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City of Ottawa – Water and Wastewater Rate Review Study



Prepared for Councillor Jeff Leiper, City of Ottawa
by
LAC & Associates Consulting

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Lorne Cutler, P.Eng., MBA founded LAC & Associates Consulting following his a 25-year career in international trade finance and development. LAC & Associates specializes in providing consulting services to the private, public and NGO sectors in the areas of finance, international trade development and finance; municipal finance; and public policy. LAC & Associates Consulting is located in Ottawa, Canada.

City of Ottawa – Water and Wastewater Rate Review Study September 2015

BACKGROUND

On May 19, 2015, the Environment Committee of the City of Ottawa approved a proposal for the City to review the method by which it charges for water and wastewater. Currently in Ottawa, 100% of the cost of water and wastewater is billed strictly based on actual water consumption with a small monthly fixed charge for fire supply services. Beyond the small charge for fire supply services, there are no additional fixed charges.

Over the past two decades, a number of factors have put severe pressure on the cost of operating a safe and reliable water and wastewater system and the offsetting revenues received from users. These factors include:

- Increased costs due to higher water purification standards
- Aging infrastructure
- A combination of dropping water consumption due to such factors as conservation and changes in the nature of Canada economic base (service based vs. manufacturing)
- Erratic weather patterns
- Increased environmental standards;
- The evolving nature of urban development

Due to increased costs and falling consumption, water rates have had to increase by 6% to 9% per year and even then, the City is not able to cover the cost of the service. Due to these various pressures, the City of Ottawa has decided to review its current water rate structure to determine if a more appropriate structure might be implemented. An improved rate structure should allow for greater predictability of annual revenues and lower annual rate increases.

Ottawa had previously considered a review of its rate structure in 2008 with the possible goal of introducing a monthly fixed charge in addition to the consumption charge. Council at the time deferred the proposal in order to install new meter reading and billing systems. . Since 2008, the various pressures on the water system have continued to mount.

CURRENT CANADIAN ENVIRONMENT

The Ontario government, similar to other provincial and state governments, requires that the full cost of operating a municipal water system must be borne by the users rather than from the

general tax base. There are various pricing models used throughout Ontario. A number of large municipalities such as Toronto, Peel Region (Mississauga and Brampton) and York Region (Markham and Vaughan) price water and wastewater strictly based on consumption, similar to what is done in Ottawa. Other municipalities such as Vancouver, Waterloo and Winnipeg charge a nominal fixed amount with the vast bulk of the charge based on consumption. London, Thunder Bay and Calgary have a fixed monthly charge between 30% and 40% of the entire bill. Sarnia's fixed monthly charge is approximately 90% of their entire bill. Of the cities examined, only London has recently changed its overall approach to billing, while some cities such as London and Mississauga have also closely examined how they bill for stormwater independently of billing for water and wastewater. In 2010, Sarnia moved from a system under which approximately 50% of the water fee was fixed, to one where approximately 90% was fixed.

While cities are required to cover water and wastewater costs from users, stormwater costs have nothing to do with how much water a user consumes. As such, some cities pay for their stormwater costs through their water billing, other cities pay for stormwater costs through the general tax base and some cities have established stormwater pricing based on property characteristics. While the Ottawa rate budget for water includes the cost of the stormwater system, it does not show any rate based income.

In addition to different pricing structures, different cities also operate their water operations under different governance structures. Cities such as Ottawa and Toronto include water operations under the general operations of the municipal government.

Other cities such as Windsor and Halifax have created municipal corporations to operate their water systems. These companies are wholly-owned by their municipalities and have independent boards which also include a number of city councillors. These structures are similar to Ottawa Hydro in nature but are structured on a cost-recovery basis rather than being required to be profitable and pay a dividend back to the municipality. Edmonton's water is provided by a wholly-owned municipal corporation, Epcor. Epcor operates with an independent board and markets its services throughout North America and pays significant dividends to Edmonton (\$141 million in 2013). Other municipalities such as Calgary have outsourced some of their operations to outside companies while maintaining ownership of their systems. Some cities in North America have privatized their water systems entirely but no major city in Canada follows this model.

While most municipalities operate their own systems either directly or through a municipal corporation, the region of York buys its water from Toronto and Peel. In the U.S. it is not uncommon for smaller municipalities to buy their water from larger municipalities or for

municipal water corporations to provide services for larger metropolitan regions that may be composed of several smaller cities.

Hence, there are almost as many ways of structuring municipal water systems as there are municipalities in Canada.

SCOPE OF THIS STUDY

The purpose of this study is to review the experience of different municipalities across Canada, and to a lesser extent the U.S. The study examines how various municipalities charge for water; the financial pressures that their water systems are facing and a review of how their water rates have changed over the past few years.

A comparison has also been made on average water pricing across a number of Canadian cities. Cities in Quebec have not been included in this study, as water costs are substantially covered through the tax base rather than by users. Different systems have been evaluated based on the guiding principles established by Ottawa for its water review study. These include:

- Fairness and Equity
- Financial Sustainability
- Affordability
- Transparency
- Promotion of Water Conservation
- Support for economic development

While no comprehensive study can look at water pricing without looking at costs of operating Ottawa's water system, particularly under a cost-recovery system, the scope of this report does not include any analysis of the validity of the costs associated with building, maintaining and operating Ottawa's water, wastewater and stormwater systems. As well, this study also does not look directly at the water requirements of the Industrial, Commercial and Institutional (ICI) sectors. Given the limited scope of this study, we do not propose pricing or an actual pricing structure but examine lessons learned from other cities. In most cases, information was obtained through public sources but direct discussions were held with several cities.

Observations and recommendations have been made based on the approaches and experience of other Canadian cities.

Financing Pressures – Water systems throughout Canada are facing several pressures that have impacted pricing. Ottawa is no different in this regard. The various pressures include the following:

1. **Increased Costs** – The cost of running Ottawa’s water system has increased significantly over the years. Increases are due to a number of factors including:
 - Aging infrastructure and the need for significant maintenance and refurbishment
 - Enhanced water treatment standards
 - Ottawa River Action Plan
 - Inflation
 - City growth

The Ottawa River Action Plan, adopted in 2010, is Ottawa’s most significant of the projects being pursued by the City of Ottawa. This project had broad support by residents of Ottawa. Major wastewater spills into the Ottawa River over the years and the resulting short-term decline in water quality helped to galvanize support for this project.

The Ottawa River Action Plan involves the separation of waste and storm water sewers and the construction of holding tanks to prevent stormwater from running into the Ottawa and Rideau Rivers. To date, approximately \$750 million has been spent on this project which is expected to take almost 25 years to complete. The most significant element of this project, the underground storage tanks, has risen in cost from \$195 million in 2013 to \$231 million. Of this amount, the Federal and Provincial governments are contributing \$62 million each, with the City paying the difference, including any additional cost overruns.¹

While there have been pressures on the revenue side, the major reason for the increase in water prices has been the increased cost of running the system including infrastructure expansion, renewal and maintenance costs.

Actual operating expenses are outlined in Figure 1. This information has been taken from City of Ottawa budget documents. Actual rather than budgeted amounts have been used.

¹ <http://ottawacitizen.com/news/local-news/0408-orap>

Figure 1 – Cost of Water, Wastewater and Stormwater System as reported in Ottawa’s Operating and Capital Budget documents are:

Year	Amount (\$ million)				Rate of Increase Over Prior Year (%)
	Water	Wastewater	Stormwater	Total	
2015 (budget)	160.91	165.29	13.63	339.83	3.90%
2014	155.14	157.94	14.00	327.08	6.96%
2013	145.47	147.67	12.65	305.79	5.75%
2012	135.38	140.26	13.53	289.17	8.75%
2011	130.83	122.96	12.11	265.90	5.49%
2010	120.41	120.07	11.58	252.06	-1.93%
2009	131.54	115.07	10.41	257.02	16.42%
2008	110.39	110.39	n.a.	220.77	11.99%
2007	87.16	114.98	n.a.	197.14	1.96%
2006	86.08	108.36	n.a.	194.44	4.92% (over 2 years)
2005	n.a.	n.a.	n.a.	n.a.	n.a.
2004	n.a.	n.a.	n.a.	185.31	3.00%
2003	n.a.	n.a.	n.a.	179.97	n.a.

*Figure 1 is based on a review of Ottawa’s publicly posted budgets from 2011 to 2015. Each year contained actual results for the two prior years. Of earlier budgets, only the 2004 Draft Budget was available from the Ottawa Public Library.

The cost of operating Ottawa’s water system has increased every year regardless of drops in consumption. Since there is no distinct budget page for stormwater prior to 2008, it is assumed that stormwater costs were included within wastewater. Between 2009 and 2015, the period for which on-line budget numbers are available, the cost of running the water and wastewater system increased from \$257 million to \$340 million, an increase of 32%. Since 2003, the water budget has increased from \$180 million to \$340 million, an increase of 89%. In this same period, the Consumer Price Index went up approximately 24%.²

2. **Decreased Water Consumption** – Over the past 20 years, the general trend in water consumption in Canadian cities has been downward and Ottawa is no exception. Between 2003 and 2010, per household residential water consumption dropped by

² <http://www.statcan.gc.ca/tables-tableaux/sum-som/101/cst01/econ46a-eng.htm>

approximately 13% and overall water demand dropped by 6%.³ Even with the increase in population over time, overall water consumption has dropped. The City of Ottawa has actively promoted water conservation. The City provides water efficiency kits to residents and for a period of time even subsidized low-flow toilets. The City has determined that decreased consumption will help to save capital costs over time as certain expansions may not be required.

