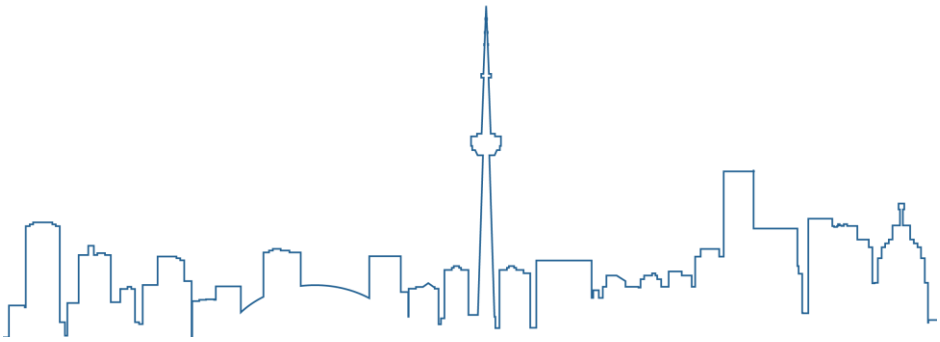
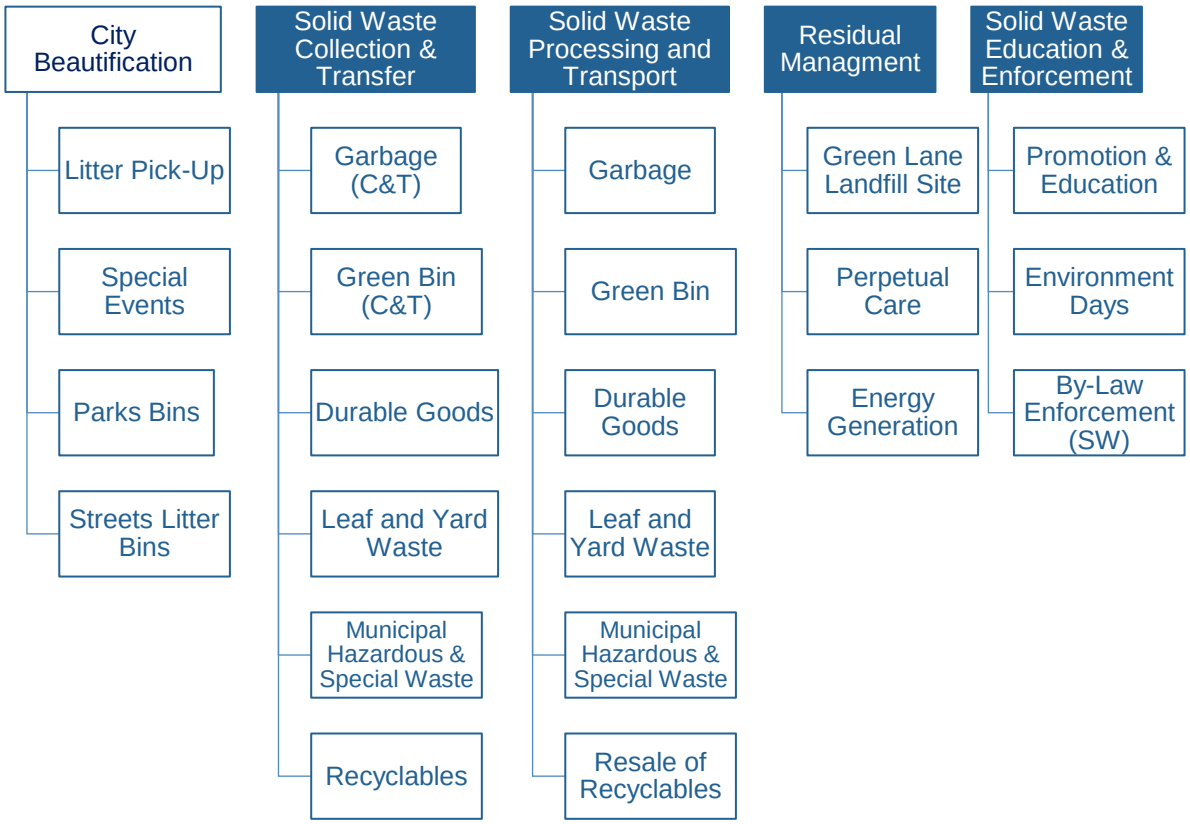
TORONTO



# WASTE MANAGEMENT SERVICES

# PROGRAM MAP

## Solid Waste Management Services




**Shaded boxes reflect the activities covered in this report**

Solid Waste Management Services is responsible for collecting, transporting, processing, composting and disposal of municipal and some private sector waste. This includes garbage, Blue Bin recyclables, Green Bin organics, litter, yard waste, over-sized and metal items, as well as household hazardous waste and electronic waste. Solid Waste Management Services' goal is to be a leader in providing innovative waste management services within the City of Toronto in a safe, efficient, and courteous manner, creating environmental sustainability, promoting waste diversion and maintaining a clean city.

Solid Waste Management Services oversees, manages and operates:

- 7 transfer stations (six with household hazardous waste depots);
- 1 Operating Green bin Organics Processing Facility (a second under expansion)
- 4 Collections Yards and 1 Litter Collection Yard
- Green Lane Landfill and 160 Closed Landfills
- 1.4 million Residential bins (Green Bin/Garbage/Blue Bin).

