City of Guelph – Automated Collection System

Guelph, Ontario, Canada
Population: 120,000
Cost per Household: $156
Approximate Budget: $10,148,262

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EXECUTIVE SUMMARY

The City of Guelph has converted from a manual bag-based collection system to a fully automatic cart-based collection system for the organics, recyclables and garbage streams. This transition fulfills the Solid Waste Management Master Plan’s recommendation to increase waste diversion rates and create operational efficiencies. The cart-based collection was phased in over a three year period from 2012 to 2014.

Stakeholder support and adoption was essential to the success of the program. A survey of Guelph households revealed 80% of residents using waste carts were satisfied with the City’s automated collection system when compared to the previous system. The City also achieved the highest waste diversion rate in Ontario at 69% in 2013.

The program successfully reduced the collection fleet by four trucks which resulted in operational savings of over $460,000 per year through reduced capital replacement costs, maintenance, fuel costs, and injury and labour costs.

PROGRAM PLANNING

COMMUNITY ENGAGEMENT

The City of Guelph is strategically located in the heart of southern Ontario, only 100 kilometers from the City of Toronto. Situated within Wellington County, the City of Guelph is surrounded by agricultural country. In addition, Guelph features a diversified industrial base including life science, information technology, environmental enterprise, automotive and advanced high-technology industries. According to Statistics Canada, in 2011, the population of the City of Guelph was 121,688.

The City of Guelph has developed a robust waste diversion system offering a wide range of waste diversion services to the community. Due in part to the exceptional services and strong community support and commitment to diligent sorting, the City has already surpassed the first two waste diversion targets set by the Solid Waste Management Master Plan (SWMMP) (55% by 2011 and 65% by 2016) achieving a 69% diversion rate in 2013. The City has well-established curbside and drop-off programs, which target single family, multi-residential, commercial and construction and demolition waste.

The City has accomplished the following goals:

- Opened a new organics waste processing facility;
- Initiated diversion programs for construction and demolition (C&D) wastes;
- Established a free drop-off for electronic waste;
- Upgraded sorting technology at the City’s Material Recovery Facility (MRF) to enhance recycling;
- Added new By-law provisions for waste diversion in multi-residential properties and at special events and assisted event organizers with implementing three stream sorting systems;
- Introduced three stream sorting at City facilities; and
- Implemented a Bike Reuse Centre to keep bikes out of landfill.
SYSTEM’S PLANNING PROCESS

Beginning in 2008, the City of Guelph began researching municipal waste collection best practices, and the feasibility of implementing an automated cart program—as recommended in the 2008 Solid Waste Management Master Plan (SWMMP).

In 2009, the City of Guelph began building a state-of-the-art Organic Waste Processing Facility (OWPF) to process Guelph’s organic waste stream into clean, nutrient-rich compost. To operate the OWPF, the City was required to comply with conditions set by the Ontario Ministry of the Environment and Climate Change (MOECC). One such condition was that Guelph’s OWPF could not accept organic waste in plastic bags, thus requiring the City to move away from a bag-based collection system for organics.

During this time, City staff continued researching the benefits of converting from a bag based collection system to a fully automatic cart-based collection system. The City hired BMA Management Consulting Inc. to complete a peer review of the staff recommendations regarding the conversion to a fully automatic cart-based collection system for all three waste streams: organics, recyclables and garbage. In their analysis they concurred with the recommendation that the conversion to a fully automatic cart-based collection system for all three streams would be less expensive over the long-term, compared to only the conversion of the organic waste stream to carts.

Based on the findings of this research, in August 2010, City Council approved the transition from a manual bag-based collection system to a fully automatic cart-based collection system for all three streams. The implementation of the fully automated cart program allowed the City to address five key issues:

1. Minimize plastic bags for all three streams (organics, recycling and garbage)
2. Allow residents weekly yard waste pick up by topping up to the limit of the organics container
3. Meet the recommendations of the SWMMP to minimize waste disposal, increase diversiton and ensure fiscal responsibility
4. Transition to industry best management practices
5. Comply with the Environmental Compliance Approval issued by the MOECC with respect to eliminating plastic bags in the organics waste stream

An automated waste collection system for all three waste streams was implemented over a three year period from 2012 to 2014. The final phase of the cart rollout, which included the downtown core, took place in 2014. To achieve continued success with reducing the amount of waste Guelph sends to landfill, lowering operating costs and decreasing Guelph’s carbon footprint, all Guelph businesses and residents already served by the City’s curbside waste collection program, were required to take part in the new automated waste collection program.

