

The City of Calgary

# Industrial, Commercial and Institutional Waste Diversion Strategy Analysis

April 23, 2014

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## 1. PURPOSE

In order to achieve the Council-approved goal of 80/20 by 2020, all sectors must increase waste diversion. The City of Calgary (The City) has delivered successful waste diversion programs in the Single Family (SF) and Construction and Demolition (C&D) sectors. The recently approved Multi-family (MF) Recycling Strategy is the next positive step towards achieving 80/20. Cities across the globe are challenged by the magnitude and complexity presented by the Industrial, Commercial and Institutional (ICI) sector. At 34 per cent, it represents the largest portion of the waste stream. Low diversion numbers indicate an opportunity for effective large scale diversion of materials from landfills.

This report outlines engagement and analysis conducted in response to Council's direction to recommend an ICI Waste Diversion Strategy (the Strategy). The Strategy sets a city-wide target of 80 per cent diversion from City landfills by 2020. The Strategy targets the most common materials in the waste stream (i.e. paper, cardboard and organics) and largest generators of waste to maximize diversion from the ICI sector. In addition, a comprehensive use of tools in the implementation plan will increase the potential for success in achieving the 80/20 target. The City will provide education, communication, data management and reporting and stakeholder engagement; and will ensure compliance with proposed amendments to the Waste and Recycling Service Bylaw (20M2001). The private sector will continue to be the primary provider of collection and processing services. The City will monitor and address needs in the local market, providing guidance and support to ensure diversion goals are achieved.

## 2. PREVIOUS COUNCIL DIRECTION

On 2011 May 25 SPC on Utilities and Environment meeting (UE2011-11), Administration was directed to:

- a) Report back to Council no later than 2013 March, in conjunction with the residential organics diversion report on the progress of ICI organics diversion including possible synergies with the proposed City compost facility for processing food and yard waste from both residential and non-residential sources;
- b) Report back to SPC on Utilities and Environment no later than 2013 December with an ICI Waste Diversion Strategy.

At the 2013 April 15 Special Meeting of Council (C2013-0246), Waste & Recycling Services updated Council on the progress of the Organics Diversion Program including possible inclusion of ICI sector organics. It was communicated that, once The City's composting facility is fully operation and producing quality compost, they will consider the addition of specific ICI customers.

At the 2013 May 1 report to SPC on Utilities and Corporate Services (UCS2013-0035), updated Committee on the results of engagement activities undertaken with the ICI sector and planned next steps. This report builds on the outcomes of the 2013 May report presented to Committee.

At the 2013 December 11 SPC on Utilities and Corporate Services (UCS 2013-0756) recommended that Council approve the deferral of the Industrial, Commercial and Institutional Waste Diversion Strategy to no later than 2014 April.

### 3. THE CURRENT STATE OF THE INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL SECTOR

The ICI sector is the largest of the four sectors in Calgary in terms of waste generated. In 2012, the sector contained over 160,000 businesses, employed 780,000 workers and produced 214,000 tonnes of waste, which is 34 per cent of the total waste disposed in City landfills. It is the most complex of the waste sectors due to the number and diversity of stakeholders, building sizes and types, variety of collection infrastructure, service provision and the uniqueness of the waste stream (Figure 1).

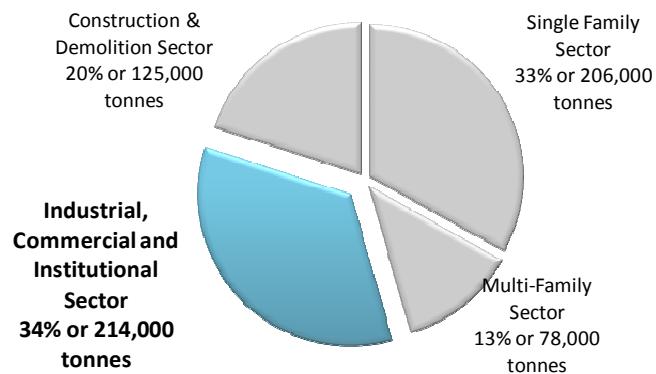
The stakeholders (generators, haulers and processors) vary in size and focus. For example, private haulers range from large integrated businesses (e.g. BFI, Waste Management) to smaller niche haulers (e.g. BluPlanet Recycling).