3. **Unpredictable Consumption Impacts** – While overall residential water consumption is on a downward track, in any given year there could be external factors that would impact significantly on consumption. Thusly, while the average trend might be for consumption to drop approximately 1-2% per year, this can be impacted by external factors resulting in an annual drop of around 5% or possibly increased consumption. Since water use peaks in the summer months, an unusually wet spring and summer can result in decreased water usage. Similarly, an unusually dry or hot summer can result in higher water consumption rates. The City of Vancouver, which gets less rain in the summer months than the rest of the year, tries to limit summer usage by increasing the normal water costs by 33% between June 1 and September 30. Vancouver is the only major Canadian city that does this. In addition to weather-related situations, other issues may also arise. For example, in Spring 2011, water usage in Manotick, Barrhaven and Riverside South was severely restricted due to the unexpected requirement to replace the Woodroffe watermain. A major long-term water outage of this nature could result in a significant decrease in revenue.
4. **Water Funds Raised Through Development Charges** – Development Charges (DCs), by their nature can only be used to support new capital projects. They cannot be used for refurbishment of existing structures. The City sets different DCs for development within the Greenbelt and development outside the Greenbelt. The overall rates are significantly different.

Over the past several years, the City has had a policy of intensification. This has led to less individual houses being built outside of the Greenbelt and more apartment condominium units and semi-detached dwellings being built within the Greenbelt. Over the past few years, this situation has been further exacerbated with a downturn in new residential construction. While the DC for sanitary sewers is relatively the same within and outside the Greenbelt due primarily to the requirements of the Ottawa River Action Plan, the DC for water is significantly different charges between the two zones. While

³ <http://www.torontosun.com/news/ottawa/2010/02/21/12969461.html>

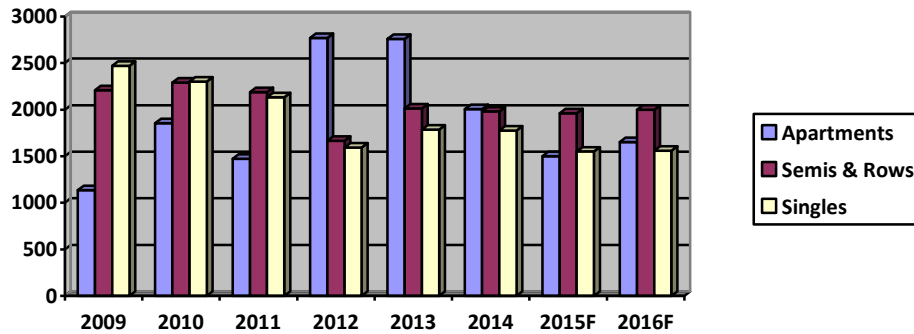
significant work may have to be done to aging water lines within the Greenbelt, DCs can only be charged for new infrastructure or capacity, not for refurbishment of existing facilities. Since rural areas do not receive water from the City nor do they have sanitary sewers, water-related DCs from rural areas are not applicable.

Figure 2 shows the relative DCs by area and type of housing for 2014. Figure 3 is a CHMC-sourced chart outlining housing starts by type in Ottawa over the past six years and projections for 2015 and 2016. This figure shows that there has been a shift in housing types over the past several years. Whereas in 2006 apartments constituted approximately 30% of all new housing starts, by 2015, apartments constituted over 40% of all new construction. Since most multi-unit buildings in Ottawa are built within the Greenbelt, there seems to have been a shift in where construction has taken place. A shift to construction inside the Greenbelt would impact significantly on DCs raised specifically in respect of water requirements.

Given this situation, more research is required to determine if the City had expectations with respect to the level of DC that are not being met.

Figure 2 – 2014 Ottawa Development Charges for Water Related Infrastructure

Service	Single & Semi Detached		Apartments and Back to Back and Stacked Townhouses (> 2 bedrooms)		Apartments (≥ 2 bedrooms)		Row Housing	
	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
Water	\$353	\$3,030	\$208	\$1,608	\$153	\$1,184	\$276	\$2,279
Sanitary Sewer	\$4,415	\$4,302	\$2,600	\$2,283	\$1,915	\$1,681	\$3,458	\$3,236
Stormwater Drainage	\$42	\$42	\$25	\$22	\$18	\$16	\$33	\$32

Figure 3- Annual Housing Starts in Ottawa⁴

OTTAWA WATER RATES

Ottawa water rates have risen consistently over the past 15 years and continued increases are expected. While property tax increases have stayed under 4% and more recently 2%, water rates have gone up an average of 5-8% per year for the past 15 years such that 2015 water rates are 178% percent greater than they were in 2001. Given that the average decline in household water consumption during this period was approximately 15-20%, an increase of 178% is much more correlated to the increase in water costs than the drop in consumption.

Figure 4 – Ottawa Historic Water Consumption Rates

Year	Water Rate (\$/m ³)	Wastewater Rate (\$/m ³)	Total Water Consumption Charge (\$/m ³)	Fire Supply Charge (monthly)	% Annual increase in Consumption Charges
2015	\$1.699	\$1.988	\$3.687	\$3.33	6%
2014	\$1.603	\$1.876	\$3.479	\$3.14	7%
2013	\$1.498	\$1.753	\$3.251	\$2.93	7%
2012	\$1.40	\$1.638	\$3.038	\$2.64	6%
2011	\$1.320	\$1.544	\$2.864	\$2.63	3.9%
2010	\$1.276	\$1.480	\$2.756	\$2.64	9%
2009	\$1.264	\$1.264	\$2.528	\$2.64	9%
2008	\$1.159	\$1.159	\$2.318	\$2.64	9%
2007	\$0.868	\$1.259	\$2.127	\$2.64	9%
2006	\$0.775	\$1.178	\$1.953	\$3.95	8.98%
2005	\$0.692	\$1.100	\$1.792	No charge	15.16%
2004	\$0.585	\$0.9711	\$1.5561	No charge	3.5%
2003	\$0.565	\$0.9379	\$1.5029	No charge	0%
2002	\$0.565	\$0.9379	\$1.5029	No charge	13.5%
2001	\$0.495	\$0.8291	\$1.3241	No charge	

⁴ CMHC – Housing Market Outlook – Ottawa, Spring 2015

While the vast bulk of Ottawa’s revenue for the water and wastewater system comes from consumption charges, there are additional fees charged for services such as inspections, replacement of water meters, water service connections, pipe thawing, etc. The fees charged are outlined in Ottawa’s annual budgets. Figure 5 lists some sample fees and compares them from 2008 to 2015.

Figure 5 – Selected Ottawa Water-Related Service Fees

Service	2008 Rate (\$)	2015 Rate (\$)	Increase
Water Connection – 20 mm on Ductile Iron or Cast Iron	\$508.00	\$626.00	23.2%
Water Connection – 20 mm on PVC	\$643.00	\$704.00	9.4%
Water Connection – 20 mm – cost plus 15% (hourly)	\$141.00	\$132.00	-6.4%
Thawing of Services – 20 mm and 25 mm	\$307.00	\$310.00	1.0%
Hot water thawing	\$99.00	\$107.00	8.0%
Fire flow tests	\$186.00	\$241.00	29.6%
Turn off water for non-payment	\$72.00	\$86.00	19.4%
Inspection for new water meters	\$72.00	\$90	25%
New water meter 15 – 20mm Pos. Disp.	\$278.00	\$246.00	-11.5%
75 mm Turbine	\$1,469.00	\$2,349.00	59.9%
100 mm Compound	\$4,947.00	\$4,191.00	-15.3%
100 x 50 mm Fire Assembly – cost plus 15% (hourly)	\$211.00	\$190.00	-10.0%

While these fees change from year to year, in some years they go up and in other years they go down. As well, some fees can go up in a given year while other fees will go down. There is no explanation in the budgets as to how these fees are set and the scope of this study did not allow for a detailed analysis of these fees. Over the 2008 to 2015 period, however, water consumption rates increased by 59% and the water/wastewater/ stormwater budget increased by 54%. From scanning these various fees, only a few came close to meeting the increase in expenditures or the increases in water consumption rates. Many of the fees would not even meet the rate of increase of general residential property taxes in Ottawa. While these fees probably represent only a small portion of revenue for the water system, it is worth noting that these fees have not kept pace with either residential water consumption fees or overall water-related expenditures.