During the planning process, the following key messages were developed:

» The City of Guelph is rolling out a new way to collect organic, recyclable and garbage. Carts will be used instead of plastic bags.
» Using carts will reduce the amount of waste Guelph sends to landfill, lower the City’s operating costs and decrease Guelph’s carbon footprint.
» Processing our organic material locally at the Organic Waste Processing Facility, using carts and sorting carefully, will help the City reach its waste diversion target of 70% by 2021.
» The carts will be phased in over three years, each fall, starting in 2012.
PLANNING PROCESS EFFECTIVENESS

The planning process as described above was effective for the following reasons:

✓ The cart program was rolled out for a three year period to keep costs affordable and align with the life-cycle replacement of the current manual trucks.
✓ Converting to an automated system has reduced the collection fleet by four (4) collection vehicles —saving the City $460,000 annually in labour and operating costs.
✓ The City received a Continuous Improvement Fund (CIF) grant in the amount of $1,335,519 from Waste Diversion Ontario.
✓ All residents, businesses, multi-residential communities and the downtown core have now transitioned to the fully automated cart collection program. Households receive organics cart collection on a weekly basis and garbage and recycling on a bi-weekly basis.
✓ The project was completed on time and within budget.

RECOVERY PLAN FOR SERVICE INTERRUPTIONS

During the transition from bag based collection to automated cart collection, there were no service interruptions. To ensure that there were no service interruptions, the City developed and implemented the following plan:

» The new trucks and carts were ordered and delivered prior to the start of implementation so training could be provided to collection drivers and staff.
» The City assigned additional staff and minimized vacation scheduling during the implementation stage.
» Temporary staff were hired to go door-to-door with various promotion and education materials to ensure that carts were set out properly on the very first day of collection. Further, temporary staff were assigned to moving and staging carts for proper spacing prior to collection. If there was an error in cart placement and/or contamination, a door hanger was left detailing the corrective action(s). These measures ensured that the collection trucks would be able to collect all materials without needing to get out of the trucks which would have slowed their collection time.

CHANGES IN TECHNOLOGY, EQUIPMENT, TECHNIQUES AND SUSTAINABILITY

All carts have radio-frequency identification (RFID) tags attached that the City can use to monitor the carts. All collection vehicles have RFID readers, which have been employed to record the use of the carts since December 2012. In addition to the RFID readers, each truck is equipped with a GPS and cameras to enable drivers to verify collection of carts and routes. Drivers can use the monitoring equipment to report obstruction of carts, contamination issues, and other concerns on the route. Compliance staff, if required can follow up and report. Reader detects the RFID tag in the cart and on the arm to verify a lift is completed. The system reports the lift through phone signals to the office providing valid & up-to-date real time information. This technology helps in improving communication between drivers customer service staff to respond to resident concerns.
DESIGN OF THE COLLECTION SYSTEM

COLLECTION SYSTEM DESCRIPTION

The City of Guelph previously provided a manual collection service to collect the organic waste (green bags), recyclables (blue bags) and garbage (clear bags). The collection driver stopped in front of each home, got out of a split body truck and manually tossed the green and blue bags by hand, into the appropriate compartment of the truck. A second rear packer then went through and collected the clear bags.

The new cart program offers an automated collection system. This system uses new trucks that allow the driver to control a mechanical arm on the vehicle to pick up and empty the carts from the curb into the correct compartment of the truck and return them to the curb. The system uses automated split trucks such that one week it collects organics and recyclables, and the following week it collects organics and garbage. Organics are collected weekly, and, recyclables and garbage are collected biweekly on alternating weeks. The system uses the same truck to collect all streams on alternate weeks ensuring only one truck goes down a residential street each week.

This automated system is faster, more efficient and requires fewer trucks on Guelph’s roads. This method of collection is used for all residents and businesses (including multi-residential buildings and the downtown core) that participate in curbside collection.

