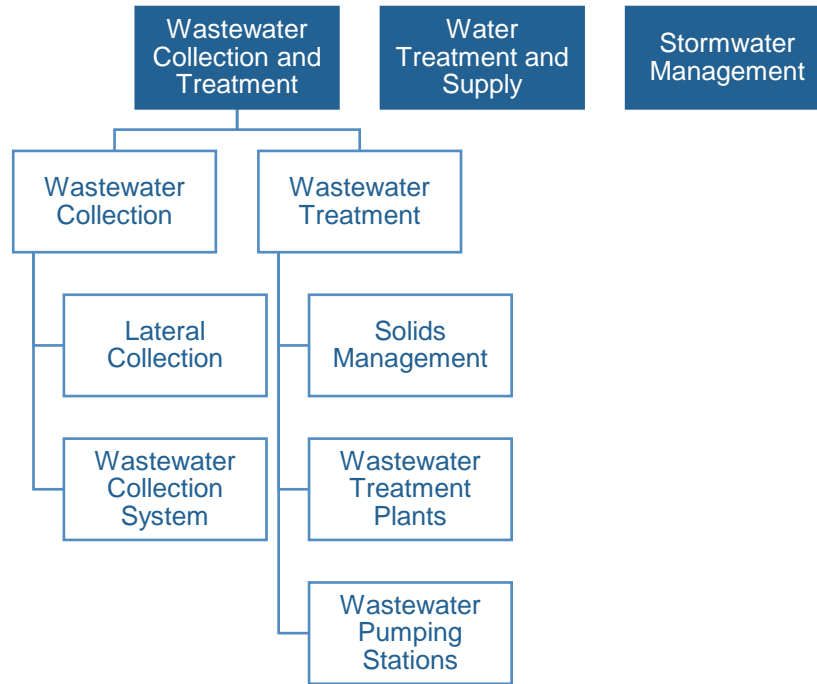


WASTEWATER SERVICES

PROGRAM MAP

Toronto Water



Wastewater services encompass the collection of wastewater from residential or ICI (industrial, commercial, and institutional) properties and its treatment in wastewater treatment plants before it is returned to Lake Ontario. It also includes the disposal or use of residual materials.

In Toronto, wastewater is collected and treated from 4,091 kilometres of separate sanitary sewers, and 1,525 kilometres of combined storm/sanitary sewers for a total 5,616 km of wastewater pipe. Also, 4,918 kilometres of completely separate storm sewers do not flow to Toronto's wastewater plants.

Wastewater is pumped by 74 pumping stations to four wastewater treatment plants where physical and biological treatment processes remove solids, chemicals and pathogens. There are also 12 storm water pumping stations which do not feed to the treatment plants. Toronto's combined wastewater treatment plants can treat over 1.5 billion litres of wastewater a day.




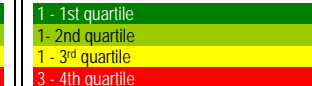
The safe and effective treatment of wastewater is important to a community's continued health and well-being. Toronto Water must operate under strict regulations and meet or exceed treatment standards set by the Ministry of the Environment to ensure wastewater treatment has a minimal impact on the natural environment. Funding for these services is provided through municipal water rates, which include a sewer surcharge.

SUMMARY OF PERFORMANCE MEASUREMENT RESULTS

Question	Indicator/Measure	Internal Comparison of Toronto's 2017 vs. 2016 Results	External Comparison to Other Municipalities (MBNC) By Quartile for 2017	Chart & Page Ref.
How much wastewater is treated each year?	Megalitres of Wastewater Treated per 100,000 Population – (Activity Level)	Increase Volume of wastewater treated increased (Activity Level Indicator)	3 Lower volume of wastewater treated compared to others (Activity Level Indicator)	35.1 35.2 pg. 5/6
How old is the wastewater pipe system?	Average Age of Wastewater Pipe	Stable Average age of wastewater pipes has remained relatively stable at 65 years (Service Level Indicator) (No graph)	4 Wastewater pipe is older compared other municipalities (Service Level Indicator)	35.9 pg. 12
How much wastewater bypasses full treatment each year?	Percentage of Wastewater estimated to have Bypassed Treatment – (Community Impact)	Increase Volume of wastewater bypassing full treatment increased (Community Impact)	3 Higher rate/volume of wastewater bypassing full treatment compared to others (Community Impact)	35.3 35.4 pg. 7/8
How often are Toronto beaches unsafe for swimming?	Average Percentage of Time (Days) Beaches are Posted as Unsafe to Swim from June to August – (Community Impact)	Increase Warnings of unsafe swimming conditions increased (Community Impact)	N/A	35.5 pg. 8
How many wastewater mains (sewers) backup?	Annual Number of Wastewater Main Backups per 100 kilometres of Wastewater Main (Customer Service)	Decrease Rate of wastewater main backups decreased (Customer Service)	4 Higher rate of wastewater main backups compared to others (Customer Service)	35.6 35.7 pg. 9/10
What does it cost to collect wastewater?	Operating Cost of Wastewater Collection per kilometre of Pipe – (Efficiency)	Decrease Operating cost of wastewater collection decreased (Efficiency)	4 Higher operating cost of wastewater collection compared to others (Efficiency)	35.8 35.9 pg. 11/12