Generators range from small corner stores to hospitals, schools, large office towers and malls. There are processors for paper, cardboard, organics, metals and commingled recycling in Calgary and surrounding areas.

Private industry has made voluntary efforts to divert a significant amount of material in this sector. A large portion of easily divertible material (up to 86 per cent) remains in the waste stream. Although the materials seem similar to those generated by the residential sector, materials are different in volume, weight and composition. For example, ICI organic waste has a higher energy value than that of the residential sector, predominantly consisting of food waste as opposed to yard waste.

The City plays a minimal role in the ICI sector with approximately 1,000 businesses served by Waste and Recycling Services. The ICI waste diversion measures implemented in Calgary are voluntary (e.g. recycling and waste audits) with the exception of differential tipping fees at City landfills.

**Figure 1: Waste disposed at City landfills by weight in 2012**



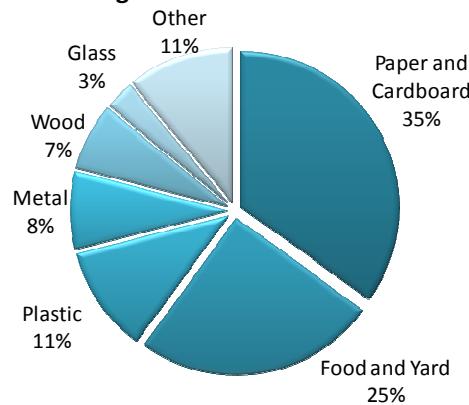
#### 4. WASTE COMPOSITION

Waste composition within the ICI sector is divided into seven main material categories (Figure 2). Although, materials appear to be similar to those generated by the residential sector, it is important

to identify the difference in the volume, weight and composition of materials. For example, paper and cardboard are a large source of waste disposed and identified at landfills in large quantities regardless of ample processing capacity.

Plastics range from plastic bottles to wrapping plastic in which case the volume relative to weight for storage and transportation differs greatly. This difference in composition, volume and weight results in the need for a higher degree of source separation to aid in processing to increase diversion. Other material streams such as wood and metal are easier to distinguish. When grouped into potential processing streams, 54 per cent of materials are considered recyclable (i.e. paper, cardboard, metals and plastics); 32 per cent are organic materials (wood, food, and yard waste) that can be composted, and 14 per cent are unrecyclable (eg. textiles, mattresses) or have limited markets (glass) at this point in time.

**Figure 2: Percentage of materials in the ICI waste stream**



#### 5. WASTE INDUSTRY

The waste industry consists of four main groups that influence the generation, collection, processing and markets.

**Generators:** From restaurants to hospitals to factories, Calgary's business community is as diverse as the waste it generates. Over half of the waste in the ICI sector comes from four of the 17 different industries in Calgary:

1. Accommodation and Food Services (17 per cent);
2. Retail Trade (15 per cent);
3. Health Care and Social Assistance (11 per cent); and
4. Manufacturing (8 per cent).

Initial results from the 2013-2014 Waste Composition Study continue to identify these sectors as the highest waste generating industries.

**Hauling/Collection:** The primary provider of collection services is a mix of small and large private waste haulers; many of which provide diversion opportunities. Haulers utilize different systems to collect waste from the ICI sector including but not limited to: front-end

and rear-end collection trucks and bins, roll-off containers and trucks, compactor systems and crane trucks and semi-underground bins.

According to a survey conducted during the 2010 Waste Modelling Study, between 10 and 30 per cent of ICI customers with private waste haulers have diversion programs (mostly recycling). The largest barriers to diversion are space, cost of service and labour intensiveness (including training of staff).

**Processors:** These include paper, cardboard, metals and comingled recyclers and organics processors in Calgary and surrounding communities. Results from a preliminary infrastructure scan concluded there is currently regional capacity for the current rates of diversion in the ICI waste stream. When diversion increases, processors mentioned that they were willing to expand operations.

