



## Toronto Long Term Solid Waste Management Strategy

**Title:** 2017 Excellence Award entry

**Category:** Integrated Solid Waste Management

**Entrant Organization:** City of Toronto

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**Entry Title:** Toronto Long Term Solid Waste Management Strategy

**Jurisdiction:** Toronto, Ontario

**Approximate Population of the Jurisdiction:** 2.8 million

**Cost Per Household for the Project:** \$2.10 per customer\*

**Approximate Budget:** \$1.9 million + applicable taxes\*

\*Approximate budget and cost per hhld relate only to the development of the Long Term Waste Management Strategy.





# Paving the Road to **Zero Waste**

## Executive Summary

As one of the most diverse cities in the nation, the City of Toronto knows that every great system starts with a plan. In 2014, with a drive towards a circular economy, the City embarked on a two-year process to develop a roadmap for the future of their Integrated Solid Waste Management System. In an effort to increase diversion to 70 percent, the Long Term Solid Waste Management Strategy (Waste Strategy) — a collaborative plan focused on the 5Rs (reduction, reuse, recycling, recovery and residual disposal) — builds on the City's existing waste management system and sets the stage for success over the next 30 to 50 years. A result of extensive planning and research, stakeholder and community engagement, and unique tools and processes, the City's Waste Strategy provides an innovative approach to the future of solid waste management and will secure their position as an industry leader for years to come.

## System Overview

As the capital of Ontario and Canada's largest city – with a population of more than 2.8 million – Toronto is one of the most diverse cities in the country. Approximately half of the City's population was born outside of Canada. Geographically spanning 630 square kilometers, the City's comprehensive, integrated waste management system provides support and services from the initial generation of waste (or avoidance of generation) through to monitoring and perpetual care of closed landfill sites. The system includes an extensive network of programs, services, vehicles, transfer and drop-off facilities, processing facilities, and residual management facilities.

A leader in North America, the City of Toronto created one of the first fully automated collection programs for curbside material. This spurred an innovative bin design which contains a gravity locking mechanism for Green Bin organics bins that are rodent and pest resistant.

The City's Solid Waste Management Services (SWMS) serves approximately 461,000 single family residences; and 409,000 multi-residential units in approximately 4,300 buildings. In addition to the residential customers, the City serves over 15,000 non-residential establishments, which includes agencies and corporations, non-profits, and schools.

On top of current waste collection responsibilities, the City is responsible for monitoring and the perpetual care of 160 closed landfill sites — 27 of which have landfill gas collection systems. Thirteen of these utilize mechanical extraction equipment while 16 incorporate passive venting.

Through extensive public consultation and community engagement — including webcasts, the Nuit Blanche art exhibit, Wast(ED) Speaker Series and movie screenings, among many others — Stakeholder Advisory Group, Key Stakeholder meetings, staff roadshows, Councillor briefing sessions, digital engagement — including webinars and MetroQuest (an online survey) — as well as in-person consultation sessions through Public Information Centers, SWMS has utilized some of the most innovative engagement and outreach strategies to develop their new Waste Strategy.