Question	Indicator/Measure	Internal Comparison of Toronto's 2017 vs. 2016 Results	External Comparison to Other Municipalities (MBNC) By Quartile for 2017	Chart & Page Ref.
What does it cost to collect wastewater?	Total Cost of Wastewater Collection per kilometre of Pipe – (Efficiency)	Stable Total cost of wastewater collection was relatively stable (Efficiency)	4 Higher total cost of wastewater collection compared to others (Efficiency)	35.8 35.9 pg. 11/12
What does it cost to treat wastewater and dispose of the residual material?	Operating Cost of Wastewater Treatment/Disposal per Megalitre Treated – (Efficiency)	Decrease Operating cost of wastewater treatment & disposal decreased (Efficiency)	2 Lower operating cost of wastewater treatment & disposal compared to others (Efficiency)	35.10 35.11 pg. 13
What does it cost to treat wastewater and dispose of the residual material?	Total Cost of Wastewater Treatment/Disposal per Megalitre Treated – (Efficiency)	Decrease Total cost of wastewater treatment & disposal decreased (Efficiency)	1 Lower total cost of wastewater treatment & disposal compared to others (lower amortization) (Efficiency)	35.10 35.11 pg. 13
What is Toronto's Citizen First (CF) Service Quality Score for sewage and waste water treatment?	Citizens First Survey Service Quality Score for sewage and waste water treatment services (Customer Service)	Increase The CF8 (2018) Service Quality Score increased compared to CF7 (2014) (Customer Service)	N/A	35.12 pg. 14

SUMMARY OF OVERALL RESULTS

Internal Comparison of Toronto's 2017 vs. 2016 Results	Internal Comparison of Toronto's 2017 vs. 2016 Results	External Comparison to Other Municipalities (MBNC) By Quartile for 2017	External Comparison to Other Municipalities (MBNC) By Quartile for 2017
Service/ Activity Level Indicators (Resources)  100% favourable or stable	Performance Measures (Results)  75% favourable or stable	Service/ Activity Level Indicators (Resources)  0% in 1st and 2nd quartiles	Performance Measures (Results)  33% 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.

SERVICE/ACTIVITY LEVELS

35.1 - HOW MUCH WASTEWATER IS TREATED EACH YEAR IN TORONTO?

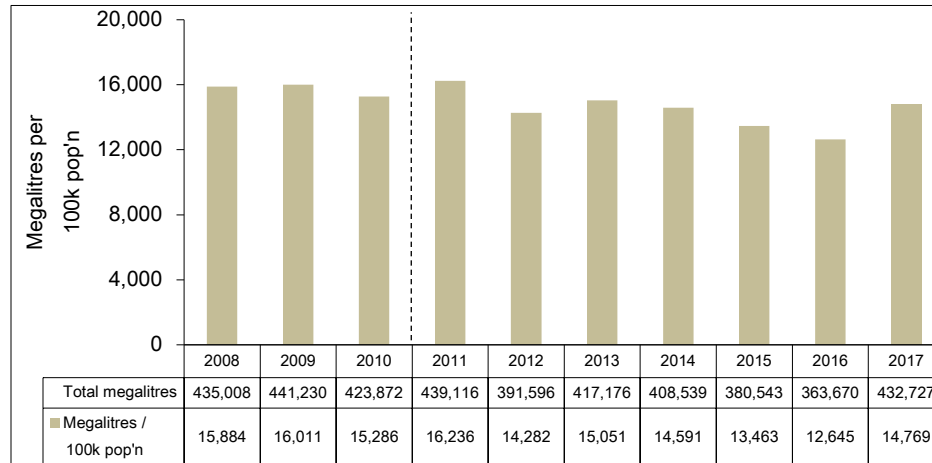


Chart 35.1 summarizes the volume (megalitres) and ratio per 100,000 population of wastewater that was treated in Toronto wastewater treatment plants. One megalitre is equivalent to one million litres.

Chart 35.1 (City of Toronto) Mega litres of Wastewater Treated per 100,000 Population

Results have also been expressed on a per 100,000 population basis to account for population growth and to allow for comparisons to other municipalities. The results for 2010 and prior years are not based on the revised population estimates. In 2017, there was an annual 16.8% increase in the volume of wastewater treated per 100,000 population.

Wet weather events are typically the primary reason for year-to-year flow variations. In dryer years with lower precipitation less storm water and groundwater are captured by the collection system and conveyed for treatment in the wastewater plants. Areas with combined sewers that carry both wastewater and storm water are particularly susceptible to higher flows due to wet weather.

However, in 2017, a major contributing factor to the high flow was due to the very high Lake Ontario water levels. Lake Ontario water flowed back into the collection system through the Combined Sewer Overflows (CSO) discharge points. This Lake Ontario water went to the wastewater treatment plants, increasing the treated flow volumes. Staff minimized flow from the Lake into the collection system by raising weirs at some CSO discharge locations, where higher weir levels would not increase the potential for basement flooding or spills.

35.2 –HOW DOES THE AMOUNT OF WASTEWATER TREATED IN TORONTO COMPARE TO OTHER MUNICIPALITIES?