# SUMMARY OF PERFORMANCE MEASUREMENT RESULTS

| Question | Indicator/Measure | Internal Comparison of Toronto's 2016 vs. 2015 Results | External Comparison to Other Municipalities (MBNC) By Quartile for 2016 | Chart & Page Ref. |
|---|---|---|---|---|
| **Community Impact Measures** | | | | |
| How much solid waste is recycled/diverted away from landfill sites? | Percentage of Solid Waste Diverted - Residential (Community Impact) | **Stable**<br>**Overall diversion rate was stable** | **2**<br>**Overall diversion rate higher compared to others** | 34.1<br>34.2<br>pg. 5/6 |
| How much waste from houses is recycled/ diverted away from landfill sites? | Percentage of Waste Diverted – Single Unit homes/houses (Curbside) – (Community Impact) | **Stable**<br>**Diversion rate for single unit houses/homes (curbside) was stable** | **1**<br>**Highest diversion rate for houses compared to others** | 34.1<br>34.3<br>pg. 5/6 |
| How much waste from apartments is recycled/ diverted away from landfill sites? | Percentage of Waste Diverted – Multi-Residential – (Community Impact) | **Stable**<br>**Multi-residential diversion rate was stable** | **1**<br>**Highest multi-residential diversion rate compared to others** | 34.1<br>34.4<br>pg. 5/7 |
| **Efficiency Measures** | | | | |
| How much does it cost to collect a tonne of garbage? | Operating Cost for Residential Garbage Collection per Tonne – (Efficiency) | **Increase**<br>**Operating cost of waste collection for all housing increased** | **2**<br>**Lower operating cost of solid waste collection for all housing types compared to others** | 34.5<br>34.6<br>pg. 7/9 |
| How much does it cost to collect a tonne of garbage? | Total Cost for Residential Garbage Collection per Tonne –(Efficiency) | **Increase**<br>**Total cost of waste collection for all housing types increased** | **2**<br>**Lower total cost of solid waste collection for all housing types compared to others** | |
| How much does it cost to dispose of a tonne of garbage? | Operating Costs for Solid Waste Disposal (All Streams) per Tonne – (Efficiency) | **Decrease**<br>**Operating cost of solid waste disposal decreased** | **4**<br>**Higher operating cost of solid waste disposal compared to others** | 34.7<br>34.8<br>pg. 9/10 |
| How much does it cost to dispose of a tonne of garbage? | Total Costs for Solid Waste Disposal (All Streams) per Tonne – (Efficiency) | **Decrease**<br>**Total cost of solid waste disposal decreased** | **4**<br>**Higher total cost of solid waste disposal compared to others** | |

| Question | Indicator/Measure | Internal Comparison of Toronto's 2016 vs. 2015 Results | External Comparison to Other Municipalities (MBNC) By Quartile for 2016 | Chart & Page Ref. |
|---|---|---|---|---|
| How much does it cost to recycle a tonne of solid waste? | Net Operating Costs for Residential Solid Waste Diversion per Tonne – (Efficiency) | **Increase**<br>**Net operating cost of solid waste diversion increased** | **4**<br>**Higher operating cost of solid waste diversion compared to others**<br>(related to high diversion rate for houses & green bin program) | 34.9<br>34.10<br>pg. 11/12 |
| How much does it cost to recycle a tonne of solid waste? | Net Total Costs for Residential Solid Waste Diversion per Tonne – (Efficiency) | **Increase**<br>**Net total cost of solid waste diversion increased** | **4**<br>**Higher total cost of solid waste diversion compared to others**<br>(related to high diversion rate for houses & green bin program) | |

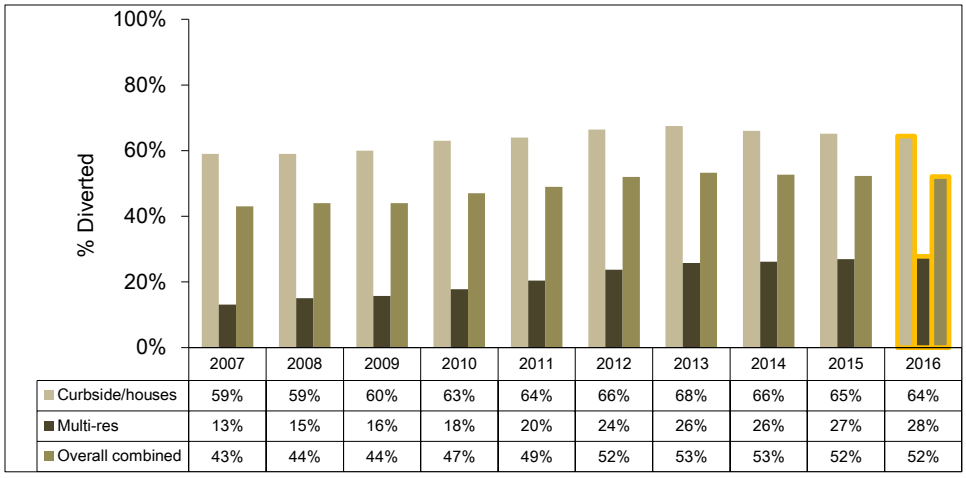
| Overall Results | Service Level Indicators (Resources) | Performance Measures (Results) | Service Level Indicators (Resources) | Performance Measures (Results) | |
|---|---|---|---|---|---|
| | N/A<br>. | 2 - Favourable<br>3 - Stable<br>4 -Unfavorable<br>55.6% favourable or stable | N/A | 2 - 1st quartile<br>3 - 2nd quartile<br>0 - 3rd quartile<br>4 - 4th quartile<br>55.6% in 1st and 2nd quartiles | |

For an explanation of how to interpret this summary and the supporting charts, please see the Guide to Toronto's Performance Results. These quartile results are based on a maximum sample size of 15 municipalities.

