Water services in Toronto refer to the process from the point that source water is pumped from Lake Ontario, to the point that drinking water is delivered to residential, and ICI (industrial, commercial, and institutional) customers. It also includes the provision of water through fire hydrants for fire protection.

The two main activities are:

- Treatment of over 1 billion litres of source water from Lake Ontario each day at four water treatment plants to ensure the quality of drinking water meets or exceeds regulatory requirements

- Distribution of drinking water via 478,164 connections to industrial, commercial, institutional and household water users/customers. In Toronto this is accomplished with 18 water pumping stations, 520 kilometres of trunk watermains, 10 major underground storage reservoirs, four elevated storage tanks, 52,900 valves, and 5,496 kilometres of distribution water mains. If these watermains were laid end-to-end, they would exceed the entire distance from Newfoundland to British Columbia.

Funding for these activities is provided through municipal water rates.
<table>
<thead>
<tr>
<th>Question</th>
<th>Indicator/Measure</th>
<th>Service/Activity Level Indicators</th>
<th>Community Impact Measures</th>
<th>Customer Service/Quality Measures</th>
<th>Efficiency Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much drinking water is treated each year?</td>
<td>Megalitres of Water Treated per 100,000 Population – (activity Level)</td>
<td>Decrease Volume of water treated decreased (activity level indicator)</td>
<td>Decrease Amount of water used per household decreased</td>
<td>Favourable Percentage of tests in compliance has remained high at 99.77% in 2010</td>
<td>Decrease Number of water main breaks decreased</td>
</tr>
<tr>
<td>How old are the water distribution pipes?</td>
<td>Average Age of Water Pipe - (Service Level)</td>
<td>Stable Average age of water pipe is stable at 59 years (service level indicator)</td>
<td></td>
<td>Favourable Zero boil water advisories</td>
<td>Decrease Number of water main breaks decreased</td>
</tr>
<tr>
<td>How much drinking water does the average household use?</td>
<td>Residential Water Use (Megalitres) per Household – (Community Impact)</td>
<td>Decrease</td>
<td></td>
<td>Favourable</td>
<td>Decrease</td>
</tr>
<tr>
<td>Is the quality of drinking water in compliance with provincial standards?</td>
<td>% of Water Quality Tests in Compliance with Provincial Drinking Water Standards - (Customer Service/Quality)</td>
<td>Favourable</td>
<td></td>
<td>Favourable</td>
<td>Decrease</td>
</tr>
<tr>
<td>Were there any boil water advisories?</td>
<td>Number of Household Days with Boil Water Advisories – (Customer Service/Quality) (MPMP)</td>
<td>Favourable Zero boil water advisories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many watermain breaks are there?</td>
<td>Number of Water Main Breaks per 100 KM of Water Distribution Pipe – (Customer Service) (MPMP)</td>
<td>Decrease Number of water main breaks decreased</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What does it cost in to distribute drinking water?</td>
<td>Operating Cost for the Distribution of Drinking Water per km of Water Distribution Pipe – (Efficiency) (MPMP)</td>
<td>Decrease Operating cost of water distribution decreased</td>
<td></td>
<td></td>
<td>Decrease Total cost of water distribution decreased</td>
</tr>
<tr>
<td>Total Cost for the Distribution of Drinking Water per km of Water Distribution Pipe – (Efficiency) (MPMP)</td>
<td>Decrease Total cost of water distribution decreased</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Indicator/Measure</td>
<td>Internal Comparison of Toronto's 2012 vs. 2011 Results</td>
<td>External Comparison to Other Municipalities (OMBI) By Quartile for 2012</td>
<td>Chart &amp; Page Ref.</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>What does it cost to treat drinking water?</td>
<td>Operating Cost for the Treatment of Drinking Water per Megalitre of Drinking Water Treated – (Efficiency) (MPMP)</td>
<td>Increase Operating cost of water treatment increased</td>
<td>1 Lower operating cost of water treatment compared to others</td>
<td>35.11 pg. 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Cost for the Treatment of Drinking Water per Megalitre of Drinking Water Treated – (Efficiency) (MPMP)</td>
<td>Increase Total cost of water treatment increased</td>
<td>1 Lower total cost of water treatment compared to others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overall Results**

<table>
<thead>
<tr>
<th>Service/Activity Level Indicators (Resources)</th>
<th>Performance Measures (Results)</th>
<th>Service Level Indicators (Resources)</th>
<th>Performance Measures (Results)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Increased</td>
<td>6 - Favourable or stable</td>
<td>0 - 1st quartile</td>
<td>5 - 1st quartile</td>
</tr>
<tr>
<td>1 - Stable</td>
<td>0 - Stable</td>
<td>1 - 2nd quartile</td>
<td>0 - 2nd quartile</td>
</tr>
<tr>
<td>0 - Decreased</td>
<td>1 - Unfavour.</td>
<td>1 - 3rd quartile</td>
<td>1 - 3rd quartile</td>
</tr>
<tr>
<td>100% stable or increased</td>
<td>75% favourable or stable</td>
<td>100% at or above median</td>
<td>38% above median</td>
</tr>
</tbody>
</table>

For an explanation of how to interpret this summary and the supporting charts, please see the Guide to the Summaries of Toronto’s Performance Measurement Results. These quartile results are based on a maximum sample size of 15 municipalities.
How much drinking water is treated each year in Toronto?

