

# 35 Wastewater



## What is the 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.

*Specific objectives 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.

**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.

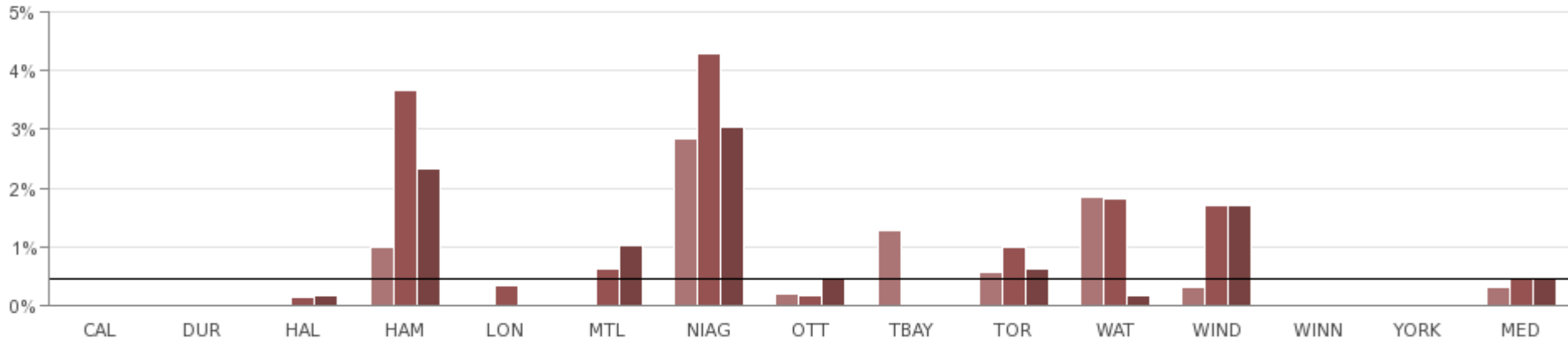
**Treatment Plants:** Number, size and complexity of the wastewater collection systems and treatment plants operated.

**Urban Density:** Proximity of pipes to other utilities increases the cost for infrastructure repair and replacement.

# Wastewater

## How much wastewater bypasses treatment?

Fig 35.1 Percent of Wastewater Estimated to have Bypassed Treatment



2012	N/A	0.00%	0.00%	1.00%	0.01%	N/A	2.85%	0.20%	1.26%	0.56%	1.83%	0.31%	N/A	0.00%	0.31%
2013	N/A	0.00%	0.13%	3.67%	0.33%	0.61%	4.30%	0.17%	0.00%	0.99%	1.81%	1.70%	N/A	0.00%	0.47%
2014	N/A	0.00%	0.17%	2.34%	N/A	1.01%	3.04%	0.45%	0.00%	0.61%	0.17%	1.71%	N/A	0.00%	0.45%

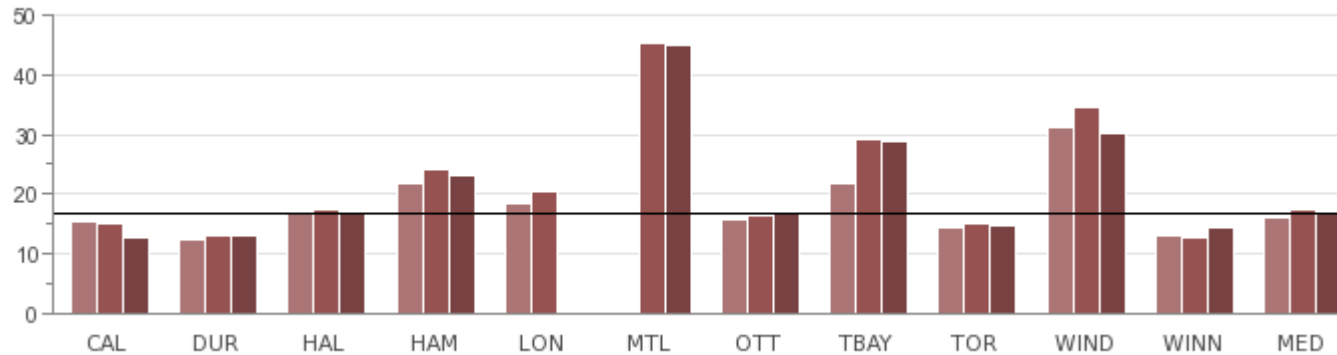
Source: WWTR110M (Community Impact)

Note: Frequency and severity of weather events can have a significant negative impact on results.