There are a number of private haulers offering food waste collection. Only a few organic material processors exist within the region due to strict provincial permit processes, knowledge in running compost facilities and lack of capital to develop larger sophisticated facilities. However, some windrow facilities exist in and around the Calgary region, including all three City landfills.

The City is developing a compost facility, designed to be scalable. It will accommodate bio-solids from the waste water treatment system as well as organic material from the single family sector. The facility will require a significant amount of wood. Diverting wood pallets from the ICI sector could potentially offset the demand for wood. Utilizing this facility for multi-family, regional and ICI material processing will be explored in subsequent stages of strategy development.

**Markets:** Market prices for recyclable materials are dependent on a number of considerations such as material quality, volumes and contractual arrangements. Market prices change over time and are monitored closely by industry and The City. The current markets for paper, cardboard, food and yard waste, plastics and metals are stable while additional markets for glass need to be investigated for further diversion in the sector.

## 6. ENGAGEMENT

A comprehensive engagement process was designed in collaboration with IPSOS REID, EBA Engineering, Sonnevera International, The City's engage! team and WRS. The City identified four groups of stakeholders as critical to the engagement process: associations (including environmental non-government organizations or NGOs), generators, haulers and processors.

Eleven industry sessions, focus groups and additional one-on-one interviews were held to determine needs, identify impacts, determine roles and responsibilities, prioritize options and establish timelines. A set of program tools were derived from research conducted by CH2MHill on North American best practices and a review of the waste composition for the sector. These program tools were used as a basis for discussion and recommendation, organized into three categories:

- Economic (Differential tipping fees and landfill levy);
- Regulatory (Mandatory source separation and franchise waste system); and
- Voluntary (waste diversion assistance and zero waste events).

Stakeholders added additional tools and processes that could assist in diversion included in Appendix A. The Strategy development process reviewed 20 potential tools for implementation based on stakeholder input, learning's from other municipalities, potential success in diverting materials, and jurisdictional authority to implement. The tools formed the foundation for the strategy and identified the actions needed to maximize waste diversion in the sector.

The engagement consisted of two phases over a two-year period (2012 April-2014 January). A summary of engagement activities is provided in Table 1 below.

**Table 1: Summary of Engagement Activities**

	Timeline	Technique & Purpose	Participants
Phase 1	April 2012	EBA/Ipsos Reid workshops (4) to identify barriers to increased ICI diversion determine support for 14 programs and explore role of The City in increasing ICI waste diversion.	47 stakeholders representing generators, haulers, processors, and associations
	July 2012	EBA/Ipsos Reid multi-stakeholder sessions (2) to review previous results; identify challenges and propose solutions.	47 stakeholders representing generators, haulers, processors, and associations
	September 2012	EBA/Ipsos Reid combined stakeholder engagement session to confirm information and demonstrate applicability to Federation of Canadian Municipalities Model.	47 stakeholders representing generators, haulers, processors, and associations
	2012	Ipsos Reid electronic survey sent to all those unable to attend.	31 – 39 electronic surveys sent out after each session
Phase 2	August - October 2013	Engagement sessions to identify barriers and timing challenges of implementing the program options and proposed solutions.	34 internal subject matter experts
	November 2013	Sonnevera Inc. workshop to get feedback on preference and timing of the program options.	34 stakeholders representing generators, haulers, processors, and associations
	December 2013	Focus group of internal SMEs to review the external engagement session results of November 2013.	14 internal subject matter experts
	December 2013 - February 2014	Infrastructures scan via interviews with ICI waste to understand available processing capacity within Calgary.	18 processors
	January 2014	Sonnevera Inc. workshop to review results to date, allow final commentary and communicate next steps including Report to Committee.	41 stakeholders representing generators, haulers, processors, and associations

## **6.1 PHASE 1: INITIAL ENGAGEMENT**

Phase 1 focused on prioritization of the tools, challenges experienced by stakeholders, The City's role and potential diversion opportunities. The key outcomes included:

### **Economic tools**

- The City to expand the Designated Materials List and increase the fee differential for contaminated loads.

### **Regulatory tools**

- Mandatory source separation with adequate infrastructure and enforcement
- Franchise waste systems, where The City would administer service contracts, received very low support.

