



City of Spruce Grove

Residential Waste Audit and Program Review

December 2016

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Glossary

Black Waste Cart – also referred to as the black garbage cart, garbage cart or garbage

Blue bag – also referred to as recycling

Compost – a soil-like substance from the breakdown of organic materials that takes place at a composting facility.

Curbside Collection Program – also referred to as curbside collection

Garbage - material that is sent to a landfill

Green Organics Cart – also referred to as the green cart and organics

Organics – material that is biodegradable and can be processed at a composting facility to produce compost.

Waste - generic term encompassing both garbage, recycling, and organic materials

Waste Composition - generic term describing the proportion of various materials in a given waste stream

1 Introduction

The City of Spruce Grove (the City) offers a high level of service in solid waste diversion, including an award-winning curbside organics program. The City's environmental programs promote reduction, reuse and recycling activities that are valued by residents. S-Cubed Environmental, in association with a consultant team that includes Beyond Attitude Consulting and 2cg Inc., undertook a residential waste audit for Spruce Grove and a waste management system review to support the City in delivering high quality services.

The residential waste audits took place in June and November 2016. One goal was to gain perspective on the waste management process as well as gather suggestions to better manage it. We arranged two sets of interviews. One with Alberta Municipalities in June and July and a second set of interviews with others familiar with the waste management landscape during November. In the fall, the consulting team provided Spruce Grove with some recommendations for Community-Based Social Marketing (CBSM) approaches that could be used for future initiatives. In a separate project, a CBSM initiative was implemented for two weeks in December. It involved having consultants come into the community to talk with Spruce Grove residents about how they manage food waste.

2 Waste Composition Audit

Two audits were conducted for the City, one in summer (June 8 to June 10) and another in fall (November 16 to 18). Two audits were completed to account for the seasonal differences in quantity and composition of the materials, and to allow annual comparisons to be made from a wider source of data. The fall audit was scheduled to take place during the last week of weekly green cart pick-up. This audit collected material from the three streams; black cart (garbage), blue bag (recycling) and green cart (organics). A sample of 100 houses were selected from several neighbourhoods representing City demographics and were classified as declining (18), status quo (23), single family (25), multi-housing (9) and growth (25). The bracketed numbers represent the number of houses from that demographic. Single and row houses, as well as mobile homes, were included in the sample. The sample also included houses with the 120 litre garbage cart. The same houses were part of the sample in the fall audit (Appendix D).

GFL collected samples from the different neighbourhoods over three days, based on the collection schedule for each day of the week. Prior to the collection, the consulting team drove by to record what streams were set out at the curb. Samples were brought to the old Public Works building. The garbage and the recycling streams were emptied inside the building, while the organics stream was emptied onto a concrete pad outside.

A team of three to four people audited the materials received and sorted them into bins lined with black garbage bags. The contents of each bag were weighed and recorded. Data was entered into a spreadsheet for data analysis. All weighing was done in kilograms, and data analysis used this unit of measurement. Following the waste sort, materials were deposited into the appropriate roll-off bin for GFL to haul to the appropriate processor.

2.1 Results

These results represent a snapshot in time in a sample of homes. Extrapolation of this data to the larger population is subject to a margin of error of approximately 10 percent, and is indicative rather than absolute.

Audit data and summer report

The audit categories and sub-categories are described in Appendix A and the data for the fall audit by waste type is shown in Appendix B, Tables 1 to 3. Appendix C includes the data for both audits by waste stream.

The summer technical memo (Appendix DE) was provided to the City in June.

2.2 Comparisons between Summer and Fall Audits

The summer audit sample size was 2527 kilograms, while the fall audit sample was 1507 kilograms. Diversion rates were 53 percent in summer and 47 percent in fall. Figure 2.2-A shows the average percentage of waste sorted by material for the summer and fall (combined) audits.

A significant amount of material was found to be placed in the wrong containers for collection. Figure 2.2-B shows the breakdown of the waste stream sample, by container, as it was received. Although 51% of the total waste stream was being diverted through the green carts and blue bags, a significant amount of the material was found to be in the wrong containers, Figure 2.2-B shows the hypothetical situation if all of the material in the garbage was properly diverted into the green cart or the blue bag. In this optimal diversion scenario, diversion would be 77 percent, a 26 percentage point increase over the actual value.

Figure 2.2-A Waste quantities received, by container type

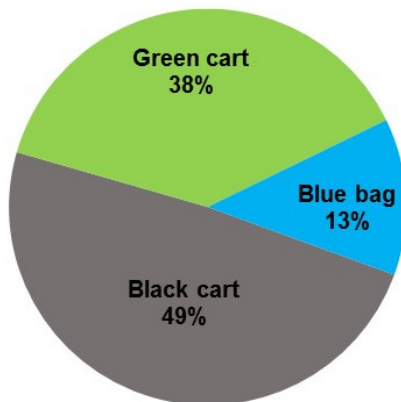
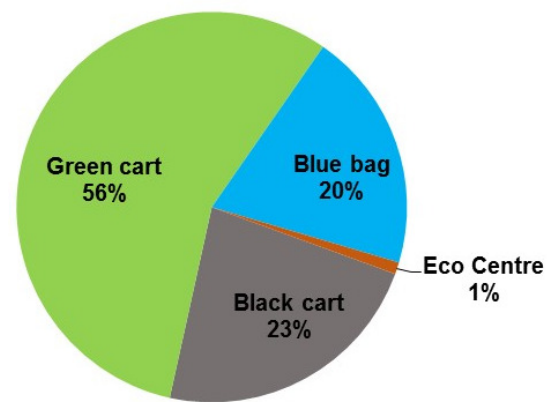


Figure 2.2-B Waste quantities received, if all material was properly diverted into the correct containers.



Within the green cart, more organic waste was included in summer, as shown in Figure 2.2-C. As a percentage of the total waste collected, recycling was greater in the fall but this was due to having less organic waste in the stream rather than more recyclables.

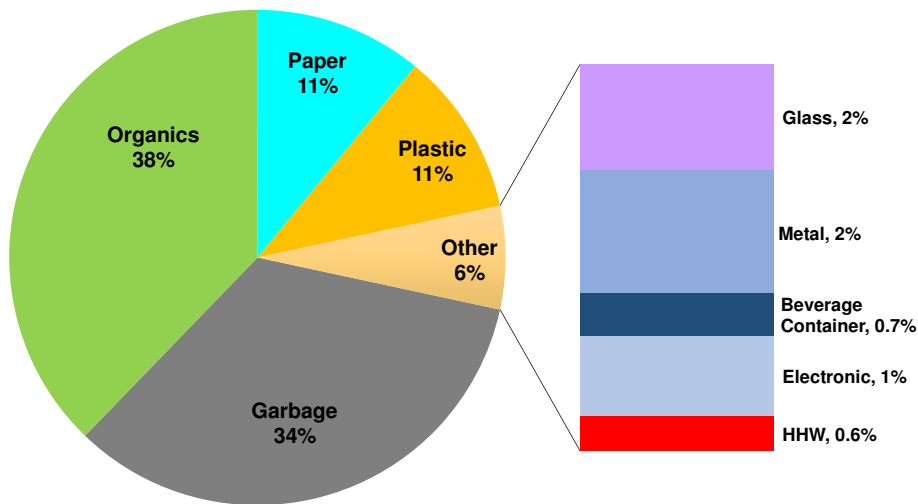
Figure 2.2-C Breakdown of waste streams for the combined and seasonal audits

	Combined Audit	Audit Breakdown	
		Summer	Fall
Black Cart	49%	47%	52%
Green Cart	38%	42%	32%
Blue Bag	13%	11%	16%

Black Cart Composition

Figure 2.2-D shows the composition of the combined audit garbage stream. In each category there are recyclable and non-recyclable materials as shown in Appendix C. It presents the percentage of materials going to a landfill. The total amount of garbage audited was 1.97 tonnes.

Figure 2.2-D Composition of sorted garbage



Comparing garbage sorted between the two seasons, there was no change in the top four material types sorted. The categories were Garbage, Organic Waste, Paper and Plastic.

Of the 38 percent Organic Waste, 36 percent is acceptable for the green cart and of that, 76 percent is food waste, 15 percent is yard waste, 8 percent is food-soiled papers and 1 percent is clean wood. Food waste makes up 28 percent of the garbage composition. In comparison, *the Tri-Regional Organics Processing Facility Feasibility Study*, which collected 48 samples across four seasons also found from the organic fraction, food waste to be the largest component in their waste audits with an average of 32 percent.

Blue Bag Composition

Homeowners are doing well with maintaining a clean recycling stream by keeping materials that are not recyclable out of the blue bag. The amount of materials sorted were similar in each season, with summer weights of 280 kg and fall weights of 235 kg.

Green Cart Composition

The most significant difference between the two audits is the amount of yard waste collected in the green cart. This is reflected in the material sorted (1067 kg in summer and 478 kg in fall). In the summer sample, organics comprised 94 percent yard waste. This number dropped to 88 percent in the fall. The amount of contamination in the organic stream was similar between seasons. More food was observed in the fall audit than the summer audit due to pumpkin and pomegranate season, and more soiled paper was observed in the summer audit.

2.3 Curbside Capture Rate

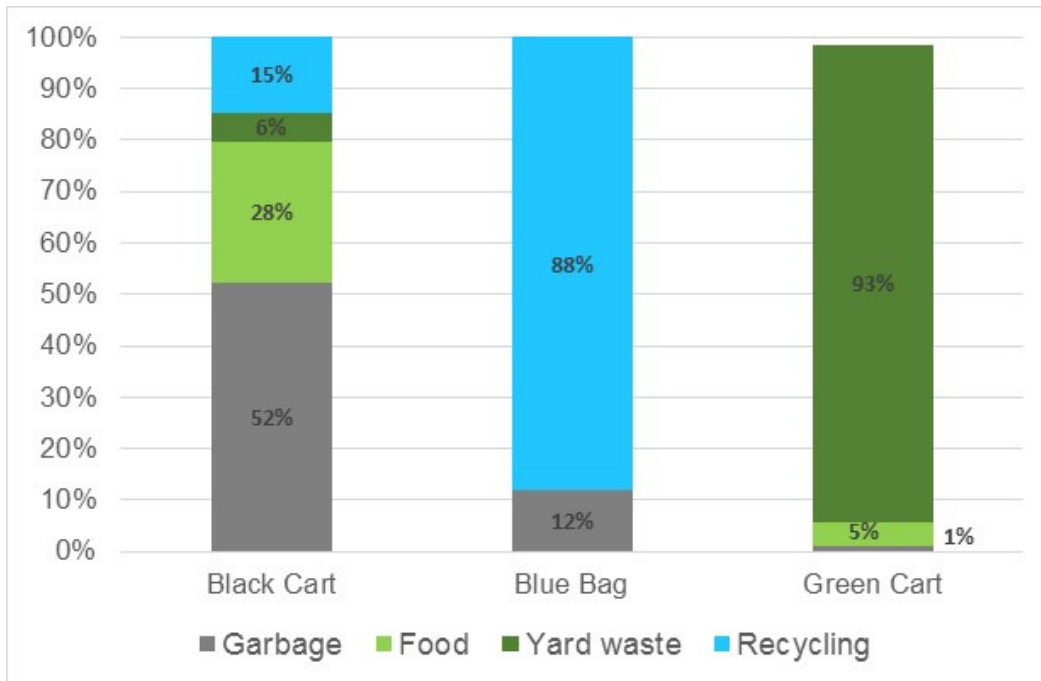
The capture rate of food waste (the amount of food waste diverted to the green cart) is only 12 percent compared to the capture rate of the combined yard waste, which is 93 percent (Figure 2.3-A). The capture rate of the blue bag recyclables is moderate at 54 percent. Of food waste thrown into the garbage, 21 percent was food still in packaging. Capture rate is equal to the total recyclables or organics collected through diversion programs, divided by the total recyclables or organics sorted from the waste streams (garbage, blue bag and green organics cart).

Figure 2.3-A Capture rate of green organics cart and blue bag materials by audit season

	Green Cart (kg)	Garbage (kg)	Total (kg)	Capture Rate
Food Waste				
Summer	26	268	295	9%
Fall	47	277	324	14%
Yard Waste				
Summer	1011	105	1116	91%
Fall	424	5	429	99%
Recycling	Blue Bag (kg)	Garbage (kg)	Total (kg)	Capture Rate
Summer	194	187	381	51%
Fall	169	129	297	57%

In Figure 2.3-B, the first column shows material in the garbage. The second column shows blue bag materials are mainly recyclables with some contamination. In the third column, green carts primarily contain leaf and lawn organics, some kitchen scraps, and minimal contamination.

Figure 2.3-B Items found in the garbage that should be diverted to the blue bag and the green cart program



2.4 Set-Out Rate

Prior to collecting the waste, the consulting team recorded the streams that were placed at the curb for collection. During the summer audit, 81 out of 100 homes (81 percent) put at least one material at the curb for collection. In the fall it was 68 out of 100 (68 percent). Comparing the set-out rate between seasons, Friday was the most consistent day. Wednesday and Thursday had fewer homes in the fall set-out their waste, as shown in Figure 2.4-A.

Green cart set-out rates dropped by 42 percent from summer to fall, while recycling went up by 2 percent and garbage cart set-out declined by 12 percent. Possible reasons for reduced set-outs during this period could include seasonality, changes in the pick-up schedule to an earlier time, the random house selection, or carts not needing to be emptied.

Figure 2.4-A Seasonal set-out rate by material

Material	Wednesday		Thursday		Friday		Average	
	Summer	Fall	Summer	Fall	Summer	Fall	Summer	Fall
Garbage	74%	41%	78%	69%	81%	59%	78%	61%
Recycling	48%	33%	33%	44%	41%	41%	40%	42%
Organics	48%	19%	67%	19%	51%	23%	56%	23%

2.5 Diversion Rate

The diversion rate is another indicator of program performance. The summer and fall audits had a diversion rate of 53 percent and 47 percent respectively.

Figure 2.5-A shows curbside tonnage for the last five years. The potential diversion rate is based on all available organics and recycling being diverted from the garbage stream. The results from the audit (Figure 2.2-B) indicated 77 percent of the materials can be diverted. The formula to calculate the potential diversion rate is:

$$\frac{(\text{Garbage} \times 77\%) + \text{Organic Waste} + \text{Recycling}}{\text{Total Waste}}$$

Figure 2.5-A Tonnes of curbside waste collected per year plus actual and potential diversion rates

Year	Garbage Tonnes	Organic Tonnes	Recycling Tonnes	Grand Total	Actual Diversion Rate	Potential Diversion Rate
2016* ¹	6576	2600	1355	10532	38%	86%
2015* ²	6041	1636	1185	8861	32%	84%
2014	6364	2169	1160	9693	34%	85%
2013	6148	2010	1017	9175	33%	85%
2012	5749	1986	1075	8810	35%	85%

Note that throughout this report, December 2016 numbers have been calculated. Some large item data is missing as per the table footnotes.

The footnotes have been excluded from subsequent tables.

*1 December 2016 tonnes were calculated by dividing December tonnes of garbage in 2014 and 2015 by billable residents, then taking the average of the two numbers and then multiplying by 2016 billable residents.

*2 Large item recycling and garbage are missing; the number was estimated by dividing large item recycling and garbage by the number of residents in 2016 and 2014, averaging the result and multiplying it by 2015 billable residents.

2.6 Fall Audit Details

Sort Area

The garbage and recycling streams were emptied inside the Public Work building, while organics were emptied onto the concrete pad adjacent to the three roll-off bins used to collect the materials. A wheelbarrow was filled with one waste stream and moved to the sort table as shown in Image 2-1.

Image 2-1 Table arrangement for waste sorting



Black Cart Composition

The black cart is intended to collect garbage. The sample was comprised of material from both small (5 percent) and large (95 percent) garbage carts. This is consistent with the actual distribution of carts, as 5.4 percent of residents in Spruce Grove have the small garbage cart. The amount of garbage audited was 793 kilograms. Image 2-2 shows garbage from the Thursday sample prior to sorting. The composition details are shown in Appendix B, Table 1.

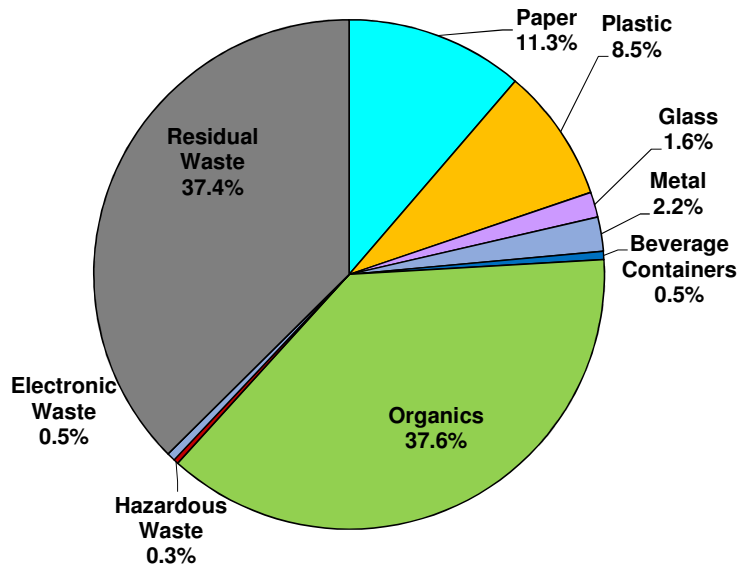
Image 2-2 Thursday's garbage awaiting sorting



The most prevalent categories in the garbage included Organics, Residual Waste, Paper and Plastic. For full details on the composition of the garbage in Spruce Grove, see Figure 2.6-A.

The Organics category consisted largely of food waste, including both edible food and inedible food such as fruit and vegetable peels. The Residual Waste category was comprised mostly of garbage that included hygiene (e.g. diapers), clothing and footwear, building materials, composite materials such as light shades, luggage, and pens. The Paper category was almost entirely made up of mixed paper and small amounts of non-recyclable paper, while the Plastic category consisted largely of material referred to as other plastic, such as garbage bags, film, wrappers and crunchy plastic, unlabeled plastic like plant pots and plastic packaging, and smaller amounts of non-rigid (3 to 7 plastic) and rigid (1 and 2 plastic).

Figure 2.6-A Garbage composition – fall audit



Blue Bag Composition

Recycling is collected in blue bags. Cardboard was generally not in blue bags, but stacked for collection beside the bags or other carts. The amount of recycling audited was 235 kilograms. Image 2-3 shows Thursday’s recycling collected prior to being sorted.

Image 2-3 Recycling waiting to be sorted

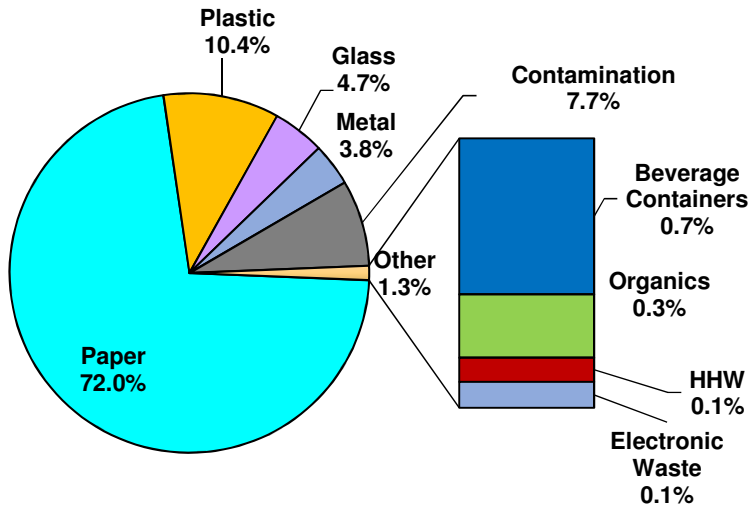


Figure 2.6-B shows the composition of recycling in Spruce Grove. The most prevalent categories in recycling include Paper, Plastic and Contamination.

The Paper category consisted largely of mixed paper and cardboard. Plastic was mostly non-rigid, rigid and other plastic such as blue bags and film. Contamination was primarily newspaper bundled with plastic strapping that would not be removed at the material processing facility. When such

newspaper was removed from the data (as this did not represent typical homeowner recycling), Glass was the third most common item, and was comprised mainly of food jars.

Figure 2.6-B Recycling composition – fall audit



The contamination rate in recycling is 8.7 percent and is the sum of the non-recyclable materials in Appendix B, Table 2. This contamination rate is similar to that found in other municipal programs. However, with the newspaper bundles included in the data, the rate jumped to 16 percent.