Single family households

### RESIDENTIAL CUSTOMERS

**870,000**

**461,000**

Single family customers

**409,000**

Multi-residential customers

### ANNUAL RESIDENTIAL WASTE DIVERTED



**683 kg** (Single family household)  
*average*



**173 kg** (Multi-residential household)  
*average*

### NON-RESIDENTIAL CUSTOMERS



**15,000**

\*2016 statistics

### City of Toronto Assets



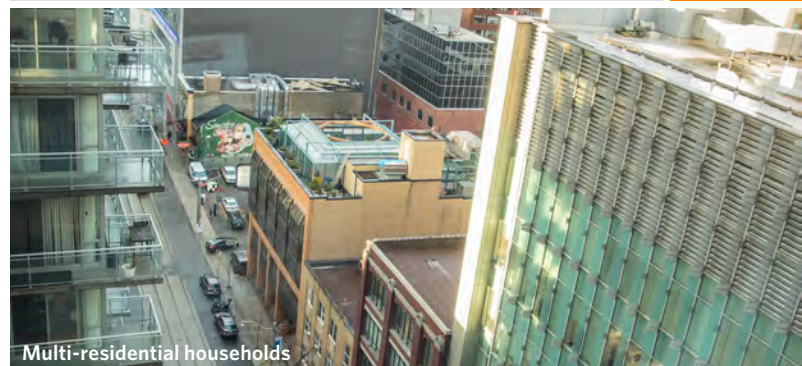
**1,600,000**  
Bins Collected



**600+**  
Trucks & Equipment



**15**  
Facilities

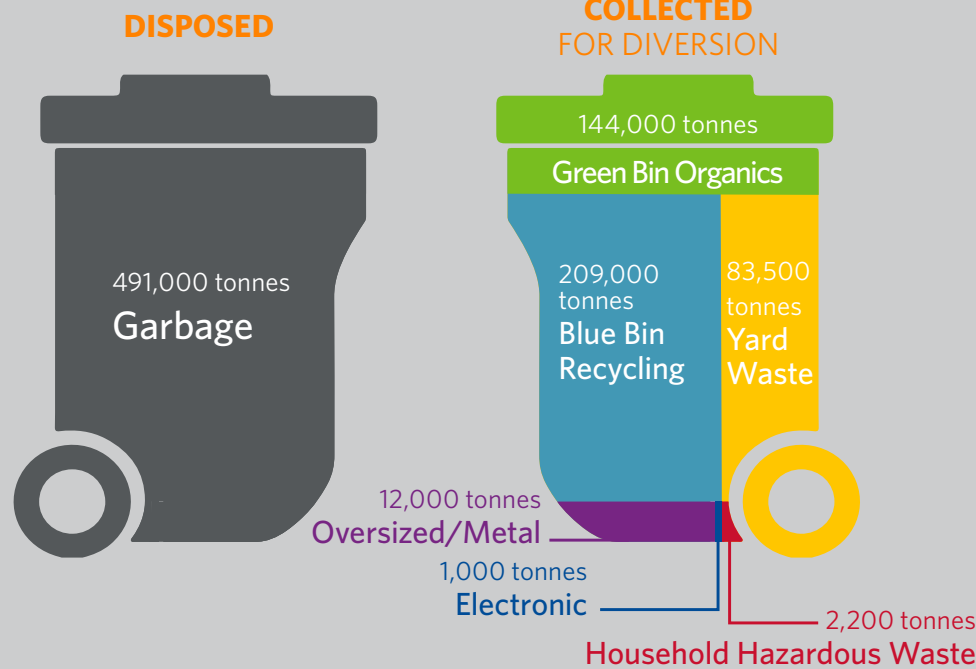


Multi-residential households





## How Much Waste did the City Manage in 2016?



## FOCUSING ON THE 5Rs



Reduce



Reuse



Recycle



Recover



Residual Disposal

### LONG TERM WASTE STRATEGY PROVIDES GUIDANCE FOR THE FUTURE

When it comes to managing garbage, securing long term waste disposal capacity has historically been a challenge. In 2007, the City purchased the Green Lane Landfill and began shipping the majority of municipal waste to it in 2011.

Even with a place to put the waste, and diversion rates increasing to 53 percent, the City needed a Waste Strategy to further reduce waste while increasing reuse, recycling and recovery. The new Waste Strategy recommends reduction, reuse, recycling, recovery and residual disposal — the 5Rs, policies and programs that are environmentally sustainable, socially acceptable and cost effective for the long term. It is intended to be a living document, with reviews, revisions and updates every five years.

In 2016, Ontario passed the *Waste-Free Ontario Act, 2016*. With an aspirational goal of zero waste, the City has undertaken an unprecedented task — to achieve 70 percent waste diversion by 2026 and create a circular economy. The Waste Strategy also focuses on using and

reusing all resources to maximize the reintegration of recovered materials back into the economy.

