

INTEGRATED WASTE MANAGEMENT ANNUAL REPORT 2012



The Environmental Services Branch provides Waste Handling services and Waste Reduction initiatives on behalf of the City of Saskatoon.

The goal of the Waste Handling Service is to provide efficient, effective, and customer-oriented waste management services. Waste Handling includes solid waste collections, the management of City-owned garbage carts, and the operation of the Saskatoon Regional Waste Management Facility (Landfill) to ensure solid waste is managed in a safe and environmentally sound manner. The design and operations of the Landfill are optimized to maximize the available space within the facility.

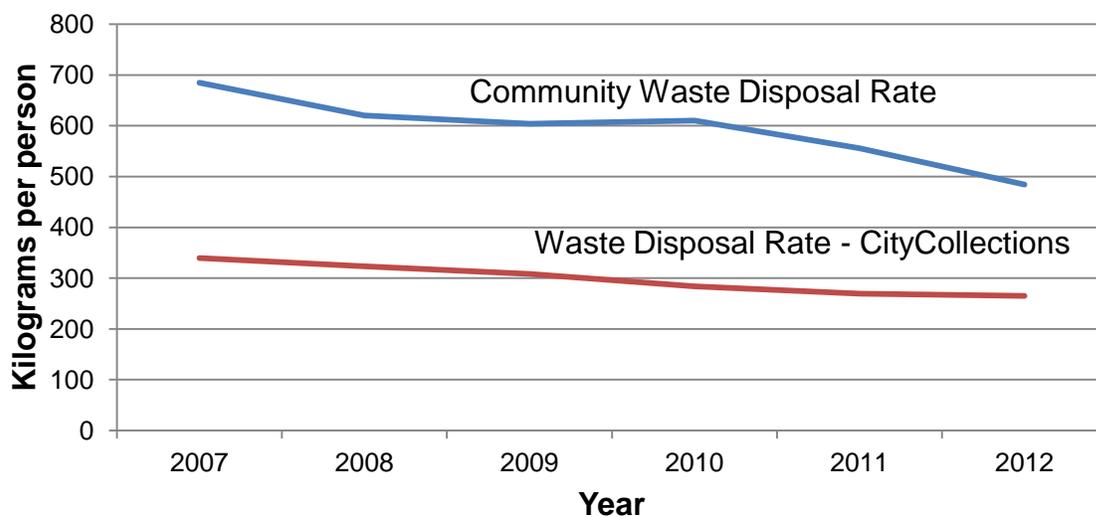
The goal of Waste Reduction is to provide a focus on reducing, reusing, recycling, and recapturing resources while seeking operational efficiencies. Initiatives under this program include recycling contracts for curbside and multi-unit dwellings, support for recycling depots located across the community, composting of yard waste at drop-off depots, and the residential subscription yard waste collection initiative. Performance toward waste reduction goals is contained in the Saskatoon Waste and Recycling Plan.

Our Customer

Saskatoon residents are the key customer for Waste Handling and Reduction services. Businesses and regional customers also make use of the various services available.

Many people in Saskatoon recycle and as a result, the community waste disposal rate has been falling. According to the National Solid Waste Benchmarking report (in which Saskatoon participated), Saskatoon residential waste disposal rates (City Collections) are higher than the Canadian average of 256 kilograms per person and are equal to the Saskatchewan average of 286 kilograms per person.

Community Waste Disposal Rate



The 2012 Citizen Satisfaction Survey highlighted the confidence residents have in the waste services provided by the City of Saskatoon. Garbage collection was listed as a

critical strength of the corporation having both high importance to residents and strong performance on their behalf.

The following ratings (out of ten) for performance were noted in the 2012 report.

Service	Performance Rating	Trend
Recycling initiatives	Phone: 5.9 Online: 5.7	Improved satisfaction
Landfill services	Phone: 7.1 Online: 7.0	Improved satisfaction
Garbage collection	Phone: 7.7 Online: 7.6	Improved satisfaction

Waste Handling Services have been provided at a competitive cost to Saskatoon taxpayers. Average annual costs for solid waste management services in Canada ranged from \$80 per household to over \$200 per household. In Saskatoon these services cost \$114.89 per household in 2012 (\$12.07 per household per month). Residential (curbside) collection services cost \$70.68 per household. \$44.20 per household was incurred in disposal costs at the Landfill.

Our People

Employees engaged in Integrated Waste Management work in the Environmental Services Branch of the Utility Services Department. Four (4) hold professional designations as either Engineer (2 PEng), Planner (1 MCIP), or Environmental Professional (1 EP). In addition, seven (7) employees hold certifications from the Solid Waste Association of North America (SWANA) including Manager of Landfill Operations (3 certifications), Certified Landfill Technical Associates (3 certifications), Manager of Recycling Systems (1 certification) and Manager of Compost Operations (1 certification).

Environmental Services employees are passionate about the work they do and providing value to the residents of Saskatoon. In 2012 employees were asked for their feedback on 'life' within Environmental Services. A survey tool was used to provide a snap-shot on perceptions of whether the culture of the Branch appropriately honours the contributions they make to citizens and the corporation. Talking Circles provided a further opportunity to share ideas for improvements in relation to the issues identified in the survey.

Employee satisfaction is generally high among employees at 86%. Strengths noted include a sense of teamwork, good internal communications, strong work-group supervisors, and the level of attention given to safety within the work-place.

2011 was a banner year for Environmental Services with respect to safety, with no loss time incidences recorded. In 2012 worker hours increased by 18.2% and the loss time incident rate jumped back up to 7.2. This is higher than both the corporate rate for the City of Saskatoon of 3.36 and the rate for the Utility Services Department of 3.55. A new Occupational Health and Safety Committee was formed by the Branch and improved safety outcomes will be a continued significant focus.

Our Work

Waste Handling Services and Waste Reduction initiatives together form an Integrated Waste Management System that includes a variety of component parts:

- Garbage Containers
- Garbage Collections
- Saskatoon Regional Waste Management Centre (Landfill)
- Recycling
- Composting
- Hazardous Waste

This Integrated Waste Services Annual Report explains what these component parts include and how the City of Saskatoon is performing in delivering these services to residents and businesses in Saskatoon.

Garbage Containers

Residential (Curbside)

The City of Saskatoon owns and maintains the black roll-out carts provided to street-oriented residential properties. Cart specifications have varied over time as different companies have been successful in winning the competitive tender for supply.

In 2012, the Containers work-group delivered 1447 containers to new homes across the community. In addition, 4457 reports of container damage or theft were addressed. Complaints related to containers have been rising as the aging hydraulic arms that collect the carts at the curbside have created issues. A number of steps are being put in place to address this issue. Specifications for carts have changed to ensure the containers can perform under the rigours of four-season use. A new preventative maintenance program on the aging fleet of vehicles is being developed in 2013. It is expected container damage will be substantially reduced in 2014.

In 2011, the Garbage Container Conversion project was completed. The anticipated benefits of conversion to individual roll-out waste carts are being realized across the entire city. Environmental Protection Officers (EPOs) are experiencing a reduction in the number of complaints related to garbage container damage (by fires and graffiti) and illegal dumping in lanes. With citizens now having more control of their own waste container, lanes are cleaner.