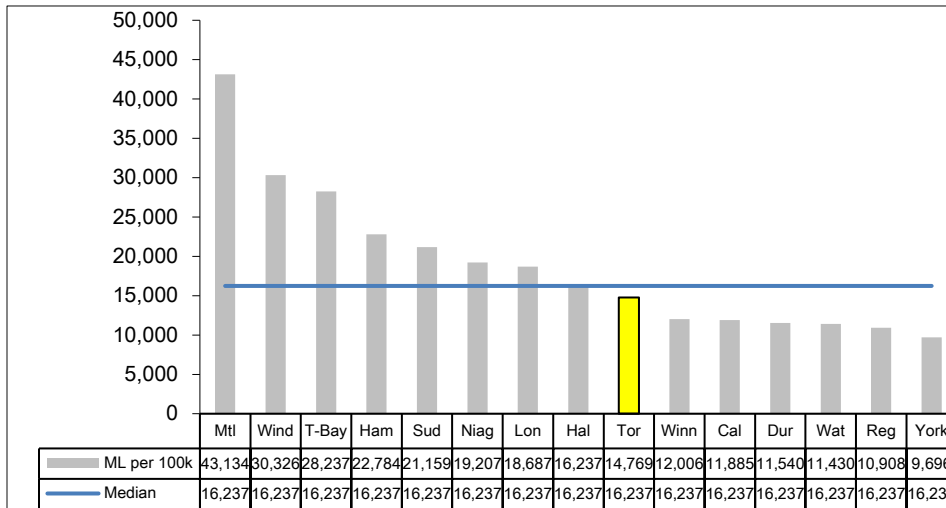


Chart 35.2 provides Toronto's 2017 volume of wastewater treated per 100,000 persons and compares it to other municipalities.

Chart 35.2 (MBNC 2017) Megalitres of Wastewater Treated per 100,000 Population

Toronto ranks ninth of fifteen (third quartile) in terms of having the highest volumes of wastewater treated per 100,000 population. Toronto has a higher population than many cities indicated, hence wastewater treated per capita may be less due to this reason. Moreover, with more condominiums proportion there may be less water and wastewater per person. Another factor to consider is that some municipalities may have a flat rate water cost, thus there is no incentive to reduce water and wastewater. This may increase the amounts of wastewater required to be treated.

It should be noted that these volumes relate to wastewater from both the residential and ICI (industrial, commercial and institutional) sectors, as well as storm water that is collected in Toronto's system through combined sewers. Jurisdictions have different proportions of high volume industrial customers, and combined sewer infrastructure, impacting these comparative results. Toronto's ICI% water represents 37% of the total water sold, which is slightly above MBN median of 34.4%, and close to average of 37.2% for those municipalities who reported this metric.

COMMUNITY IMPACT

Municipalities strive to protect the environment by minimizing the amount of untreated wastewater that is released into lakes and rivers.

35.3 –HOW MUCH WASTEWATER BYPASSES FULL TREATMENT IN TORONTO BEFORE IT IS RELEASED INTO LAKE ONTARIO?

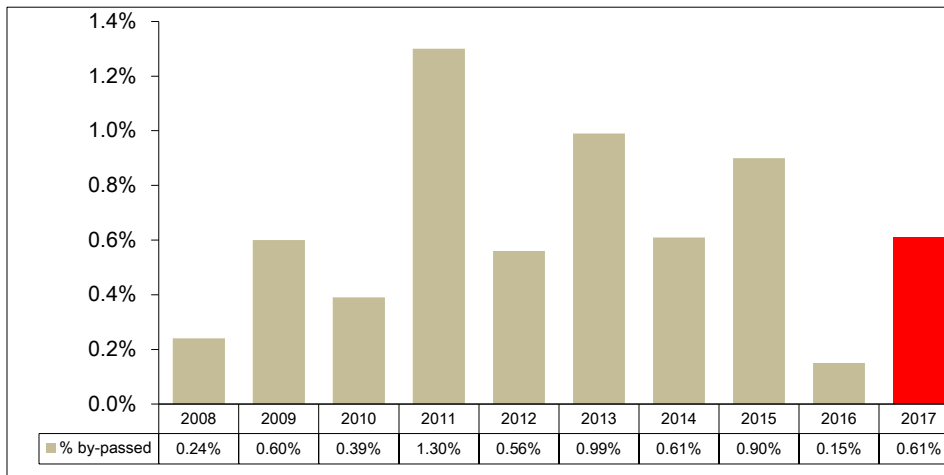


Chart 35.3 summarizes Toronto's percentage of wastewater that was released into Lake Ontario without full treatment.

Chart 35.3 (City of Toronto) % of Wastewater Estimated to Have By-Passed Full Treatment

A bypass occurs when the volume of rainwater and sewage reaching a plant exceeds the volume that can reasonably be processed in a short period of time. This only occurs due to an extreme rain storm.

During bypass, all preliminary and primary treatment occurs, as well as disinfection, to ensure treated water always meets strict federal and provincial regulations.

Very high lake water levels in 2017, compared to previous years, contributed to higher volumes of Combined Sewer Overflows (CSOs) prior to reaching the wastewater treatment plants, as well as higher volumes of flow delivered to the wastewater plants, leading to a higher bypass volume than in 2016.

35.4 – HOW DOES THE AMOUNT OF WASTEWATER BY-PASSING FULL TREATMENT IN TORONTO, COMPARE TO OTHER MUNICIPALITIES?