### **Voluntary tools**

- The City to increase the availability of waste diversion assistance (one-on-one technical assistance and educational resources).
- The City increasing promotion of waste diversion within the ICI sector through mechanisms such as recognition of progressive businesses.
- The City takes a leadership role in promoting zero waste special events in the city and encourages larger events to adopt this initiative.
- As long as potential risks are managed, The City should take a role in implementing a food redirection program.
- Develop a working groups to promote waste diversion in the city and encourage the distribution of waste diversion success stories amongst ICI sector members.

### **ICI Waste Diversion Challenges**

- An increase in recycling collection and processing options.
- An increase in diversion of organics if a processing facility is constructed, creating a market for collection and hauling of organics.

### **Measuring ICI Waste Diversion Progress**

- Feedback suggests that waste haulers and processors would be willing to share their data on an aggregate basis for The City's use in setting industry standard benchmarks and for tracking waste diversion

Table 2 presents a summary of the engagement results from Phase 1.

**Table 2: Phase 1 Engagement Results**

<b>Challenges</b>	<b>City's Role</b>	<b>Potential Diversion</b>
<ul style="list-style-type: none"> <li>• Need for increased diversion and recycling</li> <li>• Lack of convenience</li> <li>• Infrastructure limitations</li> <li>• Lack of diversion options</li> <li>• Lack of markets for materials</li> <li>• Limited public awareness and education</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring and reporting</li> <li>• Research and development</li> <li>• Waste assistance for small business</li> <li>• Infrastructure development</li> <li>• Waste education and awareness</li> <li>• Waste diversion promotion</li> </ul>	<ul style="list-style-type: none"> <li>• Top materials including paper, cardboard and organics</li> <li>• Top generators including accommodation and food services, retail trade, health care and social assistance, and manufacturing.</li> </ul>

## **6.2 PHASE 2: TIMELINES AND IMPLEMENTATION**

During Phase 2 engagement, stakeholders developed sequencing scenarios using 10 program options which were integrated as part of the strategy. They were asked to develop implementation while considering resources and potential impact.

### **Identification of challenges to increasing diversion:**

- On-site space constraints (where generators initially gather and store their waste) and a perception of high costs related to diversion were common challenges noted by participants.
- Concerns around the need for proper data to report progress as well as further investigation into processing capacity and market capability to divert specific materials.

### **Support for strategy**

- Stakeholders, who actively participated, support The City taking action to stimulate waste reduction and diversion, and agreed to the proposed tools and timelines as a reasonable approach.
- Notable options with high potential diversion impact and high support included: mandatory source separation, waste diversion working groups and differential tipping fees on materials such as cardboard.
- Stakeholders were positive about the engagement process and show a high indication of continued involvement in implementation.

### **Preferred tools for implementation**

- The use of voluntary measures (education and promotion) in conjunction with regulatory and economic measures such as mandatory recycling and differential fees, with an eventual move to bans for all materials are preferred.
- Recognition of the need to implement a number of options immediately to achieve progress toward The City's 80/20 goal, revealing a need to address diversion in the sector.
- A preference toward the use of differential fees prior to materials bans in addressing diversion.

## The City's role

- To provide strong policy direction, sufficient education and promotion of diversion, effective communication and adequate lead time for policies so stakeholders are able to prepare for the future.

## 7. LEARNINGS FROM OTHER JURISDICTIONS

The research examined best practices from 25 global municipalities for the opportunities and challenges experienced with the tools mentioned above. An analysis revealed that certain tools would be more viable in Calgary as a result of expanding existing programs.

The ICI programs with the highest success rates required source separation, robust education and advisory support to organizations in overcoming barriers commonly associated with waste diversion.

As a result of the best practice research, it was recommended that The City:

- Continue to implement and expand tools already in action such as lobbying other levels of government for new diversion initiatives, food redirection, differential tipping fees, waste diversion assistance, implementation of green procurement, zero waste events' and maintaining partnerships.
- Promote zero waste events, celebrate industry leaders, and continue with the ICI working group and infrastructure development.
- Implement new regulatory options such as mandatory source separation and landfill bans, which are key to the success of ICI diversion programs. Each option requires waste generators to change their behaviours and increases diversion significantly.