Green Cart Composition

The green cart is intended to collect organic material. 478 kilograms of organics were audited in total. Image 2-4 shows Wednesday's organic waste sample prior to sorting. The amount of organic waste was greater on Wednesday than on the other two days. The detailed composition is shown in Appendix B, Table 3.

Image 2-4 Organic waste sample



Organic Waste is the most prevalent green cart category, with small amounts of Contamination and Paper.

Organic Waste was predominantly grass and yard waste (88.5 percent), which included leaves, grass, fall cleanup material like branches, stems, and yard trimmings, some inedible food waste (8.4 percent) and edible food waste (1.5 percent). Contamination consisted of a metal fork, plastic including a straw and fork, and a grocery bag filled with plastic, paper and food waste (1 percent). Paper was made up of mixed paper and cardboard (0.4 percent). Green cart contamination was low.

Images from the audit

A variety of items found in the waste stream are pictured below (Image 2.6-5 G-O). The wide selection of sorted unopened food products allowed the consulting team to create a food and toy display similar to what was done during the summer audit. Residents need more education on what is not recyclable or compostable, and the items found in the audit are a good starting point.



Image 2-5 (G–O)

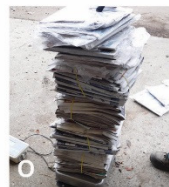
G – Garbage: edible and inedible food

H – Garbage: items that could be donated

I, J, K – Blue bag contamination: wire hangers and Eco Centre electronics

L, M – Blue bag contamination: light bulbs, sprays

N, O – Green cart contamination



3 Current Waste Management Programs

When comparing data from the past several years, keep in mind that the City's programs have changed since the 2012 study. Recyclables are picked up weekly from curbside, residents have a choice between a 120 litre black garbage cart or the standard 240 litre black garbage cart, and the Eco Centre collects wood and drywall as part of their C&D diversion program.

The consulting team conducted a review of benchmark communities in order to compare the City's waste management programs with similar municipalities. Section 4 provides a detailed analysis; information on each of these municipalities and their programs can be found in Appendix G.

As this study was conducted in 2016, 2015 data was used since it was the last full year of data that Spruce Grove and other municipalities had. Any references to comparison with benchmark municipalities is based on 2015 data.

Currently, the City offers a variety of waste management services.

3.1 Regular Curbside Program

Curbside Garbage Collection

- Garbage is collected weekly at curbside by a contractor, either in front of homes or in alleys. In the benchmark communities, five communities collect garbage every second week, while three collect weekly.
- Curbside service is provided to 9894 (2015) households, comprised of single-family dwellings and duplexes.
- Other households are serviced by the Eco Centre. Waste, including bulk waste items, can be dropped off here.

Curbside Recycling Collection

- Recycling is collected weekly at curbside, on the same day as garbage, either in front of homes or in alleys. Three benchmark communities collect recyclables every second week, and five collect weekly.
- The recycling program includes all materials typically found in curbside recycling schemes.
- The curbside service is provided to 9894 (2015) households, comprised of single family dwellings and duplexes.
- Other households are serviced by the Eco Centre, allowing recyclables and other material to be dropped off.

Curbside Organic Collection

- During the eight warmer months of the year, kitchen and yard waste is collected weekly at curbside, on the same day as garbage and recycling. From December through March, collection is monthly. In the benchmark communities, four provide weekly collection in summer and every second week in the winter. Throughout the year, one provides weekly collection, and the other collects every second week.
- The curbside service is provided to 9894 (2015) households, comprising single-family dwellings and duplexes.
- Other households are serviced by the Eco Centre, which allows food and yard waste to be dropped off in compostable bags.

Garbage is set out in a cart and is picked up weekly. Residents have a choice between a 120 litre cart or a 240 litre cart for garbage. Organic waste is set out using a 240 litre cart and picked up every week between spring and fall, and every month in winter (December to March). Recycling is collected weekly using blue bags. (This schedule change was made in June 2015.)

Eco Centre

The current location packs a lot of diversion in a small footprint. The Eco Centre accepts:

- garbage
- recyclables
- electronics
- household hazardous waste

- metal
- leaf and yard waste
- passenger car tires
- white goods
- and wood and construction material.

Additional Programs

As a supplement to other programs, the following services are also offered:

- Large item pickup (June)
- Shred-It event at the Eco Centre (June)
- E-roundup at the Eco Centre (June)
- Free Cycle (June, the week before large item pick-up)
- Christmas tree pickup (mid-January)
- Disposal of concrete and asphalt at the Public Works Yard.

Service providers

As of 2015, Good for Life (GFL) is the service provider collecting the three streams of curbside waste. The garbage is taken to the GFL facility, where it is emptied onto a tip floor and then packed into semi-trailers before being hauled to one of several landfills. Recycling is processed at the GFL facility. Material (metal, plastic, fiber) is pulled out and baled by type before being shipped to processors. Organic waste is generally taken to Cleanit Greenit for processing, although they have used Roseridge Waste Management when Cleanit Greenit has had operational issues. At the Eco Centre, GFL collects the same streams as at curbside (recycling, garbage, and organics), as well as C&D and mattresses. Other service providers for the Eco Centre include e-waste (Shanked Computer Recycling (SCRI), tires (Liberty Tire), batteries (Interstate Battery), propane tanks (Tank Traders) and HHW (Envirosort, a division of Clean Harbors).

3.2 Program Review

Responsibility for waste management services and education are shared by several City departments.

- Waste – Planning and Infrastructure
- Eco-Centre and Curbside Collection programs - Public Works
- Environmental Education - Sustainability
- Promotions and media release services - Corporate Communications

Back in April 2001, the City of Spruce Grove decided to divert yard waste from the landfill, and rolled out the green organic cart. It was a novel approach at the time, but has been primarily used by households to manage yard waste. Today, that green organic cart can and should also be used to manage food, soiled paper, edible and inedible food.

When new homes are built and residents move in, Public Works delivers a black waste cart and green organics cart. A kitchen catcher is also included, strapped onto the green organic cart's handle.

Promoting and supporting waste services requires time and effort. Sustainability hired an Environmental Coordinator in 2014, while Public Works hired a Solid Waste Coordinator in 2016. As well, the Sustainability group had access to a Municipal intern shared with all City Departments in 2016. Together they submitted a proposal for a door-to-door Community-Based Social Marketing (CBSM) campaign for 2017. CBSM initiatives were implemented in December 2016 by the consulting team to educate residents about food waste diversion. In addition to hiring dedicated staff, the waste and water groups take turns promoting initiatives at the annual Canada Day Celebrations held at Jubilee Park. Each group hosts on alternate years.

Planning and Infrastructure groups want to encourage residents to make better use of effective waste management streams, and to tackle particular topics such as food waste. In the hope of having homeowners direct more food and kitchen waste to the green organics rather than the black garbage cart, Public Works purchased a few thousand kitchen catchers. This initiative was supported by the Communications team, which then spread the word about the program via City Pulse Magazine. The issue included a coupon that could be redeemed for a free kitchen catcher, along with an article about the June 2016 waste audit (visit link to view the full PDF version).

Waste collection



BLUE BAGS

Recyclables
Weekly collection (year-round)

Includes:

- Aluminum cans
- Magazines
- Office paper
- Telephone books
- Cardboard
- Newspapers
- Toilet paper rolls
- Hard plastic bottles/containers

When is my collection day?

Monday: Aaronsville, City Centre, Greenboro, Hilldown, Kenton, Lakeside, Pleasant, Spruce Village, Stoneham, Tarnwood, Sprucewood Village

Tuesday: Grove Meadows, Lakewood, Woodside

Wednesday: Brookwood, Dratton Park, Woodhams

Thursday: Aspenridge, City Centre, Coxsdale, Jasperdale, Legacy Park, Midvale, Millgrove, Mobile City Estates, Westgrove

Friday: Deer Park, Harvest Ridge, Hawthorn, Heathridge, Spruce Ridge, Sprucewood Village

Statutory holiday collection dates:
If your regular collection date falls on a statutory holiday, please put your cart(s) and the bag(s) out on the next business day.

Collection Day Cart Placement

Park It
Car should be on the street and not on the curb, against the curb.

Point It
Point the cart to the curb of the street.

Space It
One to another cart should be a minimum of 1M.

Back Alley Pick Up
To be cleaned all around.

Front Street Pickup
Household carts to be placed on street.

Not sure what goes where?

Search for an item on Trim Trail Trash, the City's online waste collection guide. For it at www.sprucegrove.org/trimtrailtrash.

For more information visit www.sprucegrove.org/waste or call 780-962-7584.

Landfills are a limited resource, so it's definitely a concern when we see evidence that suggests we are filling them twice as quickly as necessary.
— Patrick Inglis

"They don't take up much space and when lined with a compostable bag, kitchen catchers are a very clean and low-odour way to store food waste," he says. "Once the bag is full, it can be tossed in the organics cart for collection."

"When you consider how much food waste is being thrown out instead of being turned into compost, improving that diversion rate would have a very positive impact on our landfills and the overall environment."

When analyzing the contents of the blue bags, the largest component was paper at 69.5 per cent, followed by plastic at 14 per cent, glass at 7.9 per cent, deposit items at 3.9 per cent and metal at 2.5 per cent. Just 2.1 per cent of the items found in the blue bags were not recyclable.

"Generally, residents are putting the appropriate items in blue bags for recycling," says Inglis. "We'd just like to see more blue bags on the curb each week."

In addition to improving diversion rates, putting waste in the right stream also helps keep contamination levels low, which, in turn, helps keep waste collection costs down.

"If residents aren't sure how to properly dispose of an item, we'd encourage them to check out the City's online waste collection guide," says Inglis. "It will tell you where to put that takeout pizza box" (Hint: in your organics cart, not in your blue bag!).

The guide can be found at www.sprucegrove.org/trimtrailtrash.

Tips for using a kitchen catcher

- Keep it under the counter you use it the most for the easiest to reach.
- Keep it fresh! Use it with a compostable bag to help manage odour from and odours.
- Keep it contamination free! Before putting food waste in the catcher, remove any packaging (plastic wrap or shrink wrap) — these items can go in the trash can.

Get a FREE kitchen catcher!

It's easy:

- Clip this coupon.
- Bring it to the Eco Centre, located at 50 Diamond Ave., during regular business hours (Tuesday to Saturday, 10 a.m. to 6 p.m.).
- Get your free kitchen catcher.
- Use it to collect and compost your food waste.

Limited area kitchen catcher per household. While supplies last. Offer ends on Friday, Sep. 30, 2016.

http://www.sprucegrove.org/Assets/pdf/citypulse/cp_fall2016.pdf

Once this communications-led initiative ended, kitchen catchers can still be picked up at City Hall and Public Works. Information about waste is also distributed via social media and the website. In early 2017, the City will launch a ReCollect app, another version of the What Goes Where search feature already on the Trim Your Trash webpage.

The corporate plan is a three-year initiative and the design and build of the new Eco Centre should be reviewed in conjunction with the recommendation in this report.

Charges to Customers

The Curbside Collection Program is provided at two different price levels, depending on the garbage service level received. Those with a 240 litre garbage cart are charged \$28.50 per month, while those with a 120 litre cart pay \$25.25. The service cost for residents with the larger cart is 23 percent higher than the average cost of the benchmark communities, which is \$23.23.

At the Eco Centre, there is no charge for disposing of source-separated organics and recyclables, while garbage disposal costs are allocated based on volume. Other materials, including bulky materials, white goods and metal can be disposed of there for a fee. Nominal charges exist to cover the cost of diverting of propane tanks, white goods requiring CFC removal, and wood and construction material. One goal is to encourage businesses to find private companies to manage their hazardous materials and organics, rather than using the Eco Centre. For this reason, placing limits on the number of bags or items accepted at one time is suggested.

3.3 Interviews

Effectively managing waste is a concern for all communities, and Spruce Grove is no exception. This fall, the consulting team asked experts in this area to comment on strategies Spruce Grove currently has in place, and to offer suggestions on how to improve the system. The panel of experts included:

Alberta Environment and Parks (AEP)

Pat Kane | *Section Head, Waste Policy Section*

Shelleen Lakusta | *Senior Waste Policy Advisor*

Good For Life (GFL)

Lorenzo Donini | *Manager, Materials Processing and Municipal Development*

City of Spruce Grove

Kevin Stener | *Director of Public Works*

Jennifer Hetherington | *Manager of Corporate Communications*

Robert Cotterill | *City Manager*

Ed McLean | *Councillor and Chair of the Capital Region Waste Minimization Advisory Committee*

Summary of Panel Commentary

About government and municipal roles

- With a new government, priorities are shuffled. Waste management is not high on the priority list

- for the ministry. There was no mention of carbon levies on garbage going to a landfill.
- Municipalities should continue to communicate their needs to the government.
- While the government will create policies based on feedback provided by stakeholders, it will not be directly involved in the process. To manage the process, more stewardship groups (such as the Alberta Beverage Container Corporation, Alberta Used Oil Motor Association) would be formed.
- The least ambiguous measurement for municipalities is what is being disposed to a landfill.

About improving the process

- Words of advice – Ask yourself what you want to achieve. Once you have outlined that objective, focus on achieving it.
- If Spruce Grove wants to advertise and educate on better approaches to waste management, GFL has a 7 x 12' sign in their truck that could be used for this purpose. A dedicated truck could be used for the duration of that promotion. Spruce Grove would be responsible for designing the image and having it printed on Coroplast.
- The City of Spruce Grove has in the past restricted how much garbage can be tagged and left. As departments are sensitive to this, working together to confirm when to implement new programs would be helpful. An example of these tags are show in Appendix F, page 53.
- The blue bag and green organics carts are underutilized. Focus on maximizing programs by educating about which items currently being put in the garbage could go into these carts.
- As the Eco Centre is also underutilized, stop picking up large items at curbside. Instead, have people bring items to the Eco Centre. Having Spruce Grove cover the disposal of these items is expensive.
- Consider changing the large item pickup. Discontinue curbside pickup of electronic recycling and multiple large waste items, and instead only collect two large waste items. General consensus is to stop this program and have residents take items to the Eco Centre.
- Picking up items for free sends the wrong message and should change.
- If collection services were managed by Spruce Grove staff, this is generally more expensive than working with private business.
- Include addresses on all carts, so bylaw, Green Team and GFL representatives checking carts can easily record that reference. In reviewing this idea, the consulting team learned the serial numbers of the carts are not linked to house numbers and carts do not have an area for homeowners to write down their address.

About public engagement and communication

- Communications can be responsive, if corporate budgeting includes engagement initiatives. Involve communications at the start so appropriate time and resources can be allocated. If not, allow lots of lead time to prepare the team.
- At events in town, host workshops and teach people about recycling or diverting organics to the green organics cart, or talk about the diversion program at hand.
- Response on social media is often negative. Intervening to change the message diverts funds from other areas, so being more proactive with the communication plan would help.
- Communication tools includes status quo avenues including social media, the website, and newspapers. It can also include Pulse magazine, which has been in print for two years.
- If garbage collection moves to every second week, that change will create a negative response on social media. Time is needed to prepare for the transition.
- Teach children about effective waste management in schools, so that they can come home and teach their parents.

- Communication and talking with the public is key. Just talking with a waste management expert provided more information about what contaminates blue bag materials than had been learned to date.
- Stony Plain hosted a ‘Meet Your Council’ event at a local McDonalds – a similar event might be useful for discussing effective waste management.
- Spruce Grove’s open market event offers a great venue to have a representative talk about the recycling programs.
- More literature, or education and communication about recycling would be useful. Include images to show what items belong in the garbage. As well, offer tips on how to reduce odour from kitchen catchers and green organic carts, and about what to do if a cart is broken or damaged.
- The Green Team could visit homeowners to check for non-compliance. A tagging program might be worthwhile if the material is still taken away, and no fines are imposed.

The details from these interviews are listed in Appendix F.

3.4 Solid Waste and Diversion Rate Review

Solid waste data was reviewed and analyzed to establish annual solid waste generation and diversion rates.

3.4.1 Diversion Rate and Solid Waste from Curbside and Eco Centre Programs

The population for this report comes from the Spruce Grove annual Census. Since there was no census taken in 2012, we used the growth rate of 5.1 percent per year to estimate 2012 population¹.

Note that non-Spruce Grove residents are able to access the Eco Centre. The breakdown, based on a survey of users in 2014 between September 15 to December 31, showed 77 percent were City users, 16 percent Parkland County, 4 percent Stoney Plain and 3 percent Other. No adjustment for this fact is reflected in our tables.

Figure 3.4-A shows tonnes of waste collected for each material type, further breaking down the data using the curbside program and Eco Centre collection venues. The total waste shows the sum of all categories from both programs. Individual program and total diversion rates are also detailed. The *1 and *2 refer to the note on page 7.

Diversion rate was calculated as follows:

$$\frac{\text{Organics + Recycling}}{\text{Total Waste}}$$

Potential for additional diversion at a rate of 77 percent was shown in Figure 2.2-B on page 2. That rate, included in this table, only applies to garbage generated at curbside. The Eco Centre diversion rate increased in 2015 and 2016, as drywall and wood was diverted from a landfill.

¹ Spruce Grove Demographic Report, 2016:<http://www.sprucegrove.org/community/research/census/history.htm>

Figure 3.4-A Tonnes of waste per program and diversion rate by program

Waste Type (Tonnes)		2016* ¹	2015* ²	2014	2013	2012
Curbside	Garbage	6576	6041	6364	6148	5749
	Organics	2600	1636	2169	2010	1986
	Recycling	1355	1185	1160	1017	1075
Eco Centre	Garbage	363	541	1093	979	941
	Organics	282	234	268	256	259
	Recycling	223	246	254	230	218
	Other Recycling	733	526	201	297	287
Total Waste		12132	10408	11509	10937	10516

Program		2016*	2015	2014	2013	2012
Diversion	Curbside	38%	32%	34%	33%	35%
	Eco Centre	77%	65%	40%	44%	45%
	Combined	43%	37%	35%	35%	36%
	Potential	85%	81%	78%	78%	78%

Other recycling includes metal, C&D recycling, E-waste

Figure 3.4-B shows that the bulk of diversion occurs through curbside pickup.

Figure 3.4-B Residential waste diversion by program (2012 – 2016)

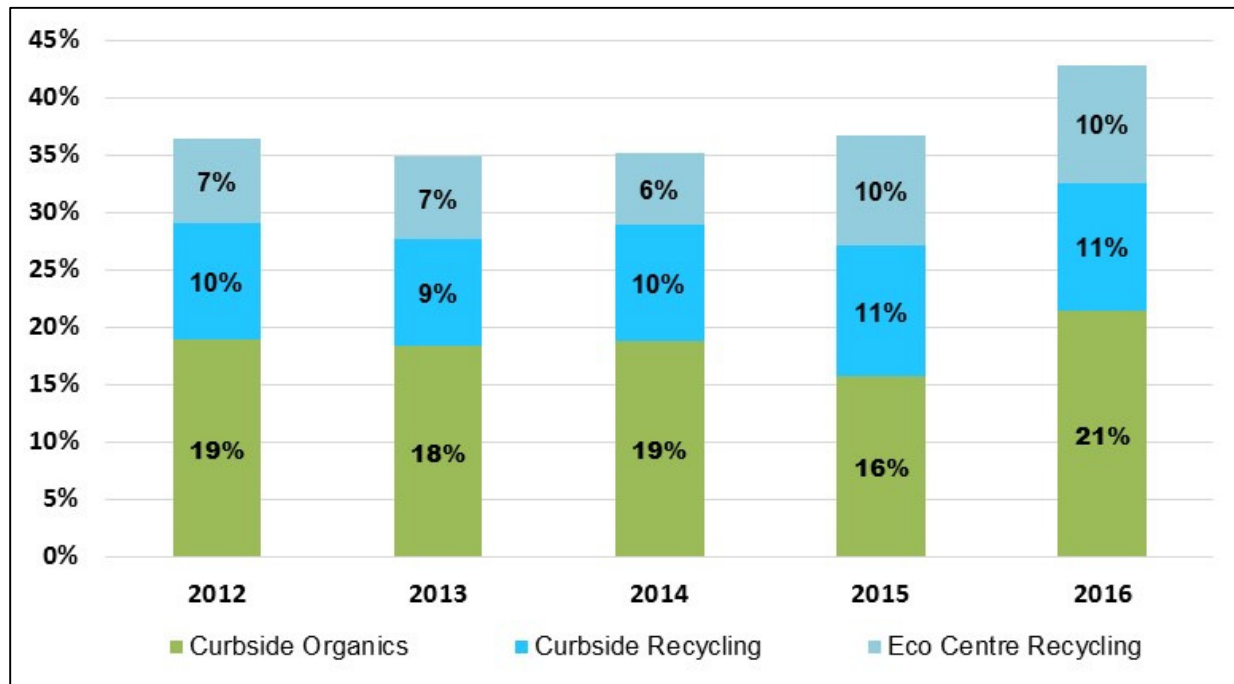


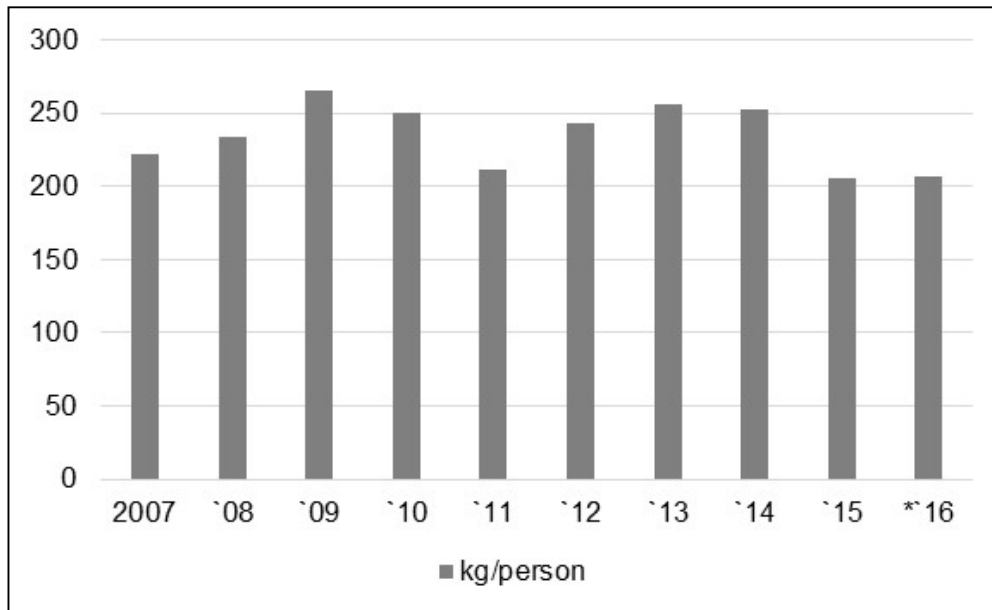
Figure 3.4-C shows the total garbage sent to a landfill from all sources, including curbside collection and the Eco Centre.