The circular economy shifts the way that waste is viewed — changing the way products are packaged and how waste is managed to maximize resource recovery. SWMS supports this movement towards a circular economy by developing a unique Unit for Research, Innovation & a Circular Economy to find new markets for waste and look at other leading practices and social research to reduce waste.

The two-year effort to develop the Waste Strategy built on the existing waste management system and identified a path to innovation and continuous improvement. The new Waste Strategy will serve the City for the next 30 to 50 years, focusing on sending less material to the landfill. It emphasizes the importance of community engagement and encourages the prevention of waste, maximizing its value before disposal while supporting the move towards a circular economy and zero waste future. The plan also complements SWMS' Asset Management Plan and Framework.

This comprehensive Waste Strategy will guide waste management in Toronto for the next

30-50 years.





All three major waste streams are collected in bins automatically to simplify the process and reduce injury risk.

The Waste Strategy was developed with extensive public consultation and included some unique elements such as the development of a sustainable rate model and the assessment of options from a public health perspective. The Waste Strategy will apply a social equity lens to future planning, including development and implementation of options to manage waste. Options considered included policy, programs, technology and implementation tools. The development of the Waste Strategy was supported by a vision and guiding principles developed in collaboration with the public and stakeholders. Lastly, the Waste Strategy supports collaboration and partnerships with organizations and groups that already play a role in diverting waste and have waste diversion related networks.

The Waste Strategy considered the following City responsibilities:

#### Public Space Bins



- Collection of approximately 8,500 street litter/recycling bins
- Maintenance and collection of 10,000 park bins and collection of litter from public right-of-ways

#### Trucks, Bin Delivery, and Maintenance Operation



- Operation and management of over 600 vehicles and pieces of equipment
- Delivery, maintenance and tracking of approximately 1.6 million Garbage, Blue Bins, and Green Bins which include RFID tags for future data analysis

#### Waste Management Facilities



- The City owns and operates:
  - Seven transfer stations (six with Household Hazardous Waste (HHW) depots)
  - Four collection yards
  - One litter collection yard
- The City owns the following facilities which are operated by private contractors:
  - Green Lane Landfill
  - Disco Road Organics Processing Facility
- The City owns the following facilities which are pending operation:
  - Dufferin Material Recovery Facility
  - Dufferin Organics Processing Facility (under expansion)
- SWMS leases a Durable Goods sorting facility

#### Closed Landfills Monitoring



- Provision of perpetual care for 160 closed landfill sites

## What makes up Toronto's comprehensive and integrated waste management services to single family residences and multi-residential units?





## Waste Strategy-System Performance and Integration

The City will utilize an extensive list of metrics and benchmarks to monitor the progress of the Waste Strategy. Some of these key performance measurements include total tonnage collected, divertible material recovery rate, landfill volume, per household waste generation, number of community partnerships, residential waste diversion rate, complaints, enforcement actions, customer satisfaction rating, and safety rating.

Prior to developing the Waste Strategy, the City conducted several studies and expanded reporting processes to further assess the performance and efficiency of the SWMS Division. This included a 2011 Service Review of core services and efficiencies, quarterly and annual reports to City Council on contractor performance, waste audits, annual Blue Bin recycling submissions to the Resource Productivity and Recovery Authority, and ongoing promotion and education performance monitoring.

The City of Toronto is unique in its ability to provide waste collection, processing and disposal through a combination of public and private forces and facilities. The City collects waste (garbage, Blue Bin recycling, Green Bin organics, oversized and metal items, household hazardous and electric waste, and yard waste) at the curb, at transfer stations, drop-off depots, and at Community Environment Days from the single family and multi-residential sectors, as well as from the non-residential sector. Non-residential and multi-residential customers are able to tailor collection services according to their needs based on frequency of collection and number/size of containers



### How Will We Measure Success?

The highlighted performance metrics below represent a portion of the metrics the City uses to measure the impact of the new Waste Strategy, monitor trends associated with waste reduction and reuse strategies, and provide transparency on all aspects of waste management in Toronto.