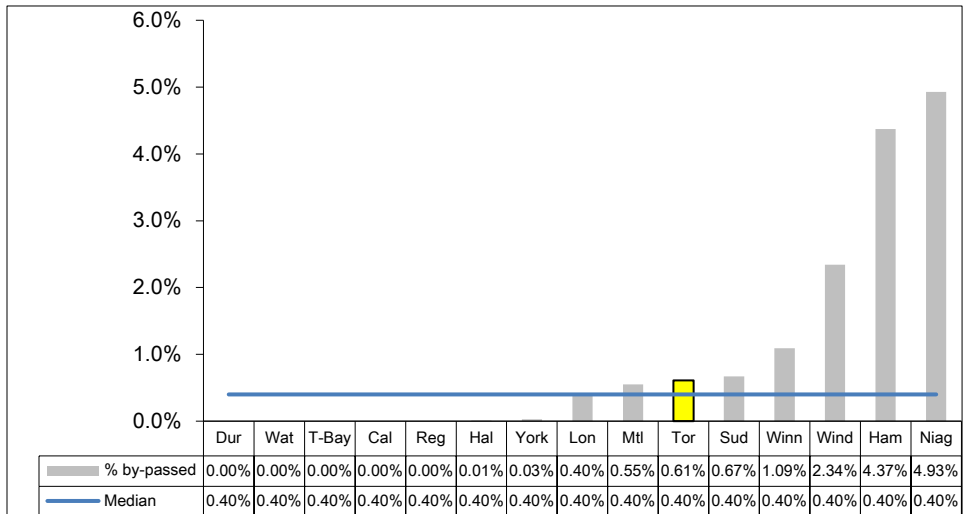


Chart 35.4 compares Toronto's 2017 results to other municipalities. Toronto ranks ten of fifteen (third quartile), in terms of having the lowest percentage of wastewater bypassing full treatment.

Chart 35.4 (MBNC 2017) % of Wastewater Estimated to Have By-Passed Full Treatment

This result is attributable to very high lake water levels in 2017 in Toronto as mentioned in 35.3. 2017 was a relatively dry year, so precipitation was not a major factor. Other municipalities had different storm intensities and capacities of their wastewater plants, and many systems are not affected at all by high water levels in the Great Lakes.

Toronto Water has undertaken a number of initiatives that have contributed to improving the water quality along Toronto's waterfront.

From June to August, the City of Toronto takes daily water samples from the 11 supervised beaches across the city and tests for E. coli bacteria. When E. coli levels are high Toronto Public Health posts warning signs against swimming.

35.5 – WHAT IS THE LIKELIHOOD FOR TORONTO'S BEACHES TO POST WARNING SIGNS AGAINST SWIMMING BETWEEN JUNE AND AUGUST?

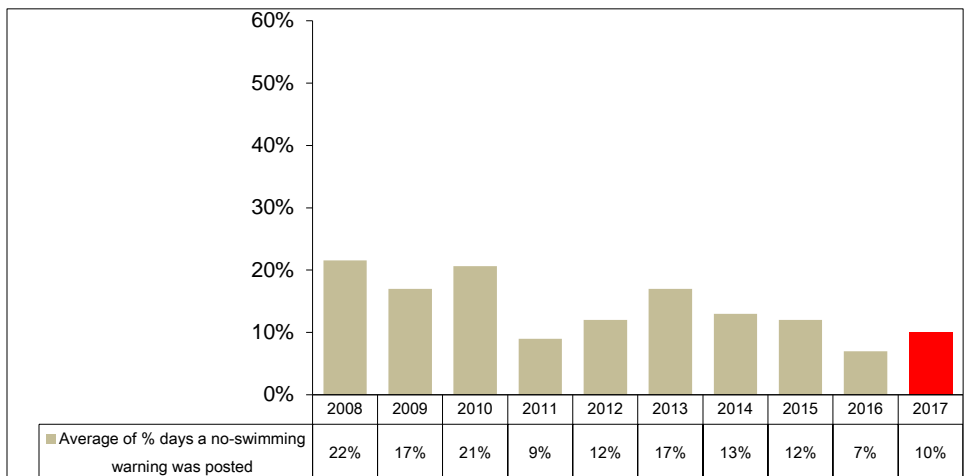


Chart 35.5 provides 2008 to 2017 results for swimming condition, being the average percentage of days that Toronto's supervised beaches are posted as unsafe for swimming.

Chart 35.5 (City of Toronto) Average Percentage of Time (days) Beaches are Posted as Unsafe to Swim from June to August

In 2017, the average percentage of days that Toronto's supervised beaches were posted as unsafe for swimming was 10% (a 3% increase from 2016). Very high lake water levels in the summer of 2017 was a contributing factor to the increased number of beach unsafe postings.

CUSTOMER SERVICE

35.6 – HOW MANY WASTEWATER MAIN BACK-UPS OCCUR IN TORONTO?

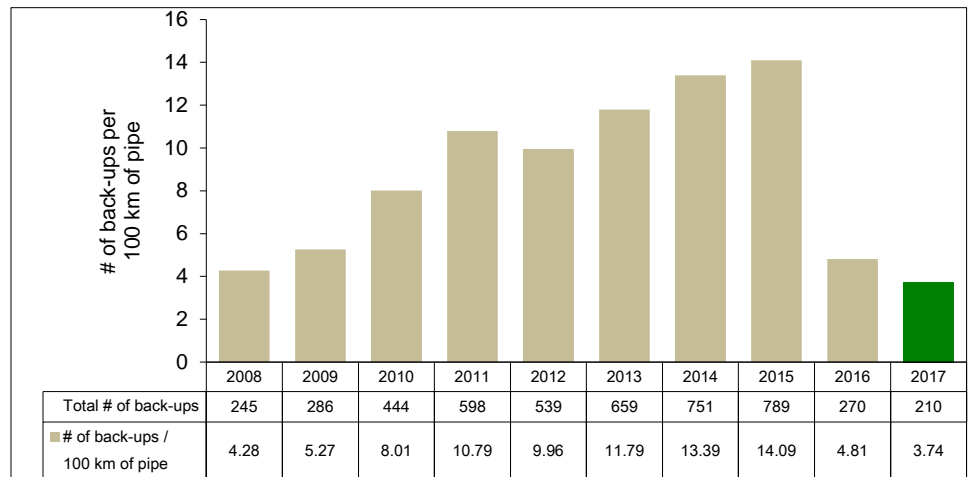


Chart 35.6 provides the total number of wastewater main back-ups as well as the rate of back-ups per 100 km of pipe.