# COMMUNITY IMPACT

Diversion rates are an important measure to determine progress towards the goal of diverting solid waste away from landfill sites. Volume based user rates for garbage collection services, provides an incentive to reduce divert more materials.

## 34.1 –HOW MUCH OF TORONTO'S SOLID WASTE IS DIVERTED AWAY FROM LANDFILL SITES?



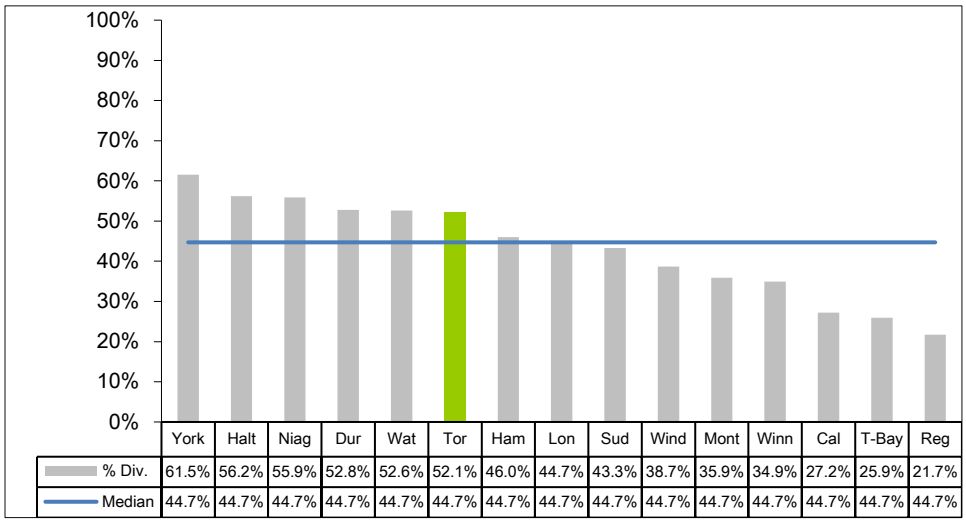

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|
| Curbside/houses | 59% | 59% | 60% | 63% | 64% | 66% | 68% | 66% | 65% | 64% |
| Multi-res | 13% | 15% | 16% | 18% | 20% | 24% | 26% | 26% | 27% | 28% |
| Overall combined | 43% | 44% | 44% | 47% | 49% | 52% | 53% | 53% | 52% | 52% |

**Chart 34.1** provides Toronto's residential diversion rates, by type of housing.

**Chart 34.1 (City of Toronto) Percentage of Residential Solid Waste Diverted**

In 2016, the combined diversion rates for curbside and multi-residential units have remained relatively stable since 2012. It should be noted that 47 per cent of Toronto's total housing stock served by Solid Waste Management Services is multi-residential homes. This presents challenges in reaching higher diversion rates, as participation in waste diversion programs in multi-residential buildings may be less convenient for residents if recycling and organics bins are inconveniently located outdoors.

## 34.2 - HOW DOES TORONTO'S COMBINED RESIDENTIAL DIVERSION RATE COMPARE TO OTHER MUNICIPALITIES?



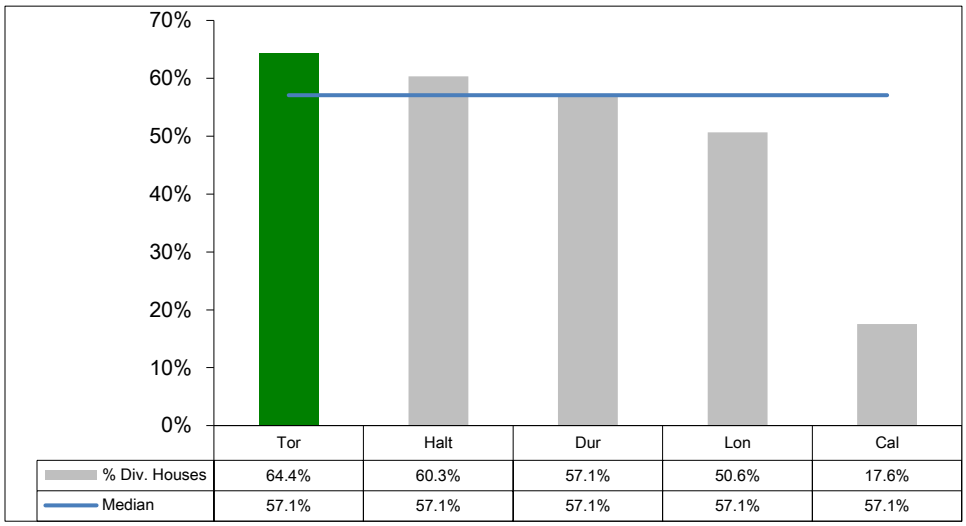

| | York | Halt | Niag | Dur | Wat | Tor | Ham | Lon | Sud | Wind | Mont | Winn | Cal | T-Bay | Reg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Div. | 61.5% | 56.2% | 55.9% | 52.8% | 52.6% | 52.1% | 46.0% | 44.7% | 43.3% | 38.7% | 35.9% | 34.9% | 27.2% | 25.9% | 21.7% |
| Median | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% | 44.7% |

**Chart 34.2** compares Toronto's 2016 overall combined diversion rate (both single unit homes/houses and multi-residential buildings) to other municipalities.