The completion of the container conversion project also allowed for the stream-lining of waste collection services as all neighbourhoods are now brought into the regular scheduled service calendar.

Multi-Unit Residential Properties

The City of Saskatoon does not provide garbage containers for multi-unit dwellings. In 2010, the Multi-Unit Dwelling Waste Bin Grant was established to offset the cost born by condominium associations and property managers for the purchase and maintenance of metal waste bins. The grant provides \$8 per year per residential unit to property managers and condominium associations who apply. Applicants determine how they want to utilize the grant. It can be used to purchase and maintain bins and utilize the city collection services, which are paid for through taxes, or to pay for a private waste removal service.

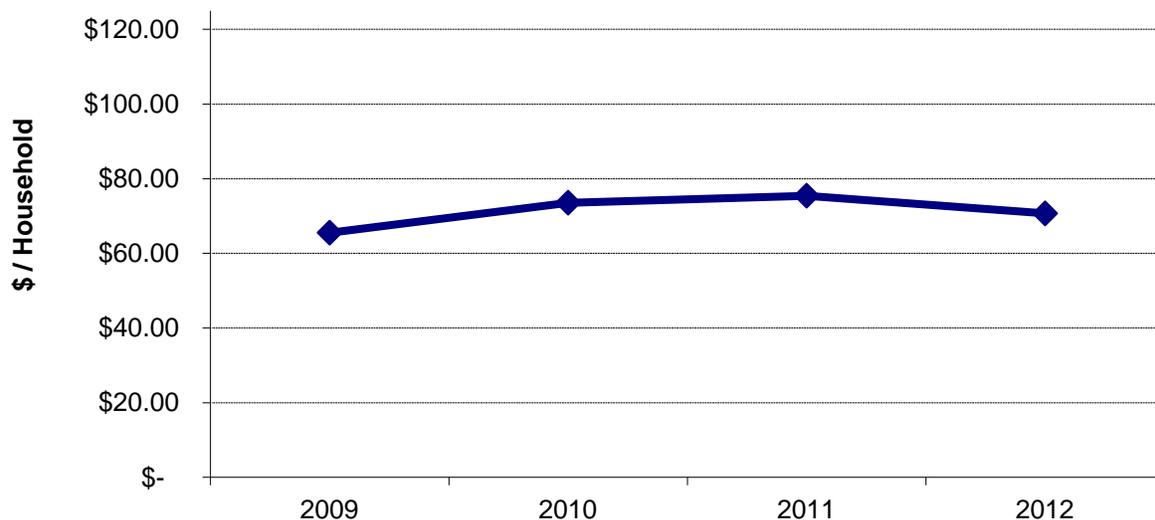
In 2012, 608 properties representing 24,416 (71%) units took advantage of this program. Environmental Services continues its efforts to build awareness of the grant among all 34,475 qualifying residences.

Garbage Collections

Residential (Curbside)

Garbage collection services are provided to 66,000 single-family homes by a fleet of eighteen (18) garbage trucks. Operational efficiencies have allowed the City to have five fewer operators and five fewer trucks than the industry average, saving \$890,000 each year. Additional savings and improved customer service will result from computerization of the service in 2014.

Collections Costs



Upon completion of the container conversion project, a review of garbage collections routes was completed to optimize the allocation of civic resources. New routes were established to maximize efficiencies and the results have been positive. The cost for

garbage collections was reduced by 6.25% in 2012 over the previous year. This has allowed operations to absorb cost inflation and urban growth without adding new resources. The 2012 cost per residential collection (or 'tip') was \$1.50, down from \$1.60 in 2011.

The amount of garbage collected per household has been falling, but remains above the national average of 0.64 tonnes. In Saskatoon, the average weight of the contents of each cart on collection day ('tip') is 19.5 kilograms. The national average is 13 kilograms. Collections vary seasonally with disposal rates climbing from 1.66 kilograms per household per day (winter months) to 2.81 kilograms per household per day during the growing season.

In a nation-wide benchmarking exercise for 2011, Saskatoon's Garbage Collections were compared to other municipal operations in Canada. Saskatoon's curbside collections are only slightly lower than the highest reporting operation (who reported 21 kilograms). The lowest reporting community generated only 8 kilograms on each collection day.

Multi-Unit Residential Properties

The City of Saskatoon will provide one collection a week for each multi-unit residential property as part of the regular service supported by property taxes. Additional levels of service may be contracted with the City or through a private waste management company.

In 2012, the City operated two (2) fork-lift trucks in the provision of garbage collection services to multi-unit residential properties and commercial contracts. 616 properties (64%) took advantage of the services provided by the City of Saskatoon. The remaining 36% of property managers and condominium associations chose to contract services through private options.

Commercial Collections

485 commercial customers used the services of the City of Saskatoon in 2012. Rates were last set in 2011 and have remained unchanged as they continue to provide full-cost recovery. The number of commercial customers has also remained stable.

Revenues from commercial accounts were \$17,000 higher than anticipated for the year.

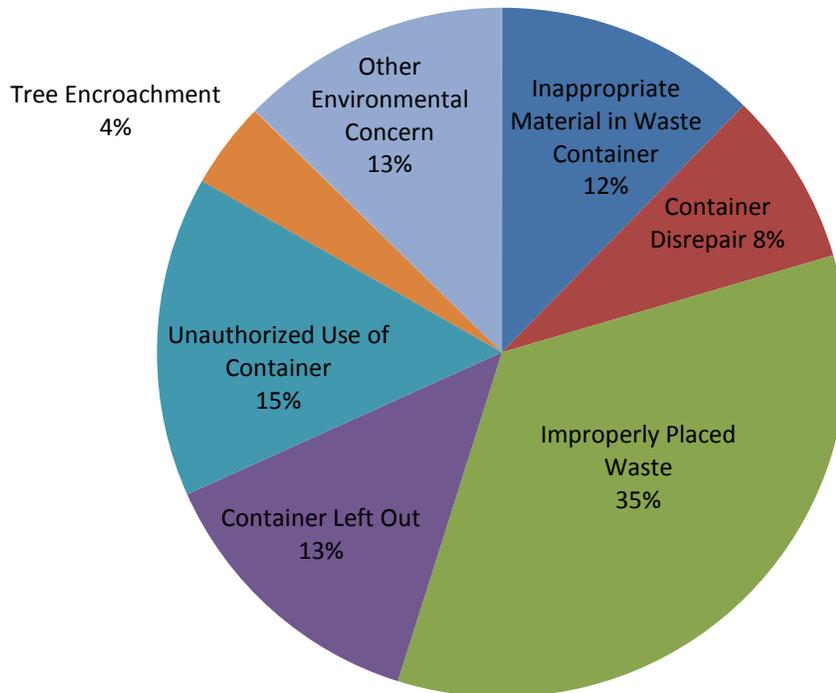
Environmental Protection

In 2012 the garbage collections fleet travelled 602,725 kilometers, consumed 197,140 litres of fuel, and emitted 537.5 tonnes of CO₂e. A spill response strategy was developed to ensure any issues related to hydraulic fluid were responsibly managed.