Figure 3.4-C Curbside and Eco Centre garbage sent to a landfill between 2012 and 2016

Year	Total Garbage (Tonnes)	Population	Per capita (kg)
2016* ¹	6939	33640	206
2015* ²	6581	32036	205
2014	7457	29526	253
2013	7126	27875	256
2012	6690	27505	243

The generation of garbage landfilled per person has fluctuated over the years, as shown in Figure 3.4-D. After 2014, the amount of garbage being sent to a landfill drops. As stated earlier, this could be due to the decline in the Alberta economy.

Figure 3.4-D Curbside and Eco Centre garbage sent to a landfill (per person)



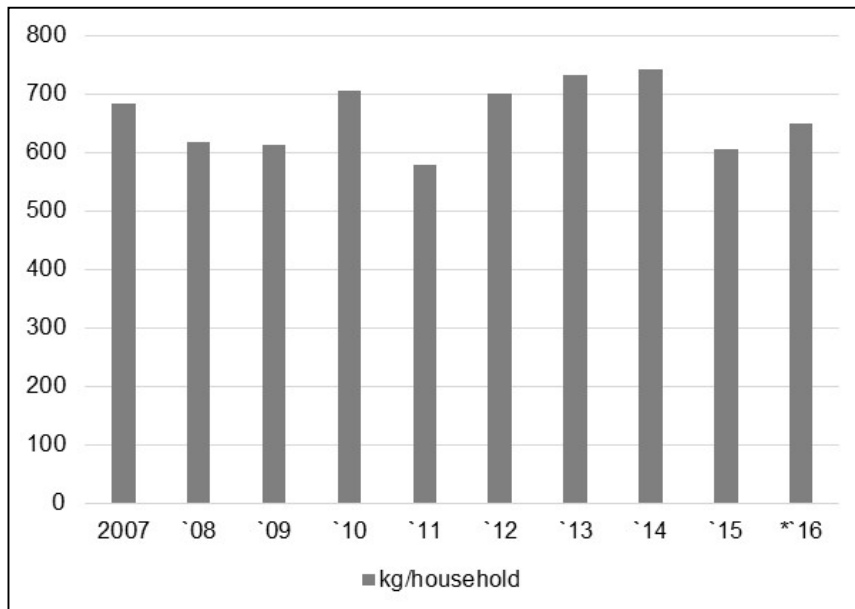
3.4.2 Solid Waste from Curbside Waste Collection

In the last two years, the amount of garbage per household being sent to a landfill has reduced (see Figure 3.4-E). Figure 3.4-F shows a fluctuation in the amount of curbside garbage being sent to a landfill over the last nine years.

Figure 3.4-E Garbage sent to landfill from curbside collection between 2012 to 2016

Year	Total Curbside Garbage (Tonnes)	Number Billed Residents	Per household (kg)
2016* ¹	6576	10130	649
2015* ²	6041	9894	611
2014	6364	8592	741
2013	6148	8411	731
2012	5749	8216	700

Figure 3.4-F Garbage sent to a landfill (per household receiving curbside collection)



During interviews with staff, concerns about the large item program were raised. City staff members feel that there are drawbacks to offering the large item collection service and the Freecycle event that occurs prior to large item pickup. However, when the consulting team looked at the data in Figure 3.4-E without the large item data, it showed only a one percent impact on the amount of garbage generated.

Since 2014, there has been a decline in both the number of large items collected at curbside, and the amount of garbage collected at the Eco Centre. The drop in large items collected may be due to the Freecycle event the week before, or the decline in the Alberta economy – the true cause is unclear.

Residents would miss the large item program if it were removed and it is a common service for many municipalities. If GFL will manage the program then it could be maintained even though there has been a decline in large item tonnage..

3.4.3 Change in Total Waste Generated

Figure 3.4-G shows the change in total waste generated from curbside collection (all three streams) and the Eco Center. A positive number indicates an increase in waste generated from the previous year. Data from 2011 was used to calculate the 2012 rate of change. The total waste generated from curbside collection shows a similar percent change per household rate since on average, 85 percent of the waste stream is from curbside collection. This change may suggest households are purchasing less due to the slower economy, or that people are taking bulky garbage to Edmonton, or that data was lost when the new hauler took over in 2015.

Figure 3.4-G Change in total waste generation per capita and per household (kg) (Curbside and Eco Centre)

Year	Total Waste (Tonnes)	Per capita rate (kg)	% Change per capita rate	Per household rate (kg)	% Change per household rate
2016* ¹	12132	361	10%	1198	12%
2015* ²	10408	325	-20%	1052	-27%
2014	11509	390	-1%	1339	3%
2013	10937	392	3%	1300	2%
2012	10516	382	9%	1280	11%

3.5 Greenhouse Gas Savings

Figure 3.5-A shows estimated annual greenhouse gas (GHG) savings achieved through the City's residential diversion program, based on the waste composition audit and the equivalencies of these savings. The savings potential from materials that could be diverted is also presented. The potential GHG savings is based on Figure 2.2-B.

The GHG calculation was made using Environment Canada's GHG Calculator for Waste Management. The equivalency conversion is 4.5 metric tons CO₂E/vehicle/year.

Figure 3.5-A Estimated annual greenhouse gas savings from 2016 data

Current Estimated GHG's Saved (tonnes)	Equivalent # of cars taken off road/year	Potentially More GHG's Saved (tonnes)	Equivalent # of cars taken off road/year
2,247	499	5061	1125

The above Environment Canada's GHG Calculator was based on the U.S. Environmental Protection Agency Waste Reduction Model. This later model has a line item for mixed MSW landfilled. The amount of curbside garbage sent to a landfill in 2016 generates 8,356 GHG which is equivalent to 1857 vehicles on the road.

4 Municipal Benchmarking Review

The benchmarking review considered eight communities that have populations of similar size and/or offer curbside collection programs for more than just garbage. The selected municipalities were close to major city centres, with access to necessary diversion infrastructure. This allows comparisons to be made with the City. We reviewed the practices of these municipalities to see if the City might consider adopting new strategies to help increase diversion rates. The completed tables are located in Appendix G.

Comparable Municipalities

1. Cochrane
2. Fort Saskatchewan
3. Leduc
4. Okotoks
5. St. Albert
6. Stony Plain
7. Strathcona County
8. Town of Beaumont

Any programs being used by a municipality that might apply to the City will be discussed in the recommendation section.

In addition to benchmarking similar programs, we also provide examples of provinces and cities that are implementing material bans or action plans.

Canadian Council of Ministers of the Environment

In 2009 the Canadian Council of Ministers of the Environment approved a Canada-wide action plan on Extended Producer Responsibility (EPR). Environment Canada EPR is “...a policy approach in which a producer’s responsibility, physical and/or financial, for a product is extended to the post-consumer stage of a product’s life cycle. EPR shifts responsibility upstream in the product life cycle to the producer (i.e. brand owners, first importers or manufacturers) and away from municipalities and general taxpayers.”

The objective of this plan is for each jurisdiction in Canada to implement a legislative EPR framework in a consistent and harmonized way. A few provinces such as British Columbia, Manitoba, Quebec and Ontario have policies to act on this plan².

City of Calgary

The City of Calgary has placed paper, cardboard and organic waste on the designated material list at their landfills. In other words, if an audit on a load of garbage showed it contains these materials, higher fees must be paid on the entire load. As a result, some businesses are seeking private haulers to take their garbage to other landfills. Other businesses are creating recycling and organic collection programs, so these materials do not end up in garbage going to the City of Calgary landfill. The City of Calgary has been leading the way since 2008, by implementing restrictions of materials that can be landfilled, increasing the cost to dispose of these materials, and finally banning material altogether.

² Source: http://www.gftc.ca/uploads/userfiles/files/epr_program_canada_finalv2.pdf

British Columbia

Multi Material BC (MMBC)³ is a not-for-profit stewardship agency developed by producers of packaging and printed paper, to meet their obligations under the Recycling Regulation. To date, most large producers of paper, print and packaging (PPP) have chosen to appoint MMBC as their stewardship agency. They estimate that of 2000 to 3000 large organizations, only 150 will be responsible for 80 percent of the cost. The program will result in an estimated \$80 million to \$100 million in savings to B.C. taxpayers. In most cases, it will be up to local governments to pass on these savings to municipal taxpayers, through methods such as redirecting funds towards other zero waste programs including organic waste management and composting, or by reducing municipal taxes.

These programs show that having stewardship agencies and municipalities collaborating to help users adds value. Other municipalities or provinces can learn by asking questions of those undergoing change. Many organizations involved with the MMBC are Canada-wide companies (such as Best Buy). In BC, collection programs are offered for CD's and DVD's. It would be nice to inform residents what these other companies are collecting, should they wish to reduce the garbage they produce.

5 SWOT Analysis of Waste Management Program

A SWOT analysis looks at the City's strengths and weaknesses, opportunities and threats. This tool can serve as a precursor to actions the City wants to take as they explore new initiatives. We used program information and interviews from other municipalities, then examined areas focusing on the City's strengths, minimizing their threats, and capturing the greatest opportunity. We also used this framework to provide a preliminary direction for implementing elements of Community-Based Social Marketing (CBSM).

³ <http://www.multimaterialbc.ca/our-program/>

CBSM techniques are proven social marketing tools based on behavioural psychology. Incorporating these tools into program education and promotional activities can effectively change behaviours. Behaviour is strongly affected by social norms and habits, some of which may stop people from engaging in new, more sustainable programs and practices.

Strengths	Weaknesses	Opportunities	Threats
Good coverage for collection	Organics capture is low on per person basis (0.06 tonnes, average for benchmark communities is 0.09). Almost 90% of kitchen waste is put in the garbage rather than green cart.	56% increase in organics diversion readily available, particularly by increasing food waste capture	Complacency on kitchen scraps may mean that the social norm is to put kitchen scraps in garbage. That habit will be hard to break and should be addressed quickly.
Good Eco Centre diversion options	Recycling capture is low on per person basis at 0.04 tonnes. The average for benchmark communities with curbside organic collection is 0.06.	50% increase in recycling is readily available	If diversion of organics is inadequate, Spruce Grove could have difficulties in the future if a ban on organic disposal is implemented.
Infrastructure in place for good diversion, both at curbside and at Eco Centre	The garbage portion is on the high end of range on per person basis, which suggests room for waste diversion programs.	Increasing organics and recycling diversion would significantly lower garbage (by 25%)	
Trim Your Trash is a good resource	Search items in Trim Your Trash could be expanded. For instance, someone trying to type in “kitchen scraps” or “kitchen waste” now receive a “I couldn’t find anything...” message. Also, food can be added to “What Goes Where” page.	Increase awareness of kitchen waste going into green cart	
Other communications vehicles, such as the Waste Collection Guide, are well done	Communication is more informational rather than compelling. Consider incorporating elements that appeal to emotion.	Provide info about other programs on the Trim Your Trash page	
Since calculation is based on weight, diversion is actually higher than is calculated, but much HHW is diverted that is measured in volume	Waste diversion is voluntary. There is no incentive for people to sort material for the curbside program, other than the possibility of getting by with a smaller cart and slightly smaller fee.	Secure commitments on Trim Your Trash Page, build new social norms for recycling and composting kitchen scraps.	

Strengths	Weaknesses	Opportunities	Threats
Communications/education staff members are in place for waste management.		Incorporate Inbound Marketing on Trim Your Trash Page and use it to create opt-in subscription list. This is inexpensive and may result in reduced need to advertise in paper. It also allows distribution of surveys, gathering more information on customers.	
		Increase curbside collection	
		Make diversion mandatory	
		Compare progress to other municipalities as a challenge, and show progress back to residents.	

Recommendations that follow are derived from the SWOT analysis.

6 Findings and Recommendations

Please consider the following recommendations for improving Spruce Grove’s waste management system.

6.1.1 Change Behaviors to place Kitchen Waste in the Green Cart

According to the waste audit findings, the amount of kitchen waste going into green carts could increase by a factor of almost 10. Currently almost 90 percent of kitchen waste is being thrown into the garbage stream. This means that a significant amount of organic material is not being diverted, and the effectiveness of an expensive service is also greatly reduced. In Spruce Grove, the total organic diversion (kitchen waste and yard waste) is approximately 60 kg per person. In contrast, the six benchmark communities with curbside organic programs collect on average 110 kg per person, with St. Albert collecting 150 kg and Stony Plain 170 kg per person.

Taking action to convince residents to put kitchen scraps in the green cart is critical. The longer that they continue to put kitchen waste in the garbage, the more difficult it will be to break them of that habit and convince them to put it in the green cart.

This change is best accomplished through a Community-Based Social Marketing (CBSM) program. The goal would be to change behaviour to composting kitchen waste, rather than throwing it in the garbage. This program should target all residents receiving green cart collection.

The CBSM program should identify reasons why people put kitchen waste in the garbage, so those barriers can be addressed directly. A strategic plan can then be developed to seek commitment from residents on placing kitchen scraps in the green cart.

Select a particular area of the City to host a demonstration project, and include a significant promotion effort. The results should be measured through audits, and the findings shared with participants and the general public. While talking with participants, the City should identify spokespeople who can champion kitchen waste collection for composting. The results and champions can be incorporated into a promotional effort to establish this behaviour as the social norm and the responsible thing to do.

It must be noted that, along with other recommendations for program changes, the call for a Community-Based Social Marketing program has been suggested to Spruce Grove before. It was mentioned in the May 2013 strategy document *Reduce Your WasteLine Curbside Program Blueprint 2013-2018*. In that document, and in the *Integrated Waste Management Review and Waste Composition Audit* by Advanced Engineering in 2012, similar disappointing numbers in organic diversion were documented.

It is time to try tackling this issue with a CBSM program in Spruce Grove. Over the past 25 years, these initiatives have proved effective in other municipalities across Canada.

6.1.2 Campaign to Reduce Food Waste

During the audit, it was determined that 21 percent of food waste thrown in the garbage was still in the original packaging. This is not only a waste management issue, it is an economic issue. If the message becomes one about saving money by reducing food waste, residents may be successfully convinced to change the behavior.

Many resources are available to promote reduction in food waste. Metro Vancouver has a good program, and Defra in the United Kingdom has done a lot of research in this area. Additionally, supermarkets in the UK have also taken up the challenge. Sainsbury's has even developed a search engine that can identify appropriate recipes when food ingredients in the fridge are entered.

This preferred behaviour of reducing food waste can also be included in the CBSM program described above, as it complements the effort to direct food that is now wasted into the proper collection stream.

6.1.3 Change Collection Frequency

The City of Spruce Grove’s curbside collection frequency is unique when compared to the benchmark communities. The recommended changes will better align service delivery with that of other municipalities. These recommendations also encourage desired sorting practices. If recyclable and compostable material continues to be sorted into garbage, it will be around longer. The recommended service system is best suited to meet the needs of residents who are sorting their garbage correctly. A summary of the collection frequency recommendations is listed in Figure 3.5-A.

Figure 3.5-A Summary of Collection Frequency Recommendations

Stream	Current Frequency	Recommended	Advantages
Garbage	Weekly	Every second week	Cheaper, removes incentive to use garbage for recyclables and organics
Organics	Weekly in warm months Monthly in cold months	Weekly in warm months Every second week in cold	Reduces incentive to throw organics into garbage so it is picked up sooner
Recycling	Weekly	Weekly	Shows importance of recycling, gets bulkier materials out of home quickly

First, reduce garbage collection to every second week. If residents are placing organics or recyclables in the garbage stream so that they are taken away sooner, this action removes that advantage. It also should reduce collection costs and greenhouse gas emissions, as garbage truck travel will be reduced by almost 50 percent. As part of this process, confirm the terminology for this service. Municipalities have been using bi-monthly and bi-weekly, but the consulting team finds the use of every second week less ambiguous to the reader. It has tangible meaning as some months could have three pickups.

Second, maintain weekly collection of the organic cart in summer, but increase winter organic collection frequency from monthly to every second week (opposite to garbage collection weeks). Access to monthly collection creates an imbalance in convenience. It is an advantage to throw food waste into the garbage stream if one knows it will leave the premises sooner. Putting it in the green cart may mean it is around for up to a month. Despite the odour-suppression of lower temperatures in the winter, having food waste stick around four times longer than when it is put in the garbage may well contribute to reduced kitchen waste diversion.

Third, maintain weekly recycling collection. Weekly pick-up sends a message about the importance of recycling. As well, recycling bags are bulky and take up a significant amount of room. Taking them away weekly provides incentive for people to recycle more. If that material lands in the garbage instead, it will be around twice as long. It is also easier to have a smaller volume of garbage (without recyclables and organics) around for two weeks.

If garbage is only picked up every second week, the large item program may need to reflect a similar change so that residents can only put out two bulky items at the curb. Overall, diverting from a landfill is a positive step. If service providers can provide added diversion options such as mattress collection, the City should consider these opportunities.

Residents who have chosen to have the smaller cart (5.6 percent) may require a 240 litre cart when moving to every second week garbage collection. Prior to launching, the program consider how this change will be managed and budget accordingly.

6.1.4 Waste Management Bylaw Changes

Spruce Grove has developed and implemented an excellent waste management program, with services that provide opportunity for all residents to divert a high percentage of their waste from a landfill.

However, waste diversion in Spruce Grove is lagging behind the benchmark municipalities. In 2015 Spruce Grove reported 42 percent diversion. Other municipalities averaged 48 percent diversion, with three topping 60 percent diversion.

The current situation is that Spruce Grove has a high quality waste management program with excellent services, but residents have a choice on whether to use it. Some choose not to sort waste the way the City prefers. There is no penalty or disincentive if people stick to the old way of doing things and throw everything in the garbage.

The City should make necessary bylaw changes, so residents are required to use the waste management program as intended. First, place a ban on putting organic and recyclable material in the garbage stream, and enforce the bylaw. For instance, if material is improperly prepared for curbside collection, it will not be picked up. To do this, examining carts and bags to note non-compliance becomes necessary. Many municipalities refuse to pick up improperly prepared loads and leave an informative sticker on the bag or carts to explain the infraction to the homeowner. An example is show in Appendix F.

The greatest risk of moving to every second week pickup for the green cart is that residents may contaminate the loads by using it for garbage disposal. To show residents that compliance is critical, each spring an auditing Green Team (consisting of four people) would tackle each neighbourhood and look inside the green carts checking for contamination. If contamination is found, it is stickered,

turned around, and not picked up. GLF suggested they could supply two people if the City provides two people. This has been useful in other municipalities, helping to get homeowners on track.

