

# WASTEWATER

## VALUE STATEMENT

*I expect my wastewater to be collected, treated and disposed of in an affordable and effective manner while being environmentally friendly.*

# WASTEWATER

## What is this Service?

The goal of Wastewater Services is the safe and effective collection, treatment and disposal of wastewater. Treatment standards established by provincial and federal agencies ensure that the impact of wastewater treatment on the natural environment is minimized.

## Objectives May Include:

- Efficient and effective collection of wastewater from customers via the municipal sewage systems, operation of wastewater treatment facilities and disposal of wastewater in accordance with federal and provincial regulation
- Maintaining adequate capacity for existing communities and future developments

Wastewater services are provided to residential and Industrial, Commercial and Institutional (ICI) sector customers. The quality of wastewater discharged into the municipal sewage system is controlled through municipal sewer-use by-laws. Funding for wastewater services is generally through municipal water rates, which usually include a sewer surcharge based on water usage to recover the costs of wastewater collection and treatment.

## Influencing Factors:

- **Age of Infrastructure:** Age and condition of wastewater collection system and frequency of maintenance costs.
- **Amortization Costs:** Amortization costs vary depending on the age of the infrastructure and the scope of capital programs and asset capitalization patterns.
- **Conservation Programs:** Extent of municipal water conservation programs can impact water consumption and wastewater treated.
- **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:** 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:** Number, size and complexity of the wastewater collection systems and treatment plants operated.

- **Urban Density:** 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 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 except for collection which is the responsibility of local municipalities (lower tiers) within their boundaries.

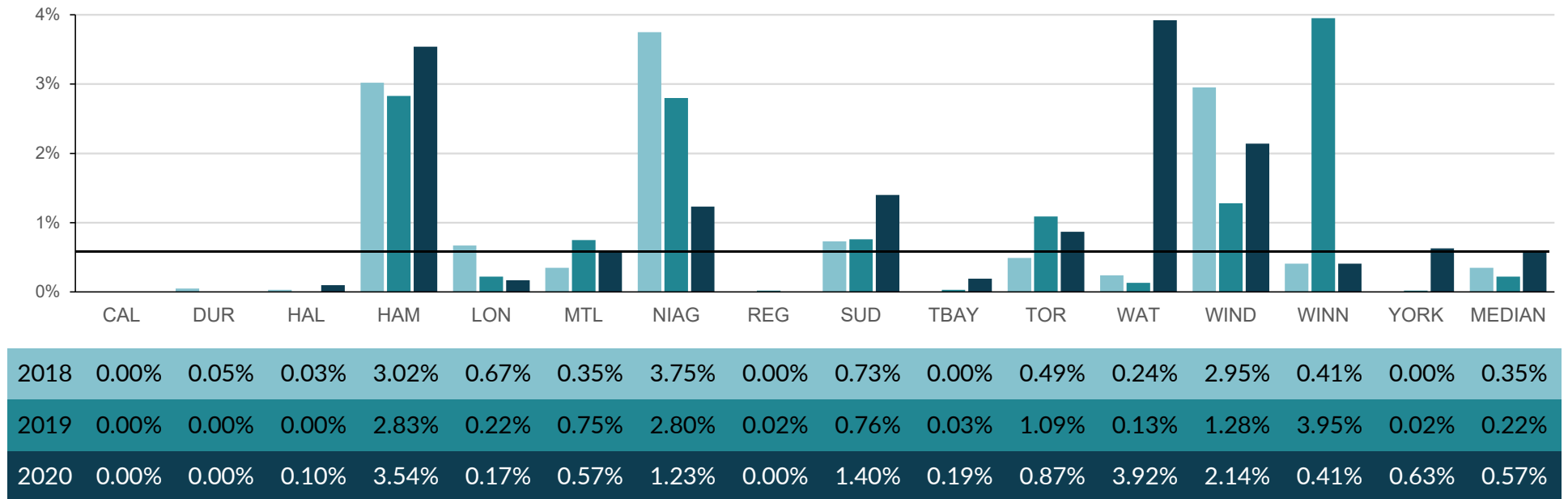
### Extenuating Circumstances:

- **COVID-19 Pandemic:** Wastewater is an essential municipal service. There was reduced treatment in the industrial, commercial and institutional sector and an increase in operating costs due to the cost of personal protective equipment to protect the health and safety of staff and reduce the risk of virus transmission. The cost of materials was increased, capital and maintenance projects were extended, delayed or deferred and material and parts deliveries were delayed.

