



# Waste Plan Regina Report

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## Executive Summary

Over the past decade, the City of Regina (Regina or The City) has experienced unprecedented growth in population and the economy which has resulted in higher waste generation rates. Regina's citizens generate about 1,000 kilograms per capita of solid waste annually; most of which (84%) is disposed in the Regional landfill with only about 16% diverted. Furthermore, waste can be an environmental liability and, therefore, requires special attention to ensure that it is being managed in an appropriate and sustainable manner. The City of Regina recognizes that it needs to address this situation and identify opportunities to move away from a disposal society to a conserver society.

To address the growing demands on its waste management system, Regina has developed a solid waste management plan, known as Waste Plan Regina to review the way in which the City currently manages solid waste and to consider alternatives for meeting and managing long term solid waste management and diversion needs. In addition, Regina sees this review as an opportunity to further promote and incorporate the five "R's" of waste management – Refuse, Reduce, Reuse, Renew and Recycle.

The primary objective of Waste Plan Regina is to ensure that the public health and safety needs of the community are met, with a focus on environmental protection and customer service. The goals of this strategy are to provide an integrated solid waste management plan for collection and disposal of residential and commercial waste, and to balance program affordability with community needs, while implementing a plan that considers both efficiencies and revenue opportunities for collection and disposal.

Waste Plan Regina examines; waste management, waste diversion service level options, support mechanisms, waste reduction and diversion best practices in the residential, industrial/commercial/institutional (IC&I) and construction/demolition (C&D) sectors. Broad environmental issues in terms of public health, environmental and social aspects are considered. The study includes an evaluation of how to finance solid waste programs, possibly using a tax based system or a user fee system approach. Other areas of exploration include consideration of enhanced services, including recycling and composting options, bulky waste collection and policies to minimize landfill disposal.

To ensure the timely completion and support for the Plan, the project implemented two key consultation components. The day-to-day activities were administered by a Steering Committee, comprising key City representatives from the following City departments: Solid Waste, Quality and Innovation, Communications, and Planning and Development. Additional support was provided by the Internal Working Group comprised of representatives from other City departments with a stake in the Plan. In addition, Waste Plan Regina established a robust public consultation strategy to engage key citizen, business and institutional stakeholders within the City.

### ES-1 Current Waste Management System

Residents, businesses, and institutions located within the City limits of Regina generated approximately 203,000 tonnes of solid waste in 2008. Businesses and institutions generate about 70% of the solid waste, with about 30% generated by residents.

The average cost of waste management services for a typical Regina household is \$110 per year or \$9.16 per month. Regina's 2008 Waste Management Operating Budget was just over \$12 million (\$12,649,927) with a transfer of about \$5 million (\$5,034,127) to the Landfill Reserve. Annual revenue is about \$8.9 million (\$8,973,930), leaving a net cost paid by General Revenues of about \$3.5 million (\$3,675,966).

Until recently, Regina employed three methods of residential garbage collection:

- Residential Manual Collection – City crews manually collected garbage from the curb using rear-loading compaction trucks. Residents who received manual garbage collection were subject to a material limit of 8 garbage bags or 23 kilograms. This service was completely discontinued in May 2009 with the conversion to Residential Automated Front Street Collection.

- Residential Automated Front of Street Collection – This service, recently introduced to the City of Regina, consists of automated garbage collection. As part of this service, residents are provided with 360-litre rollout garbage carts that need to be placed on the front street property line once weekly for collection. Approximately 34,000 homes receive this service.
- Residential Mechanical Collection – For residents with back alleys, garbage collection is provided through large steel garbage communal containers located in the alleys. These containers are emptied mechanically once weekly using side-loading trucks. Approximately 26,000 homes receive this service. Plans call for this service to be phased out, as the required collection equipment is no longer available.

City crews provide all curbside and back alley residential garbage collection services.

Regina is one of only two Canadian cities without a publicly-funded curbside recycling program. Residents have access to recycling depots, affectionately called the Big Blue Bins, which are situated at 13 locations around the City where residents can drop off paper and cardboard. Regina's residents also have the option of subscribing to residential curbside recycling programs provided by two private sector companies.

In addition, the City manages a variety of waste diversion programs including:

- Tinsel Mulch – residential natural Christmas tree composting;
- Backyard Composting Program – residential organic diversion;
- thINK Food – residential inkjet cartridge recycling;
- Call2Cycle – a national stewardship program for used batteries;
- School Visits – over 50 schools visited in 2007;
- Public Events – numerous displays, parades and media appearances; and
- Special Events – Household Hazardous Waste events.

Regina owns and operates the Fleet Street Landfill, located in the northeast quadrant of the City. The landfill services all residents, businesses and institutions in the City and acts as a regional landfill for neighbouring communities. The current Fleet Street Landfill is expected to reach capacity within three years. The Landfill will be undergoing an expansion, beginning in 2009. Phase 1 of the Landfill Expansion is expected to be ready to receive waste in the fall 2010, subject to regulatory approval.

The vast majority of waste management and diversion services targeting the IC&I and C&D sector are provided by the private sector, with minimal involvement by the City. However, the City recognizes that the IC&I and C&D sectors produce the majority of waste going to the City landfill and therefore sees a need to become more involved in promoting waste diversion activities within these sectors.

Regina presently delivers the above waste management services in an efficient and cost effective fashion. Given the basic level of service provided, it is unlikely that the City could cut back on any of the existing services in order to free up additional funds for new programs. Given this current situation, additional funds will likely have to be allocated to waste management in order to provide any new or expanded programs such as the household collection and processing of recyclable materials.

## ES-2 Waste Plan Regina Process

A key component of Waste Plan Regina involved identifying and evaluating a comprehensive list of waste management and waste diversion best practices employed by other North American communities. In the first phase of the process, the consulting team drew on their extensive experience in waste management planning and developed the Long List of Waste Management and Diversion Practices (Long List). The Long List was divided into three sectors – residential, IC&I (industrial, commercial & institutional) and C&D (construction & demolition), which was further divided into two distinct categories:

- Waste management and diversion service options – Collection and processing services (primarily to the residential sector) including curbside recycling, curbside organic collection, leaf and yard waste collection, bulky waste collection, etc.
- Waste diversion innovative practices – defined as supporting policies and programs implemented by the municipality to promote waste reduction and diversion in the residential or IC&I or C&D sectors.

Over 120 measures were identified in the Long List. The next step in the process involved developing a screening procedure to remove, from further consideration, any opportunities that were not practical or in keeping with the goals, objectives or vision for the study.

A total of eight evaluation criteria were developed for the screening process. The evaluation criteria highlighted key issues that needed to be considered in determining whether the selected opportunity made practical sense in Regina. The screening process applied the set of evaluation criteria to assess the more than 120 opportunities. Further discussion of the screening process is provided in Section 3.

Following lengthy consultations with the City's Steering Committee and Internal Working Group, the Long List was reduced to approximately 57 Short Listed Waste Management and Diversion Practices. The Short List of Waste Management and Diversion Practices represented the most promising and realistic waste management and waste diversion opportunities for the City to consider for future implementation and were divided into the three sectors:

#### Short List of Waste Management and Diversion Practices

1. Residential Measures (25)
2. IC&I Measures (18)
3. C&D Measures (14)

A detailed description of each Short Listed Waste Management and Diversion Practices is provided in Section 4 of the report. The next phase of work involved combining the Short List of Waste Management and Diversion Practices into different packages.

For the Residential Sector, direction was provided to create three Service Level Options. These Service Level Options were broadly defined as:

- “Basic” (later changed to “**Current Plus**” on the basis of input from the Citizens Working Group) comprising the current service level with minor enhancements;
- “**Enhanced**” comprising measures comparable to service levels provided in most Canadian cities and including the household collection of recyclables; and
- “**Comprehensive**” comprising measures comparable to service levels provided in leading Canadian municipalities and including the household collection of both recyclables and organics, such as food wastes.

These Service Level Options are in addition to the alternative which is to keep the existing system (status quo) as is and not make any modifications to the system.

For the IC&I and C&D sectors, it was decided to formulate the Short Listed Waste Management and Diversion Practices into two Packages for each sector:

- “**Basic**” representing a fairly low impact Package, emphasizing voluntary waste diversion initiatives; and
- “**Extended**” representing a more comprehensive approach with more mandatory initiatives.

Formulation of the three residential Service Level Options and the two waste diversion Packages for the IC&I sector and the C&D sector involved developing a series of exercises and engaging four sector-based working groups including:

- Citizen's Working Group;
- IC&I Working Group;
- C&D Working Group; and
- Waste Management Industry Working Group.

These Working Group meetings were held early in the spring of 2009 and resulted in the formulation of the Residential Service Level Options and the IC&I and C&D Waste Diversion Packages, further described in Section 5 and summarized below.

These Service Level Options and Waste Diversion Packages will be presented to the public for comment and input received will be used by the Elected Officials to ultimately decide on the preferred systems for Regina.

## Residential Service Level Options

### Current Plus

**Service Options:**

Curbside Garbage & Landfill  
Active promotion of Backyard composting  
Expanded Recycling Depots Leaf & Yard Waste Depots  
Christmas Tree Collection & Processing  
Household Hazardous Waste (HHW) events

**Supporting Mechanisms:**

Promotion & Education  
Goods Exchange Events  
Customer Reward Program  
Voluntary Grasscycling

**Current Plus:**

Potential diversion – 16% to 20% (current 16% diversion)  
Cost - \$120 to \$140 /hhld/year (current \$110 /hhld/year)

### Enhanced

**Service Options:**

Curbside Garbage & Landfill  
Active Promotion of Backyard Composting  
Single Family Curbside Recycling  
Multi-Family Recycling  
Curbside Seasonal Leaf & Yard (+ Christmas Tree) collection  
Permanent HHW Facility (less frequent operation)  
Curbside Bulky/White Goods Collection

**Supporting Mechanisms:**

Promotion & Education  
Goods Exchange Events  
Customer Reward Program  
Grass Ban  
Green Procurement Education  
Outreach Program  
User Pay for Garbage

**Enhanced**

Potential Diversion – 30% to 40%  
Cost - \$220 to \$240 /hhld/year\*

### Comprehensive

**Service Options:**

Curbside Garbage & Landfill  
Single Family Curbside Recycling  
Multi-Family Recycling  
Curbside Biweekly Leaf & Yard (+ Christmas Tree) collection  
Curbside Food Waste Collection  
Permanent HHW Facility (more frequent operation)  
Curbside Bulky/White Goods Collection

**Supporting Mechanisms:**

Promotion & Education  
Goods Exchange Events  
Customer Reward Program  
Grass Ban  
Green Procurement Education  
Outreach Program  
User Pay for Garbage  
Reduced Frequency of Garbage collection  
Mandatory Recycling

**Comprehensive**

Potential Diversion – 50% to 65%  
Cost - \$280 to \$320/hhld/year\*

\* If the Potential provincial Multi Material Resource Recovery Fund were to cover 50% of the costs of the household recycling program, then these costs would be reduced by about \$50 per household per year.

### IC&I Service Level Options

| <b>IC&amp;I Basic</b>  | <b>IC&amp;I Extended</b>   | <b>Items for Future Consideration</b>   |
|--|--|---|
| <p>IC&amp;I Sector Working Group</p> <p>Market Development</p> <p>City-Based Green Procurement</p> <p>Promoting Green Procurement in other Sectors</p> <p>Voluntary Diversion at Special Events</p> <p>School Waste Diversion Programs</p> <p>Diversion Assistance Program</p> | <p>IC&amp;I Basic</p> <p>+</p> <p>Voluntary LEED/BOMA Best Certification</p> <p>Voluntary Take Back</p> <p>Voluntary Food Waste</p> <p>Differential Tipping Fee (premium and discounted fees)</p> <p>Landfill Bans</p> | <p>Landfill Permits for Waste Haulers and Recyclers</p> <p>Mandatory IC&amp;I Waste Audits and Waste Reduction Plans</p> <p>Mandatory Recycling (covered under landfill bans)</p> <p>Packaging Bans</p> |

Note: The City provides an open landfill as service to the IC&I and C&D sectors.



### C&D Service Level Options

| <b>C&amp;D Basic</b>   | <b>C&amp;D Extended</b>   | <b>Items for Future Consideration</b>   |
|--|---|---|
| <p>C&amp;D Sector Working Group</p> <p>Market Development</p> <p>Green Building Technical Assistance</p> <p>Differential Tipping Fees*<br/>(premium/discounted fees)</p> | <p>Basic</p> <p>+</p> <p>C&amp;D Material Recycling Facility (MRF)</p> <p>LEED for Municipal Buildings</p> <p>LEED Certification for Private Sector Developments</p> <p>Landfill Bans</p> | <p>Mandatory Recycling (covered under landfill bans)</p> <p>Landfill Permits for Waste Haulers and Recyclers</p> <p>Mandatory Waste Reduction Plans</p> <p>Mandatory C&amp;D Recycling Targets</p> <p>Refundable Deposits on C&amp;D Projects</p> |

Note: The City provides an open landfill as service to the IC&I and C&D sectors.

\* The City already offers a differential tipping fee (discounted fee) for source separated shingles.

### ES-3 Sustainable Waste Management System Financing

Regina employs a traditional municipal cost and revenue allocation structure, with revenue from outside sources, such as landfill tipping fees, flowing directly into the General Fund and solid waste management costs, along with other departmental costs such as social services, being funded from the General Fund.

Following the adoption of a preferred waste management system for Regina, the City may face significant increases in costs associated with provision of its new waste management and diversion services. At this point it may be practical for the City to move away from the traditional funding model towards a utility type model.

Under a utility type model, the City would establish its waste management department into a “business unit” that captures all waste management revenues and costs. The City could apply a variety of approaches for charging residential waste management services including an annual flat fee, an annual fee for a chosen level of service (variable fees), etc.

The following table provides a summary of the various approaches for charging for residential waste management services that are available for consideration by Regina.

**Summary of Approaches for Charging for Waste Management Services**

| Issues   | Assessment Based (Property Taxes)   | Flat Annual Fee  | Annual Fee For Chosen Level of Service                                    | Fee for Individual Container/Bag Collection                               |
|--|-------------------------------------|--|---|---|
| Factor determining cost of waste management service to householder | Assessed value of property          | All households pay the same                                    | Size of garbage container selected  | Number and frequency of garbage containers or bags set out for collection |
| Mechanism for collecting revenue                                   | Tax bill                            | Included on tax bill as separate line item or separate invoice | Separate invoice or possibly included on tax bill as line item            | Sale of tags or stickers  |
| Administrative effort required to implement                        | None (this is status quo)           | Small  | Medium  | Medium  |
| Suitability for financing new diversion initiatives                | Not well suited                     | Well suited  | Well suited   | Less well suited than annual fees   |
| Incentive for additional diversion from disposal                   | None                                | None   | Yes, major incentive  | Yes, major incentive  |
| Potential to cause illegal dumping                                 | None                                | None   | Some  | Some  |
| Uncertainty associated with financing revenue stream               | Minimal                             | Minimal  | Minimal   | Some  |
| Constraints to implementation                                      | None (this is status quo)           | Small  | Medium  | Medium  |
| Early public acceptance  | Not applicable (this is status quo) | Low, due to regressive nature of fee                           | Medium, as residents given some choice and ability to control size of fee | Low, due to inconvenience of having to acquire and use tags               |
| Need for strong Council support and communication                  | None (this is status quo)           | High   | High  | High  |

A detailed description of the need for a different financing mechanism and potential financing systems used by other municipalities is provided in Section 6.

## ES-4 Implementation Considerations

The City will need to start planning for the implementation of its preferred waste management and diversion system. Implementation considerations include:

- Consulting on the Service Level Options and Waste Diversion Packages presented in this report and ultimately deciding on preferred packages for:
  - Residential Sector;
  - Industrial, Commercial and Institutional Sector;
  - Construction and Demolition Sector.
- If the City decides to provide the service, conducting a detailed implementation study on the provision of residential recycling services, collecting and processing services to address:
  - Materials to be collected;
  - Level of sorts – single stream or two streams;
  - Frequency of material collection;
  - Type of collection – automated or manual;
  - Who collects - public or private sector forces;
  - Who processes - private sector contractor or at a new public sector facility;
  - Marketing of materials - City staff or a private sector contractor;
  - Development of a communication strategy during launch of the enhanced program.
- Determining the timing of service level delivery, which may include a phased in approach.
- Moving towards a waste management utility and utilization of alternative revenues sources to fund provision of additional services.

These implementation considerations are further addressed in Section 7.

## ES-5 Project Consultation Process

Consultation plays a critical role in the development and successful implementation of a solid waste management master plan, and Waste Plan Regina is no exception. Therefore, a comprehensive public and stakeholder consultation was designed as a cornerstone of the project. Some of the key highlights of the consultation process are presented below.

### Residential Survey

The City of Regina surveyed 1,000 Regina residents in May 2008. The following are some highlights from this survey:

- The majority of respondents (97%) feel that the City provides very good waste management services;
- More than 85% of respondents feel strongly that it is important to reduce the amount of garbage going to landfills;
- Almost 70% felt that providing a convenient way to recycle materials through curbside recycling would have a lot of impact on their decision to recycle;
- Most respondents support by-laws, policies and programs to promote waste diversion by residents;
- About 90% of Regina residents support the introduction of bylaws requiring businesses to separate their recyclables for disposal; and

- Two thirds of the respondents were willing to pay up to \$10 per month (and in some cases more) for curbside recycling and over 60 percent were willing to pay up to \$10 per month (and in some cases more) for curbside food waste collection.

## Public Open House

On June 17<sup>th</sup> 2008 a Waste Plan Regina Open House was held at the City Hall Forum to introduce the project and the current waste management system to the public and to provide them with an opportunity to express their aspirations and expectations for the process through direct discussions with Regina staff and the Consultants. The Public Open House was very well attended with 110 attendees registering on the sign-in sheet. The majority of attendees identified their support for the planning process.

## Waste Plan Regina Website

The City launched a dedicated Waste Plan Regina website at [www.regina.ca](http://www.regina.ca) to provide the community with access to information about Waste Plan Regina and provide feedback through a dedicated Waste Plan Regina email. The website has been used extensively by Regina citizens and City staff have received over 600 emails and input from citizens through the website.

## Stakeholder Working Groups

To facilitate effective discussions and input with key stakeholder groups within the City, a series of four working groups was established in the early stages of the project. The four working groups include:

- Citizen's Working Group – comprised of residents and representatives from community organizations (e.g. community zone boards);
- IC&I Working Group – comprised of members from a variety of sector groups including Health, Education, Retail, Tourism, Food Services, Office Building (e.g. BOMA) and Chamber of Commerce.
- C&D Working Group – comprised of members from construction and demolition companies, the Homebuilder's Association, and reuse organizations (e.g. Habitat for Humanity Reuse Store);
- Waste Management Working Group – comprised of members of the local waste management and recycling industry.

The working groups, or in some cases individual sectors, met four times during key milestones in the project to provide advice, input and direction in the formulation of the service level options and waste diversion packages. These working groups played a major role in the Waste Plan Regina process, ensuring that the Plan reflects the needs, concerns and preferences of the different sectors.

## Elected Official Involvement

Throughout the process, the consultants maintained close working relations with the Elected Officials ensuring that they were kept abreast of all project milestones and activities. Information sessions with the Elected Officials were held five times throughout the project. This ensured that the Councillors could discuss the Waste Plan Regina with their constituents and knowledgeably address any questions or concerns that might arise. It also ensured that they continued to support the process and felt involved throughout.

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# 1. Introduction and Background

## 1.1 Background

Municipal solid waste can be a public health and environmental liability and, therefore, requires special attention to ensure that it is being managed in an appropriate and sustainable manner. To complicate matters, solid waste is also a societal issue, with potential impacts on neighbourhoods and communities from services delivered to them. Proper management requires a focused long term planning exercise.

In 1999 the City of Regina (City) adopted the report “A Solid Waste Management Plan for the City of Regina”, which established in principle the City’s solid waste management plan for meeting community needs over the next 20 years. Currently, the City operates an integrated solid waste management system using services, advocacy, and regulation to protect the natural environment and to achieve health and convenience for the citizens of Regina.

Since the completion of the last plan, public interest and demand for more diversion opportunities has increased. Also, the City is currently experiencing unprecedented growth. Along with these factors, City Council developed a new vision through a new Corporate Strategic Plan 2008-2012. The Plan envisions Regina to be Canada’s most vibrant, inclusive, attractive and sustainable community where people live in harmony and thrive on opportunity.

This vision will be realized by pursuing four strategic priorities:

- Strengthening the City’s infrastructure and managing its assets;
- Ensuring organizational capacity and effectiveness;
- Managing growth and community development; and
- Achieving operational excellence.

Each one of these strategic priorities will be achieved by completing a number of identified activities within several key areas of focus. The development of Solid Waste Management Plan has been identified as one of the key areas of focus in achieving operational excellence.

In addition the effective management of waste will contribute to the attractiveness of the City while waste diversion initiatives will help create a more sustainable community.

To meet these challenges, the City of Regina retained GENIVAR, in association with Kelleher Environmental, (Consultants) to assist in the development of an Integrated Solid Waste Management Plan (ISWMP), hereinafter referred to as Waste Plan Regina, to guide the City for the next ten years.

Direction was provided by key staff and elected officials to develop a long term, robust integrated waste management plan, to address future waste management and waste diversion needs and opportunities for the community.

## 1.2 Goals and Objectives

Waste Plan Regina was developed to meet growing challenges for the City’s Solid Waste Operations and considers all current solid waste management practices and options for future practices. The goals set out for Waste Plan Regina by the City are as follows:

- Ensure excellent public service to the community;
- Identify practices and processes to collect, dispose and reduce/divert waste from residential, industrial, commercial and institutional owners;
- Balance program affordability with public acceptance and expectations; and
- Emphasize the “5 Rs”: refuse, reduce, reuse, renew and recycle.

Waste Plan Regina was developed following these goals and using a holistic approach that addresses environmental, social, cultural, and economic implications of each option. In addition, the Plan pursues the three pillars of waste service delivery which include: public health, customer service and environmental protection. Planning was not restricted to “tried and true” options, but was extended to examine new, innovative, and alternative approaches that can help the City develop a long-term viable integrated waste management strategy.

Although the focus of Waste Plan Regina is residential waste, as this is where City has direct control through services, it is recognized that more than two-thirds of the waste is generated in the Industrial, Commercial and Institutional (IC&I) and Construction and Demolition (C&D) sectors. Therefore, Waste Plan Regina also considered options for the management, and in particular the diversion, of the key wastes from these sectors, recognizing that through better waste management planning and the development of diversion opportunities for specific materials the IC&I and C&D Sectors can demonstrate leadership and help decrease the need for disposal capacity.

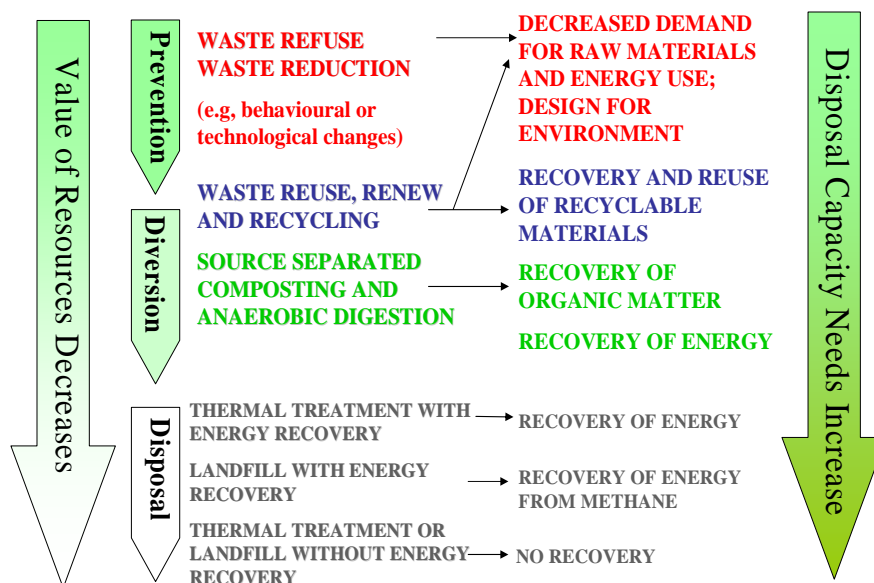
Waste Plan Regina is also consistent with the City’s solid waste management vision, by ensuring that the public’s health and safety needs are met and respects the five R’s hierarchy:

- Refuse – learn to refuse a packaging or product;
- Reduce – use less material, therefore lowering consumption of raw materials and generation of waste;
- Reuse – use the material again for the same or another purpose without significantly altering the physical form of the material;
- Renew – revitalize the existing product;
- Recycle – use the material to manufacture a new product; involves altering the physical form of an object to make a new object.

The Waste Value Chain, presented below, illustrates the hierarchical principles explored above.

Based on the City’s goals, objectives, and overall guiding principles, GENIVAR, in cooperation with City staff, the public and other key stakeholders, have developed Waste Plan Regina that will successfully service the City of Regina for a minimum of the next ten years.

## The Waste Value Chain





## 1.3 Overview of Project and Major Activities

The tasks undertaken for Waste Plan Regina are summarized below and discussed in detail in subsequent sections of this Report. The key tasks are as follows:

- Assembly of background information on the current waste management system and services and costs, including residential waste and diversion services, private sector waste and recycling services and the City's landfill;
- Development of a Long List of approximately 120 waste management & diversion service options, and waste diversion innovative practices that have been implemented or piloted in other North American communities;
- Evaluation and screening of the Long List and creation of a Short List of Waste Management and Diversion Practices for the residential, industrial/commercial/institutional (IC&I) and commercial/demolition (C&D) sectors;
- Grouping of the short listed measures into three Service Delivery Options for the residential sector and two Waste Diversion Packages for the IC&I and C&D sectors;
- Consideration of Sustainable Waste Management System Financing in order to fund the selected Service Delivery Options in the residential sector; and
- Consideration of implementation issues that the City will need to address in order to successfully implement the selected service delivery options to the residential sector, such as provision of collection and processing services, types of materials collected, etc.

Associated with each task were two main components: a consultation component and a technical component. These two components worked synergistically to provide key information and input into the process, with the input from each helping to shape subsequent tasks. These technical and consultation activities are summarized in the following sections of this report.

It is anticipated that, following the acceptance of this Report, the City will lead an extensive consultation effort on the identified Service Level Options for the residential sector and the Waste Diversion Packages for the IC&I and C&D sectors. Following this consultation period, City Council will select a preferred package for each sector to meet the needs of the City. It is anticipated that this decision will be made late in 2009 or early in 2010.

## 1.4 Overview of Project Organization

With the initiation of Waste Plan Regina, a Project Charter was developed to lead the project by defining the roles and responsibilities of staff and the communication requirements. The Project Charter outlines the governance structure of the project. This Project Charter is provided in Appendix A and summarized below.

Regina City Council ultimately governs Waste Plan Regina with more direct input from The Works and Utilities (WU) Committee.

The project is being lead by a Steering Committee, with input from a number of Working Groups. These Working Groups include:

- Internal Working Group;
- Citizen's Working Group;
- IC&I Working Group;
- C&D Working Group; and
- Waste Management Industry Working Group.

The Steering Committee and Working Groups are described below.

## Steering Committee

To ensure that Waste Plan Regina remained on course from the very beginning, a Project Steering Committee was established at the onset of the project. The Steering Committee has been responsible for implementing the project and reporting to the Elected Officials (i.e. Regina City Council, the WU Committee, and the Executive Leadership Team or ELT). Other responsibilities of the Project Steering Committee included:

- Review public consultation materials ahead of distribution/presentation/release/discussion with other groups/the general public;
- Review concepts/ideas/elements of Waste Plan Regina as they are developed;
- Assist in preparing evaluation criteria for use by the project team in evaluating various waste diversion options;
- Provide additional insight into what would/could/should be incorporated into Waste Plan Regina;
- Reaffirm and set goals and vision for future waste management;
- Define the decision-making process for the study;
- Participate in public consultation events as required (e.g. public liaison, project ambassadors, etc.); and
- Participate in regular team meetings and conference calls.

The Steering Committee is comprised of members listed in the Table below.

**Table 1-1 Steering Committee**

| Name            | Details                | Organization   |
|-----------------|------------------------|----------------|
| Derrick Bellows | Project Lead           | City of Regina |
| Robert Bjerke   | Planning & Development | City of Regina |
| Jeff Bohach     | Communications         | City of Regina |
| Trevor Lanz     | Quality & Innovation   | City of Regina |
| Michael Latoski | Project Manager        | City of Regina |

The Steering Committee held conference calls on a bi-monthly or monthly basis throughout the duration of the project. During these meetings the most recent project status report and minutes of the previous meeting were reviewed and upcoming tasks and any issues at hand were discussed. In addition, Steering Committee meetings were also convened at key decision points throughout the projects to make critical decisions.

## Internal Working Group

The Internal Working Group consisted of members of City departments that may be affected by Waste Plan Regina. They were consulted by the Steering Committee throughout the planning process to provide insight on the implications Waste Plan Regina would have on the City and the feasibility of the suggested waste management and diversion measures.

The Internal Working Group is comprised of members listed in the Table below.

**Table 1-2 Internal Working Group**

| Name          | Details                 | Organization   |
|---------------|-------------------------|----------------|
| Lisa Adam     | Communications          | City of Regina |
| Kim Sare      | Sustainable Communities | City of Regina |
| John Anderson | Fleet                   | City of Regina |

**Table 1-2 Internal Working Group**

| <b>Name</b>        | <b>Details</b>            | <b>Organization</b> |
|--------------------|---------------------------|---------------------|
| Les Malawski       | Materials                 | City of Regina      |
| Doug Richardson    | Finance                   | City of Regina      |
| Cheryl Willoughby  | Legal                     | City of Regina      |
| Scott Cameron      | Facilities                | City of Regina      |
| Sheila Harmatiuk   | Government Relations      | City of Regina      |
| Gary Nieminen      | Environmental Engineering | City of Regina      |
| Laurie-Anne Rusnak | Human Resources           | City of Regina      |
| Janice Solomon     | Community Services        | City of Regina      |

### External Working Groups

The External Working Group was initially formed as one group of external stakeholders, including members of the public, commercial sector, construction sector, waste management industry sector, etc. Over time, as the project evolved, it became apparent that the public consultation process favoured dividing the broad based External Working Group into smaller sector-based working groups. This approach benefited the project by enabling the consultants to focus each sector group on the issues and options specific to their needs, resulting in clearer input and direction from each sector group.

The External Working Group evolved into four sector-based working groups including: Citizen’s Working Group, IC&I Working Group, C&D Working Group, and Waste Management Industry Working Group. These Working Groups were consulted at key milestones of the project to provide input as to which solid waste management and diversion measures were suitable to carry through the planning process.



## 2. Current Waste Management System

### 2.1 City of Regina Overview

The City of Regina is located in southeast Saskatchewan and is the Provincial Capital with a population of 179, 246 within the City limits (based on 2006 Statistics Canada data). As of 2006, there were 78, 692 private residences within the City limits.

The City of Regina has been experiencing unprecedented economic growth over the past decade becoming one of Canada's fastest growing economies. The GDP of Regina in 2007 was \$7.7 Billion.

According to the Regina Regional Economic Development Authority, the economy of Regina consists of seven key sectors: Steel and Manufacturing, Information Technology, Film & Interactive Media, Energy & Environment, Finance & insurance, Government Services and Agri-business.



### 2.2 Provincial Stewardship Programs

The Government of Saskatchewan has initiated numerous Extended Producer Responsibility (EPR) or Stewardship programs in the province, targeting a wide range of materials. The programs are summarized in Table 2-1 and described below.

**Table 2-1 Provincial Stewardship Program**

| Name of Program                                     | Date of Implementation | Materials Targetted  | Program Specific Fees  |
|---|------------------------|--|--|
| Beverage Container Collection and Recycling Program | 1988                   | <ul style="list-style-type: none"> <li>• Aluminum Cans;</li> <li>• Plastic Bottles (Non-dairy);</li> <li>• Glass Bottles;</li> <li>• Juice Boxes/Cartons; and</li> <li>• Refillable Beer Bottles.</li> </ul> | Consumers pay a deposit on the beverage containers at the point of purchase ranging from \$0.05 to \$0.40 which are partially redeemed when returned to the SARCAN depot |
| Scrap Tire Program                                  | 1996                   | <ul style="list-style-type: none"> <li>• Passenger car/light truck tires;</li> <li>• Medium/semi truck tires;</li> <li>• agriculture vehicle tires;</li> <li>• off-road tires</li> </ul>                     | A Tire Recycling Fee is collected which ranges from \$3.50 to \$35 per tire, depending on size of the tire   |
| Used Oil Material Recycling Program                 | 1997                   | <ul style="list-style-type: none"> <li>• Used Oil;</li> <li>• Oil Filters;</li> <li>• Oil Containers</li> </ul>  | First sellers are charged an Environmental Handling Charge which is paid to the Saskatchewan Association for Resource Recovery Corporation (SARRC)                       |
| Post-Consumer Paint Stewardship Program             | 2006                   | <ul style="list-style-type: none"> <li>• Used paints and empty paint can;</li> <li>• Varnishes &amp; Urethanes;</li> <li>• Stains;</li> <li>• Driveway Sealers,</li> </ul>                                   | Consumers pay an Environmental Handling Fee at the time of purchase which pays for collection at SARCAN depots   |

**Table 2-1 Provincial Stewardship Program**

| Name of Program                                 | Date of Implementation | Materials Targetted   | Program Specific Fees  |
|---|------------------------|---|--|
|   |                        | <ul style="list-style-type: none"> <li>• etc.</li> </ul>  |  |
| Saskatchewan Waste Electronic Equipment Program | 2007                   | <ul style="list-style-type: none"> <li>• Desktop Computers;</li> <li>• Notebook Computers;</li> <li>• Monitors;</li> <li>• Televisions</li> <li>• Printers</li> </ul> | Consumers pay an Environmental Handling Fee ranging from \$5 to \$45 depending on the electronic product which is used to fund the program |

### 2.2.1 Beverage Container Collection and Recycling Program

The Beverage Container Collection and Recycling Program was launched by the Saskatchewan Ministry of Environment in 1988 to provide consumers throughout the province with a convenient way to recycle their beverage containers. The program targets non-refillable beverage containers sold throughout Saskatchewan including:

- Aluminum Cans;
- Plastic Bottles (Non-dairy);
- Glass Bottles;
- Juice Boxes/Cartons; and
- Refillable Beer Bottles.

SARCAN Recycling, a division of the Saskatchewan Association of Rehabilitation Centers, has been contracted by the Saskatchewan Government to operate Saskatchewan’s Beverage Container Collection and Recycling Program. Consumers pay a deposit on designated beverage containers at the point of purchase and then redeem them at SARCAN depots after use. SARCAN currently operates 71 recycling depots throughout the province of Saskatchewan with five of these located in the City of Regina.

### 2.2.2 Scrap Tire Program

The Saskatchewan Scrap Tire Corporation Program (SSTC) is a stewardship program launched in 1996 targeting passenger car, light truck, medium truck, agricultural, and OTR/mining tires. The mandate of the SSTC Board is to remove scrap tires from all municipal landfills by 2010, then focus on cleaning up private tire stockpiles (the City of Regina has never stockpiled tires at its landfill). There are approximately 1,200 tire retailers involved in collection and recycling of approximately one million tires per year.

The tire retailers remit a Tire Recycling Fee, a form of Environmental Handling Fee that funds the entire SSTC program. The fee is collected on passenger car/light truck, medium/semi truck, agriculture and off-road tires. The levy ranges from \$3.50 to \$35 per tire, depending on size of the tire.

### 2.2.3 Used Oil Material Recycling Program

Saskatchewan Association for Resource Recovery Corp (SARRC) was established in 1997 as a province-wide used oil materials collection system that meets the requirements of the Saskatchewan used Oil Collection Regulations. The purpose of the program is to maximize the cost effective collection of used oil, filters and containers in Saskatchewan. Materials collected in the program include:

- Used oil – any petroleum or synthetic crankcase oil, engine oil, hydraulic fluid, transmission fluid, gear oil, heat transfer fluid or other fluid used for lubricating purposes in machinery or equipment;

- Oil filters – any spin-on or element oil filter used in hydraulic, transmission or internal combustion engine applications - includes diesel fuel filters but does not include gasoline fuel filters; and
- Oil containers – any plastic container with a capacity of less than 30 litres that is manufactured to hold oil.

The program is funded by industry that remits an Environmental Handling Charge (EHC) to SARRC. The EHC is charged on the first sellers, which is \$0.05 per litre for lubricating oil, \$0.05 per litre of container size for oil containers and the charge for oil filters is \$0.50 per filter under 203 mm (8") inches in length, and \$1.00 per filter equal or greater than 203 mm (8") in length.

#### 2.2.4 Post-Consumer Paint Stewardship Program

The Product Care Association established Saskatchewan Post-Consumer Paint Stewardship Program in April 1, 2006. Prior to 2006, paint was recycled in Regina through the Paint It Recycled Program. This program was a joint venture between the City of Regina and SaskTel. This program consisted of six annual public events located at shopping centres in Regina. At these events, residents of Regina could turn in paint and empty paint cans.

In 2006 SARCAN took over paint recycling and the Paint It Recycled Program was discontinued. In Saskatchewan, SARCAN is responsible for operating the paint recycling program in this province. Consumers and trade painters can drop off unwanted household paint and other materials (see the list below) at any of the 70 SARCAN depots across the province.

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Interior &amp; Exterior: latex, acrylic, water-based, alkyd, enamel and oil-based paints</li> <li>• Empty paint cans</li> <li>• Varnishes &amp; urethanes (single component)</li> <li>• Stains</li> <li>• Barn, fence &amp; porch paints</li> <li>• Concrete paints</li> <li>• Deck &amp; floor paints (including Elastomeric)</li> <li>• Drywall paints</li> <li>• Primers</li> <li>• Undercoats</li> <li>• Driveway (non-tar based) paints &amp; sealers</li> <li>• Block fillers</li> </ul> | <ul style="list-style-type: none"> <li>• Wood finishing oils &amp; stains</li> <li>• Rust paint</li> <li>• Stucco paint</li> <li>• Paints for metal</li> <li>• Wood &amp; masonry water repellents</li> <li>• Marine paint (containing no pesticides)</li> <li>• Non-catalyzed &amp; non-nitrocellulose lacquers</li> <li>• Paint aerosols of all types, including automotive and industrial products</li> <li>• Stain blocking paints</li> <li>• Shellac</li> </ul> |
|---|--|

Eco fees, remitted by Product Care's industry partners, are the sole source of funding for this program. Product Care members, based on their unit sales in the provinces, pay the Eco fees. The industry in turn charges consumers an environmental handling fee (EHF) at the time of purchase. These fees are either shown separately or included in the product price and subject to GST. The PST does not apply to eco-fees if the paint retailer separates them on a sales receipt. The government does not collect any part of this eco-fee.

#### 2.2.5 Saskatchewan Waste Electronic Equipment Program

Launched on February 1, 2007, the purpose of the Saskatchewan Waste Electronic Equipment Program (SWEEP) is to provide the collection and recycling of obsolete electronic equipment under the Environmental Management and Protection Act. Materials Targeted by the program include:

- Desktop computers (central processing units, mouse, keyboards, cables);
- Notebook computers (notebook, laptop, tablet PCs);
- Monitors (includes CRTs and flat panel display);
- Televisions (includes CRT, flat panel or rear projection); and



- Printers (includes laser, LED, ink jet, dot matrix, thermal, dye sublimation, copy, fax, print, etc.).

An Environmental Handling Fee (EHF), funds this program. The designated electronic equipment Environmental Handling Fees that consumers pay at the point of purchase is:

- Desktop computers – \$10.00
- Notebook computers – \$5.00
- Computer monitors – \$12.00
- Desktop printers – \$8.00
- Televisions – range between \$15 to \$45 depending on size

### 2.2.6 Multi-Material Resource Recovery Fund (Pending)

The Province of Saskatchewan is currently investigating the logistics of implementing a stewardship program targeting consumer paper and packaging materials. The Multi-Material Resource Recovery Fund will aim to offset a portion of municipal operating costs for residential recycling programs. One concept being explored is to establish the funding program to defray up to 50% of the municipal operating costs for household recycling programs. No date has been identified for program implementation.

## 2.3 Residential Waste Management in Regina

### 2.3.1 Residential Garbage Collection System

Until recently, the City of Regina employed three methods of residential garbage collection:

- Residential Manual Collection – City crews manually collected garbage from the curb using rear-loading compaction trucks. Residents who received manual garbage collection were subject a material limit of 8 garbage bags or 23 kilograms. This service was completely discontinued in May 2009 with the conversion to Residential Automated Front Street Collection.
- Residential Automated Front of Street Collection – This service, recently introduced to the City of Regina, consists of automated garbage collection. As part of this service, residents are provided with 360-litre rollout garbage carts that need to be placed on the front street property line once weekly for collection. Approximately 34,000 homes receive this service.
- Residential Mechanical Collection – For residents with back alleys, garbage collection is provided through large steel garbage containers located in the alleys. These containers are emptied mechanically once weekly using side-loading trucks. Approximately 26,000 homes receive this service. Plans call for this service to be phased out, as the required collection equipment is no longer available.

City crews provide all curbside and back alley residential garbage collection services.

### 2.3.2 Residential Waste Diversion System

Over the years, the City of Regina has implemented many waste diversion programs. The Solid Waste Collection Branch of the City maintains and governs all waste diversion programs through its Waste Minimization Unit. This Unit works closely with Solid Waste Collection, Solid Waste Disposal, and other branches to provide the residents of Regina with waste diversion opportunities and education. The Waste Minimization Unit in the City of Regina manages the following waste diversion programs:

- Big Blue Bin – residential paper recycling program;
- Tinsel Mulch – residential natural Christmas tree composting;
- Backyard Composting Program – residential organic diversion;
- thINK Food – residential inkjet cartridge recycling;
- Call2Cycle – a national stewardship program for used batteries;



- School Visits – over 50 schools visited in 2007;
- Public Events – numerous displays, parades and media appearances; and
- Special Events – Household Hazardous Waste events.

According to the 2006 and 2007 City of Regina Omnibus Surveys, residents of Regina are becoming more interested in the environment. When asked to rate the importance of various issues, residents rated environment third in 2006, second in 2007, and third in 2008. As residents are becoming more interested in the environment, the push for further recycling and waste diversion is also becoming apparent.

The most recognizable programs provided by The Waste Minimization Unit are the Big Blue Bin and Tinsel Mulch programs, discussed below.

### Big Blue Bin

The Big Blue Bin program provides residents with an option to recycle paper and cardboard. Big Blue Bins are situated at 13 locations around the City where residents can drop off paper and cardboard. In addition, the program utilizes six Baby Blue Bins to provide access in areas with limited space. Residents respond well to this program and participation in the Big Blue Bin Program continues to increase. It is estimated that over 600,000 visits to the Bins occur each year from residents and businesses.

Diversion of paper and cardboard from the waste stream displaces the need for raw materials to be harvested and, as a result, 87,761 trees were spared in 2005, followed by 92,501 trees in 2006, 98,223 trees in 2007, and 95,550 trees in 2008. The paper and cardboard captured through the Big Blue Bin Program are used to make other paper products, such as egg cartons. The amount of paper and cardboard recycled over the last three years was enough to make 81,308,412 cartons in 2005, followed by 85,699,063 cartons in 2006; 91,000,967 cartons in 2007; and 88,524,588 cartons in 2008.