Chart 35.1 summarizes Toronto’s total volume (megalitres) and rate of drinking water treated per 100,000 population. One megalitre is equivalent to one million litres.

In 2012 there was a 0.3 per cent decline in the total volume of drinking water treated, consistent with the longer term trend of consumers using less water.

Contributors to reduced water consumption include:
- A larger number of high density condominiums in which water use is lower than in homes;
- Improved water conservation resulting from City initiatives;
- More efficient water consumption products;
- Impact of higher water rates;
- Wetter summers, resulting in less outdoor water use; and
- A high level of public education and environmental awareness; and
- A reduction in some large industrial water users.

How does the amount of water treated in Toronto, compare to other municipalities?

Chart 35.2 compares Toronto’s 2012 result to the volume of water treated per 100,000 population to other municipalities. These are total volumes, that include amounts used by both the residential and ICI (industrial, commercial and institutional) sectors. Toronto ranks seventh of fifteen (second quartile) in terms of having the highest volumes of water treated.

In many municipalities, the ICI sectors can use significant volumes of water in their operations. In Toronto in the ICI sector accounted for 34 percent of the total volumes of drinking water treated in 2012.
How much drinking water does the average Toronto household use?

Chart 35.3 (City of Toronto) Megalitres of Drinking Water Used per Household (Community Impact)

How does Toronto’s drinking water use per household compare to other municipalities?

Chart 35.4 (OMBI 2012) Annual Residential Water Use (Megalitres) per Household (Community Impact) & Average Number of Individuals per Household

Toronto has an approved water efficiency plan designed to protect the environment and accommodate future population growth within the planned capacity of water treatment plants.

Chart 35.3 shows the annual volume of water (in megalitres) used in an average Toronto household. In 2012, the rate of megaliters per household decreased marginally by 1,000 litres.

Natural changeout of inefficient toilets and washing machines with more water efficient models contribute to declining residential water consumption. Rebates and lower water rates are also used as incentives to lower water consumption among industrial, commercial and institutional customers.

Annual household water usage can be impacted by the amount of rain and resulting outdoor water use requirements for activities such as the watering of lawns and gardens.

Examining total daily water use during the winter months (when outdoor water use is minimal) is one way of examining longer term trends.

Chart 35.4 compares Toronto’s 2012 water use per household to other municipalities, plotted as columns relative to the left axis. Toronto ranks ninth of twelve (third quartile) in terms of having the lowest water use per household.

The average number of individuals per household is also plotted as a line graph relative to the right axis, since family size can impact household water consumption.
The quality of drinking water provided in Toronto is of paramount importance.

Toronto’s drinking water monitoring program extends in intensity and scope well beyond provincial regulatory requirements. Toronto regularly tests for many more parameters than required by the province.

During 2012, 25,783 analyses were performed on treated water as well as water at various stages of treatment. Additional tests are conducted through comprehensive distribution monitoring.

Chart 35.5 reflects Toronto’s results for the number of drinking water microbiological test results that met or exceeded the standards as set out in Ontario Regulation 169/03 of the Ontario Drinking Water Act. Results continued to be very strong in 2012.

Another measure of water quality is the weighted number of days when a boil water advisory relating to a municipal water supply is issued by the Medical Officer of Health. In Toronto, there were no boil water advisories issued in 2012 or prior years.
How many watermain breaks are there in Toronto?

Chart 35.7 summarizes Toronto’s total number and rate of watermain breaks per 100 km of pipe, and shows a large decrease in 2012.

The rate of breaks varies from year to year. Temperature fluctuations in winter can have a significant effect on the rate of breaks, especially considering the age of Toronto’s infrastructure. Other contributing factors that can lead to variations in watermain break rates are nearby construction projects and changes in water pressure due to other project work. In 2012, the winter was milder than previous winter periods, therefore lowering the broken watermain totals.

How does Toronto’s rate of watermain breaks compare to other municipalities?

Chart 35.8 compares Toronto’s 2012 rate of watermain breaks to other municipalities, plotted as columns relative to the left axis.

Toronto ranks twelve of fourteen (fourth quartile), with the highest rate of watermain breaks.

The condition and age of a municipality’s water distribution system can be significant factors in the number of watermain breaks. The average age of the water distribution pipe is plotted on Chart 35.8 as a line graph relative to the right axis.