EXPERIENCE OF OTHER CANADIAN CITIES IN WATER PRICING

1) Consumption Charges

There is a wide variety of approaches for pricing water and sewer services consumption, independent of whether any fixed charges are levied. The City Staff paper of May 19, 2015

noted several consumption billing structures. Some of these billing structures, however, should be considered as basic billing structures and some should be considered as modifications which could be applied to any basic billing structure. This study has assumed four basic structures for pricing water consumption:

1. Uniform volumetric – a set rate regardless of the amount of water consumed
2. Inclining Tiered Blocks – Water rates increase as the amount of water consumed increases for a given period. Rates are usually in blocks. Inclining tiered blocks are designed to encourage conservation by increasing the cost as more water is consumed.
3. Declining Tiered Blocks – Water rates decrease as the amount of water consumed increases for a given period. Rates are usually in blocks. Declining tiered blocks are designed to provide attractive water rates for non-residential users who have high water requirements but provide employment and other economic benefits to a community
4. Humpback Tiered Block – Water rates increase as the amount of water consumed increases to a certain limit and then rates start to decrease for increased use beyond that point. This structure is designed to encourage conservation by residential users without penalizing the larger users in the ICI sector who usually benefit from the downward sloping section of the hump.

Based on pricing structures implemented by other cities, there are four potential pricing variations identified by Ottawa staff that could be combined with the basic four consumption pricing structures listed above. Two additional variations have been included based on our research on other cities. The variations to the basic four structures:

1. Lifeline Rate – An artificially reduced rate is charged for a minimum amount of water deemed to be required for essential water consumption designed for low income people. Lifeline pricing is most common in cities with a fixed charge as all customers will have to pay the fixed charge regardless of consumption.
2. Seasonal Rate – Rates increase at certain times of the year due to seasonal variability in usage or if water availability varies by season (usually due to seasonal variations in precipitation).
3. Excess Use Rate – This structure is customer specific. A customer's average water demand is determined and then an excess rate is used for consumption during peak demand periods.
4. Time of Use Rate – Under this structure, rates would be based on time of use. This is similar to how electricity is billed.
5. Split Water/Wastewater Usage Rate – Cities levy a wastewater charge based on water consumption. Under this structure, some municipalities calculate summer wastewater usage based on average non-spring/summer usage. This is done on the assumption that consumption increases in the summer due to such activities as car washing, pool filling, gardening and lawn requirements

and that this water does not re-enter the wastewater system. It should be noted that this structure was not noted in the Staff Paper of May 19.

6. Minimum Charge – This structure was not considered by Ottawa but it occurs in some jurisdictions that only have consumption based pricing.

Figure 6 outlines the different consumption pricing structures used by various Canadian and U.S. cities. Of the cities examined, none had implemented Time of Use or Excess Use pricing. As noted in the Staff paper, both of these systems can be extremely difficult and expensive to implement and may have technological requirements that are not easily available. The vast bulk of cities reviewed charged a uniform price for water and wastewater consumption. A few cities such as Kingston, Moncton, Lethbridge and Kelowna had different rate structures for residential and ICI customers. In the case of Lethbridge, all industrial water rates were lower than residential rates. Some cities might appear in more than one category as they display multiple pricing characteristics.

The split in rate structures seems designed to encourage conservation for residential users while not penalizing non-residential customers and encouraging investment. Only Windsor had implemented a system whereby summer water consumption was not included in determining wastewater charges. Regina has been classified as having a split structure. Under Regina's structure it assumes that the full amount of water consumed is not sent back into the sewer system but the amount that is returned is dependent on the nature of the property. Kamloops charges a fixed amount for water based on up to 45 m³ for Fall/Winter use and 90 m³ for Spring/Summer use. Any consumption in excess would be charged based on actual consumption.

Figure 6 – Water Consumption Structures for Various Canadian and U.S. Cities

Water Structure Modification	Uniform	Inclining	Declining	Humpback
No modification	Ottawa , Calgary, Regina, Markham, Brampton, Guelph, Thunder Bay, Peel*, Niagara Falls, Kitchener, Waterloo, Halifax, Minneapolis, Chicago, Victoria, Moncton, Toronto (residential), Lethbridge (residential), Kelowna (Residential, Kingston (residential)	Edmonton, Saskatoon, Boston, Cleveland, Kingston (residential), Kelowna (residential)	Winnipeg (2 tiers), Moncton (ICI), Kingston (ICI), Lethbridge (ICI), Kingston (ICI)**, Pittsburg, Toronto (ICI)	
Lifeline	Kamloops	Hamilton, Cleveland	Pittsburg (2 tier – 2 nd tier varies	London

Water Structure Modification	Uniform	Inclining	Declining	Humpback
			by of user)	
Seasonal	Vancouver (33% premium), Richmond Virginia			
Excess Use				
Split Water/Wastewater	Windsor, Richmond Va, Regina			
Time of Use				
Minimum Charge	New York, Pittsburg, Vaughan			

*Region of Peel applies higher wastewater rate to ICI customers than it does to residential

**Kingston has declining rates based on larger meter size rather than increasing volumes.

2) Fixed Charge and Consumption Billing

There is a range of different structures across Canadian and U.S. cities for water consumption pricing. There are, however, three primary structures when it comes to setting overall rates:

1. Strictly based on consumption
2. Primarily consumption-based with some nominal fixed monthly/quarterly charge
3. Consumption-based with a significant monthly fixed charge

Many cities still price strictly based on water consumption with no extra fixed charges. Almost all cities in North America have separate rates for water and for sewer/wastewater. In some cases the sewer rate is higher than the water rate and in some cases it is lower. Almost all cities clearly indicated to consumers the rate for water and the rate for wastewater/sewer. In cases where the rates were changing from year to year, the water and the sewer rates did not necessarily change by the same percentage. This was likely because the costs for water and for wastewater systems may not be changing at the same rate, particularly given the costs of updating wastewater systems as opposed to drinking water systems. While most cities charged a higher rate for wastewater than fresh water, a few charged lower rates for wastewater. A few cities had implemented a specific charge designated to assist in infrastructure maintenance or replacement.

Several cities have separate pricing for stormwater which is not based on water consumption but is based on the nature of the property. Where these rates exist they are part of the fixed rate component and are not tied to consumption. This will be discussed later.

Ottawa is one of the few cities studied that did not have a stand-alone sewer rate. In Ottawa's case, the sewer rate is given as a percentage of the water rate. In such a case, rate increases for sewer consumption would be identical to water rate increases whether sewer costs were

going up at the same rate as water costs, unless Ottawa were to adjust the ratio between water and sewer rates from year to year. In Ottawa's case, the sewer to water ratio was set at 167% from 2001 to 2005 and then dropped to 152% in 2006, 145% in 2007, 100% in 2009 and then started to go back up in 2010 and has held steady at 117% for the last several years. Pricing wastewater as a percentage of water is an awkward billing system and does not appear to be widely used by North American cities. If costs for each system do not change at the same rate either Ottawa will have to change the percentage used or pricing will not reflect actual costs.

In almost all cases, the same water volume was applied to both the water rate and the sewer rate. In a few cases, a lower consumption amount was applied to the sewer rate. Typically this was in consideration that not all consumed water is returned through the sewer system. This is particularly true with respect to outdoor water consumption for uses such as rinks, car washing, gardening, house cleaning, pools, etc. Windsor used the average fall/winter water consumption rate to determine the sewer water rate in the summer months. Regina used a factor of 82% of water consumption when calculating sewer rates to compensate for the average annual amount of water consumed that is not directly returned to the sewer system. While not studied due to a lack of historic data, Richmond, Virginia bases its year-round sewer charges on water consumption during the autumn and winter months⁵. Both Regina and Richmond vary the wastewater rate based on the type of client. Residential clients under 4 units are considered to return less water to the sewer system whereas apartments and commercial users are considered to return 95-98% of the water metered. Few cities have seasonal rates. Vancouver only applied seasonal rates to the water charge, not to the sewer charge, as Vancouver's key concern was the shortage of water in the summer, not the capacity of its wastewater system. Richmond, Virginia also had a seasonal rate charge. Under their system, customers were allowed to use up to 140% of their average winter monthly consumption with no penalty. For any water in excess of 140% of average winter consumption, the consumption fee would be increased by 50%.

A number of cities charge primarily based on consumption but also have a small fixed charge to cover a specific service such as fire service, metering (including meter reading) and billing. While Ottawa has noted that many cities in Ontario have a fixed charge and Ottawa doesn't, Ottawa actually falls into the category of cities with fixed charges as many of the municipalities to which Ottawa has compared itself also only have a small fixed charge of less than \$10/month. Other cities in this category were Vancouver, Winnipeg and Waterloo. While the majority of Ontario cities have a fixed charge component, the cities that only charged based on consumption included Toronto, Mississauga, Brampton, Markham and Vaughan. These major cities, coupled with Ottawa, represent almost half of the Ontario population.

A number of cities have implemented more substantial fixed charges on the monthly bill. In most of the cases where the fixed amount was significant, it was broken down into a water and a sewer component. In some cases, there was also a stormwater component. The stormwater

⁵ <http://www.richmondgov.com/publicutilities/UtilityRates.aspx>

component is typically set by lot size. In most cases, this was still a small annual amount for homeowners spread throughout the billing cycle. Since the stormwater amount for homeowners was relatively small, no cities examined provided offsets to residential properties for such things as rain barrels or other methods for reducing run-off. It was felt that the cost of administering such a system for small properties would outweigh the benefits.