While the Big Blue Bin Program generates some revenue for the City, it does not cover the costs to operate the program. Over the last three years, the revenue from the sale of paper has declined from \$40/tonne to \$35/tonne in 2007 and 2008. At the same time, the cost to operate the program has increased, as has participation in the program.

### Tinsel Mulch Program

The Tinsel Mulch Program provides residents with the option of diverting used Christmas trees from the landfill, and instead diverting the resources for the creation of mulch. The City picks up the trees curbside, following the holiday season, and then grounds the trees into mulch. The mulch is then available for residential use through “distribution” days.

The Tinsel Mulch Program collected over 6,612 trees in 2006, 4,173 trees in 2007, and 4,503 trees in 2008. Over the years, the amount collected has been declining. It is suspected that the drop in trees is due to the increasing use of artificial trees, although no formal studies have been conducted to confirm this observation.

### Private Sector Recycling Services

The City of Regina does not currently offer residential curbside recycling collection. Consequently, private sector businesses have developed to provide this service to interested residents at a cost of approximately \$120 per household per year. Currently, Crown Shred and Recycling and Go Green Recycling are the two companies that provide curbside collection of recyclable materials to the citizens of Regina. The following materials are collected on a bi-weekly basis:

- Containers in blue box 1 including: aluminum containers & tin cans, milk cartons & jugs, plastic beverage containers, cereal box bags plastic bags, and household plastics 1 – 7.
- Fibres in Blue box 2 including: corrugated cardboard and box board, brown paper bags & tissue roll cores, magazines & catalogues, telephone books, junk mail & fliers, letter quality paper and gift wrap & packaging.

## Backyard Composting

Organics accounts for up to 50% of the residential waste stream, and are something which can be managed at the point of generation. Composting on-site removes this valuable material from the waste stream, saves space in the landfill and reduces the use of fossil fuels for waste transport. In addition, composting returns nutrients and moisture to the soil, improves soil consistency, and impedes weed growth, all without the use of herbicides, fertilizers, and excessive watering.

In order to assist residents of Regina in becoming successful composters, the City held 25 backyard composting classes in 2006, another 10 sessions in 2007, and seven sessions in 2008. In addition, the City often raffles off compost bins and manual mowers for the use of grasscycling at various events. As well, the City promotes a booklet, "Your Guide to Composting" to assist residents with getting started at backyard composting and troubleshooting.

## White Metal Goods Recycling Program

The City of Regina operates a white goods recycling program at its landfill. This program is a depot style service where residents deliver the materials to the landfill. Once delivered, City employees will decommission old appliances, remove Freon from refrigerators, and collect and sell the scrap metal. Between 2006 and 2008, this program has diverted approximately 2,700 tonnes of material and generated \$246,000 in gross revenue.

### 2.3.3 Other

#### Household Hazardous Waste (HHW) Event

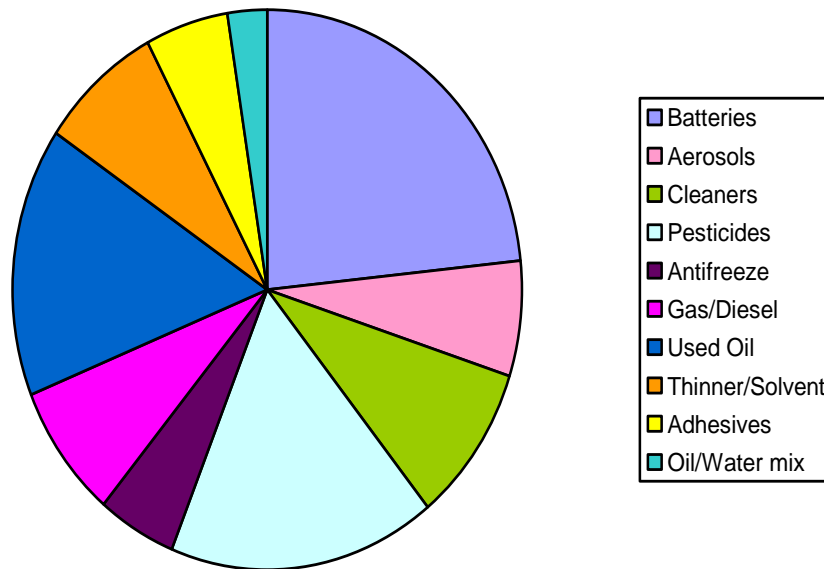
In 2007 and 2008, the province of Saskatchewan, through Product Care, sponsored Household Hazardous Waste (HHW) Events throughout Saskatchewan as part of a pilot study. The City of Regina applied for participation in the program and was accepted.

Each HHW event was held at the City of Regina Public Works Yard. The City advertised the event about two weeks prior using a wide variety of media including newspaper, radio, public service announcements and the City website. The events were well attended with the 2008 reporting 320 vehicles attending. The majority of participants heard about the event through newspaper and radio advertisements.

The total cost to the City of Regina was \$5,065.04, with the majority of this going to advertising (\$4,712.96). As part of the partnership, the City was not responsible for the costs associated with the transportation, recycling, or disposal of the materials collected. The Government of Saskatchewan through Product Care spent a total of \$14,555.23 on the event. This went to Envirotec, who was contracted for materials handling/disposal. The amount covered staffing, transport and disposal/recycling of the collected HHW products. The total cost for the event, including the amount covered by Product Care, was \$19,825.83.

The events captured and estimated 5.53 tonnes of household hazardous waste in 2007 and 9.27 tonnes in 2008, effectively eliminating it from improper storage, handling, and disposal. The majority of the waste captured was in the form of disinfectants, cleaning agents, degreasers, paint and paint products, insecticides, adhesives, and oil. Figure 2.1 shows the composition of HHW collected at the 2008 event.

**Figure 2.1 Composition of Hazardous Waste Collected by Category**



The City also has information readily available on alternatives to household hazardous substances, in the form of a booklet, “Safe Solutions for Your Home”. This information is provided to help residents identify environmentally friendly, alternative products (such as green cleaners) thus avoiding the generation of hazardous waste altogether.

### Promotion and Education and Outreach

The City’s Waste Minimization Unit is most recognized by the Big Blue Bin and Tinsel Mulch programs; however, the Unit goes far beyond this to assist Regina residents in the protection of the environment. The Unit provides fundraising opportunities to non-profit organizations whenever possible by offering time, assistance, and often equipment to facilitate special events.

### Partnerships

The Waste Minimization Unit works very closely with the non-profit sector and service clubs (e.g. Girl Guides of Canada, Street Culture Kidz, and the Regina Rotary Club) to give back to the community whenever possible. For example, the Unit assisted the Girl Guides in the 2006, 2007, and 2008 Buffalo Days Parade and Santa Clause Parade, and also volunteered time at the 2006 and 2007 Cathedral Children’s Art Festival.

The Waste Minimization Unit understands that environmental protection requires a joint effort from all stakeholders, and for this reason, maintains other professional partnerships. The Unit counts on the Saskatchewan Waste Reduction Council to provide up-to-date information on all waste diversion initiatives across Saskatchewan, and maintains regular contact with regulatory agencies, private and non-profit businesses in the waste diversion industry, and industry operated stewardship programs. This partnership enables the Waste Minimization Unit to provide the public with information on current and future initiatives and programs, through the dissemination of pamphlets and informational materials.

In addition, the Unit works with industry to distribute collection boxes to City Hall and other City facilities for the collection of inkjet cartridges, cell phones, and rechargeable batteries, which are then recycled through the external programs: thINK Food and Call2recycle.

### *Participation at Public Events*

The Waste Minimization Unit provides waste diversion information materials to various events, when requested, and often maintains a booth at public events. The Unit occupied a booth at the 2006, 2007, and 2008 Buffalo Days Exhibition and Agribition, as well as the 2007 Composting Week event held at SaskPower. The Unit also participated in judging the 2006 and 2007 Winston Knoll Collegiate Science Expo.

The Waste Minimization Unit purchases compost bins constructed by the Girl Guides and the Street Culture Kidz and raffles off these bins at public events and classes.

### *School Visits*

The Waste Minimization Unit visits classrooms at Regina's elementary and high schools every year to teach students about the importance of waste minimization and practical steps that can be taken to protect and conserve the environment.

In 2006, a total of 40 classrooms were visited: 26 elementary schools and 14 high schools. In 2007, 52 classroom visits were made; of these visits, 32 were at elementary schools and 20 were at high schools. No school visits were conducted in 2008.

## **2.4 IC&I / C&D Waste Management**

### **2.4.1 IC&I / C&D Garbage Collection System**

#### *City Services*

In addition to residential waste collection, the City of Regina offers minimal commercial waste collection. This service is limited to a small number of apartments, condominiums, institutions (including the City of Regina Corporately), and small businesses. The City does not have an interest in competing with the private sector companies which also provide waste and recycling collection service to the business community and is working towards reducing the level of commercial service provided. In 2008, the City's Commercial Collection Unit had 250 remaining contracts, representing less than 5% of the commercial marketplace.

The commercial collection operation within the City of Regina's Solid Waste Management Division operates on a cost recovery basis.

#### *Partnership with Bylaw Enforcement*

The City of Regina's Commercial Collection Unit has partnered with its Bylaw Enforcement Division to provide support for community programs. The Commercial Collection Unit provides waste containers and/or access to the City Landfill to certain community groups. These groups help keep Regina beautiful by collecting refuse that has been illegally dumped in back alleys and in other areas that the City's trucks cannot access.

Over the last three years, Bylaw Enforcement has contracted nine groups to assist with various neighbourhood cleanups as part of this partnership resulting in 342 tonnes of material in 2006 and 528 tonnes in 2007 being collected off the streets. One of the key groups contracted by the City is a youth restitution program by the name of the Atoskata Program. In 2006, the Atoskata Program collected 348 loads (270 tonnes) of illegally dumped bulky and waste material. This number increased in 2007 to 467 loads with 474 tonnes of material disposed.

#### *Litter Control*

The City of Regina Commercial Collection Unit is responsible for all public litter containers throughout the City. There are currently 57 litter containers in the downtown area and eight along Albert St. The City's manual rear loader is utilized one day per week for litter control (when not being used for commercial or residential collection).

## Private Sector Collection

With the exception of the condominiums and small businesses previously mentioned, the City of Regina does not provide garbage or recycling collection services to the IC&I and C&D Sectors. Private sector companies such as Loraas Disposal, Crown Shred and Recycling, Waste Management, Teradon Disposal, and Secureshred provide this service to the business community.

### 2.4.2 IC&I / C&D Waste Diversion System

Waste diversion for the IC&I and C&D sectors in Regina is primarily provided by the same companies who deliver commercial waste removal. In addition, Crown Shred and Recycling and Secureshred provide paper and cardboard recycling services for businesses either through regular collection of bagged office paper or with steel waste containers labeled “Cardboard Only”.

The C&D industry asserts that, in order to control costs, they actively pursue waste minimization projects on-site. They have achieved this by employing construction practices that use materials efficiently. In addition, the City provides services and incentives at the landfill to encourage diversion of C&D wastes. Incentives include zero tipping fees for the delivery of clean loads of asphalt, concrete, gravel, brick and fill dirt. Furthermore, clean loads of asphalt shingles are subject to a reduced tipping fee. The City has begun stockpiling shingles at the landfill in anticipation of future recycling opportunities.

## 2.5 Landfill Disposal

### Landfill Site

The City of Regina Landfill is located in the northeast quadrant of the city at the corner of Fleet Street and McDonald Street (and is also referred to as the Fleet Street Landfill). The total number of vehicle transactions has increased over the last four years from 137,128 in 2006 to 178,097 vehicles in 2008, with an average load of 3.48 tonnes and 3.62 tonnes, respectively. Table 2-2 outlines the general annual operating statistics for the landfill from 2005 through 2008.

**Table 2-2 General Annual Operating Landfill Statistics**

|                               | 2005        | 2006        | 2007        | 2008        |
|-------------------------------|-------------|-------------|-------------|-------------|
| Tonnes Delivered              | 478,474     | 510,965     | 550,418     | 645,456     |
| Vehicle Transactions          | 137,128     | 141,660     | 117,645     | 178,097     |
| Average Vehicle Load (tonnes) | 3.48        | 3.61        | 4.68        | 3.62        |
| Revenue*                      | \$5,741,195 | \$6,400,461 | \$6,831,026 | \$8,973,930 |

\* Landfill revenues include an estimation of revenue for residential collection transferred from the City of Regina General Fund. This value is estimated as the total tonnes of residential waste collected multiplied by the tipping fee for the year.

Landfill tipping fees for waste have increased from \$30.90/tonne in 2005 to \$38.00/tonne in 2009. Table 2-3 outlines the tipping fees for landfill users from 2005-2009.

**Table 2-3 History of Landfill Tipping Fees**

|  | 2005            | 2006            | 2007            | 2008            | 2009            |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| Waste  | \$30. 90/ tonne | \$33. 00/ tonne | \$33. 00/ tonne | \$36. 00/ tonne | \$38. 00/ tonne |
| Clean asphalt, concrete, gravel, brick & fill dirt | \$0             | \$0             | \$0             | \$0             | \$0             |
| Mixed asphalt / concrete                           | N/A             | N/A             | \$33. 00/ tonne | \$36. 00/ tonne | \$38. 00/ tonne |
| Shingles   | N/A             | N/A             | \$33. 00/ tonne | \$18. 00/ tonne | \$19. 00/ tonne |
| Cars   | \$5.00          | \$5.00          | \$5.00          | \$5.00          | \$5.00          |
| Half Tons  | \$5.00          | \$5.00          | \$5.00          | \$5.00          | \$5.00          |
| Weigh In Only                                      | \$10.00         | \$10.00         | \$10.00         | \$10.00         | \$10.00         |

Landfill deliveries have increased from 2005 to 2008 with 478,474 tonnes in 2005 rising to 645,456 tonnes in 2008.

Clean concrete, although accepted at the landfill, is recycled. The amount of clean concrete received for recycling has remained relatively consistent between 2006 and 2008. In 2006, 48,374 tonnes of concrete was received for recycling, followed by 48,412 tonnes in 2007 and 48,578 tonnes in 2008.

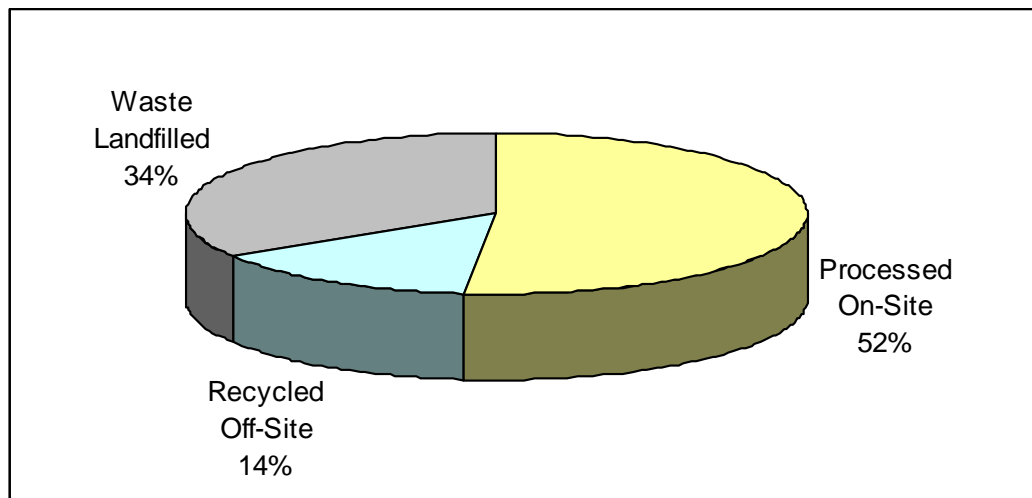
The landfill also operates a White Metals Program, in which appliances are accepted for recycling. In addition, the Small Vehicle Transfer Station has two bins dedicated to the collection of metals for recycling. In 2006, 742 tonnes of metal was recycled, generating \$62,089 of revenue. White goods accounted for 224 tonnes of the total metal recycled, with scrap metal making up the rest. In 2008, 938 tonnes of metal was recycled, generating revenue of \$109,611. White goods accounted for 432 tonnes of the total metal recycled, with the remainder coming from scrap metal.

The following table outlines the main commodities delivered to the landfill and the tonnage from 2005-2008. Figure 2.2 shows the percentage of commodities received at the landfill by category for 2008.

**Table 2-4 Commodities: Annual Tonnes Received to Landfill**

| Commodity                                       | Description                               | 2005           | 2006           | 2007           | 2008           |
|---|---|----------------|----------------|----------------|----------------|
| <b>Processed On-Site (e.g. roads and cover)</b> |   |                |                |                |                |
| Fluff   | Upholstery from automobiles               | 1,271          | 1,252          | 2,820          | 3,309          |
| Reject Dirt                                     | Wet excavation material                   | 11,205         | 20,165         | 29,536         | 23,088         |
| Fill Dirt                                       | Clean dirt                                | 186,801        | 191,517        | 205,329        | 307,507        |
| <b>Subtotal</b>                                 | <b>199,277</b>                            | <b>212,934</b> | <b>237,685</b> | <b>333,904</b> | <b>199,277</b> |
| <b>Recycled Off-site</b>                        |   |                |                |                |                |
| Asphalt & Concrete                              | Recyclable material                       | 101,213        | 65,493         | 62,496         | 44,385         |
| Clean Concrete                                  | Clean concrete only                       | N/A            | 48,374         | 48,412         | 48,578         |
| <b>Subtotal</b>                                 | <b>101,213</b>                            | <b>113,867</b> | <b>110,908</b> | <b>92,963</b>  | <b>101,213</b> |
| <b>Garbage Landfilled</b>                       |   |                |                |                |                |
| Asbestos  | Dangerous material, permitted entry       | 190            | 322            | 112            | 47             |
| Grit  | Sewage treatment plant effluent           | 772            | 455            | 479            | 407            |
| Sweepings                                       | Street dirt                               | 3,569          | 4,041          | 7,586          | 7,615          |
| Rubble  | Waste material from construction          | 47,870         | 65,460         | 62,848         | 43,548         |
| Garbage   | Most other material intended for disposal | 123,474        | 111,549        | 126,689        | 159,127        |
| Other   | Not included in other categories          | 2,110          | 2,338          | 4,111          | 7,846          |
| <b>Subtotal</b>                                 |   | <b>177,985</b> | <b>184,165</b> | <b>201,825</b> | <b>218,590</b> |
| <b>TOTAL</b>                                    |   | <b>478,474</b> | <b>510,965</b> | <b>550,418</b> | <b>645,456</b> |

**Figure 2.2 Percentage of Commodities Received at Regina’s Landfill by Category in 2008**



### Landfill Expansion

The current Fleet Street Landfill is expected to reach capacity within three years. The Landfill will be undergoing an expansion with Phase 1 of the Landfill Expansion expected to be ready to receive waste by October 2010, subject to regulatory approval.

### Landfill Gas Plant

The City of Regina unveiled the new landfill gas collection system at the Fleet Street Landfill in fall 2007. Currently landfill gas is flared daily, reducing the GHG atmospheric contributions.

The system consists of 27 wells, which were placed in the northern part of the Landfill, a blower building, and a flare. The wells collect methane gas, which are taken to the flare via the blower building. While landfill gas is currently being flared, a utilization project is underway.

Landfill gas is generated when organic waste decomposes and typically consists of approximately 50% methane and 50% carbon dioxide. Methane is a potent greenhouse gas that has 21 times the global warming potential than carbon dioxide. The new collection system will help to reduce potentially harmful greenhouse gas emissions by transforming methane to carbon dioxide and will provide a means for potential use of landfill gas as an energy source.

The landfill gas plant is currently extracting and flaring approximately 1,400 tonnes of methane per year. This is the equivalent of 80 tonnes of carbon dioxide destroyed per day.

### Landfill Gas Utilization

The City of Regina has developed a partnership with the company to transform methane gas into solar hydrogen energy. The City will accumulate greenhouse gas credits as a result of the destruction of landfill gas methane. The credits could in the future generate an estimated \$80-100,000 per year.

## 2.6 Current System Revenues and Costs

The current Regina waste management system is primarily comprised of providing waste collection services to the single family residential sector using a variety of approaches and operation of a regional landfill that accepts waste from the Residential Sector, the IC&I Sector, the C&D Sector within Regina and waste from a number of surrounding municipalities. In addition, a limited commercial sector collection is provided on a cost recovery basis to a small number of multi-family buildings, City facilities, institutions and small businesses. Waste minimization services include contracting for the operation of the



“Big Blue Bin” depot recycling services, operating the annual Christmas tree “Tinsel Mulch” program, along with some waste reduction education and promotional activities.

The costs for the provision of solid waste management services are captured in the City’s activity based accounting system. The costs for 2004 to 2008 are summarized in Table 2-5. Each of the activity accounts summarized in Table 2-5 is further broken down into individual expense codes (e.g. 61110 Regular Pay – Permanent or 84040 Allocated Fleet Costs). The allocated cost for items such as fleet includes operating costs for items such as fuel maintenance and insurances as well as the amortization of the capital costs of the vehicle. In addition to capturing costs, certain activities, such as commercial collections and sanitary landfill operations, also capture revenues earned by these activities. These revenues, although reported in the cost accounting system, flow into general city revenues and are not used directly to offset the cost of delivering the activity. These revenues are also illustrated in Table 2-5.

**Table 2-5 Estimated 2004 – 2008 Solid Waste Management Revenues & Expenses**

| Revenue *                                      | Actual Year End Revenue and Expenses |                  |                  |                  |                  |
|--|--------------------------------------|------------------|------------------|------------------|------------------|
|  | 2004                                 | 2005             | 2006             | 2007             | 2008             |
| General Fund Transfer                          | 1,615,707                            | 1,701,223        | 1,962,081        | 1,923,955        | 2,750,400        |
| E071 - Commercial Collection                   | 278,175                              | 267,392          | 275,259          | 261,249          | 317,225          |
| E101 - Landfill Charges                        | 3,073,108                            | 3,335,518        | 3,728,869        | 4,171,306        | 5,167,985        |
| E101 - Metal Recycling                         | 45,736                               | 39,580           | 62,089           | 74,536           | 109,611          |
| E101 - Allocated Landfill Disposal Costs       | 212,387                              | 182,662          | 190,280          | 193,265          | 298,431          |
| E103 - Landfill Gas Collection & Flare System  | -                                    | -                | -                | 25,000           | 26,402           |
| E103 - Greenhouse Gas Credits                  | -                                    | -                | -                | -                | 39,710           |
| E125 - Paint Recycling (Sask-Tel share)        | 9,346                                | 9,346            | -                | -                | -                |
| E130 - BBB Paper Recycling                     | 210,821                              | 204,124          | 181,083          | 181,314          | 189,129          |
| E131 - Accidents and Claims – Solid Waste      | 656                                  | 1,349            | 800              | 400              | 75,038           |
| <b>Total Revenue</b>                           | <b>5,445,936</b>                     | <b>5,741,195</b> | <b>6,400,461</b> | <b>6,831,026</b> | <b>8,973,930</b> |
| <b>Expense</b>                                 |                                      |                  |                  |                  |                  |
| E051 - Residential Manual Collection           | 1,103,533                            | 1,052,628        | 1,038,865        | 799,500          | 693,563          |
| E052 - Residential Front Street Collection     | -                                    | -                | 168,955          | 458,912          | 705,100          |
| E061 - Residential Mechanical Collection       | 1,133,389                            | 1,400,588        | 1,348,296        | 1,509,352        | 1,438,966        |
| E071 - Commercial Collection                   | 297,173                              | 274,733          | 261,952          | 275,273          | 234,891          |
| E081 - Litter Control                          | 19,635                               | 40,523           | 23,547           | 30,447           | 24,304           |
| E101 - Landfill Operations                     | 1,009,295                            | 1,529,083        | 997,176          | 1,141,221        | 1,272,722        |
| E102 - Landfill Small Vehicle Transfer Station | -                                    | -                | 409,880          | 373,669          | 454,734          |
| E103 - Landfill Gas Collection & Flare System  | -                                    | -                | -                | -                | 71,762           |
| E111 - Landfill Control                        | 183,709                              | 217,391          | 147,461          | 210,365          | 162,513          |
| E125 - Residential Special Waste               | 91,301                               | 66,952           | 58,610           | -                | -                |
| E130 - Waste Reduction & Recycling             | 417,073                              | 417,740          | 530,040          | 504,587          | 473,790          |
| E131 - Accidents and Claims – Solid Waste      | 13,336                               | 20,208           | 14,803           | 18,203           | 144,104          |
| E140 - Waste Administration                    | 462,556                              | 405,734          | 386,739          | 430,068          | 819,534          |
| E140 - Waste Mgmt Plan (100% funded)           | -                                    | -                | -                | -                | 107,917          |
| E140 - Condo Rebate                            | 92,007                               | 131,037          | 80,228           | 130,000          | (1742)           |



**Table 2-5 Estimated 2004 – 2008 Solid Waste Management Revenues & Expenses**

| Revenue *  | Actual Year End Revenue and Expenses |                |                |               |                |
|--|--------------------------------------|----------------|----------------|---------------|----------------|
|  | 2004                                 | 2005           | 2006           | 2007          | 2008           |
| E140 - Facility Support Costs  | 154,204                              | 145,300        | 149,323        | 163,891       | 169,100        |
| E141 - Employee Benefits   | 440,341                              | 380,855        | 401,823        | 342,602       | 278,764        |
| E501 - Environmental Engineering   | 194,189                              | 207,188        | 201,692        | 374,997       | 249,000        |
| E501 - Environmental Eng Studies   | <u>156,659</u>                       | <u>167,350</u> | <u>176,613</u> | <u>58,343</u> | <u>173,700</u> |
| Total Expense  | 5,768,400                            | 6,457,307      | 6,396,005      | 6,821,429     | 7,615,800      |
| Contribution to Waste Management Reserve   | 2,835,766                            | 2,633,999      | 3,388,893      | 3,770,459     | 5,034,127      |
| Total Expenses Including Reserve Contribution  | 8,604,166                            | 9,091,306      | 9,784,898      | 10,591,887    | 12,649,927     |
| Revenue Less Expenses***   | (3,158,230)                          | (3,350,111)    | (3,384,437)    | (3,760,862)   | (3,675,966)    |
| * Revenues from external sources flow into General Revenue Fund. They are not used to directly off-set solid waste costs<br>** Estimated transfer from General Revenue Fund calculated as tipping fee of \$36.00 per tonne charged on 76,400 tonnes of residential sector waste landfilled<br>*** Difference between revenue and expenses offset by contribution from general revenue fund |                                      |                |                |               |                |

The City of Regina presently delivers the above waste management services in an efficient and cost effective fashion. Given the basic level of service provided, it is unlikely that the City could cut back on any of the existing services in order to free up additional funds for new programs. Given this current situation, additional funds will likely have to be allocated to waste management in order to provide any new or expanded programs such as the household collection and processing of recyclable materials.

## 2.7 Material Composition and Quantities

### 2.7.1 Solid Waste Composition

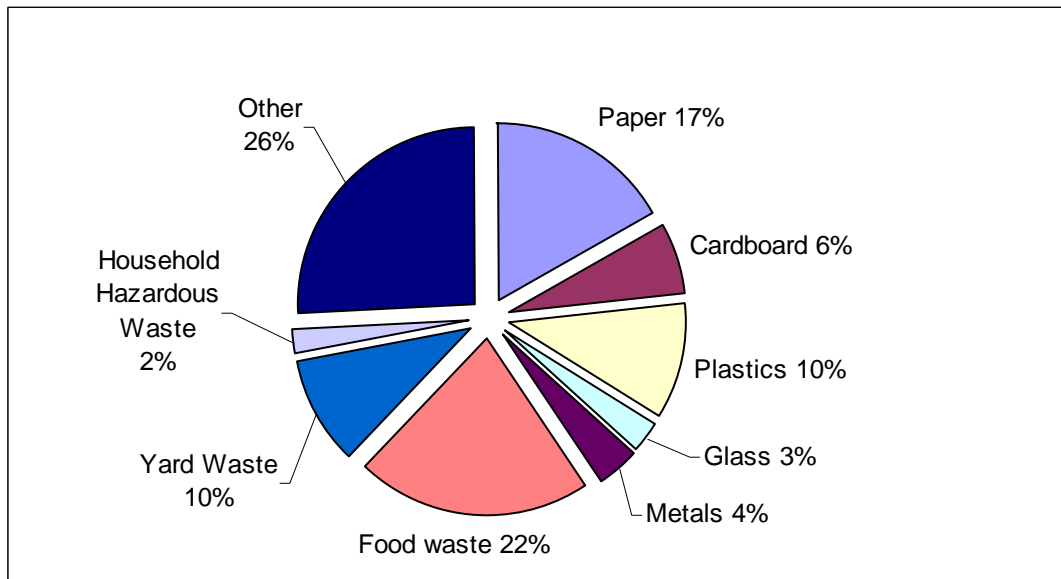
In 2007, the City of Regina retained the University of Regina, Faculty of Engineering, to conduct a waste characterization study of the garbage stream generated by the residential sector. A four season waste audit was conducted of a sample of curbside collected residential waste brought to the City landfill for disposal. Each seasonal audit sorted 100 to 130 kilograms of residential garbage into the following 11 categories:

- Paper;
- Plastic;
- Glass;
- Cardboard;
- Metal (ferrous and non-ferrous);
- Hygienic Waste;
- Meat Organics;
- Non-meat organics;
- Yard Waste;
- Household Hazardous Waste; and
- Other

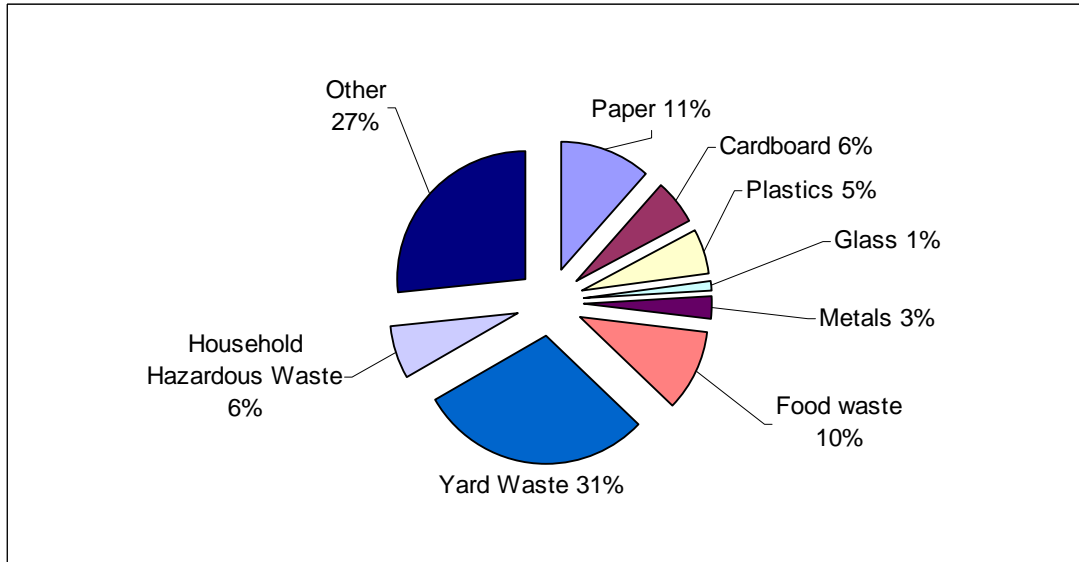
A summary of the waste audit results for the residential garbage stream is provided in Figure 2.3, showing a seasonal separation: summer and winter.

Figure 2.3 Regina Residential Waste Characterization Study

October to April Residential Waste Composition



May to October Residential Waste Composition



In addition, a number of models have been used in other waste management master plan studies to estimate waste composition and generation rates for IC&I Sectors. The results of these models have been used to estimate the waste composition of Regina's IC&I and C&D Sectors, as shown in Figure 2.4 and Figure 2.5.

Figure 2.4 Estimated Waste Characterization for the City of Regina – IC&I Sector

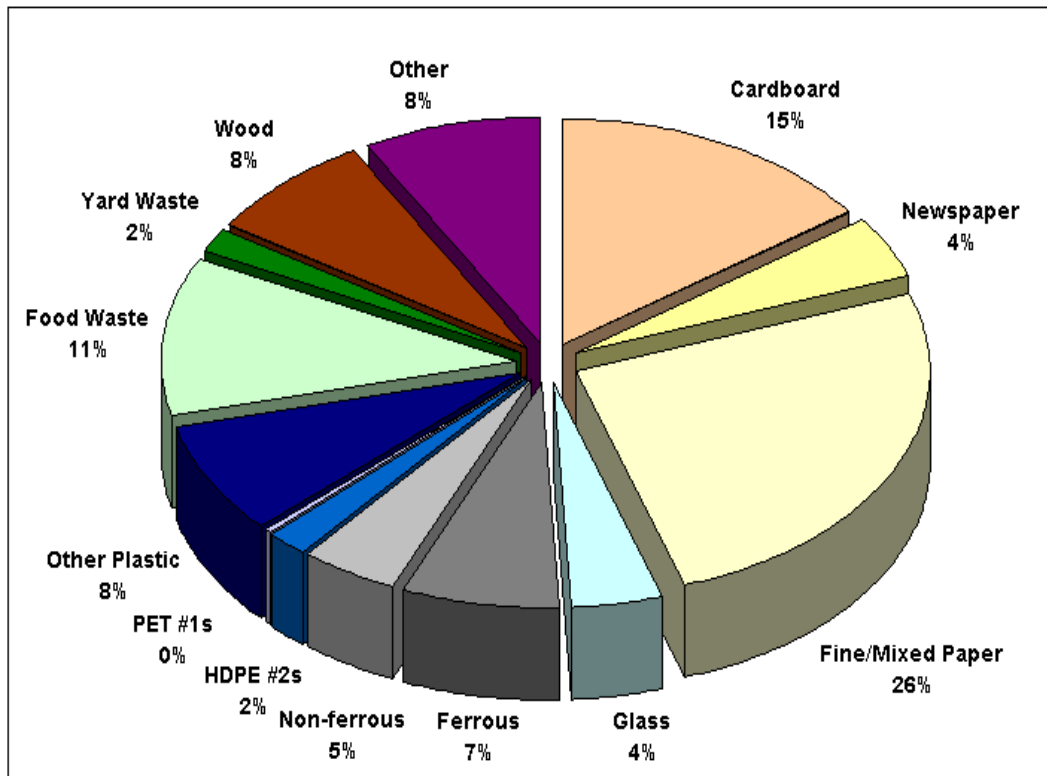
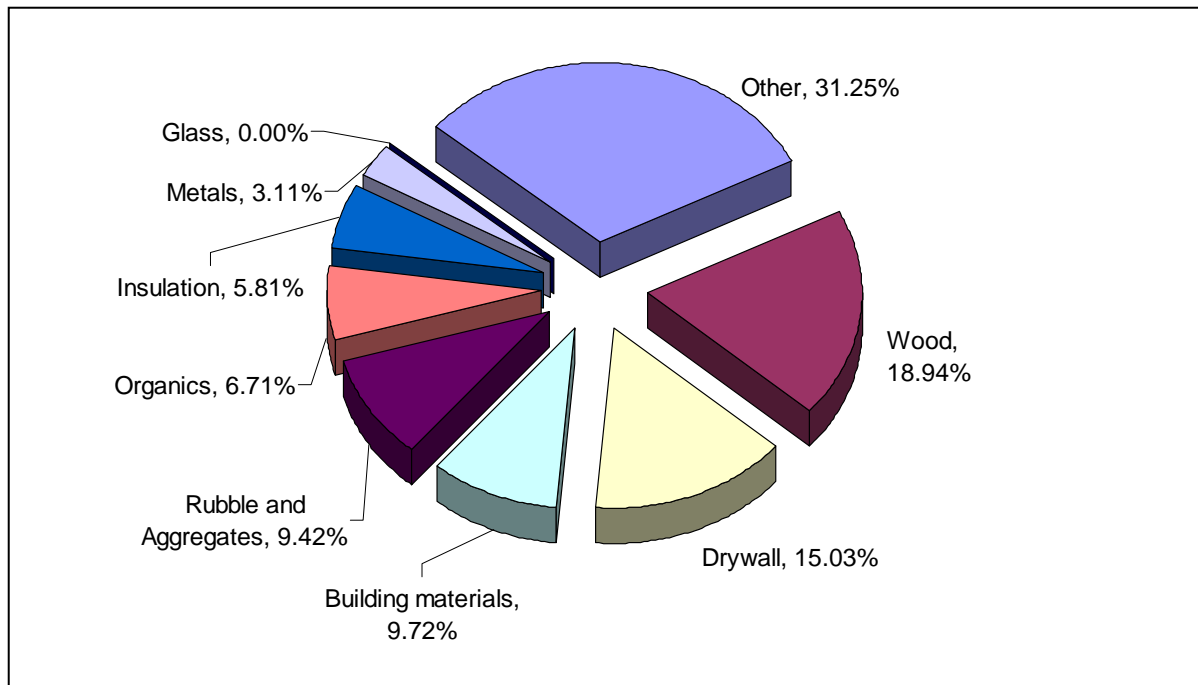


Figure 2.5 Estimated Waste Characterization for the City of Regina – C&D Sector



The City of Regina is a government town, with the provincial legislature and city government located within city boundaries. Consequently, the office building sector dominates Regina’s IC&I sector. Other prevalent sectors include the retail and food service sectors. Table 2-6 shows that among these three

sectors, over 90% of their waste stream consists of paper and paper packaging, food waste, and blue box containers.

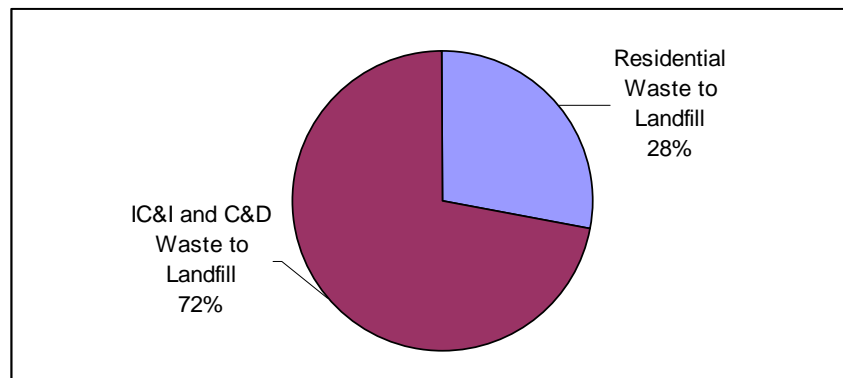
**Table 2-6 Prevalent Recyclables in the IC&I Sector**

|                 | Paper & Paper Packaging | Food Waste | Blue Box Containers | Total Percentage |
|-----------------|-------------------------|------------|---------------------|------------------|
| Restaurant      | 35%                     | 45%        | 15%                 | 95%              |
| Retail          | 52%                     | 28%        | 12%                 | 92%              |
| Office Building | 72%                     | 9%         | 10%                 | 91%              |

### 2.7.2 Solid Waste Quantities

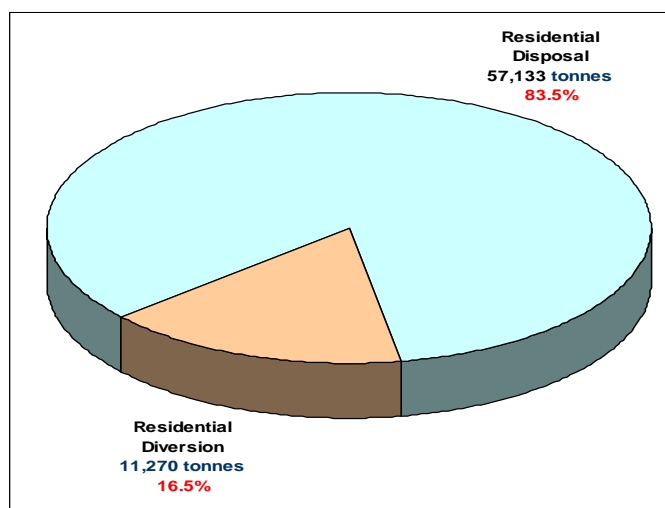
Residents, businesses, and institutions located within the City limits of Regina generated approximately 203,000 tonnes of solid waste in 2008 (not including sweepings and other waste). The amount of waste generated by the residential sector is considerably smaller than the amount of waste generated by the IC&I and C&D sectors, which contributes about 70% of the waste to landfill compared with 30% for the residential sector. The split is illustrated in Figure 2.6.

**Figure 2.6 Percentage of Residential Waste Compared with IC&I and C&D Waste Sent for Disposal**



In 2008, the residential sector generated a total of approximately 68,000 tonnes of solid waste and of this diverted about 11,000 tonnes (16.5%) of material through recycling or returned for deposit beverage container program (refer to Figure 2.7).

**Figure 2.7 Residential Waste Generated in the City of Regina**



## 3. Long List of Waste Management and Diversion Practices

### 3.1 Long List

The consulting team drew on their extensive experience in waste management planning and developed the Long List of Waste Management and Diversion Practices (Long List). This Long List included both:

- Waste management and diversion service options – Collection and processing services (primarily to the residential sector) including curbside recycling, curbside organic collection, leaf and yard waste collection, bulky waste collection, etc.
- Waste diversion innovative practices – defined as supporting policies and programs implemented by the municipality to promote waste reduction and diversion in the residential or IC&I or C&D sectors.

The following tables present a consolidated version of the Long List. The measures were divided by sector and activity, as follows:

1. Residential Sector resulted in 47 Long Listed Measures identified;
2. Industrial, Commercial, Institutional (IC&I) Sector resulted in 40 Long Listed Measures identified; and
3. Construction and Demolition (C&D) Sector resulted in 29 Long Listed Measures.

Each sector list is further subdivided into:

- Refuse/Reduce Measures;
- Reclaim/Reuse Measures;
- Recycling Measures;
- Organics Diversion Measures;
- Support and Incentive Measures; and
- Waste Disposal Measures.

This approach helped to ensure that all aspects of waste management and diversion, including waste reduction and reuse, were captured. Table 3-1 provides the key options that were present to the Steering Committee for further consideration.