In addition, the City would also benefit by sourcing a label that can be adhered to the carts. This label would contain a hand written address for each house. The written address would benefit GFL drivers and the Green Team, who can record the house address quickly when carts are found to be non-compliant. With service to over ten thousand houses, this is a daunting process. An option might be to have GLF staff identify problematic areas, and only label those carts. Concurrently, address label could be distributed in tandem with any door-to-door CBSM campaign considered in the future.

A bylaw which bans grass clippings from garbage collection may also be useful. Many municipalities now promote leaving clippings on the lawn, and this is considered to be a best practice.

Consider how Eco Centre operations could be modified to encourage businesses to hire private companies to manage their own hazardous materials and organics. Some changes could include policies that reflect bag limits, and limit the number of items accepted at one time. Operational changes could include posting a respectful policy statement, recording license plates, charging businesses for items, increasing fees, and training staff to manage difficult clients. Place signs at the entrance gate that note these operational changes. Part of keeping costs manageable for hazardous waste material involves empowering staff, so that they can turn clients away and establish policies that stop aggressive residents from returning.

A lengthy introduction period should precede implementation of the bylaw and Eco Centre policy changes, as well as a significant communications campaign stressing the convenience, environmental and economic benefits of proper waste management.

6.1.5 Change Communications Approach to Focus on Behaviour Change

The existing communications program provides the information residents need to sort waste and dispose of it correctly. Many recommendations from previous studies, such as consistent branding, have been implemented. However, waste diversion statistics indicate that from 2012 to 2015, there was little change in percentage terms. While progress has been made in 2016, much more potential diversion is possible (Figure 3.4-A, page 19).

Providing information on how and what to divert is important, and the City of Spruce Grove is doing an excellent job of making that information easily available to residents. These efforts should be maintained. However, the behavior around kitchen waste diversion needs to change. Information alone will not accomplish that purpose. To foster changes in behavior, communication needs to be compelling rather than just informative. This is most effectively done using tools that incorporate behavioural psychology, such as Community-Based Social Marketing (CBSM).

The preferred behaviour of putting food waste in the Green Cart should be addressed through a CBSM program. CBSM should also be incorporated into the rest of the waste management program elements, including the existing recycling program.

A thorough understanding of CBSM is essential to making this shift. Those who work on the program should understand that when it comes to changing behavior, applying the principles of behavioural psychology is very different from, and more effective than, conventional communications approaches.

For that reason, it is recommended that everyone working on waste management communications in the City of Spruce Grove Administration be trained in Community-Based Social Marketing. Without a thorough understanding of CBSM principles and techniques, it is unlikely that an effective program can be developed and successfully implemented.

The City has the infrastructure for effective waste diversion via collection programs and drop-off facilities. It has developed information sheets that tell people how to divert material. The CBSM program will build on these assets, bridging the gap between knowing what to do and actually doing it. This strategy will be stronger if backed with a bylaw change.

City slogans and imaging are consistent and effective. However, while images and messaging focus on what to do, not much shows people actually doing it. Consider adding messaging and photos that show successes in waste diversion. For instance, rather than just using illustrations of waste that has been properly set out, add a photograph showing the same thing. That approach suggests at least one person out there is actually doing it correctly (modeling the correct behaviour), and the observer can and should do it that way too. Incorporating photos of properly recycled material in a bag, someone placing peelings in a kitchen container, and in-house sorting provide clear guidance on what residents should be doing.

As the City begins to divert more organic waste, the City of Spruce Grove can install a 'close the loop' concept by offering a compost sale to residents. Many municipalities have provided free compost to residents on special days, and others make it available at a nominal charge. Discussion with other municipalities about how they have done this and addressed liability concerns should be part of any plan to make compost available to residents.

In addition, there is an opportunity for the City to close the loop on compost by using the material in its own landscaping operations. Compost can be introduced into existing garden beds to improve the soil. It can also be blended with soil to create a valuable garden-bedding product for municipal operations. One option is to include a requirement that a certain percentage of compost should be included in soil when supply is tendered. By closing the loop on organics itself, the City can strengthen the market for compost.

In addition, consider making compost available to schools and community groups as part of the education initiative. This action would help promote better understanding of the circle of organic matter.

6.1.6 Waste Department Should Lead on Communications

A best practice across municipalities is that the waste management department is in charge of waste management communications, and the communications department act as a resource for them. As an example, St. Albert and Strathcona operate this way and have a strong waste management communications program.

With two waste management staff members involved in education and communication, the department can take on the responsibility for producing effective communications materials aligned with CBSM. While people in the communications department can assist by providing advice and facilitating production and messaging, waste management staff should have final authority on communications tactics and materials.

Additionally, the solid waste staff members should reach out to colleagues in other municipalities to explore best practices in detail, so that successful communication programs can be replicated. Municipalities are often happy to share and collaborate. For instance, Metro Vancouver shared images for use in The Food Waste Diversion Public Engagement project that took place between December 14 and 22, 2016 in Spruce Grove. Staff from Strathcona County and St. Albert also have unique communication materials that could be investigated.

Adopt a terminology and stick with it in all communications as outlined in the glossary of this report.

Conclusion

Spruce Grove has developed and implemented an excellent waste management program and partnered with contractors to provide opportunities for all residents to divert a high percentage of their waste from a landfill. The recommendations made are based on the current three stream curbside collection process, and address the need to have better use of the programs by residents. We expect that through implementation of the recommendations herein, Spruce Grove will be able to significantly increase waste diversion and create better efficiency in its programs. If there is a change in how waste is processed, revisit these recommendations.



"...the practice of recycling pushes us in the right direction, toward the development of the technologies of sustainable material use, and toward the creation of less materialistic, more socially and environmentally engaged ways of living. There is no greater hope in any other direction. Indeed, in the long run there is nowhere else to go."

– Frank Ackerman, *Why Do We Recycle?*, Island Press, 1997

Appendix

Appendix A. Sort Category, Sub-Category and Description of Material in the Sub-Category

Category	Sub-Category	Description
Paper	Mixed paper	office paper, newsprint, magazines, flyers, phone books, catalogues, cereal boxes, pasta boxes, tissue boxes, paper egg cartons and paper coffee cups (remove lids)
	Cardboard	corrugated
	Shredded paper	bagged
	Non-recyclable	polycoat material, waxy material, takeout food containers (non-paper)
Plastic	Rigid plastic	detergent bottle, yogurt container
	Non-rigid plastic	coffee lids, flexible plastic, 3-7 items, clam shells
	Polystyrene	straws, forks, Styrofoam
	Other plastic	cd cases, wrappers, crunchy plastic, plastic wrap, film, garbage bags
Glass	Food containers	jars
	Other Glass/ Ceramic	mugs, plates, incandescent lightbulbs
Metal	Recyclable	tin food cans
	Other	tin foil, pie plates, hangers, faucet, screws,
Beverage Containers	plastic, tetra, aluminum, glass	
Organics	Edible food waste	edible food at some point
	Inedible food waste	peels, bones, tea bags, coffee grounds
	Food in packaging	food in packaging
	Food soiled paper	pizza boxes, paper food containers, coffee cups (Starbucks, etc.), napkins, compostable products, tissues
	Yard and garden	
	Clean wood	
	Other compostable	painted wood, stirsticks, popsicle sticks
Hazardous Waste	Batteries	

Category	Sub-Category	Description
	Aerosols	
	Paints/Stains	
	HHW (Product &/or Container)	
	Mercury Items	
	Other HHW	
Electronic Waste	Audio/Visual	
	Personal Electronics	
	Household Appliances	
	Kitchen Appliances	
	Power Tools	
	Lawn & Garden	
	All Other Electronics	battery operated, thermostat, lighting
Residual Waste	Misc. Garbage	plastic bags, personal hygiene, footwear, cigarette butts, cat/dog litter, sponge, paint roller, envelopes with bubble wrap, paint, toys,
	Textiles	clothing, footwear, bedding, curtains
	Building materials	treated wood, plywood, insulation

Appendix B. Fall Waste Composition – Garbage, Recycling and Organic Streams

Table 1: Garbage Composition – Fall

Material Category	Wed		Thurs		Fri		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper	17.82	8.2	37.2	11.8	18.7	7.2	73.7	9.3
Cardboard	2.04	0.9	2.1	0.7	0.9	0.3	5.0	0.6
Shredded paper		0.0		0.0		0.0	0.0	0.0
Non recyclable	1.60	0.7		0.0	9.1	3.5	10.7	1.4
Total Paper	21.46	9.9	39.3	12.4	28.7	11.0	89.5	11.3
Plastic								
Rigid plastic	3.54	1.6	5.3	1.7	3.4	1.3	12.2	1.5
Non-rigid plastic	2.64	1.2	7.3	2.3	4.1	1.6	14.0	1.8
Polystyrene	1.58	0.7	2.3	0.7	2.0	0.8	6.0	0.8
Other plastic	13.69	6.3	16.0	5.1	5.6	2.1	35.3	4.4
Total Plastic	21.45	9.9	30.9	9.8	15.1	5.8	67.4	8.5
Glass								
Food containers	1.25	0.6	4.1	1.3	3.4	1.3	8.7	1.1
Other Glass and Ceramics	2.42	1.1	0.4	0.1	1.2	0.4	4.0	0.5
Total Glass	3.67	1.7	4.47	1.4	4.52	1.7	12.7	1.6
Metal								
Recyclable	3.23	1.5	2.1	0.7	1.5	0.0	6.8	0.9
Other	3.42	1.6	1.7	0.5	5.5	0.0	10.6	1.3
Total Metal	6.65	3.1	3.8	1.2	6.9	2.7	17.3	2.2
Beverage Containers	0.95	0.4	1.9	0.6	1.3	0.5	4.1	0.5
Total Beverage Containers	0.95	0.4	1.9	0.6	1.3	0.5	4.1	0.5
Compostable Organics								
Edible food waste	23.04	10.6	30.4	9.6	36.4	14.0	89.8	11.3
Inedible food waste	32.94	15.2	38.6	12.2	28.8	11.1	100.3	12.6
Food in packaging	16.59	7.6	31.7	10.0	39.1	15.1	87.4	11.0
Food soiled paper, compostable containers	6.76	3.1	8.2	2.6		0.0	14.9	1.9
Yard and garden		0.0		0.0	5.4	2.1	5.4	0.7
Clean wood	0.65	0.3	0.0	0.0		0.0	0.7	0.1
Other non compostable organics		0.0		0.0		0.0	0.0	0.0
Total Compostable Organics	79.98	36.8	108.8	34.4	109.7	42.2	298.5	37.6
Hazardous Waste								
Batteries	0.10	0.0	0.1	0.0	0.1	0.1	0.4	0.0
Aerosols	0.36	0.2	0.5	0.2	0.3	0.1	1.2	0.2
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)	0.11	0.1		0.0		0.0	0.1	0.0
Mercury Items		0.0	0.2	0.1		0.0	0.2	0.0
Other HHW		0.0		0.0		0.0	0.0	0.0
Medical	0.05		0.1		0.4		0.5	0.1
Total Hazardous Waste	0.62	0.3	0.99	0.3	0.79	0.3	2.4	0.3
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics	0.44	0.2	0.9	0.3	0.1	0.1	1.4	0.2
Household Appliances		0.0		0.0		0.0	0.0	0.0
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0		0.0	2.8	1.1	2.8	0.3
Total Electronic Waste	0.44	0.2	0.86	0.3	2.90	1.1	4.2	0.5
Residual Waste								
Other Residual	58.76	27.1	56.6	17.9	42.6	16.4	158.0	19.9
Clothing/Footware	6.60	3.0	17.0	5.4	12.1	4.7	35.7	4.5
Building Materials	0.00	0.0	1.8	0.6	0.8	0.3	2.6	0.3
Hygiene	16.51	7.6	31.7	10.0	28.8	11.1	77.0	9.7
Animal Waste		0.0	18.2	5.7	5.6	2.2	23.8	3.0
Total Residual Waste	81.87	37.7	125.3	39.6	89.9	34.6	297.0	37.4
Total	217.09	100.0	316.26	100.0	259.75	100.0	793.1	100.0

Table 2: Recycling Composition – Fall

Material Category	Wed		Thurs		Fri		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper	30.17	50.0	43.9	48.2	51.9	61.9	126.0	53.5
Cardboard	10.18	16.9	12.8	14.0	14.2	16.9	37.1	15.8
Shredded paper	4.67	7.7		0.0		0.0	4.7	2.0
Non recyclable	1.10	1.8	0.2	0.2	0.6	0.7	1.8	0.8
Total Paper	46.12	76.4	56.9	62.4	66.7	79.4	169.7	72.0
Plastic								
Rigid plastic	2.39	4.0	2.7	3.0	2.1	2.5	7.2	3.1
Non-rigid plastic	1.52	2.5	5.1	5.6	2.6	3.1	9.2	3.9
Polystyrene	0.50	0.8		0.0	0.0	0.0	0.5	0.2
Other plastic	2.65	4.4	2.2	2.4	2.8	3.3	7.6	3.2
Total Plastic	7.06	11.7	10.0	10.9	7.5	8.9	24.5	10.4
Glass								
Food containers	2.81	4.7	3.3	3.6	3.0	3.5	9.1	3.9
Other Glass and Ceramics	0.06	0.1	1.0	1.1	0.9	1.0	1.9	0.8
Total Glass	2.87	4.8	4.31	4.7	3.84	4.6	11.0	4.7
Metal								
Recyclable	1.98	3.3	2.8	3.0	2.5	0.0	7.3	3.1
Other	1.20	2.0	0.3	0.3	0.3	0.0	1.8	0.7
Total Metal	3.18	5.3	3.1	3.4	2.8	3.3	9.0	3.8
Beverage Containers		0.0	1.3	1.4	0.5	0.6	1.8	
Total Beverage Containers	0.00	0.0	1.3	1.4	0.5	0.6	1.8	0.7
Compostable Organics		0.0		0.0		0.0		
Edible food waste		0.0		0.0	0.3	0.3	0.3	0.1
Inedible food waste		0.0	0.0	0.0		0.0	0.0	0.0
Food in packaging		0.0		0.0		0.0	0.0	0.0
Food soiled paper		0.0	0.4	0.4	0.1	0.1	0.4	0.2
Yard and garden		0.0		0.0		0.0	0.0	0.0
Clean wood		0.0		0.0		0.0	0.0	0.0
Other non compostable organics		0.0		0.0		0.0	0.0	0.0
Total Compostable Organics	0.00	0.0	0.4	0.4	0.3	0.4	0.7	0.3
Hazardous Waste								
Batteries	0.01	0.0		0.0		0.0	0.0	0.0
Aerosols		0.0		0.0		0.0	0.0	0.0
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)		0.0		0.0		0.0	0.0	0.0
Mercury Items		0.0	0.3	0.3		0.0	0.3	0.1
Other HHW		0.0		0.0		0.0	0.0	0.0
Medical							0.0	0.0
Total Hazardous Waste	0.01	0.0	0.26	0.3	0.00	0.0	0.3	0.1
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics	0.03	0.0	0.3	0.3		0.0	0.3	0.1
Household Appliances		0.0		0.0		0.0	0.0	0.0
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0		0.0		0.0	0.0	0.0
Total Electronic Waste	0.03	0.0	0.26	0.3	0.00	0.0	0.3	0.1
Residual Waste								
Other Residual	1.07	1.8	14.8	16.3	2.4	2.8	18.2	7.7
Clothing/Footware		0.0		0.0		0.0	0.0	0.0
Building Materials		0.0		0.0		0.0	0.0	0.0
Hygiene		0.0		0.0		0.0	0.0	0.0
Animal Waste		0.0		0.0		0.0	0.0	0.0
Total Residual Waste	1.07	1.8	14.8	16.3	2.4	2.8	18.2	7.7
Total	60.34	100.0	91.20	100.0	83.96	100.0	235.5	100.0

Table 3: Organic Waste Composition – Fall

Material Category	Wed		Thurs		Friday		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper		0.0	1.8	2.3		0.0	1.8	0.4
Cardboard		0.0	0.3	0.4		0.0	0.3	0.1
Shredded paper		0.0		0.0		0.0	0.0	0.0
Non recyclable		0.0		0.0		0.0	0.0	0.0
Total Paper	0.00	0.0	2.0	2.7	0.0	0.0	2.0	0.4
Plastic								
Rigid plastic		0.0		0.0		0.0	0.0	0.0
Non-rigid plastic		0.0		0.0		0.0	0.0	0.0
Polystyrene		0.0		0.0		0.0	0.0	0.0
Other plastic		0.0		0.0		0.0	0.0	0.0
Total Plastic	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glass								
Food containers		0.0		0.0		0.0	0.0	0.0
Other Glass and Ceramics		0.0		0.0		0.0	0.0	0.0
Total Glass	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Metal								
Recyclable		0.0		0.0		0.0	0.0	0.0
Other		0.0		0.0		0.0	0.0	0.0
Total Metal	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beverage Containers		0.0		0.0		0.0	0.0	0.0
Total Beverage Containers	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compostable Organics		0.0		0.0		0.0		
Edible food waste		0.0		0.0	7.2	4.5	7.2	1.5
Inedible food waste	14.79	6.1	7.5	9.8	17.1	10.7	39.4	8.2
Food in packaging		0.0		0.0		0.0	0.0	0.0
Food soiled paper	0.64	0.3		0.0	1.3	0.8	1.9	0.4
Yard and garden	227.09	93.6	63.3	82.4	133.2	83.6	423.6	88.5
Clean wood		0.0		0.0		0.0	0.0	0.0
Other non compostable organics		0.0		0.0		0.0	0.0	0.0
Total Compostable Organics	242.52	99.9	70.8	92.1	158.7	99.6	472.1	98.6
Hazardous Waste								
Batteries		0.0		0.0		0.0	0.0	0.0
Aerosols		0.0		0.0		0.0	0.0	0.0
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)		0.0		0.0		0.0	0.0	0.0
Mercury Items		0.0		0.0		0.0	0.0	0.0
Other HHW		0.0		0.0		0.0	0.0	0.0
Medical							0.0	0.0
Total Hazardous Waste	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics		0.0		0.0		0.0	0.0	0.0
Household Appliances		0.0		0.0		0.0	0.0	0.0
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0		0.0		0.0	0.0	0.0
Total Electronic Waste	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Residual Waste								
Other Residual	0.14	0.1	4.0	5.2	0.6	0.4	4.7	1.0
Clothing/Foodware		0.0		0.0		0.0	0.0	0.0
Building Materials		0.0		0.0		0.0	0.0	0.0
Hygiene		0.0		0.0		0.0	0.0	0.0
Animal Waste		0.0		0.0		0.0	0.0	0.0
Total Residual Waste	0.14	0.1	4.0	5.2	0.6	0.4	4.7	1.0
Total	242.66	100.0	76.85	100.0	159.30	100.0	478.8	100.0

Appendix C. Waste Composition Totals from Summer and Fall Audits

Material Category	Garbage	Recycling	Organics	Total	
	Total Weight per Category (kg)	Total Weight per Category (kg)	Total Weight per Category (kg)	Total Weight per Category (kg)	%
Paper					
Mixed paper	154.2	263.8	7.0	425.0	10.5
Cardboard	24.4	90.7	2.1	117.2	2.9
Shredded paper	0.0	5.8	0.0	5.8	0.1
Non recyclable	37.2	4.2	0.0	41.4	1.0
Total Paper	215.8	364.5	9.0	589.3	14.6
Plastic					
Rigid plastic	32.3	19.9	0.3	52.5	1.3
Non-rigid plastic	28.2	18.3	0.1	46.7	1.2
Polystyrene	16.9	0.9	0.0	17.7	0.4
Other plastic	133.0	24.6	0.9	158.6	3.9
Total Plastic	210.3	63.7	1.3	275.4	6.8
Glass					
Food containers	20.9	29.0	0.0	49.8	1.2
Other Glass and Ceramics	15.7	4.2	0.4	20.2	0.5
Total Glass	36.5	33.1	0.4	70.0	1.7
Metal					
Recyclable	13.3	13.7	0.0	26.9	0.7
Other	29.0	2.5	0.0	31.5	0.8
Total Metal	42.3	16.1	0.0	58.4	1.4
Beverage Containers	14.7	12.8	0.1	27.5	
Total Beverage Containers	14.7	12.8	0.1	27.5	0.7
Compostable Organics					
Edible food waste	190.1	0.9	20.2	211.2	5.2
Inedible food waste	207.3	0.0	52.9	260.2	6.4
Food in packaging	148.3	0.0	0.0	148.3	3.7
Food soiled paper	57.3	1.2	12.3	70.8	1.8
Yard and garden	110.8	0.0	1434.2	1545.0	38.3
Clean wood	8.2	0.0	0.0	8.2	0.2
Other non compostable organics	24.4	0.1	0.0	24.5	0.6
Total Compostable Organics	746.4	2.2	1519.6	2268.2	56.2
Hazardous Waste					
Batteries	1.6	0.1	0.0	1.7	0.0
Aerosols	5.4	0.1	0.0	5.5	0.1
Paints/Stains	0.0	0.0	0.0	0.0	0.0
HHW (Product &/or Container)	3.1	0.0	0.0	3.1	0.1
Mercury Items	0.4	0.3	0.0	0.7	0.0
Other HHW	0.8	0.0	0.0	0.8	0.0
Medical	0.5	0.0	0.0	0.5	0.0
Total Hazardous Waste	11.8	0.4	0.0	12.2	0.3
Electronic Waste					
Audio/Visual	0.0	0.0	0.0	0.0	0.0
Personal Electronics	12.3	0.3	0.0	12.6	0.3
Household Appliances	2.2	0.0	0.0	2.2	0.1
Kitchen Appliances	0.0	0.0	0.0	0.0	0.0
Power Tools	0.0	0.0	0.0	0.0	0.0
Lawn & Garden	0.0	0.0	0.0	0.0	0.0
All Other Electronics	13.3	0.0	0.0	13.3	0.3
Total Electronic Waste	27.8	0.3	0.0	28.1	0.7
Residual Waste					
Other Residual	464.8	22.4	15.6	502.8	12.5
Clothing/Footware	94.3	0.0	0.0	94.3	2.3
Building Materials	8.2	0.0	0.0	8.2	0.2
Hygiene	77.0	0.0	0.0	77.0	1.9
Animal Waste	23.8	0.0	0.0	23.8	0.6
Total Residual Waste	668.0	22.5	15.6	706.1	17.5
Total	1973.6	515.8	1545.9	4035.2	100.0

Appendix D. Audit Sample Address

Table 1 shows the location of houses where samples were obtained.