Fixed charges levied by various municipalities tend to vary in amount from between approximately \$20 to \$50/mn. Cities such as Calgary, Regina and Thunder Bay were at the high end for fixed charges. Sarnia was an exception with monthly charges of approximately \$73, representing 85-95% of the average monthly water bill in that city, depending on the volume of water used. Typically the fixed charge is split between water and sewer and in most cases is listed separately on the water bill. Sarnia applied a 116.25% rate on its fixed water charge in determining its fixed sewer charge. Pittsburg has no fixed charge but the first 3.7 m³ of water consumption was more than twice as much as all subsequent water use. This very high amount for a small amount of water almost acts like a fixed rate component to the pricing. A few cities, including Saskatoon and Pittsburg, had an additional consumption-based charge for infrastructure renewal.

Where possible, pricing was examined in a number of cities for the past 6 years in order to determine trends with respect to pricing changes over the past 5 years. While many cities across Canada and the U.S. are dealing with significant demands on their water systems leading to large annual price increases, only London, Ontario recently changed its pricing structure. London traditionally priced water strictly by consumption but in 2013 London switched to a fixed charge/consumption based system. A detailed analysis was done by London at the time. The London experience will be discussed later in this report. Other cities have looked at changing their pricing structure from time to time, but do not appear to have done so beyond changing rates on their existing systems. This means that most cities have stuck with their historic structure for pricing water usage. While many cities have experienced significant water cost increases over the years, few have looked at changing their pricing structures to resolve this problem.

Nevertheless, it is worth noting that while Ottawa may view itself in a minority of cities that only charges for consumption (notwithstanding the fire charge), most cities have carried forward historic pricing structures and have not changed them over the years. As noted, London and to a lesser extent Sarnia are two notable exceptions of cities that have drastically modified their pricing structures in recent years.

3) Comparative Price Change Experience

One of the reasons driving the City's review of water pricing is the revenue problems that have arisen due to declining water consumption. Other than fire charges, Ottawa's water charges are strictly based on consumption and consumption has been dropping. This experience is not unique as all cities throughout North America have been reporting declining consumption.

Ottawa has been faced with annual water charge increases in the range of 5-9% for several years and has questioned whether a pricing system, including a fixed component and a consumption component, would lead to more steady income and less need to raise prices so significantly each year. In addition to looking at current water pricing for over 20 cities across North America, LAC and Associates reviewed pricing for the past five to six years for several cities for which data was readily available. Cities with limited public data were approached directly for their historic data. Those cities that did not provide such data were not evaluated for the past six years. While not all cities provided this information, a large number of mid-to-large Canadian municipalities were very helpful in providing this information.

A detailed five year pricing statistic for a number of Ontario, Canadian and U.S. cities is provided in Annex 2. Annual water rates from 2009 to 2015 were provided for both fixed charges and consumption charges. Shorter time periods were covered for some cities if historic data was not easily available. While Kingston did not post historic data, it has set its water rates in advance, so future rate increases could be considered. For cities such as London or Hamilton that have tiered pricing, the consumption charge was based on average $\$/\text{m}^3$ rate that a resident would pay who had monthly consumption of 20 m^3 . For example, this would mean that in the case of Hamilton where the first 10 m^3 cost $\$1.37/\text{m}^3$ (both water and sewer) and subsequent consumption rates are $\$2.73/\text{m}^3$, the blended rate for $20 \text{ m}^3/\text{mn}$ would be $\$2.05/\text{m}^3$. The actual average rate experienced by a customer in a city without uniform pricing would of course depend on their actual water usage and could vary from month to month.

Data from Annexes 2, 3 and 4 were used to prepare Figure 7. Figure 7 is a table comparing water rates and rate increases between 2015 and 2014. Rate increases are compared to pricing type to see if there was any correlation between the type of pricing model used and the 2015 overall rate increases. Categories have been set as:

- No fixed pricing;
- Fixed pricing under $\$10/\text{month}$;
- Fixed pricing between $\$10$ and $\$25/\text{month}$; and
- Fixed pricing over $\$25/\text{month}$.

Annexes 2, 3 and 4 provide much more extensive detail as they show rate increases for both the fixed and consumption rate components for each city studied and rate increases for up to the past 5 years (where available), including the rate of increase in water pricing for both the fixed and consumption component of that city's pricing.

Figure 7 - Comparative 2015 Rate Increases Based on Pricing Model

Amount of Fixed Pricing in Water Rates	2015 Water Rate Increases			
	0-4%	4-6%	6-9%	>9%
No fixed charge	Pittsburg	Peel (Brampton, Mississauga), New York	Ottawa , Toronto, Markham, Vaughan	Chicago
<\$10/month		Vancouver		Cleveland
Between \$10 and \$25/month	Winnipeg, Minneapolis	Hamilton, Guelph, Pittsburg****		Saskatoon
Between \$25 and \$40/month	Sudbury*	Halifax		Thunder Bay
>\$40/month	Kingston**, Sarnia***		Regina	Calgary, Washington DC ⁶

*Sudbury's new council choose to freeze water rates in 2015 by cutting capital expenditure and dipping into reserves

**Kingston – based on 2016 approved increases. Fixed component not increasing but consumption rate going up 6.8% for residential and 7.8% for ICI users.

***Sarnia switched in 2010 from a system in which approximately 50% was based on fixed price to a system where 85% to 95% is fixed price. Cost to low water users increased almost 75% in 2010.

****Pittsburg –Planned increases for 2016 will be under 4% overall.

The above data in Figure 7 shows no clear correlation between a city's pricing models for water and the level of annual price increases. While some cities that only or overwhelmingly price based on consumption, including Ottawa, have seen price increases in the 6-9% range, other cities have seen increases under 6%. Contrastingly, while some cities such as Sudbury and Kingston that have high monthly fixed charges have been able to keep rate increases low, other cities such as Regina, Calgary, Thunder Bay and Washington have experienced very high rate increases. Given that these rate increases are all more than is required to offset the average drop in consumption from year to year, there are many more pressures on rates than just dropping consumption.

Sarnia had the highest level of fixed charges of any city studied at approximately 85% to 95% depending on water usage. Prior to 2010, Sarnia had a fixed component representing approximately 50% of the water bill. In 2010, Sarnia drastically increased the fixed component such that it now represents approximately 85% to 95% of the water bill depending on water usage. This switch resulted in rate increases of almost 75% for low water users. Rates then remained frozen from 2010 to 2013 and increased by approximately 5% in 2014 and 2.4% in 2015. It appears that low rate increases subsequent to 2010 are more a function of the significant rate increases in 2010 than the system relying so heavily on the fixed rate component.

⁶ <https://www.dewater.com/customer-care/rates.cfm>

4) Overall Pricing Comparison

As noted, there are numerous pricing structures in place across Canada. As cities have had to increase their water rates over the years, they have tried to benchmark the overall cost of water against other Canadian cities. Ottawa tends to come off vary favourably. In a Spring 2015 comparison of 15 cities prepared by Halifax, Ottawa appeared to have the second lowest annual water cost of approximately \$600/yr.⁷ A 2015 report prepared by the City of London determined that Ottawa was one of the lowest cost water providers in Ontario with a annual charge of approximately \$625 based on 20 m³/month consumption.⁸

For purposes of this study, we compared 2015 water/sewer/stormwater rates for three consumption rates to see how Ottawa compares to various cities in Ontario, Canada and the U.S., as this is more meaningful than just picking one level of consumption. It is also a fairer comparison because while Ottawa water pricing may look very reasonable for low volume users compared to a city with a high fixed charge component, it may be less attractive for high volume users.

Average monthly pricing has been determined for three scenarios:

- a low water user – 10 m³/month
- a medium user – 20 m³/month
- a high water user – 30 m³/month

Annex 2 shows the detailed comparative monthly water rates. Compared to other Ontario cities, Ottawa's current rates are slightly less expensive than the average for low water consumers, exactly at the average for medium water consumers and slightly above average for high water consumers. Compared to cities across Canada, Ottawa's water prices are lower than the average for all non-Ontario major cities. Figures 8 and 9 show a graphical comparison of Ottawa water rates against other major Canadian cities.