# Wastewater

**Figure 35.1 Percent of Wastewater Estimated To Have Bypassed Treatment**

The frequency and severity of weather events can have a significant negative impact on results.



Source: WWTR110 (Community Impact)

**London:** The largest section of the largest plant was under construction for most of 2018 which led to reduced wet weather capacity and more bypassed flow.

**Toronto:** Record setting lake levels in 2019 contributed to inflow and infiltration.

**Waterloo:** Increased volume in 2020 due to GALT WWTP Tertiary Filter replacement capital project. Planned continuous tertiary bypass throughout the duration of the project.

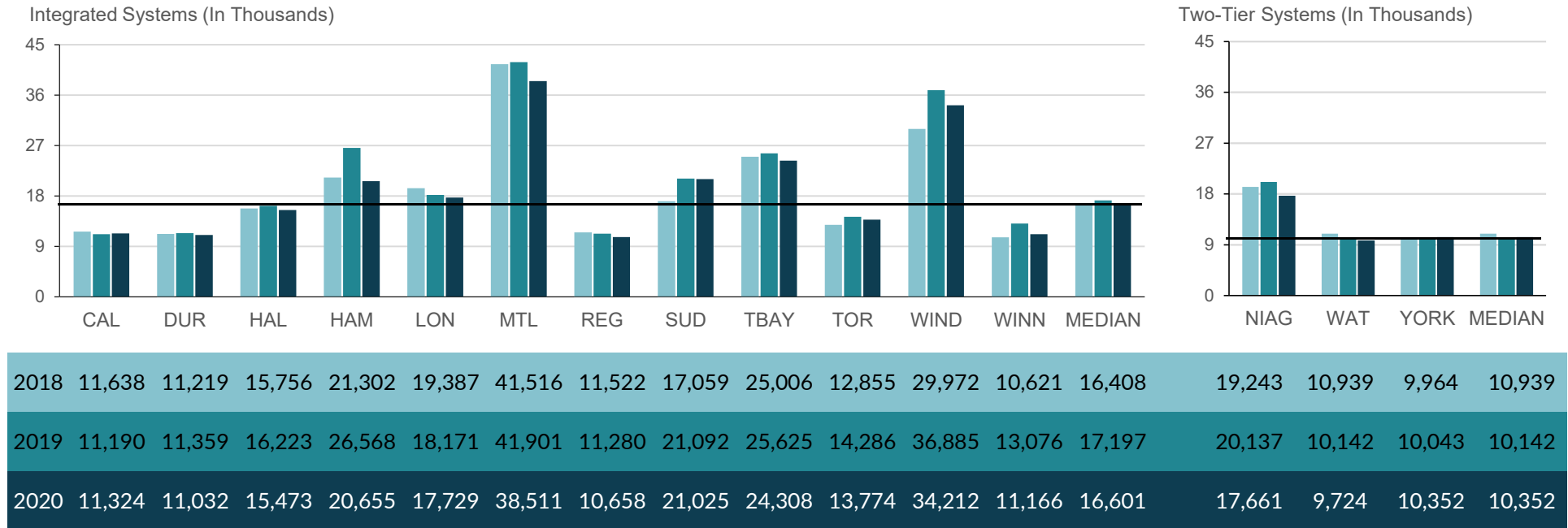
**Windsor:** Increase in 2018 and 2020 due to heavier than normal storm events. Some of these storms delivered large volumes to the plants in a short period of time resulting in the increase of volume bypassed.

**Winnipeg:** Older portions of the system are a combined sewer system resulting in variability in flow rates dependent on weather. 2018 and 2020 had unusually low flow rates.

# Wastewater

**Figure 35.2 Megalitres of Treated Wastewater per 100,000 Population**

**Integrated Systems:** The term applies to municipalities that have full responsibility for all wastewater activities including collection, conveyance, treatment and disposal. **Two-Tier System:** The term applies to municipalities that have responsibility for components of wastewater activities.



Source: WWTR210 (Service Level)

**Hamilton:** The 2019 wastewater flows were much greater primarily due to high surface water levels in Lake Ontario which surcharged into the combined sewer collection system in the spring and summer. In addition, total precipitation levels were greater in 2019 (1087 mm in 2019 vs. 797.1 mm in 2020).

**Niagara, Waterloo and York:** Responsible for all components with the exception of collection which is the responsibility of local municipalities within their boundaries.