**Table 3-1 Residential Consolidated Long List**

| Option Name and Description  | Issues/Implications  |
|--|--|
| <b>Residential Sector: Refuse/Reduce</b>   |  |
| <b>Grass Ban/Grasscycling:</b> Grass is restricted from collection either in the leaf and yard waste program or in general garbage.                                | Requires education and enforcement; can reduce water consumption in summer; requires grass ban bylaw. Some communities provide subsidies for mulching lawn mowers. |
| <b>Backyard Composting:</b> City promotes backyard composting to manage some food and yard wastes.   | Requires public education, and dedication towards the program. Some communities provide subsidies on composters and implement master composter training programs.  |
| <b>Green Procurement/Sustainable Procurement Education:</b> Residents are educated about making purchasing decisions that reduce waste and promote sustainability. | Requires a strong public education program and may need some incentives to promote (such as rebate for purchasing mulching mower)                                  |

**Table 3-1 Residential Consolidated Long List**

| Option Name and Description   | Issues/Implications  |
|---|--|
| <b>Residential Sector: Reclaim/Reuse</b>  |  |
| <b>Waste Exchange Program/Reuse Centres:</b> City establishes reuse programs ranging from reuse centres to on-line waste exchange programs enabling residents to donate and exchange reusable goods. Common for reuse centre to be established at the landfill.                           | No formal policies required; ensuring optimal program operations requires supervision of materials being dropped off. Dedicated reuse website is required that will need to be operated by the City or by a partnering organization.       |
| <b>Goods Exchange Events:</b> A day is identified by the municipality in which residents can place reusable items at the curb for use by other residents. Similar to a yard sale but no money is involved in the transaction. Also called 'Swap Days', 'Mother of All Yard Sales', etc.   | No formal policies required; requires education to maximize effectiveness of event.  |
| <b>Residential Sector: Recycle Materials</b>  |  |
| <b>Curbside Recyclables Collection:</b> Residents receive curbside collection of recyclables. Collection could be single, double or multi stream depending on MRF processing. Containers could be blue boxes or rollout carts, and processing could be done at a public or private MRF.   | Requires public education, new infrastructure and equipment, and may require bylaw; reduce number of garbage trucks; program costs money; may need to be enforced with mandatory recycling bylaw.  |
| <b>Multi-Family Recycling Program:</b> Residents living in a multi-family dwelling (e.g. apartments and condominiums) are provided access to recycling opportunities in their building complex.   | Requires public education, new infrastructure and equipment, and may require bylaw; reduce number of garbage trucks; program costs money. May need to be enforced with mandatory recycling bylaw.  |
| <b>Bulky Items Collection/White Goods Collection:</b> Residents would set their bulky items out for collection on a given day for collection by the City or the residents could book a collection through a City call-in service. Some communities charge for collection services.        | Requires public education, collection vehicles, additional staff, a secured end market; bylaw may be required.   |
| <b>C&amp;D Waste Collection:</b> Residents would receive collection services for small quantities of C&D materials in a manner similar to bulky waste collection services.  | Requires public education, collection vehicles, additional staff, a secured end market; bylaw may be required.   |
| <b>Expanded Household Hazardous Waste Events:</b> Resident are provided with more opportunities to divert their household hazardous waste (HHW) not captured by product stewardship programs, by increasing the number of HHW events provided in the community.                           | Requires public education and can incur high operational costs, most associated with the contracting of the operations of the events and disposal of the HHW to a specialized waste hauler.  |
| <b>Household Hazardous Waste Depot (Permanent Facility):</b> Residents would drop off household hazardous wastes (HHW) not captured by product stewardship programs at a permanent depot at a convenient location. Some communities establish reuse areas to help reduce operating costs. | Requires public education, specialized staff training, construction of a permanent HHW facility, and can incur high operational costs, mostly associated with disposal of HHW.   |
| <b>Recyclables/Yard Waste Drop-off Depots:</b> City expands blue bin service to offer collection of additional materials.   | Requires public education, additional processing infrastructure and end markets.   |
| <b>Material Recovery Facility (MRF):</b> Facility to receive, sort and process recyclable material into a form suitable for shipment to various markets. Can be provided by either the public or private sector.  | Crown Shred and Recycling presently operates a MRF for processing the materials they collect curbside and materials collected via the "Big Blue Bins". Conventional MRFs can process materials from both the Residential and IC&I Sectors. |

**Table 3-1 Residential Consolidated Long List**

| Option Name and Description  | Issues/Implications   |
|--|---|
| <b>Residential Sector: Divert Organics</b>   |   |
| <b>Christmas Tree Collection:</b> City would continue with Tinsel Mulch Program, seasonally collecting Christmas Trees.  | High cost per tree  |
| <b>Curbside Leaf &amp; Yard Collection:</b> Residents would receive curbside collection of their yard waste. Materials would be taken to a composting facility. Some communities starting to collect leaf and yard waste using carts. Vancouver is applying variable rates for leaf and yard waste collection. Can be collected with food waste. | Requires public education, composting facility, and collection vehicles; reduce number of garbage trucks, cost of compost used by the City, may require bylaws such as mandatory leaf and yard waste recycling bylaw. Does not require expensive in-vessel composting facility for processing; can be processed using outdoor windrow technology. |
| <b>Curbside Food Waste Collection:</b> Residents would receive curbside collection of their food waste which would be processed at a composting facility.  | Requires public education, composting facility, and collection vehicles; would reduce number of garbage trucks, cost of compost used by the City; cost associated with program; may require bylaws. Requires indoor composting technology to control odours, which is considerably more expensive than outdoor composting.                        |
| <b>Windrow Composting:</b> Aerobic composting technique employed to compost leaves and yard waste but not food waste because the composting process occurs outdoors using a variety of techniques and is subject to odour problems if food waste introduced.   | Least expensive technology and suitable for leaves and yard waste, but requires large space, and may require environmental assessment and markets for compost.  |
| <b>In Vessel/Enclosed Composting:</b> Aerobic composting technique that permits composting of food waste since the system is enclosed in order to control odours and other nuisances. Controlled process insures pathogen kill. No opportunity to generate power.  | Less expensive than anaerobic digester, but requires more space, large capital investment, environmental assessment and markets for compost.  |
| <b>Anaerobic Digestion:</b> Technology by which food waste is processed (digested) in an anaerobic environment producing methane gas that can be used to generate electricity or heat.   | The most expensive form of composting technology; requires space, very large capital investment, environmental assessment, access to power markets. Digestate requires aerobic composting in outdoor windrow to fully stabilize material.   |
| <b>Co-Digest Food Waste with Sewage Sludge:</b> Process separately collected food waste (i.e. trucked to plant) in wastewater treatment plant anaerobic digester to produce methane gas that can be used to generate electricity or heat. Requires a wet pre-digestion stage to remove contaminants such as plastic bags and broken glass.       | Additional loading of wastewater treatment plant. Generates additional wastewater treatment plant biosolids.  |
| <b>Install Garburators:</b> Householders are encouraged (or required) to install garburators in their kitchen sink drains. Food wastes are washed into garburator, ground up and carried through sewers to waste water treatment plant for treatment with sewage wastes.   | Additional water consumption. Additional loading of sewers and wastewater treatment plant. Generates additional wastewater treatment plant biosolids. Provides an alternative to separate collection of food wastes particularly for multi-family residential buildings.  |
| <b>Residential Sector: Support &amp; Incentive Options Applicable to All of the Above</b>  |   |
| <b>Mandatory Recycling or Source Separation Bylaws:</b> Bylaws stipulate that residents must source separate recyclable materials from the waste stream or prohibit them from discarding in the garbage. Residents would face materials left at curb or fines for non-compliance.  | Requires public education, development of infrastructure, bylaws, policy for non-compliance; could provide jobs, extend life of landfill site.  |
| <b>Curbside Materials Bans:</b> Designated material is banned from being collected with garbage at the curbside. The collection crew has the authority to refuse to collect the garbage if containing banned materials.  | Requires public education, development of infrastructure, bylaws, policy for non-compliance; could provide jobs, extend life of landfill site.  |

**Table 3-1 Residential Consolidated Long List**

| Option Name and Description  | Issues/Implications   |
|--|---|
| Commonly banned materials include electronic waste, recyclable materials, wood waste.  |   |
| <b>Container Limits for Garbage:</b> Bylaws stipulate that residents may only set out a prescribed number/size of waste containers. No significant waste reduction until less than 3 bag limit imposed.  | Requires public education, development of infrastructure, and policy for non-compliance.  |
| <b>Reduced Frequency Garbage Collection:</b> Pick up garbage less frequently, e.g. every second week; implemented in conjunction with curbside recyclables and food waste collection.  | Requires public education, an aggressive diversion program, development of infrastructure, and bylaws; could increase life of the landfill.   |
| <b>Pay-as-you-Throw for Garbage:</b> Bylaws stipulate that residents must pay on a volume basis for the disposal of their wastes which may employ a tag or bag system or a variable cart system (i.e. different fee levels for different sized containers).                      | Requires public education, a strong diversion program, zero tolerance enforcement, bylaws, and policy for non-compliance; may require new infrastructure and equipment; could provide jobs and extend the life of the landfill. |
| <b>Weight Based Garbage Collection:</b> All garbage is weighed and recorded at the point of collection and residents are billed according to the weight of garbage disposed rather than the volume.  | Still an issue to meet requirements outlined in the Weights and Measures Act and not feasible at this time.   |
| <b>Clear Bag:</b> Residents are required to place all garbage in a clear bag that can be scrutinized by the collection crew and left behind if containing recyclable materials.  | Privacy concerns can arise but can be overcome by allowing one small opaque bag in garbage. Doesn't make a lot of sense if partnered with a cart program since difficult to see bags.   |
| <b>RecycleBank:</b> A business that offers rewards to residential customers who participate in a community's curbside recycling program. Residents are rewarded with coupons that can be redeemed at participating stores. This is a variation on curbside recycling collection. | The community must enter into a contract with RecycleBank and pay a monthly fee per household to be part of the program. The program requires that the municipality provide single stream recycling with carts.                 |
| <b>Customer Reward Programs:</b> Selected residents are rewarded by the municipality for participating in the recycling program using different approaches such as financial rewards, media recognition, and award ceremony.   | Need to ensure that the resident is on-board and the program is well advertised   |
| <b>Payback Savings/Rebates:</b> Revenues from recyclables and/or surpluses incurred from the operations of the waste management program are rebated back to the residents.   | Could impose an administrative burden on the community and eliminates the ability to re-direct surpluses into a reserve fund for use later on   |
| <b>Pledges and Feedback:</b> Residents are encouraged to pledge to participate in an activity that the community wants to promote and/or is given regular feedback on a specific activity, such as recycling or contamination of recycling bins.                                 | Can be as interactive as desirable or can simply involve disseminating information through different media sources.   |
| <b>Green Pages:</b> Establishing a green pages section in the City residential and business telephone books that would promote reduce, reuse and recycling and contact information.  | Requires development of layout and good database for annual updates of information.   |
| <b>Keep Our City Clean Campaign:</b> Work with the community to help keep the City clean by providing labels on public garbage and recycling bins that residents can call to have full bins emptied.   | Requires education of public and good coordination of activities  |
| <b>Outreach:</b> Outreach uses tools that directly engage the resident in an action to foster and maintain behaviour change. Commonly employed tools include commitment  | Requires good understanding of residents' behaviours and attitudes and good coordination of activities and a strong public education and training program.  |



**Table 3-1 Residential Consolidated Long List**

| Option Name and Description  | Issues/Implications  |
|--|--|
| (pledges), feedback, prompts, norm, communication, outreach and incentives. Communities sometimes use citizens and/or student to promote waste management initiatives by implementing block leader programs, master training programs, or canvassing.  |  |
| <b>Promotion of Sustainable Policies:</b> Lobbying provincial and federal agencies to promote environmental issues. Involves developing set of environmental policies to lobby the provincial government   | Requires coordination of city departments to develop a strategy for lobbying provincial and federal governments. There may be opportunities to partner with other cities and municipalities.   |
| <b>Support for Waste Minimization Policy:</b> Encouraging government involvement to promote greater producer responsibility (financial and manufacturing) for products and packaging they produced - defined as "Zero Waste" in other communities  | Requires support of elected officials and CAO to bring community on board.   |
| <b>Residential Sector: Disposal of Residuals</b>   |  |
| <b>Solid Waste Collection:</b> Solid waste is collected and taken to a disposal facility.  | City is mandated to provide solid waste collection for its residents.  |
| <b>Energy From Waste: Established Technology:</b> City establishes proven mass burn energy from waste facility for the management of post-diversion materials.   | Requires public consultation, environmental studies, and new infrastructure; Much more costly than landfill. Metals can be recovered from the ash. Would extend life of landfill and reduce ability to create landfill gas.                |
| <b>Energy From Waste: New &amp; Emerging Technology:</b> City, in partnership with a vendor, establishes a waste gasification or pyrolysis facility utilizing new technology for the management of post-diversion materials.   | Requires public consultation, environmental studies, and new infrastructure; Much more costly than landfill. Can recover additional recyclables. Would extend life of landfill and reduce ability to create landfill gas.                  |
| <b>Production and Use of Solid Recovered Fuel:</b> City, or vendor establishes, a residual waste processing facility to recover additional recyclables from the garbage and produce a solid fuel that can be burned (or gasified) off-site (e.g. in a cement kiln or utility boiler).              | Requires public consultation, environmental studies, and can be costly. Recover additional recyclables. Would extend life of landfill.   |
| <b>Mixed Waste Processing/ MBT (mechanical/biological treatment)/Stabilized Landfill:</b> Garbage is sorted at a specialized facility to further remove recyclables and the remaining residual is composted or digested anaerobically and then landfilled. Well established in Europe.             | Requires public consultation, environmental studies, and can be costly. Recover additional recyclables. Would extend life of landfill. Compost produced could be used as landfill cover because too contaminated for any other application |
| <b>Bioreactor:</b> Technology is installed in an existing landfill to promote increased circulation of leachate that breaks down organic material more quickly thus generating increased methane that is captured and converted to heat or electricity.  | Need to install specialized equipment to recirculate leachate within the landfill and ensure that methane collection system is in place. Can result in increased landfill space as material breaks down more efficiently.                  |
| <b>Landfill Mining:</b> An existing landfill is mined to remove recyclable materials, such as metals in order to expand the capacity and life of the landfill. Also used to remediate leaking landfill (waste removed & processed, new liner installed, and remaining waste replaced in landfill). | Requires public consultation, environmental studies, and new infrastructure; Requires a market for fuel. Much costlier than landfill. Recover additional recyclables. Would extend life of landfill.                                       |
| <b>Landfill Residuals in City Site:</b> City continues to operate a landfill site.   | Some landfill capacity always required. Landfill site would fill more quickly with less diversion. Diversion potential lost when materials landfilled.   |
| <b>Landfill Residuals in Export Site:</b> Export residuals for disposal in a site outside Regina.  | Landfill to export waste to is not available nearby. Some landfill capacity always required. Landfill site would fill more quickly with less diversion. Diversion potential lost when materials landfilled.                                |

**Table 3-2 IC&I Consolidated Long List**

| Option Name and Description  | Issues/Implications  |
|--|--|
| <b>IC&amp;I Sector: Refuse/Reduce</b>  |  |
| <p><b>Front-End Disposal Taxes/Levies on Designated Materials or Products/Deposits:</b> This could include advance disposal fees, deposit-return or straight front-end levy. A front-end fee placed on a designated product or packaging at the point of purchase to reduce amount of waste being generated or for proper management at end of life.</p>   | <p>Requires public education, infrastructure, monitoring, and bylaws; difficult to administer.</p>   |
| <p><b>Packaging Ban at IC&amp;I Establishments:</b> City imposes bans on specific materials or packaging used by designated commercial establishments.</p>   | <p>Requires public education, promotion, and strong enforcement; may be difficult to implement due to resistance from industry and costly to enforce</p>   |
| <p><b>City based Green Procurement Specifications and Policies:</b> City staff develops green procurement specifications and policies requiring products purchased by and for the city to contain recycled materials. May also address packaging through mandatory take-back of all packaging used to supply the City, or mandated use of reusable packaging. May also require that products not contain specific designated materials that are difficult or hazardous to dispose.</p> | <p>Requires slightly increased budgets, new procurement specifications, strong reverse logistics for materials delivery, bylaws, and policy for non-compliance; promotes reusable packaging and markets for recyclables; limited products and suppliers available.</p> |
| <p><b>Promoting Green Procurement and other Sustainable Initiatives within the IC&amp;I Sector:</b> City develops a program to encourage green procurement activities and other sustainable initiatives including packaging scorecard approach similar to the one being used by Wal-Mart to evaluate suppliers based on packaging and transportation issues and EPEAT for purchasing IT equipment.</p>   | <p>Requires development of a program and adequate support staff to help IC&amp;I participants</p>  |
| <b>IC&amp;I Sector: Reclaim/Reuse</b>  |  |
| <p><b>Waste Exchange Program:</b> City establishes an on-line waste exchange program.</p>  | <p>Requires development and maintenance of on-line waste exchange and education of IC&amp;I Sector.</p>  |
| <p><b>Reuse/Drop-Off Depot Program:</b> City establishes drop-off depot(s) for specified materials.</p>  | <p>Requires infrastructure, equipment, and advertising; could help advance small business reuse; may be abused (i.e. illegal dumping).</p>   |
| <b>IC&amp;I Sector: Divert Recyclables &amp; Organics</b>  |  |
| <p><b>Mandatory Recycling or Source Separation Bylaws or 3Rs Regulations at the Municipal Level</b><br/>Bylaws stipulate that designated IC&amp;I Sectors must source separate specified recyclable materials from the waste stream or prohibit them from discarding the specified materials in the garbage.</p>   | <p>Requires infrastructure, bylaws, policy for non-compliance; create jobs in processing facilities; administration and enforcement could be costly.</p>   |
| <p><b>User Pay Program for Small Retailers and Businesses:</b> Small retailers and businesses receiving curbside collection services from the City must pay for every bag of garbage collected but recycling (and food waste diversion, if available) services free.</p>   | <p>Requires bylaw, provision of containers as part of service, infrastructure, enforcement and education of collection crew, promotion and education</p>   |
| <p><b>Voluntary Take it Back program:</b> The City works with local businesses, associations and the Province to establish voluntarily take back used goods and packaging materials originally sold through the business. This may include medication, syringes, single use batteries, garden supplies, etc. The businesses are</p>  | <p>City needs to work closely with businesses and help promote the program through its website and other forms of communication; requires a dedicated person to monitor and maintain the program and encourage new businesses to partner.</p>                          |

**Table 3-2 IC&I Consolidated Long List**

| Option Name and Description   | Issues/Implications  |
|---|--|
| responsible for ensuring proper management of the materials including reuse and recycling.  |  |
| <b>Mandatory Food Wastes Diversion:</b> Bylaws stipulate that designated IC&I Sectors must source separate food wastes from the waste stream or prohibit them from discarding the specified materials in the garbage. Materials would have to be diverted to a composting/digestion facility.   | Requires centralized composting facility, sufficient composting capacity locally, new collection infrastructure, bylaw, and policy for non-compliance; provide jobs in processing facilities; may affect landfill gas generated at landfill. |
| <b>Voluntary Food Wastes Diversion:</b> City offers food waste diversion opportunities to IC&I businesses, focusing on food service establishments. Materials would have to be diverted to a composting/digestion facility.   | Requires centralized composting facility, sufficient composting capacity locally, new collection infrastructure, provide jobs in processing facilities; may affect landfill gas generated at landfill.                                       |
| <b>Franchising of Collection or City Provides Collection Service to All IC&amp;I Generators to Ensure Service for Waste Diversion:</b> City awards franchises to commercial waste collection haulers to operate within designated zones of the City and/or City provides commercial collection service in competition with private sector. The City may stipulate diversion service level and rates to be charged as part of franchise requirement. | Requires collection infrastructure, cooperation of private sector, enforcement, bylaws, and penalties for non-compliance.  |
| <b>Private Sector Licensing To Mandate Recycling Service:</b> Bylaw requiring that all waste haulers operating within the City must provide designated waste diversion services to IC&I customers, which may include recycling services and food waste diversion services.  | Requires established markets, enforcement, bylaws, and policy for non-compliance; allows smaller players to stay in the business.  |
| <b>Incentive/Disincentives for Waste Hauler to Divert Waste:</b> City sets waste diversion requirements for waste haulers to achieve with customers by imposing financial or other incentives or disincentives.   | Requires bylaw, enforcement and reporting mechanisms   |
| <b>Waste Diversion Requirement if Liquor Permit:</b> The establishment must establish and maintain a waste diversion program if it has a liquor permit  | Requires bylaw, enforcement and reporting mechanisms   |
| <b>Voluntary/Mandatory Diversion at Special Events:</b> Bylaw requiring that recycling plans are prepared and implemented for special/public events.  | Requires leading by example, specially marked containers, bylaws, and policy for non-compliance  |
| <b>Reduced Disposal Fees for Establishing Recycling/Composting:</b> IC&I generators that recycle/compost in accordance with specified requirements may pay lower fees for disposal; reduced waste to landfill.  | Requires public education, bylaws, reporting and tracking system, infrastructure, and lower fees passed on to customers.   |
| <b>School Waste Diversion Programs:</b> City establishes a partnership program with local school boards and post-secondary educational institutions to enhance diversion rates.   | Requires collection infrastructure, public relations, and may requires a bylaw; may add costs to school board.   |
| <b><i>IC&amp;I Sector: Support &amp; Incentive Options Applicable to All of the Above</i></b>   |  |
| <b>Dedicated Landfill Levy or Fee to Support Diversion:</b> All waste delivered to City owned landfill has a levy attached that is used to fund waste diversion activities or a fee is charged waste haulers based on the amount of garbage collected.  | Requires public education, secured and sustainable markets, processing infrastructure, and levy bylaw; additional diversion potential through economies of scale; may see resistance from waste management industry and IC&I Sector.         |
| <b>Landfill Bans:</b> A ban on designated material is placed at the point of disposal. Loads exceeding permitted levels of banned material are rejected or subject to a   | Requires public education, processing infrastructure, secured and sustainable markets, and strong enforcement at landfill, bylaw; create infrastructure for  |

**Table 3-2 IC&I Consolidated Long List**

| Option Name and Description  | Issues/Implications  |
|--|--|
| surcharge.   | management of banned materials; illegal dumping may increase.  |
| <b>Ban of Recyclables in the Garbage:</b> Recyclables are banned from being placed in the garbage in the first place.  | Requires public education, processing infrastructure, secured sustainable markets, and strong enforcement during collection, bylaw; illegal dumping may increase.  |
| <b>Differential Tipping Fees:</b> Differential tipping fees are applied to loads of waste containing designated recyclables and/or organic materials. Contaminated loads cost more to dispose.   | Requires enforcement, infrastructure, processing facilities, bylaws, and inspection staff.   |
| <b>Mandatory Requirements to Properly Manage Designated Wastes or Mandatory Take Back of Designated Wastes:</b> Bylaw that requires specific wastes (i.e. designated, hazardous) to be managed in a special manner. Bylaw stipulates how wastes must be handled and where they must be disposed. Bylaw requires businesses to accept the return of used products and/or packaging. Business pays cost of waste management. | Requires infrastructure, retailer storage space, bylaw, and policy for non-compliance; provides opportunity to reduce hazardous waste to landfill and inform public of stewardship of hazardous materials; high generator costs. |
| <b>Mandatory Product Labelling in Retail and Grocery Stores:</b> Retail and grocery stores are required to install labels on shelves that describe the environmental benefits or problems with the product or packaging. Used to educate consumers at the point of purchase.   | Requires staff to help develop labels and enforcement of program.  |
| <b>Landfill Permits for Waste Haulers and Recyclers:</b> Develop a system of Landfill Permits and as part of the permit. As part of the permitting process, require them to submit annual waste and recycling reports  |  |
| <b>Flow Control:</b> Bylaw imposes flow control on specific waste categories generated within the City borders. Specific waste generated within City limits is directed to designated waste management facilities.   | Requires cooperation with private haulers, processing infrastructure, bylaw, and policy for non-compliance; opportunity to reduce hazardous waste to landfill and for public education; legislatively difficult.                 |
| <b>Waste Diversion Assistance Program:</b> City provides technical assistance services to companies that want to implement waste reduction programs such as waste auditing and staff training. Program is voluntary.   | Requires training of staff, strong promotion and education required, may help advance small business diversion.  |
| <b>Waste Diversion Promotional Programs and Challenges:</b> Waste diversion programs and challenges are developed for specific IC&I Sectors, such as schools, office buildings, etc.   | Requires trained staff to deliver program  |
| <b>IC&amp;I Sector Working Group on Waste Diversion:</b> City facilitates regular discussions among specific sector representatives to discuss/resolve common waste reduction challenges. City works with IC&I Sector and waste management service providers to host and promote waste reduction events.   | Requires coordination of regular meetings, advertisement, and incentives; could introduce new diversion opportunities and market development.  |
| <b>Waste Reduction Certification Program:</b> Businesses can receive certification if achieve specified waste reduction/diversion targets. Certification results in certain rewards and privileges.  | Requires clerical and inspection staff, education and promotion  |
| <b>Voluntary Third Party Certification for Existing Buildings:</b> The Green Building Council has developed LEED for existing buildings operations and maintenance which features water and energy efficiency, reduction in toxic cleaners and waste diversion. Similar programs have been developed by other organizations (e.g. BOMA   | Requires promotion, training of technical staff, coordination of departments, and bylaws   |

**Table 3-2 IC&I Consolidated Long List**

| Option Name and Description   | Issues/Implications  |
|---|--|
| BEST). These programs target office buildings but new plans are being developed for the retail sector.  |  |
| <b>Mandatory Recycling Targets:</b> Bylaw requiring source separation of specific materials or prohibit them from the waste stream. May be enforced through fines or denial of business permits.  | Requires public education, infrastructure, coordination of City departments, bylaws, may help establish local markets; may cause large burden for small businesses.  |
| <b>Mandatory IC&amp;I Waste Audit and Waste Diversion Plans:</b> Bylaw requiring the provision of a waste audit and waste diversion plan for the management of wastes. May require source separation of specific materials or prohibit them from the waste stream. May be enforced through fines or denial of business permits.                             | Requires public education, enforcement, bylaws, and policy for non-compliance. Plans need to be reviewed and taken seriously by city staff; may help establish local markets; may cause large burden for small businesses.   |
| <b>Market Development for Recyclable/Reusable Materials:</b> City works with IC&I Sector to develop/stimulate markets for designated recyclable materials. Can involve partnership in developing processing and end markets, financial assistance, and/or technical assistance. Can involve development of Recycling Market Development Zones or Eco Parks. | Requires infrastructure, coordination of city departments, partnerships, money for technical development   |
| <b>Other Diversion Alternatives:</b> Any other diversion alternatives identified will be included in this section.  |  |
| <b>IC&amp;I Sector: Disposal of Residuals</b>   |  |
| <b>Energy From Waste: Established Technology:</b> Establishes proven mass burn energy from waste facility for the management of post-diversion materials.   | Requires public consultation, environmental studies, and new infrastructure. Much more costly than landfill so flow control required to send IC&I wastes to EFW facility. Metals can be recovered from the ash. Would extend life of landfill and reduce ability to create landfill gas. |
| <b>Landfill Residuals in City Site:</b> City continues to operate a landfill site.  | Landfill site would fill more quickly, diversion potential lost.   |

**Table 3-3 C&D Consolidated Long List**

| Option Name and Description  | Issues/Implications  |
|--|--|
| <b>C&amp;D Sector: Refuse/Reduce</b>   |  |
| <b>Front-End Disposal Taxes/Levies on Designated C&amp;D Materials or Products:</b> A front-end fee placed on designated C&D products at the point of purchase to encourage the reduction in the amount of waste being generated or to conserve materials in limited supply. | Requires public education, administration to collect fees, infrastructure for monitoring and collecting fees, and bylaws; difficult to administer to all retail outlets in the City. |
| <b>C&amp;D Sector: Reclaim/Reuse</b>   |  |
| <b>Reuse/Drop-Off Depot Program:</b> City supports drop-off depot(s) for specified materials. City supports reuse programs such as reuse centers.  | Requires advertisement and controlled waste exchange/drop-off depot; may lead to illegal dumping.  |
| <b>Establishing Policies for Deconstruction:</b> Establish deconstruction policies that are integrated into the demolition permit. May requires completion of waste diversion plan.  | Requires education, processing infrastructure, coordination of city departments, and a policy for non-compliance.  |
| <b>Waste Exchange Program:</b> City establishes an on-line waste exchange program.   | Requires development and maintenance of on-line waste exchange and education of C&D Sector   |
| <b>C&amp;D Sector: Divert Recyclables</b>  |  |
| <b>Mandatory Recycling or Source Separation Bylaws:</b> Bylaws stipulate that designated C&D Sectors must  | Requires infrastructure for management of recyclables, bylaws, and a policy for non-compliance; could provide  |

**Table 3-3 C&D Consolidated Long List**

| Option Name and Description   | Issues/Implications  |
|---|--|
| source separate specified recyclable materials from the waste stream or prohibit them from discarding the specified materials in the garbage.   | jobs.  |
| <b>Expanded Differential Tipping Fees:</b><br>City's landfill charges variable tipping fees on incoming C&D wastes depending upon the amount of acceptable recyclable materials in the load and whether materials are separated into individual materials or arrive as mixed loads. | Requires public education, processing infrastructure, administrative system to track materials and fees, and bylaws; may increase illegal dumping. |
| <b>Requiring that all C&amp;D wastes go to a Permitted C&amp;D Recycler:</b> The City requires that all contractors take their C&D waste to an approved C&D processor for diversion purposes.   | Requires public education, processing infrastructure, enforcement staff at landfill, and bylaws  |
| <b>Landfill Permits for Waste Haulers and Recyclers:</b><br>Develop a system of Landfill Permits and as part of the permitting process, require them to submit annual waste and recycling reports   |  |
| <b>C&amp;D Material Recovery Facility (MRF):</b> Facility to receive, sort and process C&D material into a form suitable for use in various local markets. Can be provided by either the public or private sector.  | Facility required to achieve significant C&D Sector recycling  |
| <b><i>C&amp;D Sector: Support &amp; Incentive Options Applicable to All of the Above</i></b>  |  |
| <b>Dedicated Landfill Levy to Support Diversion:</b><br>Dedicated landfill levy on all C&D materials taken to the Regina Landfill; a surcharge is placed on waste and used to fund diversion programs and make disposal more expensive than diversion.                              | Requires public education, processing infrastructure, secured and sustainable markets, and bylaws; may increase illegal dumping.                   |
| <b>Landfill Bans:</b> A ban on designated materials is placed at the point of disposal.   | Requires public education, processing infrastructure, secured and sustainable markets, and bylaws; may increase illegal dumping.                   |
| <b>Mandatory C&amp;D Recycling Targets Required by Public Sector:</b> Master Specifications /Contract stipulates mandatory recycling target requirement prior to the initiation of C&D project.   | Requires public education, processing infrastructure, coordination of city departments, bylaws, and a policy for non-compliance.                   |
| <b>Refundable Deposits on C&amp;D Projects:</b> All construction companies pay a deposit as part of the building permit which is refunded based on the level of diversion achieved.   | Requires administration of program, education of program, inspection and enforcement staff.  |
| <b>Disincentive Approach:</b> Fines are used as an incentive to achieve waste diversion targets   | Requires administration of program, education of program, inspection and enforcement staff.  |
| <b>Mandatory C&amp;D Waste Diversion Plans:</b><br>Bylaw requiring the provision of a Waste Diversion Plan prior to the initiation of C&D project.  | Requires public education, processing infrastructure, coordination of city departments, bylaws, and a policy for non-compliance.                   |
| <b>Issuing Permits based on Proof of Diversion:</b> The City will issue the occupancy permit if the contractor provides proof that waste diversion was achieved during the project  | Requires administration of program, education of program.  |
| <b>LEED Certification for Municipal Developments:</b> City would require new city facilities to achieve LEED certification.   | Requires promotion, training of technical staff, coordination of departments, and policy development, inspection and enforcement                   |
| <b>LEED Certification for Private Sector Developments:</b><br>City would require new private sector commercial and/or residential buildings to achieve LEED certification.  | Requires budgeting for rebates, administration of program, education of program, enforcement staff.  |

**Table 3-3 C&D Consolidated Long List**

| Option Name and Description   | Issues/Implications   |
|---|---|
| Construction companies could receive incentives/considerations such as fee discounts or rebates on residential house building permits for achieving green building targets and higher density   |   |
| <b>City Provides Special Considerations with LEED Certified Building:</b> LEED certified buildings receive special considerations such as higher density.   | Requires administration of program and education of program.  |
| <b>Green Building Technical Assistance:</b> The City would be the first to promote green building. The City would provide incentives such as consultations, planning software for builders and developers to build green. The City could also provide technical assistance to help educate contractors' staff and set up onsite systems to green their buildings.                 | Requires business education, staff training, change in internal planning/building requirements, funding, and a lot of initial work.   |
| <b>C&amp;D Working Group on Waste Diversion:</b> City facilitates discussions with representatives from the C&D Sector to discuss/resolve common waste reduction challenges. City works with C&D Sector and waste management service providers to host and promote waste reduction events.  | Requires coordination of regular meetings, advertisement, and incentives; could introduce new diversion opportunities and market development.   |
| <b>Market Development for Recyclable/Reusable Materials:</b> City works with C&D Sector to develop/stimulate markets for designated recyclable materials. Can involve partnership in developing processing and end markets, financial assistance, and/or technical assistance. Can involve providing grants, loans or tax exemptions to develop private C&D recycling facilities. | Requires infrastructure, coordination of city departments, partnerships, money for technical development  |
| <b>C&amp;D Sector: Disposal of Residuals</b>  |   |
| <b>Energy From Waste: Established Technology:</b> Establishes proven mass burn energy from waste facility for the management of post-diversion materials.   | Requires separate collection of combustible C&D waste. Requires public consultation, environmental studies, and new infrastructure; would extend life of landfill but also increase landfill operation cost and eliminate ability to create landfill gas. |
| Same other measures as listed for Residential Sector  |   |
| Landfill Residuals in City Site: City continues to operate a landfill site.   | Landfill site would fill more quickly, diversion potential lost.  |

Appendix B provides the Long List in greater detail. The tables in this appendix include the information provided in the above tables as well as additional details on each of the measures.

### 3.2 Long List Screening Criteria and Evaluation Process

The approximately 120 measures identified for the Long List were screened to remove from further consideration any opportunities that were not practical or in keeping with the goals, objectives, or vision for the study. This was done by first developing a set of evaluation/screening criteria and then applying these criteria to screen the Long List and identify a Short List of Waste Management and Diversion Practices potentially applicable to Regina. Details on these criteria and screening process are presented below.

### 3.2.1 Evaluation Criteria

The following eight evaluation criteria were developed by the consultants in cooperation with the Steering Committee for the Long List screening process:

1. Compatibility with Regina's existing and future infrastructure (e.g. compatibility with existing collecting and disposal infrastructure – the mechanical or “hard” infrastructure requirements);
2. Community acceptance (based on public input during public consultation process);
3. Compatibility with Regina's existing programs and bylaws (e.g. requirement for new or amended bylaws, programs, and staffing – the support or “soft” infrastructure requirements);
4. Proven technology or system (e.g. the degree that the technology or system commercially is proven to work and achieves its intended purpose);
5. Provides public health benefits (e.g. reduces pollution to protect public health);
6. Provides environmental benefits (e.g. reduces pollution to protect the environment);
7. Provides customer service benefits (e.g. provides greater direct service level as requested by public); and
8. Diversion potential (e.g. the relative quantity of material diverted from disposal by the option).

Note: although cost consideration is an obvious component of the evaluation criteria, it was decided that cost was not to be a factor in moving from the Long List to the Short List.

### 3.2.2 Screening Process

Prior to meeting with the Steering Committee, the Consultants initiated the screening process by applying a rank of high, medium-high, medium, low-medium, low to each evaluation criteria for each of the approximately 120 opportunities on the Long List. This qualitative ranking helped provide a basic method for identifying the more favourable options. At the end of the process, those options with a balance of “high” relative to “lows” were assigned a preliminary acceptance for inclusion on the Short List. It should be noted that the ranking system was used only to assist the screening process and that when accepting an option for inclusion on the Short List, other criteria and priorities were considered. The Consultants relied on their expertise and experience in applying the rankings to the evaluation criteria.

The draft evaluation matrix prepared by the Consultants was sent for review to the members of the Steering Committee. A daylong workshop was conducted at the end of January 2009 to review the rankings, make any necessary adjustments, and achieve a consensus on which options to accept for inclusion on the Short List. The Consultants also met with the Internal Working Group, comprised of staff from key departments within the City, to review the short listed opportunities from each department's perspective in order to ensure that there were no unforeseen barriers (e.g. legal, planning, bylaw) associated with each short listed option that prohibited them from further consideration.

The details of this evaluation and screening process are presented in Appendix C.

The Short List resulting from this screening process is presented in the following Section 4.

During the screening process, six options were highlighted to receive support from the City but not proceed further in the Waste Plan Regina process. These options were considered better implemented by an outside organization and supported by the City or were being addressed through another study or process. These six options are further discussed in Section 4.4 of the report.



### 3.2.3 Disposal Options Screened Out

The City of Regina operates a very cost effective landfill. There are no identified problems with this facility and no major objections to its operation. Assuming the current application for expansion is approved, this facility will provide ample disposal capacity for many years to come.

Given the availability of this disposal option, the following disposal options were screened out as they were deemed to have low compatibility with Regina's existing infrastructure:

- Energy from Waste – Established Technology;
- Energy from Waste – New & Emerging Technology;
- Production and Use of Solid Recovered Fuel;
- Mixed Waste Processing / MBT (Mechanical & Biological Treatment) followed by Stabilized Landfill; and
- Landfill Mining.

In addition it is noted that new & emerging energy from waste technologies, such as plasma gasification, are not proven and would present significant risk to the City should it choose to invest in such a approach. An additional constraint associated with production and use of solid recovered fuel is finding a reliable market the waste derived fuel. Although cost was not a criterion it is noted that the cost of any of these technologies is significantly higher than the City's current landfill costs.

## 4. Short List of Waste Management and Diversion Practices

Following lengthy consultations with the City's Steering Committee and Internal Working Group, the Long List was reduced to approximately 57 short listed opportunities. This Draft Short List was presented to the External Working Groups through workshops for comment and feedback. Based on this feedback the final Short List was completed.

Detailed descriptions of each short listed measure for the Residential, IC&I, and C&D Sectors are provided in subsequent sections.

### 4.1 Residential Short List

The following section details the short listed measures for the Residential Sector.

#### 4.1.1 Grass Ban/Grasscycling

##### *Summary Description*

Grass would be restricted from collection either in the leaf and yard waste program or in the general garbage. Keeping cut grass on the lawn is beneficial by providing a source of nutrients and moisture directly to the lawn and decreasing odour problems at the compost site by removing it from the collection and disposal program.

##### *Implementation*

A promotion and education (P&E) program would be launched before the grass ban is implemented to make residents aware of the program. Educational materials on the benefits of grasscycling would also be developed and distributed to the public. The City would ensure that mulching blades are available at local merchants or available through the City for purchase and the City could run weekend sales and educational events where they install a mulching blade on lawn mowers for the public.

Following the launch of a P&E program, the City would pass a bylaw restricting grass in the garbage and/or in the leaf and yard waste collection program. The City could also establish a drop-off depot(s) for residents that still want to separately bag grass and divert it (although this is optional).

##### *Issues/Implications*

Excluding grass from the leaf and yard waste collection program would help alleviate potential odour problems (high nitrogen) at the composting site and save the City the costs for collection and processing services.

Leaving grass on the lawn could also provide benefits to residents because it reduces water consumption in the summer, as grass acts as a natural barrier to evaporation, and reduces fertilizer consumption, because grass naturally adds nutrients back in the ground. However, some residents like to remove grass from their property and the City may need to provide an outlet to those residents that do want to remove the grass. For the residents who participate in the program they would have to incur the cost of mulching blades (unless they will be provided by the City).

A bylaw imposing a ban on grass disposal and/or grass in the leaf and yard waste program would be required and a strong monitoring and enforcement infrastructure would be needed. Part-time Program/Education staff and Bylaw Officers would be required.

Capital costs would only be incurred if the City gave away mulcher blades. At \$15 per blade the City could incur costs up to \$300,000. If 20,000 households adopted the program this would translate to approximately \$0.50/hhld/mth (\$5/hhld/yr). Otherwise the costs would be covered by the P&E program cost.

### *Status in North America*

Grass bans and grasscycling are well-established practices in North America and are employed in several communities, such as:

- Toronto, ON;
- Edmonton, AB; and
- San Francisco, CA.

#### **Edmonton, Alberta**

Between April and October, Edmonton waste collectors see an 84% increase in the amount of waste set at the curbside for disposal. Most of this waste is lawn clippings which have been bagged for disposal. To assist with public education, the City of Edmonton provides a website with information on grasscycling. This includes the benefits to grasscycling, how to grasscycle, and frequently asked questions. A grasscycling brochure is linked to the website along with a television commercial, transit advertisement, and radio ads.

#### **Toronto, Ontario**

The City of Toronto has always encouraged residents to grasscycle, use clippings as mulch, or to compost clippings in their backyard composter. Effective April 1, 2001 the City stopped collecting grass clippings at the curb. To assist with public education a Lawn Improvement Hotline was established along with factsheets on organic lawn care, grass seeding tips, alternative groundcovers, xeriscaping, outdoor watering, mulch options, soil type, and pesticide elimination. The City launched, at the same time, an advertising campaign poking fun at the “fear” of leaving grass on the lawn. Based on 2006 Residential Waste Diversion tonnages, approximately 11, 680 tonnes of grass was diverted through the grass ban/grasscycling which attributes to 2% of the total waste stream (City of Toronto, 2006).

### **4.1.2 Backyard Composting**

#### *Summary Description*

The City would continue to promote backyard composting as a means of managing some food wastes (no meat or dairy) and some yard wastes (limited capacity of the backyard composters precludes handling all yard waste except where lots are large enough for multiple units).

#### *Implementation*

The City would continue to promote backyard composting as an option for the management of some food wastes and some yard wastes. Promotion could continue by giving away/subsidizing the cost for backyard composters to increase the uptake of the units to residents. The City could also set up multiple backyard composters at City sites for demonstration and provide education on effective backyard composting.

#### *Issues/Implications*

The City could reduce the amount of waste being managed for disposal if more residents participated in backyard composting. Diversion could be increased by providing more units to residents through promotional/incentive programs. The City must continue to educate the residents on proper composting for the program to be effective. If residents do not see composting happening they will not continue with the program.

Some difficulties experienced with backyard composters that would need to be addressed by the City through promotion and education include potential odour/vermin issues with composters and composting in winter.

### *Status in North America*

Backyard composting is established in many communities in North America; however, the effectiveness is questionable. Backyard composting campaigns have been implemented in numerous communities, such as:

- Toronto, ON;
- Lethbridge, AB; and
- Owen Sound, ON.

#### **Lethbridge, Alberta**

The City of Lethbridge launched its backyard composting program in 1993. To date, over 5,300 composters have been distributed to citizens.

In the past, the City worked with Norseman Plastics offering subsidies for the Norseman Earth Machine composters during a one day event. Today, the City does not subsidize the backyard composters but charges residents \$38 with free delivery for the Norseman Earth Machine. The City does provide numerous backyard composters as door prizes and for public relations events.

Backyard composting education also takes place in the form of City pamphlets available to residents and a brochure provided by Norseman Plastics with the purchase of an Earth Machine. A series of four brochures were developed on backyard composting and made available to the public.

#### **Owen Sound, Ontario**

The City of Owen Sound has a program that subsidizes backyard composters and kitchen containers. The backyard composters are purchased by the City and sold to residents for half the original purchase price and the kitchen composters are sold at about cost.

### **4.1.3 Green Procurement/Sustainable Procurement Education**

#### *Summary Description*

Residents would be educated about making purchasing decisions that result in less waste produced, less household hazardous waste produced and promote sustainability.

#### *Implementation*

The City would provide education on environmentally sustainable purchasing practices, especially as it pertains to packaging and toxicity issues. The City may require local retailers/manufacturers to label products to help consumers make educated purchasing decisions and could offer rebates for those customers who make green/sustainable purchasing decisions.

#### *Issues/Implications*

This program could result in 1-3% reduction in the waste stream resulting from source reduction measures and purchasing recyclable packaging. However, there is low reduction potential if not accompanied by incentives (e.g. price break on reusable bags and reusable mugs). It would also be important for the City to set an example by implementing its own green procurement program.

The City would need cooperation of grocery stores and retailers to provide appropriate information to customers and other measures, such as selling reusable bags. Labelling products would be an onerous task for retailers and many manufacturers of products are not local.

A bylaw for retailers/manufacturers to label products may be necessary and a rebate policy should be put in place. The costs for this program would be included in the Promotion and Education costs.

### *Status in North America*

Green procurement education programs are becoming established in North America. Some Canadian Cities that are employing these programs, include:

- Halifax, NS;
- Vancouver, BC; and
- Calgary, AB.