Chart 35.6 (City of Toronto) Number of Wastewater Main Back Ups per 100 kilometres of Wastewater Pipe

Significant infiltration and inflows into the local and trunk sewer systems during severe storm events, can contribute to overloading the system, which may cause water to back up through sewer pipes and result in basement flooding.

In 2017, the number of backups per 100 km of pipe decreased by 22%. The decrease in the number of back-ups is related to lower number and severity of storm events. After 2015 there has been a more targeted maintenance program for the wastewater linear infrastructure system, such as improved cleaning of catch basins feeding the combined sewer system. Backups occur throughout the linear infrastructure wastewater system if there are blockages during high precipitation.

Toronto's sewer system includes approximately 1,525 km of combined (sanitary and storm) sewers. Although there are some homes where downspouts are still not disconnected because of site conditions, a large number of the City's homes have disconnected their downspouts reducing the load on the wastewater linear system.

35.7–HOW DOES THE RATE OF WASTEWATER MAIN BACK-UPS IN TORONTO COMPARE TO OTHER MUNICIPALITIES?

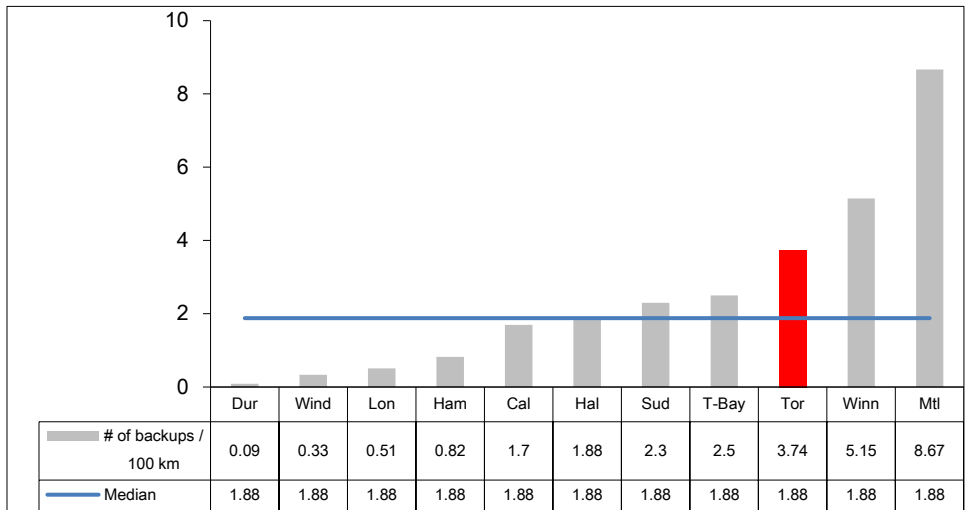


Chart 35.7 compares Toronto's 2017 rate of wastewater/sewer backups to other municipalities. Toronto ranks ninth of eleven (fourth quartile) in terms of lowest number of backups per 100 km of wastewater pipe.

Chart 35.7 (MBNC 2017) Number of Wastewater Main Backups per 100 kilometers of Wastewater Pipe

There are many factors unique to each municipality which affect the comparability of backups, such as capacity levels, linear infrastructure, environment, and operational differences. The high average age of Toronto's wastewater pipe (65 years vs average of 43.6 years) is also a contributing factor. Note that this chart includes only the 11 of 15 jurisdictions voluntarily contributing their wastewater backup's data.

In November 2012, a bylaw requiring property owners to disconnect their downspouts, where feasible, from the sewer system came into effect for the combined sewer service area.

Downspout disconnection has been phased in across the City. This will result in less storm water entering the wastewater system, which will help reduce the risk of basement flooding and minimize by-pass events at the treatment plants. In December 2012, all property owners living in basement flooding study areas were required to disconnect their downspouts, where feasible, from the sewer system.

Toronto Water also has a basement flooding protection subsidy program, which many residents have voluntarily participated in, to help protect their basements from flooding, partially caused by backups.

EFFICIENCY

Wastewater collection refers to the process of collecting wastewater from the time it exits residential and ICI properties to the point it arrives at the wastewater treatment plant.

Wastewater treatment costs include the operation and maintenance of treatment plants to meet or exceed Ministry of Environment regulations and standards. Treatment costs also include the disposal of biosolids (stabilized sludge). Biosolids are primarily composed of the organic solids that have been removed from wastewater and further processed so that they can, as in the case of the Ashbridges Bay Treatment Plant, be beneficially used for land application purposes. The City's Highland Creek Treatment Plant disposes its biosolids through incineration.

35.8 – WHAT DOES IT COST IN TORONTO TO COLLECT WASTEWATER?