During the implementation of the program, residents were allowed to select different sizes of carts to suit their individual needs (small 80 litres/21 gallons, medium 120 litres/32 gallons, large 240 litres/64 gallons and extra-large 360 litres/95 gallons). Each resident and business was provided (at minimum):

» A small green organics cart. Medium and large organics carts were provided to businesses and multi-residential buildings.
» A small, medium, large or extra-large blue recycling cart. Residents were allowed to request additional blue recycling carts at no cost to a maximum of two extra-large blue carts.
» A small, medium, large or extra-large grey garbage cart. Residents and businesses could pay for additional grey carts at cost.

Residents and businesses were given three months to try out their new carts and could request a cart size exchange at no cost. After this three month trial period, a charge applied.

Downtown Core: The City also worked individually with downtown businesses and households to provide site specific solutions for three-stream waste collection, since the City recognized residents and businesses in the downtown core have unique waste collection needs. The City offered downtown properties a number of flexible, three-stream waste collection options that best suited their individual needs. For those locations that chose not to use carts, public space containers were provided to set out their sorted organics, recyclables and garbage.

These containers, located along the street, are designed for aesthetic appeal in public spaces and encourage three stream sorting. These containers are easily collected by the automated arm of the collection truck and hold up to 227 litres/60 gallons. The collection frequency, number, size and location of public containers were reviewed in coordination with the Downtown Streetscape Manual to ensure function and visual appeal.
SYSTEM MERITS AND IMPROVEMENTS TO PREVIOUS SYSTEM

» Complies with best management practices as identified by Waste Diversion Ontario (WDO), Ontario Waste Management Association (OWMA) and Solid Waste Association of North America (SWANA).
» Reduces the waste collection fleet from 19 to 15 trucks, allowing an annual operating savings of $460,000.
» Allows residents to top up their organic cart with yard waste each week, which helps satisfy public requests for more frequent yard waste collection based on a survey completed in 2008.
» Automated collection also allows for other methods of efficiency without the constraints placed on staff by physically lifting and tipping containers, such as operating four day, ten hours per day workweeks.
» Allows for a more diverse workforce (e.g. physical ability, gender, age).
» The size of the recycling and organic carts allows for new materials to be added to the collection streams in the future without disruption to the collection process and allows for changes in the recycling stream mixture as a result of consumer and seasonable changes. The cart size also allows for collection of seasonal fluctuations in generation rates.
» Curbside collection efficiency may be increased by eliminating the collection of multiple smaller containers (e.g. compared to using blue boxes or bags). The sizes of carts enable adequate space to accommodate collection needs from households.
» Improves customer satisfaction. Residents no longer need to purchase bags for collection. All materials can be placed loosely into one of the three carts thereby reducing the cost to the residents.
» Carts also reduce the Solid Waste’s department time and cost in dealing with issues related to bag collection on snow banks, as the automated arm has the ability to collect and return the carts to the top of a snow bank. In the past, bags that were buried by snow were not collected resulting in customer complaints and requiring sending additional staff out to collect.
» The automated collection program reduces costs related to replacement labour associated with staff injuries, illness rates, and modified job duties, as well as, reduces Workplace Safety and Insurance Board costs (e.g. minimizes repetitive strain injuries to shoulder, knees, back; minimizes physical fatigue for collection staff; and minimizes exposure to traffic risks while working at the side and rear of the collection vehicles). The reduction in physical activity and disagreeable conditions may also have a positive financial effect on the inputs for job compensation and lower labour costs. Additionally, our trucks are operated on the right hand side allowing the driver an unobstructed view of pedestrians on the side walk.
» Facilitates the transition for collecting multi-residential properties by acquiring collection equipment appropriate for this sector. For multi-residential complexes where space is very limited (i.e. no garages, no backyards, small porches) an individual set of blue, green and grey carts is not always feasible. In these cases, the City recommends communal carts. Communal carts allow residents to bring waste to one or several central cart locations, shared by other residents in their complex. In-unit recycling containers and kitchen scraps containers are provided to facilitate the transfer of material to these communal locations. Larger containers and more frequent collection also facilitate a reduced number of containers and help with storage issues. Alternatively, the City also allows residents to use “dual use” carts, which alternates one week as a garbage cart and the following week as a recyclables cart. This reduces the total number of carts to two, as they would still be provided with an organics cart. The City has developed “dual use” stickers to place on these carts to identify them to the collections staff.