Collection Day	Demographic Code	Neighbourhood	Street	House Numbers	No. of Houses
Wednesday	Declining	Brookwood	Brookside Avenue	1, 3, 5, 7, 9, 11, 13, 15, 17	9
		Broxton Park	McLeod Avenue	525, 523, 521, 519, 517, 515, 513, 511, 510	9
	Status Quo	Woodhaven	Wellington Crescent	125, 123, 121, 119, 117, 115, 113, 111, 109	9
Thursday	Growth	McLaughlin	Meadowland Circle	2, 4, 6, 8, 10, 12, 14, 16, 18	9
	Multi Housing	City Centre	Jespersion Avenue	316, 314, 312, 310, 308, 306, 304, 302, 300	9
	Single Family	Apenglen	Austin Court	2, 4, 6, 8, 10, 12, 14, 16, 18	9
		Legacy Park	Lamplight Drive	2, 4, 6, 8, 10, 12, 14, 16, 18	9
Friday	Growth	Harvest Ridge	Heron Point	2, 4, 6, 8, 10, 12, 14, 16	8
		Spruce Ridge	Sage Crescent	28, 26, 24, 22, 20, 18, 16, 14	8
	Status Quo	Hawthorne	Havenwood Court	2, 4, 6, 8, 10, 12, 14	7
		Heatherglen	Sunset Blvd	34, 32, 30, 28, 26, 24, 22	7
	Single Family	Deer Park	Deer Park Blvd.	50, 48, 46, 44, 42, 40, 38	7

Appendix E. City of Spruce Grove Technical Memo - Summer Audit

Background

A summer audit was conducted for the City of Spruce Grove June 8th to June 10th, 2016. The audit included material from the garbage, the recycling and the organic streams. A sample of 100 houses were selected from several neighbourhoods representing City demographics - declining, status quo, single family, multi-housing and growth. Single and row houses were included in the sample. The sample also included houses with the 120 litre garbage cart. GFL collected the samples from the different neighbourhoods over three days. Samples were brought to the old Public Works building where the garbage and the recycling streams were emptied inside the building and the organics emptied onto a concrete pad outside the building. A team of four people audited the materials received and sorted them into ten categories. The weight of material in each category was measured and recorded. Data was entered into a spreadsheet for data analysis. All weighing was completed in kilograms, then converted to tonnes for data analysis.

Results

It should be noted from the outset that these results represent a snapshot in time. Any extrapolations of this data are indicative rather than absolute.

The aggregate of the samples from all three collection days was analyzed, to represent a typical summer stream. Photos are included Appendix 1 of this technical memo. A shared link to additional photos will be provided in an email. The glossary, categories and sub-categories are described in Appendix A and the data for each material is shown in Appendix 2 Tables 1 to 3.

Black Cart Composition

The black cart is for garbage. The sample comprised of material from both small garbage carts (5 percent) and large (95 percent). This is consistent with the actual distribution of carts, as 5.4 percent of residents in Spruce Grove have the small garbage cart. The amount of garbage audited was 1.18 tonnes. Image 1 shows garbage from the Wednesday sample prior to being sorted.

Image 1 Garbage to be sorted

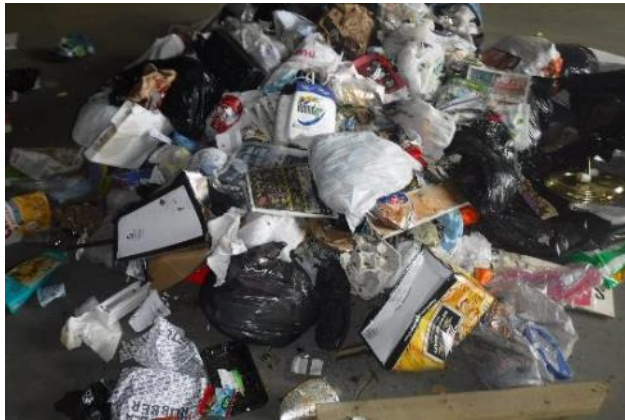


Figure 1 depicts the composition of the garbage in Spruce Grove.

The most prevalent categories in the garbage included Organics, Residual Waste, Paper and Plastic.

The Organics category consisted largely of yard waste, edible food including food in containers and inedible food such as peels. The Residual Waste category comprised mostly garbage that included diapers, hygiene, clothing, footwear, textiles, and building materials. The Paper category was mostly made up of mixed paper and some non-recyclable paper, while the Plastic category consisted largely of material referred to as Other Plastic, such as garbage bags, film, wrappers and crunchy plastic, unlabeled plastic like plant pots and plastic packaging.

Figure 1 Garbage Composition – Summer Audit

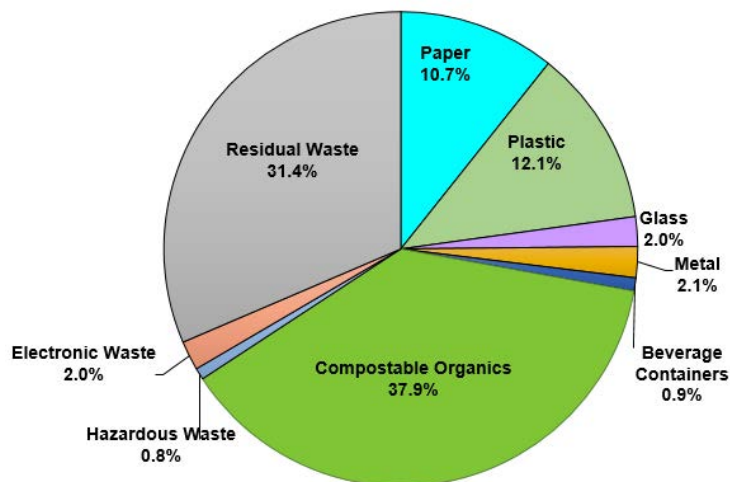


Table 1 depicts the division of the garbage (by category) into recyclable and non-recyclable streams. More details about the composition of garbage in the various waste categories included in these streams are depicted in Appendix 2, Table 1.

Table 1 Percentage of Recyclable and Non-Recyclable Material by Category – Garbage Stream

Category	R	NR
Paper	8.5%	2.2%
Plastic	2.9%	9.2%
Glass	1.0%	1.0%
Metal	0.6%	1.6%
Organic	35.2%	2.7%
Beverage	0.9%	-
HHW**	0.8%	-
Electronics**	2.0%	-
Residuals	-	31.4%

Notes: R = recyclable
 NR = non-recyclable
 ** = divertible program available

Blue Bag Composition

Recycling is collected in blue bags. Cardboard was generally not in blue bags and was stacked beside other carts or recycling bags for collection. The amount of recycling audited was 0.28 tonnes. Image 2 shows Friday’s recycling collection prior to being sorted.

Image 2 Recycling to be sorted



Figure 2 depicts the composition of the recycling in Spruce Grove.

The most prevalent categories in recycling include Paper, Plastic and Glass.

The Paper category consisted largely of mixed paper and cardboard. Plastic was mostly Other Plastic such as blue bags and film, rigid plastic and flexible plastics. Glass was almost entirely food jars.

Figure 2: Recycling Composition – Summer Audit

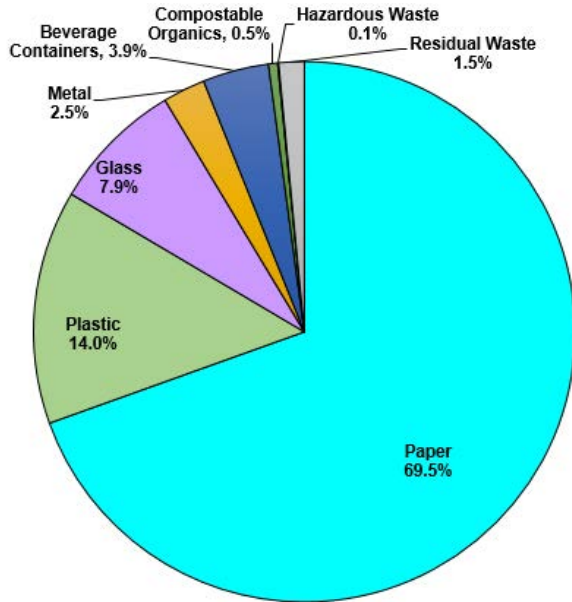


Table 2 depicts the division of the recycling (by category) into recyclable and non-recyclable streams. More recycling composition details can be found in Appendix 2, Table 2.

The contamination rate in recycling is 10.7 percent and is the sum of the non-recyclable materials in Table 2. This is a typical contamination rate, similar to those found in other municipal programs.

Spruce Grove residents are encouraged to place all glass and numbered plastics in a blue bag for recycling. However, GFL reports that non-rigid recyclables and glass are unwanted because they cannot be marketed. They represent 3.3 percent and 7.1 percent respectively, mostly making up the 10 percent residuals rate reported by GFL for the recycling stream. If these materials were considered to also be contaminants, the contaminant rate would jump from 10.7 percent to 21.1 percent.

Table 2: Percentage of Recyclable and Non-Recyclable Material by Category – Recycling Stream

Category	R	NR
Paper	67.8%	0.8%
Plastic	7.7%	6.1%
Glass	7.0%	0.8%
Metal	2.2%	0.3%
Organic	0.5%	0.0%
Beverage	3.9%	-
HHW**	0.1%	-
Electronics**	-	-
Residuals	-	2.7%

Notes: R = recyclable
 NR = non-recyclable
 ** = divertible program available

Green Cart Composition

The green cart is for organic material. The amount of organics audited was 1.07 tonnes. Image 3 shows Wednesday's organic waste sample before being sorted. Wednesday's volume was greater than that of the other two days.

Image 3: Organic waste to be sorted



The most prevalent categories in the green cart include Organic Waste followed by Residuals and Paper.

The Organic Waste was predominantly grass and yard waste (94.7%) which included branches, flowers, and yard trimmings, some edible food waste (1.2%) and inedible food waste (1.3%). The Residuals consisted of fines which was broken glass and organic material mixed. The Paper was made up of mixed paper and cardboard. The contamination of the green cart was low at 1.1 percent.

Table 3 depicts the division of the Organics (by category) into recyclable and non-recyclable streams. More details about the composition of Organics can be found in Appendix 3, Table 3.

Table 3: Percentage of Recyclable and Non-Recyclable Material by Category – Organic Stream

Category	R	NR
Paper	0.7%	-
Plastic	0.0%	0.1%
Glass	-	0.0%
Metal	-	-
Organic	98.2%	-
Beverage	0.0%	-
HHW**	-	-
Electronics**	-	-
Residuals	-	1.0%

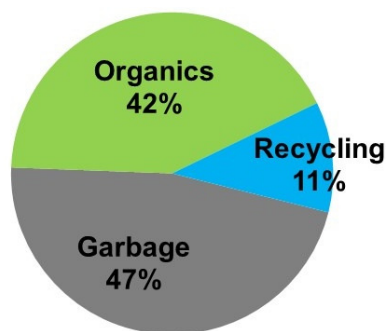
Notes: R = recyclable
 NR = non-recyclable
 ** = divertible program available

Further Analysis and Trends

Diversion Rate

The diversion rate is an indicator of the success of the program. This is the amount of recycling and organics divided by the total waste generated (garbage plus recycling and organics). The summer audit of residential waste collected at curbside found a diversion rate of 53%. This does not include waste from the Eco Centre.

Figure 3: Overall Waste Composition Summary



Set-Out Rate

The summer audit had a set-out rate of 81%. That means, out of 100 houses sampled, 81 put at least one material at the curb for collection. Possible reasons more houses did not set out a material during this period could include: the change in their pick-up schedule to an earlier time, knowledge that the large item event was the following week, the random house selection, or carts did not require emptying.

Set-Out Rate for Each Material

The average set-out rates were: garbage 78 percent, recycling was 40 percent, organics was 56 percent.

The breakdown by day is shown in Table 4. The number of house sampled each date were: Wednesday 27, Thursday 36 and Friday 37.

Table 4: Set-out Rate by Material by Audit Day.

Material	Wednesday	Thursday	Friday
Garbage	74%	78%	81%
Recycling	48%	33%	41%
Organics	48%	67%	51%

Appendix 1 - Photos from the Summer Audit



Photo 1: Recycling - Organic material contamination



Photo 2: Recycling - Cardboard



Photo 3: Recycling - Styrofoam contamination



Photo 4: Recycling - A birthday card with electronics between cardstock. Contamination



Photo 5: Recycling- Newspaper still in the plastic bag will be pulled and put into the residuals bin at the GFL facility.



Photo 6: Organics- Non-edible food in a compostable bag



Photo 7: Organics – cardboard and boxboard



Photo 8: Garbage - Packaged food



Photo 9: Garbage - unused product



Photo 10: Garbage- More food in the garbage and so was the hanging basket



Photo 9: Recycling-A birthday card with electronics between cardstock.



Photo 10: Recycling- Newspaper still in the plastic bag will be pulled and put into the residuals bin.

Appendix 3

Table 1: Garbage Composition – Summer

Material Category	Wed		Thurs		Friday		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper	31.69	10.1	19.4	4.4	29.5	6.9	80.5	6.8
Cardboard	3.40	1.1	9.5	2.2	6.5	1.5	19.4	1.6
Shredded paper		0.0		0.0		0.0	0.0	0.0
Non recyclable	1.15	0.4	20.0	4.5	5.3	1.3	26.5	2.2
Total Paper	36.24	11.5	48.8	11.1	41.3	9.7	126.4	10.7
Plastic								
Rigid plastic	6.68	2.1	7.2	1.6	6.2	1.5	20.1	1.7
Non-rigid plastic	3.87	1.2	3.4	0.8	7.0	1.6	14.2	1.2
Polystyrene	2.52	0.8	5.4	1.2	3.0	0.7	10.9	0.9
Other plastic	32.02	10.2	30.8	7.0	34.9	8.2	97.8	8.3
Total Plastic	45.09	14.3	46.8	10.6	51.1	12.0	142.9	12.1
Glass								
Food containers	4.47	1.4	2.5	0.6	5.2	1.2	12.2	1.0
Other Glass and Ceramics	6.23	2.0	3.4	0.8	2.1	0.5	11.7	1.0
Total Glass	10.70	3.4	5.87	1.3	7.30	1.7	23.9	2.0
Metal								
Recyclable	3.04	1.0	2.0	0.5	1.5	0.4	6.5	0.6
Other	6.05	1.9	7.3	1.7	5.1	1.2	18.4	1.6
Total Metal	9.09	2.9	9.3	2.1	6.6	1.5	24.9	2.1
Beverage Containers	2.54	0.8	4.1	0.9	3.9	0.9	10.5	0.9
Total Beverage Containers	2.54	0.8	4.1	0.9	3.9	0.9	10.5	0.9
Compostable Organics								
Edible food waste	34.42	10.9	26.0	5.9	39.9	9.4	100.3	8.5
Inedible food waste	15.16	4.8	44.6	10.1	47.2	11.1	107.0	9.1
Food in packaging	10.08	3.2	19.4	4.4	31.5	7.4	61.0	5.2
Food soiled paper, napkins, compostable TO	10.89	3.5	13.8	3.1	17.7	4.2	42.4	3.6
Yard and garden	20.85	6.6	38.5	8.7	46.0	10.8	105.3	8.9
Clean wood	0.42	0.1	7.1	1.6		0.0	7.5	0.6
Other compostable organics	3.26	1.0	7.0	1.6	14.2	3.3	24.4	2.1
Total Compostable Organics	95.08	30.2	156.4	35.5	196.4	46.2	447.9	37.9
Hazardous Waste								
Batteries	0.17	0.1	0.7	0.2	0.4	0.1	1.2	0.1
Aerosols	1.20	0.4	0.4	0.1	2.6	0.6	4.2	0.4
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)	2.72	0.9	0.2	0.1		0.0	3.0	0.3
Mercury Items	0.14	0.0		0.0	0.0	0.0	0.2	0.0
Other HHW	0.79	0.3		0.0		0.0	0.8	0.1
Total Hazardous Waste	5.01	1.6	1.40	0.3	2.95	0.7	9.4	0.8
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics	0.56	0.2	10.3	2.3	0.0	0.0	10.9	0.9
Household Appliances	1.32	0.4	0.8	0.2		0.0	2.2	0.2
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0	3.9	0.9	6.7	1.6	10.6	0.9
Total Electronic Waste	1.88	0.6	15.03	3.4	6.69	1.6	23.6	2.0
Residual Waste								
Other Residual	105.10	33.4	109.6	24.9	92.1	21.7	306.8	26.0
Clothing/Footwear/Textiles	3.95	1.3	38.1	8.6	16.6	3.9	58.6	5.0
Building Materials		0.0	5.0	1.1	0.6	0.1	5.6	0.5
Total Residual Waste	109.05	34.7	152.7	34.7	109.3	25.7	371.0	31.4
Total	314.68	100.0	440.32	100.0	425.46	100.0	1180.5	100.0

Table 2: Recycling Composition – Summer

Material Category	Wed		Thurs		Friday		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper	34.82	46.4	37.5	41.0	65.4	57.6	137.8	49.2
Cardboard	16.24	21.6	16.4	17.9	20.9	18.4	53.6	19.1
Shredded paper		0.0		0.0	1.1	1.0	1.1	0.4
Non recyclable	0.20	0.3	1.5	1.6	0.6	0.6	2.3	0.8
Total Paper	51.26	68.2	55.5	60.5	88.1	77.6	194.8	69.5
Plastic								
Rigid plastic	3.82	5.1	4.4	4.8	4.5	4.0	12.7	4.5
Non-rigid plastic	3.75	5.0	2.5	2.7	2.9	2.6	9.2	3.3
Polystyrene	0.13	0.2	0.1	0.1	0.2	0.1	0.3	0.1
Other plastic	6.14	8.2	4.3	4.7	6.6	5.8	17.0	6.1
Total Plastic	13.84	18.4	11.3	12.3	14.1	12.5	39.2	14.0
Glass								
Food containers	2.10	2.8	10.9	11.9	6.9	6.0	19.9	7.1
Other Glass and Ceramics	1.91	2.5		0.0	0.3	0.3	2.2	0.8
Total Glass	4.01	5.3	10.93	11.9	7.17	6.3	22.1	7.9
Metal								
Recyclable	2.26	3.0	1.2	1.4	2.9	2.5	6.4	2.3
Other	0.54	0.7	0.1	0.1	0.1	0.1	0.7	0.3
Total Metal	2.80	3.7	1.4	1.5	2.9	2.6	7.1	2.5
Beverage Containers	0.56	0.7	10.0	10.9	0.5	0.5	11.1	
Total Beverage Containers	0.56	0.7	10.0	10.9	0.5	0.5	11.1	3.9
Compostable Organics		0.0		0.0		0.0		
Edible food waste	0.67	0.9		0.0		0.0	0.7	0.2
Inedible food waste		0.0		0.0		0.0	0.0	0.0
Food in packaging		0.0		0.0		0.0	0.0	0.0
Food soiled paper, napkins, compostable TO	0.47	0.6		0.0	0.3	0.3	0.8	0.3
Yard and garden		0.0		0.0		0.0	0.0	0.0
Clean wood		0.0		0.0		0.0	0.0	0.0
Other compostable organics	0.04	0.1		0.0	0.1	0.0	0.1	0.0
Total Compostable Organics	1.18	1.6	0.0	0.0	0.4	0.3	1.5	0.5
Hazardous Waste								
Batteries		0.0	0.1	0.1	0.0	0.0	0.1	0.0
Aerosols		0.0	0.1	0.1		0.0	0.1	0.0
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)		0.0		0.0		0.0	0.0	0.0
Mercury Items		0.0		0.0		0.0	0.0	0.0
Other HHW		0.0		0.0		0.0	0.0	0.0
Total Hazardous Waste	0.00	0.0	0.15	0.2	0.02	0.0	0.2	0.1
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics		0.0		0.0		0.0	0.0	0.0
Household Appliances		0.0		0.0		0.0	0.0	0.0
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0		0.0		0.0	0.0	0.0
Total Electronic Waste	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Residual Waste								
Other Residual	1.48	2.0	2.5	2.8	0.2	0.2	4.2	1.5
Clothing/Footwear		0.0		0.0	0.0	0.0	0.0	0.0
Building Materials								
Total Residual Waste	1.48	2.0	2.5	2.8	0.2	0.2	4.2	1.5
Total	75.12	100.0	91.64	100.0	113.51	100.0	280.3	100.0