**Waste Generation**



**Waste Diversion**



**Greenhouse Gas Emissions**



**Customer Satisfaction**



**Community Partnerships**



**Safety Rating**

required. Services are funded through a combination of a 'user pay' system for garbage collection with subscription prices based on the size of bin chosen, frequency of collection, type of unit serviced as well as transfer station/landfill tipping fees, etc. Costs are also partially offset by industry funding for designated materials (i.e. WEEE, Blue Box, tires, etc).

All waste management facilities are subject to environmental compliance approvals issued by the Province's Ministry of the Environment and Climate Change which must be adhered to. The City is proactive in ensuring their own facilities, as well as those belonging to private service providers, are in compliance.





Safety is at the heart of the City's operational culture, mission and strategy, which includes training for employees and contractors working with household hazardous waste.



Toronto's more than 600 vehicles collect waste from approximately 1.6 million Garbage, Blue Bins and Green Bins.



The City operates several drop-off depots where they collect materials such as used tires, electronics, Blue Bin recycling and household hazardous waste.



Disco Road Organics Processing Facility

## A WASTE STRATEGY THAT FOCUSES ON PROVEN TECHNOLOGIES

### Anaerobic Digestion Expansion Will Allow 90 Percent of Organics to be Turned into Biogas

The City has expanded organic processing twice in the last decade — adding the Disco Road Organics Processing Facility in 2011 and the expansion of the Dufferin Organics Processing Facility. The Dufferin facility was North America's first full-scale municipal source separated organics processing facility to use anaerobic digestion. By utilizing anaerobic digestion, the City is able to divert more waste from landfill disposal, generate and collect biogas as a recoverable resource and supply digested nutrient-rich material for commercial compost.

To reduce the potential for odours and promote participation in diversion programs, the City collects organic waste every week — in comparison to garbage, which is collected biweekly — and allows material to be collected in regular plastic bags. The City collects a wide range of materials in their Green Bin Organics Program including food waste, pet waste, cat litter, diapers and sanitary items, soiled paper food packaging, tissues, napkins, paper towels, plants, and soil. This has encouraged more participation throughout the city and made the program the most widely-adopted in North America. Biweekly garbage collection is a more efficient system which requires a smaller fleet and reduces greenhouse gas emissions from collection vehicles as fewer trucks are required to collect waste.

## WASTE STRATEGY SAFETY METRIC CONSIDERATIONS

### Automation Simplifies Collection, Reduces Risk of Injuries

The City has also undertaken significant efforts to automate its collection system, utilizing an automated arm on each truck to collect containers instead of manual loading. This simplifies the collection process for residents and staff — reducing the risk of injuries. All three major waste streams; garbage, Blue Bin recycling and Green Bin organics, are collected in bins using automated collection.

## Financial, Employee and Business Management

### A WASTE STRATEGY THAT IS FINANCIALLY SUSTAINABLE

The City of Toronto utilizes a volume-based model where customer fees are based on the size of the customer's garbage bin and includes collection of recycling, organics, yard waste and household hazardous waste at no additional charge. Ongoing financial goals are measured and monitored annually through a standard budget process. In 2016, Solid Waste Management Services' capital budget was \$105 million, and their operating budget consisted of expenditures of \$378 million and revenues of \$398 million.

Financial and tonnage projections are set to identify future requirements for waste management. Other planning





The City collects yard waste every other week from mid-March through December, but bans lawn clippings to promote composting and grass-cycling.



The City provides waste collection services to over 400,000 multi-residential units.



The City picks up large objects from homes in the community.

and forecasting methods include planning with the *Waste Free Ontario Act* in mind, updating annual tonnage maps based on changes to the system (e.g. customer counts, new programs, enforcement activities, etc.) and waste composition data from audits of residential and non-residential customers.