Toronto’s watermain system is the oldest of the OMBI municipalities at an average of 59 years, with 25 percent of the watermains over 80 years old. The condition of the watermain system can be affected by the amount of co-located utilities and subway and streetcar tracks, which can accelerate pipe corrosion (through electrolysis) and is another factor contributing to Toronto’s higher rate of breaks.
What does it cost in Toronto to distribute drinking water?

Chart 35.9 (City of Toronto & MPMP) Operating Cost for Drinking Water Distribution per km of Pipe (Efficiency)

How does the cost of distributing drinking water in Toronto compare to other municipalities?

Chart 35.10 (OMBI 2012) Operating Cost for Drinking Water Distribution per km of Pipe (Efficiency)

Water distribution refers to the process of distributing drinking water from the water treatment plant through the system of water mains to the customer.

Chart 35.9 provides Toronto's operating cost and total cost (operating plus amortization) of water distribution, per kilometre of distribution 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.

There has been a longer term trend of increasing capital costs in response to aging infrastructure. In 2012 there was a decrease in operating costs per km of pipe, as well as a decrease in total operating costs. Savings in hydro, materials, supplies, and contracted services coupled with a marginal increase in water distribution length reduced overall distribution costs/km.

Chart 35.9 also provides Consumer Price Index (CPI) adjusted operating results, which are plotted as a line graph. This adjusts the actual result for each year by the change in Toronto’s CPI since the base year of 2002.

Chart 35.10 compares Toronto’s 2012 cost of water distribution per km of pipe to other municipalities. Toronto ranks eleventh of fourteen (fourth quartile) for operating costs and ninth of fourteen (third quartile) for total costs in terms of having the lowest cost.

The topography of the Toronto is a factor in our higher costs. Because the city slopes up as it goes north from Lake Ontario, it is necessary to have 12 separate pressure districts at six different levels to provide adequate pressure to all consumers. In some cases, water must be pumped three or four times before it reaches the consumer, which requires a lot of energy and money.

Toronto’s high operating costs are also related to the higher rate of watermain breaks (Chart 35.8), and the age of the infrastructure, with 35 percent of the Toronto watermain system being 50 to 80 years old and 25 percent over 80 years old.
Water treatment costs include the operation and maintenance of treatment plants as well as quality assurance and laboratory testing to ensure compliance with regulations.

Chart 35.11 summarizes Toronto’s operating cost and total cost (operating plus amortization) of water treatment per megalitre (one million litres) of drinking water.

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. Toronto’s 2012 operating costs increased significantly and as a result total costs increased as well.

This increase in 2012 costs resulted from a combination of:

- rising costs for energy and chemicals
- a change in the allocation of direct costs between and among water and wastewater accounts as part of the new financial planning and analysis project.

Chart 35.11 also provides CPI adjusted results plotted as a line graph, which adjusts the operating cost for each year by the change in Toronto’s CPI since the base year of 2002.

Chart 35.12 compares Toronto’s 2012 cost of water treatment per megalitre to other municipalities. Toronto ranks third of fifteen municipalities (first quartile) for both operating costs and total costs in terms of the lowest cost. The primary factors behind Toronto’s lower costs are efficiencies and economies of scale realized from the operation and modernization of four large water treatment plants.
2013 Achievements and 2014 Planned Initiatives

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

2013 Initiatives Completed/Achievements

- The Ministry of Environment (MOE) has completed annual inspections at the City's water treatment facilities and there have been no major non-conformance issues identified.
- Ongoing optimization at treatment plants and pumping stations to minimize energy costs while meeting required legislative standards.
- Implementation of a Strategic Technology Integration program that will rationalize work management systems and intelligence tools for long-term optimization.
- A Customer Service Roadmap is underway to ensure customer service processes and procedures are in place and staff have the tools they need to deliver excellent service to residents, businesses and City staff.
- Development of a Strategic Workforce Plan that focuses on planning and training a future workforce for the Division.

2014 Initiatives Planned

- The District Water Service Repair project which includes Lead Water Service Replacement.
- State of Good Repair projects, some of the funding for which will be dedicated to watermain replacement and infrastructure rehabilitation projects.
- Service improvement projects, including Water Metering Program
- Growth projects, including initiatives for improving water efficiency, reducing water loss and expansion projects required for future water supply demand.
- Construction of Corrosion Control Facilities.

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:

- Demand: variation in demand from ICI and residential sectors, relative to total system demand.
- Supply: cost is impacted by the water source (ground water or surface water), treatment costs and the size of the geographic area and water supply/distribution systems serviced.
- Treatment plants: number, size and complexity of a municipality's water treatment plants.
- Urban density: proximity of pipes to other utilities affects the cost for infrastructure repair and replacement.
- Age of infrastructure: age and condition of the water distribution pipe, type of water distribution pipe material and frequency of maintenance activities.
- Local water supply requirements: specific municipal water quality requirements may exceed provincial regulations.
- Weather conditions: negative impacts from severe and frequent extreme weather events.
- Conservation programs: extent of municipal water conservation programs can impact water consumption.