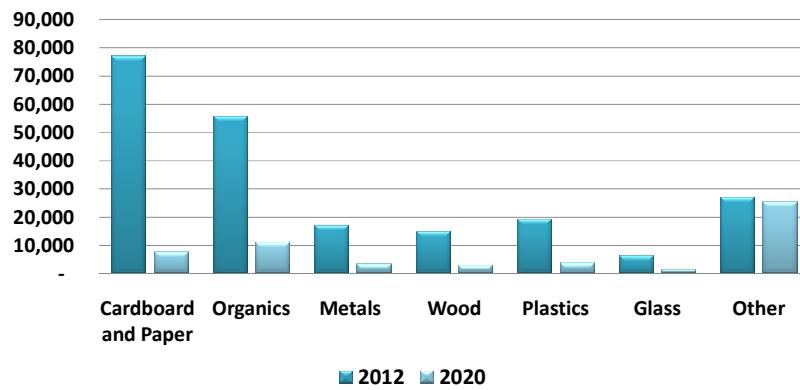
## 8. ANALYSIS

### 8.1 MATERIALS

The grouping of materials into processing streams revealed that 86 per cent of materials going to landfill can be diverted. In most cases tonnage could be reduced to less than 20 per cent of the baseline in 2012 (Figure 3). Targeting specific materials will contribute to and have the largest impact in decreasing waste at City landfills from the ICI industry. Pursuing programs aimed at diverting paper and

**Figure 3: Proposed 2020 Landfill Targets**

**Tonnes of ICI materials disposed at City Landfills 2012 and 2020 by material type**



cardboard and food and yard waste – the two largest material types by per cent – will increase diversion in the industry overall by close to 60 per cent.

In addition, targeting the largest sources (generators) of waste will influence diversion in the sector. Industry-specific engagement with the larger waste generating industries such as Accommodation and Food Services, Retail Trade, Health Care and Social Assistance and Manufacturing Sectors, is needed to understand current diversion efforts, determine barriers to diversion and educational needs to increase diversion. The opportunities and challenges differ for each material and range from space limitations to volume of material.

The Federation of Canadian Municipalities recommends four key success areas in the ICI sector:

- Partnership and collaboration;
- Infrastructure and programs;
- Policy and legislation; and
- Education and promotion.

These areas helped to consolidate the research and engagement to provide recommendations for the strategy.

## **8.2 PARTNERSHIP AND COLLABORATION**

### **Stakeholder Working Group on Waste Diversion**

An ICI working group will be formed with members of the ICI community to provide focussed discussions around common issues and challenges related to waste diversion. Potential items for discussion include:

- Infrastructure: there is a need for programs to support the changes to the Waste & Recycling Services Bylaw as well as encourage development of organics infrastructure to process ICI organics and accommodate the organics ban.
- Measurement and reporting system: work with ICI waste industry to begin the development of a data reporting system to determine a city recycling rate.
- Partnerships and industry synergies: identify potential partners to further actions within the waste management strategy and implementation plan.

### **Lobby Federal/Provincial Government for New Initiatives**

The City could lobby the Province to implement regulations to reduce waste for the entire waste system within the jurisdiction or provide additional waste reduction and diversion programs and education.

### **Data Management**

Very little data exists for the ICI sector as a whole. The main sources are Statistics Canada (generators/sources) and The City of Calgary landfill data. Stakeholders suggested The City serve as a data bank and report back to industry on the results from amalgamated data being collected and analyzed. Stakeholders recommended that The City should collect the data from key stakeholders to properly track ICI waste diversion and set industry standards.

The City is only able to access ICI data available through City landfills at this point in time. There is a need to have processors within the city and the region report processing numbers in order to calculate a true diversion rate. Industry is prepared to share data on an aggregate level and only when confidentiality is guaranteed. Initial discussions with industry, as part of an infrastructure scan, began in 2013 and continued discussions are required to develop a collaborative data management system.