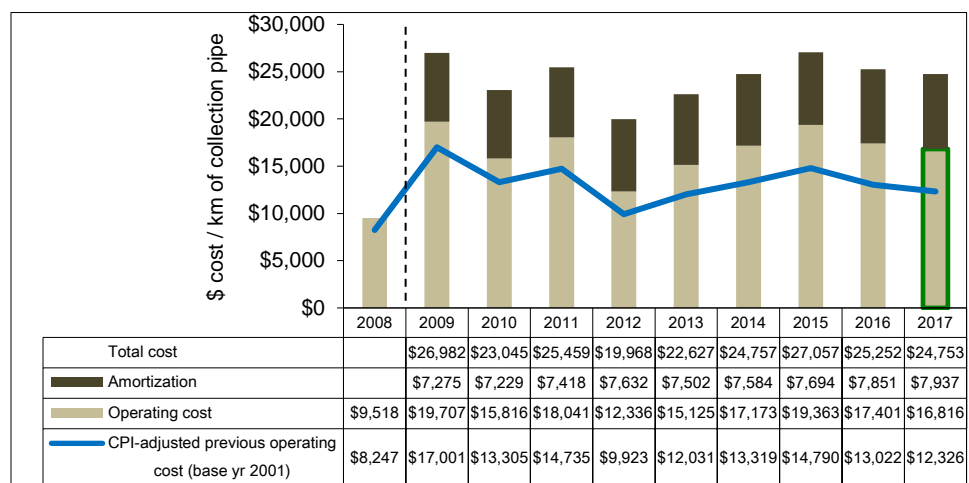


Chart 35.8 provides Toronto's operating cost and total cost (operating cost plus amortization) of wastewater collection per kilometre of collection pipe.

Chart 35.8 (City of Toronto) Operating Cost for Wastewater Collection per Kilometre of Collection Pipe

Toronto's 2017 operating costs for wastewater collection decreased by 3.4% to \$16,816 per KM of collection pipe.

Starting in 2009, changes in accounting policies were instituted; therefore, results of 2009 and subsequent years are not as comparable to 2008 and prior years. Amortization is shown as a separate stacked bar. More information is available in the Guide to Toronto's Performance Results.

Chart 35.8 also provides Consumer Price Index (CPI) adjusted operating costs (using the operating cost methodology), which are plotted as a line graph, showing strong correlation with each other. This adjustment discounts the actual operating cost result for each year by the change in Toronto's CPI since the base year of 2001.

35.9 – HOW DOES THE COST OF WASTEWATER COLLECTION IN TORONTO COMPARE TO THE OTHER MUNICIPALITIES?

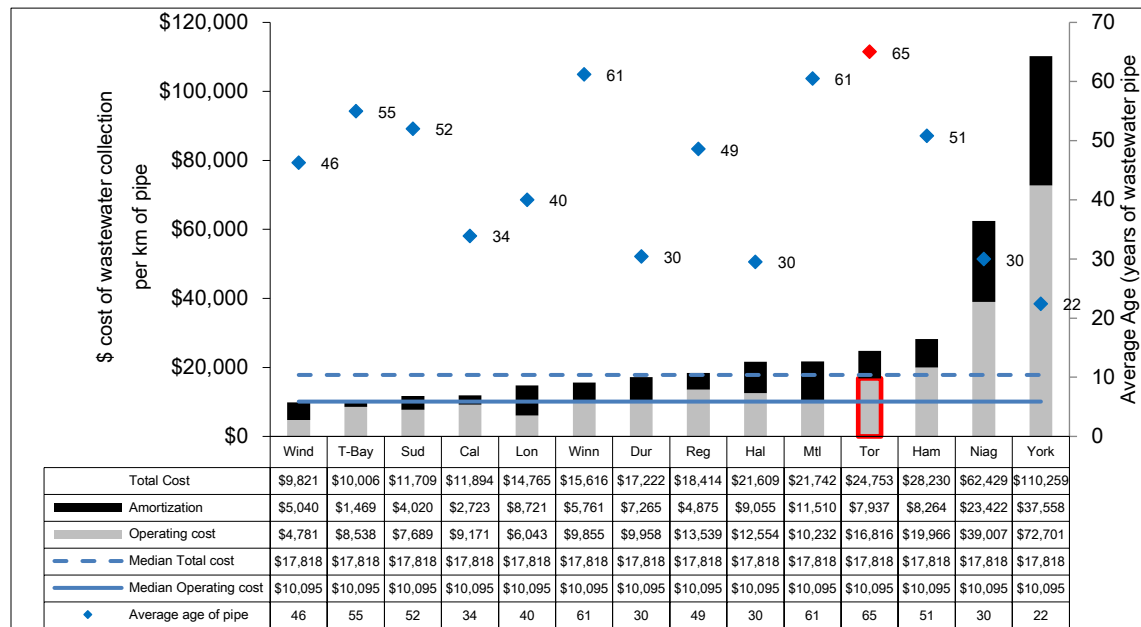


Chart 35.9 (MBNC 2017) Operating Cost for Wastewater Collection per Kilometre of Collection Pipe and Average Age of Wastewater Pipe

Chart 35.9 compares Toronto's 2017 cost of wastewater collection per kilometre of pipe to other municipalities, plotted as bars relative to the left axis.

Toronto ranks eleventh of fourteen participating municipalities (fourth quartile) in terms of having the lowest total (including amortization) operating costs. Toronto ranks eleventh of fourteen participating municipalities (fourth quartile) in terms of having the lowest operating costs.

The average age of the wastewater pipe, plotted on Chart 35.9 as a scatter plot graph relative to the right axis, can have a significant impact on costs as noted earlier. Toronto ranks fourteenth of fourteen in participating municipalities (fourth quartile) in terms of having the youngest underground infrastructure of all municipalities (the average age of wastewater pipes is 65 years) and is a key factor in Toronto's higher costs.