### HALLMARKS FOR FUTURE SUCCESS IN THE WASTE STRATEGY

Flexibility, engagement and collaboration through all facets of the solid waste stream will ensure future success for the City. This begins with research and partnering with academia for research on social trends and behavioural sciences, then pairing the research with community planning and feedback. From there, decisions can be made and partnerships and collaboration between the City, individuals, residents, corporations and nonprofits may flourish. The City will take steps to ensure ongoing support is provided through these partnerships. Finally, future success cannot happen without engagement throughout City staff and employees, which Toronto will encourage with regular updates and ongoing training and support. Incorporating nimbleness and flexibility into future planning and programming are important to ensuring compliance with the *Waste Free Ontario Act*.

## Existing Employee Programs to Ensure Motivation for Successful Waste Strategy Implementation

### EMPLOYEE RECOGNITION AND DEVELOPMENT PROGRAMS

The SWMS has a Talent Management Program that pairs interested candidates with a mentor, which allows for

cross-training and employee growth across the Division. In its third year, the program is designed to address succession planning from within the Division.

The City also has an established quarterly and annual recognition program, a newly-launched safe driver award and a perfect attendance award.

Toronto also has a dedicated Solid Waste Emerging Leaders Program for supervisors, which includes training in leadership, stakeholder and staff communications, problem solving and strategic planning. More than 30 employees have completed this training to date.

### EMPLOYEE CONCERNS MANAGED BY HUMAN RESOURCES AND SENIOR MANAGEMENT

Employee concerns are addressed by direct supervisors and management. If items need to be escalated, the City has a full-time corporate Human Resources Division and an internal People Services Consultant to address any further items. Annual town halls provide staff and employees the opportunity to directly ask senior management questions and voice their concerns.

### SAFETY PROGRAMS, CONCERNS, RECORD AND IMPROVEMENTS

The City builds public safety into the culture, mission and strategy of their operations. They have a public safety mission statement and strategy, a dedicated committee to champion public safety and incorporate safe driving into their collection rewards and recognition program. The City has integrated a detailed accident analysis to mitigate risks by understanding root causes of accidents and addressing them with an informed approach.



With a large and mobile workforce, there is the ever-present danger of accidents between pedestrians and collection vehicle drivers. To address this, the City maintains a Solid Waste Procedures Manual which addresses solid waste-specific safe operating procedures and is regularly updated. The City also consistently reviews collections operations and has developed recommendations for operations, staff training and public education. The City uses an extensive outreach campaign

to educate the public on collection truck operation and how to be safe around them. To help keep young children safe, the City offers in-school safety presentations and outreach on how to walk and act around collection vehicles, which includes a safety doodle video.

#### MANAGING CHANGE WITH OPEN DIALOGUE

The City manages change through open communication, town halls at various work locations and staff newsletters.

The Division formulated and adopted an operationally focused Solid Waste Management Service Health & Safety Strategic Framework to better enable and coordinate improvements in divisional safety programs and culture. In a sampling of the completion of close to 100 small and large scale safety focused actions between 2014 and 2015, the Division found:

**43**  
percent

**decrease** in OSHA- Recordable-Equivalent incidents

**29**  
percent

**decrease** in total annual workers compensation costs

**23**  
percent

**decrease** in lost time frequency rates

**49**  
percent

**reduction** in new claims costs

**39**  
percent

**decrease** in at-fault collisions

**87**  
percent

**reduction** in Ministry of Labour identified regulatory contraventions



## City of Toronto Solid Waste Management Services

Existing SWMS Strategic Framework that Initiated the Development of the Waste Strategy



The senior management team supports the SWMS Strategic Framework consisting of motivated and engaged employees, research and education in solid waste management, exceptional customer service, operational excellence, and a sustainable utility, all leading to the City of Toronto being an international leader in solid waste.