Bylaw Enforcement

Two (2) Environmental Protection Officers (EPO's) focus on issues in the community related to the Waste Bylaw 2004 (Bylaw No. 9071). In 2012 the EPO's addressed 860 complaints.

Waste-related Bylaw Issues



Financial Performance

The cost to deliver all Garbage Collections and Containers activities in 2012 were \$317,000 lower than budgeted as a result of increased revenues from commercial collections contracts, and savings in time and use of equipment based on the reconfiguration of garbage collection routes.

	Budget	Actual	Variance	%
Revenue	\$640	\$657	\$17	2.7%
<u>Expenses:</u>				
Salaries & payroll	2,396	2,322	(74)	-3.1%
V&E	2,403	2,229	(175)	-7.3%
Buildings & grounds	116	128	12	10.5%
Multi-Unit bin grant	255	196	(59)	-23.1%
IS Services	235	235	0	0.0%
Other expense	329	325	(4)	-1.2%
Transfer to reserves	210	210	0	0.0%
Total expense	5,945	5,645	(300)	-5.0%
Revenue less expense	(\$5,305)	(\$4,988)	\$317	-6.0%

Saskatoon Regional Waste Management Centre (Landfill)

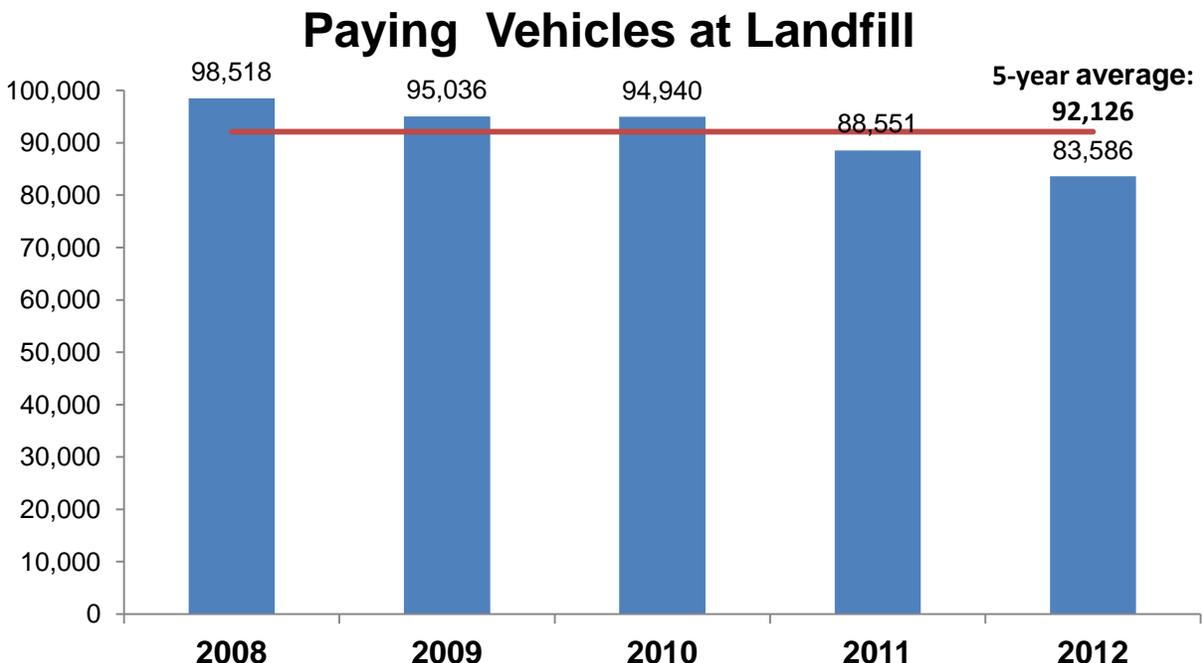
The Saskatoon Regional Waste Management Centre (Landfill) has been in operation since 1955. The Saskatchewan Ministry of Environment currently regulates the operations of the Facility under a Permit to Operate a Waste Disposal Ground.

In 2012, approximately 148,000 tonnes of material was accepted at the Landfill including 29,000 tonnes of clean earth fill used as cover. Also included in the 148,000 tonnes was approximately 900 tonnes of metals, white goods, propane tanks and batteries that were eventually removed from site.

To date, 5,564,000 cubic meters of airspace and thirty-seven (37) hectares has been consumed at the Saskatoon Regional Waste Management Centre (Landfill). The City has adopted a Landfill Optimization Strategy to protect the lifespan of the Facility to forty (40) years and beyond. A number of operational changes and capital improvements are required to ensure the estimated remaining airspace of 8,959,000 cubic meters on the sixty-six (66) hectare site is not consumed too quickly.

Operations

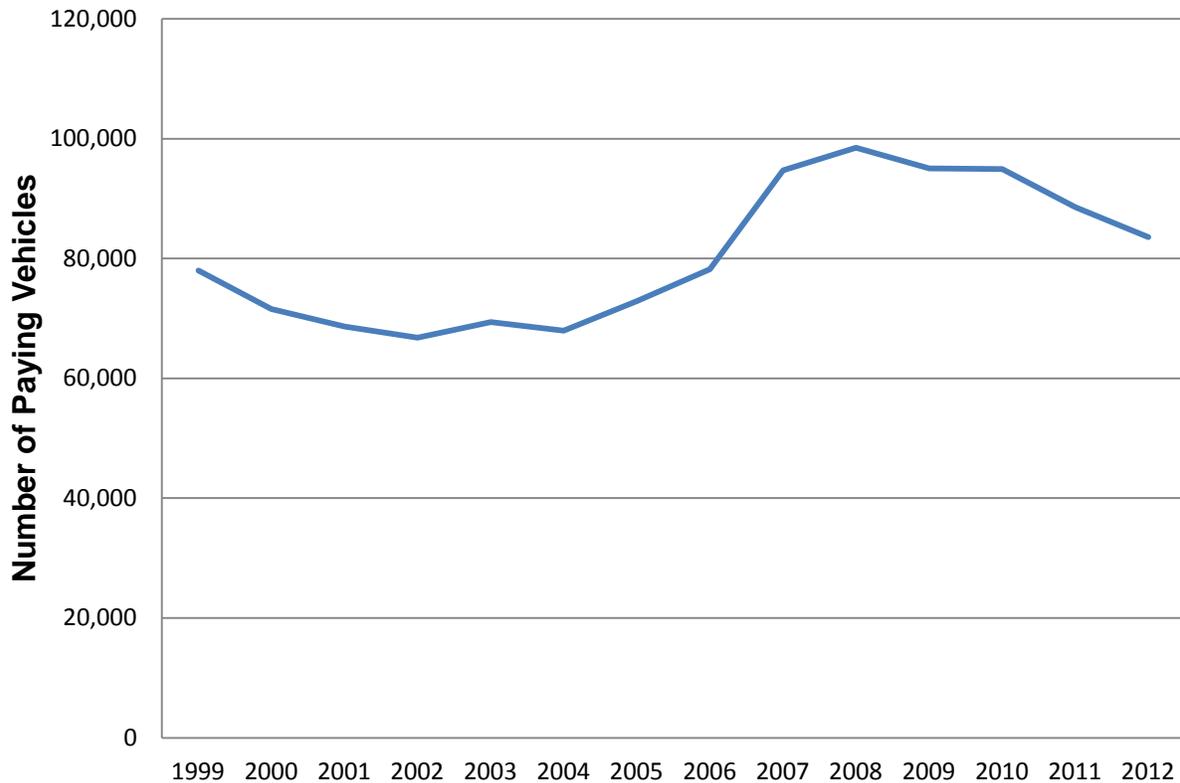
The Landfill site is a secure compound with fencing around the majority of the perimeter and security checks after-hours. Six transfer bins are located on site for public waste disposal. In addition, several public drop-off areas are provided for metals, white goods, batteries, propane tanks, and used oil, oil containers and filters. Waste management operations include waste placement, compaction and covering practices.