#### **Halifax Regional Municipality, Nova Scotia**

The Halifax Regional Municipality provides residents with information on Precycling (preventing waste before it happens). This includes green procurement and packaging reduction opportunities such as:

- Use rechargeable batteries;
- Buy in bulk;
- Purchase loose fruits and vegetables instead of packaged;
- Buy concentrates;
- Avoid single-serving packages;
- Purchase reusable products such as cloth napkins; and
- Select items with the least amount of packaging or packaging that can be reused or recycled.

#### **4.1.4 Goods Exchange Events**

##### *Summary Description*

A day would be identified by the City in which residents could exchange reusable items with one another by either placing them at the curb or taking them to a designated central location in the neighbourhood. Goods Exchange Events are similar to yard sales but no money is involved in the transaction. They may also be referred to as “Swap Days,” “Mother of All Yard Sales,” etc.

##### *Implementation*

An advertising and promotion campaign would be developed to notify residents of the Goods Exchange Events. Local neighbourhood associations and organizations would be engaged to participate and spread the word.

Goods exchange events could also be tied in with other events such as a household hazardous waste and electronic collection day.

##### *Issues/Implications*

Goods Exchange Events could help build community cohesion and involvement, similar to events such as neighbourhood yard sales.

The City would ensure that it is protected from risk and that the traded and left-over material does not become City liability. Procedures for appropriate management of left over materials would be required and rules or guidelines would be set to govern the exchange event. City bylaws must also support the exchange event.

Costs for the Goods Exchange Events would be included in the Promotion and Education budget.

### *Status in North America*

Goods Exchange Events are becoming established in North America. This program is employed in several communities in Canada and has been successfully tried in one Regina neighbourhood with good results. Examples of communities currently implementing Goods Exchange Events include:

- St. Albert, AB;
- Strathcona County, AB; and
- Peterborough, ON.

### **Strathcona, Alberta**

The Great Strathcona Exchange is a one day event enabling residents to recycle large items that can be reused by someone else. Items accepted at this event include appliances in working order (e.g. stoves, washers, dryers, and fridges), furniture, windows, doors, lawnmowers, bikes, etc. This is a half day event (8:30am – 1:00pm) that takes place every two years at the Strathcona Public Service Yard. The 13<sup>th</sup> Great Strathcona Exchange is anticipated for June 2009. For the 2007 exchange, early advertising was in the waste collection calendar and closer to the event print and website advertising took place.

### **Peterborough, Ontario**

Since 1991 the Waste Management Division of Peterborough has sponsored Reusables Exchange Weekends each year. Residents are encouraged to place items they no longer want out at the curb for others to take. The events are held five times during the year from April to October and are posted in the Waste Calendar and other media outlets. These events are considered very successful with most items set at the curb being taken by others for reuse. To participate in an Exchange weekend, residents simply place items at the curb as of 7:00 pm the Friday evening. Anything still remaining at 7:00 pm Sunday must be removed from the curb.

## **4.1.5 Curbside Recyclables Collection**

### *Summary Description*

Residents would receive curbside collection of their recyclable materials. Materials collected could include: newspaper, household mixed and fine paper, telephone books, magazines, catalogues, glass bottles and jars, steel cans, aluminum cans and foil, PET bottles and trays, HDPE bottles and tubs, PP bottles and tubs, PS trays and foam, LDPE lids, other plastic bottles, milk cartons, aseptic packaging. Collection containers could be blue boxes or rollout carts. Curbside collection could be as a separate stream or co-collected with food waste. Processing could be through a public or private (or combined) MRF.

### *Implementation*

The list of materials to be collected would be identified before the program is implemented. Materials would be identified based on a detailed analysis of curbside collection measures, including public preferences, implications on workers and market availability for the materials.

The City would develop an extensive public education program to outline what materials would be collected and ensure participation. Curbside containers and education materials would be delivered well in advance of the program commencement (minimum one month).

The City would either purchase required collection vehicles and establish routing, or develop an RFP for the collection of recyclables (could undertake a managed competition approach where public sector responds to the RFP alongside the private sector).

### *Issues/Implications*

The curbside recycling program would reduce the number of garbage trucks required immediately. However, the program will not “pay” for itself so education that the program does cost money would be required to avoid unexpected conflicts. The City would also need to engage the public in their choice for curbside container (within the constraints of collection system in place).

Once the program is established it will be difficult to remove materials. Therefore, the City would need to identify sustainable end markets (or leave it to the MRF operator) ahead of determining what materials to include in program. The City could also establish local markets.

Policies or bylaws would not be essential, although various bylaws could support the diversion potential of the program (e.g. mandatory recycling bylaws). Additional City staff would be required, including a Recycling Program Manager, Education/Program Officer, Market Development Officer (if City involved in marketing of materials), and one or two clerical staff.

Costs for a two stream alternating weekly collection (fibres week 1; containers week 2) would be approximately \$7.00 to \$8.00/hhld/month.

### *Status in North America*

Curbside recyclable collection is well established in North America and employed in majority of the communities in Canada.

#### **Toronto, Ontario**

The City of Toronto has moved from a two stream bi-weekly curbside recycling program using blue and grey box containers to a single stream semi-automated cart curbside recycling program. Materials collected in the recycling program are stipulated at a minimum to include newspapers, glass, aluminum, steel and PET as required by Ontario Regulation 101/94. Over the years the City has expanded the number of materials collected from the traditional eight categories of materials collected during the early days of the program to 19 categories of materials collected today, including HDPE bottles, plastic tubs and lids, other plastic bottles, empty paint and aerosol cans, gable top cartons, tetrapak cartons, household fine paper, boxboard, cardboard, polystyrene and film plastic.

Residents have been allowed to choose between one of three sizes of recycling carts that best accommodate their needs. The sizes of carts include 120 litre (30 gallon), 240 litre (60 gallon) and 360 litre (90 gallon) carts. The recyclables are collected on a bi-weekly schedule alternating with garbage collection. The City provides weekly food waste (green bin) collection as well. The City of Toronto provides curbside cart recycling service to over 525,000 single family households.

#### **San Diego, California**

In 1991, the City of San Diego operated a multi stream curbside collection program (three bins for newspaper, mixed paper, and containers) which served some but not all residents in the City. Participation was high and residents in other areas of the City requested to be part of the program. In order to improve efficiencies of the existing curbside program and to identify expansion options, the City conducted an extensive review of automated recycling collection trends. This concluded in a pilot program that ran from October, 1995 to January, 1996. The City had already introduced automated collection vehicles into its trash fleet and experienced increased collection efficiency and staff productivity, increased safety and aesthetics, and a decrease in collection staff and equipment.

Due to the positive results from the pilot, the City in 1999 began converting its curbside recyclables collection service to a single stream, automated collection serviced every two weeks. The final stage of the implementation was completed in December, 2001. One of the main concerns of the City was the expected increase in contamination levels and the perceived inability of the driver to check the contents of the cart. Consequently, the City installed cameras on the collection vehicle so that the driver could see the contents falling into the truck. Even though it is too late to remove, the driver will tag the container if contamination is noticed. In addition, the City uses Code Enforcement staff to check specific problem areas of the City to check for contaminated recyclables.

### **4.1.6 Multi-Family Recycling Program**

#### *Summary Description*

Residents living in a multi-family dwelling (e.g. apartments and condominiums) would be provided access to on-site recycling opportunities at their building complex.



### *Implementation*

Public education is critical to the success of any multi-family recycling program and outreach programs should be emphasized. The City would target the same recyclable materials as the curbside recycling program and could consider a mandatory recycling bylaw and other policies to drive the recycling program.

The City would need to invest in carts and collection equipment or consider contracting out the collection service and they would need to decide whether to provide totes to every unit to act as an incentive to recycle. Guidelines for accessing buildings and ensuring safety of workers and tenants would also be required.

The City could implement the program by requiring the private sector to provide the recycling service as part of the garbage collection service provided to the building. This would result in no additional costs for the City.

### *Issues/Implications*

The multi-family recycling program would reduce the number of garbage trucks required immediately.

It will be difficult to engage tenants in the recycling program unless effort is made to make recycling as convenient as garbage collection. Some communities implement bylaws requiring that landlords make recycling services in the building as convenient as garbage services. As well, some communities tie garbage collection services to participation in recycling programs and refuse to provide garbage collection service if the building does not participate in the recycling program. This would require amendment of bylaws requiring participation by all landlords in the recycling program and the ability for the City to refuse to provide garbage service if the landlord does not provide a recycling program. Guidelines will also be required for accessing buildings, such as minimum turning radius to ensure worker and tenant safety.

No policies or bylaws would be essential, although various bylaws would support the diversion potential of the program (e.g. mandatory source separation). One additional City staff member would be required in addition to the curbside recycling program staff.

### *Status in North America*

Multi-family recycling is established in many communities in Canada; however, these programs are less successful than single family curbside recycling programs due to the greater inconvenience of the program and anonymity of the tenants. Communities offering on-site multi-family recycling programs include:

- Halifax, NS;
- Edmonton, AB;
- Hamilton, ON; and
- Ottawa, ON.

### **Ottawa, Ontario**

All multi-family buildings, including condominiums, receive garbage collection and recycling services. The City contracts out the collection services to private sector companies. Buildings are permitted once a week basic service. The City provides garbage container collection service and bases the size of the container on a formula which permits a designated amount of waste per unit. Anything over the limit is charged on a per tonne basis.

The City also provides recycling carts and collection to all multi-family buildings receiving garbage collection. The building must participate in the recycling program in order to receive garbage collection services. The contracted private haulers must provide detailed collection reports for each collection truck and collection route and are paid by the lift, receiving more for recycling than garbage.



Under the City's new waste financing system, multi-family buildings are charged an annual flat fee which pays for garbage collection and disposal. Recycling costs are covered through property taxes.

#### 4.1.7 Bulky Items Collection/White Goods Collection

##### *Summary Description*

Residents would be able to set their bulky items out for collection on a given day each month (or other frequency) for removal by the City. Alternatively, the City could have a call-in service where residents book a collection for their bulky items/white goods. Some cities charge for collection services.

##### *Implementation*

The City would identify whether the program be a regularly scheduled service or a call-in service. The City would also determine if there would be cost for the service or if it would be a free service. The issue would be whether residents are willing to pay for service or if they would continue the practice of illegal dumping if there was a collection cost involved. Once established, an education program would need to be developed to inform residents of the new service.

The City would require clerical staff to take calls and require collection staff to do the collection of the materials. The City would either purchase collection vehicles (stake trucks) for the collection or develop and release a tender for the collection and management service. If the City runs the service, they would need to have an end-point to take the goods for processing (CFC management for the white goods would be an issue).

##### *Issues/Implications*

A bulky items/white goods collection service would be expensive to implement; however, there would be some offsetting cost savings from reduced clean up services and fire services associated with illegal dumping and vandalism currently experienced in the City. The program could also reduce the environmental burden associated with improper disposal of CFC appliances as long as they are managed appropriately.

The City would need to find end markets for the metals from the white goods.

A City bylaw might need to be established regarding a cost for the service (unless a free service). However, if a cost associated with the service is passed onto residents, illegal dumping may still occur.

No other policies would be required, but an education program would be critically important. The City would require a part-time Education/Program Officer and clerical staff and would incur estimated costs of approximately \$0.50 to \$0.70/hhld/month to implement the program.

##### *Status in North America*

Bulk items collection programs are well established and implemented in several communities in North America, including:

- Seattle, WA;
- Hamilton, ON; and
- Niagara Region, ON.

##### **Hamilton, Ontario**

All eligible properties (single family households, duplexes, multi-family buildings and commercial) are able to participate in the white goods (and scrap metal) collection service that is provided on a call-in basis. There is a \$20 charge for the removal of CFC-containing white goods. The provision of this service is contracted to Waste Management Canada Corporation.

Since the same collection vehicle is used for bulky waste and leaf and yard waste collection, the bulky waste collection alternates with seasonal leaf and yard waste collection (offered from April to Mid June

and September to early December). Bulky waste collection is offered only when leaf and yard waste collection is not offered.

### **Niagara Region, Ontario**

Niagara Region offers white goods and bulky goods collection on a call-in basis. Residents are required to call and make a collection appointment and are required to purchase a \$20 tag for anything containing CFCs.

## **4.1.8 Household Hazardous Waste Event**

### *Summary Description*

Household hazardous waste, although a very small portion of the waste stream, represents the most hazardous and toxic portion of the waste stream with the greatest potential to harm the environment and its residents. A hazardous waste collection event is organized at a convenient location (e.g. landfill site) where residents bring all of their household hazardous wastes. The frequencies of events are often determined based on customer response. For some materials, this program helps to supplement other stewardship programs already in place (e.g. waste paint, oil, tires). The program helps to remove toxic materials that would otherwise end up in the landfill or in the wastewater treatment plant and potentially cause future environmental problems.

### *Implementation*

The City would establish events at a convenient time(s) and location(s). The event would have to follow applicable City bylaws and have appropriate permits. City staff (if City operated) would have to be trained in the proper collection, management, packing and shipping requirements of each type of material. The City would work with a secure landfill for the disposition of non-recyclable materials and market recyclable commodities (e.g. car batteries, oil, etc.).

Residents would need to be informed and educated of the program (i.e. what materials are acceptable, hours of operation, locations) well in advance of the program.

### *Issues/Implications*

The Household Hazardous Waste Event(s) would supplement existing product stewardship programs offered by the province. The environmental benefit comes through reducing hazardous materials in the landfill and/or the wastewater treatment plant and would also reduce the risk of exposure to hazardous chemicals now borne by the waste collectors and processors.

These events would only manage a very small portion of the waste stream, especially since a paint stewardship program is offered through SARCAN. HHW events tend to be very expensive, between \$1,000 and \$2,000 per tonne, to collect, handle, bulk, transport and dispose. In the case of Regina's 2008 HHW event, the cost to collect, handle, bulk, transport and dispose was about \$15,000 which worked out to approximately \$46 per participating vehicle and approximately \$1,600 per tonne of HHW collected.

No policies are required for the program but it would require special education/training for staff working at the Events.

### *Status in North America*

Hazardous Waste Events are established in several communities in Canada.

### **Regina, Saskatchewan**

The City of Regina has been working with the Saskatchewan Department of Environment to host an annual Household Hazardous Waste Event for its residents. Regina's 2008 HHW event, cost about \$15,000 to collect, handle, bulk, transport and dispose which worked out to approximately \$46 per

participating vehicle and approximately \$1,600 per tonne of HHW collected. In addition, the City funded about \$5,000 in advertising for the event for a total event cost of about \$19,800.

## **Toronto, Ontario**

The City of Toronto hosts over 20 household hazardous waste events every year during its environmental day events held in different neighbourhoods throughout the spring, summer and fall. The Household Hazardous Waste Event is one of several activities available to the community during the environmental day event which also includes free compost pick up, end-of-life electronic pickup, energy and waste saving devices and information distribution, and backyard composter sales.

### **4.1.9 Household Hazardous Waste Facility**

#### *Summary Description*

A permanent Household Hazardous Waste Facility would be set up at a convenient location (e.g. landfill site) where residents could bring all of their household hazardous wastes. For some materials, this program would supplement other stewardship programs in place (e.g. waste paint, oil, tires). This program would remove materials that would otherwise end up in the landfill or in the wastewater treatment plant.

#### *Implementation*

The City would need to establish a permanent facility at a city owned location. The facility would have to be built to Ministry of Labour/Ministry of Environment specifications for the handling of hazardous materials. The City staff (if City operated) would have to be trained in the proper collection, management, packing and shipping requirements of each type of material and the City would work with a secure landfill for the disposition of non-recyclable materials. The City could also market recyclable commodities (e.g. car batteries, oil, etc.).

Residents would need to be informed and educated about the program, for example, what materials are acceptable and hours of operation (does not have to be daily).

#### *Issues/Implications*

A permanent Household Hazardous Waste facility would supplement existing product stewardship programs. The environmental benefit would come through reducing hazardous materials in the landfill and/or the wastewater treatment plant and would reduce the risk of exposure to hazardous chemicals now borne by the waste collectors.

The cost of facilities varies widely. Key cost variables include type of depot (cost of build), hours of operation, and staffing levels (which may or may not align with the quantity of material returned). A simple facility may cost tens of thousands of dollars to construct compared with a sophisticated facility which may cost hundreds of thousands of dollars to construct. Those communities with permanent facilities experience cost savings through the operation of the facility which can process more vehicles and store HHW materials for longer periods of time before transporting them for disposal. The actual disposal costs are similar to a HHW event on a \$ per tonne basis.

Regina's HHW program would only manage a very small portion of the waste stream, especially since a paint stewardship program is offered through SARCAN.

No bylaw would be required for this program; however, it requires special education/training for staff working at the depot.

#### *Status in North America*

Household Hazardous Waste facilities are established in several communities in Canada, such as:

- Owen Sound, ON;
- Wellington County, ON; and

- Calgary AB.

### **Owen Sound, Ontario**

Owen Sound operates a permanent HHW facility, which is open to the public one Saturday per month from March to November. The City of Owen Sound took the step in providing cost-effective HHW disposal services by operating the facility once per month. The permanent depot is open to all residents of those municipalities that share the Owen Sound landfill site. The program is also open to residents from neighbouring municipalities on a fee for service basis. Landfill tipping fees are used for operational and capital funding for this program.

The City uses its own staff to unload vehicles and sort and pack the collected hazardous materials. The capital cost for establishing the permanent HHW facility was about \$56,000. The cost of the program in 2005 was \$593/tonne.

### **Wellington County, Ontario**

Wellington County has individual household hazardous waste facilities located at five County landfill facilities and are open year-round. The facilities are open to the public during landfill hours of operation. In order to reduce operating costs the County accepts only the following household hazardous waste material:

- Automotive Motor Oil (maximum 25 litres per day);
- Automotive Oil Filters (maximum 5 filters per day);
- Automotive Antifreeze (maximum 25 litres per day);
- Automotive Batteries (maximum 4 batteries per day);
- Household Batteries (place in a clear sealable plastic bag);
- Aerosol Cans (empty or containing product); and
- Propane Cylinders (no larger than 20 lb. tanks).

Wellington County augments the Household Hazardous Waste Facilities with seven Household Hazardous Waste Events located at community centres throughout the County.

## **4.1.10 Recyclables/Yard Waste Drop-off Depots**

### *Summary Description*

The City continues with the current Big Blue Bin service. The City could expand the services to offer collection of additional materials.

### *Implementation*

The City would continue with the Big Blue Bin service, expanding the number of locations to increase the diversion potential of the program. Currently the program is achieving approximately 8% diversion of the residential waste stream. The City could also provide drop-off for additional materials (all materials as would be collected curbside) plus yard waste giving residents more reasons to use the depots.

Educational materials should be developed to outline the additional service locations and materials that can be managed.

The City would continue to arrange for the processing of the materials once collected. This may be done through the release of a tender for processing services. Collection services could be tendered as well, with possibly both services put into one tender/RFP. If the depots were compartmentalized enough, materials could be baled and shipped directly to end markets. In this approach, the City would need less processing infrastructure.

### *Issues/Implications*

It is expected that the provision of depots in more locations would increase diversion rates by providing residents with greater access and more convenience to the depots. However, typically depot programs achieve less than 50% of the diversion potential of curbside collection programs and there is potential for depots to be abused by residents who use them to drop off “garbage.”

Coordination of the collection of recyclables from the depots is required to ensure that overflows do not occur and the depots remain aesthetically appealing. As well, end markets are needed for all materials collected and may require further processing to accommodate end markets.

This program is voluntary and, therefore, no formal policies are required. The development of an extensive educational program would help promote the importance of recycling and increase the diversion potential. The monthly cost for the program is estimated to be \$0.40 to \$0.70/hhld/month.

### *Status in North America*

Drop-off depots are well established in North America and are employed in several communities in Canada including:

- St. Albert, AB;
- Capital Regional District, BC;
- Kamloops, BC.

#### **Capital Regional District, British Columbia**

The Capital Regional District (CRD) has implemented materials bans at the landfill including: corrugated cardboard, directories, mixed paper, newspaper, yard and garden waste. All of these items are accepted at the Heartland Recycling Facility for a \$3 entrance fee. Yard waste depots are available to residents any time of the year, which is supported by leaf and branch collection programs. Backyard composting education is used to assist with yard waste diversion.

#### **Kamloops, British Columbia**

In Kamloops, residents can take their yard waste to one of three drop-off depots including the Cinnamon Ridge Compost Facility and two other yard waste drop-off sites located in town. All of the sites accept grass clippings, leaves and garden waste, brush and tree prunings and small branches.

### **4.1.11 Materials Recovery Facility (MRF)**

#### *Summary Description*

The City would develop a facility to receive, sort, and process residential recyclables into a form suitable for use in various end markets. The facility could be owned and/or operated by either the public or private sector. The design of the MRF will depend on the type of collection program implemented, a two stream or single stream recycling program. Typically, the single stream recycling programs require a high level of processing at the MRF then the two or multi-stream recycling programs.

#### *Implementation*

The list of materials to be collected will be identified before the program is implemented. Materials will be identified based on the curbside collection program.

The City would develop an RFP for the establishment of a Material Recovery Facility (MRF). The MRF could be owned and operated by the City, or owned by the City and operated by the private sector (typical approach most often used in other municipalities in Canada) or left to the private sector to own and operate.

### *Issues/Implications*

Once the program is established it would be difficult to remove materials. The City would need to work with end markets (or leave it to the MRF operator) to develop markets for materials ahead of determining what materials to include in program. The City could also establish local markets.

Implementation of the program requires time. The RFP process for construction and operation of a MRF (i.e. write and release an RFP for a MRF, review submissions, negotiate, award, and build a MRF) typically takes at least 18 months.

### *Status in North America*

MRFs are well established in North America and employed in most communities in Canada.

#### **Calgary, Alberta**

The City of Calgary has recently contracted the construction and operation of a MRF which will be one of the largest municipal MRFs operating in Canada. The single stream sorting facility can sort up to 40 tonnes of recyclable materials per hour, or more than 120,000 tonnes per year. Calgary's MRF will be operated by a private sector company and will process recyclables from the residential and commercial sector. It has cost an estimated \$30 million to construct and will employ 60 people.

## **4.1.12 Christmas Tree Collection**

### *Summary Description*

The City would continue with its Tinsel Mulch program, seasonally collecting Christmas Trees.

### *Implementation*

Christmas Tree Collection provides mulch back to residents in the spring for gardening. It could also be incorporated into a curbside leaf and yard waste collection program and provide greater service to residents.

### *Issues/Implications*

The program, as it is currently implemented in the City, results in very low diversion rates. The program is also relatively expensive (high cost per tree) to provide and could be cheaper if incorporated into a leaf and yard waste curbside collection program.

This is a voluntary program and no formal policies are required.

### *Status in North America*

Christmas Tree collection is well established and employed in many communities in Canada.

#### **Regina, Saskatchewan**

The City of Regina offers curbside Christmas tree collection through its Tinsel collection program.

## **4.1.13 Curbside Leaf and Yard Collection and Outdoor Windrow Processing**

### *Summary Description*

Residents would receive curbside collection of their yard waste. This could include spring brush collection, fall leaf collection, and optionally, summer grass collection (alternatively grass could be banned from collection). Materials would be taken to an outdoor windrow composting facility to be processed. Materials could be collected in kraft bags or in carts, or could be collected with food waste but this would be more expensive to process. Some communities apply user fees to leaf and yard waste collection.



### *Implementation*

Prior to implementation, the City would determine what materials would be included in the program. A detailed analysis of curbside collection measures would need to be completed. The City could incorporate its seasonal Christmas tree collection (the Tinsel Mulch Program) in the program and would need to determine if grass is to be included in the program.

The City would need to develop a public education program outlining what materials would be collected, how the materials are to be set out, and the collection schedule. The City would be required to deliver curbside containers (if carts are to be used) and education materials well in advance of the program starting (minimum one month).

The City would need to develop a leaf and yard waste outdoor windrow composting facility. This is currently being planned by the City at the landfill site. The City would also need to purchase the required collection vehicles and establish routing or develop an RFP for the collection of leaf and yard waste (the City could undertake a managed competition approach where public sector responds to the RFP alongside the private sector).

### *Issues/Implications*

Curbside leaf and yard collection would reduce the number of garbage trucks required. The composting facility could also offset the cost of top soil/solid amendment/compost used by the City. Participation in the program is expected to be high considering the very positive response to the idea of the program as determined in the residential waste management survey conducted in the spring of 2008. However, the City would need to further engage the public by allowing them a choice of curbside container (within constraints of collection system in place).

The City would need to develop markets for the compost and would need to have an outdoor composting facility in place at the landfill before introducing the collection system. The City has already planned for an outdoor windrow composting system as part of the landfill expansion plans. The outdoor aerobic composting technique will be employed to compost leaves and yard waste but not food waste (which is subject to odour problems if food waste is introduced). Composting would also reduce landfill gas generated in the landfill and may have an effect on the cost implications of the gas recovery program.

The City could use a separate fleet of trucks for collection; however, it would be very expensive to purchase a single use fleet of trucks for only a seasonal leaf and yard waste program (e.g. 12 weeks of collection service throughout the year). Alternatively, the City could use spares/other vehicles from the private sector, although at a premium cost.

No policies or bylaws would be needed, although various bylaws could support the diversion potential of the program (e.g. mandatory source separation of leaf and yard waste). The cost of the program is estimated at \$1.40 to \$1.50/hhld/month and would require a part-time Education/Program Officer.

### *Status in North America*

Curbside leaf and yard waste collection is well established in North America. These programs are implemented in most communities in North America, including:

- Vancouver, BC;
- Region of Peel, ON; and
- Toronto, ON

### **Region of Peel, Ontario**

The Region of Peel provides a curbside pick-up for source separated leaf and yard waste throughout the growing season (April to November). Weekly curbside pick-up is provided in spring and fall, with pick-up every two weeks during the summer. The leaf and yard waste is picked up in paper bags to avoid a plastic contamination in finished compost. The collected leaf and yard waste is sent to an open windrow composting facility. The finished compost is blended with other products and sold to landscapers and

garden centres and some is used for internal operations or sold to residents. A small amount is distributed to local residents during Environment Days. The use of compost reduces water requirements and adds soil structure through the addition of carbon to the soil, as well as trace quantities of nutrients and fertilizers.

#### 4.1.14 Curbside Food Waste Collection

##### *Summary Description*

Residents would receive weekly curbside collection of their food waste. Collection of food waste is commonly co-collected with either recyclables or garbage (typically dependent on collection frequency of garbage and recyclables and location of MRF, landfill, and composting facility). Materials would be collected in small carts (ranging in size from 45 to 120 litre carts); larger carts can be used if yard waste is collected at the same time. Processing typically occurs in an in-vessel composting facility; this approach reduces odour concerns associated with windrow composting facilities.

##### *Implementation*

The City would determine the processing approach to be used for the food waste to help determine what materials to accept in the program. The City would also need to conduct a detailed analysis of curbside collection measures, including public consultation collection preferences and implications on workers to determine the collection approach.

The City would need to develop a public education program outlining what materials would be collected, how materials should be set out for collection and the collection schedule. The City would need to deliver curbside containers and education materials well in advance of the program starting (minimum one month).

The City would either purchase required collection vehicles and establish routing or develop an RFP for the collection of food waste and the material to be co-collected (could undertake a managed competition approach where public sector responds to the RFP alongside the private sector).

##### *Issues/Implications*

Food waste collection could reduce the number of garbage trucks required. Garbage collection could be reduced to every second week. Food waste composting could offset the cost of top soil/solid amendment/compost as used by the City.

Participation in the program is expected to be high considering the very positive response to the idea of the program as determined in the waste management survey conducted in the spring of 2008. However, the program will not “pay” for itself so education that the program does cost money would be required to avoid unexpected conflicts. The City would also engage the public in their choice for curbside container (within constraints of collection system in place).

The program would require time to implement and may be difficult to alter once established. The City will need at least 15 months lead time to implement the collection program. As well, once the materials to be collected are established it would be difficult to remove them from the program.

No policies or bylaws would be essential, although various bylaws could support the diversion potential of the program (e.g. mandatory source separation of food waste). The cost to the City is estimated to be \$5.50 to \$6.25/hhld/month and additional staff required would include one or two Education/Program Officers, a part-time Market Development Officer (if City involved in marketing of materials), and clerical staff.

##### *Status in North America*

Curbside food waste collection is employed in several communities in North America, including:

- Toronto, ON;



- Halifax, NS; and
- San Francisco, CA.

### **Toronto, Ontario**

The City of Toronto was one of the first communities in Ontario and is the largest community in North America to implement a city-wide source separated organics (SSO) collection program for single family households. Toronto launched its SSO program in September 2002 with a four-phase roll-out schedule from 2002 to 2005. The first phase of the roll-out involved 70,000 households in Etobicoke. Over the next three years the other four areas in Toronto came on board. Today, Toronto provides SSO curbside service to over 525,000 single family households.

Households are issued a 45-litre green cart which is collected on a weekly basis with recyclables and garbage is collected on alternating biweekly basis. Residents can use compostable and/or plastic bags to collect the food waste in the kitchen and transfer it to the green bin. The use of plastic bags is highly unusual for food waste collection programs due to the contamination problems during the processing phase; however, Toronto uses anaerobic digestion technology to process the food with a hydropulping process at the front end to pre-process and remove the plastic contaminants.

### **San Francisco, California**

Since 2000, San Francisco offers a residential 3-Cart automated collection program featuring garbage, recycling, and food waste collection. The recyclables are collected in a blue cart, compost (kitchen and yard waste) in a green cart, and garbage in a black cart. Even though a variety of cart sizes are available, residents typically select a 32-gallon (120-litre) cart for recyclables, either a 32-gallon (120-litre) or 64-gallon (240-litre) cart for compost, and a 32-gallon (120-litre) cart for garbage. Residents generally order blue and black carts, while the green carts tend to be optional. With increased education lately there has been a noted increase in number of residents selecting green carts. The residents pay for each service.

The 3-Cart collection takes place weekly on the same day throughout the year. Blue and black carts are collected by one truck while a dedicated truck collects the green cart later in the day.

## **4.1.15 Outdoor Windrow Processing (Composting) for Yard Waste**

### *Summary Description*

An aerobic composting technique would be employed to compost leaves and yard waste, but not food waste because the composting process occurs outdoors and is subject to odour problems if food waste is introduced.

### *Implementation*

An outdoor windrow composting facility would need to be developed. The City is in the process of planning the development of an outdoor windrow composting unit at its landfill.

### *Issues/Implications*

Outdoor windrow composting is suitable for leaf and yard waste, but requires large space and may require markets for compost and an environmental assessment.

### *Status in North America*

Windrow composting is well established in North America and employed in most communities in Canada to process leaf and yard waste.

### **Markham, Ontario**

The Town of Markham provides curbside leaf and yard waste collection using only kraft bags because, unlike plastic bags, kraft bags decompose naturally with the leaf and yard materials leaving a rich

compost product that has a higher value. The kraft bag composting process requires no debugging or screening machinery to remove plastic from the compost. The Town of Markham takes the leaf and yard material it collects to the Bloomington Compost Site. The leaf and yard material is composted in outdoor windrows.

### **Brandon, Manitoba**

The City of Brandon has been composting for almost 20 years and is considered a leader in composting in Manitoba. Presently there are three open windrow composting pads used to process leaf and yard waste material as well as straw and manure from local farms. In the past, the City has composted approximately 3,300 tonnes of manure and straw and about 3,000 tonnes of leaf and yard waste annually. Most of the finished compost is used by the City, including the parks department and the solid waste department for reclamation of a landfill.

## **4.1.16 In-Vessel/Enclosed Processing**

### *Summary Description*

An aerobic composting technique would be implemented to permit the composting of food waste. The system would be enclosed in order to control odours and other nuisances. The controlled process insures pathogen kill, however there would be no opportunity to generate power.

### *Implementation*

An in-vessel or enclosed composting facility would need to be developed. This could be owned and operated by the City or an RFP for a centralized composting facility could be developed for private ownership and operation of a facility. If private ownership was decided, implementation would include writing and releasing an RFP, reviewing submissions, negotiating with vendors, awarding a contract, and building/purchasing the facility and can expect to take at least 18 months.

### *Issues/Implications*

An aerobic composting facility is less expensive than an anaerobic digester, but requires more space. The aerobic composting facility requires a large capital investment, environmental assessment, and markets for compost.

### *Status in North America*

In-vessel/enclosed composting is employed in many large communities in Canada, including:

- Peel Region, ON;
- Hamilton, ON;
- Prince Edward Island; and
- Halifax, NS.

### **Peel Region, Ontario**

In March 2007, the Region of Peel officially opened its new composting facility located at the 41-acre Peel Integrated Waste Management Facility (PIWMF) in Brampton, Ontario. The organics composting plant has the capacity to process 60,000 tonnes of organic material annually. Equipped with six 30-metre aerated static tunnels, the facility processes all SSO material collected in Brampton and Mississauga. SSO collected in the community of Caledon is processed at the 10,000 tpy composting facility located at the Caledon landfill site. A curing facility has been constructed at the former Chinguacousy Landfill Site in Caledon to take compost from the two composting facilities.

### **Prince Edward Island**

In July 2002, Prince Edward Island introduced an SSO program for all island residents and businesses. The food waste and yard waste is diverted to the Central Compost Facility which is an enclosed

composting system using a containerized composting system and aerated static piles for curing the finished material. The composting facility has a 30,000 tonnes per year capacity

#### 4.1.17 Promotion and Education

##### *Summary Description*

Promotion and education (P&E) programs are an integral component of any waste management and diversion system. The more comprehensive the P&E campaign the higher the rate of waste diversion achieved. Programs may include traditional advertising and/or social marketing techniques.

##### *Implementation*

An effective P&E program requires a good understanding of resident's behaviours and attitudes prior to design and development of the program. P&E programs would be introduced prior to the implementation of a new waste management/diversion program in order to increase participation and would be implemented throughout the program to maintain support for and participation in the waste management/diversion program.

##### *Issues/Implications*

P&E is an essential component of any diversion program. Social marketing techniques (such as outreach) combined with on-going education and communications can achieve great success in increasing and maintaining participation in a diversion program.

Timing of the P&E is important. Needs and barriers to an activity must be identified and addressed prior to the implementation of the activity and continual follow-up with communications and advertising is necessary to maintain success.

Different levels of P&E could be implemented requiring different levels of effort. Depending on the level of effort, P&E would require an additional part-time up to two full time Education Program Officers employed by the City and the estimated cost is \$1.50 to \$5.50/hhd per year.

##### *Status in North America*

All communities with a waste diversion program use P&E to promote the program. The comprehensiveness of the P&E programs varies considerably from community to community. Examples of communities with extensive P&E programs include:

- Hamilton, ON;
- Region of Peel, ON; and
- Halifax, NS

##### **Region of Peel, Ontario**

The Region of Peel actively promotes their waste diversion programs through an extensive communication and education program. A wide-array of communication approaches are used including:

- |  |  |   |
|--|--|---|
| • Household Brochures                    | • Outdoor (e.g. transit signs, billboards) | • Specially Designed Multi-Family Program                     |
| • General/Newspaper advertisements       | • Special events                           | • Flyer Drop Offs   |
| • Radio and/or television advertisements | • Door hangers and magnets                 | • Backyard Composter and Blue Box Sales and Compost Giveaways |
| • School tours/presentations             | • Calendars                                | • Newsletters   |

- Student/Teacher education kits
- Speaking Engagements
- Posters

The Region uses their solid waste websites to provide a one-stop location for residents to find information about waste management and diversion services and opportunities. Some of the interesting features of their solid waste website include:

- Links to collection calendars for download on the Region's website;
- Information on how to divert hazardous solid waste (HSW), compact fluorescent lights and waste electronics and offer alternative green cleaner suggestions to eliminate the need for toxic household cleaners;
- An *A-Z Listing of Services* which offers almost 250 topics from which to get information ranging from grasscycling to reuse centres; and
- The benefits to backyard composting, grasscycling and leaf mulching.

#### 4.1.18 Mandatory Recycling or Source Separation Bylaws

##### *Summary Description*

Bylaws would stipulate that residents must source separate specified recyclable materials from the waste stream or prohibit them from discarding the specified materials in the garbage. Communities typically leave the set out garbage at the curb and/or issue fines for non-compliance.

##### *Implementation*

Most communities implement mandatory recycling or source separation bylaws to persuade the non-committal portion of the residential sector to participate in the recycling program. Often the community will target all materials in the recycling program.

The bylaw would need to support an existing recycling program. Infrastructure would be required for the collection of materials; the program cannot be mandatory without a viable diversion option in exchange for disposal. The collection and processing service delivery could be through public, private, or public-private partnerships.

##### *Issues/Implications*

Slightly higher diversion rates could be expected if a mandatory recycling bylaw was coupled with a curbside ban. Higher diversion rates could also extend the life of the landfill site.

The bylaw will not accomplish any diversion unless combined with development of the recycling infrastructure and end markets. Along with the commitment to implement a recycling program the mandatory recycling and source separation bylaws could help in the development of an expanded recycling infrastructure and could provide jobs associated with the collection and processing of materials.

Public education will be important to the success of the bylaw. In addition, enforcement measures will need to be identified such as leaving the garbage at the curb if it contains prohibited materials and/or issuing fines.

A bylaw would have to be developed by the City for mandatory recycling of specified materials and Bylaw Officers would have to ensure compliance. The City would also require a policy and penalties for those in non-compliance and a strong monitoring and enforcement infrastructure. The program could also be supported with a bylaw for Pay-as-you-Throw for garbage for residents as a means of providing economic incentive to divert.

##### *Status in North America*

Recycling bylaws are well established throughout North America and are employed in communities such as:

- Seattle, WA;
- Kamloops, BC; and
- Toronto, ON.

### **Toronto, Ontario**

Through its Mandatory Recycling Bylaw, the City of Toronto requires residents to participate in its recycling program and has set its fine at \$105 for reoccurring offences.

### **Kamloops, British Columbia**

Based on the results of the Residential Curbside Recycling Pilot Program, a curbside recycling program supported by a mandatory recycling bylaw was introduced in 2008. The pilot program demonstrated that curbside customers can reduce the volume of garbage they place at the curb by 25 to 50% each week.

## **4.1.19 Curbside Material Bans**

### *Summary Description*

Designated material would be banned from being collected with garbage at the curbside through the development of a bylaw. The collection crew would have the authority to refuse to collect the garbage if containing banned materials. Commonly banned materials include electronic waste, recyclable materials, and wood waste.

### *Implementation*

Based on the availability of recycling markets, specific material bans could be put in place through bylaws and should be supported with the same material bans at the landfill.

### *Issues/Implications*

The bylaw would require public education, development of infrastructure, bylaws, and policy for non-compliance. The bylaw has the potential to provide jobs and extend the life of the City landfill site.

### *Status in North America*

Curbside material bans are fairly well-established in North America and employed in many communities in Canada, including:

- Toronto, ON;
- Niagara Region, ON; and
- Vancouver, BC.

### **Niagara Region, Ontario**

Most area municipalities in the Niagara Region have introduced a material ban on blue box recyclables. Bags that contain banned materials are stickered for noncompliance and left at curbside. To date, there have been no known repeat offenders.

### **Vancouver, British Columbia**

All materials banned at Metro Vancouver disposal facilities including blue box recyclables, household hazardous waste and electronics are banned from curbside collection. If banned materials are spotted in the trash, the bags could be left behind.

## 4.1.20 Reduced Frequency Garbage Collection

### *Summary Description*

The City would pick up garbage less frequently, e.g. every second week. Reduced frequency garbage collection is typically coupled with curbside collection of recyclables and organics (food waste), which results in residual garbage comprising about 30 – 40 % of the household material stream. Items that cause odours should be in the organics stream rather than in the garbage and are typically collected on a weekly basis.

### *Implementation*

The City would need to implement an aggressive diversion program before switching to biweekly garbage collection and should introduce it at the same time as curbside food waste collection. If there is no food waste collection service then reduced frequency garbage collection could be introduced during the winter months but not during the summer months (due to odour issues).

An extensive education program would be required to show residents that they do not need weekly garbage collection if they fully participate in the diversion programs.

### *Issues/Implications*

Reduced frequency garbage collection would promote greater participation in diversion programs and could help extend the life of the landfill site. It would also result in lower waste management costs.

The program would not be feasible unless it is combined with development of infrastructure and implementation of other options. Education programs would also need to be in place to address any dissent that residents may have with the idea of reduced garbage collection service.

A City bylaw imposing mandatory recycling of specified materials could be required.

### *Status in North America*

Reduced frequency garbage collection programs are well established in communities that provide food waste collection, including:

- Halifax, NS;
- Prince Edward Island; and
- Vancouver, BC.

### **Prince Edward Island**

All of Prince Edward Island (PEI) residents are provided waste management service through the Island Waste Management Corporation (IWMC) which oversees all aspects of waste, recyclable, and organics collection along with other PEI diversion programs including Christmas tree collection, spring and fall cleanup, and household hazardous waste collection.

All residents in PEI receive biweekly black cart (140-litre/37-gallon or 240-litre/64-gallon) garbage collection that alternates with green cart organics (kitchen and yard waste) collection. In addition to the black cart, two clear transparent plastic bags or rigid containers can be set out for collection but must not weight over 75 lbs. The maximum weight for each black cart is 220 lbs. Blue bag recyclables are collected on a monthly basis.

### **Halifax Regional Municipality, Nova Scotia**

The Halifax Regional Municipality provides biweekly garbage pick-up in a bag or can that alternates with organics collection. Garbage collection is on the same day as recycling collection.

#### 4.1.21 Pay-As-You-Throw for Garbage

##### *Summary Description*

Bylaws would stipulate that residents must pay on a volume basis for the disposal of their wastes, which may employ a tag or bag system or a variable cart system (i.e. different fee levels for different sized containers). Before implementation, extensive diversion programs must be in place.

##### *Implementation*

The City would implement diversion programs for recyclables and leaf and yard wastes at a minimum, ahead of looking at user fees for waste. Residents would have the opportunity to reduce the amount of waste they generate, thereby, saving money on disposal. An extensive education program would be required to show residents their options and how they can save money.

The City would need to develop an order, delivery and implementation schedule to ensure that the program is implemented in an efficient and effective manner.

Variable cart programs are often operated as a utility and charged similar to other utilities.

##### *Issues/Implications*

Pay-as-you-Throw (PAYT) programs are often credited with achieving 5% source reduction, depending on how stringent the program. It could also extend the life of the landfill site through this source reduction.

However, the program will not accomplish diversion unless combined with development of a waste diversion infrastructure. An expanded infrastructure would be needed because the city does not have adequate waste diversion infrastructure in place for diverting materials (recyclables and organics).

Current cart sizes would not achieve additional diversion; therefore the City would need to offer smaller carts (e.g. 120 litre and 240 litre) in order for residents feel that they have choice in the size of cart and associated fee.

If a variable cart program is implemented then the City should establish a utility system and collect funds separate from property taxes. Care will need to be taken to address cries of double taxation and social inequities. The City can address these issues by reducing the mill rate and providing subsidies and discounts to lower income, seniors and disabled households.

##### *Status in North America*

Pay-as-you-Throw for garbage are well established in several communities in Canada, such as:

- St. Albert, AB;
- Victoria, BC;
- Airdrie, AB;
- Kamloops, BC; and
- Vancouver, BC.

##### **Kamloops, British Columbia**

On July 1, 2006, the City of Kamloops introduced a variable rate container system which allows residents to choose from one of four sizes of containers ranging from 120 litres to 360 litres. The rates are based on the size of the container. Residents may purchase tags for additional garbage at \$2 per tag. The City owns and leases the carts, which provides them with control over the carts and eliminates issues about replacing old and damaged carts, which the City does free of charge.