**Chart 34.2 (MBNC 2016) Percentage of Residential Waste Diverted**

Toronto ranks sixth of fifteen (second quartile) in terms of having the highest diversion rate.

## 34.3 – HOW DOES TORONTO'S DIVERSION RATE FOR HOUSES COMPARE TO OTHER MUNICIPALITIES?




| | Tor | Halt | Dur | Lon | Cal |
|---|---|---|---|---|---|
| % Div. Houses | 64.4% | 60.3% | 57.1% | 50.6% | 17.6% |
| Median | 57.1% | 57.1% | 57.1% | 57.1% | 57.1% |

**Chart 34.3** shows the percent residential waste diverted for houses compared to other municipalities.

**Chart 34.3 (MBNC 2016) Percentage of Residential Waste Diverted for Houses (Curbside)**

Toronto had the highest/best diversion rate of the MBNC municipalities in 2016 for single family homes/houses.

### 34.4 – HOW DOES TORONTO'S DIVERSION RATE FOR MULTI-RESIDENTIAL HOUSING COMPARE TO OTHER MUNICIPALITIES?

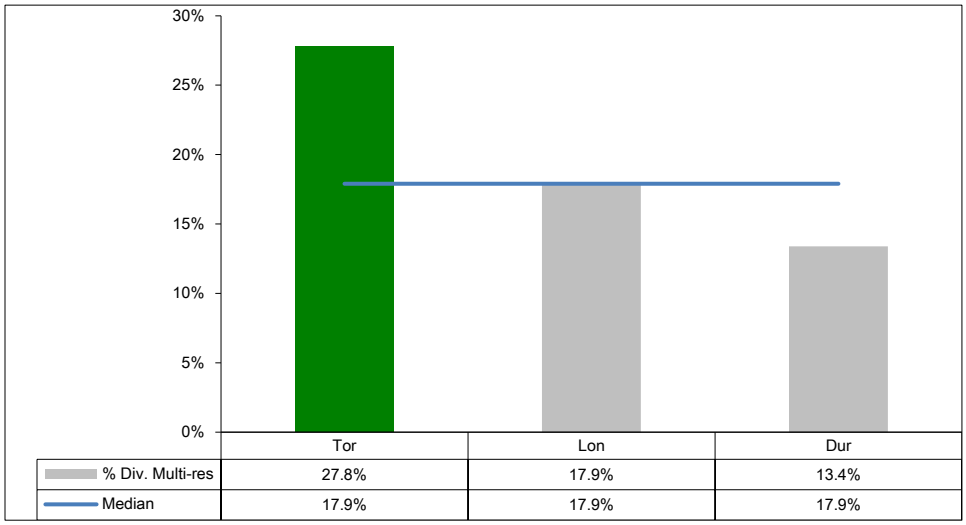



**Chart 34.4** compares Toronto's 2016 multi-residential (apartments) diversion rate to other municipalities.

**Chart 34.4 (MBNC 2016) Percentage of Residential Waste Diverted for Multi-Residential (Apartments)**

Toronto ranks first of three municipalities (first quartile) in terms of having the highest diversion rates. Note that not all municipalities are able to split their diversion rates between single and multiple family households.

## EFFICIENCY

In solid waste management there are three main activities where efficiency can be compared on a cost per tonne basis: Collection; Disposal; Diversion

### 34.5–HOW MUCH DOES IT COST TO COLLECT ONE TONNE OF GARBAGE IN TORONTO?

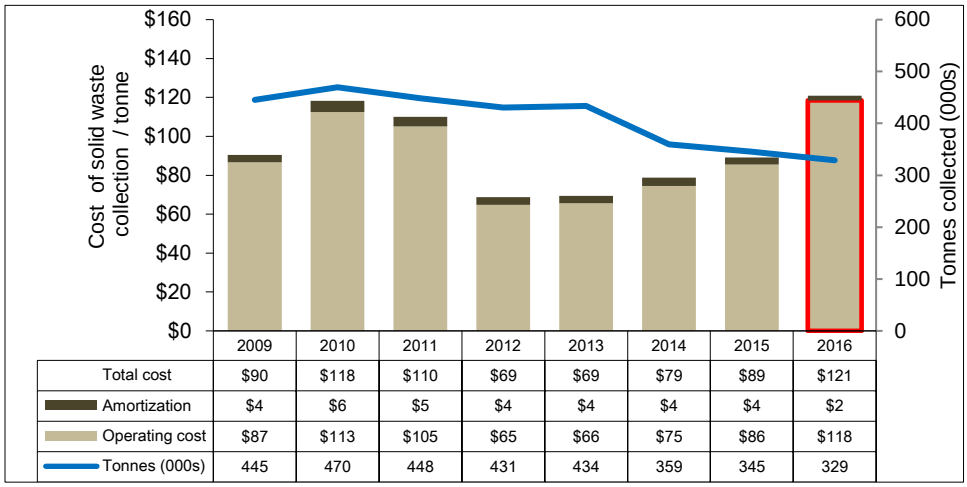



**Chart 34.5** provides Toronto's operating and total (operating plus amortization) cost of solid waste collection per tonne, which are plotted as bars relative to the left axis.

