



21 Wastewater Services

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: 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.*

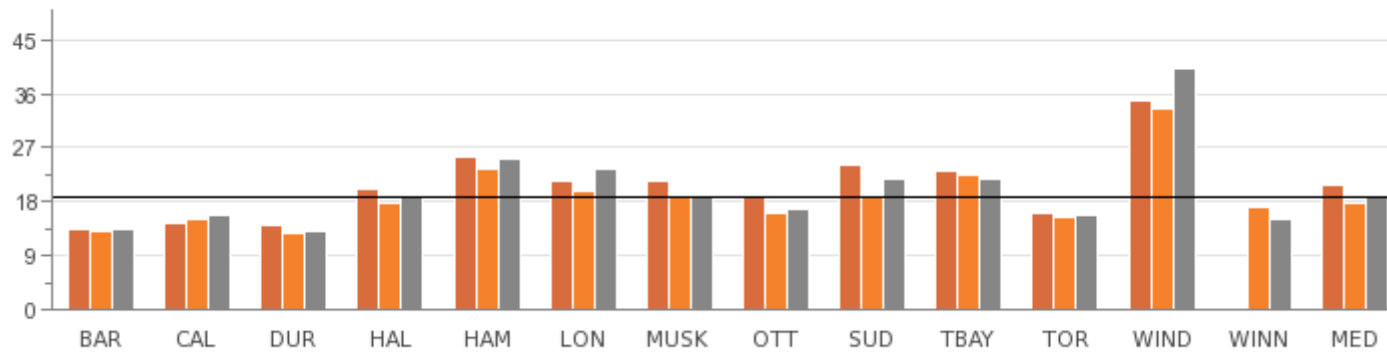
Two-Tier Systems: *The term applies to those Municipalities that have responsibility for components of wastewater activities, e.g. Niagara, Waterloo and York are responsible for all components with the exception of collection which is the responsibility of local municipalities (lower-tiers) within their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

Wastewater Services

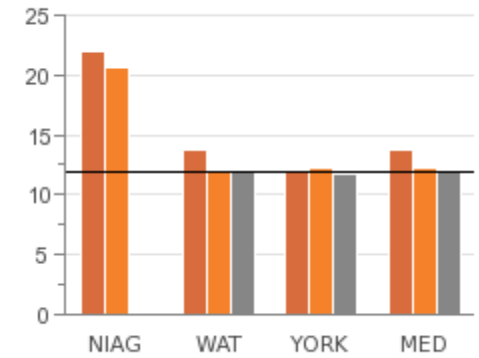
How much wastewater is treated in each municipality?

Fig 21.1 Megalitres of Treated Wastewater per 100,000 Population

Integrated Systems (In Thousands)



Two-Tier Systems (In Thousands)



	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	
2009	13,540	14,462	14,183	20,134	25,330	21,353	21,433	19,061	24,057	23,216	16,011	34,828	N/A	20,744		22,023	13,673	11,831	13,673
2010	13,021	15,097	12,759	17,810	23,351	19,868	18,987	16,161	19,164	22,607	15,286	33,407	16,944	17,810		20,615	11,950	12,202	12,202
2011	13,250	15,793	13,211	19,224	25,261	23,583	18,770	16,648	21,760	21,741	15,738	40,066	15,231	18,770		N/A	11,876	11,806	11,841

Source: WWTR210 (Service Level)

Note: Refer to Additional Information.

Note: Includes residential and ICI sectors.

What is the average age of the infrastructure and the population density of the serviced community?

Fig 21.2 Average Age of Infrastructure and Population Density of Serviced Community

Municipality	Average Age of Wastewater Pipe	Population Density
Barrie	21	1,400
Calgary	33	1,286
Durham	20	1,531
Halton	27	491
Hamilton	49	435
London	40	865
Muskoka	40	6
Niagara	N/A	N/A

2011 RESULTS

Municipality	Average Age of Wastewater Pipe	Population Density
Ottawa	29	299
Sudbury (Greater)	43	266
Thunder Bay	55	305
Toronto	59	4,401
Waterloo	N/A	400
Windsor	44	1,436
Winnipeg	57	1,446
York	18	575

Source: WWTR105 (Community Impact) WWTR009 (Population Density)

Note: Summary table is provided for cross-referencing purposes.

