centre

In 2016, 135,000 tonnes of residential waste was processed through the Edmonton Compost Facility (ECF). As a result of high levels of contamination in the mixed waste

system, a large amount of the material processed at the ECF was not suitable for typical compost end uses. Processing mixed waste in this manner requires a large processing capacity and increased cost for little net benefit.

The following table shows, at a high level, the waste that was processed at the ECF. Although the facility processed 135,000 tonnes of waste material, more than half (72,000 tonnes) was inorganic material. This material was processed through the system, but ended up in a landfill as it could not be composted. The large amount of inorganic material being processed through the composting facility is a result of Edmonton's mixed waste collection system (i.e. all waste that is not recyclable is collected at source and processed together).

	Tonnes
Waste processed through the Edmonton Compost Facility	135,000
less: Contamination	72,000
Organic material processed	63,000

By implementing a Source Separated Organics program, Administration will require homeowners to separate food waste at home. This material will then be collected separately from garbage and be processed much more efficiently, which will result in a lower level of inorganic waste being processed through the composting facility and higher levels of recycled products being processed for sale. As grass, leaf and yard waste will no longer be collected in the mixed household waste, additional processing capacity is not required for this material. Preliminary estimates show that organic waste processing capacity can be significantly reduced.

	Tonnes
Estimated household food waste	80,000
less: processing capacity of Anaerobic Digestion Facility	40,000
Required additional household food waste processing capacity	40,000

The above table identifies the estimated organics processing capacity required once recommendations 2 and 3 are fully implemented. A recent waste characterization study conducted for Waste Services indicated that approximately 22 percent of single unit residential garbage, and 25 percent of multi-unit residential garbage, is made up of food waste. This equates to approximately 80,000 tonnes per year. Factoring in the organic waste processing capacity of the Anaerobic Digestion Facility of 40,000 tonnes, the additional organic waste processing capacity is approximately 40,000

tonnes. Additionally, capacity will be required for future growth of the city. That analysis is part of the work currently underway with Integrated Infrastructure Services and will be reflected in the project business case coming forward in the fall of 2018.

The amount of organic waste processing capacity required under this scenario is significantly less than what is currently in place. This change will result in significant avoidance of future capital funding requirements, future operating expense reduction, and a significant reduction to the physical footprint of the organic waste processing facilities. If, based on engineering assessments, the Edmonton Composting Facility (ECF) will need to be rebuilt, this reduced processing capacity requirement could lower the capital cost for a new facility by up to $50 million (+/- 50%), based on preliminary estimates. In addition, the annual operating expense to process organic waste could be reduced by up to $4 million (+/- 50%) per year. This combination of future cost savings and avoidance will mitigate the financial impacts associated with transitioning organics into a more efficient and modernized program and will allow Waste Services to maintain its commitment of low, stable and consistent rate increases over the long term.

In August 2017, Administration initiated the development of the long-term strategy for the Compost Facility building and technology. The strategic direction will be based on the age of the equipment and building, possible changes to regulations, technological developments, and, most significantly, the amount and type of organic waste to be collected. The consultant's report is expected in July 2018 based on the assumption of implementation of the Source Separated Organics program. A fully detailed business case will be brought to the Utility Committee in the fall of 2018 as part of the 2019-2022 proposed Capital Budget, to authorize development funding.
**Note: this business case will also reflect the extent to which EPCOR may want to participate in any future organics processing for its biosolids, at EPCOR's expense.

Citizen outreach and education

Introducing a Source Separated Organics program and changing the way that grass, leaves and yard waste is collected from residences, are major changes that will require an extensive and ongoing education and citizen outreach program that will:

- inform citizens of details about how and when these changes will impact waste collection services;
- explain why these changes are happening and how they will provide long-term benefits to Edmonton; and
- ask citizens how they wish to be informed and educated to ensure that the transition is as convenient and successful as possible.

The education and citizen outreach program is currently being developed. It will begin before the implementation of these major program changes and will carry on through

implementation and as part of the ongoing development and implementation of additional waste reduction and diversion programs.