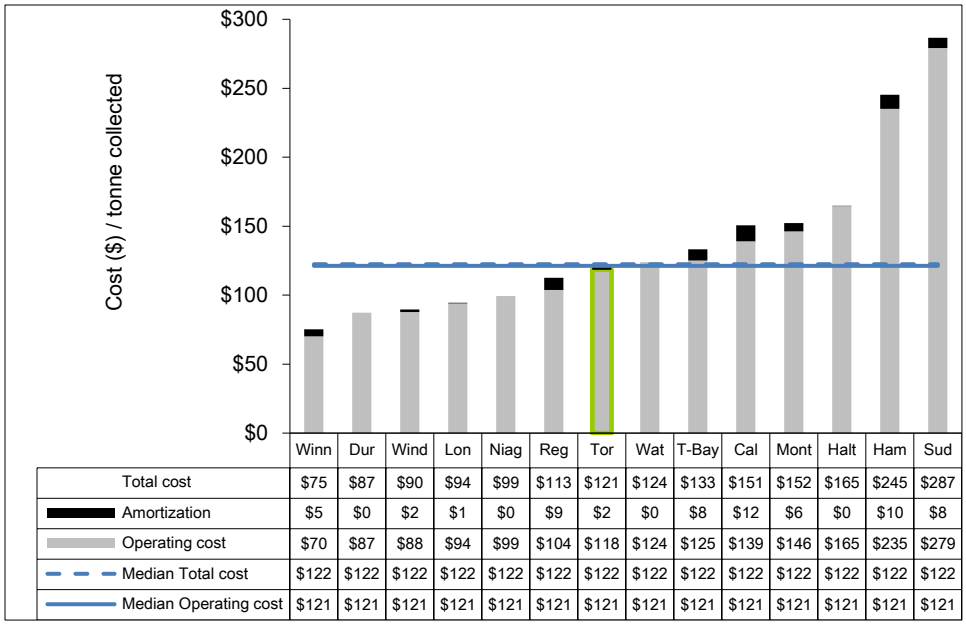
**Chart 34.5 (City of Toronto) Operating Cost of Solid Waste Collection per Tonne and Tonnes of Solid Waste Collected**

The operating cost, as well as the total operating cost per tonne increased in 2016. The reason for this increase is on account of increases in processing contracts and in capital costs due to the purchase of new larger Green Bins for single family households. Operating costs also increased due to the increasing levels of contamination in the Blue Bin recycling program. New products and packaging that are introduced into the market can cause confusion on how to properly sort and dispose the items into the correct waste stream.

The tonnage of waste collected decreased by 5 per cent in 2016. Year over year, the City manages and sends less waste to landfill by weight. The City continues to see a decline in garbage and Blue Bin recycling tonnes, in part due to the changing nature of products and packaging, specifially the light-weighting of packaging materials. Weight-based performance measures do not accurately reflect performance and overall changes in the waste system, as the weight of recyclables continue to decrease but the volume remains the same.

The tonnes of waste (in thousands) collected over this 8-year period are also provided as a line graph relative to the right axis on Chart 34.5. It shows a decrease of 26 per cent, or 116,426 tonnes, over the period from 2009 to 2016, arising from the success of the City's diversion programs. The longer term trend has seen the cost per tonne increase each year since 2012 as fixed costs are spread over lower tonnes of materials (i.e. light-weighting of packaging) and higher volumes of waste (i.e. more units of lighter materials managed) .

## 34.6 – HOW DOES TORONTO'S COST OF GARBAGE COLLECTION COMPARE TO OTHER MUNICIPALITIES?




| | Winn | Dur | Wind | Lon | Niag | Reg | Tor | Wat | T-Bay | Cal | Mont | Halt | Ham | Sud |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total cost | $75 | $87 | $90 | $94 | $99 | $113 | $121 | $124 | $133 | $151 | $152 | $165 | $245 | $287 |
| Amortization | $5 | $0 | $2 | $1 | $0 | $9 | $2 | $0 | $8 | $12 | $6 | $0 | $10 | $8 |
| Operating cost | $70 | $87 | $88 | $94 | $99 | $104 | $118 | $124 | $125 | $139 | $146 | $165 | $235 | $279 |
| Median Total cost | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 | $122 |
| Median Operating cost | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 | $121 |

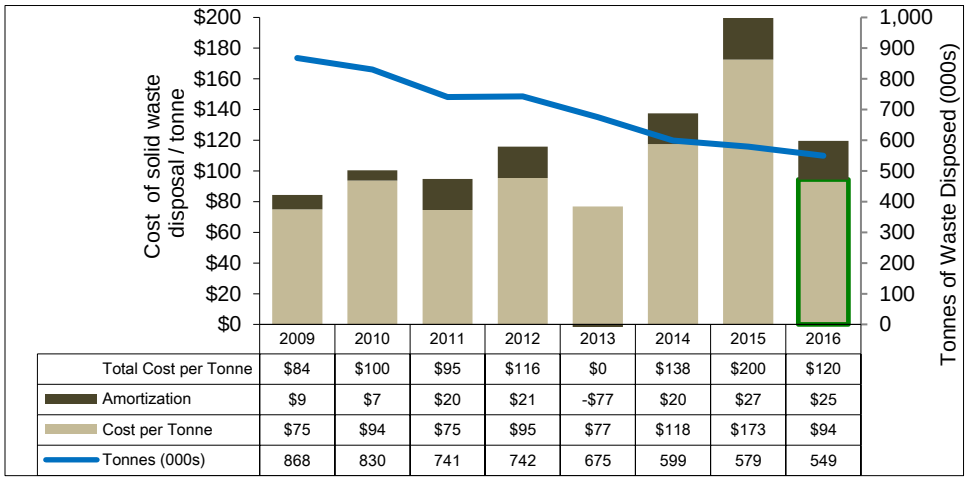
**Chart 34.6** compares Toronto's 2016 operating and total (operating plus amortization) collection costs per tonne to other municipalities.