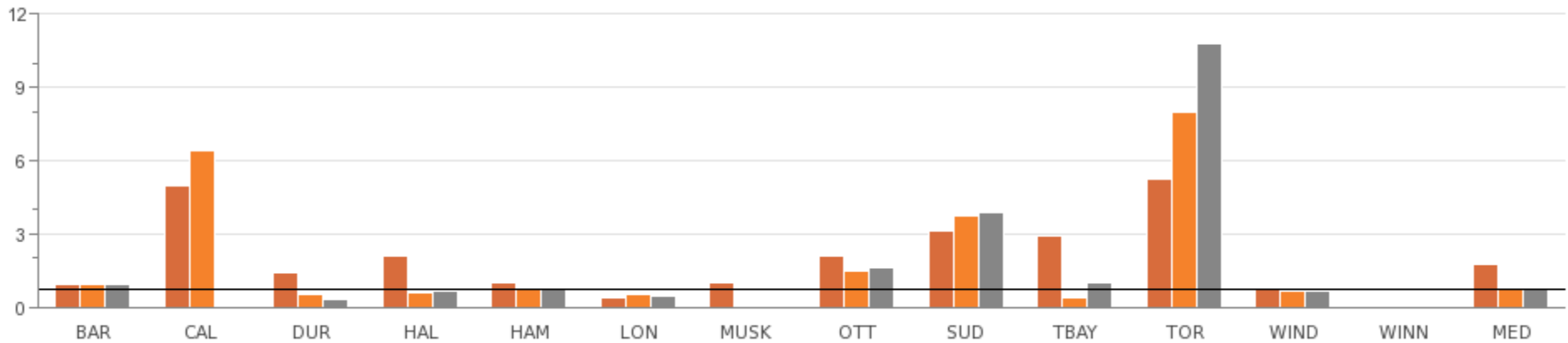
Additional Information

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 an inflow of groundwater into the system causing an excess capacity to the system. These factors result in an increased frequency of wastewater main backups relative to newer systems that do not have such deficiencies incurring higher maintenance costs for older systems.

Density of Development: The density of development within a service area has a direct impact on the cost of maintenance and repair of the wastewater systems. The downtown areas of older communities typically have higher density development on narrow road allowances. The cost of maintaining and repairing pipes in a dense urban environment is higher, resulting in higher costs for maintenance and repair activities relative to a suburban environment. Communities with lower development densities typically have wider unrestricted road allowances which make repairs easier and less costly to carry-out.

How many wastewater main back-ups occurred?

Fig 21.3 Annual Number of Wastewater Main Backups per 100 Km of Wastewater Main (Integrated Systems only)



2009	0.94	4.98	1.42	2.08	1.00	0.36	0.97	2.12	3.12	2.94	5.27	0.70	N/A	1.75
2010	0.93	6.42	0.54	0.56	0.81	0.51	0.00	1.46	3.77	0.39	8.01	0.69	N/A	0.75
2011	0.94	0.06	0.34	0.67	0.80	0.43	0.00	1.62	3.90	0.98	10.79	0.69	N/A	0.75

Source: WWTR405M (Customer Service)

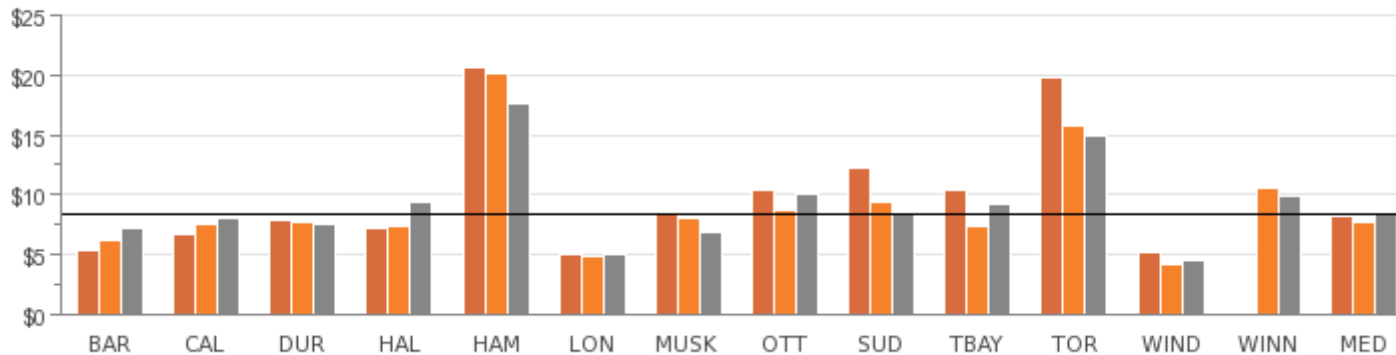
Note: Refer to Additional Information.