### How will the Waste Strategy Support Community Relations?

The Waste Strategy will build on existing community relations to expand stakeholder groups. In 2013, SWMS introduced a Customer Service & Waste Diversion Implementation (CSWDI) section with staff that work with schools, charities, institutions and religious organizations, and multi-residential buildings to deliver waste diversion education in the form of presentations, lobby displays and site visits. Since 2013, the primary focus of this group has been implementing the Green Bin organics program in all City-serviced multi-residential buildings and follow up with building owners/property managers to provide additional assistance to educate the residents and encourage program participation. They also assist in trouble-shooting any challenges being experienced with waste management (i.e. set out, contamination, participation, etc.).

Implementation of all new major programs include comprehensive stakeholder mapping and consultation where required in order to address any community



concerns and feedback. Also, specifically related to the City's landfill (Green Lane Landfill), there are a range of community relations activities including:

- Host Community Agreement
- First Nations Community Benefits Agreement
- Green Lane Landfill Public Liaison Committee
- First Nations Liaison Committee
- Property Value Protection Plan
- Habitat Restoration Project

## WASTE STRATEGY IMPLEMENTATION TOOLS

The City offers comprehensive promotion and educational tools and resources to its customers including:



**Videos** — Short, humorous videos used to provide information on solid waste programs



**Waste Wizard** — an online waste sorting tool



**ReUseIt** — provides information on not-for-profits which accept donations of reusable items



**Collection Calendars** — information about collection and SWMS programs available electronically and in hard copy to residents



**311** — Toronto's customer service phone line



**3Rs Ambassadors Volunteers** — an education and outreach program using resident volunteers to help people living in apartments or condos to reduce their environmental impact



**Community Environment Day Events**



**Speaking Engagements**



**Targeted Campaigns and Advertisements**



**Multi-Residential Outreach**

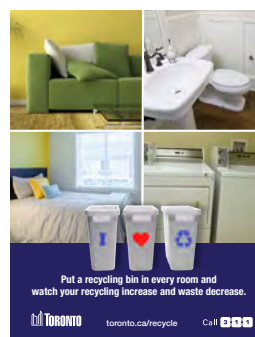
To simplify diversion for residents, the City regularly hosts Community Environment Days, which provide residents with alternative means to drop off reusable materials such as art supplies, sporting goods, textiles, etc., and safely dispose of small electronics and household hazardous waste. More than 40 of these events are held annually from April to September across the City.



## City of Toronto's Recycling, Organics & Garbage Website



## Recycling & Waste Reduction Poster Series





### WHAT GOES IN THE GREEN BIN?

**Green Bin Tips**

- Do not use biodegradable bags.
- Do not double bag the plastic bag (no twist ties).
- Take food items out of their plastic bags/wraps; too much plastic causes problems.

**YES ✓**

- Fruits, vegetables
- Meat, poultry, fish products
- Plants, bread, cereals, rice
- Dairy products, eggs and shells
- Coffee grounds/filters, tea bags
- Cake, cookies, candy
- Diapers, sanitary products
- Animal waste, bedding, cat litter
- House plants, including soil
- Paper-soaked
- Food packaging, ice cream containers, popcorn, flour and sugar bags
- Tissues, napkins, paper towels (not soaked with chemicals such as cleaning products)

**NO ✗**

- Plastic or foil bags/wraps
- Outer packaging
- Foam polystyrene meat trays and liners
- Plastic food containers, glass jars, pop cans
- Hot drink cups, lids, sleeves
- Dryer sheets, baby wipes, makeup pads, dental floss, cotton tipped swabs
- Hair, pet fur, feathers, wax, wood pieces, cigarette butts, wine corks, vacuum bags/contents, fireplace and BBQ ashes

**Curbside collection**

- Use either your kitchen container or Green Bin. Do not tie both.
- Use either a plastic bag or foil paper bag to line either container.
- Excess material? Put non-food waste (e.g. houses, diapers, animal waste) in a clear plastic bag inside your Green Bin.