Engagement on potential waste diversion programs

The two recommended program changes in the above section are expected to advance the residential diversion rate significantly. However, these programs alone will not allow Edmonton to reach the 90 percent goal. It is anticipated that these programs will increase the combined residential diversion rate to approximately 81 percent (87 percent for single unit homes and 63 percent for multi-unit homes). To divert up to 90 percent of residential waste from landfill, further waste collection and processing changes are required. The following section provides a summary of potential additional waste diversion program changes that the City could implement to help reach the ultimate 90 percent diversion target. Based on research into the effectiveness of these programs in other municipalities these programs have the potential to further increase the residential waste diversion rate. However, market research that was conducted in January, 2018, showed that residents have some concerns with the implementation of these additional programs. Accordingly, Waste Services will conduct public engagement on these potential program changes to gather feedback and input from residents to inform the direction and details of the implementation of future waste diversion programs.

Additional programs to increase residential waste diversion:

The following section highlights waste diversion programs that will be assessed by City Administration.

1.Multiple Stream Recycling Collection

Waste Services processes approximately 45,000 tonnes of residential recycling on an annual basis. This material is collected and processed as a mixed single stream (i.e. paper and plastic is processed together). Sorting this material is inefficient and ineffective. Up to 25 percent of this material cannot be properly sorted and ends up being sent to landfill. This, combined with further limitations caused by the changing recyclable material import criteria in China (a major buyer of recycled material), could be mitigated through a multiple stream recyclable collection program.

Multiple stream recycling would ask residents to separate their recyclable material into separate bags or bins for collection. For example, fibre material such as paper and cardboard could be collected separately from plastic and aluminum cans. In this manner, material could be sorted more effectively and efficiently, resulting in higher rates of residential diversion. This initiative was not tested in recent market research, nor was it included in the scope of the 2017 municipal best practice review. Therefore, further study and engagement on this program is required.

2. Textile recycling program

Additional diversion targeted by initiative: one percentage point

Overview of potential initiative: Under this program, textiles (i.e. used clothing, shoes, bags and other materials made from fabrics), would be sorted from garbage and diverted from the waste stream. Community drop-off points would be identified for textiles and partnerships with community organizations to be recipients of materials would be developed.

Three of the 23 municipalities/regions scanned are implementing textile recycling programs to increase their waste diversion rates. And three additional municipalities (Strathcona County, Halifax and Metro Vancouver) are currently evaluating or are in the process of implementing a textile recycling program to help improve diversion rates and promote beneficial reuse of material.

3. Introduce volume limits and a clear bag program.

Additional diversion targeted by initiative: two percentage points (for initiatives a and b following)

a. Waste Volume Limits

Overview of potential initiative: Under this initiative, residents would be asked to limit the amount of general household waste (non-recyclable, non-organic garbage) set out for collection. This could be accomplished either through a garbage bag limit, or through a cart system. An additional step in this program would be to evaluate the frequency of collection. In general, the goal of such programs is to encourage residents to properly sort materials into the appropriate streams (such as SSO, grass-cycling, recycling and into ECO stations), thus reducing the overall need for general waste pick up. As such, it can be an effective waste reduction strategy overall.

At least 22 of the 23 municipalities researched limit either the volume of garbage or the number of garbage bags households can set out for collection including Halifax, Waterloo and Vancouver.

b. Clear bag program

Overview of potential initiative: Under this initiative, residents would set out their waste in clear or transparent bags, with minimal allowances made for opaque/privacy bags as required, addressing a potential citizen concern. Municipalities that choose this approach indicate that clear bags allow waste collectors and inspectors to see the

bag contents and avoid collecting garbage that contains materials not accepted for disposal including sharp objects and broken glass. Clear bags also help keep hazardous materials out of the waste stream.

At least three of the 23 municipalities/regions require households to use clear or transparent garbage bags for household garbage set-out. Municipalities using this program report significant decreases in waste set out and an increase in recycling and organics participation (food scraps and yard waste). Several municipalities allow for the use of one small (black) privacy bag.

Additional Items for Consideration

Curbside vs. Alley Collection

As part of the overall changes in collection initiatives outlined here, the City is evaluating other operational improvements in the collection process, including changes to curbside collection. Currently, 53 percent of collection in Edmonton is delivered through front street collection and 47 percent through alley collection. The proposed change addresses complaints related to damage to alleys due to the operation of heavy collection vehicles in the lanes. The City has reviewed its operation and has concluded that it is feasible to safely move more collection to the front street. However, this change will impact how many residents set out their waste and more work is needed to address concerns raised in market research about on-street parking and winter road access.

Addition information on all of the initiatives (those proposed and those still under evaluation) is summarized in Attachment 1.