Fewer paying customers at the Landfill Facility has been observed and correlates to a significant increase in construction activities both on and near the site. The Circle Drive South construction, along with on-site capital improvements that included impacts to internal roadways, tipping area locations and access, and other site restrictions, added

significant time and complexity to the use of the site by visitors. Within a longer time context, however, the number of visitors to the Landfill remains in line with the ten year average of 84,391 paying vehicles per year.

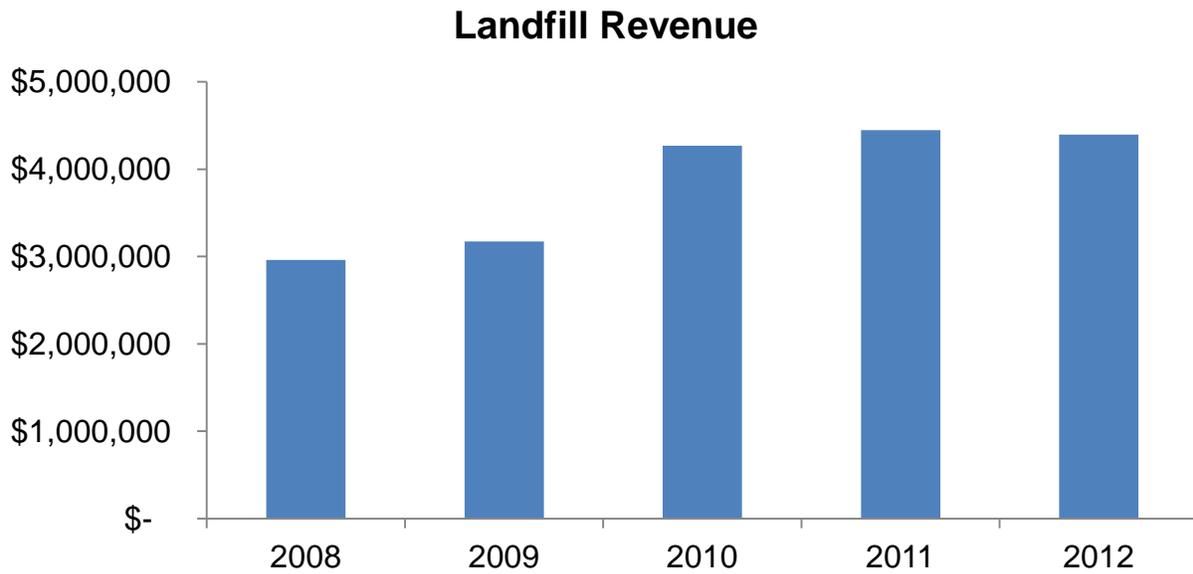
Landfill - Chargeable Loads



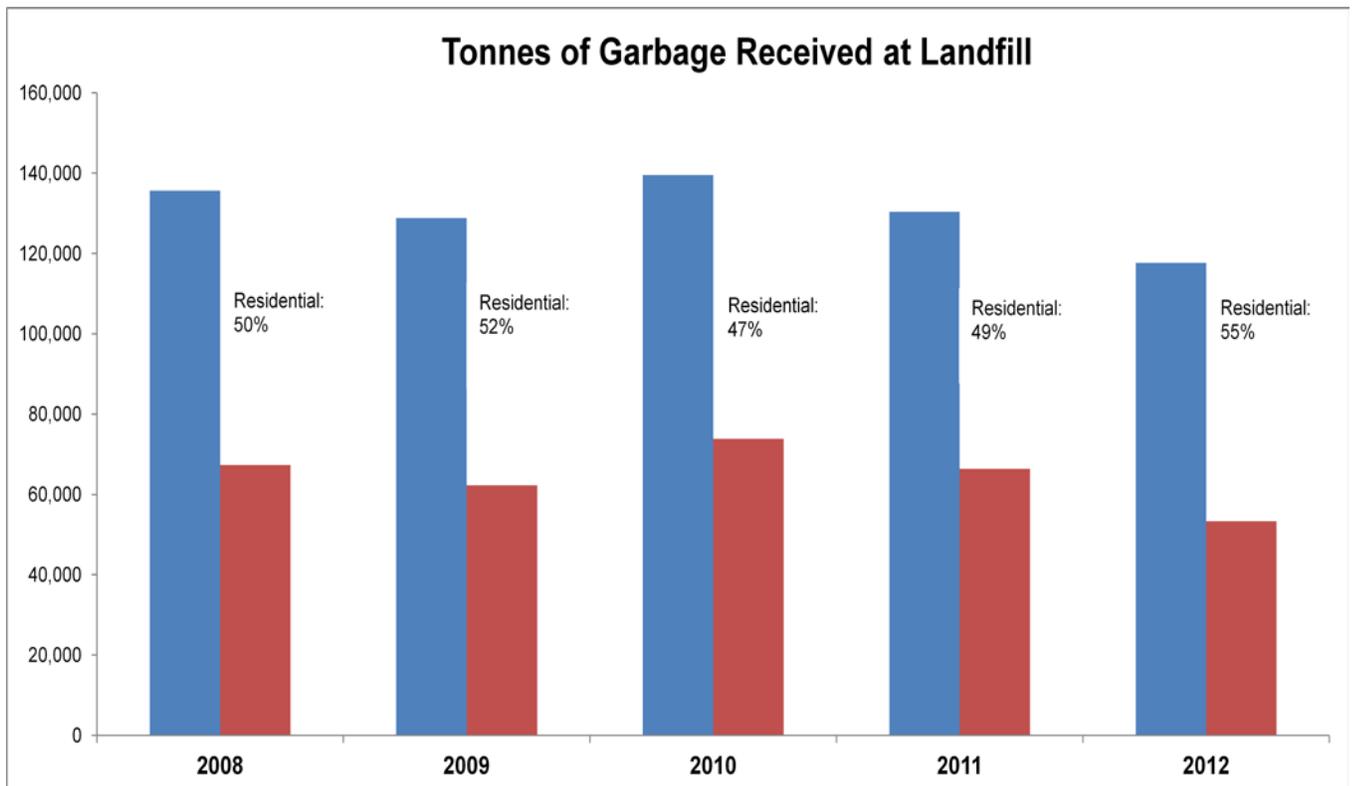
A new program for large commercial haulers to the Landfill Facility was introduced in 2012 to reduce congestion and wait-times for smaller customers of the Facility. Haulers delivering more than 500 loads to the Saskatoon Regional Waste Management Centre (Landfill) in one year were eligible to participate in the Radio Frequency Identifier (RFID) Program and make use of an automated scale. 5,775 loads were delivered through the automated scale. As an incentive, and to recognize the cost savings realized through the use of an automated scale, an 8.5% discount is available.