**More Tips**

Call 311

LiveGreen

### Blue Bin Recycling

**Recycling Tips**

- Rinse clean, reusable food, liquids, contents before recycling
- Put items in bins and not in bags
- Put shredded paper in a clear plastic bag
- Separate different types of clear wrap from newspapers, flyers, magazines, water/salt drink cans. Recycle separately!

**Glass**

- Bottles, jars (all out)

**Plastics**

- Thin, flat
- Clean food containers/dishware
- Disposable plates, cups, berry containers
- Wash bottles (no perfume)
- Detergent, hand soap, shampoo bottles
- Wash bottles (no perfume)
- Newspaper/flyers, magazine bags
- Plastic paint pots
- Empty food cans (no gelatin)
- Clear compact disc cases
- Empty food cans (no gelatin)

**Soft, stretchy plastics**

- Wash bags (no food)
- Beach bags (no food)
- Handbags (no food)
- Bulk food produce bags
- From food/separable bags (no meat/poultry)
- Garage/shop shopping bags
- Dry cleaning bags
- Newspaper/flyers, magazine bags
- Household items (no food)
- Garden soil/mulch/compost/road salt bags
- Diaper/washroom hygiene bags
- Clear wrap from toilet paper, napkins, paper towels, water/salt drink cans

Call 311

LiveGreen

### Bad Things Happen When the Wrong Items and Recycling Get Together



### Recycling Bloopers

**Items that don't belong in your Blue Bin:**

1. Textiles	2. Pots & pans
3. Medical waste	4. Electronics
5. Batteries	6. Tools & scrap metal
7. Small appliances	8. Dishware
9. Tanks & cylinders	10. Don't bag recycling

**Multi-residential collection**

- Use your kitchen container with a plastic bag
- Use your bag to your building's Green Bin

**Learn more:** [toronto.ca/3rs](http://toronto.ca/3rs) or 416-338-1882

Call 311

LiveGreen

### WHERE DO MY skates GO?

**WASTE WIZARD**  
toronto.ca/wastewizard

### Recycling and Waste Resources and Posters

As part of its ongoing promotion and educational efforts, the City also maintains a comprehensive website which contains a variety of information for houses, apartments and condos, non-residential, and drop-off depots. The website is laid out with a general overview section and a “what goes where” section which provides information on acceptable and non-acceptable materials for Blue Bins, Green Bins and garbage as well as information on how to safely dispose of household hazardous waste and waste electronics through City services. Detailed lists of acceptable and prohibited materials and information on collection and drop-off are available by clicking on the appropriate tab.

Toronto’s cultural diversity presents a challenge in delivering a solid waste management public communications campaign and in engaging residents to the greatest extent possible. In these challenges, targeting single family residential and multi-residential audiences and all other customers require different approaches, although the goal of improving waste management system performance is the same. However, their website can be translated into 51 languages through Google Translate and they offer printed materials in various languages as well. To address customer service, the City has a centralized 311 phone line. They also operate a centralized customer service team for operations and

billing/service requests. All requests are tracked, but not primarily used as a customer satisfaction measurement because these also include rudimentary requests such as bin exchanges, requests for additional bins, and operator complaints and compliments.

To measure behavioral change in the community and get residents to participate in the programs, the City has hosted focus groups and workshops for major communication pieces, performs curbside waste audits, visual audits at Transfer Stations and inbound analyses at the Materials Recovery Facility. Employees regularly inspect bins for contaminated items as well. On the customer service side, staff look at traffic to the website and Waste Wizard to see what information residents are looking for and at, so they can better target user needs in the future.