Table 3 – Organic Waste Composition – Summer

Material Category	Wed		Thurs		Friday		Total	
	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%	Weight per Category (kg)	%
Paper								
Mixed paper	5.22	1.0		0.0		0.0	5.2	0.5
Cardboard	1.09	0.2		0.0	0.7	0.3	1.8	0.2
Shredded paper		0.0		0.0		0.0	0.0	0.0
Non recyclable		0.0		0.0		0.0	0.0	0.0
Total Paper	6.31	1.2	0.0	0.0	0.7	0.3	7.0	0.7
Plastic								
Rigid plastic		0.0		0.0	0.3	0.1	0.3	0.0
Non-rigid plastic		0.0	0.1	0.0		0.0	0.1	0.0
Polystyrene		0.0		0.0		0.0	0.0	0.0
Other plastic		0.0		0.0	0.9	0.4	0.9	0.1
Total Plastic	0.00	0.0	0.1	0.0	1.2	0.5	1.3	0.1
Glass								
Food containers		0.0		0.0		0.0	0.0	0.0
Other Glass and Ceramics		0.0		0.0	0.4	0.2	0.4	0.0
Total Glass	0.00	0.0	0.00	0.0	0.38	0.2	0.4	0.0
Metal								
Recyclable		0.0		0.0		0.0	0.0	0.0
Other		0.0		0.0		0.0	0.0	0.0
Total Metal	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beverage Containers	0.06	0.0		0.0		0.0	0.1	
Total Beverage Containers	0.06	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Compostable Organics								
Edible food waste		0.0	12.7	3.9	0.4	0.2	13.0	1.2
Inedible food waste	4.10	0.8		0.0	9.4	4.4	13.5	1.3
Food in packaging		0.0		0.0		0.0	0.0	0.0
Food soiled paper, napkins, compostable TO		0.0	8.0	2.5	2.5	1.1	10.4	1.0
Yard and garden	514.58	97.4	302.4	93.5	193.6	90.0	1010.6	94.7
Clean wood		0.0		0.0		0.0	0.0	0.0
Other compostable organics		0.0		0.0		0.0	0.0	0.0
Total Compostable Organics	518.67	98.2	323.0	99.8	205.8	95.6	1047.5	98.2
Hazardous Waste								
Batteries		0.0		0.0		0.0	0.0	0.0
Aerosols		0.0		0.0		0.0	0.0	0.0
Paints/Stains		0.0		0.0		0.0	0.0	0.0
HHW (Product &/or Container)		0.0		0.0		0.0	0.0	0.0
Mercury Items		0.0		0.0		0.0	0.0	0.0
Other HHW		0.0		0.0		0.0	0.0	0.0
Total Hazardous Waste	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Electronic Waste								
Audio/Visual		0.0		0.0		0.0	0.0	0.0
Personal Electronics		0.0		0.0		0.0	0.0	0.0
Household Appliances		0.0		0.0		0.0	0.0	0.0
Kitchen Appliances		0.0		0.0		0.0	0.0	0.0
Power Tools		0.0		0.0		0.0	0.0	0.0
Lawn & Garden		0.0		0.0		0.0	0.0	0.0
All Other Electronics		0.0		0.0		0.0	0.0	0.0
Total Electronic Waste	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0
Residual Waste								
Other Residual	3.33	0.6	0.4	0.1	7.2	3.3	10.9	1.0
Clothing/Footware		0.0		0.0		0.0	0.0	0.0
Building Materials		0.0		0.0		0.0	0.0	0.0
Total Residual Waste	3.33	0.6	0.4	0.1	7.2	3.3	10.9	1.0
Total	528.37	100.0	323.52	100.0	215.22	100.0	1067.1	100.0

Appendix F. Interviews

Alberta Environment and Parks (AEP)

Pat Kane | *Section Head, Waste Policy Section*

Shelleen Lakusta | *Senior Waste Policy Advisor*

- A new government results in the shuffling of priorities. The topic of waste is not one of the top five, and is down on the list to be presented to the ministerial staff.
- Government does not want to be involved in stewardship programs and will be removing fees from the regulations when they have the chance to talk with the ministry about these changes. They prefer an advisory role, leaving industry or consumer stewards to manage the program. They would like to see expansion on the types of electronics and automotive containers collected. As recycling doesn't pay for itself, a stewardship program could build up funds, and allow municipalities to access those funds to divert materials. The government is involved with the Household Hazardous Waste program.
- Municipalities should continue to communicate their needs to the government.
- All policies require consultation with the stakeholders, a write-up of findings and further consultation. Changing policy takes time.
- The Capital Waste Minimization Committee is a technical group and a standalone committee from the Capital Regional Board. (The board group has legislative ties to planning.)
- Words of advice – Ask yourself what you want to achieve, then focus on that goal.
- The measurement that has the least ambiguity among municipalities is what is disposed to a landfill.

Good for Life (GFL)

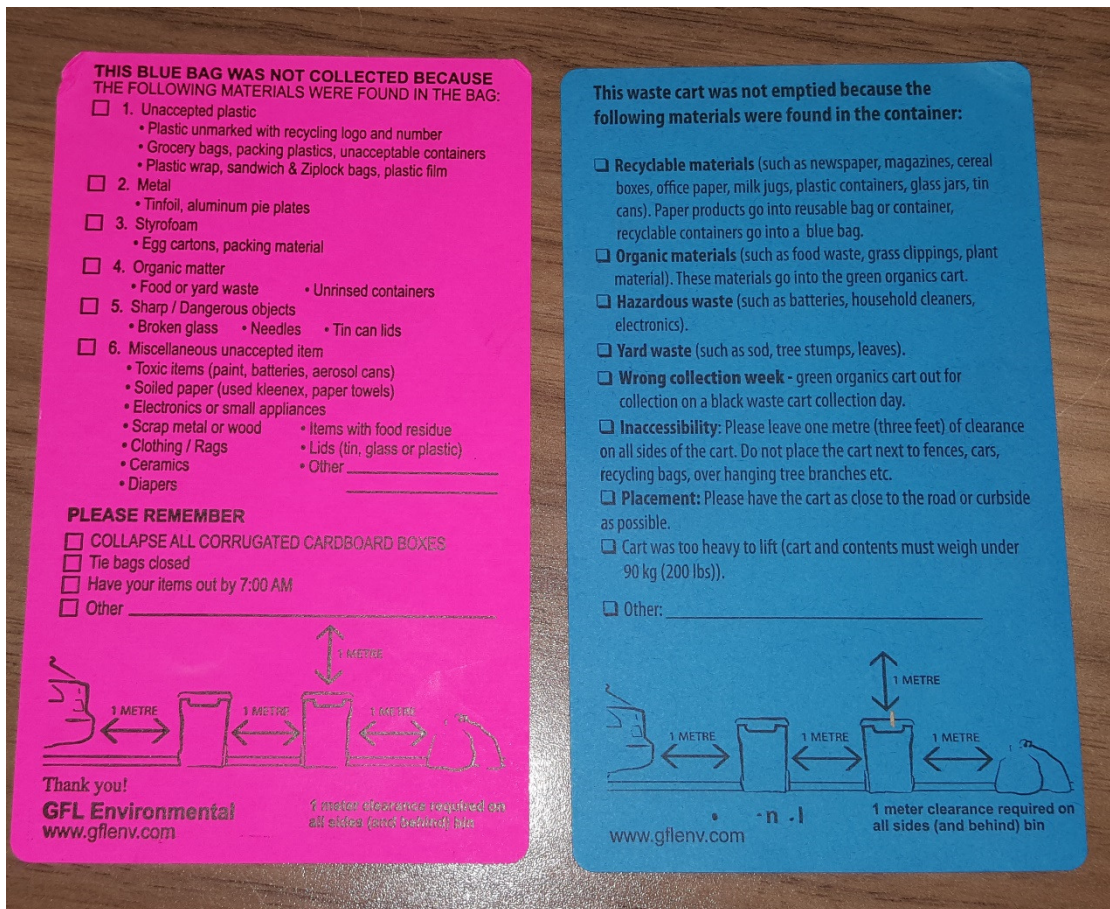
Lorenzo Donini | *Manager, Materials Processing and Municipal Development*

- Change the large item pickup; limited to two large items and two electronic recycling items.
- The GFL truck has a frame for a 7 x 12 foot sign Spruce Grove could access. Spruce Grove would be responsible for designing the image on Coroplast.
- Regarding tagging homeowners that set out carts or recycling bags in non-compliance – in the past, politics in the City of Spruce Grove have restricted how much tagging and leaving of garbage can take place. Although they may be open to it, once homeowners start complaining the process has been stopped.
- With an election in 2017, we need to do more talking and education and then bring out a new program in 2018.
- When Spruce Grove decides to make big changes, do it all at the same time and go big.
- If there is going to be any impact on diversion, you need to reduce the collection of garbage to every second week.
- From his experience, in-house waste collection is more expensive because of the asset aspect. Think about going to every second week pickup and having your own trucks and your own people – that isn't good use of time. If you are clear on what you need, then GFL can be the company to support you.
- GFL recycling processing terminology: an out-throw is a material that is recycled in the blue bag but accidentally gets baled into the wrong recycling stream. For instance, in the making of a bale of newspaper if a yogurt container accidentally gets processed with the newspaper it is called an

out-throw. Ideally, that yogurt container would have been pulled off the conveyor belt and baled with like plastic. Contamination is something that is not recyclable and should not be in the blue bag in the first place, like a Barbie, a toy truck (which should be thrown in the garbage) and wax paper or an ice cream container (can be put into the green cart or the garbage).

- Another interesting observation that shows unacceptable paper (i.e. wax paper) that is baled with newspaper and processed together is when there are yellow or black flecks in the newsprint. These flecks lowers the newspaper grade.
- Strathcona County is a municipality that is relentless in their messaging to the community. They also change the message regularly. It would be worth connecting with this group to see how Spruce Grove can utilize their ideas.
- RFID tags can easily be popped into the handle of a cart.
- Mattresses could be picked up for recycling at a cost of \$15 per mattress – this is something to be discussed.
- Advice: The blue bag and green organics cart are underutilized. Maximize those programs and get items that are in the garbage into those streams.

Image Appendix F-1 Example of the GFL tags being used



Kevin Stener | Director of Public Works

- The Eco Centre is underutilized. People should go to this location for those large items that they hoard and dump on the street once a year.
- There are big plans for the new Eco Centre, which could result in no more free cycle week or large item recycling. These two programs are a headache, with many calls and complaints. As well, the large item program is expensive as the disposal of those items is covered by Spruce Grove.
- Picking up items for free sends the wrong message.
- A business case would be required regarding mattress collection. There is no pick up service offered for tires, so why pick up mattresses? How does the user cover that cost?
- At the current location of the Eco Centre, the situation remains status quo until the Eco Centre gets moved to the Public Works property in late 2019.
- Why do you want to collect information, and what would you do with that information if RFID tags are installed?
- Look at programs from a cost analysis perspective, then discuss the best place to put effort. Right now, the curbside program is covering for the Eco Centre operations. If there were no large item pickup and people had to come to the Eco Centre to manage waste, additional revenue would be collected and the Eco Centre would be able to offer more.
- No interest in homeowner compost sale, have them go to the retail outlets.

Jennifer Hetherington | *Manager of Corporate Communications*

- Jennifer deals with all external communication avenues for all departments by developing communications plans (where, what to expect, timing) and the guiding messages.
- Communication includes status quo avenues: social media, the website, and newspaper. It could include Pulse magazine (running 2 years).
- When new ideas come forward that go outside of status quo guidelines, there is little that can be done, especially if it is not part of the corporate plan.
- Initiatives need to be part of the corporate budget and communications should be part of the discussion, so time and resources can be allocated.
- Spruce Grove's population growth has an impact on their department.
- Communication messages are geared to adults.
- Receiving timely information would be useful. For instance, she was unaware that lids were required to be closed on garbage carts. When cart lids are not closed, they will not be picked up.
- A negative response on social media looks bad, and requires a reactive response, diverting resources to curb the negativity. Social media response is another reason to stop the free cycle and large item collection, as social media channels are always messy during that period. Communication in the past has always been reactive to requests from waste.
- The community is fairly happy, and since it's an election year we want to keep it that way.
- Electronic billboards are in place for non-profits and public works.
- Get into the schools and educate the children.
- She is not ready to have the program shift to garbage collection every two weeks, because of the negative response on social media.
- In 2017, an app will be launched to help homeowners know what materials go where.
- Advice: At events in town, host workshops and teach people about recycling or diverting organics to the green organics cart.

Robert Cotterill | *City Manager*

- Robert is the City Manager and has experience with waste management programs across

Canada.

- Spruce Grove is seen by residents as a clean city, and he thinks if a program supports that view then residents will support any program.
- Have the Green Team pre-visit a homeowner to check for non-compliance. He supports a tagging program, but continue to take the material away. Don't fine the resident.
- Schools are where you teach the children, then what they learn comes home. They teach their parents.
- Believes that the private sector is cheaper than if the City did their own collection services.
- Advice: If people are forced to do something that is new, if they need it they will look at the closest government body to help.

Ed McLean | *Councillor and Chair for the Capital Waste Minimization Advisory Committee*

- Ed is on City Council and is Chair for the Capital Waste Minimization Advisory Committee. He lives in Spruce Grove (a requirement for being on Council).
- Ed presented a big picture view about getting Alberta on board to reduce what goes to the landfill. He liked that other municipalities had the same types and colours of carts, same collection of materials, and the same way to calculate diversion.
- Communication and talking with the public is key. He said he learned more about what was contamination in the blue bag then he has known in the past just by talking with Stacey Schaub-Szabo. He spoke about a 'Meet Your Council' event in Stony Plain hosted at the McDonalds. That might be something to do when we want to talk about waste.
- Spruce Grove's open market event is a great venue to have a presence to talk about the recycling programs.
- He would like to see more literature or education and communication about recycling and what items belong in the garbage – using images. He would also like ideas to mitigate the smell of the green organics cart and kitchen catcher. What happens if a cart is broken? Where do we get a new one?
- Advice: Have addresses on all the carts. That way, if you have bylaw or the Green Team or GFL checking a cart they have a reference that can easily be recorded.

Appendix G. Municipality Interviews

St. Albert

Contact	<p>Christian Benson, Manager, Environment Strategic Services & Environment, P: 780-459-1746 cbenson@stalbert.ca</p> <p>City of St. Albert 5 St. Anne Street St. Albert, AB T8N 3Z9, cbenson@stalbert.ca www.stalbert.ca</p>
Demographics	<p>Population: 63,255 (2014) / 64, 645 (2016)</p> <p>Number of total households: 22,290 (2011); 26,364(2015) where</p> <p>What percentage of their city consists of businesses compared to residential? 82% residential and 18% commercial.</p> <p>See the Economic Development Report which is a quarterly report.</p>
Garbage tonnages	<p>Residential Waste Tonnages: 7,687 tonnes (2015)</p> <p>Number of houses collected. 19,800 households</p> <p>Who do you collect from? No commercial, just households</p> <p>What is the criteria? NA</p> <p>Averages or last 5 years. Four waste streams</p> <p>Garbage, 7,687 metric tonnes</p> <p>Recycling 4,840 metric tonnes</p> <p>Organics 9,320 metric tonnes</p> <p>E-waste 191 metric tonnes</p>
Commercial	No commercial
Residential Tonnages	
Garbage (tonnes)	7,687 metric tonnes (2015)
Recycling (tonnes)	4,840 metric tonnes (2015)
Organics (tonnes)	9,320 metric tonnes (2015)
Specify other materials and their tonnes. Add rows if needed.	<p>87,000 Litres paint (2015)</p> <p>34,400 Litres household hazardous waste (2015)</p> <p>29,900 Litres oil (2015)</p> <p>4,023 aerosol cans/other (2015)</p> <p>5,389 dry cell kg batteries (2015)</p>

	3,827 Kg fluorescent bulbs (2015) 4,531 aerosol cans/paints (2015) 431 batteries (2015) 18 tires (full cages) (2015)	
Contractor collecting garbage organics recycling HHW OTHER	Contractors or service providers processing the materials. Garbage in house, brown bin, internal staff Organic and recycling GFL DBS environmental hazardous Does this have a cost or could be municipal staff collecting? Can't be disclosure but it is a monthly fee per house	
Residential Fees	What do the residents pay for the services? Utility bill includes 3 sizes for carts: 60 Litre container = \$1.1 120 Litre container = \$4.64 240 Litre container = \$9.56 Recycling program = \$4.91 Curbside organics = \$5.8 Size of waste cart is chosen by clients Recycling is mandatory Flat fee \$ 7.24 (2016)	
Waste bans	Bylaws follow, no landfill bans	
Diversion rate Is this a residential diversion rate or a city diversion rate?	65 percent (from the past 4 years) - 2015 - the highest in the province and country Diversion rate is calculated by taking the total amount of waste and discount organic plus recycling and e waste collected per year. St Albert follows standard; some municipalities include other parameters. Some gaps include a bit more marginalized broken glass, no buried, no productive.	
Details about the residential programs (add in urls)		
Garbage	Collection	Carts has 3 choices for carts, 60, 120, 240
	Garbage limits	Bi weekly

	Large item collection days	Twice a year, two drop off events per year.
	Other – state specifically	
	Where taken	Transfer station: Roseridge
Recycling	Collection	Curbside, carts, blue bag for recycling, brown bin for garbage and green bin for organics.
	Depot	Recycling depot opens 40hours a week, from Tuesday to Saturday
	Where taken, who processes	GFL contractor
Organics	Collection	Automated cart program, GFL operates
	Depot	NW compost depot, 15 years old. Transfer station, temporary.
	Seasonal programs	4 weeks in fall for leaves collection, residential program and Christmas week for trees collection.
	Where taken, who operates	Internal staff
HHW	HHW (tires, paint, electronics)	Attached recycling depot
	Where taken, who operates	City staff and taken by DBS environmental for incineration.
Public Communication	<p>What methods does the city connect with residents about their programs? Surveys, yearly annual reports, website or send to residents directly.</p> <p>Do you conduct audits? No formal audits, staff do it for individual bins. Check the route every month.</p> <p>Do you do stakeholder surveys? Yes, yearly, satisfaction survey, five years a waste program survey, city website, community satisfaction yearly, environmental perception survey every 5 years.</p> <p>Do you have newsletters? <u>As part of the city</u></p> <p>“Take it or leave it Program”, event on June 25th.</p> <p>Each year, Public Works organizes the Take It Or Leave It event to give residents a chance to unload unwanted items and to pick up</p>	

	<p>items that they may want.</p> <p>https://stalbert.ca/experience/community-calendar/city-events/take-it-or-leave-it</p>
Waste Goals	75% waste diversion by 2020.
Legislation	GHG proposed for the province, tax, everything regulated by province, electronics, paints, etc..
Additional Comments	Taking a GHGe claim for carbon offsets, hazardous GHGe oil and recycling, find a contractor to claim these carbon credits.

Additional Questions:

St. Albert performs informal, on-street audits by our operations staff with the intention of avoiding contamination. The audits are not formal and we do not currently have any statistics.

St. Albert is in contract with Roseridge Landfill Commission for organic processing of the residential organic program. GFL may take material to different processing facilities for other municipalities based on their own respective contracts.