Automated collection ensures that the City of Guelph’s recycling collection program is competitive under full Extended Producer Responsibility (EPR), if recycling collection responsibility was required to be assumed by Producers. If Producers chose alternate collection service providers, it will allow the City to continue for co-collection of organics and garbage.
INNOVATIVE AND UNIQUE ASPECTS

Three Stream Collection
The system uses automated collection for all three streams – organics, recyclables and garbage. The split body truck co-collects organics and recyclables, one week, and uses the same truck to collect organics and garbage the following week: such that only one truck goes down each residential street.

Cart Size Selection and Exchanges
Residents were allowed to select different sizes of carts to suit their individual needs and were given a three month grace period to exchange their cart size without cost. Offering a variety of cart size options allowed the public to provide input and earned support for the program.

Multi-Residential Collection
Automated collection solutions at various multi-residential properties: communal carts, provision of in-unit recycling containers and kitchen scraps containers, larger containers and more frequent collection, and “dual use” carts.

Downtown Core Waste Collection
Residents and businesses in the downtown core were able to select their preferred collection method (carts, public space containers or a combination). Public space containers are also automated. Individual meetings were held to determine the best method of collection.

Special Events Collection
Carts are provided to special events to provide source separation resources and assist event organisers in diverting waste from landfill. A waste sorting station, manned by volunteers is placed at the event. Events included Rib Fest and Canada Day.

Cart Assistance Program
For residents who are concerned about the mobility of the carts, a cart assistance program is offered. Staff will assist individuals by collecting and returning their carts on their collection day.
ENVIRONMENTAL CONTROLS AND REGULATORY COMPLIANCE

IMPACT OF ENVIRONMENTAL QUALITY, RESOURCE CONSERVATION, ENVIRONMENTAL COMPATABILITY & HUMAN HEALTH

» Supports Council’s adoption of the recommendations from the 2008 Solid Waste Management Master Plan (i.e. carts eliminate the need for plastic bags to contain the organics, recyclables and garbage). It also supports the voluntary provincial target for reducing the use of plastic bags by 50% by 2012. This initiative was also supported by Guelph residents to minimize waste and reduce the use of plastic film. By introducing the cart system, plastic bags have been reduced by eliminating the need to place plastic bags at the curb. This reduction of plastic bags in drastically noticed in the organics stream. Figure 1 shows the “before” picture using bag-based collection and the “after” picture using cart-based collection. Note: the majority of bags in the after picture are the certified compostable bags containing organics.

![Figure 1: Organics Collection Before and After Implementation of Automated Collection](image)

» It reduces the waste collection fleet from 19 to 15 trucks, allowing a reduction in Guelph’s carbon footprint since there are fewer trucks on Guelph roads.

» It allows for reduction of residue waste disposal and processing efficiencies in the Material Recovery Facility (MRF) which are realized through the elimination of plastic bags, as well as, the loss of any recyclables remaining inside the bags.

» All materials entering the new OWPF are plastic free. Paper and certified compostable bags are acceptable for use in the organic carts. Compostable bags in the organics stream allows for the complete breakdown of almost all materials collected.

» Cart collection increases diversion rates by increasing resident participation rates and capture rates due to the improved convenience.

» Carts reduce the possibility of litter strewn in neighbourhoods from wind blowing bags away from the curb or the contents out of blue boxes or containers, thereby reducing the loss of recyclables from being collected. Carts also deter animals from tearing open the bags.

» It facilitates the transition for collecting recyclables and organics from multi-residential properties not currently on City collection, thereby increasing the waste diversion rate. Bags are cumbersome and inefficient to collect at multi-residential properties due to the volume and un-segregated placement of the three streams at the curb. Large piles of waste, leftover garbage and blowing debris are a significant problem for neighbours of multi-residential properties that utilize charge piles.

» It also creates the opportunity to move to a type of user pay system which results in increased recycling rates. User pay systems support a zero waste philosophy by reducing the amount of waste generated by changing resident's purchasing habits. It promotes purchasing of products with less packaging and more recyclable materials. A user pay program can be an effective way for residents to pay for curbside collection.
» The new collection trucks use “diesel exhaust fluid” and meet the new federal and provincial emission control standards.
» The automated collection program reduces impact on human health related to staff injuries, illness rates and modified job duties (e.g. minimizes exposure to sharps such as broken glass or hypodermic needles; minimizes repetitive strain injuries to shoulder, knees, back; minimizes physical fatigue for collection staff; reduces direct exposure and risk of injury from unfavourable weather such as rain, snow, ice and extreme hot and cold temperatures; and minimizes exposure to traffic risks while working at the side and rear of the collection vehicles).