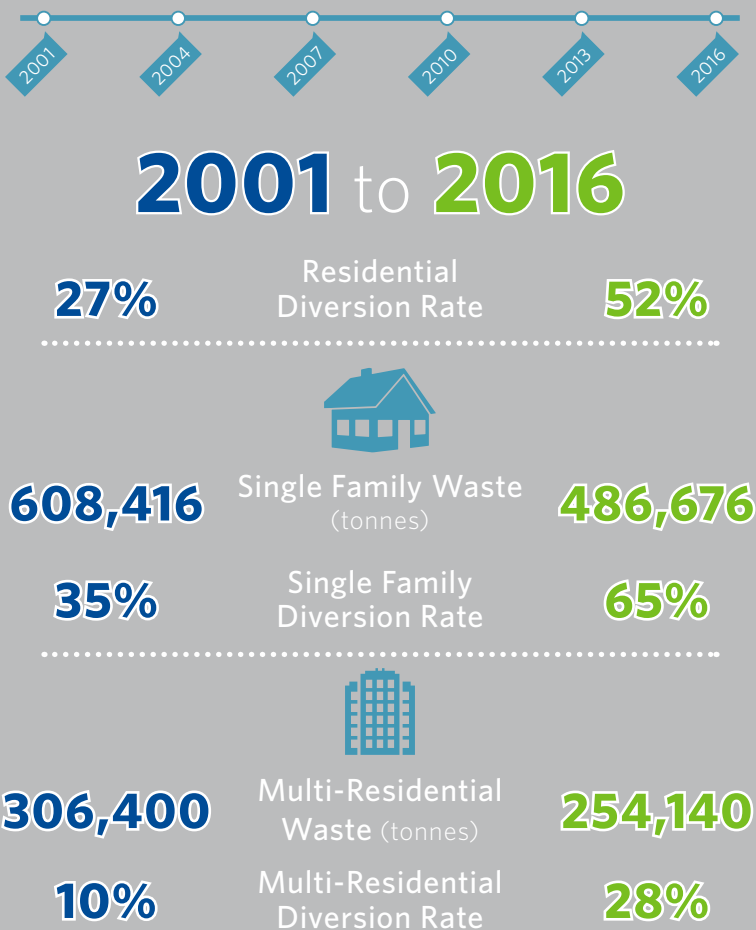
SWMS encourages residents of multi-residential buildings to participate in diversion programs through in-building presentations, Community Environment Days, and campaigns such as the Mayor’s Towering Challenge, and also provides workshops for superintendents and property managers.

In addition to the online resources, the City also utilizes printed resources, such as posters, sorting guides which can be printed from the website or ordered through 311.





# 15 year period.



## What Results are Expected from the Strategy?

Overall, the efficiency and performance of Toronto's SMWS Division has increased considerably over the years. It is expected that the Waste Strategy will contribute to enhanced efficiencies and continued improvements to the diversion rate for both single family and multi-residential homes.

During the 15 year period from 2001 to 2016, the City's residential diversion rate went from 27 percent to 52 percent, in part due to:

- Expansion of the Blue Bin Recycling Program
- Roll out of the Green Bin Organics Program
- Moving from two-stream to single-stream recycling
- New forms of education and outreach

In general, the combined single family and multi-residential diversion rate has remained relatively the same, with the diversion rate in multi-residential buildings improving. Diversion in multi-residential buildings is well less than half of the diversion achieved by single family households because of a combination of technical, processing, contamination, participation, communication and competitive challenges that are familiar in any municipality. Apartments and condos make up over half of Toronto's housing and will continue to grow more quickly than single family homes into the future. The Waste Strategy contains a number of options aimed at increasing diversion from apartments and condos, including consideration of mixed waste processing.

Overall the Waste Strategy is expected to further enhance the comprehensive, integrated waste management system already in place which makes the City of Toronto a world-class leader in waste diversion initiatives in North America.

## Supplemental Materials

[City of Toronto's Recycling, Organics & Garbage Website](#)

[Long Term Solid Waste Management Strategy website](#)

[YouTube Garbage and Recycling Educational Videos](#)



# CITY OF TORONTO **WASTE STRATEGY** IN ACTION