No formal audit information, but by comparing summer collection (with yard waste) to winter collection (without the yard waste) the City estimates 15 percent – 20 percent of organic collection is kitchen/food scraps by weight.

The City runs a handful of ads and communication materials per year. Recently, we updated our communications with a new ‘Quick Sort’ Guide.

https://stalbert.ca/uploads/PDF-infosheets/Solid-Waste_Quick-Sorting-Guide.pdf

There are no plans currently to implement a landfill ban on organic or recyclable material

Important Links

1. Report on the Environment 2015. <https://stalbert.ca/uploads/PDF-reports/ReportOnTheEnvironment-2015.pdf>
2. Billing Rates 2016: <https://stalbert.ca/living-here/utilities/accounts-and-rates/billing-rates/>
3. RESIDENTIAL SOLID WASTE MANAGEMENT BYLAW 24/2011 <https://stalbert.ca/uploads/legislative/ResidentialSolidWasteConsolByBL36-2015EffectiveJan1-2016.pdf>
4. Landfill - <http://www.roseridge.ab.ca/>

Strathcona County

Contact	<p>Leah Seabrook, Manager Waste Management Services, 780-416-6797, leah.seabrook@strathcona.ca</p>
Demographics	<p>Population: 95597 (2016)</p> <p>Number of total households:</p> <p>Number of Single family: # 28,481</p> <p>Number of Multi-family (duplex and townhouses): #4043</p> <p>Number of Apartments: #2177</p> <p>Others? Manufacture Homes - 924</p> <p>What percentage of their city consists of businesses compared to residential? Not available</p>
Garbage tonnages	<p>Residential Waste Tonnages: 13,218 (2015)</p> <p>Number of houses collected. Approximately 28,100</p> <p>Who do you collect from? (single-family dwellings, multi-unit, apartments, condos) All single family (urban/hamlets), about 80 percent of rural single family, and about 50 percent of multi-family</p> <p>What is the criteria? (For example apartment buildings with 8 or less units, etc.) We only service multifamily duplex/row housing. We do not service apartment buildings.</p>
Commercial	<p>Non-Residential</p> <p>ICI tonnages: (averages or past 5 years) Not available</p> <p>Please also indicate any anomalies, like a large building being torn down.</p> <p>C&D – what is done with this stream? Left to manage privately</p> <p>Multi-family tonnages (Averages): do not have this information separated for our collections, nor do we track for private collections</p> <p>For ICI and Multi-Family what is the total waste going to landfill, and what percentage of that would be from the ICI or multi-family community or the residential community? Do not capture this information.</p> <p>Do you have any special plan with this group? – We created a bylaw in 2015 requiring apartment buildings to have at minimum recycling for old buildings.</p>

	Any new buildings coming online will be required to set up for the full program (ie. Organics), however they handle this privately.
Residential Tonnages	
Garbage (tonnes)	Might be the same as above (year) see above .
Recycling (tonnes)	7780 tonnes
Organics (tonnes)	12,119 tonnes
Contractor collecting garbage organics recycling HHW OTHER	Contractors or service providers processing the materials. All curbside streams collected by GFL Contracted costs.
Residential Fees	Curbside services are covered under the utility rate of \$25.50 per month on average (2015/2016) Our recycle stations are covered under the tax rate. What the actual contractor service fees are or processing fees are? – This is contractual information and cannot share
Waste bans	Any bylaws in their community or where they take their garbage? Yes, see our website. http://www.strathcona.ca/files/files/at-lls-bylaws-39-2014wastemanagementbylaw.pdf
Diversion rate Is this a residential diversion rate or a city diversion rate?	60% (2015) Diverted/Total Collected = diversion rate <i>Diversion is the garbage landfilled plus residuals/total waste. Waste is garbage plus recycling plus organics</i> We take average of residuals and subtract them from our diverted numbers. <i>How accurate are your numbers?</i> We do audits on loads to get an average and then use that number for our

		residuals. We do not have the ability with our processors to have exact numbers each and every load/month.
Garbage	Collection	Curbside – automated waste/organics, manual recycling. We also have recycle stations and an enviro service building (HHW, etc.)
	Garbage limits	Biweekly collection
	Large item collection days	Twice a year, two items per household
	Where taken	Rosieridge
Recycling	Collection	Manual collection of unlimited recycling (blue bags)
	Depot	See our website http://www.strathcona.ca/departments/utilities/waste-collection-recycling/recycling/recycling-stations/
	Where taken, who processes	GFL
Organics	Collection	Automated collection – weekly from mid April-mid October, biweekly in winter months.
	Depot	Brush and yard waste collection
	Seasonal programs	Extra yard waste collection two times per year.
	Where taken, who operates	GFL – Biocycle, City of Edmonton processes our brush and yard waste from our depot.
HHW	HHW (tires, paint, electronics)	See our website
	Where taken, who operates	Various, but mainly EnviroSort for HHW, GEEP for electronics, GFL for oil
Public Communication	<p>What methods does the city connect with residents about their programs? – Web, annual calendar, social media, app, public outreach, newspaper,</p> <p>Do you conduct audits? We have a curbside auditing program in the summer. We try to do informal load audits of each stream two times per year.</p> <p>Do you do stakeholder surveys? – every two years</p>	
Waste Goals	70% diversion by 2018	

Legislation	<p>Proposed legislation that is affecting your municipality</p> <p>Lack of legislation is affecting our program</p>
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Additional Information

GLF holds our contract and they subcontract to Biocycle.

We have been starting to change our stickers for carts to inform more about food waste, however this is our next target area in terms of marketing and communication, so have not done much yet.

Appendix:

Waste collection and recycling: <http://www.strathcona.ca/departments/utilities/waste-collection-recycling/>

Waste collection services from Strathcona County include a curbside recycling program, organics collection and roll-out collection carts.

This collection system known as the Green Routine has the potential to divert 89 per cent of our waste from going to the landfill! Your efforts, now, will help make sure we have a healthy community for future generations

Programs include:

- Composting
- Recycling stations
- Broadview Enviroservice Station
- Large item pick up
- Extra yard waste collection

Town of Stony Plain

Contact	Miles Dibble, Sustainability Planner (780-963-8651 – m.dibble@stonyplain.com)
Demographics	<p>Population: 16,127 (2015)</p> <p>Number of total households: 6,829 (2013)</p> <p>Number of Single family: 4,241 (2013)</p> <p>Number of Multi-family (duplex and townhouses): 936 (2013)</p> <p>Number of Apartments: 1,652 (2013)</p> <p>What percentage of their city consists of businesses compared to residential? Unknown</p>
Garbage tonnages	<p>Residential Waste Tonnages: See below for the amounts and above for the number of dwellings.</p> <p>Who do you collect from? Single-family dwellings and some multi-unit dwelling</p> <p>What is the criteria? Street accessibility or historically pickup for some multi-unit dwelling buildings</p> <p>Averages or last 5 years. See below</p> <p>Please also include any changes that would have affected the numbers recently. New residential growth</p> <p>Any audits conducted and results?</p>
Commercial	<p>Confirm if multi-family and ICI are picked up by private haulers. ICI is and most multi-unit dwellings are as well</p> <p>Non-Residential</p> <p>ICI tonnages: Unknown</p> <p>Please also indicate any anomalies, like a large building being torn down. N/A</p> <p>C&D – what is done with this stream? Unknown</p> <p>Multi-family tonnages: Unknown</p> <p>For ICI and Multi-Family what is the total waste going to landfill, and What % of that would be from the ICI or multi-family community or the</p>

	<p>residential community? Both unknown</p> <p>Do you have any special plan with this group? Overall no, some multi-unit dwellings received municipal pickup though</p>
Residential Tonnages	
Garbage (tonnes)	2869 (2014)
Recycling (tonnes)	1354 (2014)
Organics (tonnes)	2787 (2014)
Specify other materials and their tonnes.	E-Waste: 67 (2014) & Paint 26 (2014)
Contractor collecting Garbage, organics, recycling, HHW, OTHER	<p>Contractors or service providers processing the materials. Unknown.</p> <p>Please list the materials each service provider processes. N/A</p> <p>Does this have a cost or could be municipal staff collecting? N/A</p>
Residential Fees	<p>What do the residents pay for the services? In 2015, \$21.13 for non-apartments, \$12.95 for apartments and \$8.20 for senior apartments</p> <p>May be in tax rate. Unknown</p> <p>What the actual contractor service fees are or processing fees are? Unknown</p>
Waste bans	<p>Any bylaws in their community or where they take their garbage? None</p>
Diversion rate Is this a residential diversion rate or a city diversion rate?	<p>% and (year) Use provided data to calculate</p> <p><i>How this is calculated?</i> At your discretion</p> <p><i>Please mention any gaps in calculating this.</i> Up to you</p> <p><i>Diversion is the garbage landfilled plus residuals/total waste.</i> Usually Not</p> <p><i>Waste is garbage plus recycling plus organics.</i> Yes but sometimes includes e-waste and paint (recycled)</p>

	<p><i>How accurate are your numbers?</i> Relatively</p> <p><i>Where are the gaps?</i> ICI and multi-unit dwellings, annual large item pick up (treasure hunt)</p>	
Details about the residential programs (http://www.stonyplain.com/Town-Services/Garbage-and-Recycling.htm)		
Garbage	Collection	Carts and bins
	Garbage limits	Bi-weekly for carts, bins depend on site
	Large item collection days	Annual Treasure Hunt
	Where taken	Unknown
Recycling	Collection	Curbside, carts
	Depot	Rotary Recycling Centre
	Where taken, who processes	Unknown
Organics	Collection	Carts
	Depot	Bin available at depot
	Seasonal programs	Annual e-waste and hazardous material round-up
	Where taken, who operates	Unknown
HHW	HHW (tires, paint, electronics)	Rotary Recycling Centre and annual event
	Where taken, who operates	Unknown
Public Communication	<p>What methods does the city connect with residents about their programs? Social media, website and letters</p> <p>Do you conduct audits? No</p> <p>Do you do stakeholder surveys? Unknown</p> <p>Do you have newsletters, is there something on the website you really like? Trash Talk</p>	

Waste Goals	Does the community have a direction that they are going? Not specifically.
Legislation	Proposed legislation that is affecting your municipality. None known
Additional Comments	GHG benefits or trends. Diversion rates have increased the past 5 years or so <ul style="list-style-type: none"> - Any situations, like landfill capacity almost up, that is impacting their planning. No public landfills in the area.

Additional Information

We have not conducted any official audits, but informally have not seen any significant differences in contamination levels between single detached dwellings and multi-unit dwellings (due note that the use of the term "family" in reference to housing should be avoided, as the number of families in a dwelling may vary and is not necessarily dependent upon it being a single detached home or a multi-unit dwelling)

Our waste collection provider is GFL for all of the cart and curbside collection. There are more than one company for takes the material found in the recycling depot.

The Town provides information to residents via the website, social media, a waste app and via mailouts.

Important Links

<http://www.stonyplain.com/Town-Services/Garbage-and-Recycling.htm>

The Town of Stony Plain is committed to protecting the environment. In fact, Environmental Responsibility is one of the five themes of the Town's Municipal Development Plan. This commitment to reducing waste at the source is further evidenced by the strategic action items described in the Town's *Environmental Stewardship Strategy*

Fort Saskatchewan

Contact	Bradley McDonald, Utility Manager, 780-992-6259, bmcDonald@fortsask.ca
Demographics <i>*one duplex = 2 households; Ft Sask does not have counts splitting duplex from detached</i>	Population: 24,040 Number of total households: 9600 Number of Detached/Semi-Detached/Duplex*: 6870 Number of Multi-family (townhouses): 793 Number of Apartments: 1891 Others: Acreage/Rural: 46 What percentage of their city consists of businesses compared to residential? 5%
Garbage tonnages	Residential Waste Tonnages: 5,029tonnes (excluding recycling & organics); 2015; From 7,600 curbside customers (households) Who do you collect from? All residential (we do not have statistics for the 2,200 households serviced by front-load) What is the criteria? Any property occupied as a residence. Method of collection varies based on site-by-site considerations. Averages or last 5 years. AVG 4704 tonne/yr 2011-2015 Please also include any changes that would have affected the numbers recently. Increase in overall waste generation reflects population growth, recent slow-down in year-over-year increases (6% increase 2011-2012 and '12-'13 vs. 1% increase '14-'15) not yet analyzed or explained. Any audits conducted and results? Document on file
Commercial	Non-Residential ICI tonnages: (averages or past 5 years) Franchise Agreement – all ICI customers use a common hauler. However, each account is independent and service level determined by customer based on a standard 'menu' and hauler invoices customer directly. We do not have any data on tonnages or diversion. C&D – what is done with this stream? Private Haulers. Some

	<p>material is brought to our municipal transfer station by commercial haulers and individual residents and that material is landfilled. Other haulers or residents might bring it to a facility where it is sorted. We do not have data.</p> <p>Multi-family tonnages (Averages):</p> <p>Collected by City contractor, service level set by City and we bill the customer; no data is available for this sector.</p> <p>For ICI and Multi-Family what is the total waste going to landfill, and What % of that would be from the ICI or multi-family community or the residential community? UNKNOWN</p> <p>Do you have any special plan with this group?</p> <p>Co-mingled Recycling service is available to both multi-unit residential and ICI sectors. Affordable organics service will be introduced in 2018*. Under new contract we will be requiring hauler to provide a scale on the front-load truck to track (for statistical purposes) the material collected from each site.</p> <p>*ICI sector contractor offers organic service but it is not known what the participation rate is; the service is substantially more costly than our current residential service and we are looking for options to provide economies of scale to the ICI sector.</p>
Residential Tonnages	
Garbage (tonnes)	Same as above – 5,029 tne
Recycling (tonnes)	1,071 tne; 2015; 7,600 curbside households
Organics (tonnes)	291 tne; 2015; 1,000 curbside households (pilot program)
Contractor collecting garbage organics recycling HHW, OTHER	<p>Progressive Waste Solutions is contracted by the City to collect / process / dispose residential recycling, organics, and waste</p> <p>GFL has a franchise agreement to collect/process/dispose ICI sector waste, recycle, and organics</p> <p>HHW collected at Transfer Station or Toxic Round-up</p>
Residential Fees	\$25/mon curbside; \$15/mon/unit front-load – Fully Utility Funded
Waste bans	At this time, only “common-sense” restrictions such as HHW or

	biologically hazardous; no restrictions on volume or mandatory diversion at this time	
Diversion rate Is this a residential diversion rate or a city diversion rate?	<p>21% (2015) – CURBSIDE DIVERSION</p> <p><i>(Curbside Recycle + Curbside Organics) / (Total Curbside Material)</i></p> <ul style="list-style-type: none"> ■ Based on truck-ticket summary provided by contractor <p><i>Only includes materials collected through curbside service</i></p> <p><i>Residuals in diverted streams not reported</i></p> <p><i>How accurate are your numbers? As accurate as the truck-ticket report provided by the contractor – these tickets form the basis of payment through contract, so accuracy is required.</i></p> <p><i>Where are the gaps?</i></p> <ul style="list-style-type: none"> ■ we do not have data for multi-unit residential ■ we do not have data for ICI ■ calculating diversion at the transfer station is difficult (C&D mixed with household waste, yard waste, etc.; material at that site includes out-of-town waste) ■ Significant volume of yard waste dropped-off by residents not counted ■ “Grass-Cycling”, home composting, etc. not counted 	
Details about the residential programs (add in urls) fortsask.ca/waste		
Garbage	Collection	Weekly, manual (e.g. bags,cans)
	Garbage limits	none
	Large item collection days	once per year in April
	Other – state specifically	
	Where taken	Private landfill
Recycling	Collection	Weekly, manual (e.g. blue-bag)
	Depot	8,609 111 ST – recycling open 24 hours Sorted materials (paper, plastic, glass, cans); cardboard, scrap metal, Re-usable accepted daily during staffed hours (9-5 Apr-Oct, 11-5 Nov-Mar)
	Where taken, who processes	Haul contractor keeps co-mingled and sorted material and processes at private MRF Scrap metal hauled to a buyer

		Other materials through program (e.g. ARMA)
Organics	Collection	Curbside organics pilot program by contract
	Depot	grass/leaves open 24 hours, Branches/brush accepted daily during staffed hours
	Seasonal programs	Natural Christmas Tree collection, January
	Where taken, who operates	Curbside material to private facility; City compost pile for yard-waste drop-off
HHW	HHW (tires, paint, electronics)	See staffed hours above ARMA – paint, tires, electronics Motor oil, glycol Fluorescent bulbs/ballasts, all batteries, propane tanks, smoke detectors, empty extinguishers Clean Farms program pesticide containers Toxic Round-up Event in May
	Where taken, who operates	City operates drop-off facility; materials taken by registered processors or specialized collectors
Public Communication	<p>What methods does the city connect with residents about their programs? Website, newspaper; we will be launching Recollect APP in late 2016, early 2017</p> <p>Do you conduct audits? Last audit 2014; next in 2019</p> <p>Do you do stakeholder surveys? Last survey 2015; next to be determined</p> <p>Do you have newsletters, is there something on the website you really like? No. We will be overhauling our communications plan next year. We are looking forward to the Recollect App launch.</p>	
Waste Goals	Implement organics collection and increase diversion to 55% or better	
Legislation	Proposed legislation that is affecting your municipality We look forward to the revised/updated Recycle Designation	
Additional Comments	Our diversion rate is among the lowest in the region, especially among communities our size Desire to control cost increases	

Additional Information

2014 audit; was limited to curbside collection

Progressive Waste has been taking residential organics to Clean-it Green-it (stopped taking to Clover Bar as they were rejecting loads to frequently, Clean-it Green-it seems less fussy about minor contamination)

From the 2014 audit of the area receiving separate organics collection 100% of the yard waste was diverted but only a small fraction of the food waste. Food waste promotion, we haven't. But we definitely need to.