Waste Management Strategy Update

There are many additional elements to the Waste Strategy that are under review, as well as the most recent recommendations made by the City Auditor. Further work on the strategy elements will be brought back to Utility Committee in Q2 of 2019. More specifically, additional elements include:

- Non-regulated business - Currently the City's Program and Service Review is evaluating the waste non-regulated business from the perspective of relevance, effectiveness. It is anticipated that a set of initial recommendations will be presented to the Utility Committee in June 2018, which will likely result in further analysis on the Industrial Commercial & Institutional (ICI) dimension of the program;
- Waste Hierarchy and Waste Prevention - The Office of the City Auditor identified a program opportunity in this area, and more work needs to be done

to better understand what program and policy options are available to better impact waste reduction. The residential sector is responsible for approximately 40 percent of all solid waste generated in Edmonton. While in the last few decades there has been increased focus on increasing waste diversion from landfill globally, the total waste generated remains significant. Conference Board of Canada (2009 data) indicates that Canada generates more municipal waste per capita on an annual basis than any of its peer countries[1]. Moreover, Alberta produces more waste per capita than any other province in Canada[2]. To reduce the amount of municipal waste generated in Edmonton, a renewed focus on waste prevention is needed. Waste Services will investigate potential opportunities to reduce waste generation in the City and will incorporate these findings in updates to Utility Committee in accordance with recommendation #5 Q2, 2019.

- Collaboration with Regional Partners - Municipal waste is generated in each municipality, and in the Edmonton Metropolitan Region, each municipality has its own distinct waste collection, processing and disposal programs and services. A future opportunity exists to increase collaboration within the region for these services. Over the course of the next 12 months, Waste Services, along with the Regional Economic Development Department, will work with municipalities in the Edmonton Metropolitan Region to identify potential collaboration opportunities. Initially, the regional jurisdictions will be consulted on their interest to participate in organics processing and recyclable processing.
- Communication and education programs specific to the multi-unit sector - The City of Edmonton provides waste collection service to the entire multi-unit sector (i.e. condominiums and apartments). This sector makes up approximately 30 percent of the total residential waste stream in Edmonton. This sector typically experiences a much lower diversion rate than the single unit sector, largely due to two main reasons. First, many older buildings do not have infrastructure or space in place to accommodate today's waste diversion programs. Second, the multi-unit sector typically has a higher resident turnover rate than the single unit sector, resulting in an ongoing educational challenge to ensure that diversion opportunities are taken up. For these reasons, a targeted approach to increase waste diversion in multi-unit buildings is required.

Administration will be working on the above elements with a view to returning to the Utility Committee in Q2 of 2019 with further recommendations on the strategy and potentially corresponding changes to Waste Policy #C527.

[1] http://www.conferenceboard.ca/hcp/Details/Environment/municipal-waste-generation.aspx

[2] https://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/envir32b-eng.htm

Legal Implications

Contractual obligations and enforcement mechanisms will require further investigation prior to implementation of service changes.

Corporate Outcomes and Performance Management

Corporate Outcome: Edmonton is an environmentally sustainable and resilient city			
Outcome(s)	**Measure(s)**	**Result(s)**	**Target(s)**
Edmonton is recognized as an environmentally sustainable city.	Percentage of residential waste diverted from landfill	2016- 52%	Achieve 90% residential waste diversion

Risk Assessment

Risk Element	Risk Description	Likelihood	Impact	Risk Score (with current mitigations)	Current Mitigations	Potential Future Mitigations
Environmental	Program changes do not result in expected increase in diversion rate	3 - possible	2 - moderate	6 - low	Conduct extensive research to determine best recommended waste diversion program	Implement performance measurement system to track program success
Customers/ Citizens	City receives negative feedback on proposal from citizens	3 - possible	2 - moderate	6 - low	Conduct market research to determine citizen tolerance for change	Conduct extensive public education and communication on program changes
Financial	Costs associated with program changes not in line with budget estimates	3 - possible	2 - moderate	6 - low	Complete budget estimates for program change options	Evaluate program operating and capital impacts. Obtain pricing or quotes where appropriate. Add contingency for unexpected expenses

Attachments

1. Attachment 1 - Waste Management Strategy Update

2. Attachment 2 - Waste Management Strategy Overview (1992)
3. Attachment 3 - Waste Management Strategic Plan (2008)
4. Attachment 4 - Federation of Canadian Municipalities Research
5. Attachment 5 - 2018 Waste Services Survey - Summary of Market Research Findings

Others Reviewing this Report

- A. Laughlin, Deputy City Manager, Integrated Infrastructure Services