Toronto has an Integrated System, which means it has full responsibility for all wastewater activities including collection, conveyance, treatment and disposal. Two-tier systems apply to all municipalities that have responsibility for components of wastewater activities, e.g. Niagara and York Region. Toronto's total operating costs per KM are similar to other larger cities with older pipes, like Montreal and Hamilton.

35.10 – WHAT DOES IT COST TO TREAT AND DISPOSE OF WASTEWATER IN TORONTO?

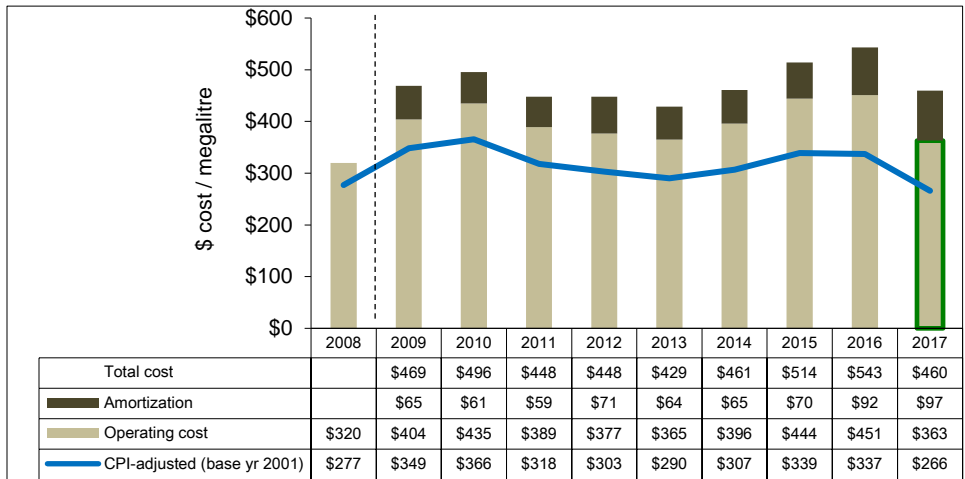


Chart 35.10 summarizes Toronto's operating cost and total cost (operating cost plus amortization) of treating a megalitre (one million litres) of wastewater.

Chart 35.10 (City of Toronto) Operating and Total Cost for Wastewater Treatment and Disposal per Megalitre

The 2017 total costs per megalitre decreased 15.3% and operating costs decreased by 19.5% from 2016. The decrease was due to higher volumes of wastewater treated caused by high lake levels, and larger volumes of CSOs requiring treatment. Actual total treatment and disposal costs were historically very stable increasing 0.7% from 2016 and 1.7% from 2015.

35.11 – HOW DOES TORONTO'S COST OF WASTEWATER TREATMENT AND DISPOSAL COMPARE TO OTHER MUNICIPALITIES?

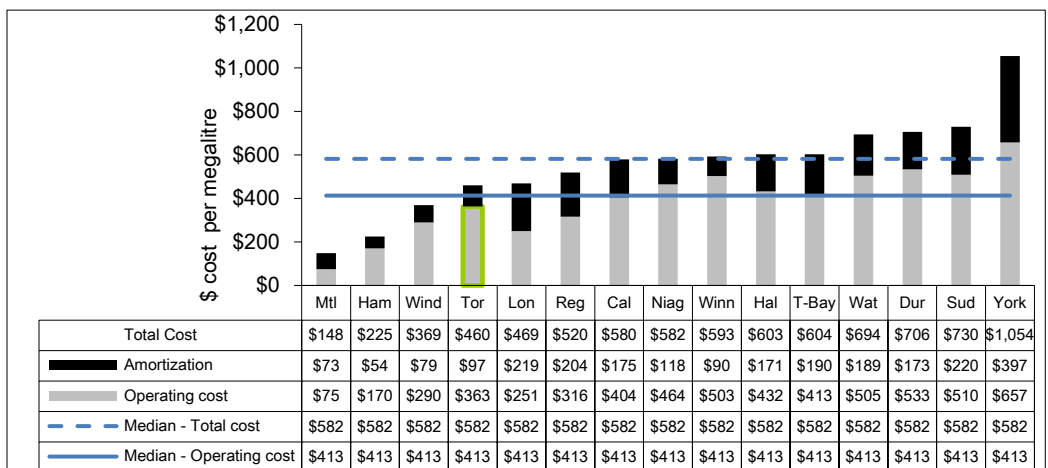


Chart 35.11 compares Toronto's 2017 cost of wastewater treatment and disposal per megalitre to other municipalities.

Chart 35.11 (MBNC 2017) Operating and Total Cost for Wastewater Treatment and Disposal per Megalitre

Toronto ranks sixth of fifteen municipalities (second quartile) in terms of having the lowest operating costs, and ranks fourth of fifteen municipalities (first quartile) in terms of total costs.

The oldest treatment plan has been in operation since 1929. Older and aging treatment plants are relatively more costly to maintain than newer plants in municipalities. Additionally, the strategies in the City's Biosolids and Residuals Master Plan (BRMP), approved in 2009 for three of the City's four wastewater treatment plants, contribute to Toronto's costs.

CUSTOMER SATISFACTION: CITIZENS FIRST (CF) SERVICE QUALITY SURVEY RESULTS

One way to measure satisfaction of a public service is to through the use of surveys. The Citizens First surveys, conducted every 2 to 3 years by the [Institute for Citizen-Centred Services](#), provides a comprehensive overview at how citizens view their government services.