Saskatoon has some of the highest rates of residential garbage self-hauled to the Landfill in Canada. The average size of loads delivered to the Facility has been shrinking and was 0.64 tonnes in 2012 (falling from 0.75 tonnes in 2011). 58,932 (59.8%) of all loads delivered to the Landfill Facility received a rate subsidy of some kind in 2012. A review of all subsidies identified opportunities to maintain affordability to customers visiting the Landfill Facility while better reflecting the true cost to provide services. As of January 1, 2013, all subsidies previously available to customers at the Landfill were removed with the exception of a 75% subsidy which is applied to very small loads weighing less than 250 kilograms. This subsidy continues as the City does not currently offer a service for the handling of bulky items that may not fit in City-provided roll-out garbage carts.

Financial Performance



Landfill Rates have increased in each of the last four years. The phased increases were designed to help customers in their planning while at the same time ensuring rates reflect the future needs for capital improvement and operating changes required by the Landfill Optimization strategy. Revenue forecasting has proven challenging as there is no observable correlation between tipping fees and tonnes of material delivered to the Facility.

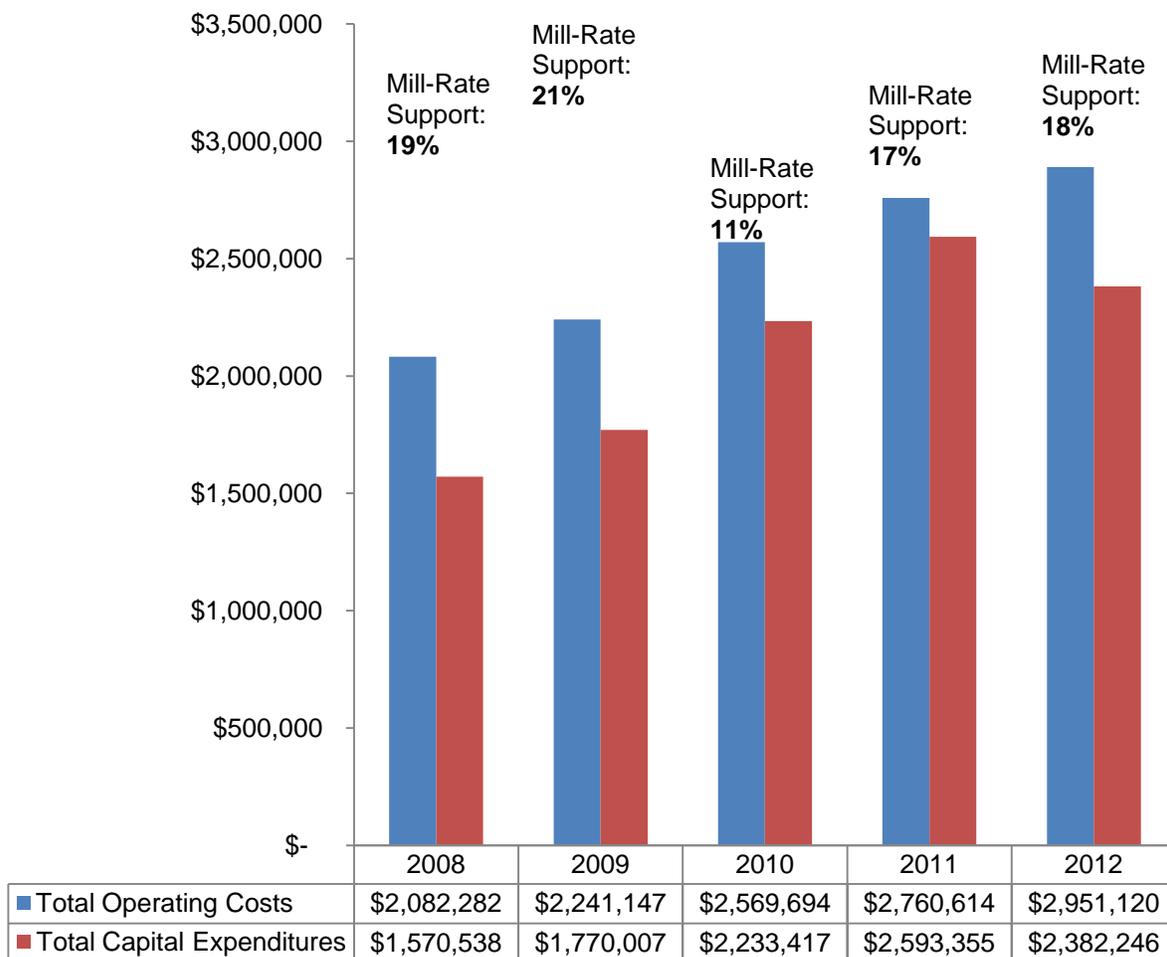


Year	2008	2009	2010	2011	2012
Total Tonnes Received	135,648	128,844	139,495	130,354	117,660
Chargeable Tonnes Received	67,303	62,268	73,810	66,343	53,297
Landfill Rate (tipping fee)	\$40	\$45	\$55	\$65	\$85

The existence of a second, privately-operated Landfill within the Saskatoon region is unique and impacts the ability to plan.

In a nation-wide benchmarking exercise for 2011, the Landfill Rates for the Saskatoon Regional Waste Management Centre were compared to other facilities. Saskatoon's tipping fee of \$65 per tonne was below the national average of \$82.66 per tonne and considerably lower than the \$125 per tonne charged by the highest reporting facility. The lowest reporting facility charged \$43.50 per tonne.

Landfill Expenditures



With the adoption of the Landfill Optimization Strategy to extend the life of the Facility, operating costs and expenditures of capital improvements have risen. In 2012, \$5.3million was invested at the Landfill, 18% of which came from the general tax base (mill-rate support).

Approximately 41,000 staff hours were spent on-site to support the daily operating requirements of the Facility. Salaries and payroll costs were \$1.7million and accounted for 32% of Landfill expenditures in 2012.

Waste management at the site required the use of four (4) pieces of heavy equipment for waste placement, compaction, and covering practices. The Solid Waste Association of North America (SWANA) benchmark average for a landfill of similar size to Saskatoon is six (6) pieces or 1.7 pieces for every 100 tonnes of material received for disposal each day. Vehicle and equipment costs were \$779,000 in 2012, 66.4% over budget, and accounted for 14% of total expenditures.