## **Airdrie, Alberta**

The City of Airdrie was the first community in Alberta to implement a PAYT garbage system. A bag tag system was introduced in 1992 because Airdrie found it had little control over hauler contract costs or tipping fees charged at the Calgary landfill. One thing Airdrie could do was to reduce the amount of waste that it sent to landfill. PAYT was phased in gradually. Initially residents could set out up to five bags of garbage per week (extras cost \$2/tag) and now there is a two bag per week limit (extras cost \$1/tag). In 1998 the tags were reduced from \$2 to \$1 to reflect the true cost in disposing of an extra bag of garbage.

Residents are charged a flat fee for garbage collection services as well as an Environmental Service Fee for waste diversion services. The City of Airdrie bills its garbage and recycling services separately on the utility bill. The City distributes one bimonthly utility bill for water, sewer, waste management, and environmental services.

### **4.1.22 Customer Rewards Programs**

#### *Summary Description*

Selected residents would be rewarded by the municipality for participating in the diversion programs by using different approaches such as financial rewards, media recognition, and award ceremonies.

#### *Implementation*

The City would advertise the program well to ensure that all residents are aware of the opportunity to participate. The City could identify a couple of incentive programs that are promoted by the City and get City Councillors involved in participating and/or promoting the program.

#### *Issues/Implications*

Customer Rewards Programs would provide an opportunity for the City to continue its good public relations and to show its support for waste diversion. This program could provide an opportunity to develop friendly neighbourhood competitions and encourage neighbourhood pride.

The City would need to work with local media to promote the program and implement a comprehensive public education and awareness campaign.

No policies or bylaws would be required for this measure.

#### *Status in North America*

Customer Rewards Programs are becoming established in North America and are employed in select communities, including:

- Hamilton, ON;
- Berkley, CA; and
- London, UK.

### **Hamilton, Ontario's Gold Box Reward Program**

To promote successful waste management practices in the home, the City of Hamilton's Waste Management Division launched the "Gold Box" Reward and Recognition Program in January 2007. The Gold Box program recognizes residents who reach and exceed the goal of 65% waste diversion from landfill.

Residents are encouraged to complete a ballot provided on the City's website. From the submitted ballots, City staff draw the name of one resident each month and performs an audit on their household waste, recyclables, and source separated organics. All audited households that meet or exceed the community target of 65% waste diversion from landfill receive a reward. Participation is voluntary and the contest is only open to households within the City of Hamilton that receive curbside waste collection service.



Each month, the city recognizes one winning household. Each winning household:

- Is presented with a cheque for \$100 to illustrate the savings that can be realized by diverting waste from landfill by recycling and composting. The cheque represents the approximate the value of taxes paid for waste management (\$122 for 2007);
- Is recognized in the local media;
- Is recognized before City Council on an annual basis; and
- Is given 'gold' boxes to use each week for recyclables collection (instead of using the standard blue box).

To date, the City has recognized five Grand Prize winners who have achieved between 82% and 90% waste diversion.

### **Berkeley, California's Cash for Trash Reward Program**

The Cash for Trash program, which began in 2001, provides monetary rewards to Berkeley residents whose garbage contains minimal recyclables. On selected days, Ecology Center staff collected garbage from randomly selected addresses. The collected garbage was searched for recyclables, with permission from the residents. A 1% by weight of recyclables in the garbage was the target to identify a finalist. Those with no recyclable material in their trash were awarded cash prizes of at least \$250 to a maximum of \$2,000. If no winners were identified, the prize money rolled over to the next day for a potentially larger reward for the next winner.

## **4.1.23 Outreach**

### *Summary Description*

Outreach would use tools that directly engage the residents in an action to foster and maintain behaviour change. Commonly employed tools include commitment (pledges), feedback, prompts, norm, communication, outreach, and incentives. Communities sometimes use citizens and/or students to promote waste management initiatives by implementing block leader programs, master training programs, or canvassing.

### *Implementation*

An effective outreach program would require a good understanding of resident's behaviours and attitudes prior to design and development of the outreach program, as well as good coordination of outreach activities and timing. Outreach programs would be introduced prior to and throughout the implementation of a new waste management/diversion program in order to gain and maintain participation.

### *Issues/Implications*

Outreach combined with on-going education and communications could achieve great success in increasing and maintaining participation in the targeted activity. However, needs and barriers to an activity would need to be identified and addressed prior to the implementation of the activity. As well, using students to go door-to-door prior to the launch of a new program has proven very effective in raising resident understanding and commitment to a program. Continuous follow-up with communications and advertising would be essential to maintain success.

Timing of the outreach would be important and policies that require integration of outreach into new programs would be needed. City costs and staffing requirements would be included in the P&E budget.

### *Status in North America*

Outreach programs are becoming established in North America. Many communities in Canada have implemented one or more tools and include communities such as:

- Ottawa, ON;

- Markham, ON; and
- Hamilton, ON.

### **Ottawa, Ontario's Recycling Report Card**

As part of its Integrated Waste Management Master Plan, the City of Ottawa is developing a P&E campaign for both single family and multi-family households. The campaign uses some social marketing strategies as well as some interesting feedback approaches:

- Developing a report card for residents, which grades (i.e. A,B,C,D) the capture rates being achieved in the recycling program for individual materials (e.g. newspaper receives an A- and HDPE receives a C+); and
- Publishing waste audit results in the audited neighbourhoods and asking residents to consider how well they are doing compared with other neighbourhoods.

The intent is to send a positive message and encourage residents rise up to the challenge.

### **San Diego, California's Door-to-door Canvassing**

As part of the "Recycle or Else" campaign, the City of San Diego launched a number of outreach and communication strategies to achieve the following goals:

- Understand customer barriers;
- Develop programs to lower the barriers and increase the benefits;
- Integrate programs and communications; and
- Define clear, consistent message points.

One of the strategies employed in the campaign involved sending temporary staff to two targeted neighbourhoods in order to conduct door-to-door canvassing. During the canvassing the City representatives informed residents about the benefits of recycling and encouraged them to participate in the City's recycling program. As a result of the combined door-to-door canvassing and a door hanger program, participation increased from 36.8% to 69.7% of households in the one neighbourhood and from 51.6% to 59.8% of households in the second neighbourhood.

## **4.1.24 Promotion of Sustainable Policies**

### *Summary Description*

This program would require lobbying provincial and federal agencies to promote environmental issues and involves developing a set of environmental policies to be implemented by various levels of government.

### *Implementation*

This measure would require involvement by elected officials, preferably in partnership with other municipalities, to lobby the provincial and federal governments to develop environmental policies and programs.

### *Issues/Implications*

This program would provide an opportunity for elected officials to become actively involved in environmental policy.

### *Status in North America*

Promotion of sustainable policies is becoming more established in North America and programs are being employed in communities such as Ottawa, ON and San Francisco, CA.

## **San Francisco, California**

In February 2006, The San Francisco Board of Supervisors voted unanimously to pass a resolution that supports state-wide legislation and local initiatives requiring manufacturers to take responsibility for collecting and recycling their products at the end of their useful life.

The Extended Producer Responsibility (EPR) resolution, asks the state to take the financial burden of disposing toxic products off of taxpayers and place it on the manufacturers. As the San Francisco resolution puts it: *By covering the costs of collection and disposal, local governments are subsidizing the production of waste because manufacturers know that whatever they produce, the local government will foot the bill for recycling or disposal. San Francisco and local governments voiced their displeasure with footing the bill for picking up after producers of toxic and disposable consumer products.*

### **4.1.25 Support for Waste Minimization Policy**

#### *Summary Description*

This policy encourages government involvement to promote greater producer responsibility (financial and manufacturing) for products and packaging produced; defined as "Zero Waste" in other communities.

#### *Implementation*

This measure would require the City to develop a policy and/or bylaw supporting "Zero Waste" initiative thereby providing the necessary governing mandate to Regina to pursue and implement relevant "Zero Waste" initiatives.

#### *Status in North America*

These programs are becoming established in North America and are being adapted by many communities, such as:

- Kootenay, BC;
- Seattle, WA;
- Metro Vancouver, BC; and
- Toronto, ON.

## **Metro Vancouver, British Columbia**

On May 26, 2006 the Greater Vancouver Regional District directors voted unanimously to adopt a Zero Waste philosophy. Metro Vancouver plans to work towards a Zero Waste goal by providing programs and services to promote and encourage both producer responsibility and user responsibility practices.

## **Regional District of Kootenay Boundary, British Columbia**

In March 2002, the Regional District of Kootenay Boundary approved a proposed zero waste strategy for the region. The new strategy, called "Bringing Zero Waste to Kootenay Boundary – A Strategy for a Waste Free Future" provides a blueprint for moving from concept to implementation. It consists of eight initiatives to be pursued at the local level and ten initiatives involving local government efforts to influence change at the provincial level. The strategy is broad-based, targeting increased materials efficiencies in businesses, local economic development through "resource recovery" and public policy renewal to facilitate the development of a zero waste economy.

### **4.1.26 Solid Waste Collection and Landfill of Residuals in City Site**

#### *Summary Description*

Solid waste continues to be collected and taken to a landfill facility.

### *Implementation*

The City continues to mandate the provision of solid waste collection for its residents which is hauled to the City landfill for disposal. The City currently operates a landfill and is in the process of expanding the landfill as required to meet the City's growth needs for the next 25 years. The collection program could be altered to become a PAYT program to promote waste diversion through economic incentives and potentially reduce the amount of waste to be collected and landfilled.

### *Issues/Implications*

The potential increase in waste diversion through collection programs could result in a longer life for the landfill. The landfill is the lowest cost waste management option and could be easily used by the City to manage all IC&I and C&D waste as well.

Garbage collection service and landfill capacity will always be required and must be taken into account when planning for diversion. The site could fill more quickly if desired diversion goals are not achieved and diversion benefits are lost when potentially recyclable materials are landfilled.

The City could support this measure with a bylaw for user fees for garbage for residents as a means of providing economic incentive to divert. No additional City staff would be required.

### *Status in North America*

Solid waste collection and landfilling of residuals is well established and employed in most communities in Canada.

## **Regina, Saskatchewan**

The City of Regina owns and operates a regional landfill within City boundaries.

## **4.2 IC&I Short List**

The following section details the short listed Measures for the IC&I Sector.

### **4.2.1 Packaging Ban at IC&I Establishments**

#### *Summary Description*

The City would impose bans on specific materials or packaging used by designated commercial establishments.

#### *Implementation*

The City would need to work with affected businesses to ensure successful implementation of the bylaw and minimal financial and operational impact on business.

#### *Issues/Implications*

The program would require public education, promotion, and strong enforcement. It could be difficult to implement due to resistance from industry and may be costly to enforce.

#### *Status in North America*

Packaging bans are becoming established in North America and are employed in the Western U.S.A, including:

- Portland, OR;
- San Francisco, CA; and
- Oakland, CA.

## **San Francisco, California**

Launched in June 2007, San Francisco's Food Service Waste Reduction Ordinance requires that all disposable food ware (take-out containers) used in San Francisco be either biodegradable/compostable or recyclable unless there is no suitable product that is within 15% of the cost of non-compostable or non-recyclable alternatives. The Ordinance also bans the use of PS disposable food ware but permits a food vendor may charge a "take out fee" to customers to cover the cost difference of the biodegradable or compostable disposable food service ware product that is not affordable.

## **Modbury, England**

In September 2009, the village of Modbury, England became the first town in the United Kingdom to ban plastic bags. In Modbury, residents have switched to cloth bags for groceries. The town estimates each one saves a thousand plastic bags. The stores also carry biodegradable, cornstarch-based bags for a charge.

### **4.2.2 City Based Green Procurement Specifications and Policies**

#### *Summary Description*

City staff would develop green procurement specifications and policies and create a bylaw that requires products purchased by and for the City contain recycled materials and other environmental attributes. The City could also address packaging through mandatory take-back of all transport packaging material, or mandate the use of reusable shipping containers. Bylaws and policies could also require that products not contain specific designated materials that are difficult or hazardous to dispose.

#### *Implementation*

A bylaw would have to be developed by the City to stipulate recycled content, other environmental attributes and reuse requirements for goods used by the City from paper to top dressing for fields to shipping containers. The City would require all departments to follow the bylaw; and may require the provision of slightly increased budgets for each department, as environmentally preferred goods and materials often have a 5-15% premium over typical costs.

City waste management staff would need to create new procurement specifications with procurement staff and a communications strategy for staff and suppliers to inform of the change in procurement policies. The program would also require strong reverse logistics for materials delivery (e.g. return of containers).

#### *Issues/Implications*

This program would create an opportunity for Regina to be seen as a leader in innovative thinking. The program would help promote and sustain markets for recycled materials and sustainable delivery mechanisms. The City could promote the use of reusable packaging for the delivery of goods to the City and could help secure recycling markets through the purchase of products with a minimum recycled content level (e.g. paper – 50%; garbage bags – 30%).

However, markets for environmentally preferred products may not be fully developed. Suppliers would have to source materials that meet the green specifications, which could put a burden on smaller suppliers and it could be challenging for small producers to get certification for green products resulting in an unlevel playing field. This could reduce the number of suppliers to the City and businesses would have to adapt or lose business to the City.

Prices may be considerably higher for environmentally preferred products (depends on the product) due to the limited number of products available that would meet green specifications.

The City could lead by example then encourage the private sector to follow suit over time.

The City should also consider a monitoring and reporting structure to account for impact/effectiveness of program.

No additional staff would be required; however, a cost increase of 5% to 15% for the purchase of green goods/services should be anticipated.

### *Status in North America*

City based green procurement programs are well established and an increasing number of North American Communities are adopting these programs, including:

- Toronto, ON;
- Calgary, AB;
- San Francisco, CA; and
- Richmond, BC.

### **San Francisco, California's Precautionary Purchasing Ordinance**

In June 2005, the mayor signed in to law the "precautionary purchasing ordinance" which phases out the use of toxic products used within the City government including certain types of paint, cleaning solutions, and plant fertilizers. San Francisco is the first city in the US to adopt an ordinance of this kind. The ordinance established procedures for purchasing green products by City departments and mandates that designated products (Targeted Product Categories) must be purchased from "approved alternative product lists" (unless a waiver is granted based on cost, performance, other factors). The criteria used to evaluate each targeted products category must consider the following factors: human health and environmental impacts including greenhouse gas, air pollution emissions, transportation impacts groundwater and surface water contamination, water and energy efficiency, renewable energy sources, recycled content, durability, and reusability or recyclability at end of life.

Targeted Product Categories include:

- Computers, monitors and other accessories (copiers and printers)
- Food, beverages, disposal food service items
- Lighting
- Electrical fixtures and furniture
- Toner and ink cartridges
- Cleaners and disinfectants
- Asphalt, asphalt patching products
- Graffiti removal chemicals
- Motor oil
- Paints

### **Toronto, Ontario**

The City of Toronto is one of the largest single purchasers of goods, materials, and services in Canada and recognizes that it has an opportunity to support environmentally preferred products and influence the marketplace for these goods and services. Toronto's Environmentally Responsible Procurement Policy enables the Purchasing and Materials Management Division to require that specifications are reviewed and revised to ensure environmentally preferred products (EPP's) or services are acceptable and advise bidders of the City of Toronto's Environmentally Responsible Procurement Policy. Over the years, the Purchasing and Materials Management Division has amended basic specifications for contracts and tenders to place an emphasis on purchasing products and services that contain the maximum level of post-consumer reusable or recyclable content. The completed specifications are placed on a Masters Specifications Database which departments can access through the Clerks Department. Environmentally preferred attributes have been incorporated into many key specifications.

### 4.2.3 Promoting Green Procurement and Other Sustainable Initiatives within the IC&I Sector

#### *Summary Description*

The City would develop a program to encourage green procurement activities and other sustainable initiatives, including packaging scorecard approach similar to the one being used by Wal-Mart to evaluate suppliers based on packaging and transportation issues and EPEAT for purchasing IT equipment.

#### *Implementation*

The City would develop a green procurement program that could be modelled after other successful programs (e.g. British Columbia's Sustainability Purchasing Network) that provides useful information, case studies, and tools for companies to use in adopting green procurement and other sustainable activities. The City would need to develop a communication campaign and provide technical assistance and web based education and learning tools for the IC&I Sector. Promotion of the program would also be needed (e.g. case studies and successes) and the City should consider working with the Chamber of Commerce and other associations to promote green procurement.

The City would need to provide specifications to help industry adopt waste reduction measures and target transportation packaging to achieve biggest impact.

There could be an opportunity to highlight accomplishments through awards and rewards programs.

#### *Issues/Implications*

Promoting sustainable initiatives with the IC&I Sector would help promote and sustain markets for recycled materials and sustainable delivery mechanisms. It would create opportunities to establish cooperative purchasing markets and opportunity for companies to experience savings through reduced disposal charges and source reduction. However, markets for environmentally preferred products may not be fully developed and prices may be considerably higher for environmentally preferred products (depending on the product).

The City could establish itself as a leader in promoting green procurement and could engage the private sector in leading by example. The program will also be more effectively implemented if policy is driven from the top down with senior management highly committed and engaged in the process.

A strong P&E campaign would be required and City staff would be required to develop and maintain the program. A reporting structure should be considered to account for impact/effectiveness of program. The program could be supported with a bylaw for mandatory recycling and costs would be covered under the P&E program.

#### *Status in North America*

Programs to promote sustainable initiatives in the IC&I Sector are becoming more established in North America. Communities that have adopted promotional programs include:

- London, UK; and
- Vancouver, BC.

#### **London, United Kingdom**

London ReMade has established a "Green Procurement Code" which it launched in 2001 with the intent of gaining government and business support to stimulate demand for products containing recycled content and secure demand for recycled materials. Participants are required to sign the Mayor's Green Procurement Code to show their commitment. The initiative is intended to 'close the recycling loop' by getting participants to purchase recycled-content materials and supplying their waste materials to the manufacturers of those, and other recycled-content products. To date over 500 public and private sector organizations have signed, ranging from FTSE 100 companies to all of London's local authorities, small and medium sized enterprises, charities and universities. The signatories can decide upon four different



levels of commitment ranging from minimal commitment, which involves attending meetings and providing occasional feedback, to full commitment by becoming an environmentally progressive organization moving towards measurable change.

#### 4.2.4 Mandatory Recycling or Source Separation Bylaws or 3Rs Regulations at the Municipal Level

##### *Summary Description*

Bylaws would stipulate that designated IC&I Sectors must source separate specified recyclable materials from the waste stream or prohibit them from discarding the specified materials in the garbage.

##### *Implementation*

The City would need to implement the programs in all City operated facilities immediately to set an example to others. Service delivery could be through private or public-private partnerships. The City would need to develop a technical assistance program available free of charge or for a fee to businesses.

##### *Issues/Implications*

The program would require infrastructure, bylaws, and a policy for non-compliance. It could create jobs in processing facilities, although administration and enforcement could be costly.

##### *Status in North America*

Mandatory recycling bylaws are becoming established in North America and are employed in several communities, including:

- Owen Sound, ON;
- Newfoundland (office paper);
- Halifax, NS; and
- Seattle, WA.

##### **St. Johns, Newfoundland**

All IC&I businesses with 25 or more employees were required to participate in a mandatory office paper recycling program starting September 2005. All remaining businesses needed to comply with the regulation starting March 2006. The program applies to all IC&I applicable enterprises in St. John's and three other adjacent municipalities. Businesses are required to set up recycling programs and source separate office paper including white and colour paper, newspaper, business cards, envelopes, post it notes, and file folders.

##### **Owen Sound, Ontario**

In 2006, the City of Owen Sound implemented a bylaw requiring all commercial, industrial, institutional (IC&I) and restaurant premises in the City of Owen Sound to implement recycling programs and divert designated materials identified by the bylaw. The City distributes recycling carts to the companies and provides extensive support materials on its website including an on-line audit form, an audit guide, sample recycling policy, and sample sign designs.

#### 4.2.5 User Pay Program for Small Retailers and Businesses

##### *Summary Description*

Small retailers and businesses receiving curbside collection services from the City would pay for every bag of garbage collected but recycling (and food waste diversion, if available) services would be free.



### *Implementation*

Regina already charges for commercial collection services to small waste generators who are not serviced by the private sector service providers. In addition, the City provides services to small commercial businesses located in residential areas that can use City provided residential garbage collection services.

### *Issues/Implications*

This program would require a bylaw, provision of containers as part of the service, infrastructure, enforcement, and education of collection crew and the public.

### *Status in North America*

User pay programs for the IC&I Sector are not well established in North America but are employed in some Canadian communities, such as:

- Toronto, ON;
- Ottawa, ON; and
- Owen Sound, ON.

### **Toronto, Ontario**

In 2002, the City of Toronto launched its Yellow Bag Program as a waste diversion initiative to encourage Toronto's small commercial customers to decrease the amount of garbage requiring disposal while increasing recycling and organics diversion. Businesses using City service are required to purchase authorized yellow garbage bags provided by the City at \$3.10 per bag (which covers the cost of garbage collection and disposal) and place the bags at the curb for nightly collection. In turn, recycling and organic collection are provided by the City at no charge. Owners must purchase carts for organic collection. In order for eligible commercial establishments to receive municipal collection, they must recycle. Failure to participate in the recycling program will result in cancellation of garbage collection service. Many Toronto businesses decided they did not want to comply with City requirements and contracted with the private sector for waste collection service when the Yellow Bag program was introduced.

## **4.2.6 Voluntary Take It Back Program**

### *Summary Description*

The City would work with local businesses, associations, and the Province to voluntarily take back used goods and packaging materials originally sold through the business. This could include medication, syringes, single use batteries, garden supplies, etc. The businesses would be responsible for ensuring proper management of the materials including reuse and recycling. The City would provide promotional materials and reward participating businesses by publishing their names in various media and providing advertising and support at their locations.

### *Implementation*

The City would begin the program by targetting materials that have the highest environmental impact and/or have ready markets/infrastructure in place for their management. A program would be implemented for each material as it is designated for management.

The City would have to work with businesses to set up collection points throughout the City and could also act as a liaison with the end markets for the management of the materials.

### *Issues/Implications*

A voluntary Take It Back Program would provide an opportunity to reduce hazardous materials going to landfill and provide an opportunity for good public education on sound stewardship of hazardous materials.

Programs would have to be developed by the City in cooperation with businesses. The infrastructure would need to be in place to divert the products and packages by the businesses. The program would require storage space at retailers and would require new supply chain management systems. New take back systems would have to be set up by the retailer and this would result in a high potential cost which may be difficult on small businesses. There could also be development of a supply chain reverse logistics management structure to return the products to the manufacturer.

The City should consider a reporting structure to account for impact/effectiveness of program and could establish rewards for those who participate. The voluntary program would not require any new policies or bylaws but would set out the infrastructure for a mandatory program in the future. The City would require an additional part-time Education/Program Officer; however, costs for collection and processing of designated materials would be borne by the manufacturers.

### *Status in North America*

Voluntary take back programs are not well established in North America and are only employed in a few communities in Canada, such as:

- Ottawa, ON; and
- Durham Region, ON.

### **Ottawa, Ontario**

In the Take It Back! (TIB) Program the City of Ottawa encourages partnerships with local businesses to "take back" many of the Household Special Waste materials that they sell. Over 500 retailers participate in the program, which collects an array of items (over 97 items) under the headings of automotive (i.e. used motor oil, tires, car batteries, propane tanks), garden supplies (i.e. pots, trays), health (i.e. medications, needles), electronics (i.e. computers, toner cartridges, cell phones, batteries) and household (i.e. hangers, garment bags, bubble wrap, disposable batteries). In 2002, an audit was performed on 14 different products taken back by participating retailers. It was determined that participating retailers diverted yearly, at minimum, 402 tonnes of material from the landfill or City run hazardous waste depots.

## **4.2.7 Voluntary Food Wastes Diversion and Processing**

### *Summary Description*

The City would offer food waste diversion opportunities to IC&I establishments (e.g. restaurants) that had large amounts of food wastes in the waste stream. Materials would have to be diverted to an in-vessel or enclosed composting facility.

### *Implementation*

The City would need to establish new collection infrastructure and provide separate collection bins to generators. Infrastructure would be required for the management of the compostable materials and service delivery could be through public, private, or public-private partnerships.

The City would need to establish a centralized in-vessel or enclosed composting facility for the management of the materials. This could be owned and operated by the City. Alternatively, a RFP for a centralized composting facility could be developed for the private ownership and operation of a facility. Alternatively businesses could consider investing in an on-site composting system, but this could prove expensive for the business.

The City would have to implement the program in all City-operated facilities immediately upon promoting the program (or before), to demonstrate “walk the talk.” Public education and advertising programs would have to be developed by the City prior to implementation.

### *Issues/Implications*

A voluntary Food Waste Diversion Program would help in the development of a processing infrastructure if long-term commitment to food waste diversion was made a priority and the program was well enforced. The program would also provide jobs in the processing facilities. The City could consider implementing a rewards program for those who participate. A voluntary program could also lead to mandatory food wastes collection, if participation was low.

The City could introduce a residential food waste collection program to gain economies of scale. The City would not likely pursue this program unless they planned to offer a residential curbside food waste collection program.

The hauling industry or City would have to develop new collection infrastructure, ensuring that the collection service was efficient and timely to avoid complaints about nuisance factors. Sufficient composting capacity must also be available locally.

This program could be seen as establishing an unfair financial burden on targeted establishments. Costs associated with starting up a composting program in a restaurant could be an issue because the restaurant industry is characterized as very fragile with low profit ratios.

The City would require an additional part-time Education/Program Officer and should consider a reporting structure to account for impact/effectiveness of program. The cost for the program could be fully or partially borne by the businesses.

### *Status in North America*

Voluntary Food Waste Diversion Programs are becoming established in North America and are employed in several communities in North America, including:

- Seattle, WA;
- Portland, OR; and
- San Francisco, CA.

### **Portland, Oregon**

Launched in 2005, the City of Portland Composts! program gets businesses to participate in its food waste composting program by providing educational materials, technical assistance, and on-site staff training. The City of Portland works with the commercial sector to promote food waste diversion programs in restaurants, hotels, hospitals, grocery stores, and other food producing establishments. Food waste is collected by qualified commercial waste haulers and taken to the City's transfer station where it is inspected and shipped to a private sector composting facility. The compost is sold in participating stores throughout the City.

The City offers a variety of grants, loans, and other financial assistance is available to help offset the costs associated with starting food-scrap collection, including the Waste Assessment Grants, a partnership between Portland Development Commission, Oregon Manufacturing Extension Partnership and Zero Waste Alliance, to provide matching grant funds (50-75%) to businesses in support of innovative strategies to eliminate waste, improve production efficiency, and implement lean manufacturing processes.

Currently, over 165 Portland businesses are participating in the voluntary food waste composting program.

## San Francisco, California

The City offers a variety of programs to divert food waste from the commercial sector including redistribution of food to food banks, recovering food processing waste by farmers as animal feed, collection of grease and meat for rendering, on-site composting pilots and food waste collection services provided by the City's two franchised haulers.

More than 1,800 San Francisco restaurants and other food-related businesses are providing food scraps and other compostable material to San Francisco's food scrap compost program. To encourage commercial sector food recovery, the city contracts with a consultant to assist program development and analysis. The consultant also provides training, monitoring, follow-up, and outreach to food waste generating customers with commercial food collection service (provided by the city's haulers).

### 4.2.8 Diversion at Special Events

#### *Summary Description*

The City would encourage recycling plans to be prepared and implemented for special/public events.

#### *Implementation*

The City would implement a policy or program that would set standards and procedures for encouraging diversion at special events. The City could require event organizers to identify waste reduction/recycling opportunities and submit plans and results. The City would lead by example by implementing the program at all City-sponsored events and could offer rewards for participants, such as free advertising on City property, website, etc.

Specially marked containers would have to be made available/provided by the service provider.

Once the voluntary program is established, a bylaw could be developed to require mandatory diversion. To make the measure mandatory, a bylaw would have to be developed by the City.

#### *Issues/Implications*

The City would be able to provide different levels of support for diversion at special events. It could help the City attract more "green events" and help promote diversion and the "green image" of the City. However, the event organizer would assume the cost, which could impact on the delivery of some events.

The City would have to find ways to educate the public attending the event to use appropriate containers, however, when people are at these events they often don't always take the time to be "environmentally" conscious, therefore, the diversion rate achieved at the event may be quite low.

Materials for diversion at special events are usually very dirty, mixed with garbage, making them difficult to process.

The City would have to create a policy that would establish a procedure for encouraging diversion at special events. A City bylaw dictating mandatory diversion at all special events could be implemented and penalties for non-compliance would need to be established. The City could consider withholding permits for special events until a plan is submitted to show that the program will be in place.

The City would require an additional part-time Education/Program/Bylaw Officer, however, the cost for the collection and processing of designated materials would be borne by venue operator.

#### *Status in North America*

City programs for diversion at special events are becoming established across North America and are employed in several communities, including:

- Niagara Region, ON;
- San Francisco, CA; and

- New York, NY.

### **San Francisco, California**

San Francisco Special Events Ordinance No. 73-89 requires any applicant seeking permission for the temporary use or occupancy of a public street, a street fair, or an athletic event within the city and county that includes the dispensing of beverages or which generates large amounts of other materials to submit a recycling plan. Recycling plans must include arrangements for collection and disposition of source separated recyclables and/or compostables by a service provider or the event organizer. For effective recycling and composting, clearly labelled recycling and composting receptacles must be sited together with any trash receptacles in convenient locations. In addition, the event coordinator must show proof of garbage and recycling services and that a recycling training certificate (or letter from the single family environmental registered recycling provider) has been obtained.

### **New York City, New York**

New York City has a mandatory recycling ordinance that requires recycling in the city, including at all special events. The department of sanitation has issued rules setting requirements for different types of events. For example, the department requires the sponsors of the more than 5,000 street fairs held in the city each year to meet with a department staff member prior to the event to review recycling procedures. The city requires all street fair recycling programs to collect, at a minimum, corrugated cardboard. At events in which vendors sell food and/or beverages, the program must also collect metal cans, glass bottles and jars, plastic bottles, and aluminum foil.

## **4.2.9 School Waste Diversion Programs**

### *Summary Description*

The City would establish a partnership program with local school boards and post-secondary educational institutions to enhance diversion rates. This could be done through providing diversion services or educational material support.

### *Implementation*

The City would work with the local school boards to set up diversion programs for paper and food wastes (at a minimum). The City could provide the collection services, which would require the purchase of collection vehicles and the establishment of a recycling facility and composting facility. Alternatively, on-site composting could be investigated. This would only be implemented if there were recycling and composting facilities for other sectors (IC&I or Residential) as it would not be cost effective to implement the program for schools alone.

### *Issues/Implications*

School waste diversion programs would address a visible component of the school waste stream, removing easily distinguishable and valuable materials from the waste stream. The programs are relatively easy to implement and would provide good public relations, excellent profile, and visible benefits to the community.

The program is anticipated to have high levels of success (i.e. greater diversion – 80%) because school children already know what to do to divert. However, coordinators would still be required at each school.

School boards would have to be shown that the programs are cost-effective, as some programs may add costs to the school boards that they cannot afford.

If the program would be voluntary, no policies would be required. However, if school diversion would be mandatory, the City would have to pass a bylaw, and it could be difficult to impose penalties for non-compliance.

The City would require an additional part-time Education/Program Officer. Costs for promotion would be included in the P&E budget; however, costs for the collection and processing of designated materials would be borne by school boards.

### *Status in North America*

School waste diversion programs are well established in many school boards in North America, including the communities of:

- Durham Region, ON;
- New York, NY; and
- San Francisco, CA.

### **Durham Region, Ontario**

The Durham School Board, along with the Halton Public and Catholic, Toronto Catholic, and York Region school boards, participate in Ontario EcoSchools Waste-Free Lunch Challenge, which encourages students to bring waste-free or "boomerang" lunches which contain no throwaway packaging and produce no waste. Food is packed in reusable containers and drinks in refillable bottles. A boomerang lunch means any uneaten food or waste material is returned home. School lunches are a major source of waste with the average student's lunch generating 30 kilograms of garbage per year, or 8,500 kilograms per school, according to the Recycling Council of Ontario.

### **New York City, New York**

The City has established three programs promoting waste diversion in New York City Schools. TrashMasters! Super Recyclers contest showcases model school recycling programs, the TrashMasters! Reduce and Reuse Challenge rewards innovative waste prevention practices, and the TrashMasters! TeamUp to Clean Up program encourages students to clean up and beautify their schools and neighbourhoods. Winning schools receive \$6,000 with smaller cash awards to runners up, etc.

## **4.2.10 Landfill Bans**

### *Summary Description*

A ban on designated materials would be placed at the point of disposal (i.e. transfer station or landfill). Loads exceeding permitted levels of banned material would be rejected or subject to a surcharge. Typical banned materials include OCC, electronic waste, easy to divert recyclables and easy to divert materials including food waste and yard waste.

### *Implementation*

The ban combined with an enforcement strategy involving rejecting loads or applying heavy surcharges would be the instrument used to encourage diversion. To effect change, loads would have to be rejected (forcing cost back on haulers and businesses) and/or the surcharge would have to be set at a level (e.g. a doubling of the tipping fee) to create a disincentive to disposal and make diversion more economically attractive.

A processing infrastructure and end market would be required for targeted materials to ensure that generators would have a diversion alternative to disposal. Indicating the ban was forthcoming, the City could work with the private sector to establish processing capacity for the materials. Secure and sustainable markets would need to be established for the targeted materials.

The City would need to establish an educational program outlining the banned materials, enforcement procedures and diversion alternatives. The City would also have to implement the program in all City-operated facilities immediately upon passing the bylaw (or before).



### *Issues/Implications*

A landfill ban could help create the development of an infrastructure for the management of the banned materials. A processing infrastructure would be required for the targeted materials that generators would want to divert in order to avoid disposal levy/rejected loads.

The City would have to work with the haulers to enforce the bans. Waste haulers could require separate bins for the banned materials. This could result in extra costs to local generators, including the cost for bins, storage, collection and administration. The ability to implement this program would vary from generator to generator.

Implementation of landfill bans for designated materials at the provincial level would help to ensure level playing field.

The public may not directly see any impact from this initiative except when they directly take materials to the landfill site for disposal. The ban could lead to increased illegal dumping if surcharges are perceived as too high or the ban too onerous.

The City would develop a bylaw imposing a landfill ban on specific materials and setting maximum amounts allowed in a load without rejection or being subject to surcharge. No additional policies or bylaws would be essential, although various bylaws could support the diversion objectives of the levy (e.g. mandatory source separation).

Additional costs to the City would include an inspection station at the landfill. Costs for inspecting loads would vary with rate of compliance. The City would also require one additional Bylaw Officer and one part-time clerical staff.

### *Status in North America*

Landfill bans are well established in North America and implemented in many communities in Canada, including:

- Regional District of Nanaimo, BC;
- Nova Scotia; and
- Metro Vancouver, BC.

#### **Metro Vancouver, British Columbia**

Metro Vancouver has imposed both a ban on recyclable materials and a differential tipping fee that penalizes loads containing five percent or more of the banned substances. The list of banned materials for all residents and businesses in Metro Vancouver includes:

- Corrugated cardboard
- Newsprint
- Office paper
- Gypsum drywall
- Paints, solvents, and flammable liquids, gasoline and pesticides
- Vehicle tires
- Oil, oil filters and empty containers
- Yard trimmings
- Blue box recyclables
- Beverage containers (all except milk)
- Lead-acid (car) batteries
- Medications/ pharmaceuticals
- Electronic waste including personal computers, printers and TV's

#### **Regional District of Nanaimo, British Columbia**

The Regional District of Nanaimo (RDN) entered into partnership with a private sector composting company, International Composting Corporation, in which the composting company offered to construct an enclosed food waste composting facility and in return the Region placed a ban on IC&I organics at the Regional landfill. All IC&I food waste is redirected to the food waste composting facility.

Bylaw 1428 imposes ban on all food and organic waste from commercial sources including food services, food and beverage stores, hospitals, educational institutions with food services, nursing and residential

homes, community food services, etc. The Region has worked with waste haulers to provide alternative collection for organics. Businesses are required to pay for collection and processing of the organic food waste as well as the bins. The food waste ban affects approximately 800 businesses and institutions.

#### 4.2.11 Differential Tipping Fees (premium and discounted fees)

##### *Summary Description*

Differential or variable tipping fees would be charged on incoming loads of wastes depending on the amount of recyclable materials in the load and whether or not the materials are separated into individual materials or arrive as mixed loads. The fees would be designed as either a premium to the regular tipping fee to act as an incentive to diversion or a discount to the regular tipping fee to reward source separation. For example, a surcharge for mixed loads would be designed to make disposal more expensive than diversion and therefore encourages separation/diversion. Contaminated loads would also cost more to dispose.

##### *Implementation*

Differential tipping fees would need to be strongly enforced at the landfill with a zero tolerance policy adopted. Bylaws would need to be developed to support the differential tipping fees and the City would need to hire additional inspection staff at the landfill and education and enforcement staff to work with haulers and companies that are repeat offenders.

##### *Issues/Implications*

The environmental benefit of differential tipping fees would come through increased diversion of recyclables. The public would not directly see any impact from this initiative except when they directly take materials to the landfill site for disposal and pay the surcharge or receive a discounted tip fee. The levy would be the instrument, which would encourage diversion by acting as an economic disincentive/incentive. The levy would encourage source separation of mixed loads if the differential is significant enough.

The City of Regina would have to work with the haulers and the landfill operators to administer the differential tipping fees. The waste haulers would have to charge the levy back to their customers (this would require generator identification and billing capabilities).

A processing infrastructure would be required for materials that generators would want to divert to avoid increased tipping fees.

A bylaw would need to be developed to support the differential tipping fees and could be supported by a mandatory recycling bylaw. The City would require an additional full-time Inspection Officer at the landfill and a part-time clerical staff. This program could also provide a potential source of additional revenue from incremental increase in tipping fee from contaminated loads containing recyclables.

##### *Status in North America*

Differential tipping fees are becoming established in North America and are employed in several communities in Canada, including:

- Kootenay Regional District, BC;
- Metro Vancouver, BC; and
- Orillia, ON.

##### **Kootenay Boundary Regional District, British Columbia**

In January 2006, Kootenay Boundary Regional District implemented a “five times” penalty for mixed loads containing banned materials to encourage source separation and diversion of recyclable materials (tipping fee is \$65/tonne). Prior to January, the Region charged only two times the penalty. It found the



double (two times) penalty did not work well enough as a disincentive to promote diversion. Businesses would rather pay the penalty than source separate.

### **Metro Vancouver, British Columbia**

Metro Vancouver has coupled a landfill ban on designated materials with differential tipping fees for loads containing the banned materials. Garbage is inspected at the transfer stations and other disposal sites for the banned recyclable materials. Loads that arrive at the disposal sites containing more than five percent (by volume) of banned materials are assessed at a 50% surcharge (an additional \$35.50 per tonne) on the whole load (current tip fee is \$71/tonne).

## **4.2.12 Landfill Permits for Waste Haulers and Recyclers**

### *Summary Description*

The City would develop a system of Landfill Permits for waste haulers. As part of the permitting process, the City would require waste haulers to submit annual waste and recycling reports.

### *Implementation*

The City would need to develop a bylaw requiring private waste service providers to obtain permits to utilize the landfill. A condition of the permit would be to report on the waste disposal and diversion quantities of waste. The City would need to work closely with the waste service providers to develop a reporting system that provides beneficial information to the City without being too onerous for the service provider.

### *Issues/Implications*

The program would provide greater control over waste information; however, would result in additional administrative work for waste haulers.

### *Status in North America*

Permits for waste haulers are not well established in Canada but are employed in a couple of communities in North America, including:

- Portland, OR;
- Philadelphia, PN; and
- Austin, TX.

### **Portland, Oregon**

All permitted commercial waste haulers and recyclers (called Permittees) must complete monthly recycling and composting reporting forms and submit information to the City. Information includes the tonnage collected and the tonnage for each material sold. The Permittees must report the total number of commercial customers, separated into multi-family and businesses, and must report each month's tonnage and market information for each of the recyclable or compostable material collected from multi-family and other commercial customers, and tonnage for each of these materials sold or delivered for recycling or composting, including optional recyclables. Failure to deliver a complete, signed, accurate report, or corrected information as requested by OSD, by a specific deadline constitutes an infraction. (The Infraction Assessment is \$300 for the first Incident).

## **4.2.13 Waste Diversion Assistance Program**

### *Summary Description*

The City would provide technical assistance services to companies that want to implement waste reduction programs, such as waste auditing and staff training. The program would be voluntary.

### *Implementation*

The City would train technical assistance staff to be able to provide assistance on waste reduction programs. The program would need to be supported by promotional and educational materials.

### *Issues/Implications*

This program would be a good grassroots program for small business and could help the City advance small business recycling/diversion and understand waste generation in the small business sector.

The City would be a leader in showing what is done and promote its own programs.

There would be no mandatory requirements for businesses to implement recommendations from the technical assistance program (unless mandatory recycling/composting is implemented as well) and no formal policies would be required because the program would be voluntary.

The City would need to hire and train an additional three full-time Education/Program Officers and would bear the cost for developing promotion and education information and toolkits.

### *Status in North America*

Waste Diversion Assistance Programs are becoming established in North America. Several projects are being implemented in North American communities and include:

- Metro Vancouver, BC;
- Seattle, WA; and
- Portland, OR.

### **Metro Vancouver, British Columbia's SmartSteps Program**

SmartSteps™ is a program launched by Metro Vancouver providing technical assistance, tools and information to help businesses become more eco-efficient. The program targets small and medium sized businesses. The SmartSteps sustainable business program works to promote eco-efficiency and sustainable work practices that take into consideration social, financial, and environmental elements. Key elements of the program include: waste reduction and recycling, water conservation, energy efficiency, air quality control, and sewer use discharge reduction. One of the aims of the program is to provide IC&I businesses with information, technical assistance and tools to help make the business case for sustainability.

### **Seattle, Washington's Resource Venture Organization**

This organization, sponsored by Greater Seattle Chamber of Commerce in partnership with Seattle Public Utilities, promotes waste prevention and green procurement in businesses and provides free information and technical assistance to improve environmental performance of their operations. The Resource Venture program provides free waste reduction assistance to Seattle businesses. The program provides an employee education guide book called Recycling at Work: 6 Steps to Increase Participation in Your Recycling Program. The Venture Program also features prominently in Seattle's commercial food waste diversion program by providing information and assistance to businesses to start up a commercial food waste diversion program.

## **4.2.14 IC&I Sector Working Group on Waste Diversion**

### *Summary Description*

The City would facilitate regular discussions among specific sector representatives (e.g. school boards, government, retailers, hospitals, waste haulers and recyclers) to discuss/resolve common waste reduction challenges. The City would work with the IC&I Sector and waste management service providers to host and promote waste reduction events.

### *Implementation*

The City would coordinate regular meetings with various sectors to discuss their common issues, introduce new programs, identify problem materials, etc. The City would advertise the program to help promote involvement and maximize potential for cross-business synergies.

### *Issues/Implications*

The City would need to identify relevant IC&I members and get them to commit to program. The City would also work in cooperation with industry associations to ensure wide dissemination of successful diversion ideas.

High visibility of the program could help to demonstrate that the IC&I stakeholder groups and the City of Regina are strongly supporting and promoting waste diversion. This could be used to invite private sector to introduce new 5Rs diversion opportunities. It could also result in the identification of new market development opportunities and new waste diversion trends and best practices.

No formal policies would be required because the program would be voluntary.