⁷ Water Talk, Halifax Water – Spring 2015

⁸ 2015 Water and Wastewater Strategy Paper, John Braam and Martin Hayward, City of London, Nov 2014

Figure 8 – Ottawa Water/Wastewater Monthly Rates Compared to Other Ontario Cities

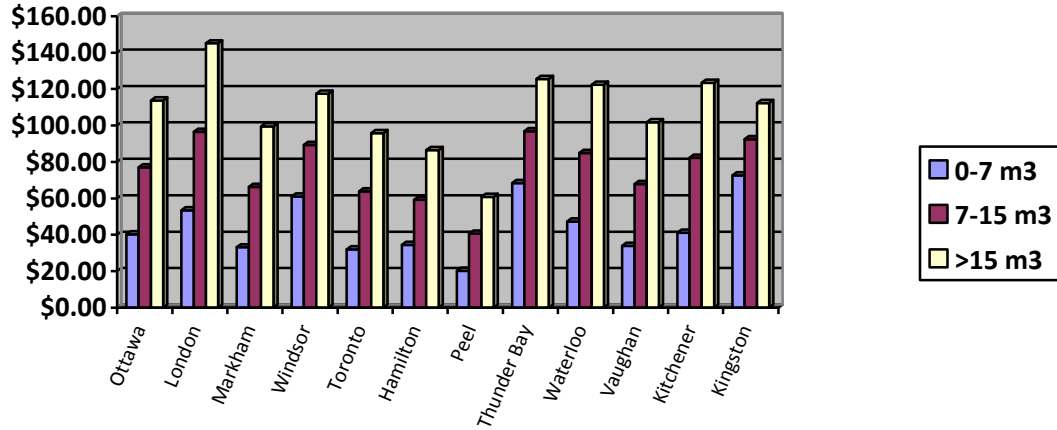
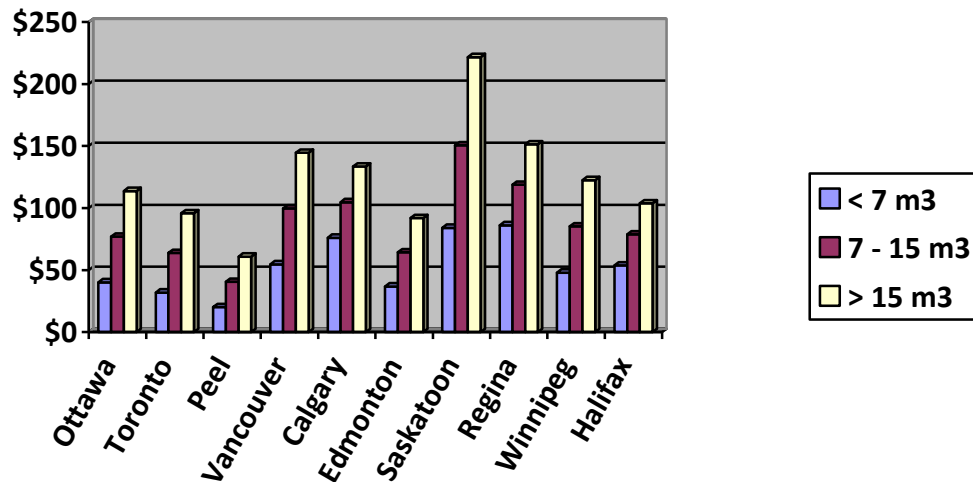


Figure 9 – Ottawa Water/Wastewater Monthly Rates Compared to other Canadian Cities



5) City of London Experience

Very few cities in Canada have reviewed their water pricing structures over the past 10 years and even fewer have made the decision to change their water pricing structure. London appears to be the only major Canadian city that has recently changed its actual water pricing structures. In 2012, the City of London implemented a significant review of its water pricing structure with a goal to slow down the degree of annual rate increases as well as to meet certain other criteria. London had frozen water rates in 2011 and had subsequently increased rates in 2012 and 2013 by 7.5% for each year. These rates of increase are not atypical of many Canadian cities. Nevertheless London decided to re-evaluate its pricing structure.

Similar to Ottawa, London set a number of evaluation criteria in its review of water pricing. These were:

- Ensure financial stability
- Promote conservation
- Encourage and support economic development
- Fairness and equity
- Sustainability

As well, London sought to identify all costs that were considered to be fixed, the practice of other jurisdictions and, impact on various classes of customers.

London's list of evaluation criteria is similar to that being applied by Ottawa except that Ottawa has two extra criteria of affordability and transparency. The review conducted by BMA Management Consulting recognized that there was no one way to meet the objectives of the Canadian Water and Wastewater Association (CWWA). Prior to London changing its pricing structure in 2013, London's pricing structure was composed of the following:

- Consumption charge for water with a minimum charge of \$5.40/month
- Consumption charge for wastewater
- Flat rate charge for stormwater based on lot area (\$13.34 in 2013)

BMA conducted a detailed analysis of the costs associated with the water system to determine which costs were fixed in nature and which were variable based on consumption. They determined that 61% of the water costs and 78% of the wastewater costs for London were fixed. BMA determined that while charging a fixed rate to cover all fixed costs would be fair, it would not be affordable to many people and conservation would be compromised. As such, they recommended that 30% of the total cost for water and wastewater come from a fixed monthly fee. While this might not be fair or equitable, it would make the system more affordable and promote conservation.

Even by charging only 30% as a fixed cost might result in those who used the least water experiencing the highest water bill increase. This might be too expensive for low income residents. It would penalize those who used the least water and would actually result in the highest per litre cost for low water users as the fixed costs would be amortized over a much lower volume of water. For these reasons, London decided to include the first 7 m³/month of water at no charge (or included in the fixed charge). Approximately 14.7% of all residential and 12.2% of all ICI customers used 7m³/month or less. Conceptually, this is actually not that different from cities that have implemented a minimum monthly charge as this minimum charge would include the first block of water usage.

Prior to 2013, residential and ICI customers paid different volumetric rates for the same amount of water consumed. Residential users paid the highest rates followed by commercial and then

industrial users. This is common in a number of Canadian cities. BMA recommended that fairness demanded all customers pay the same rate for water. In order to still promote economic activity, London adopted a humpback pricing curve so that water and wastewater rates peak at \$5.3956/m³ for volumes of 25-35 m³/mn and then fall back to rates of \$2.0503/m³ or less. This supports conservation by residential or low volume users while still providing affordable water to major ICI users. This was deemed to support economic development. While residential users would never have the same demand as ICI users, if by some chance they did in a particular heavy month (ex: filling a swimming pool, washing the exterior of a house, building and maintaining a backyard skating rink) the residential user would pay the same rate as an ICI client.

Prior to the review, London had virtually no fixed charges but had a monthly minimum fee of \$5.40. London had annual price increases of 5-7%. While this rate of increase was expected to start to drop as costs stabilized, this was not expected to occur until around 2018/2019. The new system was expected to still result in large increases for a few years but that rate increases would drop to 2-3% by 2016/2017. London advises that they are still on target and annual revenues are more predictable under the new pricing structure.

In deciding to move forward with this new system, London put a lot of effort into training their city councillors so that they understood the new system. As well, extensive information was provided to the public and the media so that they could understand the issues and the reason for the new system. London had to be candid about the various reasons for cost increases and not blame dropping consumption as the main reason for the pricing problems. To assist low income users, London implemented a \$3 annual fee to all customers which would be applied to assist lower income customers. Of the money raised, \$100,000 would be used to forgive water bills due to unexpected water events (leaky toilet, faucet, etc), \$100,000 was given to the Salvation Army to provide direct assistance to those who couldn't pay their bills (Halifax has a similar program through their Salvation Army) and \$100,000 would help lower income people install water efficient faucets, toilets, etc.

London reported that they received 400-600 complaints in the first 6 months of the new system. Most complaints were either from low water users who were faced with higher bills under the new system or by people who didn't want to pay the \$3 annual assistance charge. Complaints have since leveled off to about 1 per month.

6) Pricing for Stormwater

While the majority of Canadian cities do not have a separate fee for stormwater, a few of them do. Ottawa does not currently have a specific charge for stormwater. It is lumped in with the wastewater charge and is calculated as part of water consumption. While budget documents show the expenses for stormwater management, they don't actually show rate revenue under stormwater. Given this situation, both monthly water bills and budget documentation are not

transparent with respect to stormwater revenue. Consumers do not know that they are being billed for stormwater management.

It should also be noted that given the large rural component of Ottawa, several villages within the metropolitan Ottawa area, including Manotick and Greely, use well water rather than city water and several areas are not on the wastewater system. Areas such as these do not likely have special stormwater infrastructure and this must be taken into account should Ottawa develop a specific program to bill for stormwater services that is not water based.

Below are specific models from London, Edmonton and Mississauga for calculating stormwater charges that are based on property characteristics rather than water usage.

London - Pricing for stormwater was reviewed separately by BMA. They reported that based on the view of the Water Environment Federation stormwater allocation should consider the following⁹:

- Stormwater users are properties that add runoff or are served by the provision of stormwater services.
- Beneficiaries are those who benefit from stormwater management.
- Service fees are dedicated charges paid by stormwater generators based on the estimated amount of water that leaves their property or in relation to the services that they receive.

As such, property owners or residents should pay stormwater user fees in proportion to the stormwater runoff that comes from their property and the overall cost of the stormwater system. As well, all properties benefit from stormwater management even if their chance of flooding is less.

London already had a system in place that charged properties directly for stormwater management that did not rely on the tax base. Prior to 2013, residential users paid 91% of the cost while ICI users paid the other 9%. Residential customers were considered to be subsidizing ICI customers. Based on various methodologies, it was determined that residential customers should pay approximately 79% of the cost of the stormwater system. BMA proposed a system where all residential customers would pay a standard fee regardless of their property size and ICI customers would pay the same fee if their property was under 0.4 hectares and \$98.42/month per hectare if their properties were over 0.4 hectares. This would result in a slight decrease in the stormwater rates charged to residential customers and ICI customers with small properties. Those with properties over 0.4 hectares would see a big increase. There don't appear to be offsetting credits for those who take steps to lower stormwater run-off. The current stormwater fixed charge for residential customers is \$14.49.