Unit Type	Number of Units	Average Age	Industry Average
Roll-Off Trucks <i>These units transfer waste from the public transfer stations to the working face.</i>	3	6 years	3.5 years
Loaders <i>This unit is used for waste and cover placement along with other site maintenance.</i>	1	5 years (leased)	4.5 years
Dozers <i>This unit is used to push waste at the working face.</i>	1	1 year (leased)	7 years
Compactors <i>These units are used for compacting waste to achieve the desired density for the mound.</i>	2	13 years	12 years
Skid Steer <i>This unit is used for site maintenance.</i>	1	22 years	–
Light Duty Trucks <i>These units are used for on-site maintenance including snow clearing and staff mobility.</i>	4	14 years	8 years
Water Truck <i>This unit is used for dust control and fire suppression.</i>	1	2 years	8 years

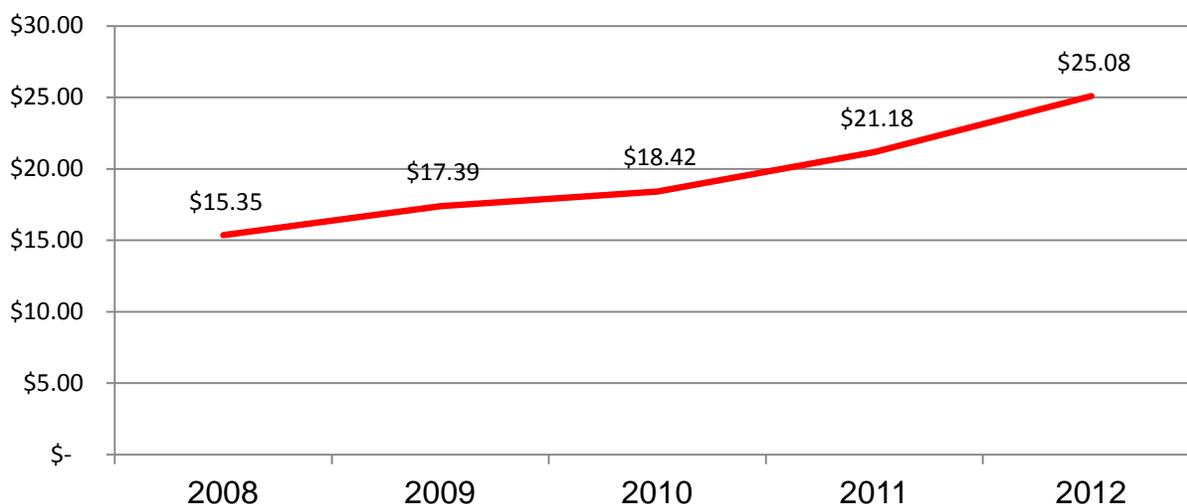
Much of the equipment operated at the Landfill is well beyond its economic life. Downtime resulting from increased maintenance and repairs for older equipment has affected not only the budget, but staff productivity as over-time has become a significant issue. Examples include the loader (unit R2106) which was down 2222 hours or 61% of the time in 2012 and the compactors (2620 and 2621) down 43.5% of the time (1581 hours combined).

	Budget	Actual	Variance	%
Revenue	\$6,425	\$4,397	-\$2,028	-31.6%
Expenses:				
Salaries & payroll	1,363	1,715	352	25.8%
V&E	468	779	311	66.4%
Buildings & grounds	303	210	(92)	-30.5%
Other expense	275	247	(29)	-10.5%
Transfer to reserves	3,659	2,383	(1,276)	-34.9%
Total expense	6,068	5,333	(735)	-12.1%
Revenue less expense	\$357	(\$937)	(\$1,293)	-362.4%

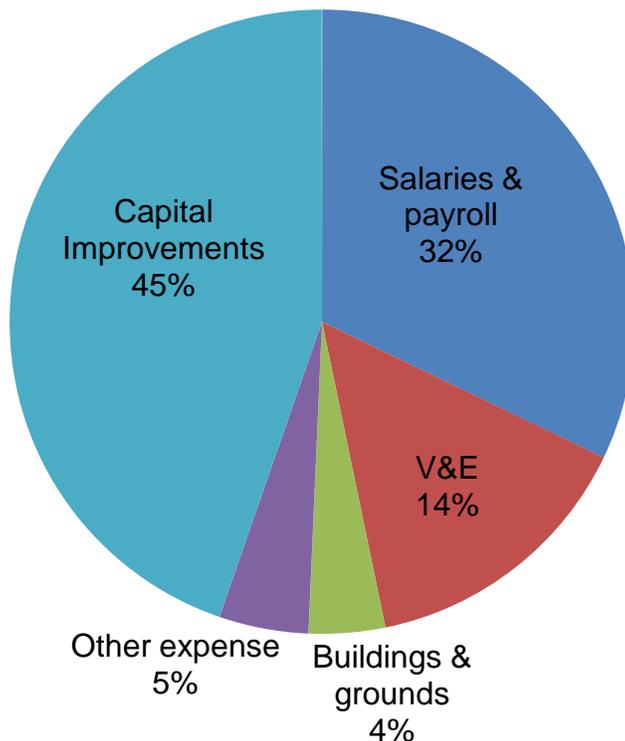
The Landfill variance in 2012 was over \$1.2million as a result of revenue shortfalls below expectations and costs incurred for salaries and equipment resulting from equipment downtime.

Costs incurred at the Landfill for each tonne of material disposed has increased over the last five (5) years. While over-expenditures on equipment and staffing resulting from equipment downtime has been an issue, a significant proportion of this cost escalation is attributable to the capital improvement program. 45% of 2012 expenditures at the Landfill were put toward capital projects.

Landfill Operating Cost/Tonne



Landfill Expenditures



Capital Improvements

The capital program at the Saskatoon Regional Waste Management Centre (Landfill) follows the recommendations established by the Integrated Landfill Management Plan or Landfill Optimization Strategy. Specifically, the following key investments were ongoing in 2012.

Construction of a **five (5) hectare lined cell** to receive waste for the next eight (8) years. The landfill cell is constructed to standards designed to manage all environmental impacts that could occur at a landfill site.



Features include a geosynthetic clay liner, high-density polyethylene geomembrane and non-woven geotextile, drainage layer, leachate collection system, and lift station.



Installation of **leachate collection wells** to intercept groundwater that could come in contact with leachate from older unlined landfill cells.

Equipment shed including eight (8) bays for equipment and a wash bay connected to the sanitary sewer system.



A **Heavy Grit Dewatering Facility** with retractable cover to receive, dry, and appropriately manage grit-containing loads trucked by City and private haulers.



Infrastructure investments included water and sewer connections and entrance road work.

Saskatoon Light and Power management the construction of the Landfill Gas Collection System commenced construction and twenty-nine (29) vertical wells were drilled into the north mound connected by lateral and header piping. Construction will continue through 2013 along with construction of the blower/flare station and power generation facilities.

Environmental Protection

A number of environmental protection measures are part of the regular operations of the Landfill.

Surface water management ensures that any storm water that may have come in contact with garbage does not flow off-site. Storm water management infrastructure also helps minimize the creation of leachate ('garbage juice') and protect roadways and other customer-serving assets of the site. Improvements to storm water infrastructure are integrated into the capital improvement plan for the site.

Ground water monitoring results are reviewed by an independent party each year to ensure the Landfill is not impacting the environment beyond its site. In 2012 there were forty-three (43) monitoring locations analyzed. Additional leachate collection system development is planned on the basis of monitoring results. Twenty-seven (27) hectares of the waste footprint at the Landfill Facility is unlined and leachate interception is therefore an important environmental protection measure.