Important Links <http://www.fortsask.ca/residents/organics-waste-recycling>

Town of Beaumont

<p>Contact</p>	<p>Sadie Miller, Environmental Sustainability Coordinator Sadie.Miller@beaumont.ab.ca 780-929-4306</p>
<p>Demographics</p>	<p>Population: 17,720 What percentage of their city consists of businesses compared to residential? 5% business, 95% residential</p>
<p>Garbage tonnages</p>	<p>Residential Waste Tonnages: 3,367.3 MT total in 2015 (5,018 households)</p> <p>Who do you collect from? (Single-family dwellings, multi-unit, apartments, condos): Single-family residential (with some apartment/condo complexes, subject to Town approval.</p> <p>What is the criteria? (For example apartment buildings with 8 or less units, etc.): Single-family, townhouses, residential. Apartment buildings, multi-unit, etc. have to apply/request services from the Town. Typically if the automated waste truck can collect in their area, the request will get approved).</p> <p>Averages or last 5 years: 4,022 MT/year average from 2011-2015</p> <p>Please also include any changes that would have affected the numbers recently. -Switched to bi-weekly waste collection in 2014 -Switched to automated cart collection in 2012/2013 -Introduced organics collection in 2013</p> <p>Any audits conducted and results? -In house audit to determine popular contaminants, no solid percentages or diversion rates recorded. Results indicated a high number of recyclables in the waste stream.</p>
<p>Commercial</p>	<p>Non-Residential ICI tonnages: Non-Residential/ICI are collected independently and the Town does not have any of this information. C&D – what is done with this stream? – Independent collection. Multi-family tonnages (Averages): Independent. The stats from Multi-Family units that the Town does service are included with the Residential stats.</p> <p>Do you have any special plan with this group?</p>

	-We are hoping to run a pilot project and draft an ICI/Multi-Family waste bylaw in 2017/18. Long term plans are to service this group and mandate the 3 stream program.
Residential Tonnages	
Garbage (tonnes)	3,367.3 MT (2015)
Recycling (tonnes)	851 MT (2015)
Organics (tonnes)	1,384.9 (2015)
Contractor collecting garbage organics recycling HHW OTHER	<p>Contractors or service providers processing the materials</p> <ul style="list-style-type: none"> -GFL Environmental collects all 3 streams -Waste & Organics sent to LDRWMF; GFL processes recycling -HHW and e-waste collected at annual round-up event. Contractors hired each year. This year it was Shankled Computer Recycling and DBS Environmental. <p>Does this have a cost or could be municipal staff collecting?</p> <ul style="list-style-type: none"> -Waste, organics and recycling collection and processing is charged through our Utilities. Round-up events are grant funded through Alberta Recycling.
Residential Fees	<p>What do the residents pay for the services?</p> <ul style="list-style-type: none"> -\$27.58/month. -Solid waste services are not subsidized by taxes. <p>What the actual contractor service fees are or processing fees are?</p> <ul style="list-style-type: none"> -\$30,258/month, \$28,452/month and \$22,480/month for waste, organics and recycling respectively. -Recycling processing fees are dependent on the quantity received each month. Most recent was \$6,378 for the month of May.
Waste bans	<p>Any bylaws in their community or where they take their garbage?</p> <ul style="list-style-type: none"> -Waste Management Bylaw, outlines collection rules. -All waste and organics is brought to the Leduc and District Regional Waste Management Facility
Diversion rate Is this a residential diversion rate or a city diversion rate?	<p>40% in 2015. This includes all Town services offered by GFL Environmental (residential, Town buildings and the odd Multi-Family)</p> <p><i>How this is calculated?</i></p> <ul style="list-style-type: none"> -Annual totals: organics + recycling +roundups/solid waste <p><i>Please mention any gaps in calculating this.</i></p> <ul style="list-style-type: none"> -Does not include any residuals that are landfilled from organics or recycling stream

		<p>-Does not include additional services, such as seasonal yard waste bins</p> <p><i>How accurate are your numbers?</i></p> <p>-Hard to say. We try to get monthly residuals from the contractor but they are either approximate or not available at all.</p> <p><i>Where are the gaps?</i></p> <p>-No ICI/Multi-Family/C&D numbers included</p> <p>-Residual numbers. We don't know how much of the organics getting collected is actually organic.</p>
Details about the residential programs (add in urls)		
Garbage	Collection	Curbside, 240 L carts
	Garbage limits	Bi-weekly collection
	Large item collection days	Drop-off once a year (no curbside collection)
	Other – state specifically	HHW, E-waste Round up
	Where taken	LDRWMF
Recycling	Collection	Curbside, blue bags
	Depot	No Depot – residents must take extras to Leduc or Edmonton
	Where taken, who processes	GFL Environmental
Organics	Collection	Curbside, 240 L Carts
	Seasonal programs	Additional yard waste picked up curbside twice a year (one week in spring, one week in summer) -yard waste bin available throughout spring, summer and fall for leaves, grass and twigs
	Where taken, who operates	GFL Environmental for all services
HHW	HHW (tires, paint, electronics)	Annual round-up event OR taken to LDRWMF
	Where taken, who operates	Shanked Computer Recycling and DBS Environmental did our round-up event this year. All items brought to the LDRWMF are taken care of on their end.
Public Communication	<p>What methods does the city connect with residents about their programs?</p> <p>-Newspaper ads</p> <p>-Annual mail-outs with collection calendar and additional info</p>	

	<ul style="list-style-type: none"> -Solid Waste Information Booklet -Keep it Green Beaumont solid waste app <p>Do you conduct audits?</p> <ul style="list-style-type: none"> -No, not regularly. The last formal audit was done in 2011 or 2012 <p>Do you do stakeholder surveys?</p> <ul style="list-style-type: none"> -No, but we will be when we launch the ICI/Multi-Family pilot projects
Waste Goals	<p>Does the community have a direction that they are going?</p> <ul style="list-style-type: none"> -We are striving for 80% diversion.
Legislation	<p>Proposed legislation that is affecting your municipality</p>
Additional Comments	<p>Pressure from landfill to reduce waste due to their limited ability to accept MSW.</p>

Additional Information:

Our audit wasn't specific enough to know this. If contamination is different between single and multi-family. It was a very quick and general in-house audit, and our contractor didn't even indicate which houses/units he had collected from. We also don't offer collection for the majority of multi-family houses in Beaumont, so we would have very limited information on this regardless.

We are a member of the Leduc and District Regional Waste Management Authority and therefore the Authority ultimately decides where our organics go. GFL is only responsible for collecting our green carts and depositing/stockpiling the contents at the landfill. Right now, our organics are being brought to Bio-Cycle in Strathmore. Previously they were brought to Hairy Hill Integrated Bio-Refinery, but this facility shut down last year.

We only conducted an in-house audit on our grey (waste) carts and there was very limited amounts of yard waste in the small sample we gathered. Our residents are generally very good at putting yard waste into their organics bin, or bringing it to our Operation's Facility where we provide a bin for extra yard waste. Audits on our grey waste carts showed a significant amount of food waste and recyclables, but not yard waste. So food waste could go into the carts but are not.

We have yet to do a dedicated food waste campaign, but would like to do that this year. General advertising, such as lists of What Goes Where in the newspaper and on social media are our primary communication tools. We also have the Keep it Green Beaumont app for solid waste which we promote heavily. We occasionally piggy back off of a local fundraising group that sells compost to help explain to residents the value food waste can have.

Important Links <http://www.beaumont.ab.ca/>

Curbside Collection Program,
<http://www.beaumont.ab.ca/pages.php?pg1=1005&pg2=2006&pg3=3002&pg4=4003>

Cochrane

Contact	Fabrizio Bertolo Manager, Waste & Recycling Direct: 403-851-2294
Demographics	Population: number (year this is from) 25, 100 (2015) Number of total households: 8300 + 400 condos Number of Single family: # included on total households Number of Multi-family (duplex and townhouses): # Number of Apartments: # all included on total households What percentage of their city consists of businesses compared to residential? Just residential
Garbage tonnages	Residential Waste Tonnages: Number. And year this is from Number of houses collected. Curbside 3,700 tonnes (2015) 3,300 tonnes from Ecocentre (2015) Who do you collect from? (single-family dwellings, multi-unit, apartments, condos) From all, but not breakdown available What is the criteria? (For example apartment buildings with 8 or less units, etc.) Except condos, apartments no collected, town house as much as possible, we try to collect all of them, some have their own collection services. Dwellings are willing to be part of the program. Averages or last 5 years. Without including Ecocentre 2012: 4,100; 2013: 4,500; 2014: 4,900 Please also include any changes that would have affected the numbers recently. Population growth, 10 – 12% increase of population. Any audits conducted and results? No
Commercial	No information available
Residential Tonnages	
Garbage (tonnes)	Might be the same as above (year) Curbside 3,700 tonnes (2015) 3,300 tonnes from Ecocentre (2015)
Recycling (tonnes)	For curbside program 1, 680 tonnes
Organics (tonnes)	We don't have an organics curbside program yet (will be implemented in April 2017)

	However, Eco Centre accepts organics and until now it receives more yard waste than food scraps.	
Specify other materials and their tonnes. Add rows if needed.	Eco centre Review Zero waste framework. 2012 approved by the Council.	
Contractor collecting Garbage, organics Recycling, HHW OTHER	Contractors or service providers processing the materials. GFL for recyclables and also garbage Eco Center has HHW, Clean Harbor Does this have a cost or could be municipal staff collecting? Yes, mostly hauling to take from Eco Center	
Residential Fees	What do the residents pay for the services? \$20.55 curbside collection. Eco centre charge is open for business, residents. Business get charge \$5/ month for using Eco centre.	
Waste bans	Any bylaws in their community or where they take their garbage? City of Calgary have a landfill ban strategy that affects Cochrane as we use their landfills. The City of Calgary has a goal for 2018 for no accepting recyclables to landfill and 2019 no organics to landfill. In 2011 they started with the curbside program.	
Diversion rate Is this a residential diversion rate or a city diversion rate?	21% (2015) Including Eco centre 46% <i>How this is calculated? Total waste – diverted waste</i> <i>Please mention any gaps in calculating this. No consider contamination in the waste collected.</i> <i>Diversion is the garbage landfilled plus residuals/total waste. Waste is garbage plus recycling plus organics</i> <i>How accurate are your numbers? 90% accurate for 2015 and 100% for 2016</i>	
Garbage	Collection	Curbside
	Garbage limits	Weekly
	Large item collection days	Not collected but accept it at Eco centre
	Where taken	Garbage landfill, Spyhill in Calgary, 20mins from Cochrane Large items are recycled as much as possible
Recycling	Collection	Curbside, weekly
	Depot	Eco centre Tuesday to Saturday 10am to 6pm
	Where taken, who processes	Municipal Eco center manage, The material goes to different private companies. GFL

Organics	Collection	Town of Cochrane doesn't have organics carts No curbside but Ecocentre receives yard waste and organics that it is send to a composting facility.
	Seasonal programs	Christmas tree pick up from households
	Where taken, who operates	Municipality
HHW	HHW (tires, paint, electronics)	Ecocentre Paints are managed by Clean Harbors through Alberta Recycling program E-waste is managed by Alberta Recycling program. Geep for electronics
Public Communication	<p>What methods does the city connect with residents about their programs? Social media, events in town, festivals, markets, talking and engaging residents, send brochures through utility bill, town of Cochrane's website.</p> <p>Do you conduct audits? No, but we did one this year.</p> <p>Do you do stakeholder surveys? 2013, residence survey</p> <p>Do you have newsletters, is there something on the website you really like?</p> <p>No newsletters but website is interesting, it advises on how to reduce waste, for recycling and residents especially, and communication campaign.</p>	
Waste Goals	<p>Does the community have a direction that they are going?</p> <p>80% diversion by 2020</p>	
Legislation	<p>Proposed legislation that is affecting your municipality. City of Calgary's strategy for organics and recycling is directly affecting Cochrane's strategy to reduce waste.</p>	
Additional Comments	<p>GHG benefits or trends.</p> <ul style="list-style-type: none"> - GHG e is working a lot for organic programs to achieve goal of waste diversion, the recycling program is working very good. 	

Links

<http://www.cochrane.ca/199/Waste-Recycling>

- **Organics**
At their meeting May 25, 2015 Cochrane Council approved moving ahead with an organics diversion strategy, including curbside organics collection, to be implemented in April 2017. Watch for news and updates.
- **Pay-As-You-Throw Waste Disposal**
Dispose of extra bagged household waste and miscellaneous small waste items (for a small fee: \$2 per bag or \$20 per level truck load. This program lasts all year.

- **Food Waste Composting**

Bring food waste to the Cochrane Eco Centre where it will be turned into high-quality garden and landscape compost! Acceptable items:

Includes, Fruit and vegetable peelings and waste, Egg shells, Tea bags, coffee filters and coffee grounds, Pasta, rice, bread, Meat bits and bones. Please bring your food waste in a sealed bucket or 100% compostable bag and empty into the designated bin. This program lasts all year.

City of Leduc

Contact	Pamela Goertzen, Environmental Sustainability assistant, 780-980-7198 ext 6042 pgoertzen@leduc.ca
Demographics	<p>Population: 30,498 (2016)</p> <p>Number of total households: 8,369 households receive curbside collection by the city</p> <p>Number of Single family: #</p> <p>Number of Multi-family (duplex and townhouses): #</p> <p>Number of Apartments: #</p> <p>There are approx. 70 multi family buildings in Leduc. The total number of units is not readily available.</p> <p>What percentage of their city consists of businesses compared to residential? Info not readily available</p>
Material Tonnages at a high level	
Garbage tonnages	<p>Residential Waste Tonnages: waste = 3,395 tonnes,</p> <p>Who do you collect from? (single-family dwellings, multi-unit, apartments, condos)</p> <p>Single family and multi-family buildings with max of 6 units.</p>
Commercial	<p>Confirm if multi-family and ICI are picked up by private haulers.</p> <p>These are all collected by private haulers</p> <p>Non-Residential</p> <p>Multi-family tonnages (Averages): NA</p> <p>Do you have any special plan with this group?</p> <p>We have completed a stakeholder engagement process with commercial and multi-family to determine how we can include them on our waste diversion plans.</p>
Residential Tonnages	
Garbage (tonnes)	3,395 tonnes
Recycling (tonnes)	1,328 tonnes
Organics (tonnes)	2,375 tonnes (2015 and number of households in 2015 was 8,072)
Contractor collecting Garbage, organics, Recycling, HHW, OTHER	<p>Contractors or service providers processing the materials.</p> <p>GFL</p> <p>Please list the materials each service provider processes.</p> <p>Waste, recycling and organics</p>
Residential Fees	<p>What do the residents pay for the services? \$21/month utility fee</p> <p>What the actual contractor service fees are or processing fees are?</p>

	I don't believe our contract allows us to share this information.	
Waste bans	Any bylaws in their community or where they take their garbage? None	
Diversion rate Is this a residential diversion rate or a city diversion rate?	52% in 2015 <i>Diversion is the garbage landfilled plus residuals/total waste. Waste is garbage plus recycling plus organics</i> <i>How accurate are your numbers? Based on weigh scale tickets. Accuracy is affected by not including contaminants that are pull from the recycling stream and organics stream and landfilled.</i>	
Garbage	Collection	Curbside, carts
	Garbage limits	1 cart every other week
	Large item collection days	Once a year
	Other – state specifically	Extra cart can be rented for \$10 a month
	Where taken	Leduc and District Regional waste mgmt. facility
Recycling	Collection	Curbside bags
	Depot	Mon, tues, fri, sat 8-5 Wed, Thurs 9-6 Blue bags, HHW, paint, ewaste, organics, used oil,waste (first bag free then \$2 a bag)
	Where taken, who processes	Municipal depot, multiple process deal with materials. Recycling is processed by GFL, cardboard by WM
Organics	Collection	Curbside carts
	Depot	Yard waste transfer stations open 24 hrs
	Seasonal programs	None
	Where taken, who operates	Municipally operated, taken to landfill
HHW	HHW (tires, paint, electronics)	Paint, HHW and ewaste – no tires
	Where taken, who operates	Paint, HHW – DBS Ewaste – ecycle Used oil – van Brabant oil
Public Communication	What methods does the city connect with residents about their programs? Advertising, public events, social media, city newsletter, displays in city facilities. Do you conduct audits? <i>yes</i> Do you do stakeholder surveys? <i>Yes</i>	

	<p>Do you have newsletters, is there something on the website you really like?</p> <p>The sort smart app is popular</p>
Waste Goals	65% waste diversion by 2021
Additional Comments	Landfill will be at capacity for wet waste in 2018

Additional Information:

We have only conducted audits of single family residents.

They used to be taken to the Anaerobic Digester in Hairy Hill. Since that has been shut down, they are now taking them to Bio-Cycle in Strathmore.

We have a comprehensive marketing strategy that involves all media mediums. The focus is largely on proper sorting and not necessarily just on food scraps. Limiting the size of waste bin and providing bi weekly waste collection has helped with getting food scraps into the organics carts.

You mentioned that landfill will be at capacity for wet waste in 2018 – What does that mean? Is the City going to be banning organics going into the garbage – how are they intending to manage this. Is this residential or any garbage? The landfill authority is still looking at their options regarding landfill capacity. A ban on organics is not currently being considered. If an on-site solution cannot be found, waste will need to be shipped elsewhere. The landfill is used by residential and commercial customers.

Important Links

<http://www.leduc-county.com/services/waste-and-recycling>

For more information on the Residential Waste Sort and Residential Summer Waste Sort Reports visit: <http://www.leduc-county.com/services/waste-and-recycling#sthash.6qdiBEm.dpuf>

Okotoks

Contact	<p>Paul Lyons, Phone: (403) 995-2775, Manager, Waste Services</p> <p>Email: plyons@okotoks.ca, 400-1118 North Railway St., Okotoks, Alberta T1S 1K1</p>
Demographics	<p>Population: number (year this is from) 28,016 (2015)</p> <p>Number of total households: 9,857 (2015)</p> <p>Number of Single family: # 7,795 (2015)</p> <p>Number of Multi-family (duplex and townhouses): # 513 (2015)</p> <p>Number of Apartments: # 1,237 (2015)</p> <p>Others?</p> <p>What percentage of their city consists of businesses compared to residential?</p>
Material Tonnages at a high level	
Garbage tonnages	<p>Residential Waste Tonnages:</p> <p>4, 000 tonnes (2015)</p> <p>Who do you collect from? (single-family dwellings, multi-unit, apartments, condos) : Single family, few apartments,</p> <p>What is the criteria? (For example apartment buildings with 8 or less units, etc.) Arbitrary, few buildings, 20 businesses.</p> <p>Carts 120 Litres in size</p> <p>Averages or last 5 years. = 3,851 tonnes</p> <p><u>2011</u>: 3,789, <u>2012</u>: 3,596, <u>2013</u>: 3,914, <u>2014</u>: 3,956, <u>2015</u>: 4,000</p> <p>Please also include any changes that would have affected the numbers recently. Early this week (June 2016) council approve a comprehensive program, it states that after October 1st will collect organics with blue cart and then garbage, we anticipate 25% decline of all garbage in 2017.</p> <p>Any audits conducted and results? No</p>
Commercial	<p>Non-Residential Private are doing all the other</p> <p>Please also indicate any anomalies, like a large building being torn down.</p> <p>None</p> <p>Multi-family tonnages (Averages): No</p> <p>Do you have any special plan with this group?</p> <p>By law might be this year or next year might mandate ICI to increase diversion.</p>
Residential Tonnages	

Garbage (tonnes)	4,000 (2015)
Recycling (tonnes)	2015 – Including electronics waste, plastic, fiber, 2,939 tonnes including organics
Organics (tonnes)	Grass and leaves, food waste from residential, drop off program, 45 tonnes of food waste (2015)
Specify other materials and their tonnes. Add rows if needed.	755 tonnes grass and leaves 1,852 tonnes recyclable material includes regular recyclable, plastic, Al, fiber, glass. Waste streams: e-waste (60 tonnes), garbage, organic and recycling
Contractor collecting garbage organics recycling HHW OTHER	Contractors or service providers processing the materials. RMW Consulting Remain process is in town of Okotoks Organics (grass and leaves): Foothills landfill for composting, food waste for environment ENCICEN, Please list the materials each service provider processes. HHW: BBS environmental GEEP e waste Does this have a cost or could be municipal staff collecting? Garbage is collected by the City of Okotoks, Recycling RMW Food waste Enviro can Grass drop off transported to the landfill All cost associated funded through utilities, no tax base
Residential Fees	What do the residents pay for the services? Current \$20.50 per month / residential. What the actual contractor service fees are or processing fees are? Build on the residential fee
Waste bans	Any bylaws in their community or where they take their garbage? No waste bans, residents can choose , participating in the week collection, no limit, in what they can take to the landfill residential can buy more bags
Diversion rate Is this a residential diversion rate or a city diversion rate?	Haven't tracked what is going to the landfill from residential. 2015, 38% monthly basis, 41% (year) <i>How this is calculated? Tonnage of garbage, tonnage of recycling and organics. Factor taking garbage and were not taking to the landfill</i> <i>Please mention any gaps in calculating this. Different ways of calculating.</i> <i>Hard to determine what gaps exist or not exist.</i> <i>Diversion is the garbage landfilled plus residuals/total waste. Waste is</i>

	<i>garbage plus recycling plus organics</i> <i>How accurate are your numbers? 99% straight from chart from internal documents</i> <i>Mention the residential element vs the entire city (it's hard to get ICI numbers for example) Almost impossible to get ICI numbers, until is mandatory collection with ICI, no formal arrangement multiple contractors, different business models, no communicate</i>	
Garbage	Collection	Carts : 120 litre 180 litre for garbage 240 litre for recycling 120 litre for food waste (October)
	Garbage limits	Garbage and everything weekly.
	Large item collection days	None
	Where taken	Directly to the landfill
Recycling	Collection	carts
	Depot	Depot open 7 times a week, from 9am – 5pm. Monday to Saturday and Sunday 11am – 5pm
	Where taken, who processes	Municipal or private, name of the location: <i>See above</i>
Organics	Collection	<i>See above</i>
	Seasonal programs	Seasonal programs for leaves and branches from April to October.
	Where taken, who operates	Municipal
HHW	HHW (tires, paint, electronics)	Electronics and paint
	Where taken, who operates	IBB environmental
Public Communication	What methods does the city connect with residents about their programs? <i>Newsletter, local newspaper, quite a number public communication going to events, website, advertisements</i> Do you conduct audits? <i>No</i> Do you do stakeholder surveys? <i>No but will do some this year,</i> Do you have newsletters, is there something on the website you really like? <i>Newsletter, comprehensive website, very creative providing new info,</i>	

	updated
Waste Goals	80% diversion rate by 2020.
Legislation	Proposed legislation that is affecting your municipality. No from a waste perspective, missing expanding produce responsibility, we can't recycle a lot of material like polystyrene, Styrofoam.
Additional Comments	None, plan based on environmental initiatives, get food waste or more compostable materials. Programs environmentally driven, we are planning to achieve our target and the results we want, with a positive result to landfill.

Additional Information:

Envirocan takes it material to any of its facilities (Penhold, Strathmore, Taber etc.)

755 tons of grass and leaves we recycled last year

Organics cart will be rolled out for October 2016,

Not currently looking at banning organics going to the garbage.

Important Links

<http://www.okotoks.ca/doing-business/okotoks-advantage/quick-facts-demographics>

<http://www.okotoks.ca/search/gss/waste>