⁹ Water, Wastewater and Storm Rate Review, BMA, Page 26

Edmonton - Edmonton have much more complicated systems for calculating the stormwater fee. In Edmonton, the stormwater fee is based on the following methodology¹⁰:

- **Area of property** - lot size in square metres (m²).
- **Development Intensity** - the measure of the portion of lot being utilized for its intended development.
 - For residential customers the intensity of development factor is 1
 - For non-residential properties that are largely undeveloped or utilizing on-site stormwater management, a reduced factor may apply
 - Properties draining directly to the North Saskatchewan River are eligible for a credit to reduce their stormwater fee
- **Run-off coefficient** - the permeability of the lot's surface (i.e. grass versus concrete), based on land zoning.
 - The run-off coefficient for a single detached residential house is typically 0.5-0.65.
 - Depending, however, on a property's land zoning classification, the run-off coefficient can range from 0.20 to 0.95.
- **Rate** - 3.30 cents per m² of land area per month

This system is more fair than the system utilized by London as Edmonton's recognizes individual factors associated with a property. However, Edmonton's system is much harder to administer. Each property would have to be examined and updated should its usage or characteristics change.

Mississauga – While Mississauga has no fixed charges on its water bill, starting in 2016, it will implement a stormwater charge. Mississauga first started studying this in 2012. Mississauga determined that it was more fair and equitable to implement a stormwater charge based on property rather than to include it in the property tax. The system in Mississauga will be based on property size.

A Tiered Single Family Unit (SFU) is to be established which corresponds to the average size resident in Mississauga. A small home would have a SFU value of 0.7 and a large house would have an SFU of 1.4. Multi-family homes would have fractional SFU values. For non-residential properties, the number of SFU billing units is determined by dividing the impervious area by the SFU size. Each SFU would be billed at the same rate. It is assumed that a large home is on a large lot and does not take into account large homes on small lots resulting in very little permeable area.

Residential properties are evaluated based on size, rather than looking at the actual impervious area of the property. Non-residential properties are evaluated based on actual impervious area. In setting up the system, Mississauga also worked backwards to determine how much each SFU would be billed. The City determined its stormwater cost based on three scenarios related to

¹⁰ http://www.edmonton.ca/city_government/utilities/stormwater-utility-faq-residential.aspx

various levels of spending on their stormwater system. The City selected an appropriate scenario and then determined the cost for each SFU based on the number of SFUs in Mississauga.

This program has taken several years to implement given the need to evaluate each property to determine the number of SFUs and the permeability of ICI properties. It was, however, deemed to be more fair than putting this on the property tax. Mississauga also did a detailed review of its stormwater system to see how much money needed to be raised to address the operating and capital costs. In its review, Mississauga determined its proposed system would be either slightly more or slightly less expensive for homeowners compared to full cost recovery on the property tax base, the proposed system would raise far more money from large users such as shopping malls than raising money through property taxes.

Evaluation of Pricing Models against City of Ottawa Criteria

From reviewing other major Ontario and Canadian cities it is apparent that there is a wide range of price structures being followed in Canada for water pricing. Figure 10 evaluates different pricing systems and options against the criteria established by Ottawa. This evaluation is based primarily on the experience of other cities. The table looks at various Fixed/Consumption charge splits. As well, it looks at various pricing structures that can be implemented for the consumption portion of the rate regardless of how much the fixed charge might be. This includes whether there is tiered pricing, free initial water, etc.

The second part of Figure 10 evaluates different models for stormwater pricing.

In judging the impact of the various scenarios, the impact on Economic Development is difficult to determine. An analysis of the types of current ICI users in Ottawa would be required as well as an analysis of the types of businesses that Ottawa hopes to attract. ICI users are split between commercial/industrial and institutional. Ottawa is not a city with a lot of heavy industry and the scope of this study did not include an analysis of how much water is used by industry. On the other hand, Ottawa has some significant institutional users such as universities, hospitals, government facilities, etc. These types of organizations may be less price sensitive than commercial/industrial water users.

There is no weight put on the factors reviewed in Figure 10. A system might be considered highly fair and equitable, such as billing for stormwater based on the nature of one's property, but given that it would likely increase costs to ICI clients, it might score low in supporting economic development. Similarly, a humpback or declining rate system would be very supportive of economic development but neither structure would promote conservation. The City in consultation with its residents must determine the appropriate weight to give to each factor.

Figure 10 – Evaluation of Different Water Pricing Factors

Pricing Characteristic	Fairness and Equity	Financial Sustainability	Affordability	Transparency	Preserves Conservation	Supports Economic Development
Water/Wastewater System						
Current Ottawa System	High since everyone pays the same but lower since everyone does not share cost of system equally	Highly dependent on growth in costs and decline in consumption	High affordability as long as rates stay reasonable	Very transparent	Yes	Yes - since high water users are not penalized
<25% Fixed Charge – one consumption rate	High since everyone pays the same but better equity since everyone contributes to fixed cost	Highly dependent on growth in costs and medium dependent on consumption	Medium-high affordability as long as rates stay reasonable overall	Very transparent	Yes	Yes - since high water users are not penalized
25-50% Fixed Charge – one consumption rate	High since everyone pays the same but better equity since everyone contributes to fixed cost	Highly dependent on growth in costs and low-medium dependent on consumption	Medium-high affordability as long as rates stay reasonable overall	Very transparent	Less	Yes - since high water users are not penalized
>50% Fixed Charge – one consumption rate	High since everyone pays the same but better equity since everyone contributes to fixed cost	Highly dependent on growth in costs and low dependent on consumption	Low affordability for lower income, Sarnia is an example	Very transparent	Low incentive to conserve, water is almost free in Sarnia	Yes - since high water users are not penalized
Separately calculated Water & Sewer Rates	No impact over current system	More expensive for Ottawa to implement as it must	No impact over current system	Higher transparency as pricing relates	Not applicable	Yes - since high water users are not penalized

Pricing Characteristic	Fairness and Equity	Financial Sustainability	Affordability	Transparency	Preserves Conservation	Supports Economic Development
		be able to track expenses better		directly to costs		
Incline Charges	Depends on how prices increase between tiers and the size of the tiers	Depends on rates, if too steep will encourage conservation which lowers revenues	Depends on rates, if tiers are too short or ramp up too high affordability will be a problem	Bills will be less transparent/predictable unless bands are broad	Yes	Depends on overall rate, may not attract high ICI water users
Decline Charges	Not fair to residential users if they are paying much higher than ICI	If it encourages water usage by ICI sector, it result in high financial sustainability	Depends on initial rate, should be for high users since rates drop	Less transparent/predictable unless bands are broad	No	Yes
Humpback Charges	Not fair to residential users if they are paying much higher than ICI	If it encourages water usage by ICI sector, it may result in high financial sustainability	Depends on rates, should be affordable for high users since rates drop	Less transparent/predictable unless bands are broad	Yes - for residential but no - for ICI	Yes
Fixed Price with free initial water	Yes - since everyone will get the first amount of water for free	Yes - if priced properly	Free water mitigates fixed cost for lower income residential clients	Yes	Yes - if free amount is less than most people use	Yes - likely no impact since free amount is relatively negligible for most ICI customers
Lower Cost water for	No as different classes	If it encourages	Not if	Yes	No	Yes

Pricing Characteristic	Fairness and Equity	Financial Sustainability	Affordability	Transparency	Preserves Conservation	Supports Economic Development
ICI users	of users pay different rates	higher consumption is may help financial sustainability	residential users are subsidizing ICI users			
Higher Cost Water for ICI users	No - unless all classes of users are charged the same rate	Not if it discourages water usage and overall revenue	Yes	Yes	Yes	Likely not but will depend on overall water cost compared to other cities
Minimum charge for all users for first block of water	Yes	Yes - easy to implement and results in all users paying a minimum amount	Yes - subject to the minimum amount	Yes	Yes - for amounts above the minimum amount, below the minimum there is no incentive to conserve	Should have no impact on ICI users unless minimum amount is based on type of user
Stormwater System						
Current system – Part of sewer charge on water bill	No - by charging based on water usage, there is no recognition of the factors that impact on run-off such as area and permeability, properties creating vastly different amounts of runoff could pay the same if their water usage is the same	No - stormwater charge will drop if water consumption drops regardless of costs, need to continually change rates	Yes - if rates are low enough	None	Rewards water consumption but there is no reward for maximizing permeable surfaces	Yes - since by charging through water usage, users with large properties and extensive non-permeable surfaces are not billed for the nature of their property
Billed based on	More equitable but	Yes – only variable is	Some difficulty	Yes	No - because no	No - since charge