Fire prevention and suppression is critical. Materials within the mound have the potential to burn for prolonged periods and to release toxins into the atmosphere. Landfill staff are trained in fire prevention and suppression and operate a water truck on-site to respond to incidents in a timely manner. A strong relationship with Saskatoon Fire and Protective Services has also been developed as Landfill fires pose a unique challenge.

Landfill gas management began in 2012 with the completion of the clay cap on the north mound of the site. The Landfill Gas Energy Generation project will commence full operations by mid-year 2014.

Greenhouse gas emissions reduction efforts occur at two levels at the Landfill. The destruction of landfill gases (which have greenhouse gas concentrations up to 21 times stronger than carbon dioxide) is addressed through landfill gas management. Emissions from equipment used on site were 578.5 tonnes CO₂e in 2012. As equipment is replaced, Tier IV emissions-compliant equipment is being selected to significantly reduce this impact.

Recycling

The 2012 Waste Diversion Rate in Saskatoon was 28.5% comprised of the following:

Waste	Tonnes
Recycling	
Fibre from Depots	6,662
Subscription Recycling	2,835
Outgoing Recyclable Material from Landfill (mixed metals, propane tanks, batteries)	887
Compost	19,500
Clean Fill	29,178
Landfill	147,588

Many people in Saskatoon recycle and 45% of respondents to the Environmental Awareness Survey conducted in July 2012 stated that the availability of recycling is the most important environmental issue facing the city.

The waste stream is characterized through periodic waste audits. The following table presents the findings from the 2012 Waste Characterization Study.

2012 Waste Audit					
Industrial, Commercial, Institutional (ICI) Waste Composition			Residential Waste Composition		
Material Type	%	Change from 2006	Material Type	%	Change from 2006
All Paper	24.4%	+3.4%	Food Waste	32.0%	+19.0%
Food Waste	21.7%	+13.7%	Yard Waste	8.4%	-19.6%
Plastics	18.8%	+6.8%	All Paper	18.5%	-3.5%
Diapers	6.5%	-1.5%	Plastics	12.3%	-2.7%
Textiles & Fabric	5.9%	-1.1%	Textiles & Fabric	6.4%	+0.4%
Tissue Paper	4.4%	+0.4%	Tissue Paper	3.8%	+1.8%
Ferrous Metal	4.3%	-2.7%	Ferrous Metal	3.4%	+0.4%
Wood (painted or pallets)	3.1%	-19.9%	Diapers	4.6%	+2.6%
Beverage Containers	2.0%	+1.0%	Glass	1.7%	+0.7%
Yard Waste	1.6%	-3.4%	Wood (painted)	1.5%	-3.5%
Glass	0.8%	-0.2%	Beverage Containers	1.1%	+0.1%
HHW	0.5%	-1.8%	HHW	0.5%	-0.5%
Other	5.7%	+5.1%	Other	5.7%	+4.7%

The availability of diversion options for wood products and yard waste has had a significant impact on the materials handled at the Landfill. The proportion of waste comprised of these two material types was significantly reduced throughout the community.

There are mixed results for recyclable paper materials. Residential paper decreased in proportion over the last study period six (6) years ago. Meanwhile, paper generated by the Industrial, Commercial, Institutional (ICI) sector increased.

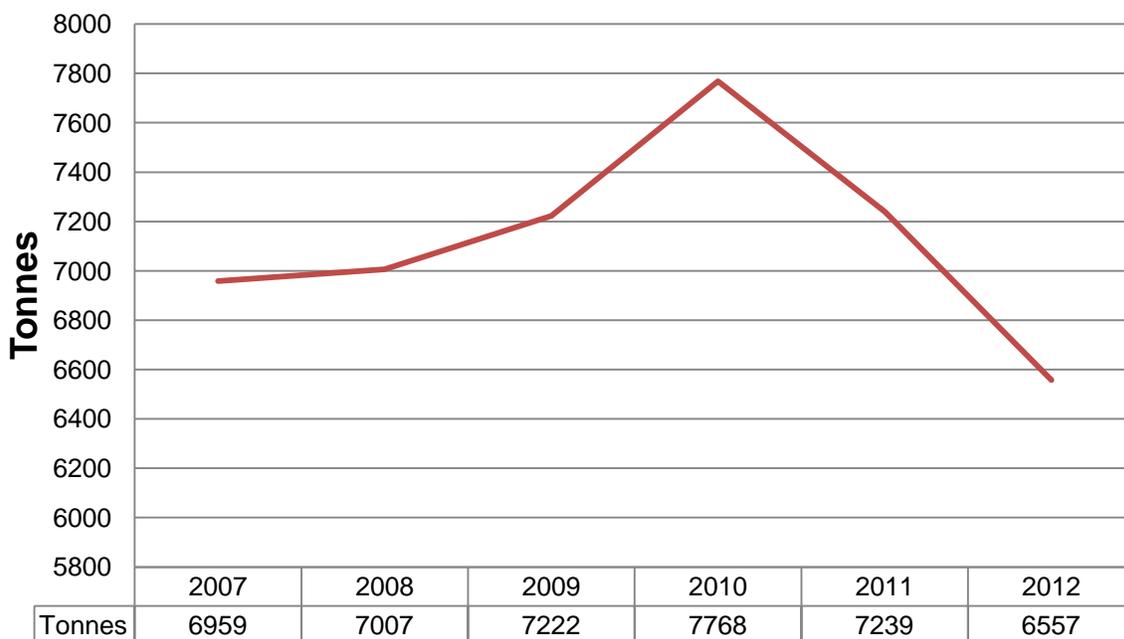
50.4% of the ICI sector waste stream is comprised of materials that could be recycled. In 2012, 37.0% of the Residential waste stream could still be recycled.

If more sophisticated organics processing was available in Saskatoon, 26.4% of the material generated by the ICI sector could be diverted from the Landfill. 41.9% of the Residential waste stream was comprised of organic material.

Recycling Depots

The City of Saskatoon and Cosmopolitan Industries Ltd. have been partners in recycling since 1983. Through this partnership, a variety of paper and cardboard materials have been diverted from the Saskatoon Regional Waste Management Centre (Landfill). The following chart highlights some of the achievements of this program.

Recycling Trends (Depots)



In 2012, the number of depot locations declined from 78 to 54. Of the fifty-four (54) depots, six (6) are City-owned depots available to the public, an additional twenty-five (25) locations established by Cosmo are accessible to the public, four (4) are located at City-facilities such as City Hall or a Fire Hall, and nineteen (19) locations have been established by Cosmo for private use.

Cosmopolitan Industries negotiates the placement of recycling containers on private property across the community. The City has learned the reduction in the number of depots located on private property is not an intentional strategy but rather a market reality. There are a number of commercial entities who are developing the pads within their parking lots as a result of demand for developable commercial real estate. In other instances the land use is transitioning to something else, again as a result of the hot real estate market in Saskatoon.

All recyclable paper material is collected by the City of Saskatoon collections fleet from each of the 54 locations and delivered to the sorting facility operated by Cosmopolitan Industries at 28 – 34th Street East.