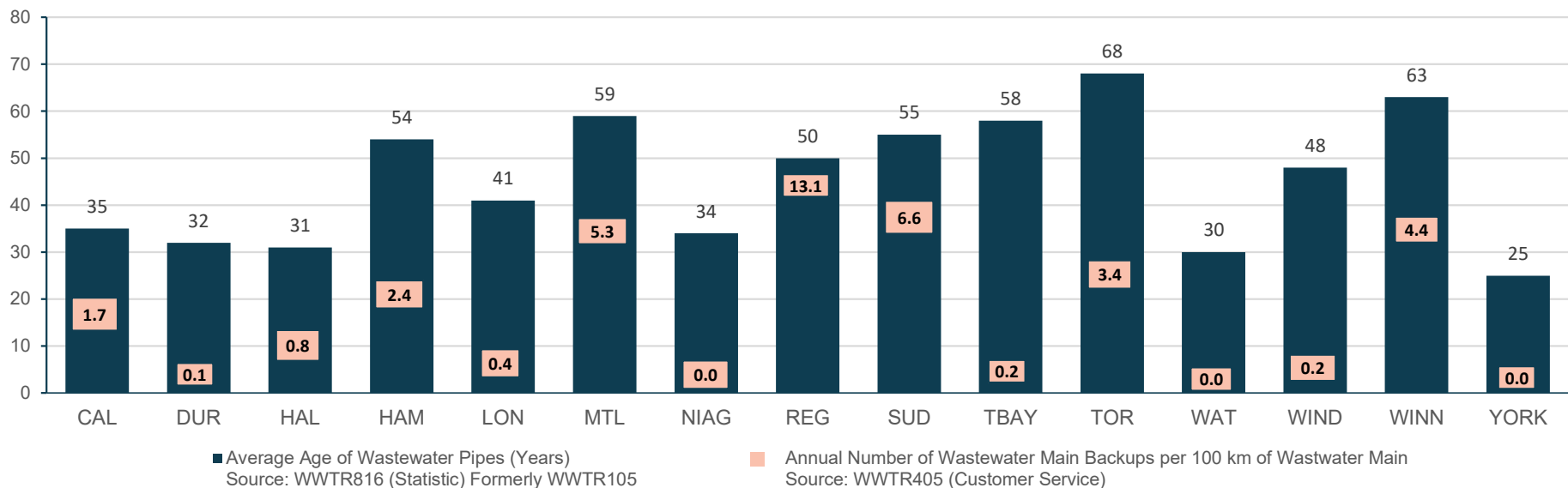
**Sudbury:** Volume treated in 2018 was significantly lower due to low precipitation levels. 2019 and 2020 are more in line with multi-year trends.

# Wastewater

**Figure 35.3 Average Age of Wastewater Pipe / Annual Number of Wastewater Main Back-ups per 100 Km of Wastewater Main**

Age of Wastewater Pipes: Older wastewater pipes are often in poor condition and contain cracks, leaking joints and broken sections, contributing to increased pipe blockages and/or an inflow of groundwater into the system causing increased flow. These factors result in an increased frequency of wastewater main back-ups relative to newer systems that do not have such deficiencies and result in higher maintenance costs for older systems.

Wastewater Main Back-ups: The annual number of wastewater backups is directly related to the design of the wastewater pipe and the design of the wastewater collection system, i.e. the extent to which storm sewers are connected to or combined with sanitary sewers resulting in increased flow. Design criteria, age and condition of the wastewater collection infrastructure combined with localized major precipitation events can result in flows that exceed system capacity and result in wastewater backups.



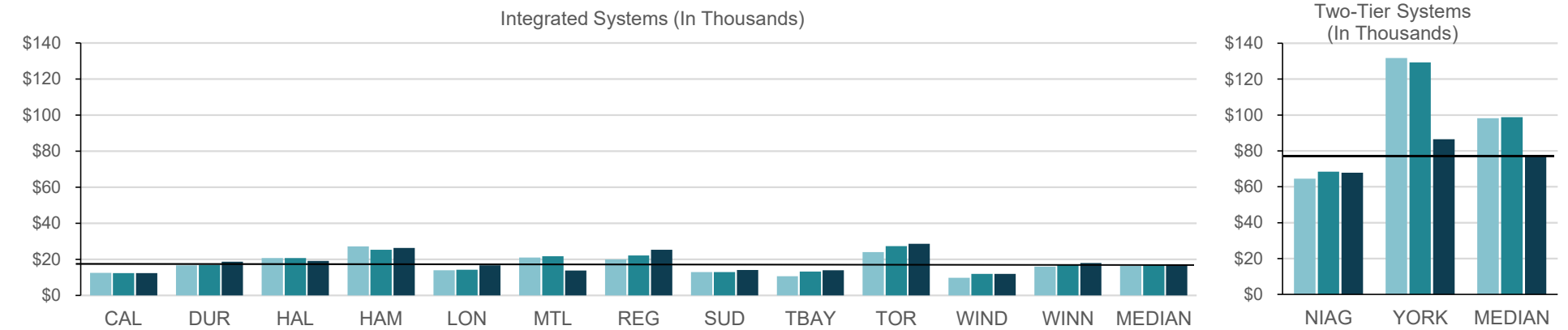
Niagara and Waterloo: Backups are recorded within municipal boundaries only.