ENVIRONMENTAL COMPLIANCE

Automated cart collection meets all Environmental Compliance Approval requirements as provided by the MOECC. The carts provide a method to collect organics without the use of plastic bags as required by the Environmental Compliance Approval for the OWPF.

All trucks and vehicles are registered as waste carriers as per the MOECC and Ontario Ministry of Transportation requirements. The MOECC requirements include a driver certification program and all drivers meet these requirements.

At all times, staff must adhere to all safety policies and guidelines for waste collection and comply with the Solid Waste Resource Innovation Centre - Environmental Compliance Approvals as well as Waste Collections - Environmental Compliance Approvals which are mandated and enforced by the MOECC. All operators and staff are trained to ensure environmental compliance. This includes being trained on worker responsibilities and the Ontario Ministry of Labor requirements.

There have been no orders, fines or non-compliance citations related to waste collection at the City of Guelph during or after the transition to automated collection.

AWARDS AND AUDIT DATA FOR COLLECTION SYSTEM

The City of Guelph has long been recognized as a leader in waste collection and diversion activities. On June 2, 2010, the City was awarded the Waste Diversion Ontario, Continuous Improvement Fund grant (CIF Project #284) in the amount of $1,335,519, to assist in the implementation of an automated cart collection system, as it was recognised as a best practice.

As part of the Waste Diversion Ontario municipal data reporting audit, the City of Guelph received the Ron Lance Memorial Award for Highest Residential Waste Diversion Rate in Ontario, in 2012 at 67%. Recently, the City was again audited and recognised from Waste Diversion Ontario, as having the highest residential waste diversion rate in 2013 in Ontario at 69%. Collection data is audited as part of the municipal data reporting.

During the cart rollout, the City received various awards with respect to promotion and education of the program including the following:

» Recycling Council of Ontario (RCO), 2013, Gold, Municipal Communications and Design
» Municipal Waste Association (MWA), 2013, Silver, Promotion and Education Award Campaign
» MWA, 2013, Gold, Promotion and Education Award, Calendar
» RCO, 2014, Silver, Municipal Diversion Award
» SWANA, 2014, Gold, Awareness Campaign Excellence Award - Waste Cart Rollout
PERFORMANCE, ECONOMICS, AND COST EFFECTIVENESS

EQUIPMENT/SYSTEMS & INNOVATIVE TECHNOLOGY

A streamlined cart management system was developed for the City in 2014 to help with cart distribution. Lateral Innovations consists of two major components: Innovadel and Innovatrac. Innovadel is used internally to help residents with cart exchanges, repairs, and damages while tracking all three streams in 45,000 households across the municipality. A screen shot is presented in Figure 2.

Innovatrac consists of an RFID transponder installed on each cart, with a truck-mount reader and a tablet to generate real time reports. This fleet technology allows for the collection of organics on a weekly basis and recycling and garbage on an alternating bi-weekly basis. Further, this technology allows the collection of four streams which includes yard waste, organics, garbage, and recycling. The cart numbers are assigned to each household allowing data to be collected on a daily basis. This data includes the types (organics, recycling, or garbage) and the sizes of carts set out by address. An example is provided in Figure 3 taken as a screen shot from the cart management system. The automated cart collection system was completed on time and under budget and met the projected operational efficiencies. The efficiency and effectiveness is described in the Budgeted Operational Savings, System Efficiency and Operational Performance Section on page 10.

Figure 2: Website Database for Cart tracking within the City

Figure 3: Website for Tracking of Carts within the City
The success of Lateral Innovations allowed the City of Guelph to develop and implement two new applications for collections: 311 GIS and Sort Right. 311 GIS is a map based application to allow citizens to report non-emergency issues in regards to collection. The technology makes it easier for people to access City services, and helps bylaw officers respond more efficiently and effectively to concerns.