Residential Recycling Program

In 2012 a contract for the delivery of the Residential Curbside Recycling Program was negotiated with Loraas Recycle. The Program includes bi-weekly collection of blue roll-out carts on a different day from City garbage pick-up, but from the same service location (ie. front street or back lane). All recyclable materials can be placed in the blue recycling cart; with no sorting by citizens required. Materials that may be placed in the cart include aluminum and tin cans, aluminum foil and pie plates, corrugated cardboard, mixed paper, newspaper, polycoat, fine paper, magazines, boxboard, recyclable plastic containers #1 thru #7 that have contained non-hazardous products, all provincial legislated beverage containers, milk cartons and jugs, and glass food and beverage containers.

Implementation of the Program was scheduled to begin on January 2, 2013, with the delivery of carts expected to take six (6) months and scheduled in such a manner as to ensure the collection of materials could begin within two (2) weeks of cart delivery.

The cost of the program is fully cost-recovered from utility fees charged monthly to qualifying property owners (ie. those receiving garbage collection services from City-provided black roll-out carts). The fee for 2013 has been set at \$4.66 per household per month. The contract with Loraas Recycle constitutes 82% of the total utility fee. Other charges cover costs for program education, contract administration, and a contribution to a stabilization reserve.

An education campaign was launched on November 26, 2012. The primary objective of the campaign is to build awareness and enthusiasm for the new recycling program to inspire broad acceptance and seamless adoption of recycling behaviours that lead to a doubling of material diverted from landfill. In 2012, Saskatoon collected and recycled approximately 6,500 tonnes of material. The goal is to double the tonnes recycled in the community.

Recycling is a significant environmental initiative. The benefits in terms of extending the life of the Saskatoon Regional Waste Management Centre (Landfill) have been estimated at 8 years at current residential waste disposal rates. This is equivalent to recapturing 15% of the landfill airspace each year.

Recycling also has significant and positive greenhouse gas implications. The energy used to manufacture, transport, and dispose recyclable materials is large. Energy savings of 95% are possible when aluminum cans are recycled and for 6.5 tonnes of greenhouse gas (CO₂e) is saved for every tonne recycled. For every tonne of newspaper recycled, 2.8 tonnes CO₂e are saved. For every tonne plastic recycled, 2.3 to 3.6 tonnes CO₂e are saved.

Based on the goals of the Residential Recycling Program, it is anticipated 73,076 tonnes CO₂e will be saved each year. This is equivalent to removing 14,328 cars from Saskatoon roadways annually.

Multi-Unit Dwelling Recycling Program

A Memorandum of Understanding between the City of Saskatoon and Cosmopolitan Industries was signed in June 2012 outlining the principles for negotiating a sole-source contract for the delivery of a Multi-Unit Dwelling Recycling Program.

Negotiations and consultations with stakeholders, including residents, tenants, building managers, and building owners, will continue into 2013.

Recycling Partnerships

Other local recycling opportunities are available in the community. The Saskatchewan Waste Reduction Council maintains a province-wide online database of information on where to recycle a variety of materials. The City of Saskatoon partners with the Council in promoting this online tool: <http://www.saskwastereduction.ca/>

Composting

Leaves and Grass Subscription Program

The Leaves and Grass Subscription Program served 3000 households in 2012. Growth in the number of program participants has been restricted to match the resources available (one dedicated collection truck operated five days a week). In 2012, the program added 600 subscribers as a result of improved routing, but maintaining resource levels. The program costs in 2012 were \$188,000, or \$62.66 per household, shared between the resident (\$40) and the City (\$22.66). Along with material delivered by the City of Saskatoon Parks Branch, the subscription program was responsible for the diversion of approximately 1,600 tonnes of organic waste in 2012.

Compost Depots

Two compost depots, one on McOrmond Drive and the other on Highway 7, provide residents the opportunity to drop off yard waste at no charge. These temporary locations accept leaves, grass, non-elm tree and shrub branches, as well as garden waste that would otherwise end up in the landfill.

The total quantities delivered to both compost depots in 2012 was estimated at 19,500 tonnes; with approximately 7,900 tonnes delivered to the Highway 7 depot (41%), and 11,600 tonnes to the McOrmond depot (59%).

Commercial haulers may also use the compost depots on the basis of a seasonal permit. In 2012, 198 permits were sold to commercial users, 104 of which were for the first company vehicle at a cost of \$150. These commercial users delivered 5,300 tonnes of organic material or 27% of the total material received at the two depots.

The compost depots represent an exceptional deal for commercial contractors who would otherwise pay Landfill entry fees of \$10 for each visit and weight charges on the material tipped based on \$85/tonne. For a commercial company, the payback on a seasonal permit at the Compost Depots can be achieved after two or three visits.

Hazardous Waste

In 2012, sixteen (16) Household Hazardous Waste Collection Days collected 40,000 kilograms of hazardous materials from 1451 customers. The following materials are accepted by the program:

- Adhesives – contact cement, caulking, sealers, flooring adhesives, various household glues, other household adhesives
- Aerosols – hair spray, deodorant, insect repellents and killers, lubricants, spray cleaners, other household aerosols
- Automotive Chemicals – antifreeze, fuels, fuel and oil mixtures, oils, used oil filters, batteries, carburetor cleaners, windshield cleaner, engine degreasers, other automotive fluids
- Batteries – lead-acid, lithium, alkali, NiCad, NiMH, other rechargeable and disposable battery types
- Cleaners – oven cleaner, acid and alkaline based cleaners, oxidizing cleaners, disinfectants, waxes, soaps, softeners, other household cleaners
- Fuels – lamp oils, automotive fuels, kerosene, diesel
- Mercury – raw mercury, thermometers, thermostats, fluorescent tubes, compact fluorescent lights
- Yard and Garden Chemicals – pool chemicals, lawn herbicides, garden chemicals, rodent poisons, gopher killer, insecticides, other yard and garden chemicals
- Cylinders – propane, oxygen and fire extinguishers
- Solvents – paint thinner, acetone, alcohols, naphtha, other household-use solvents
- Paints – damaged and non-original paint containers not accepted through the Saskatchewan Paint Stewardship Program

The following materials are not accepted:

- Class 1 (Explosives) including materials such as gun powder, small arms cartridges and fire works
- Class 7 (Radioactive) including materials such as ionization chamber-type smoke detectors
- Biohazardous materials such as needles, or “sharps”
- Paint that is accepted through the Saskatchewan Paint Stewardship Program

Household hazardous waste materials are also responsibly managed at the Landfill. An Eco-Centre for the recovery of oil, oil containers, and oil filters has been established in partnership with Saskatchewan Association for Resource Recovery Corporation (SARRC) The Eco-Centre (one of 36 across Saskatchewan) captures in excess of 20,000 litres of used oil, over 1,000 used oil filters, and more than 1,200 kilograms of oil containers each year. These materials are reused and recycled, saving approximately 53 tonnes of CO_{2e} each year.

The Landfill also accepts a variety of materials – appliances, batteries, metals, propane tanks – jointly classified as white goods. 880 tonnes of mixed metals and appliances containing refrigerants were removed from the Landfill for reuse or recycling in 2012 once the refrigerants were safely removed. In addition, 41,500 kilograms of propane tanks and 28,000 kilograms of batteries were removed for safe disposal.