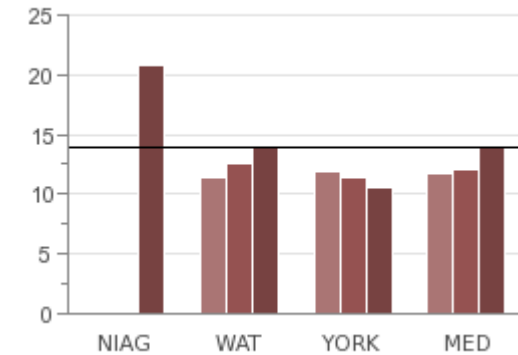
## How much wastewater is treated in each municipality?

Fig 35.2 Megalitres of Treated Wastewater per 100,000 Population

Integrated Systems (In Thousands)



Two-Tier Systems (In Thousands)



2012	15,272	12,517	16,778	21,762	18,347	N/A	15,641	21,636	14,282	31,269	13,076	16,210
2013	15,222	13,241	17,426	24,134	20,380	45,225	16,450	29,218	15,051	34,464	12,775	17,426
2014	12,633	13,189	16,610	23,109	N/A	44,857	16,668	28,940	14,591	30,301	14,360	16,639

N/A	11,482	11,836	11,659
N/A	12,627	11,444	12,036
20,778	13,915	10,624	13,915

Source: WWTR210 (Service Level)

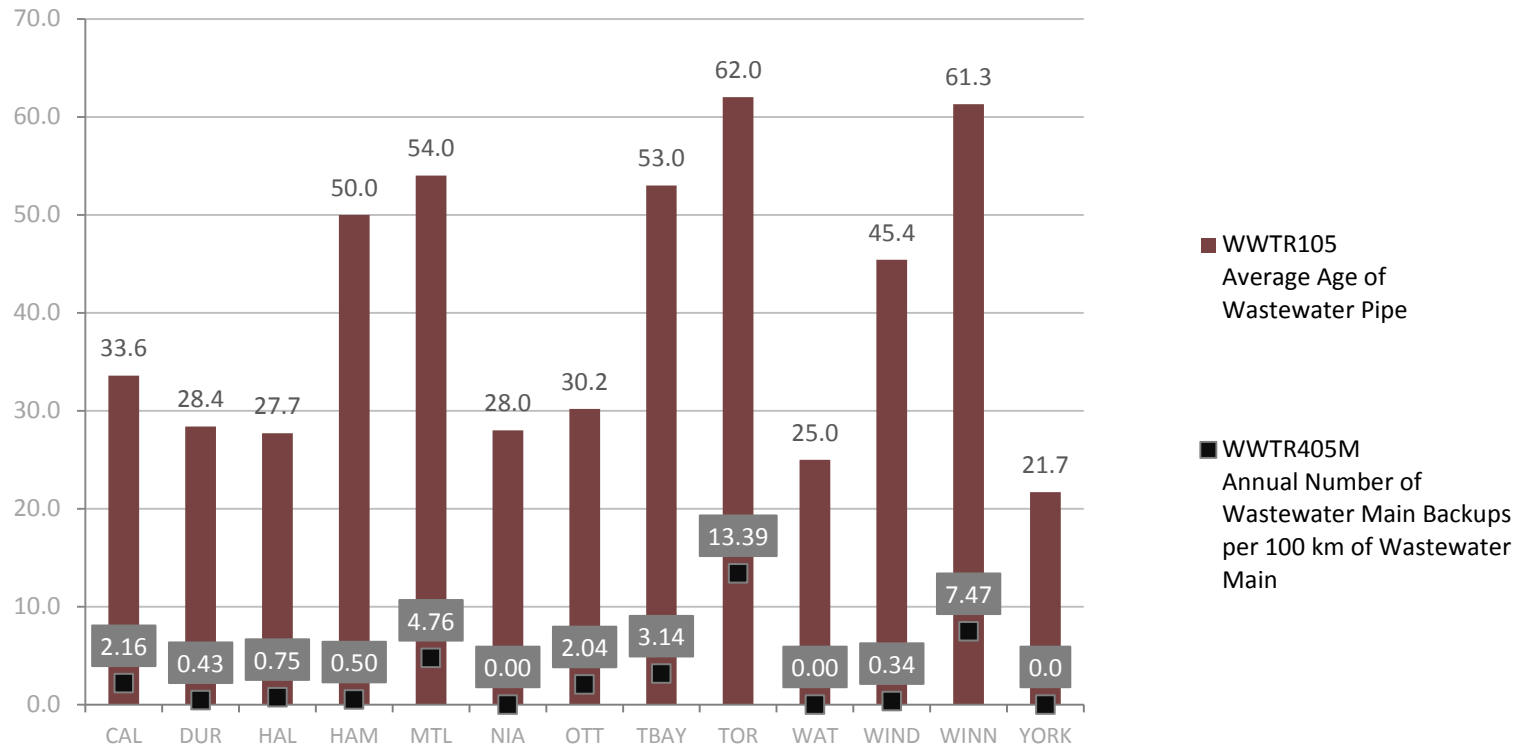
Note: Refer to additional information regarding integrated vs. two-tier systems. Calculations include residential and ICI (Industrial, Commercial and Institutional) sectors.