### *Status in North America*

Working groups in the IC&I Sector are just becoming established in North America and are implemented in a few cities including:

- Philadelphia, PA;
- Jefferson County, IN; and
- Toronto, ON.

#### **Philadelphia, Pennsylvania**

Philadelphia Commercial Recycling Council was founded in April 1995, shortly after the establishment of the City's commercial recycling program. Twenty business leaders, representing a wide range of businesses that were interested in recycling issues, formed the Council as a forum in which to discuss methods for designing programs, promoting employee participation, and encouraging other businesses to implement programs

Since its origin in 1995, the Greater Philadelphia Commercial Recycling Council has provided its members with a forum for discussing recycling and related environmental issues in the Delaware Valley. Members hail from both large and small businesses and institutions and from urban and suburban communities.

The Council's mission is to support environmental managers through peer-to-peer consultation, state-of-the-art information, professional educational opportunities, technical assistance, and networking. Our bottom line is that environmentally responsible actions by businesses and institutions are about efficiency and smart resource management. Council members can have a direct influence on policy and economic development initiatives for the Delaware Valley.

#### **Jefferson County, Indiana**

Representatives from the IC&I Sector (i.e. school boards, industry, government, hospitals, media, waste haulers and recyclers, business) meet for lunch once a month to discuss waste reduction programs and activities and develop programs.

## **4.2.15 Voluntary Third Party Certification for Existing Buildings**

### *Summary Description*

The Green Building Council has developed LEED (Leadership in Energy and Environmental Design) for existing buildings operations and maintenance which features water and energy efficiency, reduction in toxic cleaners, and waste diversion. Similar programs have been developed by other organizations (e.g.

BOMA BEST). These programs target office buildings but new plans are being developed for retail sector. The City would promote third party certification for existing buildings.

#### *Implementation*

The City would need to develop a communication campaign and provide technical assistance to promote the program. The City should consider working with the Chamber of Commerce and other associations to promote the program as well, and could develop an awards and rewards program to encourage program.

Since the program would be voluntary, the City would not need to develop supporting bylaws.

#### *Issues/Implications*

The program would help promote and sustain markets for recycled materials and sustainable delivery mechanisms and could provide opportunities to establish cooperative purchasing markets. Companies could also experience savings through reduced disposal charges and source reduction; however, diversion would depend on the degree to which businesses are encouraged to participate in the third party certification program.

The private sector would be more engaged if it sees that the City is leading by example and the program would be most effectively implemented if policy is driven from the top down with senior management highly committed and engaged in the process. The City should consider establishing itself as a leader in promoting third party certification.

No policies or bylaws would be required to support a voluntary program, however a strong promotion and education campaign would be necessary and the City would need to work with different city departments to develop communication campaign and promote the program.

#### *Status in North America*

City initiatives to promote third party certification in existing buildings are becoming established in North America and are mandated by a few communities including Portland, Oregon.

#### **Portland, Oregon**

All City owned and occupied existing buildings must achieve LEED for Existing Buildings (Silver).

#### **Seattle, Washington**

The City of Seattle was the first city in the United States to formally adopt a sustainable building policy that used LEED as a standard. This policy called for new and renovated City projects with over 5,000 ft<sup>2</sup> of occupied space to achieve a LEED Silver Rating.

### **4.2.16 Mandatory IC&I Waste Audit and Waste Diversion Plans**

#### *Summary Description*

A bylaw requiring the provision of a waste audit and waste diversion plan for the management of wastes would be required for the IC&I Sector. The plan could require source separation of specific materials or prohibit them from the waste stream. The program could be enforced through fines or denial of business permits.

#### *Implementation*

The City would need to develop a bylaw requiring IC&I solid waste generators to conduct waste audits and report on the quantities and diversion opportunities to the City.

The City would need to work closely with the business sector to develop an audit and reporting system that works for both.

### *Issues/Implications*

The program would require public education, enforcement, bylaws, and policy for non-compliance. Plans need to be reviewed and taken seriously by city staff. The program could help establish local markets; however, it could cause a large administrative burden for small businesses.

### *Status in North America*

Mandatory requirement for waste diversion plans are not well established in North America but are established in some communities, such as:

- Owen Sound, ON;
- Portland, OR; and
- Austin, TX.

### **Owen Sound, Ontario**

In 2006, the City of Owen Sound implemented a bylaw requiring that all industrial, commercial and institutions within the City of Owen Sound complete a waste audit (visual or weight based) and a prepare recycling plan to be submitted to the City. The City provides a form for all businesses to complete. The bylaw does not apply to home office environments. The establishments must post the recycling plan and ensure that an adequate supply of recycling containers and signage is made available throughout the establishment. Majority of businesses have submitted the audit reports and diversion plans.

### **Portland, Oregon**

Since 1996, all commercial garbage and recycling customers have been required to recycle at least 50 percent of their waste materials. In addition, all businesses must complete a City-provided recycling plan form identifying which materials would be recycled. The plans must be submitted to the waste hauler servicing the customer, then to the City, upon request. Customers could choose the quick form which pre-determines which materials would be diverted or the long form which allows them to identify materials to be recycled to achieve 50 percent diversion. Failure to implement a recycling program can result in a fine (\$500 for the first month).

## **4.2.17 Market Development for Recyclable/Reusable Materials**

### *Summary Description*

The City would work with the IC&I sector to develop/stimulate markets for designated recyclable materials. The program could involve partnership in developing processing and end markets, financial assistance, and/or technical assistance. It could also involve development of Recycling Market Development Zones or Eco Parks.

### *Implementation*

The City would need to promote partnerships among private companies to create a demand for recyclable materials and new uses for materials. The City would need to develop a technical assistance program and could provide funding to entrepreneurs with new, innovative ideas. The City would also need to help develop policies to direct market development activities and identify a site which could be dedicated to market development initiatives, such as an industrial park that becomes an eco park

### *Issues/Implications*

This program would provide the City an opportunity to show leadership in developing innovative end markets and local markets for recyclable and/or reusable materials and would provide good public relations. There would be opportunities for synergies to develop among private sector companies and to develop new end markets for materials that would otherwise go to landfill.

The program would require support and involvement of different city departments and support by City Council and adequate funding.

The City would need to conduct feasibility studies to identify potential markets and could support market development activities with mandatory recycling bylaws, landfill bans, green procurement initiatives and incentive programs to ensure adequate diversion of recyclable materials and support for new end use markets.

The City could provide financial resources, such as capital investment and grants and/or loans, and could support the program by creating a range of bylaws and policies. A part-time Market Development Officer would also be required if the City is involved in marketing of materials.

### *Status in North America*

Market development programs for recyclable materials are becoming established in North America. Similar programs include:

- Edmonton's Centre of Excellence, AB;
- California; and
- London ReMade, UK.

### **London, United Kingdom's London Remade Program**

London ReMade is a non profit company based in the City of London, UK striving to develop local markets and jobs for recyclable materials. The principle investor in the company is the London Development Agency, the Mayor's agency responsible for driving London's sustainable economic growth.

London ReMade's philosophy in developing end markets involves both stimulating demand for existing products and diversifying the market. It is accomplishing this objective by working to broaden the end users of recycled materials and stimulating demand through "buy recycled" programs.

Since its inception, the organization has identified more than 30 new recycled products/ applications and 230 potential end users and has experienced broader social and environmental benefits associated with the creation of 915 jobs and the diversion of 1.8 million tonnes of waste from landfill through its Green Procurement Code program.

### **California's Recycling Market Development Zones**

California has established a series of recycling market development zones (RMDZ), which provide provides attractive loans, technical assistance, and free product marketing to businesses that use materials from the waste stream to manufacture their products and are located in a zone. The State defines the market development activity in the zone as the creation and development of markets for products made in part from postconsumer waste materials diverted from the waste stream. When these diverted materials are used to produce new products, the products are referred to as recycled-content products.

## **4.2.18 Landfill Residuals in City Site**

### *Summary Description*

The City continues to operate a landfill site.

### *Implementation*

The City continues to provide a City landfill for disposal of municipal and IC&I waste. The City currently operates a landfill and is in the process of expanding the landfill as required to meet the City's growth needs for the next 25 years. Waste diversion could potentially reduce the amount of waste to be landfilled.

### *Issues/Implications*

The Landfill site would fill more quickly with no diversion plans.

### *Status in North America*

Landfilling of residual solid waste is well established and employed in most communities in Canada.

#### **Regina, Saskatchewan**

The City of Regina owns and operates a regional landfill within City boundaries.

## **4.3 C&D Short List**

The following section details the short listed Measures for the C&D Sector.

### **4.3.1 Mandatory Recycling or Source Separation Bylaws**

#### *Summary Description*

Bylaws would stipulate that designated C&D businesses must source separate specified recyclable materials from the waste stream or prohibit from the materials from being discarded in the garbage.

#### *Implementation*

The City would need to implement the programs in all City operated facilities immediately, to set an example to others. Service delivery could be through private or public-private partnerships. The City would need to develop a technical assistance program available free of charge or for a fee to businesses.

#### *Issues/Implications*

This program would require the development of an infrastructure for management of recyclables, bylaws, and policies for non-compliance. The program has the potential to create new jobs.

#### *Status in North America*

Mandatory recycling bylaws for the C&D Sector are established in several communities in North America and include:

- Halifax, NS;
- Portland, OR; and
- Chicago, IL.

#### **Chicago, Illinois**

In December 2004, the Chicago City Council passed the Construction or Demolition Site Waste Recycling Ordinance. Beginning in January 2006, the ordinance requires:

- 25% recycling of all C&D debris, measured by weight, starting January 1, 2006; and
- 50% recycling of all C&D debris, measured by weight, starting January 1, 2007.

#### **City of Portland, Oregon**

The Job Site Recycling Ordinance, passed by the City of Portland, states that the following materials are required to be separated and recycled:

- Rubble (concrete/asphalt);
- Land Clearing Debris;
- Corrugated Cardboard;



- Metals; and
- Wood.

The ordinance applies to all building projects in Portland with a permit value of \$50,000 or more (including construction and demolition phases). The general contractor (or property owner where no general contractor is named) is responsible for ensuring that sub-contractors participate in job site recycling. Failure to comply with the ordinance results in a penalty of \$500 for the first violation.

### 4.3.2 Expanded Differential Tipping Fees

#### *Summary Description*

The City's landfill would charge differential or variable tipping fees on incoming C&D wastes depending upon the amount of acceptable recyclable materials in the load and whether materials are separated into individual materials or arrive as mixed loads.

#### *Implementation*

The City would pass a bylaw establishing differential tipping fees depending on the material diverted and/or contingent on the level of diversion being achieved. Separated loads would carry a lower cost than mixed loads (e.g. as is done currently by the City which charges half the tipping fee per tonne for separated loads of shingles).

The City would have to establish a processing infrastructure/end markets for the separated loads and separate dumping locations would have to be set up at the landfill for each of the materials.

The administration system would have to track materials and charge differential fees accordingly and an education program would be required to explain how the differential fees work.

#### *Issues/Implications*

The differential tipping fees would be the instrument which would encourage diversion by acting as an economic incentive. No additional policies or bylaws would be essential, although various bylaws would support the diversion objectives of the differential tipping fee (e.g. mandatory source separation). To effect change, the levy would have to be increased to create a disincentive to dispose of mixed loads and make diversion more economically attractive. The program could help increase diversion over time as more companies realize potential savings, and if implemented it could lead to the creation of new diversion facilities/opportunities.

The environmental benefit of the program comes through increased diversion and reduction in the use of non-renewable resources (e.g. aggregate, metals, etc.).

Differential tipping fees would only encourage source separation of mixed loads if the differential is significant enough. Most communities charge at least double to five times the tipping fee for mixed loads containing recyclables. This could lead to illegal dumping if differential tipping fees are too high.

There is currently no local collection services/processing services for the separated C&D materials, therefore development of a processing infrastructure would be required. As well, markets for materials such as drywall, wood wastes, and asphalt would need to be established and sufficient capacity for processing large concrete would also be needed.

This program would require careful tracking ahead of providing discounts. This could be difficult to measure and track because many companies share waste disposal infrastructure (e.g. dumpsters, collection service).

The City would require a bylaw designating the fees. It could be supported with a bylaw for mandatory waste reduction workplans for businesses and institutions for designated materials. The City should also consider a reporting structure to account for the impact/effectiveness of the program.



There would be no capital cost to the City and it could be a potential source of additional revenue from the increase in tipping fees for contaminated loads containing recyclables.

### *Status in North America*

Differential tipping fees for C&D wastes are becoming established in North America and is employed in several communities in Canada, including:

- Capital Regional District, BC;
- Simcoe County, ON; and
- Kootenay, BC.

### **Simcoe County, Ontario**

In 2001, Simcoe County introduced differential tipping fees at its landfill sites to encourage source separation and diversion of targeted materials. The differential tipping fee program uses a three-tier approach to encourage source separation of divertible materials. The tipping fee for source separated materials is \$55/tonne and \$115/tonne for regular waste loads (not containing targeted recyclables). Loads containing targeted materials are called mixed waste loads and are penalized with a doubling of the regular tipping fee to \$230/tonne. The differential tipping fees focus on C&D materials including wood, asphalt shingles, drywall, concrete, bricks and asphalt.

## **4.3.3 Landfill Permits for Waste Haulers and Recyclers**

### *Summary Description*

The City would develop a system of Landfill Permits and as part of the permitting process and could require waste service providers to submit annual waste and recycling reports.

### *Implementation*

The City would need to develop a bylaw requiring private waste service providers to obtain permits to utilize the landfill. A condition of the permit would be to report on the waste disposal and diversion quantities of waste. The City would need to work closely with the waste service providers to develop a reporting system that provides beneficial information to the City without being too onerous for the service provider.

### *Issues/Implications*

This program would provide greater control over waste information; however, would create more administrative work for the waste service providers.

### *Status in North America*

Permits for waste haulers are not well established in North America and are only employed in a couple of communities targeting the IC&I Sector, such as:

- Portland, OR;
- Philadelphia, PN; and
- Austin, TX.

To date, there are no known examples of communities requiring waste haulers of C&D materials to submit waste and recycling reports.

#### 4.3.4 C&D Material Recovery Facility (MRF)

##### *Summary Description*

The City would develop a facility to receive, sort, and process C&D material into a form suitable for use in various local markets. The facility could be provided by either the public or private sector. A typical facility would target easily divertible materials, such as concrete, drywall, wood, metals, asphalt and brick. Markets would need to be established for the diverted materials.

##### *Implementation*

The City would need to conduct a feasibility study of the C&D materials to be diverted and processed at the C&D MRF. An RFP for the establishment of the C&D MRF would also need to be developed. The facility could be owned and operated by the City or it could be owned by the City and operated by the private sector or it could be solely owned and operated by the private sector. The City would need to establish the level of commitment by the private sector.

The City would need to work closely with waste haulers and recyclers to determine the most effective collection equipment, procedures and processing requirements.

##### *Issues/Implications*

A C&D facility would help to achieve significant diversion in the C&D sector and would be an important component of the market development strategy. The City would need to ensure that viable end markets are already established; however, operating the C&D MRF could create local markets and partnership opportunities with local municipalities.

The City could experience some resistance by the C&D industry unless a level playing field were established. Development of a C&D MRF could be supported by flow control, requiring all C&D waste to be diverted to the C&D MRF; however, there could be a legal challenge if flow control is attempted. It could also be supported by differential tipping fees and landfill bans; however, processing fees must be feasible and competitive with landfill tipping fees.

The development of a C&D MRF would most likely need policies and regulations (landfill bans, differential tipping fees, mandatory recycling bylaws) to drive recyclable C&D materials to the C&D MRF and in order to assure its viability. The program would require additional City staff depending on the extent to which the City is involved in ownership and operations at the facility; however the cost for collection and processing would be borne by the C&D sector.

##### *Status in North America*

MRFs for C&D material are becoming more established in North America and there are numerous private sector C&D MRFs operating across North America, including:

- Metro Vancouver, BC;
- Halifax, NS; and
- San Francisco, CA.

##### **Halifax, Nova Scotia**

In 2001, Halifax Regional Municipality began to implement new bylaws to regulate the C&D industry. The C&D Licensing Bylaw establishes minimum diversion targets for C&D materials and requires them to be processed at a C&D Processing Facility using a phased-in approach. The C&D Licensing Bylaw stipulates:

- In 2001 – 50% of all incoming C&D material arriving at a C&D Processing Facility or Transfer Station shall be recycled or otherwise diverted from disposal;
- From 2002 to 2005 – 60% of all incoming C&D material arriving at a C&D Processing Facility or Transfer Station shall be recycled or otherwise diverted from disposal; and

- From 2006 and beyond – 75% of all incoming C&D material arriving at a C&D Processing Facility or Transfer Station shall be recycled or otherwise diverted from disposal.

### **San Francisco, California**

The City of San Francisco implemented its Construction and Demolition Debris Recovery Ordinance on July 1, 2006 requiring all contractors in the city to send their C&D debris to a certified facility for recycling. The City intends to use the ordinance to increase the amount of C&D debris recycled by 80%. This will account for more than 100,000 tons of material disposed in city landfills annually.

The Ordinance requires that mixed C&D debris must be transported off-site by a registered transporter and taken to a registered facility that can process and divert from landfill a minimum of 65% of the material. The ordinance applies to all new construction, remodelling, and demolition projects that generate more than one (1) cubic yard of C&D material.

Only registered transporters can remove C&D material from a construction site; therefore, any company which removes C&D debris from a construction site (and is not exempt) must apply to be a Registered Transporter. Any facility that accepts mixed C&D material must apply to be a Registered Facility.

### **4.3.5 Landfill Bans**

#### *Summary Description*

A ban on designated materials would be placed at the point of disposal (i.e., transfer station or landfill). Loads exceeding permitted levels of banned material would be rejected or subject to a surcharge. Typical banned materials include wood, metals, aggregate, soil (fill), shingles and drywall.

#### *Implementation*

The ban combined with an enforcement strategy involving rejecting loads or applying heavy surcharges would be the instrument used to encourage diversion. To effect change, loads would have to be rejected (forcing cost back on haulers and businesses) and/or the surcharge would have to be set at a level (e.g. a doubling of the tipping fee) to create a disincentive to disposal and make diversion more economically attractive.

A processing infrastructure and end market would be required for targeted materials to ensure that generators would have a diversion alternative to disposal. Indicating the ban was forthcoming, the City could work with the private sector to establish processing capacity for the materials. Secure and sustainable markets would need to be established for the targeted materials.

The City would need to establish an educational program outlining the banned materials, enforcement procedures and diversion alternatives. The City would also have to implement the program in all City-operated facilities immediately upon passing the bylaw (or before).

#### *Issues/Implications*

The City would have to work with the haulers to enforce the bans. Waste haulers could require separate bins for the banned materials. This could result in extra costs to local generators, including the cost for bins, storage, collection and administration. The ability to implement this program would vary from generator to generator.

A landfill ban could help create the development of an infrastructure for the management of the banned materials. A processing infrastructure would be required for the targeted materials that generators would want to divert in order to avoid disposal levy/rejected loads.

Landfill bans would result in extra cost for local generators and could lead to increased illegal dumping if costs are perceived as too high. Implementation at provincial level would help to ensure a level playing field.

The public may not directly see any impact from this initiative except when they directly take materials to the landfill site for disposal.

The City would develop a bylaw imposing a landfill ban on specific materials and setting maximum amounts allowed in a load without rejection or being subject to surcharge. No additional policies or bylaws would be essential, although various bylaws could support the diversion objectives of the levy (e.g. mandatory source separation).

Additional costs to the City would include an inspection station at the landfill. Costs for inspecting loads would vary with rate of compliance. The City would also require one additional Bylaw Officer and one part-time clerical staff.

### *Status in North America*

Landfill bans are well established in North America and employed in most communities in Canada, such as:

- Toronto, ON;
- Halifax, NS;
- Capital Regional District, BC; and
- Metro Vancouver, BC.

### **Capital Regional District, British Columbia**

Landfill bans have been part of the CRD's waste diversion strategy since 1991 and are implemented when viable recycling alternatives are developed. Since 1991, eight materials bans have been implemented of which four impact C&D activities. Recyclable materials banned from disposal and the year the ban was implemented includes:

- Drywall (1991);
- Corrugated Cardboard (1993);
- Metal Appliances (1993);
- Vehicle Tires (1993);
- Directories (1993);
- Scrap Metals (1995);
- Fill Materials (1995).

The CRD strictly enforces the bans and applies a zero tolerance approach to contaminated loads. The Region assigns bylaw officers at the Hartland landfill and provides on-site signage notifying contractors of the bans. Issuing fines is left to the bylaw officer's discretion. Officers may issue a \$200 fine per infraction. CRD staff cite continuous presence of bylaw officers at the landfill as a deterrent to bringing in contaminated loads. The CRD's budget includes \$120,000 to cover the annual enforcement costs. About \$20,000 is recovered annually through fines.

### **Halifax Regional Municipality, Nova Scotia**

The Halifax Regional Municipality passed the C&D Licensing Bylaw which prohibits the disposal of easily divertible C&D material (essentially matching the definition of inert material developed by the province). Under the Bylaw, the following materials are banned from disposal in a construction and demolition debris disposal site:

- asphalt paving;
- aggregate and soil;
- brush and leaves;
- concrete;
- milled wood free of adhesives, coatings and preservatives;
- porcelain and ceramic;
- root balls and stumps;
- scrap metal;
- window glass.

### 4.3.6 Mandatory C&D Recycling Targets Required by Public Sector

#### *Summary Description*

Master Specifications and Contracts developed by the City would stipulate mandatory recycling target requirements prior to the initiation of C&D project.

#### *Implementation*

The City would develop appropriate targets in consultation with industry and based on available markets for materials. The City could initially encourage generators to recycle on a voluntary basis and gradually move to mandatory, as markets become well established.

#### *Issues/Implications*

The program would require public education, processing infrastructure, coordination of city departments, bylaws, and a policy for non-compliance.

The program could offer significant benefits if demolition materials are reused onsite.

#### *Status in North America*

These programs are becoming established in North America and are being implemented by several public entities in Canada, such as:

- Greater Toronto Airport Authority (GTAA);
- San Francisco, CA; and
- Metro Vancouver, BC.

#### **Greater Toronto Airport Authority's Demolition Diversion Requirements**

The Greater Toronto Airport Authority (GTAA) manages, operates, and controls Toronto's Pearson International Airport. When the GTAA launched its \$4.4 billion redevelopment project, the first portion of the redevelopment project involved the demolition of the old Terminal One building. Demolition specifications included the requirement to divert a minimum 90% of materials from landfill. This figure rose from 60% on earlier GTAA demolitions as an attempt to reduce project costs. Additionally, the GTAA chose to retain ownership of the material so the crushed concrete could be reused on-site in the new construction directly adjacent to the demolition site thereby virtually eliminating the transportation and disposal costs of moving materials off-site.

All concrete (205,000 tonnes) generated from the demolition was reused and nearly all other demolition wastes were reused and recycled, including asphalt and brick rubble. All metals were separated for individual recycling including copper from electrical wiring. Over 95% waste diversion (mostly reuse) was achieved during the demolition of the old Terminal One building. An estimated \$1,845,000 was saved by recycling concrete on site alone.

#### **San Francisco, California**

Any person applying for a permit for full demolition of an existing structure must submit a Demolition Debris Recovery Plan (DDRP) to the Department of the Environment that outlines a minimum of 65% diversion from landfill of construction and demolition debris, including materials source separated for reuse or recycling. The Demolition Debris Recovery Plan must be submitted at the time the person applies for a demolition permit from the Department of Building Inspection.

### 4.3.7 Refundable Deposits on C&D Projects

#### *Summary Description*

All construction companies would pay a deposit as part of the building permit which would be refunded based on the level of diversion achieved.

### *Implementation*

The City would have to develop appropriate diversion targets based on discussion with industry and market availability. The measure would require the development of a bylaw to enforce the diversion levels.

The City would need to ensure that all of its own projects were meeting diversion targets to set an example for others.

### *Issues/Implications*

The program would require administration, public education, and inspection and enforcement staff.

The program is a financially based incentive that has been proven to work elsewhere.

### *Status in North America*

These programs are becoming more established in North America and employed or being considered in several communities, including:

- San Jose, CA;
- San Diego, CA;
- Langley, BC; and
- Alberta.

#### **San Jose, California**

Introduced in 2001, the City of San Jose's Construction and Demolition Diversion Deposit (CDDD) Program is an incentive program to encourage the recovery of C&D debris. The City collects a deposit prior to any construction, renovation or demolition project, which is fully refunded if the contractor can prove that 50% of the C&D debris was diverted from landfill. Partial refunds may be authorized when less than 50% by weight of the waste generated by project is diverted from landfill.

When applying for a permit, the City determines the deposit based a number of factors including type of construction/renovation/demolition, project size and project value. The deposits range from \$0.10 per ft<sup>2</sup> to \$1.16 per ft<sup>2</sup>. This program provides an incentive to generators of C&D waste to recycle or reuse materials rather than dispose of them. The intent of the deposit is to equalize the financial costs to contractors and developers between diverting and landfilling the C&D materials. It is estimated that the City can achieve its 50% diversion target by diverting half of C&D materials currently going to landfill.

#### **Langley, British Columbia**

The City of Langley is the only municipality in British Columbia and possibly Canada with a deposit program whereby contractors must post a \$5,000 bond prior to any building demolition to ensure that the drywall is removed and recycled. The bond is returned when receipts are produced showing that the materials were taken to an approved gypsum recycling facility.

## **4.3.8 Mandatory C&D Waste Diversion Plans**

### *Summary Description*

A bylaw requiring the provision of a Waste Diversion Plan prior to the initiation of C&D project would be developed.

### *Implementation*

The City would need to develop a bylaw requiring C&D solid waste generators to develop waste diversion plans for project and report on the estimated quantities of material generated as wastes and diversion opportunities to the City.

The City would need to work closely with the business sector to develop a waste diversion plan and reporting system that works for both.

### *Issues/Implications*

This measure would require public education, processing infrastructure, coordination of city departments, bylaws, and a policy for non-compliance.

### *Status in North America*

These programs are becoming established in North America and are employed in several communities, including:

- Oakland, CA;
- San Francisco, CA; and
- Portland, OR.

### **Oakland's Waste Reduction and Recycling Plan**

Building permit applicants are required to develop a Waste Reduction and Recycling Plan (WRRP) for all project C&D waste to assist in achieving the City's goals of reducing construction and demolition debris sent to landfills by 50% or greater. The WRRP, which must be submitted at the time of permit application, must show how projects would meet the 50% or greater diversion of all construction and demolition debris. The plan affects all new construction projects, all demolition projects (with the exception of demolition of single family dwellings and duplexes), and alteration or addition (renovation) projects with construction valuation of \$50,000 or greater (with the exception of single family residents).

If the submitted WRRP indicates that less than 50% of C&D waste diversion would be achieved then the contractor is required to provide additional information (in writing) explaining why the 50% requirement cannot be achieved (e.g. hazardous materials, health and safety issues). Upon submission, the WRRP is reviewed to ensure that it is complete and that quantities of materials generated and the overall plan for reducing waste by 50% or greater is realistic. Plans are returned if there is a problem (e.g. incomplete, writing illegible, calculations unrealistic or inaccurate, or wrong form is submitted). A hold is placed on issuance of the building permit until revisions are received and approved.

### **4.3.9 LEED Certification for City Projects**

#### *Summary Description*

The City would require all new city facilities to achieve LEED (Leadership in Energy and Environmental Design) certification. This measure assumes that the City would build in mandatory recycling targets as part of the LEED requirement.

#### *Implementation*

The City would lead by example in implementing a LEED certification requirement for all new City, City operated, or City funded projects. The City could showcase their buildings to builders/developers to promote the concept in other sectors.

The City would pass a bylaw requiring minimum LEED recycling targets in municipal developments. The City would have to coordinate the planning/building department with the solid waste department and train technical assistance staff.

#### *Issues/Implications*

LEED certification has several waste diversion benefits. It encourages the development of waste recycling programs for tenants of LEED certified buildings, extends best building practices, and helps reduce waste because higher points are received for implementing diversion programs.



LEED certification does not place as much emphasis on waste reduction and diversion as with other areas of environmental concern, such as water and energy conservation. Therefore, LEED certification would only result in a very small percentage of waste being diverted unless a mandatory diversion requirement is stipulated as part of the specification. It also requires all contractors to understand and be able to source materials to meet LEED certification requirements and would most likely carry higher costs for the building.

### *Status in North America*

Requiring LEED certification for municipal developments is a well established practice in many communities in North America, including:

- Toronto, ON;
- Portland, OR; and
- Vancouver, BC.

### **Canadian Communities**

The following Canadian communities have adopted LEED:

- Canada – LEED mandated for all new Federal buildings;
- Vancouver – LEED gold mandated for all new public buildings and considering applying LEED certification requirements to new private building constructions;
- Victoria – LEED gold mandated for all new public buildings;
- Calgary – LEED silver mandated for all new public buildings;
- Kingston – LEED silver mandated for all new public buildings; and
- Toronto – LEED gold mandated for all waterfront development new buildings.

### **Portland, Oregon**

In 2001, the City of Portland adopted a Green Building Policy requiring new construction and major renovations of all city facilities to meet the certified level of LEED, which was amended in 2005 requiring that new public buildings achieve LEED Gold. Part of this involved a stipulation that 75% of all C&D waste must be recycled. The amendment also required that city-owned, occupied, existing buildings achieve LEED for Existing Buildings at the Silver level. Further amendments required that all new commercial or mixed-use buildings over 10,000 square feet that receive financial assistance from the PDC totalling more than \$300,000 and 10% of the total cost must achieve LEED Silver certification.

## **4.3.10 LEED Certification for Private Sector Developments**

### *Summary Description*

The City would require all new facilities greater than a certain size to achieve LEED (Leadership in Energy and Environmental Design) certification. The program could have the requirement that specific targets for waste minimization and diversion be achieved to obtain LEED certification. The program could be encourage developers to achieve high LEED certification by permitting bonuses, such as higher densities, accelerated approval timelines, and discounted disposal charges.

### *Implementation*

The City would pass a bylaw requiring minimum LEED standards for private sector developments. The City would have to coordinate the planning/building department with the solid waste department and would need to train technical assistance staff.

The City could lead by example by implementing a higher LEED certification requirement for all new City, City operated or City funded projects.



The City could showcase private sector buildings to promote the concept, as well as allow higher densities on sites (than would otherwise be permitted) in instances where additional LEED certification was pursued.

### *Issues/Implications*

LEED certification has several waste diversion benefits. It encourages the development of waste recycling programs for tenants of LEED certified buildings, extends best building practices, and helps reduce waste because higher points are received for implementing diversion programs.

LEED certification does not place as much emphasis on waste reduction and diversion as with other areas of environmental concern, such as water and energy conservation. Therefore, LEED certification would only result in a very small percentage of waste being diverted unless a mandatory diversion requirement is stipulated as part of the specification. It also requires all contractors to understand and be able to source materials to meet LEED certification requirements and would most likely carry higher costs for the building.

The City would require a bylaw for minimum LEED recycling targets and would require an extensive promotion program through media, website, presentations to Chambers of Commerce, BIAs, etc. There would be no capital cost to the City, only costs for administering the program, which would require an additional part-time Education/Program Officer and clerical staff.

### *Status in North America*

The requirement for private sector developments to have LEED certification is becoming established in North America. These programs are implemented in several regions in Canada, including:

- Edmonton, AB;
- Arlington County, VA;
- Calgary, AB; and
- Los Angeles, CA.

#### **Los Angeles, California**

As of last year, the City of Los Angeles requires all private sector projects at or above 50,000 square feet (or 50 units) to comply with LEED. In exchange, the City will work with builders to speed up approvals and to remove obstacles in the municipal code for elements of sustainable building design, such as green rooftops, cisterns and permeable pavement.

#### **Edmonton Alberta**

The City of Edmonton provides rebates to developers that achieve LEED certification; the per house rebate increases as LEED level increases.

#### **Arlington County, Virginia**

Arlington County permits private developers to apply for bonus density and/or height if they achieve LEED certification.

## **4.3.11 Green Building Technical Assistance**

### *Summary Description*

The City would provide incentives such as free consultations, fee discounts and grants for builders and developers to build green. The City could also provide technical assistance to help educate contractors' staff and set up onsite systems to green their buildings. This approach could be tied in with an adopted green building program such as LEED.

### *Implementation*

The City would train staff on Green Building requirements and LEED requirements in order to provide technical assistance to the C&D sector. The City would have to change internal planning/building requirements to recognize requirements of LEED and other green building codes.

### *Issues/Implications*

A Green Building Technical Assistance Program would promote many environmental benefits such as source reduction, the purchase of recycled content/lower content building materials (e.g. pre-engineered joists) and end market development. It would also help raise the awareness of other greening opportunities such as water and energy conservation.

There would be no mandatory requirements for contractors to implement recommendations from technical assistance program (unless mandatory recycling is implemented as well), however, the City should lead by example by implementing green initiatives.

The City would need to train technical assistance staff and should provide funding for a financial assistance program available to builders and developers to build green. The benefits would be long term and are significant in terms of the use of better building materials with higher recycled content, but would not be visible or measurable in short term.

No mandatory policies or bylaws would be required; however a communications strategy and training would be necessary. The City would incur the cost for developing promotion and education information and toolkits.

### *Status in North America*

Technical assistance for green buildings in the C&D sector is becoming established in North America and is employed in several communities, including:

- Vancouver, BC; and
- Squamish-Lillooet Regional District, BC.

### **Metro Vancouver's Build Smart Program**

Metro Vancouver has implemented the Build Smart Program which encourages sustainable waste management and diversion activities during construction, renovation and demolition activities and features a number of activities and programs to encourage C&D waste diversion including the following:

- Contractors are provided with Metro Vancouver's "3Rs Code of Practice for the Building Industry", which was introduced in 1997 to encourage industry to reduce, reuse and recycle construction and demolition waste;
- Information on construction and demolition best practices are provided including "Job Site Recycling: A Guide for Builders and Developers" and "Demolition & Salvage: A Guide for Developers and Renovators";
- Job site technical assistance is offered free of charge to show how demolition and construction materials can be recycled and money saved. Some of the services offered include setting up recycling programs, auditing waste generated, identifying salvage and recycling opportunities and providing on-site education of employees; and
- The "Project Waste Management Master Specification" encourages contractors to prepare and submit a waste management plan containing an analysis of the proposed job site waste to be generated including identification of the types of recyclable and waste materials (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project is suggested. The Specification is available as a template for contractors to adopt.

All of the programs and activities under the Build Smart Program are voluntary. Metro Vancouver believes in working with contractors to reduce their waste by educating them about reducing costs and tipping fees by diverting wastes.

### **Squamish-Lillooet Regional District, British Columbia**

The Town of Whistler, located in the Squamish-Lillooet Regional District, has been experiencing unprecedented growth over the past decade. In response to a need to address its growing C&D waste problem, the Region hired a consultant to prepare the Construction and Demolition Waste Management Study in 2003. The report made the following recommendations:

- Develop an infrastructure for recycling of wood waste and other C&D materials before introducing regulations to source separate materials for recycling;
- Provide effective hauling services at job sites to ensure recycling. Contractors often cite space limitations as the main reason for poor recycling. There is a need to provide smaller bins and more convenient pick up services;
- Establish voluntary recycling targets (e.g. 50% wood waste and 75% OCC) to start and if targets are not reached within a specified period of time then adopt a mandatory approach; and
- Develop a comprehensive education program including demonstration projects, on-site technical assistance, workshops, how-to guides and recognition of achievements.

#### **4.3.12 C&D Sector Working Group on Waste Diversion**

##### *Summary Description*

The City would facilitate discussions with representatives from the C&D sector to discuss/resolve common waste reduction challenges. The City would work with C&D sector and waste management service providers to host and promote waste reduction events.

##### *Implementation*

The City would coordinate regular meetings with various members of the C&D sector to discuss their common issues, introduce new programs, identify problem materials, etc. The City would advertise the program to help promote involvement and maximize potential for cross-business synergies.

##### *Issues/Implications*

The high visibility of program could help show that waste diversion is at the top of the City's agenda by having regular meetings between the C&D sector and the City of Regina to discuss waste diversion opportunities. This could be used to engage the private sector and introduce new 5Rs diversion opportunities and could also result in the identification of new market development opportunities and new waste diversion trends and best practices.

The City would need to identify relevant C&D members and get these members to commit to the program. The City would also need to work in cooperation with industry associations to ensure representative participation and wide dissemination of successful diversion ideas.

The program would be voluntary, therefore, would not require any formal policies and would incur negligible expense to the City.

##### *Status in North America*

C&D Sector Working Groups on Waste Diversion are not well established in North America but partnerships have been established in a few communities in Canada, including:

- Calgary, AB;
- Nova Scotia; and

- Whistler, BC.

### **Province of Nova Scotia**

The Nova Scotia Department of Environment in partnership with the Resource Recovery Fund Board (RRFB), Halifax C&D Recycling Inc., and the Department of Transportation and Infrastructure Renewal will use old asphalt shingles to pave a road as part of an innovative recycling pilot project. Halifax C&D Recycling Inc. has developed a process to separate waste asphalt shingles into asphalt grit, which can be recycled into pavement. This recycling process is believed to be the only one of its kind in the world. The RRFB Nova Scotia has provided 40% of the funding, with businesses located along the piloted paved road providing an additional 40% and the Department of Transportation and Infrastructure Renewal paying the remainder. The RRFB's value-added manufacturing program challenges entrepreneurs to develop innovative technologies and business models for diverting waste from the province's landfills.

#### **4.3.13 Market Development for Recyclable/Reusable Materials**

##### *Summary Description*

The City would work with the C&D Sector to develop/stimulate markets for designated recyclable materials. This could involve partnership in developing processing and end markets, financial assistance, and/or technical assistance. This program could also involve providing grants, loans or tax exemptions to develop private C&D recycling facilities.

##### *Implementation*

In order to develop markets for recyclable and reusable C&D material the City would need to promote partnerships among private companies to create demand for recyclable materials and new uses for materials. The City could provide funding to entrepreneurs with new, innovative ideas, and could consider identifying a site which can be dedicated to market development initiatives, such as an industrial park that becomes an eco park.

The City would need to develop a technical assistance program and would need to help develop policies to direct market development activities.

##### *Issues/Implications*

This program would be an opportunity for the City to show leadership in developing innovative end markets and local markets for recyclable C&D materials and provide good public relations. There would also be opportunities for synergies to develop among private sector companies and to develop new end markets for materials that would otherwise go to landfill.

Success of this program would require support and involvement of different City departments and by City Council, as well as adequate funding. The City could also support market development activities with mandatory recycling bylaws, landfill bans, green procurement initiatives and incentive programs to ensure adequate diversion of recyclable materials and support for new end use markets.

The City would need to establish viable end markets for divertible C&D materials. Feasibility studies could be conducted to identify potential markets.

This program would likely require financial resources, such as capital investment and grants and/or loans, including investment in a C&D recycling facility as part of the market development strategy.

##### *Status in North America*

Market development of C&D recyclable and reusable material is not well established in North America, however it is implemented in several communities in the United States and abroad. Some communities taking the initiative include:

- Los Angeles, CA;
- Edmonton, AB; and

- United Kingdom (WRAP Aggregate Program).

### **Edmonton, Alberta**

The City of Edmonton accepts loads of concrete, bricks, asphalt rubble and paving stones at three locations free of charge (as long as they meet certain specifications). The majority of the materials come from City projects (70%) with the remaining 30% coming from commercial contractors. The material is crushed and mixed to produce recycled aggregate. The program which started off accepting 20,000 tonnes of C&D aggregate annually is now accepting 120,000 tonnes and has a capacity of 200,000 tonnes annually. Many city contractors take advantage of the cost savings. In addition, about 60 tonnes of metal, including rebar, are recovered from used concrete and recycled. The City estimates that it saves \$4-5/tonne by using the recycled concrete in place of virgin resources.

### **Los Angeles, California**

In March 1995, the City of Los Angeles passed a motion requiring that road base in all city projects include crushed miscellaneous base with 100 percent recycled asphalt, concrete, and other inerts, except when site conditions or standards require another specification.

## **4.3.14 Landfill Residuals in City Site**

### *Summary Description*

The City continues to operate a landfill site.

### *Implementation*

The City continues to provide a City landfill for disposal of C&D waste. The City currently operates a landfill and is in the process of expanding the landfill as required to meet the City's growth needs for the next 25 years. Waste diversion could potentially reduce the amount of waste to be landfilled.

### *Issues/Implications*

The Landfill site would fill more quickly with no diversion plans.

### *Status in North America*

Landfilling of residual solid waste is well established and employed in most communities in Canada.

### **Regina, Saskatchewan**

The City of Regina owns and operates a regional landfill within City boundaries.

## **4.4 Additional Measures**

Although several of the measures were identified important measures to pursue, they were considered options that needed to be pursued in conjunction with other City departments and initiatives. These measures were tagged as requiring a multi-departmental approach and therefore needed to be pursued as City mandates.

### **4.4.1 Keep Our City Clean Campaign**

#### *Summary Description*

The City would work with the community to help keep the City clean by providing labels on public garbage and recycling bins that residents could call to have full bins emptied.

#### *Implementation*

The City should pursue this by involving impacted departments such as parks and recreation, bylaws, and solid waste.

### *Issues/Implications*

The program would require public education and good coordination of activities.

## 4.4.2 Waste Exchange Program/Reuse Centres (Residential)

### *Summary Description*

The City would establish reuse programs ranging from reuse centers to on-line waste exchange programs enabling residents to donate and exchange reusable goods. It is common for reuse centre to be established at the landfill.

### *Implementation*

The City would support other organization's efforts such as Value Village and Goodwill.

### *Issues/Implications*

No formal policies would be required; however a dedicated reuse website would be required and would need to be operated by the City or by a partnering organization. Ensuring optimal program operations requires supervision of materials being dropped off.

## 4.4.3 Co-Digest Food Waste with Sewage Sludge (Residential)

### *Summary Description*

Process separately collected food waste (i.e. trucked to plant) in the wastewater treatment plant anaerobic digester to produce methane gas that could be used to generate electricity or heat. This would require a wet pre-digestion stage to remove contaminants such as plastic bags and broken glass.

### *Implementation*

Regina is building a new wastewater treatment plant and should investigate the co-digestion of food waste as part of wastewater treatment plant usage.

### *Issues/Implications*

Co-digesting food waste would generate additional wastewater treatment plant biosolids and result in additional loading of the wastewater treatment plant.

## 4.4.4 Green Pages (Residential)

### *Summary Description*

Establishing a green pages section in the City residential and business telephone books that would promote reduce, reuse and recycling and contact information.

### *Implementation*

The City could support implementation by others, such as local environmental organizations and community groups.

### *Issues/Implications*

This program would require development of a layout and good database for annual updates of information.

#### 4.4.5 Bioreactor (Residential)

##### *Summary Description*

Technology would be installed in an existing landfill to promote increased circulation of leachate that breaks down organic material more quickly thus generating increased methane that is captured and converted to heat or electricity.

##### *Implementation*

This technology is being investigated as part of Regina's Landfill Expansion Environmental Assessment Study.

##### *Issues/Implications*

The City would need to install specialized equipment to recirculate leachate within the landfill and ensure that a methane collection system is in place. It could result in increased landfill space as material breaks down more efficiently.

#### 4.4.6 Reuse/Drop-Off Depot Program (C&D)

##### *Summary Description*

The City would support drop-off depot(s) for specified materials. The City would also support reuse programs such as reuse centres.

##### *Implementation*

The City should support other organization's efforts such as Habitat for Humanity.