**Role of The City:**

- Providing information on waste diversion options.
- Serving as a data bank, monitor and report results.
- Reporting on ICI waste diversion results.
- Conducting research and development.

### **8.3 INFRASTRUCTURE AND PROGRAMS**

**Infrastructure**

Regular infrastructure and market scans need to be completed prior to the implementation of regulatory measures to ensure processing and market capacity for diverted materials. As mentioned before there appears to be capacity for current rates of diversion in the ICI waste stream and processors mentioned that they were willing to expand operations should the market require. Real capacity should be clarified through a comprehensive data management system. In addition, stakeholders identified a need for education or regulatory measures to increase the supply of diverted materials and promote diversion in the sector. Recycling markets should be examined consistently to create an economic incentive for processors to seek out materials and increase diversion.

The private sector indicated their interest in expanding their composting operations; therefore, to provide transparency and certainty, The City should signal through regulation (e.g. mandatory source separation, collection, designated materials list, and/or bans) its intention to divert organics from this sector. Additional capacity may be available through The City's composting facility, but this capacity is planned for population growth in the single family stream. An Anaerobic Digestion facility is identified in the WRS Infrastructure Investment Plan (WRIIP) in the 2019-2022 budget cycle at an estimated cost of approximately \$60 million (UCS2014-0023). This facility will be included in the WRS 2019-2022 Business Plan and Budget request should the private sector be unable to manage the diversion of ICI organic material. It is proposed that a dedicated strategy be designed to divert organics in the ICI sector.

**Zero Waste Events**

Program development for zero waste events will promote diversion through public education and capture large audiences as well as showcase successes. Special events offer an opportunity for focused waste diversion as well as public education. To avoid the waste associated with these events, organizers may be required as part of their permit to include waste diversion opportunities and meet certain targets. This will be introduced on a voluntary basis and facilitated by The City as part of its special events program.

**Food Redirection**

Excess food from restaurants and grocery distributors is redirected to food banks/shelters. Redirection of consumable food waste from grocers and restaurants to those in need through providers such as social agencies can provide effective redistribution of edible food

while fulfilling a social need. These programs already exist through agencies such as the Calgary Interfaith Food Bank, which diverts an estimated 10,000 tonnes per year to their customers. There is the potential to increase redirection of food through awareness and educational programming.

### **Waste Diversion Assistance**

The City can provide technical and information assistance to companies interested in implementing waste diversion programs. This will help businesses develop the capacity to explore diversion practices through one-on-one technical assistance as well as online educational resources.

Role of The City:

- Demonstrate leadership.
- Assist small businesses with their ICI waste diversion opportunities.
- Develop infrastructure to fill gaps in industry where required.

## **8.4 POLICY AND LEGISLATION**

Best practice research indicated that the overall use of voluntary measures be undertaken in conjunction with regulatory and economic measures. Jurisdictions that implemented regulatory measures earlier saw higher rates of diversion. In addition, jurisdictions that implemented a comprehensive program for the sector experienced higher rates of success. The City recommends extensive communication around the regulatory measures (mandatory source separation, differential tipping fees and landfill bans).

The waste sector, from materials and buildings to spaces, is impacted by legislative frameworks from the local to the international level.

- International policies, such as the recent “Green Fence Initiative” in China, will impact the viability of markets for recyclables. Local markets should be developed to ensure stability and decrease the environmental impacts (e.g. transportation of recyclable materials).
- Federal and provincial policies and action plans such as the Canada-wide Extended Producer Responsibility (EPR) Action Plan and the proposed Designated Materials Regulations will encourage increased diversion from the ICI sector through potential EPR policies.
- The lack of regulations for the ICI waste sector at the provincial level reveals a potential opportunity to collaborate on the development of new initiatives.
- Municipal jurisdiction allows for the implementation of all 20 of the potential tools. Only seven of the tools reviewed would require changes to or creation of new bylaws, of which three are recommended. For example, mandatory source separation would require amendments to the Waste & Recycling Services Bylaw (20M2001) and the Land Use Bylaw (1P2007). Additions to schedules in current bylaws may also be required.