York: Reports average age of wastewater pipe only.

# Wastewater

**Figure 35.4 Total Cost of Wastewater Collection and Conveyance per Km of Pipe Relative to the Number of Wastewater Pumping Stations Operated**

This measure reflects the total cost for the collection and conveyance of wastewater and includes amortization which can vary significantly from year to year depending on the type of infrastructure, capital fund expenditures, etc. Municipalities providing services over a broad geographic area generally have higher operating costs due to the number and type of wastewater facilities and pumping stations operated. The distance between the individual systems has an impact on the daily operating costs for both the collection and conveyance of wastewater. Refer to Fig. 35.2 for description of Integrated and Two-Tier Systems.



Total Cost of Collection and Conveyance													Source: WWTR305T (Efficiency)			
2018	\$12,615	\$16,768	\$20,841	\$27,221	\$14,047	\$21,115	\$20,009	\$13,019	\$10,693	\$24,079	\$9,838	\$16,049	\$16,409	\$64,551	\$131,801	\$98,176
2019	\$12,461	\$16,947	\$20,821	\$25,437	\$14,309	\$21,718	\$22,251	\$13,059	\$13,240	\$27,338	\$11,997	\$16,947	\$16,947	\$68,430	\$129,278	\$98,854
2020	\$12,446	\$18,837	\$19,232	\$26,405	\$16,795	\$13,876	\$25,318	\$14,216	\$13,956	\$28,744	\$11,943	\$17,983	\$17,389	\$67,926	\$86,466	\$77,196

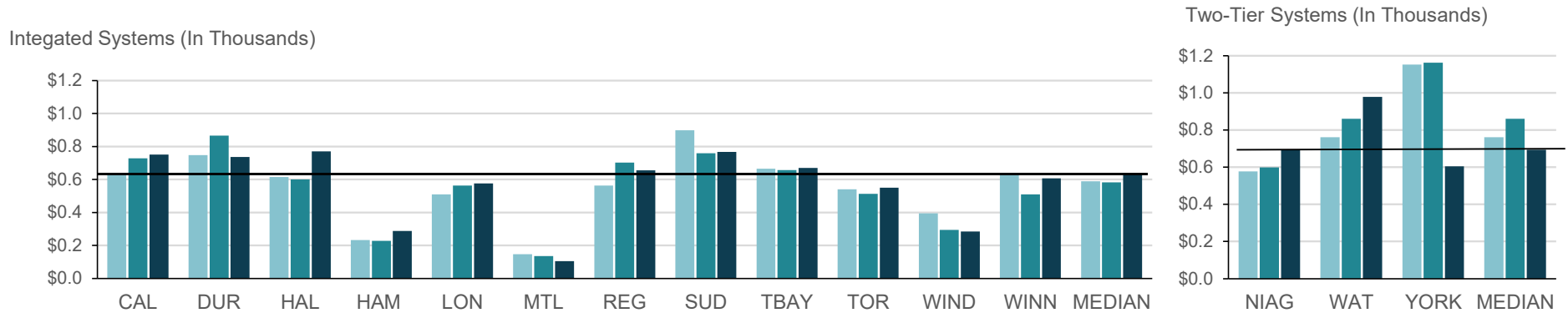
Pumping Stations 2020													Source: WWTR804 (Statistic)		
	40	51	83	80	38	132	20	70	4	74	8	75		112	21

Waterloo: Does not report – only partial jurisdiction over wastewater collection.

# Wastewater

**Figure 35.5 Total Cost for Treatment/Disposal per Megalitre Treated Relative to the Number of Wastewater Treatment Plants Operated**

This measure reflects the total cost for the treatment and disposal of wastewater. It also includes amortization which can vary significantly from year to year depending on the type of infrastructure, capital fund expenditures, etc. Municipalities providing services over a broad geographic area generally have higher operating costs due to the number and type of wastewater plants operated. The distance between the individual systems has an impact on the daily operating costs for both the treatment and disposal of wastewater.