Comment: The annual number of wastewater backups is directly related to 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, resulting in wastewater backups.

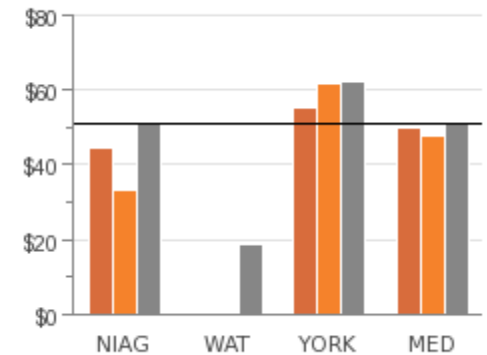
What is the operating cost of wastewater collection and conveyance?

Fig 21.4 Operating Cost of Wastewater Collection/Conveyance per Km of Pipe

Integrated Systems (In Thousands)



Two-Tier Systems (In Thousands)



2009	\$5,317	\$6,677	\$7,808	\$7,197	\$20,659	\$5,043	\$8,518	\$10,443	\$12,289	\$10,425	\$19,707	\$5,158	N/A	\$8,163		\$44,397	N/A	\$55,515	\$49,956
2010	\$6,284	\$7,472	\$7,664	\$7,404	\$20,040	\$4,831	\$7,992	\$8,701	\$9,306	\$7,310	\$15,816	\$4,198	\$10,480	\$7,664		\$33,300	N/A	\$61,749	\$47,525
2011	\$7,141	\$7,987	\$7,558	\$9,409	\$17,581	\$5,105	\$6,933	\$10,058	\$8,423	\$9,234	\$14,868	\$4,494	\$9,942	\$8,423		\$50,811	\$18,617	\$62,144	\$50,811

Source: WWTR305M (Efficiency)

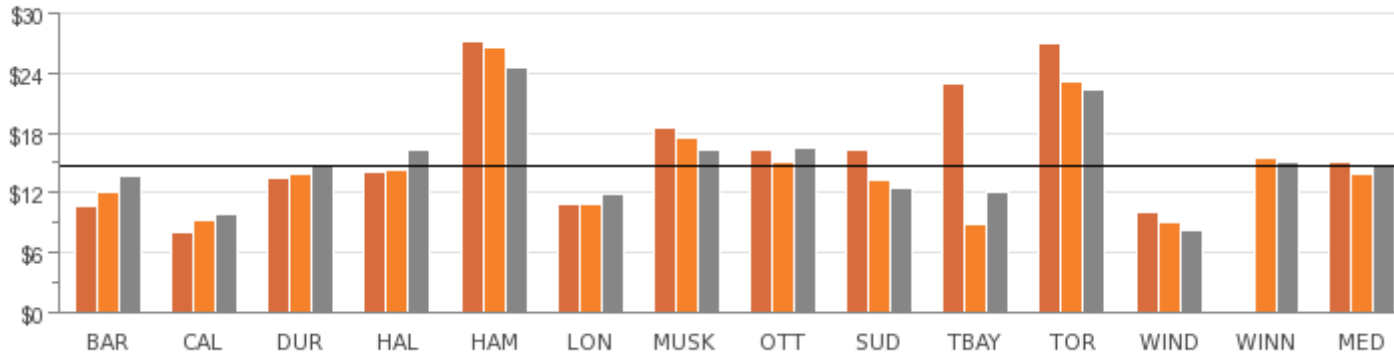
Note: Refer to Additional Information.

Comment: Municipalities providing service over a broad geographic area generally have higher operating costs due to the number and type of wastewater treatment facilities operating and the distance between the individual systems. This affects the daily operating costs for collection, conveyance and treatment of wastewater.