The goal of the digital tool “Sort Right” is to provide residents with a searchable database of over 900 items, identifying their specific recycling and disposal instructions. Additional sorting notes for each waste item describe specific set out instructions (e.g. cart lining requirements) and public-drop off location and hours of operation. A secondary goal was to design the tool in-house at a minimal cost, and avoid any yearly subscription fees associated with other existing tools. http://guelphapps.elasticbeanstalk.com/

**BUDGETED OPERATIONAL SAVINGS, SYSTEM EFFICIENCY AND OPERATIONAL PERFORMANCE**

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<thead>
<tr>
<th>Goals</th>
<th>Efficiency and Effectiveness</th>
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<tr>
<td>Reduce the collection vehicle fleet by 4 vehicles</td>
<td>Met goal; reduced fleet by 4 trucks from 19 trucks to 15 trucks</td>
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<td>Reduce operating costs by $460,000 per year</td>
<td>Met goal; reduced fleet by 4 trucks reducing capital replacement costs by approximately $167,000 ($1.17 million over 7 year depreciation), reduced fleet maintenance and fuel costs by $100,000; reduced collection staff by 3 full time positions for a savings of $135,000 per year; reduced replacement labour costs by $66,000 for a Total Operating Savings of $468,000</td>
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<td>Reduce replacement labour costs (sick time, injuries and modified duties) by 72%</td>
<td>Below projected target; reduced replacement labour costs by 62%, although 558 short term disability hours were related to medical issues unrelated to employment</td>
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<td>Reduce WSIB claims by 90%</td>
<td>Exceeded goal; reduced WSIB claims by 95%</td>
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<td>Improve customer satisfaction</td>
<td>Met goal, a statistically significant survey of Guelph households revealed 80 per cent of residents using waste carts are satisfied with the City’s automated collection system when compared to the previous bag collection system</td>
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<td>Increase the City’s waste diversion rate of 49% by at least 2%</td>
<td>Exceeded goal, increased the City’s waste diversion rate in 2013 to 69% through the opening of the OWPF, diligent sorting into 3 stream by residents and waste cart use</td>
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The automated cart collection system was completed on time and under budget by $850,000. The fleet technology was changed from drop frame to straight frame. Additionally, the cart tender had offered a price lower than anticipated which allowed the City to stay under budget.
MAINTENANCE PROGRAM FOR COLLECTION VEHICLES

All collection vehicles are inspected daily in accordance with Ministry of Transportation requirements and rinsed and cleaned of debris at our Organics Waste Processing Facility daily by the collection drivers. Vehicles are also brought in every three to four (3-4) weeks for maintenance by fleet staff for servicing the automated arm, to review the waste packer operation and conduct a complete vehicle wash. Additionally, approximately eight (8) times per year, vehicles are also brought in for a lube and check-over service which includes review of tires brakes and lubrication. Four (4) times per year, vehicles are brought in for an “A” service which includes an additional complete engine service, removal of wheels for inspection of the braking system, drive train and PTO operation. Vehicles are brought in annually for a “C” inspection which meets all Ministry of Transportation requirements. All vehicles have automated lubrication systems for greasing.

RECOVERY PLANS FOR SERVICE INTERRUPTIONS

The automated collection fleet consists of:

» 7 split trucks, automated side loaders (60% recyclables, 40% organics)
» 1 single stream automated truck
» 5 split trucks, automated side loaders (60% waste, 40% organics)
» 2 spare split automated trucks.

This fleet technology has had ZERO weather related cancellations since 2013 (implementation of program). The split body straight frame is constructed with the same specifications as snow removal equipment, allowing collections in all weather conditions. The trucks are equipped with GPS tracking, as well as two way radios with an emergency call feature. Frequency of collection has allowed us to achieve only one truck going down the road per day.

WORKER HEALTH AND SAFETY

EMPLOYEE TRAINING PROGRAM

The Corporation of the City of Guelph and the department of Solid Waste Resources are guided by their Corporate Values of integrity, excellence and wellness and are committed to maintaining the Health and Safety of every individual: employees, contractors, volunteers and visitors. Health, safety and environmental legislative requirements for compliance, are maintained with corporate and departmental resources. The City of Guelph has set compliance standards focusing on systematic continuous improvement in their safety management system.