Pricing Characteristic	Fairness and Equity	Financial Sustainability	Affordability	Transparency	Preserves Conservation	Supports Economic Development
property size	not fairer because it doesn't take into account permeability	cost of stormwater system, not consumption of water	in determining all property sizes, may be expensive for some ICI users		allowance is made for permeable surfaces	will be based on size of property not property value, any system based on property characteristics is likely to be more expensive for businesses than tax roll
Billed directly based on property size and permeability	Yes – highly fair and equitable	Yes - but if it encourages property owners to increase permeability, revenue could drop	No - very costly for City to determine permeability of each property, may be expensive for ICI users	Low – may be difficult to measure permeability, could be subject to dispute.	Yes - since allowances are made for permeable surfaces, could also be applied on residential properties based on % hard surfaces	Only for those ICI users with high level of permeability on their property
Rate offsets for run-off mitigants	Yes - highly fair and equitable	No - cost of administering mitigants on residential properties would probably outway savings from reduced run-off	High costs for city but lower costs for residents with offsets	Low – may be difficult to measure value of mitigants and could be subject to dispute	Yes - as it encourages residential users to implement mitigants to lower run-off	Large ICI clients may be able to implement stormwater ponds on their property lower their fees

Conclusions and Recommendations

Since 2003, based on City of Ottawa budget documents, the cost of operating Ottawa's water and wastewater system has gone up 89%. During the same period, Ottawa's water rate went up 145%. A major reason why water rates went up faster than the increase in the cost of the system is due to the decline in water consumption by Ottawa residents. This experience is no different from other Canadian cities. Nevertheless, it means that the main driver for rate increases over the years has been the increased cost of running the system, including capital renewal and refurbishment, not the drop in water consumption. Were Ottawa to move to a system with a significant fixed price component, Ottawa would continue to experience significant rate increases unless the increase in expenditures were to stop or slow.

Sarnia experienced a breather in rates going up after 2010 until 2014 but this was more likely a result of rates increasing by up to 75% for low volume users in 2010 rather than because they initiated a major fixed component (which they already in fact had). Even with depending on 85%-95% of its revenue from fixed charges, Sarnia still had to increase water rates by about 5% in 2014 and a further 2.4% in 2015. If dropping consumption was the only factor driving water rates, Sarnia should be seeing minimal increases.

If Ottawa were to consider moving to a significant fixed rate component, it would not likely slow down the rate of increase unless costs could be stabilized. London has advised that it has been able to slow down the growth in expenditures and this has resulted in their new system reaching price stability a few years earlier than it would have under a consumption-based system. Some cities have slowed the growth in rates by lower capital reserves. This may be a one-time fix but could leave a city exposed down the road.

Currently consumption is dropping by 1-2% per year in Ottawa. With a 7% average rate increases, 5-6% of this is due to increased costs of the system, including capital renewal, and 1-2% is due to consumption drops. By moving to a system where 25% of the revenue is from a fixed charge, rates would still have to go up by about 5.75%-6.75% a year. A 50% fixed charge would still require rate increases of 5.5%-6.5% if costs do not stop increasing. While some cities with high fixed charges are increasing rates less than 5% per year, there are a number of major cities that use fixed charges that are seeing similar annual rate increases to Ottawa or higher.

There are several aspects of the current system, however, that could be modified to give greater transparency, flexibility and equity. These changes would, however, have some associated costs and perhaps have some impact on economic development. It will be a question of determining the economic impacts and weighing the different criteria. It is recommended that the city consider the following:

Billing

1. Whether or not the pricing system is changed, the charges for water, wastewater and stormwater should be more closely correlated to the actual costs for each system. It is not clear that this is currently happening. The water and

wastewater rates should be clearly indicated on the bill rather than wastewater given as a percentage of the water rate.

2. Should Ottawa stay with the existing water billing system, the budget and the water bills should be re-structured. The monthly bill should show the stormwater charge separately or at least change “sewer charge” to “wastewater/stormwater charge”. The City’s budget documents should be changed to include Stormwater Services revenue under the Stormwater Services expense pages and not all on the Sanitary Services pages. This will provide greater clarity.

Pricing Structure

1. Unless Ottawa can accurately predict its water costs for the next five years and halt or slow down the annual increases in spending, converting to a new system will not halt the increase in rates. If a new system is implemented and rates continue to go up by more than 2% per year set as the target for tax increases, residents will question the need for the change and the associated cost of implementation. This could be a problem for a Council that was perceived to have changed the water billing structure in order to significantly decrease annual increases in water rates. Therefore no change in the rate structure should be considered without the city having a firm understanding of its expenses for the next five years and the annual increases that would result for a blended fix charge/consumption billing system.
2. Should the City go to a significant fixed component, it may wish to consider London’s example in not charging for the first block of water. A significant fixed charge component is going to impact most heavily on the lowest water users, many of whom may have trouble paying for an increased water bill. While few cities provide any free water to their residents, most cities that have a fixed component have been charging this for many years so there is no transition period. If Ottawa were to change its billing structure, a transition period and recognition of the impact on the lowest users should be considered.
3. Without a firm analysis of the ICI users including number of users for specific volumes of water, there is not enough information to know if a inclining, declining or humpback structure would be the most appropriate for ICI users.
4. Regardless of any contemplated structure, all users should be charged the same for water. While there may be different tiers, there should not be different prices for different classes of users.

Stormwater Billing

1. The City should consider developing a special stormwater charge based on property size and permeability. There are several viable models that can be followed. Since stormwater impacts of a specific property have nothing to do with the water usage on that property, pricing for stormwater should not be tied to water consumption. Similarly, stormwater generated from a specific property has nothing to do with the valuation of that property. A single family home on a 50ft by 100ft lot in Westboro or Kanata would generate the same amount of stormwater but the house in Westboro would pay significantly more in stormwater costs because it is likely to have a higher valuation from MPAC. It would be more equitable and predictable if stormwater was billed separately based on the characteristics of a property. Several cities have been able to implement this type of system and Ottawa should be no exception.
2. It is recommended that any stormwater system be based on property size. Permeability should also be a factor if it can be implemented in a cost effective manner. This will likely impact negatively the most on large retail complexes or companies with large parking lots.
3. Several areas of Ottawa are not hooked up to either the water or stormwater system. A few areas are on the stormwater system but do not receive Ottawa water. Areas without any access to stormwater sewers should not be included in the stormwater charge except to the extent that the City has installed any special stormwater systems in their neighbourhood. Rural areas that are on the stormwater system but not the water system should be included in any stormwater billing program. While most rural residential properties are larger than those in the city, the non-permeable surface for most is probably equivalent to a city house (i.e.: most houses sit on large open properties). As such, any rural residential property should probably be charged at the same rate as an urban residential property.
4. The stormwater charge should be a fixed monthly charge on the water bill so it would be predictable.

Communications

1. For greater transparency, Ottawa should post at least 5 years of historic water rates on its website. This is common in several cities throughout North America.
2. Ottawa should clearly list the water charges on its website in addition to showing the cost to an average consumer. Perhaps an interactive model can

be developed in which a user can input their average consumption and the model will return the expected monthly and annual bill.

3. Ottawa needs to improve the information provided to citizens with respect to the need to increase water rates. There has been a tendency to blame high increases on a drop in consumption, rather than increases in expenditures. Communications needs to be more direct and not blame consumers for rate increases. While residents have not been pleased by the high annual increases in water, Ottawa has not done a good job of explaining the reasons for the increases or in noting how Ottawa water costs compare to other Canadian cities. While rates continue to increase, Ottawa rates appear to be quite reasonable compared to those of many Canadian cities.
4. Communications with the public with respect to any changes to the systems should truly be consultative rather than top down. Passive open houses based on storyboards should be discouraged. Proper town halls with an opportunity for people to ask questions in public will allow for a greater acceptance of any changes. The issue of water pricing is highly technical so people will benefit from hearing the questions of others.

Development Charges

1. Given the Provincial focus on intensification, Ottawa's adoption of intensification and the impact that this has on Ottawa's aging water infrastructure, the City should be lobbying the Province to change the Development Charges Act to allow development charges for the replacement/refurbishment of mature water facilities rather than just the enlargement of such facilities. Ottawa has one set of development charges for inside the Greenbelt, where the infrastructure is mature but aging and another set of development charges outside the Greenbelt where development typically takes place in greenfield sites where meaningful DC charges can be included for water. The cost of replacing and upgrading water infrastructure within the greenbelt cannot be captured by development charges. Had Ottawa only one set of development charges, Ottawa might not be as affected by the increase in development inside the Greenbelt and a decline outside the Greenbelt.

Other Fees

1. It is recommended that the pricing for the miscellaneous water fees be examined in greater detail so as to determine why these fees do not increase at the same rate as either: the water/wastewater consumption rate; increase in overall water/wastewater costs; or the general property tax rate. If these

fees are being used to provide incidental revenue, it should be determined that they are sufficient to cover the cost of the service being provided.

In moving forward to implement any changes to the water billing system, Ottawa should first be sure that the changes will provide the desired results. Changing the structure of the system for change sake is not a valuable use of resources and would not be popular with most residents or businesses. We must recognize that few cities have changed their rate structures in the past 5 years but have stayed with the systems that they have historically had in place. Any changes must be accompanied by real benefits for the public and must address real problems experienced by users and the City. To date, the City has tried to frame the need to change the system due to dropping consumption and by inferring Ottawa is one of the few cities in Ontario without a fixed charge. From the research conducted, the main driver for increased rates has been increased costs, primarily due to infrastructure repair and refurbishment. While most cities do have a fixed charge, in several cases this fixed charge is relatively minor and is designed to cover the cost of billing and metering rather than the cost of running the water/wastewater infrastructure. As well, while most cities may have fixed charges, several major population centers such as Toronto, Peel Region and York Region do not have fixed charges.