### **Differential Tipping Fees and Landfill Bans**

Differential tipping fees charge haulers for contaminated loads and are used to target specific materials from disposal in landfills. Stakeholders suggested the use of differential fees as a step toward landfill bans. Landfill bans prohibit the disposal of certain material streams at City landfills. Standard enforcement involves rejecting loads containing banned

material. A two-year lead time for most type of bans allows sufficient time to coordinate the planning and proper development of programs and infrastructure.

### **Mandatory Source Separation**

The multi-family and ICI sectors are similar in terms of generator locations, building types, collection and processing. Many generators are located in higher density locations such as downtown and in high rise buildings (offices, hotels, etc). Many of these buildings experience the same challenges when it comes to on-site recycling and waste disposal. In addition, material composition differs for each industry.

Source separation has been addressed in the Multi-family Recycling Strategy where a bylaw is proposed for on-site source separated recycling. This bylaw will apply to a number of buildings in the ICI sector identified as mixed use. The addition of ICI generators would build on the momentum established, leading to more efficiencies for haulers and increased material processing. Smaller generators might experience space challenges. This could be resolved by innovation from private sector companies and waste diversion education by The City. Between 18- 24 months should be provided for generators, haulers and processors to prepare for the change.

#### **Role of The City:**

- Establish regulatory framework.
- Work with generators and haulers to educate the ICI sector regarding regulations.
- Collaborate with the Province of Alberta to develop regulations.

## **8.5 EDUCATION AND PROMOTION**

Challenges to diversion such as space constraints and the perception of high costs for diversion could be dismissed with further education to businesses and their employees. Stakeholders suggested a number of options available to generators that will improve space constraints and decrease costs. Various avenues for diversion education and communication of best practices and success stories should be utilized. The City should collaborate with the non-profit and private industry in providing waste diversion educational services to reach a larger audience in a shorter period of time.

Promotion and education can encourage waste diversion awareness and participation in the ICI sector. Options include celebrating leaders in diversion, certification of businesses who achieve specific diversion standards as well as encouraging green procurement activities and other sustainable initiatives.

#### **Role of The City:**

- Promote ICI waste diversion.
- Develop recycling business case to educate industry on the cost benefits of waste diversion.

## 9. CONCLUSION AND NEXT STEPS

Throughout the two year engagement process stakeholders remained highly engaged, showing support for The City taking action to stimulate reduction and diversion within the ICI sector. The cross-section of industry groups also showed a willingness to collaborate and participate in implementing the strategy.

The iterative process of stakeholder input, research and results confirmation was beneficial for both stakeholders and The City. It provided grounds for debate and eventual understanding of the issue or proposal. An example is the processing capacity for recyclables, where stakeholders reported low capacity. A subsequent infrastructure scan by The City indicated sufficient capacity for current levels of recycling which enabled high support for differential tipping fees. This learning environment was recommended as a basis for continued engagement in the sector, especially in a sector where The City lacks direct control and oversight of many elements critical to success.

An implementation plan is currently being developed, that will include short and longer term actions to coincide with Councils business plan and budget cycles.

An ICI waste diversion strategy that targets most common materials is therefore recommended and included as Attachment 1. Stakeholder supported City actions include:

- Waste & Recycling Service Bylaw amendment, ensuring that specified recyclable materials are collected on-site and adequate storage capacity is available. Lead time of two years to prepare the sector is recommended. Draft bylaw amendments will be prepared no later than 2015 September for program implementation in Q4 2016. This includes facilitating revisions to development standards within the land use bylaw to accommodate ICI sector diversion efforts.
- Additions to the designated materials list to increase the differential for contaminated loads and incentivize industry to source separate materials. Add paper and cardboard to the designated materials list for 2015 January with other materials to follow.
- Develop an Organics specific strategy that will consider industry organics processing capacity and potential as well as AD opportunities. Mandate on-site organics source separation by Q4 2016 effective Q4 2019. Add ICI organics to the designated materials list by Q1 2017 and ban ICI organics by Q4 2019. This provides generators, haulers and processors three years to prepare for the change. Implement the program in 2020.
- Develop an education and communication plan to promote awareness of diversion, build capacity in sector, and reach wider audiences through partnerships.
- Facilitate an industry working group to develop innovative and collaborative solutions to waste issues and promote waste diversion goals and targets.
- Implement material bans at City landfills to prohibit their disposal. Provide sufficient lead time (minimum two years) for industry to adapt and provide necessary programs and infrastructure.
- Design and develop material-specific programs to target materials in each industry.
- Design and develop a data management system that will allow WRS to report an accurate diversion rate and recycling rate for Calgary.
- Continuous monitoring of local and end markets for source separated materials,

processing capacities and regulations to ensure the success of programs.