All operators undergo extensive training and are certified to operate the equipment. Training includes minimum standards for driving records upon hiring. A road test is completed at the point of hire for the type of vehicle they operate and a minimum “D” drivers license and “Z” air brake endorsement is required. Training includes CVOR (Commercial vehicle Operator Registration) training, commercial motor vehicle inspection, hours of work training, load security, spills training,
defensive driving, job shadowing and 1-2 weeks of practical training on the automated collection vehicle. Once training is completed, drivers undergo a certification process and their operation is evaluated to certify that they meet all City of Guelph and Ministry of Labour (MOL) health and safety requirements, as well as, the environmental MOECC requirements. Training is repeated every 2-3 years depending on requirements.

<table>
<thead>
<tr>
<th>Corporate safety management system:</th>
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<tbody>
<tr>
<td>Accountabilities/Responsibilities; for Employer, Supervisors, Employees &amp; Supplied Labour</td>
<td>Musculoskeletal Disorder Prevention Program</td>
</tr>
<tr>
<td>Blood borne Pathogens</td>
<td>Occupational Health and Safety Policy Statement</td>
</tr>
<tr>
<td>Confined Space</td>
<td>Reporting and Investigating Serious Incidents or Accidents</td>
</tr>
<tr>
<td>Fall Protection Program</td>
<td>WHMIS Program</td>
</tr>
<tr>
<td>Fire Safety Measures Program</td>
<td>Work Refusal Policy</td>
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<tr>
<td>Guelph Asbestos Awareness Program</td>
<td>Working Alone Policy</td>
</tr>
<tr>
<td>Hearing Conservation Program</td>
<td>Workplace Inspection Program</td>
</tr>
<tr>
<td>Hot Work Program</td>
<td>Workplace Violence Policy</td>
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<tr>
<td>Job Hazard Analysis</td>
<td>Use of Personal Protective Equipment</td>
</tr>
<tr>
<td>Lock Out Program</td>
<td>Hazard Recognition Inspections</td>
</tr>
<tr>
<td>Prevention of Slips, Trips, Falls</td>
<td>Health and Safety Training</td>
</tr>
<tr>
<td>Safe Movement of Materials</td>
<td>Housekeeping for Improved Safety</td>
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**SAFETY PROCEDURES AND INJURIES**

In 2011, the Ontario MOL issued orders to a recycling and waste operator “to take every precaution reasonable in the circumstances for the protection of the worker from musculoskeletal disorder hazard associated with the repeated extended reach”. The use of automated collection has now minimized and removed this risk as the workers are no longer lifting and tossing bags from the curb. Limiting the requirement to manually handle waste also significantly reduces the potential for hypodermic needle pricks or illness brought on by exposure to biohazardous material.

The Solid Waste Resource department has completed a formal Job Hazard Analysis on all potentially hazardous work performed by collection staff. Standard operating guidelines and procedures were developed from these reviews, and equipment controls and training were designed and implemented to reduce the risks associated with the work. The department has also implemented a hazard reporting program to address staff concerns before an incident may occur. A review of near miss incidents and accidents, including the performance of a root cause analysis, is discussed at regular staff update meetings with the goal of raising awareness on ways to reduce accidents and injuries and generate awareness of job hazards. Since 2013, there have been ZERO work related injuries in our automated cart related collection system.

Drivers are trained and complete a commercial motor vehicle inspection daily. Vehicle inspections are reviewed daily by the supervisor. Part of their daily work includes reviewing the operation of the vehicle while operating and cleaning the truck at the end of the day.
PUBLIC ACCEPTANCE, APPEARANCE, AND AESTHETICS