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

**Two-Tier Systems:** The term applies to 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 within their boundaries.

## What is the number of wastewater main back-ups relative to the average age of wastewater pipes?

Fig 35.3 Average Age of Wastewater Pipe and Number of Wastewater Main Back-ups per 100 Km of Wastewater Main



Source: WWTR105 (Statistic); WWTR405M (Customer Service)

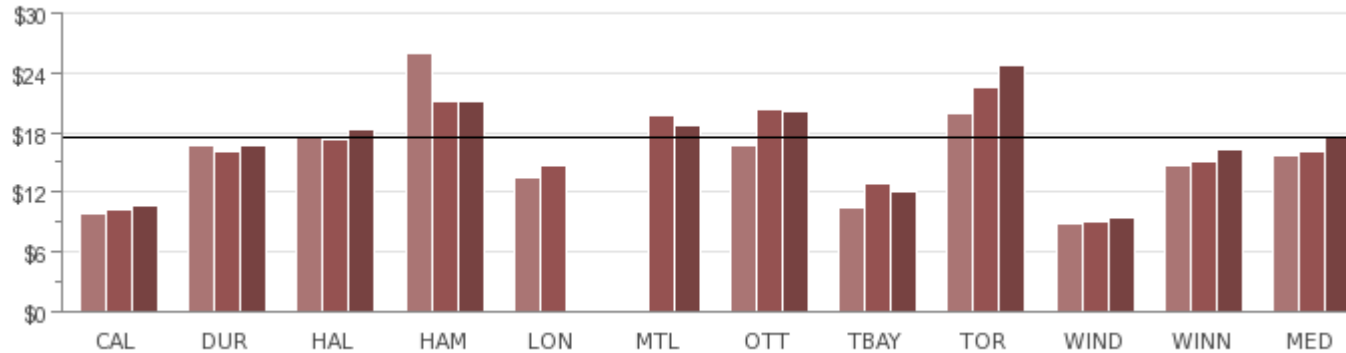
*Note: Average Age of Wastewater Pipe: Older wastewater pipes are often in poor condition and contain cracks, leaking joints and broken sections, contributing to increased pipe blockages and/or an inflow of groundwater into the system causing increased flow. These factors result in an increased frequency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

*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.*

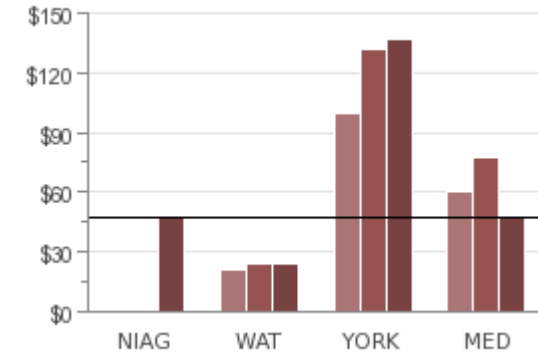
## What is the total cost of wastewater collection and conveyance?