## Appendix A: Program Tools Considered

Economic Tools	Description
<b>Disposal Surcharges – Dedicated Landfill Levy</b>	Place a levy or surcharge on all waste entering City landfills. This surcharge would serve the dual purpose of creating a financial disincentive, while also providing a funding mechanism for diversion programming.
<b>Differential Tipping Fees/Expand Designated Materials List</b>	Apply increased fees for loads containing designated materials to additional materials, such as cardboard or plastic.

Regulatory Tools	Description
<b>Mandatory Recycling/Source Separation Requirements</b>	Regulatory requirement to participate in diversion activities. This may take the form of physical diversion infrastructure, including separate collection containers and/or proof of material diversion.
<b>Franchise Waste System</b>	The City would administer ICI waste collection service contracts. This would allow The City control over how this waste stream is managed, allowing for establishment of targets and diversion mechanisms ( <i>not recommended</i> ).
<b>Landfill Bans</b>	Prohibit the disposal of certain materials at City landfills.
<b>Private Sector Requirements to Provide Recycling Services</b>	Require waste haulers to provide recycling services ( <i>not recommended</i> ).
<b>Mandatory Waste Audits and Waste Diversion Plans</b>	Organizations are required through regulation to complete waste plans and audits that set out plans and targets for diverting waste materials ( <i>not recommended</i> ).

Voluntary Tools	Description
<b>Food Redirection</b>	Develop a program to redirect unwanted or excess food to people in need eg. Excess food from restaurants and grocery distributors is redirected to food banks/shelters.
<b>Waste Diversion Assistance/Enhanced Educational Programming</b>	Develop technical and educational waste diversion assistance information and tools for ICI waste generators.
<b>Waste Diversion Promotion/Celebrate Industry Leaders</b>	Promote waste diversion through recognizing organizations that show progressive initiatives in this area and/or certification of businesses that achieve certain diversion standards.
<b>Waste Exchange Program</b>	Materials and waste exchanges are markets for buying and selling reusable and recyclable commodities. Some are physical warehouses that advertise available commodities through printed catalogues, while others are simply Web sites that connect buyers and sellers.
<b>Recycling/Organics Collection for Small Business</b>	The City could build on the residential recycling program to provide collection of recyclables and/or organics to small business/organizations.
<b>Zero Waste Special Events</b>	Organizers are educated about waste diversion, required to complete waste plans and audits or required to include waste diversion opportunities and meet targets as part of their business permit.
<b>Working Group on Waste Diversion (include measurement system)</b>	ICI community members form a group to discuss common issues and challenges related to waste diversion, as well as potential solutions.

<b>Lobby Province for New Initiatives (Extended Producer Responsibility for paper and packaging, measurement system)</b>	The City lobbies the Province to implement regulations to reduce waste.
<b>Partnerships (i.e. NGO's)</b>	Create partnerships internally and externally to promote waste diversion and create awareness.
<b>Implement and Promote Green Procurement</b>	Continued endorsement of The City's Sustainable, Ethical and Environmental Procurement policy and promotion of green procurement.
<b>MRF Access/Capacity</b>	Facilitate access to Cascades to allow private haulers access to the material recovery facility (MRF)/ determine capacity for ICI materials.
<b>Composting Facility Access/Capacity</b>	Allow private haulers access to the The City's composting facility/determine capacity for ICI materials.
<b>Develop Transfer Station for Organics/Recycling (eg. eco-stations)</b>	Develop a transfer station (if needed) to provide a convenient and efficient drop-off location for ICI recyclables and organics and to reduce traffic volume at the landfills.