Citizens First 8 (CF8) is the most recent survey and was conducted between December 2017 – February 2018. A total of 401 Toronto residents were surveyed in CF8. The final data are weighted for Toronto by age and gender. Based on this sample size, Toronto's results have a margin of error of $\pm 4.9\%$ for a result of 50% at the 95% confidence interval. However, data based on sub-groups is subject to a greater margin of error.

The Service Quality Score (SQR) relates to how Toronto residents rate their municipal services. Respondents were requested to provide a score on a 5-point scale where 1 means 'very poor' and 5 means 'very good'. In order to remain consistent with results from previous years, all the results are scaled from 0 to 100.

Rating	Very Poor 1	2	3	4	Very Good 5
Score	0	25	50	75	100

The survey respondents were asked the following question: Please rate the quality of [Sewage and waste water treatment]. If you did not use this service in the past 12 months, select 'Does Not Apply'.

35.12-WHAT IS TORONTO'S SERVICE QUALITY RATING FOR SEWAGE AND WASTE WATER TREATMENT?

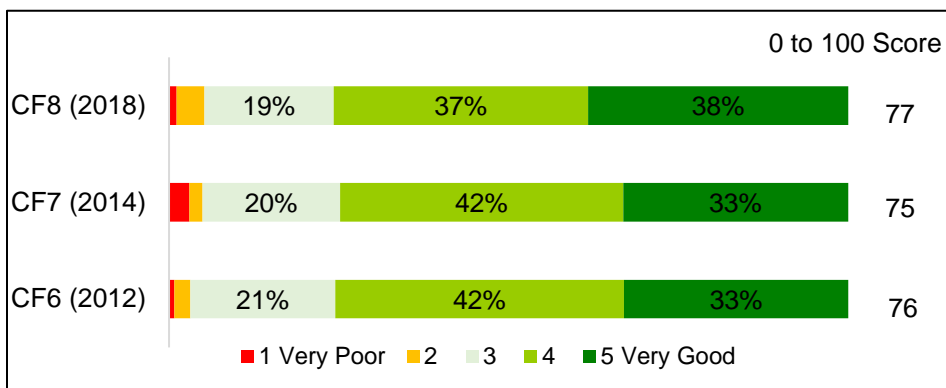


Chart 35.12 displays the Service Quality Score for Toronto's sewage and waste water treatment services. In CF8 (2018), Toronto's sewage and waste water treatment services scored 77 out of 100, an improvement from

Chart 35.12 (Citizen's First 7 and 8) Service Quality Score for Sewage and waste water treatment

75 in 2014 results. The vast majority (75%) of all CF8 survey respondents who have used sewage and waste water treatment services in the past 12 months rated Toronto's sewage and waste water treatment services at a "4" or "5" on the 5-point scale.

2017 ACHIEVEMENTS AND 2018 PLANNED INITIATIVES

2017 Achievements

The following initiatives have improved or are expected to further improve the efficiency and effectiveness of Wastewater Services in Toronto:

- The Ministry of Environment and Climate Change (MOECC) has completed annual inspections at the City's water treatment facilities and there have been no major non-conformance issues identified.
- The management structure of the Toronto Water Customer Care Centre, the first step of a transformational initiative that sets the stage for further improvements planned to increase customer satisfaction, was implemented in Q2 2017 and resulted in \$0.747 million in savings due the reduction of 8 positions.
- Optimizing GIS technology to enhance operational efficiency and improve customer service.
- Piloting smart grid technologies to help with in the field data collection and connectivity.
- As of September 1, 2017, received and processed 3,267 Basement Flooding Protection Program applications to provide financial subsidy to install flood protection devices such as backwater valves.
- Ongoing education and outreach program attending 267 outreach events with an estimated attendance of 3.9 million people as reported by event organizers.

2018 Initiatives Planned

- Ensure delivery of water and wastewater services for 3.6 million residents and business in Toronto, and portions of York and Peel.
- Provide treatment and supply of 435 billion litres of water (including York Region).
- Continue collection and treatment of 400 billion litres of wastewater.
- Continue maintenance and repair of 6,100 km of watermains, 4,100 km of sanitary sewers, 5,000 km of storm sewers, and over 1,400 km of combined sewers.
- Provide Environmental Monitoring and Protection including on-going public consultations and awareness programs.

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:

- **Age of Infrastructure:** The age and condition of wastewater collection system and frequency of maintenance costs.
- **Government Structure:** Single-tier service providers with jurisdiction over the wastewater system vs. two-tier system where the responsibility for wastewater service is divided between the local municipalities and the Regional municipality.
- **Policy and Practices:** The frequency of wastewater collection system maintenance activities, collection system age, condition and the type of pipe material.
- **Supply and Demand:** Respective volume of wastewater generated relative to the total system demand. The quantity of wastewater flows from ICI sectors relative to residential demand.
- **Treatment Plants:** The number, size and complexity of the wastewater collection systems and treatment plants operated.
- **Urban Density:** The proximity of pipes to other utilities increases the cost for infrastructure repair and replacement.
- **Weather Conditions:** Negative impacts are associated with more severe and frequent extreme weather events.

Additional Information:

- **Integrated Systems:** The term applies to those Cities and Municipalities that have full responsibility for all wastewater activities including collection, conveyance, treatment and disposal.
- **Two-Tier Systems:** The term applies to those Municipalities that have responsibility for components of wastewater activities, e.g. Niagara, Waterloo and York are responsible for all components with the exception of collection which is the responsibility of local municipalities (lower-tiers) within their boundaries.