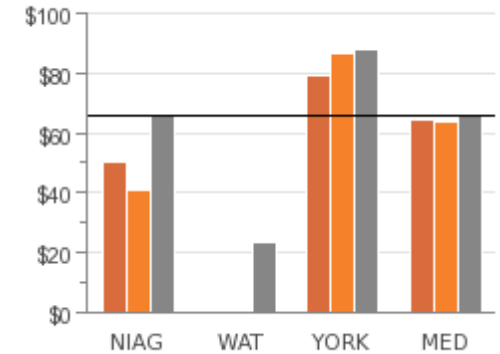
What is the total cost of wastewater collection and conveyance?

Fig 21.5 OMBI Total Cost of Wastewater Collection / Conveyance per Km of Pipe (includes amortization)

Integrated Systems (In Thousands)



Two-Tier Systems (In Thousands)



2009	\$10,693	\$8,066	\$13,558	\$14,023	\$27,062	\$10,785	\$18,539	\$16,287	\$16,206	\$22,952	\$26,982	\$10,118	N/A	\$15,115		\$50,260	N/A	\$79,008	\$64,634
2010	\$12,168	\$9,174	\$13,970	\$14,184	\$26,537	\$10,953	\$17,475	\$15,061	\$13,366	\$8,828	\$23,045	\$8,957	\$15,429	\$13,970		\$40,904	N/A	\$86,756	\$63,830
2011	\$13,775	\$9,946	\$14,746	\$16,342	\$24,513	\$11,777	\$16,202	\$16,539	\$12,565	\$12,161	\$22,286	\$8,172	\$14,997	\$14,746		\$65,563	\$23,626	\$88,131	\$65,563

Source: WWTR305T (Efficiency)

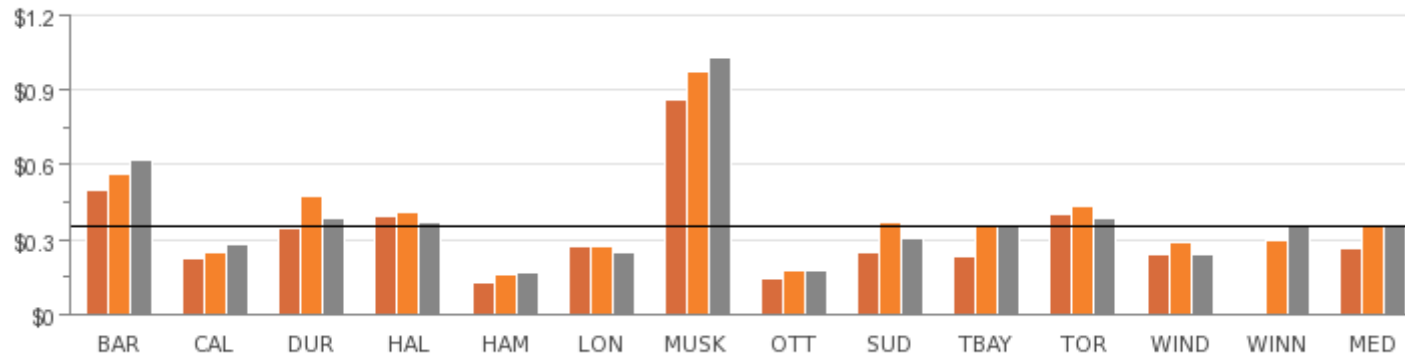
Note: Calculation includes amortization.

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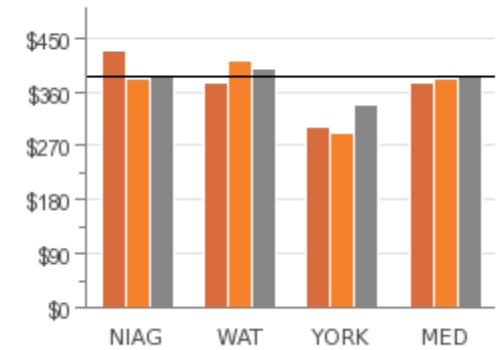
What is the operating cost for the treatment and disposal of wastewater?