**Chart 34.6 (MBNC 2016) Operating Cost of Solid Waste Collection per Tonne**

Toronto ranks seventh of fourteen (second quartile) in terms of having the lowest operating cost per tonne and the lowest total cost per tonne collected.

Toronto provides bi-weekly curbside collection and multi-residential bulk-lift collection. Collection operations are provided through a combination of municipal staff and contracted services. Overall costs in relation to other municipalities are lowered by the significance of multi-residential collection (bulk-lift), which is typically less expensive than curbside collection.

## 34.7–HOW MUCH DOES IT COST TORONTO TO DISPOSE OF ONE TONNE OF GARBAGE?




| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|
| Total Cost per Tonne | $84 | $100 | $95 | $116 | $0 | $138 | $200 | $120 |
| Amortization | $9 | $7 | $20 | $21 | -$77 | $20 | $27 | $25 |
| Cost per Tonne | $75 | $94 | $75 | $95 | $77 | $118 | $173 | $94 |
| Tonnes (000s) | 868 | 830 | 741 | 742 | 675 | 599 | 579 | 549 |

**Chart 34.7**

Summarizes Toronto's operating and total (operating plus amortization) cost of solid waste disposal per tonne, plotted as bars relative to the left axis.

**Chart 34.7 (City of Toronto) Cost of Solid Waste Disposal per Tonne and Tonnes of Solid Waste Disposed**

Tonnes disposed (in thousands) are also plotted as a line graph relative to the right axis. The City of Toronto has revised its methodology with respect to what is included and excluded in this Chart. This includes total tonnes managed at City Transfer Stations and all non-City of Toronto materials accepted at Green Lane Landfill.

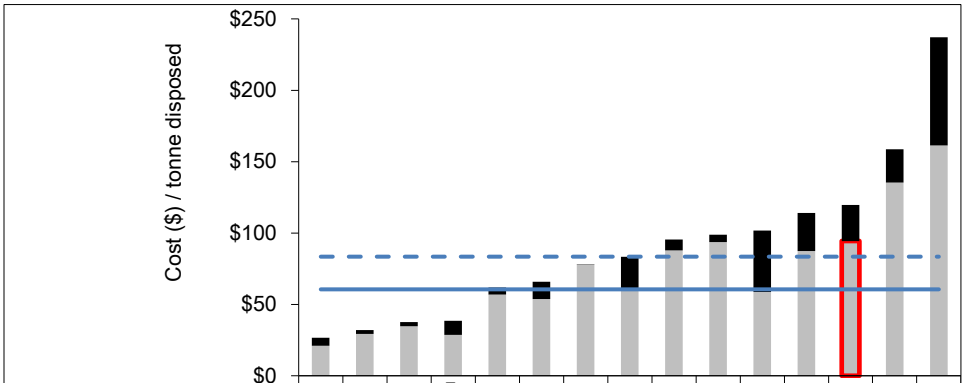
In 2016, both the operating cost and the total operating costs to dispose garbage (including amortization) decreased from the previous year.

In 2016, the disposal cost per tonne have decreased due to:

- Lower program support costs allocated from other City Divisions (IDC/IDR)
- Lower capital costs at Green Lane Landfill for gas control systems

The volume of waste disposed decreased by 37 percent between 2009 and 2016 (318,333 tonnes) due to enhanced diversion programs and the reduction of commercial waste now handled by other service providers. As a result, fixed costs are spread over lower volumes.