SUCCESES AND FAILURES IN EDUCATION AND OUTREACH PROGRAMS

The City’s communication efforts have successfully achieved the communication plan goals and objectives and have been well received by residents. The City commissioned public opinion research, compiled web analysis, and culled data and anecdotal research from the City’s waste collection division, to measure the success of the program’s communication efforts against its objectives and goals.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Quantitative and Qualitative Measures</th>
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<tr>
<td>To increase the City’s waste diversion rate of 49% by at least 2%.</td>
<td>The City’s diversion rate in 2013 was calculated as 69%, the highest in the province of Ontario. This rate was 18% higher than the target set in the objective, based on the opening of the OWPF, diligent sorting into 3-stream by residents and the waste cart use.</td>
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<td>To ensure 90% of residents were aware of the new cart collection system.</td>
<td>Metro line research was commissioned to administer telephone interviews. The findings revealed that 98% of residents in neighborhoods scheduled to receive carts in 2012 were aware of the new waste cart collection program. A second telephone survey was competed in 2013 which revealed that 74% of residents were aware of the program and was very satisfied with the communication of information.</td>
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<td>To encourage at least 60% of households within 2012 to select their preferred sizes of blue and grey carts</td>
<td>The City received cart selections from 67% of the 15,000 households scheduled to receive carts in 2012. The Metroline telephone survey indicated that in June 2012, 68% of the population said they completed the cart selection form.</td>
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<td>To ensure 90% of households had their carts at the curb on their first collection day.</td>
<td>The City estimated that 99% of households had the right carts placed at the curb on their first day of collection.</td>
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Opportunities to improve the communications campaign have been identified through anecdotal feedback from Solid Waste staff and residents, as well as, feedback from Guelph residents. Feedback from all sources led to improvements in the subsequent rollout years.

- Wording was updated throughout the Cart Size Selection Brochure and Waste Cart User Guide to refine and clarify the information to make it as concise and clear as possible for residents. The material was also updated to stress the new collection frequency for recyclables; changing from weekly to every other week.
- Following the second year’s rollout in (2013), the Online Cart Size Selection form was updated with an improved layout and new content, including mandatory acknowledgement statements to assist residents with appropriate cart size selection:
  - I understand that all waste material must fit completely inside the carts, so the lids can close. Material left beside or on top of carts (including cardboard) will not be collected.
  - I understand that the collection of recyclables is changing from once weekly (blue bags) to every other week (blue cart).
- Information boards used at cart displays and at special events in 2012 were converted into free-standing banners for 2013 and 2014. In addition to offering a more professional appearance, these new banners made the display carts more accessible for residents to view and test since the original boards sat on top of the carts at the display and had to be lifted off the carts when residents wanted to look inside or try rolling them.

Following the first year’s (2012) rollout, the number of radio and print ads were decreased since the target audience had already started to become aware of the program.
COLLECTION SYSTEM IMPORTANCE IN THE COMMUNITY

Waste collection is an integral municipal service provided to residents in the City of Guelph. Since implementation of automated collection, carts are being used at single family homes, multi-residential properties, downtown businesses and special events to ensure diligent sorting and diversion of waste. Last year, the City achieved the highest diversion rate in Ontario at 69%.

To assist residents with mobility issues, the City implemented a cart assistance program which allows residents to request that their carts are placed at the curb for them and returned at the end of the collection day.

Recently, one of our collection drivers was “spotted” on Facebook for their excellent service. This includes working with our youngest community members proving that this service is an important part of the community.

CUSTOMER INTERACTION SURVEY RESULTS & CUSTOMER SERVICE

In 2014, the City responded to over 8,000 phone calls and received more than 26,000 unique website pageviews on the curbside waste collection information pages. Metroline Research was commissioned to administer a statistically significant telephone survey. The findings revealed:

- 98% of residents in neighborhoods scheduled to receive carts in 2012 were aware of the new waste cart collection program.
- 80% of residents using waste carts were satisfied with the City’s new waste collection system.
- The majority (74%) of residents interviewed were “very satisfied” with the communications and information they received from the City of Guelph about the new waste cart collection system.
- Survey respondents also indicated that they generally found the new carts easier to use and store than bags. Many liked not having to buy bags anymore and found waste storage less messy.

Effective customer service was integral to the successful transition from bag-based collection to cart-based collection. To mitigate customer service concerns, a variety of programs were implemented with respect to collection. These included:

- Promotion of the new program through various communication outlets, including print media, public displays, information sessions, truck and bus decal ads, door hangers, and user guides.
- Offering a variety of cart sizes to residents and businesses to meet their individual needs enabled public input and earned community acceptance and support for the program.
- A cart assistance program was implemented for residents with mobility issues to help move their carts to the curb.
- Additional temporary customer service staff were hired and customer service hours were extended to address increased call volumes. Weekly customer service meetings were held with all staff to discuss frequently asked questions and address key concerns raised by residents.

PUBLIC RELATIONS MEASURES AND EDUCATION AWARD

A formal communications plan was developed and implemented for the cart rollout program that outlined public relations measures and education. The City of Guelph also received the 2014 Gold Awareness Campaign Excellence Award for the Waste Cart Rollout from SWANA.