**Total Cost for Treatment/Disposal**

Source: WWTR310T (Efficiency)

2018	\$634	\$748	\$615	\$232	\$509	\$147	\$563	\$899	\$666	\$541	\$394	\$639	\$589	\$577	\$761	\$1,152	\$761
2019	\$728	\$867	\$600	\$228	\$563	\$135	\$703	\$760	\$658	\$513	\$294	\$509	\$582	\$599	\$861	\$1,162	\$861
2020	\$751	\$736	\$770	\$287	\$577	\$105	\$656	\$768	\$670	\$550	\$283	\$607	\$632	\$693	\$979	\$605	\$693

**Treatment Facilities 2020**

Source: WWTR801+WWTR802+WWTR803 (Statistics)

3	11	6	2	5	2	1	10	1	4	2	3	11	13	8
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Regina: Operating expense for WWTP includes scheduled capital upgrades for certain years throughout the contract and will fluctuate.

Sudbury: Treatment costs were up 6% while volume of wastewater treated was up nearly 24%. This resulted in a net decrease.

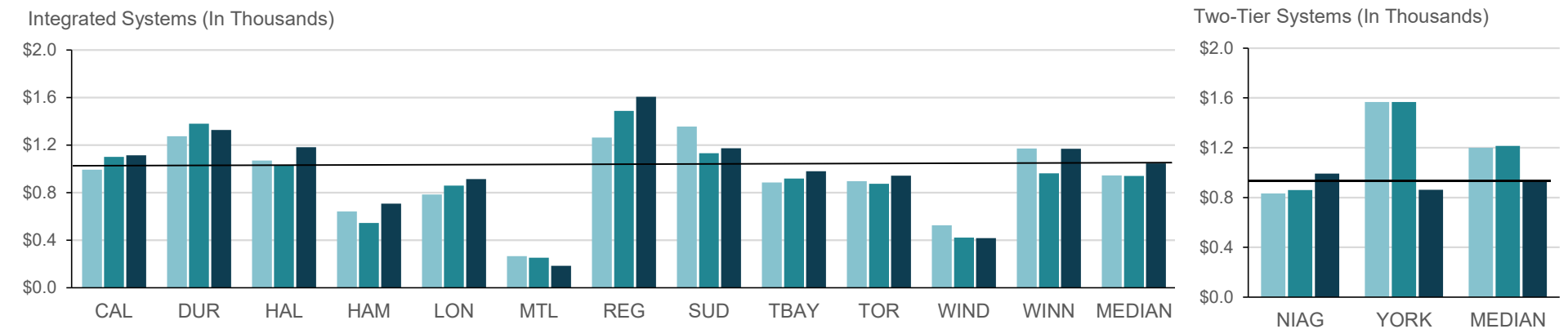
York: The Region is responsible for treatment costs on behalf of 9 local municipalities.



# Wastewater

**Figure 35.6 Total Cost of Wastewater for Collection/Conveyance and Treatment/Disposal per Megalitre Treated**

This measure reflects the combined total cost for the collection, conveyance, treatment and disposal of wastewater. Municipalities providing service over a broad geographic area generally have higher operating costs due to the number and type of wastewater pumping stations and treatment plants operated. The distance between the individual system has an impact on the daily operating costs for wastewater treatment/disposal and collection/conveyance. Amortization can vary significantly from year to year depending on the type of infrastructure, capital fund expenditures, etc. Refer to Fig. 35.2 for description of Integrate and Two-Tier Systems.



2018	\$993	\$1,274	\$1,071	\$642	\$785	\$265	\$1,265	\$1,357	\$885	\$897	\$525	\$1,172	\$945	\$832	\$1,567	\$1,200
2019	\$1,102	\$1,381	\$1,034	\$546	\$859	\$252	\$1,489	\$1,132	\$919	\$875	\$423	\$962	\$941	\$861	\$1,566	\$1,214
2020	\$1,114	\$1,327	\$1,183	\$708	\$914	\$185	\$1,607	\$1,174	\$980	\$942	\$418	\$1,169	\$1,047	\$992	\$863	\$928

Source: WWTR315T (Efficiency)

Regina: Operating expense for WWTP includes scheduled capital upgrades for certain years throughout the contract and will continue to fluctuate.

Sudbury: Overall treatment costs were up 6%, while volume of wastewater treated was up nearly 24% resulting in a net decrease.

Waterloo: Does not report - responsible for treatment and disposal only. See Fig. 35.5.