## 34.8 – HOW MUCH DOES IT COST TORONTO TO DISPOSE OF ONE TONNE OF GARBAGE COMPARED TO OTHER MUNICIPALITIES?



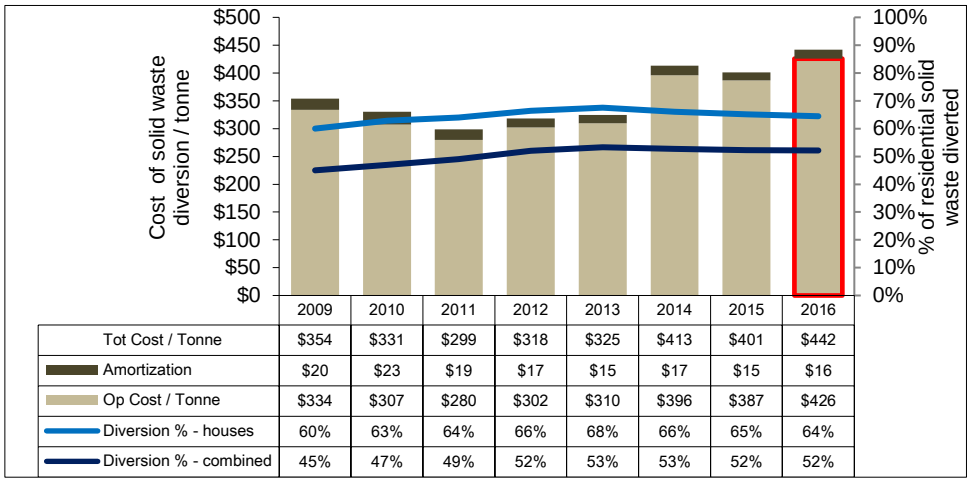

| | Lon | Winn | Reg | T-Bay | Sud | Cal | Mont | Halt | Niag | Ham | Wat | Wind | Tor | York | Dur |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total cost | $27 | $32 | $38 | $38 | $62 | $66 | $78 | $83 | $95 | $99 | $102 | $114 | $120 | $159 | $237 |
| Amortization | $6 | $3 | $3 | $10 | $5 | $12 | $0 | $23 | $8 | $5 | $43 | $27 | $25 | $23 | $76 |
| Operating cost | $21 | $29 | $35 | $29 | $57 | $54 | $78 | $61 | $88 | $94 | $59 | $87 | $94 | $135 | $161 |
| Median - Total cost | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 | $83 |
| Median - Operating cost | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 | $61 |

**Chart 34.8** compares Toronto's 2016 solid waste disposal costs per tonne to other municipalities, with amortization costs per tonne shown as stacked bars.

**Chart 34.8 (MBNC 2016) Cost of Solid Waste Disposal per Tonne**

Toronto ranks thirteenth of fifteen (fourth quartile) in terms of having the lowest operating cost per tonne of solid waste disposal and having the lowest total cost per tonne disposed.

## 34.9 – HOW MUCH DOES IT COST TORONTO TO DIVERT OF ONE TONNE OF GARBAGE?




| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|
| Tot Cost / Tonne | $354 | $331 | $299 | $318 | $325 | $413 | $401 | $442 |
| Amortization | $20 | $23 | $19 | $17 | $15 | $17 | $15 | $16 |
| Op Cost / Tonne | $334 | $307 | $280 | $302 | $310 | $396 | $387 | $426 |
| Diversion % - houses | 60% | 63% | 64% | 66% | 68% | 66% | 65% | 64% |
| Diversion % - combined | 45% | 47% | 49% | 52% | 53% | 53% | 52% | 52% |

**Chart 34.9 (City of Toronto) Net Operating Cost of Solid Waste Diversion per Tonne and Percentage of Residential Solid Waste Diverted**

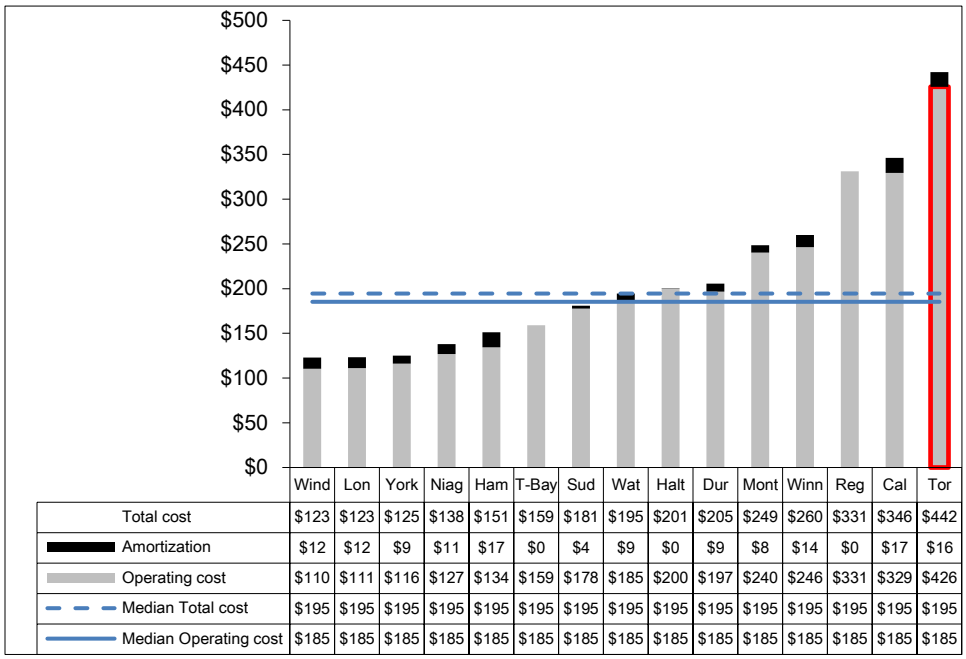
**Chart 34.9** shows Toronto's operating and total cost (operating cost plus amortization) of solid waste diversion per tonne from 2009 to 2016. It is contrasted against the City's overall/ combined diversion rate (houses and multi-residential apartments) and the diversion rate for houses only, reflected as line graphs relative to the right axis.

Traditional recyclables such as paper and containers have lower collection and processing costs and high market values (revenues from the sale of diverted materials are offset against costs for this measure).

In recent years, enhanced diversion programs such as the Green Bin organics program have increased diversion rates, but they also are more costly to collect and process, and typically have lower market values compared to Blue Bin recycling materials. Generally, as diversion rates rise, so will diversion costs on a per tonne basis, as has been the experience in Toronto.

In 2016, total cost per tonne and operating cost per tonne increased by 10% from the previous year. The 2016 diversion rates for houses and combined were stable in 2016.