Fig 35.4 Total Cost of Wastewater Collection / Conveyance per Km of Pipe (includes amortization)

Integrated Systems (In Thousands)



Two-Tier Systems (In Thousands)



2012	\$9,781	\$16,705	\$17,551	\$25,904	\$13,543	N/A	\$16,645	\$10,512	\$19,968	\$8,921	\$14,748	\$15,697
2013	\$10,214	\$16,023	\$17,245	\$21,071	\$14,726	\$19,673	\$20,379	\$12,922	\$22,627	\$9,059	\$15,050	\$16,023
2014	\$10,751	\$16,629	\$18,330	\$21,143	N/A	\$18,794	\$20,189	\$12,129	\$24,757	\$9,454	\$16,248	\$17,480

N/A	\$21,540	\$99,177	\$60,359
N/A	\$23,683	\$131,552	\$77,618
\$47,262	\$23,691	\$136,736	\$47,262

Source: WWTR305T (Efficiency)

Note: Refer to additional information regarding integrated vs. two-tier systems. The amortization cost component can vary significantly from year to year depending on the type of infrastructure, capital fund expenditures, etc.

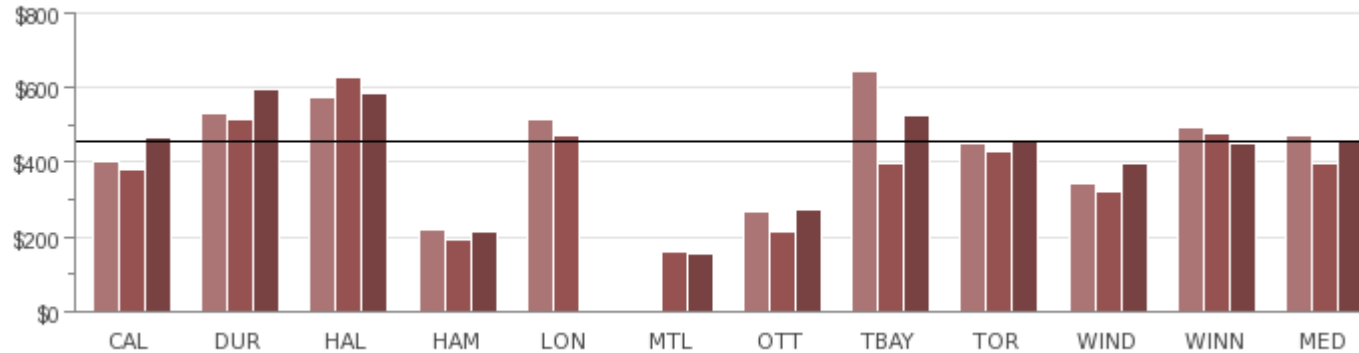
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## What is the total cost for the treatment and disposal of wastewater?

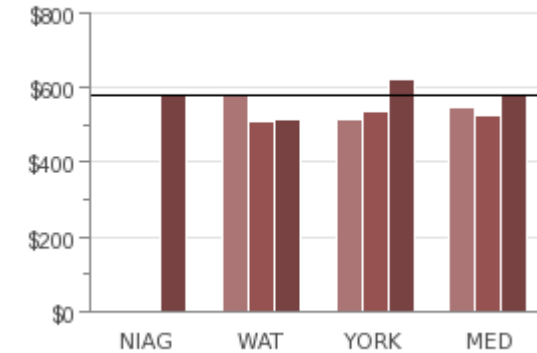
Fig 35.5 Total Cost for Treatment/Disposal per Megalitre Treated (includes amortization)