##### *Issues/Implications*

This program would require advertisement and controlled waste exchange/drop-off depot. It could lead to illegal dumping.

These programs are generally established by the non-profit sector (e.g. Habitat for Humanity), therefore, the City should not lead these initiatives rather provide support to others.



## 5. Service Level Options

### 5.1 Methodology for Developing Options

The approach for combining the Short List of Waste Management and Diversion Practices into options and ultimately selecting an Integrated Solid Waste Management Plan for Regina was initially explored informally with the Elected Officials, senior staff, the Steering Committee, and the Internal Working group during a series of meetings held in late January of 2009.

On the basis of these consultations it was decided to group the short listed measures into a number of packages to present to the citizens of Regina. These packages are in addition to the alternative which is to keep the existing system (status quo) as is and not make any modifications to the system.

Combining the individual waste management and diversion measures and formulating the packages was based on input from the four Working Groups. These Working Group meetings were then held early in the spring of 2009 to obtain input on formulating the packages. These meetings, where participants worked through a number of exercises, included individual meetings with:

- The Citizens Working Group;
- The Industrial Commercial and Institutional (IC&I) Sector Working Group;
- The Construction and Demolition (C&D) Sector Working Group; and
- The Waste Management Industry Working Group.

An overview of these community consultations is provided in Section 8 and details are included in Appendix G4.

Based on the input provided during these consultations, three Service Level Options for the Residential Sector and two Service Level Options for both the IC&I and the C&D Sectors were defined.

For the Residential Sector, direction was provided to create three Service Level Options in addition to the services currently provided and described in the preceding Section. These Service Level Options were broadly defined as:

- “Basic” (later changed to “**Current Plus**” on the basis of input from the Citizens Working Group) comprising the current service level with minor enhancements;
- “**Enhanced**” comprising measures comparable to service levels provided in most Canadian cities and including the household collection of recyclables; and
- “**Comprehensive**” comprising measures comparable to service levels provided in leading Canadian municipalities and including the household collection of both recyclables and organics, such as food wastes.

For the IC&I and C&D sectors, it was decided to formulate the Short Listed Waste Management and Diversion Practices into two packages for each sector:

- “**Basic**” – representing a fairly low impact package, emphasizing voluntary waste diversion initiatives; and
- “**Extended**” – representing a more comprehensive approach with more mandatory initiatives.



All of the packages are comprised of combinations of short listed measures presented in the preceding Section. The alternative is to leave the waste management system untouched and continue with status quo.

## 5.2 Residential Sector Service Level Options

The three Service Level Options for the Residential Sector are presented in Table 5-1. Each of the three Service Level Options includes both a listing of the individual services, as well as a listing of supporting mechanisms designed to enhance participation in the various services and programs.

Each listed measure provides a reference to a detailed profile of the measure provided in Appendix D.

### 5.2.1 Current Plus Service Level

The Current Plus Service Level Option is essentially the existing service level with a number of relatively minor enhancements.

The services to be provided include:

- Solid Waste Collection and Landfill of Residuals in City Site (see Profile of Measure RES1)
- Backyard Composting (see RES2)
- Expanded Recyclables Drop-off Depots (see RES3)
- Leaf & Yard Waste Drop-off Depots and Outdoor Windrow Processing (see RES3)
- Christmas Tree Collection & Processing (see RES4)
- Household Hazardous Waste (HHW) Events (see RES5)

The associated support mechanisms to promote participation in these programs and achieve greater diversion of waste from disposal include:

- Promotion & Education (see RES6)
- Goods Exchange Events (see RES7)
- Customer Reward Programs (see RES8)
- Voluntary Grasscycling (see RES9)

The Current Plus Service Level Option is expected to achieve a Residential Sector diversion rate ranging from 16% to 20%. This includes the estimated diversion achieved by the SARCAN container depot program. The current system achieves a diversion rate of about 16%.

The Current Plus Service Level Option is expected to cost between \$120 - \$140 per household per year or \$10.00 or \$11.67 per household per month. This compares with the current cost of about \$110 per household per year or \$9.16 per month.

**Table 5-1 Residential Service Level Options**

| <b>Current Plus</b>  | <b>Enhanced</b>  | <b>Comprehensive</b>  |
|--|--|---|
| <p><b>Service Options:</b></p> <ul style="list-style-type: none"> <li>▪ Curbside Garbage &amp; Landfill</li> <li>▪ Active promotion of Backyard composting</li> <li>▪ Expanded Recycling Depots Leaf &amp; Yard Waste Depots</li> <li>▪ Christmas Tree Collection &amp; Processing</li> <li>▪ Household Hazardous Waste (HHW) events</li> </ul> <p><b>Supporting Mechanisms:</b></p> <ul style="list-style-type: none"> <li>▪ Promotion &amp; Education</li> <li>▪ Goods Exchange Events</li> <li>▪ Customer Reward Program</li> <li>▪ Voluntary Grasscycling</li> </ul> | <p><b>Service Options:</b></p> <ul style="list-style-type: none"> <li>▪ Curbside Garbage &amp; Landfill</li> <li>▪ Active Promotion of Backyard Composting</li> <li>▪ Single Family Curbside Recycling</li> <li>▪ Multi-Family Recycling</li> <li>▪ Curbside Seasonal Leaf &amp; Yard (+ Christmas Tree) collection</li> <li>▪ Permanent HHW Facility (less frequent operation)</li> <li>▪ Curbside Bulky/White Goods Collection</li> </ul> <p><b>Supporting Mechanisms:</b></p> <ul style="list-style-type: none"> <li>▪ Promotion &amp; Education</li> <li>▪ Goods Exchange Events</li> <li>▪ Customer Reward Program</li> <li>▪ Grass Ban</li> <li>▪ Pay-as-you-Throw for Garbage</li> <li>▪ Green Procurement Education</li> <li>▪ Outreach Program</li> </ul> | <p><b>Service Options:</b></p> <ul style="list-style-type: none"> <li>▪ Curbside Garbage &amp; Landfill</li> <li>▪ Single Family Curbside Recycling</li> <li>▪ Multi-Family Recycling</li> <li>▪ Curbside Biweekly Leaf &amp; Yard (+ Christmas Tree) collection</li> <li>▪ Curbside Food Waste Collection</li> <li>▪ Permanent HHW Facility (more frequent operation)</li> <li>▪ Curbside Bulky/White Goods Collection</li> </ul> <p><b>Supporting Mechanisms:</b></p> <ul style="list-style-type: none"> <li>▪ Promotion &amp; Education</li> <li>▪ Goods Exchange Events</li> <li>▪ Customer Reward Program</li> <li>▪ Grass Ban</li> <li>▪ Green Procurement Education</li> <li>▪ Outreach Program</li> <li>▪ Pay-as-you-Throw for Garbage</li> <li>▪ Reduced Frequency of Garbage collection</li> <li>▪ Mandatory Recycling</li> </ul> |
| <hr/> <p><b>Current Plus</b></p> <ul style="list-style-type: none"> <li>▪ Potential diversion – 16% to 20% (current 16% diversion)</li> <li>▪ Cost - \$120 to \$140 /hhld/year (current \$110 /hhld/year)</li> </ul>   | <hr/> <p><b>Enhanced</b></p> <ul style="list-style-type: none"> <li>▪ Potential Diversion – 30% to 40%</li> <li>▪ Cost - \$220 to \$240 /hhld/year*</li> </ul>   | <hr/> <p><b>Comprehensive</b></p> <ul style="list-style-type: none"> <li>▪ Potential Diversion – 50% to 65%</li> <li>▪ Cost - \$280 to \$320/hhld/year*</li> </ul>  |

\* Funding from the pending provincial Multi Material Resource Recovery Fund could potentially reduce the cost by \$50 per household per year

### 5.2.2 Enhanced Service Level

The Enhanced Service Level Option builds on the preceding Current Plus option and is comparable to the service level provided in most Canadian cities.

The household collection of recyclables, either from the front curbside, or back ally is the key addition associated with this Service Level Option.

The services to be provided include:

- Solid Waste Collection and Landfill of Residuals in City Site (see RES1)
- Backyard Composting (see RES2)
- Single Family Curbside Recyclables Collection and Processing at a Materials Recovery Facility (see RES10)
- Multi-Family Recycling Program (see RES11)
- Curbside Seasonal Leaf & Yard (+ Christmas Tree) Collection and Outdoor Windrow Composting (see RES12 + RES4)
- Household Hazardous Waste Depot (less frequent operation) (see RES13)
- Bulky Items Collection/White Goods Collection (see RES14)

The associated support mechanisms to promote participation in these programs and services include:

- Promotion & Education (see RES6)
- Goods Exchange Events (see RES7)
- Customer Reward Programs (see RES8)
- Grass Ban (see RES9)
- Pay-As-You-Throw for Garbage (see RES17)
- Green Procurement/Sustainable Procurement Education (see RES15)
- Outreach (see RES16)

A number of these support mechanisms are the same as listed for the Current Plus option (e.g. Promotion and Education). The difference between the two Service Level Options is that more resources would be expanded on the activity such as promotion and education, under the Enhanced option.

The Enhanced Service Level Option is expected to achieve a Residential Sector diversion rate of between 30% and 40%.

This Service Level Option is expected to cost between \$220 to \$240 per household per year or about \$18.33 to \$20.00 per household per month. This is approximately twice the cost of the current service level.

The Saskatchewan government is presently considering introducing a product stewardship program to help pay for multi-material recycling. If such a program were to pay for 50% of the cost of a household recycling program, then these costs could be reduced by about \$50 per household per year.

### 5.2.3 Comprehensive Service Level

The Comprehensive Service Level Option is comparable to the service level provided in leading Canadian cities such as Halifax, Victoria, and Toronto. It builds on the Enhanced option and features household collection of both recyclables and organics (i.e. food wastes). The services to be provided include:

- Solid Waste Collection and Landfill of Residuals in City Site (see RES1)

- Single Family Curbside Recyclables Collection and Processing at a Materials Recovery Facility (see RES10)
- Multi-Family Recycling Program (see RES11)
- Curbside Biweekly Leaf & Yard (+ Christmas Tree) Collection and Outdoor Windrow Composting (see RES12 + RES4)
- Household Hazardous Waste Depot (more frequent operation) (see RES13)
- Bulky Items Collection/White Goods Collection (see RES14)
- Curbside Food Waste Collection and In-Vessel/Enclosed Processing (see RES18)

The associated support mechanisms include:

- Promotion & Education (RES6)
- Goods Exchange Events (see RES7)
- Customer Reward Programs (see RES8)
- Grass Ban (see RES9)
- Green Procurement/Sustainable Procurement Education (see RES15)
- Outreach (see RES16)
- Pay-As-You-Throw for Garbage (see RES17)
- Reduced Frequency of Garbage Collection (e.g. biweekly) (see RES19)
- Mandatory Recycling or Source Separation Bylaws (see RES20)

Mechanisms that were introduced in the preceding Service Level Options, such as P&E, would be afforded more resources under this Service Level Option than under the other Service Level Options.

The Comprehensive Service Level Option is expected to achieve a Residential Sector diversion rate of between 50% and 65%.

This Service Level Option is expected to cost between \$280 to \$320 per household per year or about \$23.33 to \$26.67 per household per month.

### 5.3 Industrial Commercial & Institutional Waste Diversion Packages

The approach to the IC&I Sector differs markedly from the approach to the Residential Sector, as the City does not offer collection services to most generators. Private sector companies generally provide collection services to IC&I clients, while the City provides the landfill for the disposal of materials generated within the Sector. For this reason, the short listed measures focus on promoting environmentally sound waste management and diversion practices rather than the delivery of specific services.

The short listed measures applicable to the IC&I Sector were reviewed with the members of IC&I Sector and Waste Management Sector Working Groups. There was strong support for promotion and voluntary measures and much less support for measures that introduced the potential for significant amounts of additional administrative work.

Based on these consultations, two sets of Waste Diversion Packages, “**Basic**” and “**Extended**” for the IC&I Sector were formulated and are presented in Table 5-2.

Each listed measure provides a reference to a detailed profile of the measure provided in Appendix E.

**Table 5-2 IC&I Waste Diversion Packages**

| <b>IC&amp;I Basic</b>   | <b>IC&amp;I Extended</b>  | <b>Items for Future Consideration</b>   |
|---|---|---|
| <ul style="list-style-type: none"><li>▪ <b>IC&amp;I Sector Working Group</b></li><li>▪ <b>Market Development</b></li><li>▪ City-Based Green Procurement</li><li>▪ Promoting Green Procurement in other Sectors</li><li>▪ Voluntary Diversion at Special Events</li><li>▪ School Waste Diversion Programs</li><li>▪ Diversion Assistance Program</li></ul> | <p style="text-align: center;"><b>IC&amp;I Basic</b><br/>+</p> <ul style="list-style-type: none"><li>▪ Voluntary LEED/BOMA Best Certification</li><li>▪ Voluntary Take Back</li><li>▪ Voluntary Food Waste</li><li>▪ Differential Tipping Fee (premium and discounted fees)</li><li>▪ Landfill Bans</li></ul> | <ul style="list-style-type: none"><li>▪ Landfill Permits for Waste Haulers and Recyclers</li><li>▪ Mandatory IC&amp;I Waste Audits and Waste Reduction Plans</li><li>▪ Mandatory Recycling (covered under landfill bans)</li><li>▪ Packaging Bans</li></ul> |

Note: The City provides an open landfill as service to the IC&I and C&D sectors

### IC&I Basic Waste Diversion Package

- IC&I Sector Working Group (see IC16)
- Market Development (see IC17)
- City-Based Green Procurement (see IC11)
- Promoting Green Procurement in other Sectors (see IC12)
- Voluntary Diversion at Special Events (see IC13)
- School Waste Diversion Programs (see IC14)
- Diversion Assistance Program (see IC15)

### IC&I Extended Waste Diversion Package (Basic +)

- Voluntary Third Party (LEED/BOMA Best) Certification (see IC18)
- Voluntary Take Back (see IC19)
- Voluntary Food Waste Diversion & Processing (see IC10)
- Differential Tipping Fees – (premium and discounted fees) (see IC111)
- Landfill Bans (see IC112)

In addition to the above measures, a number of short listed measures applicable to the IC&I Sector were set aside for future consideration based on the input provided by the IC&I and Waste Management Sector Working Groups.

The measures set aside for future consideration are as follows:

- Landfill Permits for Waste Haulers and Recyclers
- Mandatory IC&I Waste Audits and Waste Reduction Plans
- Mandatory Recycling (covered under landfill bans)
- Packaging Bans

## 5.4 Construction and Demolition Waste Diversion Packages

The approach to the C&D Sector is similar to the IC&I Sector. Based on consultations with the C&D and Waste Management Sector Working Groups, two Waste Diversion Packages were formulated “**Basic**” and “**Extended**” and are presented in Table 5-3.

Each listed measure provides a reference to a detailed profile of the measure provided in Appendix F.

### C&D Basic Waste Diversion Package

- C&D Sector Working Group (see CD2)
- Market Development (see CD3)
- Green Building Technical Assistance (see CD1)
- Differential Tipping Fees (premium and discounted fees) (see CD7)



**Table 5-3 C&D Waste Diversion Packages**

| <b>C&amp;D Basic</b>   | <b>C&amp;D Extended</b><br><br>Basic<br>+   | <b>Items for Future Consideration</b>  |
|--|---|--|
| <ul style="list-style-type: none"><li>▪ <b>C&amp;D Sector Working Group</b></li><li>▪ <b>Market Development</b></li><li>▪ Green Building Technical Assistance</li><li>▪ Differential Tipping Fees* (premium/discounted fees)</li></ul> | <ul style="list-style-type: none"><li>▪ C&amp;D Material Recycling Facility (MRF)</li><li>▪ LEED for Municipal Buildings</li><li>▪ LEED Certification for Private Sector Developments</li><li>▪ Landfill Bans</li></ul> | <ul style="list-style-type: none"><li>▪ Mandatory Recycling (covered under landfill bans)</li><li>▪ Landfill Permits for Waste Haulers and Recyclers</li><li>▪ Mandatory Waste Reduction Plans</li><li>▪ Mandatory C&amp;D Recycling Targets</li><li>▪ Refundable Deposits on C&amp;D Projects</li></ul> |

Note: The City provides an open landfill as service to the IC&I and C&D sectors

\* The City already offers a differential tipping fee (discounted fee) for source separated shingles

### C&D Extended Waste Diversion Package (Basic +)

- C&D Material Recycling Facility (MRF) (see CD4)
- LEED for Municipal Buildings (see CD5)
- LEED Certification for Private Sector Developments (see CD6)
- Landfill Bans (see CD8)

In addition, a number of the short listed measures applicable to the C&D Sector were set aside for future consideration based on the input provided by the C&D and Waste Management Sector Working Groups.

These measures set aside for future consideration are as follows:

- Mandatory Recycling (covered under landfill bans)
- Landfill Permits for Waste Haulers and Recyclers
- Mandatory Waste Reduction Plans
- Mandatory C&D Recycling Targets
- Refundable Deposits on C&D Projects

## 6. Sustainable Waste Management System Financing

### 6.1 Introduction

The purpose of this Section is to provide City of Regina with information on various solid waste management financing practices and approaches.

The present system serving the Residential Sector costs about \$110 per household per year. The expansion of service to the “Enhanced” or “Comprehensive” levels, as discussed in the previous sections, will result in a doubling or tripling of these costs depending on the service level ultimately selected. Funding this large increase in costs solely from General Fund Revenue is unacceptable. These costs are presently funded from the General Fund which in turn is financed through residential and business sector property taxes and other sources of revenue such as landfill tipping fees and parking meter revenues. Given this reality, this section presents a number of different financing approaches together with some case studies illustrating the application of these approaches in other municipalities.

### 6.2 Potential Revenue Sources

#### 6.2.1 Property Taxes

Historically, the most common way of financing a significant portion of the operating costs of solid waste management has been through the property tax base. Under this approach, property owners, including both residents and business, pay taxes based on the assessed value of their properties. These tax revenues flow into the general Fund that is used to fund a wide variety of City services including the provision of solid waste management services. There is no direct linkage between a specific portion of the property tax paid and a specific municipal service such as solid waste.

From a taxation perspective, property taxes are progressive as owners of properties with relatively high assessed values, typically people with relatively high incomes, pay more than owners of properties with relatively low assessed values.

Depending upon the assessment base of the municipality, tax revenues from the business sector may serve effectively to subsidize services provided in the Residential Sector.

Most property owners will not easily accept major increases in their property taxes. This is particularly true when there is not a clear linkage or understanding between the service provided and the portion of the property tax required to pay for it. For this reason, it is often difficult to fund major, costly changes (e.g. addition of curbside side collection of recyclables) to a solid waste management system solely on the basis of general tax revenue.

#### 6.2.2 Landfill Tipping Fees

Landfill tipping fees can provide a convenient source of revenue when the municipality controls a landfill that receives waste from external sources. These external sources (i.e., sources other than city collection vehicles) can include:

- Businesses serviced by private haulers;
- Other municipalities; and
- Residents who directly haul their waste to disposal facilities.

Tipping fees (charges per tonne of material received) can be based on a variety of policies. These include:

- Charging on the basis of historical charges adjusted for inflation;
- Charging what the market will bear in relation to other competitive alternatives;

- Charging on the basis of the cost of operating the current facility;
- Charging on the basis of the cost of operating the current facility plus provisions to its closure and long term care and the development of a replacement facility in the future (full cost accounting); or
- Charging on the basis of the cost of the overall waste management system including the landfill.

Landfill tipping fees are relatively simple to administer. Vehicles entering and leaving the landfill can be weighted and charges levied on the basis of the weight of material disposed.

Other factors to be considered in setting landfill tipping fees include:

- Considering the impact that the cost charged for landfill disposal may have on businesses within the community, particularly businesses that generate large quantities of waste;
- Considering that excessive landfill fees may lead to illegal dumping;
- Considering the density of the material being disposed since landfill capacity is consumed on the basis of volume but disposal is generally charged on the basis of the weight of material received; and
- Considering that higher fees may help to promote diversion of materials from landfill but may result in changes in revenue depending on the magnitude of the fee increase and resulting reduction in the quantities disposed.

Revenue from landfill tipping fees represents a relatively stable and dependable source of revenue. If tipping fees rise to very high levels, generators will seek other competitive alternatives. The level of economic activity in the community ultimately determines business sector waste quantities. Therefore, annual quantities will tend to track with the level of economic activity.

Since the revenue generated by landfill tipping fees is the product of the quantity disposed multiplied by the tipping fee, diversion efforts in the revenue generating sector can have a negative effect on landfill revenue.

### 6.2.3 Recyclable Material Sales Revenue

Revenue can be realized through the sale of recyclable materials (or compost) collected and processed by municipalities. These revenues are generally employed to offset the cost of processing the materials.

There are a variety of options for realizing the revenue.

- The municipality can own and operate the municipal recycling facility (MRF), market the recovered materials and realize the revenue from their sale;
- The municipality can contract with a private sector operator to process and market the recyclables but;
  - The municipality can retain the revenue from the sale of the materials;
  - The private sector operator can retain the revenue but the municipality can receive lower material processing costs in return; or
  - Revenue can be shared between the municipality and the operator.

Recyclable materials are commodities and historically have experienced wide fluctuations in prices. The revenue sharing arrangements negotiated by any particular municipality is a function of their ability to actually market the materials and their ability to manage, or tolerate, the risks associated with commodity price fluctuations.

Some private sector operators may have access to more stable markets than individual municipalities. On the other hand, if a private sector operator is required to carry additional risks they will likely require additional compensation, generally in the form of higher material processing fees.

Some municipalities have found that even when a private sector operator contracts to manage the material price risks, they will often attempt to renegotiate the contracts if there is a significant drop in material prices during the term of the contract.

## 6.2.4 Fees Charged Directly to Householders

There is a growing trend to charge householders directly for selected solid waste management services. This trend is in response to the growing complexity and cost of the services provided. These fees range from flat annual fees per household, through variable annual fees for servicing variable sizes and types of containers, to direct charges for individual container pick up.

### 6.2.4.1 Flat Annual Fee

Under this approach an annual cost per household (or collection stop) is calculated. It may represent the full cost of providing service to the household or a portion of the program costs not covered through other revenue sources such as general tax revenue or tipping fees. The fee charged is the same for each household regardless of their property value. Communities can apply different flat fee strategies including:

- Flat annual fees may be phased in over time by initially being set to cover a portion of the program costs and then gradually increased to ultimately cover the full cost of the program; and
- Flat annual fees may be set to cover a base level of service with additional charges being levied for additional services.

Flat annual fees can be collected through a variety of approaches including being applied as a separate line item on the property tax bill or charged on a utility bill with other services such as water and sewage fees, or alternatively a separate invoice can be issued to actual householder residents.

The primary differences between flat annual fees and property taxes are:

- The magnitude of property tax paid is determined by the assessed value of the property while with an annual flat fee all householders pay the same amount;
- With an annual flat fee there can be a clear linkage between the services provided and the cost of the service. This is not the case with general property taxes which typically do not show the allocation of the property tax to a specific waste management service; and
- Flat fees enable a community to gradually move to a variable container pay-as-you-throw program which is more difficult to achieve under a property tax system.

When introducing a flat annual fee care must be taken to effectively communicate what the fee is for and that it does not constitute a form of double taxation (e.g. if the fee had not been introduced, property taxes would have had to increase significantly).

Flat fees have been criticized for being regressive for the following reasons:

- It discriminates against lower income and senior families who are now required to pay the same fee as more affluent families but were being subsidized by affluent families under the property tax approach; and
- It discriminates against larger families if a bag limit is imposed along with the flat fee.

Some communities compensate for this by offering subsidies and discounted rates to lower income, disabled and senior families. Other communities establish a flat fee approach as an interim step towards a variable fee system as discussed below.

### 6.2.4.2 Variable Fees for Chosen Level of Service

A refinement of the flat annual fee is to charge different fees for different levels of service. Under this approach householders can be offered different size garbage containers with different annual fees

charged for servicing them. In general, the larger the size of container required, the higher the fee. In this way, a household that generates more waste pays more than one that generates less.

The fee can be charged as a one time annual payment or divided into quarterly or bi-annual payments. This is a function of the billing system used. As with the flat annual fee, the charges for the chosen level of service can be included on the tax bill or invoiced separately.

In addition, some communities charge separate annual fees for servicing other material streams such as recyclables and household organics as well as the variable fee for the garbage. This approach is not very common and typically communities combine garbage fees with recycling and organic diversion fees in order to promote waste diversion. One of the reasons for offering different sized garbage containers at different fee levels is to promote waste diversion activities, such as recycling and composting. Charging for the collection of recyclables and organics would be counter to this goal.

As with a flat fee system, a variable fee system is often criticized for being regressive and causing other problems for the following reasons:

- It discriminates against large families (i.e. more people in a household means they generate more garbage and have to pay more);
- It will lead to illegal dumping if households select a small container to save money and then illegally dump any waste generated beyond the capacity of the container.

Many communities have tackled these criticisms by arguing that a variable fee system gives more control to the householder to choose the size of the container and associated fee than a property tax or flat fee approach. Also, some communities provide subsidies and fee discounts to disadvantaged families. Finally, those communities that introduce a zero tolerance illegal dumping policy and back it up with proper enforcement and fines rarely encounter an illegal dumping problem.

#### 6.2.4.3 Fees for Individual Container Pick Up

Fees can be charged for picking up individual containers or bags. Under these types of programs householders are required to purchase tags and the waste is only picked up if a tag has been attached to waste inside a reusable container or a bag that is to be collected. The community will determine the number of containers or bags that can be placed at the curb without requiring a tag (e.g. one, two, three, etc.) and any additional containers or bags require a tag. These are referred to as partial PAYT programs. A full PAYT program requires that a tag be placed on every container or bag placed at the curb for collection.

Charges for individual containers/bags can be employed in conjunction with other programs. For example, a householder may receive a base level of service under a flat fee program (which may include recycling and yard waste services) and the tags pay for the collection and disposal of the individual container or bag.

Charges for individual container pick up are not well suited to automated collection programs due to the requirement to check for a tag prior to servicing a container or picking up an item. Communities with automated collection system tend to adopt a variable container system instead.

There is the added requirement to distribute and sell tags within the community. In some locations this is done through convenience stores as well as through municipal offices.

This form of direct user pay can lead to budget shortfalls if residents, in response to the program, reduce the quantity of waste that they set out for collection. Often a community will overestimate the number of tags that will be purchased when introducing a PAYT program which results in a revenue shortfall. This can be especially problematic if the community is relying of the fees from the tags to pay for a large portion of the waste management system costs.

As with other PAYT programs, this type of program has been criticized as leading to illegal dumping. Majority of communities report minimal illegal dumping problems that are short lived (2-3 months) and easily and effectively overcome this through enforcement and fines.

#### 6.2.4.4 Weight Based Collection Changes

In theory, it is possible to weigh individual containers as they are being collected using load cells in the arms of automated collection vehicles. These weights can be recorded and a weight based invoice generated for each individual collection. This type of program has not been widely deployed due to the maintenance requirements under the Canadian Weights and Measures Act that requires frequent calibration of the load cells on the individual collection vehicles to check their accuracy.

The issues regarding the budget implications associated with reduced waste quantities and the potential for illegal dumping are the same as with the other direct PAYT approaches discussed above.

#### 6.2.4.5 Summary of Alternative Approaches for Charging Householders

The following Table 6-1 provides a summary of the various approaches for charging for residential waste management services:

**Table 6-1 Summary of Approaches for Charging for Waste Management Services**

| Issues   | Assessment Based (Property Taxes)   | Flat Annual Fee  | Annual Fee For Chosen Level of Service                                    | Fee for Individual Container/Bag Collection                               |
|--|-------------------------------------|--|---|---|
| Factor determining cost of waste management service to householder | Assessed value of property          | All households pay the same                                    | Size of garbage container selected  | Number and frequency of garbage containers or bags set out for collection |
| Mechanism for collecting revenue                                   | Tax bill                            | Included on tax bill as separate line item or separate invoice | Separate invoice or possibly included on tax bill as line item            | Sale of tags or stickers  |
| Administrative effort required to implement                        | None (this is status quo)           | Small  | Medium  | Medium  |
| Suitability for financing new diversion initiatives                | Not well suited                     | Well suited  | Well suited   | Less well suited than annual fees   |
| Incentive for additional diversion from disposal                   | None                                | None   | Yes, major incentive  | Yes, major incentive  |
| Potential to cause illegal dumping                                 | None                                | None   | Some  | Some  |
| Uncertainty associated with financing revenue stream               | Minimal                             | Minimal  | Minimal   | Some  |
| Constraints to implementation                                      | None (this is status quo)           | Small  | Medium  | Medium  |
| Early public acceptance  | Not applicable (this is status quo) | Low, due to regressive nature of fee                           | Medium, as residents given some choice and ability to control size of fee | Low, due to inconvenience of having to acquire and use tags               |
| Need for strong Council support and communication                  | None (this is status quo)           | High   | High  | High  |



### 6.2.5 Fee Charged Directly to Businesses

In addition to collecting materials from residents, some communities have chosen to offer collection services to IC&I Sector generators. These quantities are generally small as most materials generated within the IC&I Sectors are collected by private sector haulers.

The above options identified for the Residential Sector collectors can also be employed in the IC&I Sector.

### 6.2.6 Product Stewardship Funding

Saskatchewan is a leader in implementing product stewardship programs. As discussed in Section 2, programs are in place for a variety of different materials including; selected containers, paint, used oil, tires, and electronics. In Saskatchewan these programs have largely been implemented independently of municipalities. In some other jurisdictions municipalities have partnered with stewards in delivering programs, particularly in the area of material collection. Participation in these programs has provided municipalities with an additional source of revenue, although this revenue generally only covers the cost of the service provided by the municipalities.

Saskatchewan is currently actively considering a resource recovery program (Multi-Material Resource Recovery Fund, see Section 2.2.6) to assist in funding municipal recycling programs. In other provinces such programs have typically funded 50% of the overall municipal cost of curbside recycling programs. Ontario is currently considering raising this funding level to 100%. Should Saskatchewan implement such a resource recovery program, it would provide a major source of additional funding for a curbside recycling program.

### 6.2.7 Other Grants and Subsidies

Grants and subsidies represent an additional potential source of revenue depending upon the programs that are available. In the waste management sector, producer responsibility (product stewardship) programs, as discussed above, represent the major potential source of such funds.

## 6.3 Cost Accounting and Governance Structure

As discussed in Section 2, Regina employs a traditional municipal cost and revenue allocation structure, with revenue from outside sources, such as landfill tipping fees, flowing directly into the general revenue account and solid waste management costs, along with other departmental costs such as social services, being funded from general revenue. Although both costs and revenues are tracked in the City's activity based accounting system, there is no link between revenues and costs.

When faced with significant increases in costs due to the provision of new services, such as curbside recycling, some municipalities have moved away from this traditional approach towards a utility type model. The first step in this transition is to establish a "business unit" where revenues are used to directly offset costs. Additional funding sources, such as those discussed in the previous section, can be then used to provide additional revenues. In this manner the need for significant increases in tax rates to fund new services can be mitigated.

Once a waste management business unit, rather than just a cost centre, has been established a clear understanding of the sources and uses of funds can be developed and the potential issue of business sector tax revenue being used to subsidize residential sector services can be addressed.

It is essential that the waste management business unit must become fully acquainted with their true waste management costs by applying full cost accounting principles to gain greater insight into the unit's financial operations. Full cost accounting ensures that all revenues and expenses associated with provision of waste management services are identified.

In 1995, Alberta Environmental Protection's Action of Waste prepared two influential documents on Full Cost Analysis for municipal waste management titled, A Full Cost Analysis Guide for Municipal Waste

Managers. The Guide was developed to adopt a common definition of full cost analysis applicable to waste management systems in the province and to assist municipal waste managers in implementing full cost analysis procedures.

The Guide defines full cost analysis in the following way<sup>1</sup>:

*Full cost analysis shall mean the total of all real, definable and measurable costs, both direct and indirect from all sources, incurred or attributed to the particular project or system in question, when taken together with all additional considerations that are not measurable in monetary terms but may influence decisions or perceptions relating to the project or system.*

The approach to full cost accounting varies in intensity depending on the system used. The US Environmental Protection Agency (USEPA) has tried to simplify the full cost accounting procedure by focusing on three major types of costs that are relatively easy to determine - up-front costs, operating costs, and back-end costs. The USEPA recognizes that other less tangible costs require special consideration including remediation costs at inactive sites, contingent costs, environmental costs, and social costs. The three primary costs are defined as:

- **Up-front costs** comprise the initial investments and expenses necessary to implement MSW services. These include public education and outreach, land acquisition, permitting, and building construction or modification.
- **Operating costs** are the expenses of managing MSW on a daily basis, including operations and maintenance, capital costs, debt service, and any unexpected costs.
- **Back-end costs** include expenditures to properly wrap up operations and take proper care of landfills and other MSW facilities at the end of their useful lives. Costs include site closure, building/equipment decommissioning, post closure care, and retirement/health benefits for current employees.<sup>2</sup>

Many communities have begun to apply full cost accounting principles and procedures with good success, resulting in the identification of operational efficiencies and cost savings.

The ultimate step in the creation of a waste management utility is the establishment of a separate governance structure. Although a number of municipalities have adopted the business unit model and refer to it as a utility, few individual municipalities have taken this final step of establishing a separate entity and governance structure for waste management. Those that have are generally groups of municipalities that are served by a single waste management authority.

## 6.4 Examples from Other Municipalities

Historically, most Canadian municipalities have financed their solid waste management systems in a manner similar to Regina. In response to the provision of enhanced, more costly levels of service a number of Canadian cities have started to employ a variety of different funding approaches and cost accounting structures as discussed above. These case studies are presented below:

### 6.4.1 Vancouver

The City of Vancouver's Engineering Services Department adopted a self-financing cost centre approach to its waste management services in the late 1990s, when the City of Vancouver's Council approved that the Solid Waste Utility be implemented on January 1, 1998. Although called a Solid Waste Utility, this entity operates as a utility in function only; it is not a legal utility. Vancouver's Solid Waste Utility is responsible for all solid waste operations and accounts with the exception of street cleaning, litter collection, and abandoned garbage collection.

<sup>1</sup> A Full Cost Analysis Guide for Municipal Waste Managers. <sup>1</sup>Alberta Environmental Protection, Action of Waste, September, 1995

<sup>2</sup> US EPA website <http://www.epa.gov/epaoswer/non-hw/muncpl/fullcost/whatis.htm>

By establishing the cost centre, the City stipulated that full program costs would be recovered through fees. Since then, all solid waste system costs have been removed from the property taxes and instead show up as separate line items on the property tax bill. Residents and users pay directly for the service levels to which they subscribe. By removing the costs of solid waste collection and disposal out of the general levy, residential property taxes were reduced by 5.7% in the year the utility was implemented.

Vancouver's Solid Waste Utility is governed in the same manner as other programs and services provided by the City of Vancouver, with roles and responsibilities defined and allocated as set out under the Vancouver Charter.

In 2004, City Council voted in favour of implementing an automated garbage collection system featuring variable service levels to residents. As described in the report to Standing Committee on City Services and Budgets, dated September 14, 2004, the reasons outlined for the variable subscription system were three fold:

- Provide an economic incentive for residents to reduce, reuse, and recycle;
- The five cart size options is one of the widest selections available in the market allowing for greatest user flexibility, equity, and fairness, and
- Residents pay for what they generate – residents are in control.

From 2005 to 2006, the City transitioned from a manual garbage collection system to a fully automated garbage collection system. In 2006, the City launched its leading edge garbage collection system featuring an automated cart program and five subscription rates. Vancouver's variable rate cart program is an example of a PAYT approach, which uses economic tools to drive waste reduction and diversion. In fact, PAYT is considered the most important policy that a community can introduce to effect positive waste diversion behaviour in the residential sector.

With the variable rate cart program, residents are permitted to choose from one of five garbage collection service levels as well as one of four yard waste collection service levels and one service level for recyclables. The costs for each service level are proportional to the size of the cart chosen. The larger the cart size chosen by residents, the greater the fee. The pricing structure has been set to cover the cost of providing the service and has been uniquely based on a two tier costing approach which involves a flat fee reflecting the cost to get the collection vehicle to the curb and a variable fee reflecting the cost to collect the cart. In addition, the City offers the sale of tags to be attached to additional garbage set out for collection. The City does not use a cart system for its recycling program, rather it continues to collect recyclables using blue boxes (for containers) and blue bags (for newspapers) and yellow bags (for other fibres).

The 2007 fee is based on a two-tier system that uses a cost-of-service approach, as follows:

- Garbage
  - The fee is based on a \$50 flat service fee + \$27/ 100 litre collection fee
  - 5 cart sizes to choose from (75 litre to 360 litre)
  - The above results in an annual fee ranges from \$70 to \$147 per household based on cart size
- Recycling
  - Stop fee (\$10/yr) + service fee (\$10/yr) = \$20/yr
- Yard Trimmings
  - The fee is based on a \$33 flat service fee + \$8 per 100 litre collection fee
  - 4 cart sizes to choose (120 litre to 360 litre)
  - The above results in an annual fee ranges \$43 to \$62 based on cart size

The container fees increase with the size of the container as shown in Table 6-2.

**Table 6-2 City of Vancouver’s Variable Rate Subscription Fees in 2007**

| Garbage Container       |                       | Yard Trimmings          |                       | Recycling             |
|-------------------------|-----------------------|-------------------------|-----------------------|-----------------------|
| Container Size (litres) | Collection Fee (2007) | Container Size (litres) | Collection Fee (2007) | Collection Fee (2007) |
| 75                      | \$70                  | Not available           | Not available         | \$20                  |
| 120                     | \$82                  | 120                     | \$43                  | \$20                  |
| 180                     | \$99                  | 180                     | \$47                  | \$20                  |
| 240                     | \$115                 | 240                     | \$52                  | \$20                  |
| 360                     | \$147                 | 360                     | \$62                  | \$20                  |

The average household has experienced a slight increase in waste management service costs (garbage, yard trimmings, and recycling) from 2005 to 2007, with the average household paying \$149/yr in 2005, \$161/yr in 2006 and \$172/yr in 2007 respectively.

### 6.4.2 Victoria

The City of Victoria, British Columbia is a lower tier municipality within the upper tier region of the Capital Regional District (CRD). The two levels of government maintain very distinct waste management roles, with the City of Victoria responsible for garbage collection and the CRD responsible for waste diversion (including recycling, yard waste and food waste collection and processing, and P&E) and garbage disposal.

The CRD finances its residential waste diversion programs through a surcharge placed on the tipping fees at its regional Hartland Landfill. All garbage disposed at the landfill, including municipal garbage, is charged a tipping fee including the waste diversion surcharge. The City of Victoria, in turn, charges the collection and disposal fees back to its residents in the form of a flat fee applied to the water bill every four months. The City operates its waste management services through its waste management department. To date it has not established its waste management services as a separate cost/revenue centre or business unit.

In 1990 the CRD experienced a dilemma when it realized that it had very little landfill capacity remaining at its Hartland Landfill. In order to obtain public approval for a landfill expansion proposal, the CRD committed to an extensive program to divert waste. The CRD also had to assure the public that there would be no pressure to expand or relocate again for at least 25 years.

In response, the CRD implemented its first Blue Box curbside recycling program in March 1989, servicing the four core municipalities of Oak Bay, Saanich, Victoria, and Esquimalt. The CRD used funds from tipping fees to pay for the Blue Box collection and processing services and continues to do so today. When the recycling program was implemented, the CRD had to significantly increase tipping fees to pay for the recycling program. The tipping fee was raised from \$10.50 per tonne in 1988 to \$75 per tonne in 1993.

Prior to 1990, waste management costs in the City of Victoria were covered through property taxes. In response to the increased tipping fees introduced by the CRD in the early 1990s, the City of Victoria revamped its garbage collection system. In January 1992, a flat fee system and partial Pay-as-you-Throw system was introduced in the City of Victoria in order to reduce the amount of waste requiring disposal and the cost. In 1992, residents were permitted to place two cans or bags of garbage at the curb without requiring the resident to purchase and affix tags on the extra cans/bags of garbage. In 1996, the City reduced the number of “free” cans/bags to one.

In 1996, residents of the City of Victoria paid a flat annual fee of \$147 per household for bimonthly (every two weeks) curbside recycling and weekly garbage collection services. This covered one bag per week and extra bags cost \$3.00 each (\$1.50 covers collection and disposal cost for the additional

bag/container, the remaining \$1.50 goes into general revenues). The City sold very few addition stickers, about 12,000 stickers per year (~1 sticker/hhld/year).

Today, the system remains virtually the same with a minimal increase in costs. In 2008, the City of Victoria announced that it would raise its flat fee by from \$150/hhld to \$156/hhld/yr to defray additional costs associated with increases in tipping fees at the CRD's Hartland Landfill, increases in fuel costs and wages, and the recently discovered revenue shortfall.

### 6.4.3 Edmonton

In 1995, the City became the first large Canadian community to finance part of the waste management services using a flat fee for both single family and multi-family waste management services. The various programs operated by the City's Waste Management Department are funded through a variety of different sources – the monthly solid waste bill, property taxes, and revenues from tip fees and the sale of recyclables. The City of Edmonton does not operate as a solid waste utility; rather, it operates as a Waste Management Department within the City.

In 1995, the City of Edmonton introduced a monthly flat fee to cover processing and disposal activities. Initially, the monthly flat fee was used to fund all processing and disposal related activities (i.e. transfer stations, municipal recycling facility, Edmonton Composting facility, landfill disposal, and Eco stations). Property taxes were used to fund collection related activities (i.e., garbage and recyclables collection, litter collection, and community recycling depots) and public education programs. Over the years, however, the City has consciously reduced its reliance on property taxes to fund parts of the waste management system and has used the flat fee approach to cover an increasing portion of waste management costs needed to cover new processing and disposal programs.

In 2007, the average cost per single family household contributed \$247 per year towards the cost of waste management services. An average of \$65/hhld or 26% (based on assessment value of \$243,500) was collected through property taxes and \$182/hhld/yr or 74% was collected through flat fees. In addition, the residential waste management system continues to be partially financed from taxes collected from businesses and revenues generated from tipping fees at the City's Clover Bar Landfill as well as revenues from the sale of recyclables.

In March 2008, City Council voted to create a waste management utility, effective January 1, 2009. Starting in January 2009 all waste management costs are now charged as a flat fee and removed from the property taxes entirely. With the tax payment for waste services eliminated, most property owners can expect to receive a refund on their 2009 tax notice. This change requires an amendment to the Waste Management Bylaw to allow for conversion of waste management services to a public utility.

EPCOR Utilities, which provides power and water services to Edmonton, administers electricity, water, sewer, and waste utility bills. Water, sewer, and waste disposal charges are put on one bill. All utility bill fees are collected by EPCOR, which bills on a monthly basis.

### 6.4.4 Ottawa

In 2006, the City of Ottawa was the first City in Ontario to introduce a flat fee charge for part of its residential waste management services. Prior to this, the City funded all residential waste management activities through property taxes, landfill tipping fees and revenues from the sale of recyclables.

In July 2005, facing significant tax increases, the City Council approved the implementation of an alternative method to fund solid waste services. The new funding approach funds the cost of residential garbage collection and disposal through a separate flat fee but continues to fund residential waste diversion and recycling costs through the property tax bill. As a result of the new funding approach, the City was able to remove \$21 million waste collection system costs from the property taxes and shift it to a flat fee, which resulted in a tax reduction of 3.9% in 2006.

Starting in 2006, residential garbage collection and disposal is funded through a flat fee per household. The flat fee is billed on residential property tax bills, but appears as a separate line item. The flat fee is

collected in the same manner as property taxes and is subject to the same penalties and interest rates for non-payment.