## 34.10–HOW DOES TORONTO'S COST OF SOLID WASTE DIVERSION COMPARE TO OTHER MUNICIPALITIES?




| | Wind | Lon | York | Niag | Ham | T-Bay | Sud | Wat | Halt | Dur | Mont | Winn | Reg | Cal | Tor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total cost | $123 | $123 | $125 | $138 | $151 | $159 | $181 | $195 | $201 | $205 | $249 | $260 | $331 | $346 | $442 |
| Amortization | $12 | $12 | $9 | $11 | $17 | $0 | $4 | $9 | $0 | $9 | $8 | $14 | $0 | $17 | $16 |
| Operating cost | $110 | $111 | $116 | $127 | $134 | $159 | $178 | $185 | $200 | $197 | $240 | $246 | $331 | $329 | $426 |
| Median Total cost | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 | $195 |
| Median Operating cost | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 | $185 |

**Chart 34.10** compares Toronto's 2016 diversion costs per tonne to other municipalities.

**Chart 34.10 (MBNC 2016) Net Operating Cost of Solid Waste Diversion per Tonne**

Toronto ranks fifteenth of fifteen municipalities (fourth quartile) with the highest operating and total cost per tonne diverted. However, these diversion programs have also resulted in Toronto having the highest diversion rates for single-family homes/houses (Chart 34.3). Organics (Green Bin) materials also comprise a larger proportion of Toronto's diverted materials and these tend to be more costly to process than other types of recyclables.

Toronto's Green Bin program differs from many others in that it accepts diapers, sanitary products and plastic bags (with the organics). The acceptance of these additional items and subsequent removal of plastic materials from the Green Bin stream means that Toronto requires a process with greater associated costs. These differences should be considered when comparing Toronto to other municipalities, as many other green bin programs from those jurisdictions do not accept these materials.

# 2016 ACHIEVEMENTS AND 2017 PLANNED INITIATIVES

The following initiatives are intended to further improve the efficiency and effectiveness of Solid Waste Management Services in Toronto:

**2016 Initiatives Completed/Achievements**

1. City Beautification
    - Provided clean-up services at 81 large special events and over 2000 smaller events
    - Removed nearly 7,000 tonnes of litter from City streets and litter bins
2. Solid Waste Collection & Transfer
    - Rolled-out of 2nd Generation Green Bin (Scarborough and Etobicoke)
    - New Front-End Contractor (GFL) for Multi-Residential Customers
3. Solid Waste Processing & Transport
    - Managed 929,000 tonnes (all materials) through City Transfer Stations
    - Managed 210,000 tonnes of Blue Bin Recycling
    - Managed 139,000 tonnes of Green Bin Organics
    - Managed 81,000 tonnes of Yard Waste
    - Managed sale of 162,000 tonnes of Recyclables valued at $21M
    - Awarded contract for Dufferin Organics Processing Facility
    - Aerosol Segregation Program at Cherry St. Reuse Centre Residual Management
4. Residual Management
    - Managed 550,000 tonnes at Green Lane Landfill
    - Completed of Green Lane Landfill Financial Model
    - Constructed of Landfill Gas Flare 3
    - Demolished of the Brock West Landfill Power Plant
    - Secured Delegated Authority for General Manager to Enter into Renewable Natural Gas Agreements
5. Solid Waste Education & Enforcement
    - Completed and Approval of the City's Long Term Waste Management Strategy
    - Developed of 10-Year Sustainable Rate Model
    - Contamination Education Campaign
    - Common Terminology and Fee Clarification By-law Update

**2017 Initiatives Planned**

In moving forward towards 70% overall waste diversion, SWMS has established strategic directions with the following 2017 deliverables:

- Planning and implementation of the Long Term Waste Management Strategy.
- Continuing to implement a comprehensive multi-residential education and engagement program, including 3Rs Ambassador Program.
- Continued rollout of Next Generation Green Bins for curbside customers & continuing to support Green Bin organics programs in multi-residential locations.
- Completion of a comprehensive Asset Management Framework and Implementation Plan.
- Implement Design, Build, Operate and Maintain contract for Dufferin Green Bin organics facility expansion.
- Pursue revenue generation opportunities at the Dufferin and Disco Organics Processing Facilities, as well as the Keele Valley and Green Lane Landfill with regards to Renewable Natural Gas production.
- Ongoing monitoring and maintenance plan for perpetual care closed landfill sites.
- Ongoing installation of landfill gas control and leachate control as legislated, as well as ongoing engineering, development and monitoring of the Green Lane landfill site.
- Motivate and engage employees with the Employee Recognition Program, Management Team and Annual Town Hall meetings.
- Pursue operational excellence with the evolution of KPIs, environmental health & safety, collection efficiencies and I&T strategy.
- Finalize roll-out of CNG trucks leading to reduced future fuel costs as well as environmental benefits.

**Factors Influencing the Results of Municipalities**

The results of each municipality included in this report can be influenced to varying degrees by factors such as:

- governance: single-tier vs. upper-tier vs. mixed municipal systems
- program design: based on urban/rural mix of single-family homes, multi-unit residential buildings, commercial, industrial, seasonal homes and tourists, age of infrastructure, proximity to collection sites, processing sites and sellable markets
- participation: the rate of public participation in recycling activities
- service levels: frequency of collection, bag limits, single stream waste collection vs. co-collection programs, hours of operations and the number and types of materials collected
- service provisions: reliance on private contractors; transfer disposal and operations; public and private sector
- education: how municipalities promote, manage and enforce their garbage collection, disposal, recycling and diversion programs and services
- disposal method: location of landfill site (local or outside municipality) or use of incineration