Fig 21.6 Operating Cost of Wastewater Treatment/Disposal per Megalitre Treated

Integrated Systems (In Thousands)



Two-Tier Systems



2009	\$499	\$224	\$344	\$392	\$132	\$274	\$861	\$144	\$253	\$237	\$404	\$240	N/A	\$264		\$429	\$375	\$303	\$375
2010	\$567	\$249	\$471	\$411	\$159	\$276	\$973	\$173	\$369	\$353	\$435	\$293	\$300	\$353		\$383	\$414	\$293	\$383
2011	\$616	\$283	\$385	\$374	\$172	\$246	\$1,029	\$178	\$306	\$355	\$388	\$245	\$352	\$352		\$387	\$399	\$338	\$387

Source: WWTR310M (Efficiency)

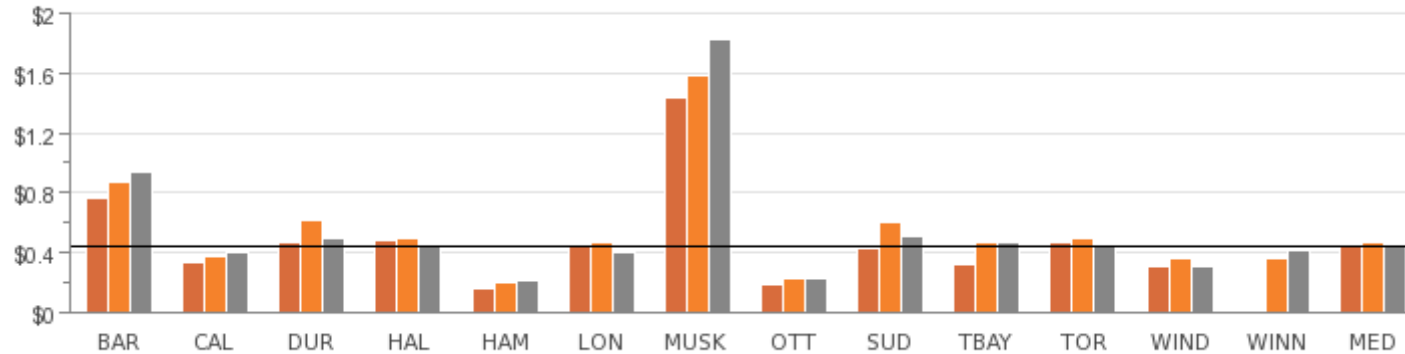
Note: Refer to Additional Information.

Comment: The cost of treating wastewater and disposing of bio-solids per megalitre of wastewater. Bio-solids are primarily organic accumulated solids separated from wastewater that have been stabilized by treatment. Wastewater is treated to meet or exceed the provincial Ministry of the Environment regulations and standards.

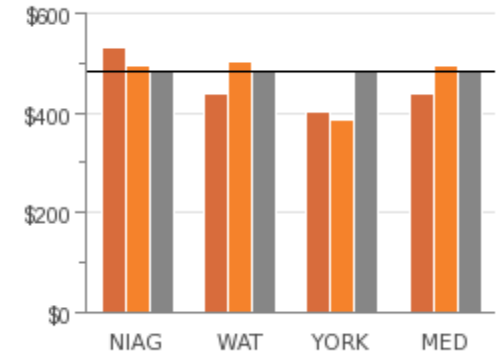
What is the total cost for the treatment and disposal of wastewater?

Fig 21.7 OMBI Total Cost for Treatment/Disposal per Megalitre Treated (includes amortization)

Integrated Systems (In Thousands)



Two-Tier Systems



2009	\$767	\$335	\$472	\$479	\$166	\$458	\$1,438	\$193	\$431	\$327	\$469	\$306	N/A	\$445		\$532	\$440	\$403	\$440
2010	\$871	\$377	\$613	\$496	\$196	\$470	\$1,587	\$225	\$599	\$470	\$496	\$364	\$361	\$470		\$494	\$504	\$386	\$494
2011	\$937	\$398	\$497	\$460	\$209	\$409	\$1,823	\$233	\$511	\$476	\$447	\$305	\$420	\$447		\$487	\$483	\$483	\$483

Source: WWTR310T (Efficiency)

Note: Calculation includes amortization.

Comment: The cost of treating wastewater and disposing of bio-solids per megalitre of wastewater. Bio-solids are primarily organic accumulated solids separated from wastewater that have been stabilized by treatment. Wastewater is treated to meet or exceed the provincial Ministry of the Environment regulations and standards.