### Integrated Systems



2012	\$401	\$533	\$572	\$218	\$515	N/A	\$267	\$641	\$448	\$344	\$492	\$470
2013	\$383	\$514	\$629	\$191	\$474	\$163	\$215	\$396	\$429	\$323	\$480	\$396
2014	\$466	\$598	\$582	\$215	N/A	\$157	\$273	\$527	\$461	\$398	\$453	\$457

### Two-Tier Systems



N/A	\$579	\$517	\$548
N/A	\$510	\$537	\$524
\$579	\$516	\$621	\$579

Source: WWTR310T (Efficiency)

Note: Refer to additional information regarding integrated vs. two-tier systems. The amortization cost component can vary significantly from year to year depending on the type of infrastructure, additions and disposals of capital assets, capital fund expenditures, etc.

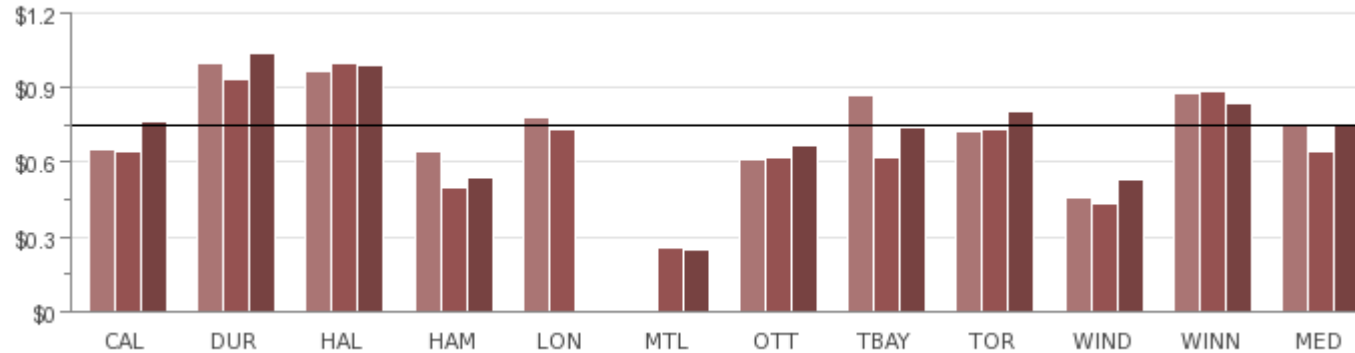
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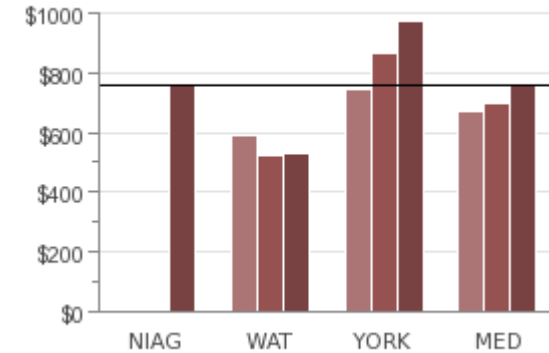
## What is the total cost for the collection, conveyance, treatment and disposal of wastewater?

Fig 35.6 Total Cost of Wastewater Collection/Conveyance and Treatment/Disposal per Megalitre (includes amortization)

Integrated Systems (In Thousands)



Two-Tier Systems



2012	\$651	\$997	\$966	\$644	\$779	N/A	\$615	\$871	\$724	\$460	\$881	\$752
2013	\$642	\$937	\$999	\$502	\$730	\$254	\$620	\$618	\$732	\$432	\$886	\$642
2014	\$765	\$1,040	\$986	\$540	N/A	\$247	\$668	\$737	\$801	\$531	\$837	\$751

N/A	\$593	\$744	\$669
N/A	\$524	\$864	\$694
\$761	\$530	\$970	\$761

Source: WWTR315T (Efficiency)

Note: Refer to additional information regarding integrated vs. two-tier systems. The amortization component can vary significantly from year to year depending on the type of infrastructure, additions and disposals of capital assets, capital fund expenditures, etc.

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