The new funding model also shifted the costs of residential garbage collection and disposal from the commercial and industrial tax bill to full cost recovery from the residential properties obtaining services. Businesses no longer help to pay for residential garbage collection services that they do not receive.

In 2008, flat fees charged for residential garbage collection and landfill disposal were \$82 per household receiving residential curbside garbage collection and \$33 per household receiving multi-residential bin tipping garbage collection. No other changes have occurred. All waste management services are managed by the City's Waste Management Department with all program costs and revenues linked to the general revenue fund. The City's Waste Management Department has been investigating the idea of becoming a separate cost/revenue centre with a separate waste management fund.

#### 6.4.5 Prince Albert

In 2003, the City of Prince Albert, Saskatchewan implemented an automated waste and recycling collection system in which residential households were allocated a cart from the city and are restricted to placing no more than 600 litres of garbage for collection every two weeks. Each resident receives a 300 litre cart for garbage and a 240 litre cart for recyclables. From October through to May, residents receive biweekly garbage collection and weekly collection during the summer months (June to September). In addition, residents receive automated recycling collection on a biweekly basis.

Prior to launching the automated collection system, the City established a Solid Waste Utility (business unit) with a separate waste management fund and moved from paying for its waste management services through the property tax base to charging residents a flat fee for waste management services. All residential households are charged \$12/month for garbage and recycling services. Instead of removing the waste management portion of the mill rate off the property taxes, the City was able to avoid a property tax increase that was pending. When switching to the full cost recovery flat fee financing system, the City chose to phase in the transition over a three year period by charging \$4/hhld/mth the first year, \$8/hhld/mth the second year and \$12/hhld/mth the third year. During the transition year, the waste management system costs were supplemented by the General Revenue Fund.

The residents are charged for waste management services as a separate line item on the water bill. The \$12 monthly fee covers all waste management service costs.

## 7. Implementation Considerations

### 7.1 Consultation Strategy on Service Level Options

The overall strategy for finalizing Waste Plan Regina is to establish a number of waste management Service Level Options, three in addition to the current system for the Residential sector and two each for the IC&I and C&D sectors. City Council will lead an extensive community consultation effort to obtain input on these Service Level Options and then decide on the best Service Level Option and Waste Diversion Packages to meet the needs of the City.

The objectives of the public engagement strategy are to inform residents and stakeholders of the service level options and packages, to solicit input on issues and opportunities within the options, and involve them in the decision making process. Methods to support the strategy will include the following:

- Public opinion polling;
- Focus groups;
- Web site with online feedback mechanism;
- Public meetings;
- Displays in key public locations (e.g. city hall lobby, city facilities, shopping malls) with comment cards;
- Door to door interviews.

Feedback obtained through the public engagement process will inform the Council decision-making process. Once the Service Level Option and Waste Diversion Packages have been chosen, more public engagement specific to implementation of the services will be required.

### 7.2 Residential Recycling Service

The provision of residential recycling services to single family households including both front of household curbside and back alley collection, as well as the provision of service to multi-family residential buildings, is a key aspect of both the Enhanced and Comprehensive Service Level Options.

If the selected Waste Plan Service Level Option includes residential recycling, there are a number of variables that must be addressed before such a service can be implemented. These variables will need to be addressed through a detailed implementation study and must include, but are not limited to:

- Materials to be collected – e.g. paper, cardboard, aluminum and steel cans and plastic containers, etc.;
- Level of sorts – e.g. single stream versus two-stream collection and processing;
- Frequency of collection – e.g. biweekly versus weekly;
- Type of collection – e.g. automated versus manual material collection;
- Who collects – material collection provided by public or private sector forces;
- Who processes – processing of materials by a private sector contractor or at a new public sector facility. If a new public sector processing facility is built will public or private sector forces operate it;
- Marketing materials – the party responsible for marketing the recovered materials; City staff or a private sector contract operator; and
- Roll Out Strategy – development of a roll out strategy and communication campaign for rolling out the programs once the details have been decided.



### 7.2.1 Materials to be Collected

Decisions will have to be made regarding which materials to collect in any future recycling program. This decision affects the quantity of material to be collected, the nature of the process for sorting the collected materials, and, ultimately, the diversion from disposal achieved by the program.

SARCAN currently collects beverage containers through its network of depots. A decision will have to be made as to whether or not to collect these materials in the recycling program as well. The City will need to take into consideration that SARCAN will continue to bleed high grade and valuable materials (e.g. aluminum cans) from the system. However, as in other communities with beverage container deposit/return programs, a portion of the residential population will choose convenience over cash and will recycle their beverage containers in the curbside program instead of taking them to a redemption centre.

The current (spring 2009) recession has severely impacted the demand and price for all commodities including recyclable materials. Some communities are paying to recycle certain materials. However, this is viewed as a short to medium term situation and markets are expected to rally back over time. A decision on which individual materials to collect will have to be made on the basis of market demand, prices, and transportation costs.

Regardless of which materials are initially collected, the recycling program, including the processing facility, should be designed with flexibility to accept additional materials as conditions change.

### 7.2.2 Levels of Sorts

Historically recyclables have been collected and processed as two separate streams – containers and fibres. At the Material Recycling Facility (MRF) both the collection and processing require that the two streams remain separated from one another. The advantage of a two stream system is lower processing costs, lower contamination rates and higher quality of recyclable materials.

Recently there has been a move to single stream (particularly in larger municipalities) where all materials are co-mingled in a single container by the householder and collected in a single compartment of a truck. These materials are processed at a specialized single stream facility equipped with front end screens to separate the containers from the fibres. Some municipalities have reported higher participation from residents following the switch to single stream, as having only one recycling container to manage may be easier for householders. Collection is cheaper but processing is more expensive.

However the drawback to single stream recycling occurs during the processing. There have been processing issues associated with cross material contamination (e.g. fibres in the containers, or glass in the fibres) which results in lower market value for the materials. The presence of these contaminants may require the use of additional sorters to overcome the problem of diminished quality and value of the recycled material.

A two-stream system requires households to have two separate collection containers (e.g. a blue box and a grey box). A single stream system requires that they only have one larger container.

A comparison of both systems from a financial and operational perspective will need to be conducted. Ultimately a decision will have to be made on implementing a two-stream or single stream system.

### 7.2.3 Frequency of Collection

When designing a recycling system, a decision will have to be made regarding the frequency of collection. Some two-stream systems collect both containers and fibres every week, while others alternate with the collection of fibres one week and containers the next, thus employing a single truck compartment.

Some single stream systems provide collection every week while others provide collection every second week. When material is collected every second week, households must be provided with larger

containers (or multiple containers). Bi-weekly collection tends to result in lower participation and recovery rates.

#### 7.2.4 Type of Collection

As with garbage collection, a decision will have to be made between fully automated (side-arm), semi automatic (bin tipper) or manual (blue box) collection.

If plans call for the same truck to service both single family and multi-family buildings it should be noted that most multi-family buildings are serviced with large wheeled bins that require either fully automatic or semi automatic bin tippers.

If a two stream automated collection system is implemented then each household will require two bins requiring manual collection.

Regardless of the frequency of collections, recyclables should generally be collected on the same day as garbage in order to simplify the collection schedule for households.

#### 7.2.5 Who Collects

A decision will have to be made regarding who will provide the collection services, public sector forces or private sector contract forces.

If public sector forces are employed the City will have to acquire and maintain the additional collection vehicles. If collection services are contracted out, the cost of the trucks can be included in the overall service contract costs.

#### 7.2.6 Who Processes

A decision will have to be made regarding who will process the collected materials. The City can build its own new MRF, which could be operated by City forces, or the operation could be contracted out to the private sector. Alternatively, processing could be contracted out to a private sector operator with its own MRF.

#### 7.2.7 Marketing Materials

Regardless of who owns and operates the MRF, a decision will have to be made regarding who is responsible for marketing the recyclable materials and carrying the price risks associated with the sale of these commodities. Some communities have chosen to assume 100% of the revenues and the risks, whereas other communities, especially smaller communities, tend to be risk averse and would rather leave the risk and revenues to the private sector. Often a community will pursue a revenue sharing arrangement where the community receives a portion of the revenue.

City staff could be responsible for marketing these materials or it could be the responsibility of the contract operator of the MRF.

#### 7.2.8 Roll Out Strategy

Once the City has developed detail plans for the program and its implementation considerations, a detailed roll out strategy and communication campaign will need to be developed. This roll out strategy will address the specific timing and procedures for distributing collection containers to households, informing them about the launch of the program and providing detailed instructions on how to recycle.

### 7.3 Timing Issues

The Service Level Options presented in Section 5 have been introduced as discrete packages. Once a Service Level Option has been selected, actual implementation will have to be phased in based on the

availability of both resources and required infrastructure. For example household recycling may be first delivered to single family households before extending the service to multi-family residences.

Over a longer timeframe it could also be possible to evolve from one Service Level Option to the next. For example, the “Enhanced” Service Level Option, with household recycling service, could be initially implemented and at a later date the City could decide to move to the “Comprehensive” Service Level Option with the collection of household organics (e.g. food wastes).

The same applies to support mechanisms. In some cases, voluntary versions of the measure should be introduced and promoted first. Over time this can be followed up with mandatory version of the measure. A number of the support mechanisms can be initially introduced as voluntary measures through educational programs. Experience has shown that the majority of residents will respond to this type of incentive. Experience has also shown that a minority will not respond to this type of program and these minorities require a more aggressive approach such as mandatory requirements.

## 7.4 Creation of a Waste Management Utility

In Section 6, the idea of creating a waste management business unit or, ultimately, a separate waste management utility was introduced as part of an overall approach for providing sustainable waste management system financing. Case studies were also provided to illustrate similar steps taken by several other municipalities.

The steps in moving towards the creation of a separate waste management utility are as follows:

- Step 1 – Move to establishing a waste management business unit that receives revenues from landfill charges, commercial waste collection, the sale of recyclables, and other revenue sources in a separate waste management fund. This business unit pays out for the provision of direct waste management costs through the waste management fund. The general fund supplies revenues to make up the shortfall between costs and revenues.

This first step is more of an accounting change than change in operating practices.

- Step 2 – Gradually replace the transfers from the general funds with funds from the alternative financing sources discussed in Section 6 (e.g. annual fees charged to householders). Move towards having the residential sector pay for the costs of servicing the residential sector. These revenues feed into the waste management fund.
- Step 3 – Undertake additional studies for the formation of a separate utility with its own governance structure. These studies will address the full cost allocation for indirect services provided by the City, as well as the governance structure for the new utility.
- Step 4 – Based on the outcome of the Step 3 studies, make a decision with respect to moving forward with a separate autonomous waste management utility.

## 8. Project Consultation

Public consultation plays a critical role in the development and successful implementation of a solid waste management master plan, and Waste Plan Regina is no exception. Therefore, a comprehensive public and stakeholder consultation was designed as a cornerstone of the project. A series of steps were taken to collect opinions and thoughts from various stakeholders affected by this project, ranging from the general public and business associations to directly affected stakeholders.

The public consultation strategy employed a number of different approaches to meet, listen, solicit opinions, and respond to key stakeholders including the public, local businesses, community groups, business associations, elected officials, non-government organizations, and others throughout the course of the completion of the plan. The broad stakeholder consultations were conducted through a combination of approaches including public opinion research, open house, dedicated Waste Plan Regina website, dedicated Waste Plan Regina email, stakeholder meetings and working group sessions, and informal interviews with stakeholders and members of City Council.

The consultation efforts focused on being open and transparent. Relevant and necessary information was shared at all stages of the decision-making process using different media sources including the Waste Plan Regina website, newsletters, and articles.

The public consultation sessions were organized into discrete time segments, corresponding with key project tasks and milestones. The consultations occurred as follows:

- Introductory Spring 2008 Consultation involving:
  - Residential survey;
  - Development of Public Background Document;
  - Establishment of Waste Plan Regina website;
  - Open House; and
  - Meetings with Elected Officials.
- Summer and Fall 2008 Consultations involving:
  - Eight Sector stakeholder meetings; and
  - Meetings with Elected Officials.
- Winter 2009 Consultations involving:
  - Meeting with members of stakeholder groups;
  - Meetings with Elected Officials; and
  - Public open house at the Regina Public Library focussing on project progress.
- Early Spring 2009 Consultations involving:
  - Four Sector stakeholder meetings;
  - Meetings with Elected Officials;
  - Waste Plan Regina newsletter distributed to multiple stakeholders via email subscription; and
  - Home and Garden Show display.
- Late Spring 2009 Consultations involving:
  - Four Sector stakeholder meetings; and
  - Meetings with Elected Officials.
- Post June 2009 Consultations

Each consultation session is described in more detail below and supported with documentation provided in Appendix G.

## 8.1 Introductory Project Consultations Spring 2008

### Residential Survey

A public perception survey was conducted early into the project to gain insight into the needs and priorities of Regina residents with respect to the City's future waste management and waste diversion plans. In addition, the City wanted to gain insight and a better understanding into the motives, behaviours, and attitudes of its citizens towards the environment, waste management, and recycling.

The residential survey was conducted from May 1<sup>st</sup> to May 14<sup>th</sup> 2008 by Insigtrix Research Inc., a well-established research and polling company based in Saskatchewan. A total of 1,000 telephone interviews were conducted within the Regina city limits consisting of a randomly selected and representative sample of Regina residents.

Survey results are provided in Appendix G1. A brief summary of the key findings are presented below. All statistical results are within a margin of error:  $\pm 3.1$  percentage points, 19 times out of 20.

The following are some highlights from the residential survey:

- Majority of respondents (97%) feel that the City provides very good waste management services;
- More than 90% of Regina residents believe that it is their responsibility as citizens to ensure a clean, healthy environment;
- More than 85% of respondents feel strongly that it is important to reduce the amount of garbage going to landfills;
- Almost 70% felt that providing a convenient way to recycle materials through curbside recycling would have a lot of impact on their decision to recycle;
- Most respondents support bylaws, policies and programs to promote waste diversion by residents;
- Approximately 85% of respondents support the idea of the City providing curbside recycling services; and
- Approximately 90% of Regina residents support the introduction of bylaws requiring businesses to separate their recyclables for disposal (businesses should be required to recycle).

Interestingly, the survey also revealed that most respondents were willing to pay for waste diversion services:

- 41% of respondents are willing to pay up to \$10 per month for curbside recycling and 25% were willing to pay up to \$20 per month for curbside recycling; and
- 44% of respondents are willing to pay up to \$10 per month for curbside food waste collection and 18% were willing to pay up to \$20 per month for curbside food waste collection.

### Development of Public Background Document

A background document/brochure was developed to introduce Regina citizens to the City's current waste management system and concepts. The background document explored the amount of waste generated by the key sector groups – Residential, IC&I and C&D and the cost to provide current waste management services to the householder. A copy of the background document (Lets Talk Trash Brochure) is provided in Appendix G1.

## Open House

On June 17<sup>th</sup> 2008 a Waste Plan Regina Open House was held at the City Hall Forum from 3:30 to 8 pm. The intent of the Open House was to introduce the project and the current waste management system to the public and to provide them with an opportunity to express their aspirations and expectations for the process through direct discussions with Regina staff and the consultants. In addition, participants were encouraged to complete an exit survey to provide further input into the process. The results of the exit survey are provided in Appendix G1 as well as the poster boards used during the Open House.

The Public Open House was very well attended with 110 attendees registering on the sign-in sheet and 84 completing the exit survey. Majority of attendees identified their support for the planning process.

When asked how they heard about the open house, participants responded as follows:

|   |     |
|---|-----|
| Radio   | 27% |
| Poster  | 8%  |
| Newspaper   | 18% |
| Display board at City Hall                        | 9%  |
| Inside Green (Saskatchewan Roughrider supplement) | 5%  |
| Other   | 32% |

Some of the comments from the Open House were as follows:

- Having the mayor involved and supportive of the process is important;
- Information was generally considered useful and informative;
- A dedicated website is needed to post reports and information during the process; and
- Need staff available to provide information to citizens.

## Establishment of Waste Plan Regina Website

During this period, the City launched a dedicated Waste Plan Regina website at [www.regina.ca](http://www.regina.ca) in order to provide the community with access to information about Waste Plan Regina and provide a point of communication and feedback through a dedicated Waste Plan Regina email. The public was also able to subscribe to regular updates (i.e. newsletters, event invitations) via email. The City received about 600 emails through its Waste Plan Regina website requesting further information, regular updates and submitting feedback on the process. Through the website, citizens were able to subscribe to Waste Plan Regina updates that would be sent to their email address on a regular basis.

## Meetings with Elected Officials

The Consultants met with Elected Officials in mid June to outline the project, report of the progress of the project to date, and provide an overview of the completed residential survey. This process ensured that the City Council remained abreast of key project tasks and milestones and provided an opportunity for feedback and input on key decision making points throughout the process.

Throughout the project, the meetings with the Elected Officials were highly informative for both the elected officials and the consultants and helped to ensure that the project met the Councillors expectations and any modifications to the schedule or process were acknowledged and approved.

## 8.2 Summer and Fall 2008 Consultations

### Sector Meetings

During the summer and fall of 2008, City staff and the consultants met with members of eight sector groups to introduce the project, inform them about the purpose and intent of the Waste Plan Regina process and to obtain input to their sector's waste management needs and waste diversion opportunities.

These meetings provided an opportunity for focused feedback from the targeted business groups, business associations, and community groups to identify broad level needs and opportunities. At the same time, effort was made to obtain a commitment to continued engagement by the sectors for the duration of the project. The eight sector groups included:

1. Retail and Office Buildings;
2. Education;
3. Health;
4. Local Waste Management Industry;
5. Homebuilders;
6. Restaurants and Food Services;
7. Chamber of Commerce;
8. Community Zone Boards.

A summary of attendees, meeting notes and PowerPoint presentations are provided in Appendix G2.

### Meetings with Elected Officials

The Consultants met with Elected Officials in mid November to provide an overview of the project to date and obtain direction and feedback on future steps. During the meeting, the consultants presented a summary of the discussions with the eight sector groups and reviewed the next steps in the process. At this meeting, the consultants asked the elected officials to think about how to start organizing the measures to present to their constituents at a later date.

## 8.3 Winter 2009 Consultations

### Meeting with the External Working Group

By mid winter 2009, the consultants had developed a Long List of Waste Management and Waste Diversion Measures with approximately 120 possible service delivery options and supporting mechanism measures identified. During meetings held with the Steering Committee and the Internal Working Group, the Long List underwent an evaluation process to eliminate the unrealistic measures and keep the promising measures that were sensible to the needs of Regina and support the goals, objectives and vision of the City (see Section 3 for further discussion), which became the Short List of Waste Management Practices (see Section 4 for further discussion).

At this point, the evaluation process and Short List was presented to the External Working Group, comprising of a broad base of stakeholders representing members of the community, IC&I Sector, C&D Sector and Waste Management Sector. The meeting had several purposes: to reintroduce the purpose of Waste Plan Regina for any new members and provide a context to Regina's current waste management system and why the City was addressing not only residential waste management and diversion issues but also IC&I and C&D waste management and diversion issues. The process for developing the long list of measures and moving to a short list of measures was reviewed with the group. Key shortlisted measures and concepts were described along with a short video describing the integrated waste management system adopted in Nova Scotia.

Unfortunately, the meeting was poorly attended with only six members attending. Given the poor attendance and the changing requirements of the project, a new strategy was implemented to better engage the community and obtain higher participation by the stakeholder groups.

A summary of attendees, meeting notes and PowerPoint presentations are provided in Appendix G3.



## Meetings with Elected Officials

The consultants met with Elected Officials in mid January to review the Long List screening and evaluation process and present the selected Short List of waste management and waste diversion measures. A discussion was held and direction sought about how to organize the short listed measures into viable Service Level Option packages.

## 8.4 Early Spring 2009 Consultations

### Four Sector Stakeholder Meetings

The External Working Group was initially formed as one group of external stakeholders, including members of the public, commercial & institutional sector, construction sector, waste management industry sector, etc. Over time, as the project evolved, it became apparent that the public consultation process favoured dividing the broad based External Working Group into smaller sector-based working groups. This approach benefited the project by enabling the consultants to focus each sector group on the issues and options specific to their needs, resulting in clearer input and direction from each sector group. It also enabled the project team to achieve higher attendance at the meetings since the topics and issues discussed were focused on their sector's needs and opportunities.

The External Working Group evolved into four sector-based working groups including: Citizen's Working Group, IC&I Working Group, C&D Working Group, and Waste Management Industry Working Group. The project team worked exceedingly hard to ensure that each meeting had a high turnout and was well represented by the various sub groups within each sector. Particular effort was made to engage members of the community. Over 50 residents and community groups were contacted from lists of interested citizens established through the dedicated Waste Plan Regina website, contacts established during a Waste Plan Regina display at the February Home Show and through a list of active community groups provided by the Department of Government Relations.

In early April (March 30<sup>th</sup> to April 3<sup>rd</sup> 2009) the consultants met with each of the four Working Groups. Due to the previous efforts to contact attendees, the turnout for each sector meeting was high with the following attendance achieved for each:

- Citizens Working Group – 19 attended the meeting;
- IC&I Sector Working Group – 16 attended the meeting;
- C&D Sector Working Group – 11 attended the meeting;
- Waste Management Industry Working Group – 8 attended the meeting.

Involvement of the stakeholder groups at this point in the project was very important in the process. The attendees were asked to participate in a number of exercises to help formulate the short list of measures into distinct packages of measures that would be presented to the public at a later date in the project (as presented in detail in Section 5).

Each working group spent between two and three hours working on the exercises to help shape the packages of measures. Their participation in the process was critical to ensure that the packages of measures reflected the desires of their stakeholder group. The following provides a summary of the documents and exercises used with each Working Group to assemble the relevant Short List into Service Level Option packages for the residential sector and Waste Diversion packages for the IC&I and C&D sectors. The documents, exercises, and meeting notes for all four Working Groups are provided in Appendix G4.

### Citizen's Working Group

- Presentation
- Reference Document (residential short list options and evaluation criteria)
- Exercises

- Residential Service Delivery Exercise – Worksheet 1
- Residential Support Mechanisms Exercise – Worksheet 2
- City and IC&I Mechanisms – Worksheet 3
- Additional Questions - questionnaire

#### *IC&I Working Group*

- Presentation
- Reference Document (IC&I short list options)
- Exercises
  - IC&I Short List Measures – Worksheet 1
  - Additional Question & comments - questionnaire

#### *C&D Working Group*

- Presentation
- Reference Document (C&D short list options)
- Exercises
  - C&D Short List Measures – Worksheet 1
  - Additional Question & comments - questionnaire

#### *Waste Management Industry Working Group*

- Presentation
- Reference Documents (IC&I and C&D short list options)
- Exercises
  - Combined IC&I and C&D Short List Measures – Worksheet 1
  - Additional IC&I Question & comments – questionnaire
  - Additional C&D Question & comments – questionnaire

Upon development of the packages of measures, each attendee was sent a summary of the packages and descriptions of each measure in the packages and a request to attend a meeting scheduled for the end of May.

#### *Meetings with Elected Officials*

The consultants met with Elected Officials in early April to report on the progress of the project to date and provide and to involve them in a series of exercises as well. The exercises ensured that the Elected Officials were aware of the process and involvement of the stakeholder groups in developing the packages.

## 8.5 Late Spring 2009 Consultations

### *Four Sector Stakeholder Meetings*

The Consultants met with the four Working Groups and the Elected Officials in late May 2009 (May 26<sup>th</sup> to 29<sup>th</sup>) to review the relevant sections of the draft Waste Plan Regina report and the packages to ensure that there was a agreement among the members of each of the Working Groups that the various packages were ready to be presented to the public for comment and feedback.

Comments from the previous meetings were reviewed with the working groups and further discussed. Some of the key comments and issues identified from the working groups are presented in Appendix G and are summarized as follows:

### *Citizen Working Group*

- Among this group of citizens, there was very strong demand for curbside/back alley recycling. Majority of the participants stressed that residential recycling should be mandatory.
- Majority of the group insisted that all options presented for consideration should include curbside/back alley recycling.
- The majority of the group wanted the City to pursue Pay-as-you-Throw in all Service Delivery Packages
- Most stated that multi-family recycling must be available if single-family curbside/back alley recycling is provided. Most viewed this as an issue of fairness/equity. If single-family residents have access to on-site recycling, so should multi-family residents.
- Improve public education regarding where Regina compares to other communities (use strong wording in this comparison)
- Ensure that the residents understand how much it costs to provide waste management services now and how much more it will cost them so they can make a decision on a desired service level

### *IC&I Working Group*

- Many attendees believe that mandatory measures support equitable treatment of all businesses and establish a level playing field.
- In order to achieve acceptance for any measures, businesses need to understand the reason and benefits to them of any program changes. Support all initiatives with comprehensive promotion and education measures.
- Many attendees were concerned about the cost to business of the proposed measures. The initiatives should provide benefits that justify the costs.
- Before introducing a waste diversion measure, the City needs to ensure that markets for the targeted materials are in place and well established.
- The City of Regina should lead by example. This is an opportunity for Regina to show leadership.
- The measures must be convenient and easy to understand with minimal administrative requirements.
- Continue meeting with the working group and work on establishing markets for divertable materials.

### *C&D Working Group*

- There was overall support of the measures to promote waste diversion by attendees but they identified significant concerns about the implementation details such as market availability for diverted materials and logistics of site management required for on-site separation of materials.
- This group is not supportive of any measure that would lead to significant additional administrative requirements.
- They identified a vital need for market development and the creation of material processing facilities to ensure that any diverted/banned material had a place to go.
- LEED training and certification is needed if any measures to promote it are introduced. Small businesses are concerned about the cost of acquiring LEED training or LEED trained staff. Larger developers are concerned about the lack of availability of LEED trainers and/or professionals.
- There is a desire for uniform requirements across the province (i.e. Alberta C&D strategy). Measures should be developed that complement provincial requirements.

- The participants supported the creation of an industry advisory group to participate in planning and implementation of waste plan strategies.

#### *Waste Management Industry Working Group:*

- Strong support for creation of Waste Management Industry Working Group and continued opportunities to participate in the waste management planning process.
- In general, the participants supported source separation requirements if customers approve of the initiatives and recognize the associated increase in costs for additional service.
- Attendees favour extensive promotion with some mandatory measures.
- Some concern over the hauler liability associated with landfill bans and the difficulty in determining responsibility for contaminated loads.
- Supportive of, and willing to participate in the market development for diverted materials.

Based on input from the working groups, some minor modifications to the packages were made. The consultants explained the next phase of the project would move from the technical component culminating in the development of the packages of options for presentation to the citizens of Regina, to the actual public consultation component, which would be developed and executed by the City. Their continued involvement in the process was encouraged.

#### *Meetings with Elected Officials*

The Consultants met with Elected Officials in late May to deliver the various packages of options for each stakeholder group:

- Developed three Service Level Options for Residential Sector (in addition to Status Quo),
- Developed two Waste Diversion Packages for IC&I Sector
- Developed two Waste Diversion Packages for C&D Sector

During the presentation, the consultants discussed the issues and concerns addressed by each of the members of the working groups (see above). An overview of the consultant's report was presented along with a brief summary of the proposed consultation strategy to take the packages out to the community and receive feedback. The Elected Officials were asked for their thoughts and advice on development and delivery of the consultation strategy scheduled post June.

## 9. Glossary and Abbreviations

### 9.1 Glossary

|  |  |
|--|--|
| Aerobic Treatment:                       | Biological treatment of organic waste by bacteria that require oxygen. (e.g. windrow composting – see Composting)  |
| Anaerobic Digestion (AD):                | The controlled biological conversion of organic material, by bacteria, in the absence of oxygen, to produce biogas, liquid effluent and a solid, partially stabilized organic material.  |
| Biodegradable:                           | Capable of decomposing under natural conditions.   |
| Biological Treatment:                    | A treatment technology that uses bacteria to process organic waste.  |
| BOMA Best:                               | A program of national environmental recognition and certification for existing commercial buildings. Participants in this program are recognized as leaders in environmental stewardship.  |
| Blue Box Program:                        | Program of collection of recyclable materials using plastic Blue Boxes. Diversion programs for Blue Box Waste (recyclables) are common in Canadian municipalities.   |
| Bulky Waste:                             | Large items of waste materials, such as appliances, furniture, large auto parts, trees, stumps.  |
| Citizen Working Group:                   | Working Group consisting of members of the Regina public.  |
| City:                                    | City of Regina.  |
| Combustion:                              | <ol style="list-style-type: none"><li>1. Burning, or rapid oxidation, accompanied by the release of energy in the form of heat and light.</li><li>2. Refers to controlled burning of waste, in which heat chemically alters organic compounds, converting into stable inorganics such as carbon dioxide and water.</li></ol>   |
| Commercial Waste:                        | All solid waste emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centers, and theatres.   |
| Compost:                                 | The relatively stable humus material that is produced from the aerobic decomposition or composting process in which bacteria in soil mixed with degradable organic materials break down the mixture into an organic soil amendment.  |
| Composting Facilities:                   | A facility where the organic component of municipal solid waste is decomposed under controlled conditions.   |
| Composting:                              | The controlled biological decomposition of organic material in the presence of air to form a humus-like material. Controlled methods of composting include mechanical mixing and aerating, ventilating the materials in a vessel or placing the compost in piles out in the open air and mixing it or turning it periodically. |
| Construction and Demolition Waste (C&D): | Waste building materials, dredging materials, tree stumps, and rubble resulting from construction, remodeling, repair, and demolition of homes, commercial buildings and other structures and pavement.  |
| C&D Working Group:                       | Working Group consisting of members of the C&D Sector.   |

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| Consultation:                           | A two-way communication process to involve interested persons in the planning, implementation and monitoring of a proposed undertaking.  |
| Digestion:                              | The biochemical decomposition of organic matter  |
| Disposal Facilities:                    | Facilities for disposing of solid waste, including landfills and incinerators, intended for permanent containment or destruction of waste materials.   |
| Disposal:                               | Final placement or destruction of wastes. Disposal is typically accomplished through use of approved sanitary landfills or incineration with or without energy recovery.   |
| Diversion Rate:                         | The percentage of waste materials diverted from traditional disposal such as landfilling or incineration by recycling, composting, re-use or avoidance.  |
| Diversion:                              | The management of materials by reduction, reuse, recycling, and composting.  |
| Economies of Scale:                     | The theory that constructing a larger facility can be less expensive to construct and operate, on a per unit basis, than several smaller facilities having the same capacity, or throughput.   |
| Elected Officials:                      | Members of City Council.   |
| Energy Recovery:                        | The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.                |
| Energy-from-Waste (EFW):                | The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.                |
| Extended Producer Responsibility (EPR): | A policy to shift the responsibility of a product's life cycle away from the municipality to the producers and to provide incentives for producers to consider the environmental impacts into the selection of materials and the design of the product.                                    |
| Ferrous Metals:                         | Metals derived from iron or steel; products made from ferrous metals include appliances, furniture, containers, and packaging like steel drums and barrels. Recycled products include processing tin/steel cans, strapping, and metals from appliances into new products.                  |
| Gasification:                           | Conversion of solid material such as coal or waste into a gas for use as a fuel.   |
| Grasscycling:                           | Grass clippings are left on the lawn when mowing to decompose. Grass clippings are thus diverted from the waste stream.  |
| Greenhouse Gas:                         | A gas, such as carbon dioxide or methane, which contributes to potential climate change.   |
| Hazardous Waste:                        | Materials that can pose a substantial or potential hazard to human health or to the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on environmental agency list of hazardous wastes. |

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| High Density Polyethylene (HDPE):                    | A material used to make plastic rigid containers, milk and juice jugs, margarine tubs, and detergent bottles. The plastic is translucent or opaque and does not crack when bent. Referred to as No. 2 Plastic.   |
| Household Hazardous Waste (HHW):                     | Hazardous products used and disposed of by residential as opposed to industrial consumers. Includes paints, stains, varnishes, solvents, pesticides, and other materials or products containing volatile chemicals that can catch fire, react or explode, or that are corrosive or toxic.  |
| Household Waste (Domestic Waste):                    | Solid waste, composed of garbage and rubbish, which normally originates in a private home or apartment house.  |
| Incineration:  | A thermal treatment technology involving destruction of waste by controlled burning at high temperatures with the overall aim of reducing the volume of waste.   |
| Incinerator:   | A furnace for burning waste under controlled conditions.   |
| Industrial Waste:                                    | Unwanted materials from an industrial operation; may be liquid, sludge, solid, or hazardous waste.   |
| Industrial, Commercial & Institutional (IC&I) Waste: | Combination of wastes generated by industrial, commercial and institutional sectors that are not typically picked up at the curb or accepted at public drop-off facilities as part of the municipal waste collection process. These wastes are primarily managed by way of contract with private waste management service providers. |
| IC&I Working Group:                                  | Working Group consisting of members of the IC&I Sector.  |
| Institutional Waste:                                 | Waste generated at institutions such as schools, libraries, hospitals, prisons, etc. (part of the IC&I waste stream).  |
| Integrated Solid Waste Management Plan (ISWMP):      | See Integrated Waste Management System.  |
| Integrated Waste Management System:                  | The combination of diversion and disposal alternatives comprising one waste management system. For example – blue box recycling, source-separated organics composting, incineration, and landfilling of ash and residuals could all form part of an integrated waste management system.  |
| Internal Working Group:                              | Working Group consisting of staff members from a number of City of Regina Departments that may be affected by Waste Plan Regina.   |
| Landfills:   | Sanitary landfills are outdoor disposal sites for non-hazardous solid wastes. Waste is spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.   |
| Low Density Polyethylene (LDPE):                     | A material used to make plastic bags, dispensing bottles, computer components, food storage and other trays, etc. The plastic is translucent or opaque and is flexible. Referred to as No. 4 Plastic.  |
| LEED Certification:                                  | Green Building Rating system developed to provide standards for environmentally sustainable construction.  |
| Litter:  | Waste disposed of in incorrect places.   |
| Materials Recovery (or Recycling) Facility (MRF):    | A facility that processes (separates, bales) residentially collected mixed recyclables into individual recyclable product streams, for shipment to market.   |



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| Mixed Municipal Waste:                 | Solid waste that has not been sorted into specific categories (such as plastic, glass, yard trimmings, etc.)   |
| Municipal Solid Waste (MSW):           | Common garbage or trash generated by industries, businesses, institutions, and homes.  |
| Non-Ferrous Metals:                    | Nonmagnetic metals such as aluminum, lead, and copper. Products made all or in part from such metals include containers, packaging, appliances, furniture, electronic equipment and aluminum foil.   |
| Old Corrugated Cardboard (OCC):        | Bulky cardboard that is typically found in boxes used for shipping and packaging. It is made from 2 strips of cardboard with a wavy, or “corrugated” strip running through the centre.   |
| Old Newspaper (ONP):                   | Old newspapers set out, collected and processed for recycling.   |
| Operation and Maintenance Costs:       | Usually expressed annually, operation and maintenance costs are a sum of money to operate and maintain the facility in operating order (i.e., labour, utilities, equipment repairs, materials, supplies, disposal fees, etc.).                             |
| Organic:                               | Referring to or derived from living organisms. In chemistry, any compound containing carbon except carbon dioxide.   |
| Pay-as-you-Throw (PAYT):               | Residents pay on a volume basis for disposal of waste.   |
| Pilot Tests:                           | Small-scale testing of a waste management technology under actual site conditions to identify potential problems prior to full-scale implementation.   |
| Plasma-Arc Reactor:                    | A thermal waste treatment technology that operates at extremely high temperatures and can produce a synthetic gas.   |
| Pollution:                             | Generally, the presence of a substance in the environment that because of its chemical composition or quantity can prevent the functioning of natural processes and produce undesirable environmental and health effects                                   |
| Polyethylene Terephthalate (PET):      | A type of plastic that is clear or coloured transparent with high gloss. It is used for carbonated beverage bottles, peanut butter jars, and some household cleanser cleaners. Bottles have a raised dot on the base and are referred to as No. 1 Plastic. |
| Private Sector:                        | The part of the economy which operates for private profit and is not controlled by the government.   |
| Promotion and Education (P&E):         | Communicate with the public to provide information on a program and persuade members of the public to follow the program.  |
| Public Sector:                         | The part of the economy that deals with the delivery of goods and services by and for the government.  |
| Recycle/Reuse:                         | Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (i.e. recycling of aluminum cans, paper, and bottles, etc.).  |
| Residential Waste:                     | Waste generated in single and multi-family homes, including newspapers, clothing, disposable tableware, food packaging, cans, bottles, food scraps, and yard trimmings.  |
| Residual Municipal Solid Waste (RMSW): | Common garbage or trash generated by industries, businesses, institutions, and homes that remains after diversion programs have been used to remove recoverable materials.   |

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| Residual:                        | Amount of a pollutant remaining in the environment after a natural or technological process has taken place; e.g., the sludge remaining after initial wastewater treatment, or particulates remaining in air after it passes through a scrubbing or other process. |
| SARCAN:                          | A non-profit association that provides recycling services to the Regina public. Consists of drop-off depots located throughout the City for drop off of specified recyclable material.   |
| Service Level Options:           | A group of waste management and diversion measures which provide a specified level of service.   |
| Source Reduction:                | Reducing the amount of materials entering the waste stream from a specific source by redesigning products or patterns of production or consumption (e.g., using returnable beverage containers). Synonymous with waste reduction.                                  |
| Source Separated Organics (SSO): | Organics separated by the household or business that include food wastes and leaf and yard wastes. Source separated organics are collected by a separate collection vehicle and sent for processing/composting.  |
| Source Separation:               | Segregating various wastes at the point of generation (e.g., separation of paper, metal and glass from other wastes to make recycling simpler and more efficient).   |
| Stakeholder:                     | Any organization, governmental entity, or individual that has a stake in or may be impacted by a given approach to environmental regulation, pollution prevention, energy conservation, etc.   |
| Steering Committee:              | Key senior representatives from selected City Departments.   |
| Support Mechanisms:              | An instrument or process implemented to aid and maintain other programs.   |
| Thermal Treatment:               | Use of elevated temperatures to treat wastes (e.g., combustion or gasification).   |
| Tipping Fee:                     | A monetary fee paid to process a dispose of waste at a facility.   |
| Transfer Station:                | Facility where material is transferred from collection vehicles to larger trucks or rail cars for longer distance transport.   |
| User Fee:                        | Fee collected from only those persons who use a particular service, as compared to one collected from the public in general.   |
| Waste Characterization:          | The process of identifying the various components, including quantities, and materials found within a waste stream.  |
| Waste Exchange:                  | Arrangement in which individuals or companies exchange their wastes for the benefit of both parties.   |
| Waste Generation:                | The weight or volume of materials and products that enter the waste stream before recycling, composting, landfilling, or combustion takes place. Also can represent the amount of waste generated by a given source or category of sources.                        |
| Waste Generator:                 | The individual, household, establishment or business engaged in an activity that generates a specific waste or wastes.   |

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| Waste Management System:                 | A set of facilities or equipment used in, and any operations carried out for, the management of waste including the collection, handling, transportation, storage, processing or disposal of waste, and may include diversion programs and facilities and one or more waste disposal sites. |
| Waste Management Utility:                | A separate business unit/organization that maintains the infrastructure for waste management services.  |
| Waste Management Industry Working Group: | Working Group consisting of members of the Waste Management Industry.   |
| Waste Minimization:                      | Measures or techniques that reduce the amount of wastes generated during industrial production processes; term is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.  |
| Waste Plan Regina:                       | Report on The Integrated Solid Waste Management Plan for the City of Regina.  |
| Waste Reduction:                         | Using at-source reduction, reuse, or composting to prevent or reduce waste generation.  |
| Waste Stream:                            | The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that is recycled, burned, or disposed of in landfills, or segments thereof such as the "residential waste stream" or the "recyclable waste stream."  |
| White Goods (also White Metal Goods):    | Usually large household appliances such as washing machines, dishwashers, and refrigerators/freezers.   |
| Yard Waste:                              | The part of solid waste generated at the household in the yard composed of grass clippings, leaves, twigs, branches, and other garden refuse.   |
| Working Group:                           | A group of people that meet on a regular basis to consult on a project in order to provide input from the sector that they represent.   |
| Zero Waste:                              | Refers to efforts to reduce solid waste disposal to zero, or as close to zero as possible, by minimizing excess consumption and maximizing the recovery of wastes through recycling and composting and other diversion efforts.   |

## 9.2 List of Abbreviations

|       |  |
|-------|--|
| BOMA  | Building Owners and Managers Association         |
| CDDD  | Construction and Demolition Diversion Deposit    |
| CFC   | Chlorofluorocarbons                              |
| CRD   | The Capital Regional District, BC                |
| DDRP  | Demolition Debris Recovery Plan                  |
| EFW   | Energy-from-Waste                                |
| EHF   | Environmental Handling Fee                       |
| ELT   | Executive Leadership Team                        |
| EPEAT | Electronic Product Environmental Assessment Tool |
| EPP   | Environmentally Preferred Products               |

|        |   |
|--------|---|
| EPR    | Extended Producer Responsibility  |
| GDP    | Gross Domestic Product  |
| GTAA   | Greater Toronto Airport Authority                                       |
| HDPE   | High Density Polyethylene   |
| Hhld   | Household   |
| HHW    | Household Hazardous Waste   |
| IC&I   | Industrial, Commercial & Institutional                                  |
| ISWMP  | Integrated Solid Waste Management Plan                                  |
| LDPE   | Low Density Polyethylene  |
| LEED   | Leadership in Energy and Environmental Design                           |
| MRF    | Materials Recovery (or Recycling) Facility                              |
| MSW    | Municipal Solid Waste   |
| OCC    | Old Corrugated Cardboard  |
| ONP    | Old Newspaper   |
| OSD    | City of Portland Oregon Office of Sustainable Development               |
| PAYT   | Pay-as-you-Throw  |
| PET    | Polyethylene Terephthalate  |
| PIWMF  | Peel Integrated Waste Management Facility                               |
| PP     | Polypropylene   |
| PS     | Polystyrene   |
| RFP    | Request for Proposals   |
| RMDZ   | Recycling Market Development Zones                                      |
| RRFB   | Resource Recovery Fund Board  |
| SARCAN | Saskatchewan Association of Rehabilitation Centers – Recycling Division |
| SSO    | Source Separated Organics   |
| SSTC   | Saskatchewan Scrap Tire Corporation Program                             |
| TIB    | Take It Back  |
| Tpy    | Tonnes per year   |
| USEPA  | United States Environmental Protection Agency                           |
| WMC    | Waste Management Corporation  |
| WRRP   | Waste Reduction and Recycling Plan                                      |

## 9.3 List of Measurement

### Area

|                 |             |
|-----------------|-------------|
| m <sup>3</sup>  | cubic metre |
| ft <sup>2</sup> | square foot |

### Mass/Weight

Re. Orders of Magnitude:  $x 10^2 = x 100$ ,  $x10^3 = x 1000$ , etc.

|    |              |                          |
|----|--------------|--------------------------|
| kg | kilogram     | 1 x 10 <sup>3</sup> gram |
| t  | metric tonne | 1 x 10 <sup>3</sup> kg   |
| lb | pound        | 1 lb = 453.592 grams     |

### Volume

|     |        |                       |
|-----|--------|-----------------------|
| L   | litre  |                       |
| gal | gallon | 1 gallon = 3.785412 L |

### Time

|     |        |
|-----|--------|
| min | minute |
| hr  | hour   |
| wk  | week   |
| y   | year   |

### Elements

|    |      |
|----|------|
| Fe | Iron |
|----|------|

### Miscellaneous

|   |         |
|---|---------|
| % | percent |
|---|---------|