Annex 1

Comparative Average 2015 Water Pricing by City

City	Total Water and Wastewater Consumption Rates (\$)			Total Fixed Charges (\$)	Monthly Water Cost (\$)		
	0-7 m ³	8-15m ³	>15 m ³		10 m ³ /mn	20 m ³ /mn	30 m ³ /mn
Ottawa	3.68	3.68	3.68	3.4	\$40.20	\$77.00	\$113.80
Other Ontario Cities							
London	0	3.7732	4.856	42.11	\$53.43	\$96.58	\$145.14
Markham	3.3154	3.3154	3.3154	0	\$33.15	\$66.31	\$99.46
Windsor	2.827	2.827	2.827	32.71	\$60.98	\$89.25	\$117.52
Toronto	3.1945	3.1945	3.1945	0	\$31.95	\$63.89	\$95.84
Hamilton*	1.365	2.22	2.73	18.25	\$34.47	\$59.22	\$86.52
Peel Region	2.028	2.028	2.028	0	\$20.28	\$40.56	\$60.84
Thunder Bay	2.8595	2.8595	2.8595	39.76	\$68.36	\$96.95	\$125.55
Waterloo	3.76	3.76	3.76	9.65	\$47.25	\$84.85	\$122.55
Vaughan	3.391	3.391	3.391	0	\$33.91	\$67.82	\$101.73
Kitchener	4.1121	4.1121	4.1121	0	\$41.12	\$82.24	\$123.36
Kingston	1.9824	1.9824	1.9824	52.87	\$72.69	\$92.52	\$112.34
Other Canadian Cities							
Vancouver**	4.501	4.501	4.501	9.67	\$54.68	\$99.69	\$144.70
Calgary	2.87	2.87	2.87	47.36	\$76.06	\$104.76	\$133.46
Edmonton	2.5846	2.7553	2.7553	11.00	\$36.85	\$64.40	\$91.95
Regina	3.26	3.26	3.26	64.53	\$86.13	\$118.73	\$151.33
Saskatoon***	6.646	6.646	6.646	17.60	\$84.06	\$150.52	\$221.69
Winnipeg	3.73	3.73	3.73	10.65	\$47.95	\$85.25	\$122.55
Halifax	2.503	2.503	2.503	28.78	\$53.81	\$78.84	\$103.87
U.S. Cities (U.S. \$)							
Chicago	2.01435	2.01435	2.01435	9.00	\$29.14	\$49.29	\$69.43
New York	3.48556	3.48556	3.48556	0.0	\$34.86	\$69.71	\$104.57
Minneapolis	2.32371	2.32371	2.32371	18.74	\$41.98	\$64.76	\$87.08
Boston	3.9704	4.1202	4.24165	0.0	\$40.15	\$81.96	\$124.38

*Hamilton – Lower rate only applies to first 5 m³/month

**Vancouver – rates are 33% higher from June 1 to Sept. 30

***Saskatoon – rate increases after 21.2m³

Annex 2
Comparative Water Rate History – Ontario Cities
Average Rate for 20 m³/month

Year	Ottawa				Markham				Windsor				Hamilton*			
	Fixed Water Rate	Variable Water Rate	% Increase	% Increase	Fixed Water Rate*	Variable Water Rate	% Increase	% Increase	Fixed Water Rate*	Variable Water Rate	% Increase	% Increase	Fixed Water Rate	Variable Water Rate**	% Increase -	% Increase
			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate
2015	3.33	3.6868	6.1%	6.0%	n.a.	3.3154	n.a.	8.2%		0.477		11.19%	18.25	2.05	3.46%	4.59%
2014	3.14	3.4785	7.2%	7.0%	n.a.	3.0649	n.a.	16.6%		0.429			17.64	1.96	0.46%	5.38%
2013	2.93	3.2507	7.3%	7.0%	n.a.	2.6277	n.a.	8.7%					17.56	1.86	4.28%	4.17%
2012	2.73	3.038	3.8%	6.1%	n.a.	2.4164	n.a.	9.2%					16.84	1.7856	4.21%	4.26%
2011	2.63	2.8644	-0.4%	3.9%	n.a.	2.2129	n.a.	10.4%					16.16	1.7127		
2010	2.64	2.756	0.0%	9.0%	n.a.	2.0042	n.a.	0.0%								
2009	2.64	2.528			n.a.	2.0042										

Year	London#				Toronto				Peel Region (Mississauga/Brampton)				Vaughan^			
	Fixed Water Rate	Variable Water Rate***	% Increase	% Increase	Fixed Water Rate	Variable Water Rate***	% Increase	% Increase	Fixed Water Rate	Variable Water Rate***	% Increase	% Increase	Fixed Water Rate	Variable Water Rate***	% Increase -	% Increase
			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate			Fixed Water Rate	Variable Water Rate
2015	42.11	2.72472	10.79%	7.27%	n.a.	3.195		8.02%		2.02817		7.10%		3.391		9.90%
2014	38.01	2.54	170.92%	-27.74%	n.a.	2.9579		9.00%		1.89379		7.74%		3.0856		8.85%
2013	14.03	3.515	7.02%	7.49%	n.a.	2.7137		9.00%		1.7577		6.54%		2.8347		8.03%
2012	13.11	3.2701	7.11%	7.49%	n.a.	2.4897		9.00%		1.64987		8.18%		2.624		8.95%
2011	12.24	3.0422	0.00%	0.00%	n.a.	2.2842		10.80%		1.52517		9.18%		2.4084		13.29%
2010	12.24	3.0422			n.a.	2.0616				1.39693				2.1258		
2009																

*Hamilton - Based on blended rate

#London - First 7 m³ free, assumed 2015 increase for 16-25 m³ was 7%, same as increase for first 8-15 m³

^ Vaughan – minimum monthly charge of \$16

Annex 2 Continued

Comparative Water Rate History – Ontario Cities
Average Rate for 20 m³/month

	Thunder Bay			Sarnia				
	Fixed Water Rate	Variable Water Rate***	% Increase - Fixed Water Rate	% Increase Variable Water Rate	Fixed Water Rate	Variable Water Rate	% Increase Fixed Water Rate	% Increase Variable Water Rate
2015	39.76	2.8595	11.91%	11.84%	72.96	0.4582	2.43%	2.44%
2014	35.53	2.55675	6.03%	6.02%	71.23	0.4473	5.11%	5.30%
2013	33.51	2.4115	7.06%	7.07%	67.77	0.4248	0.00%	0.00%
2012	31.3	2.25225	6.70%	6.72%	67.77	0.4248	0.00%	0.00%
2011	29.3346	2.1105	14.29%	14.31%	67.77	0.4248	-1.07%	-1.62%
2010	25.667	1.84625			68.5	0.4318	195.13%	-76.83%
2009					23.21	1.8636		

Annex 3
Comparative Water Rate History – Canadian Cities
Average Rate for 20 m³/month

Year	Regina				Halifax				Winnipeg			
	Fixed Water Rate	Variable Water Rate**	% Increase - Fixed Water Rate	% Increase - Variable Water Rate	Fixed Water Rate*	Variable Water Rate	% Increase - Fixed Water Rate	% Increase - Variable Water Rate	Fixed Water Rate*	Variable Water Rate	% Increase - Fixed Water Rate	% Increase - Variable Water Rate
2015	53.53	2.98	7.97%	7.97%	26	2.503	4.00%	4.77%	10.649	3.73	16.70%	2.75%
2014	49.58	2.76	7.95%	8.24%	25	2.389	0.00%	27.35%	9.125	3.63	20.07%	2.54%
2013	45.93	2.55	8.63%	8.97%	25	1.876	1.26%	3.93%	7.6	3.54	25.00%	2.61%
2012	42.28	2.34	9.45%	8.84%	24.69	1.805	1.48%	14.10%	6.08	3.45	33.33%	4.23%
2011	38.63	2.15	8.54%	9.14%	24.33	1.582	97.32%	283.05%	4.56	3.31	0.00%	3.44%
2010	35.59	1.97	9.34%	8.84%	12.33	0.413			4.56	3.2		
2009	32.55	1.81										

Year	Vancouver				Calgary			
	Fixed Water Rate	Variable Water Rate****	% Increase - Fixed Water Rate	% Increase - Variable Water Rate	Fixed Water Rate	Variable Water Rate***	% Increase - Fixed Water Rate	% Increase - Variable Water Rate
2015	7.25	1.663665	0.000%	4.879%	46.76	2.7978	13.77%	2.60%
2014	7.25	1.58627	3.571%	16.987%	41.1	2.7269	9.11%	9.58%
2013	7	1.35594			37.67	2.4885	9.09%	9.63%
2012					34.53	2.27	8.96%	9.51%
2011					31.69	2.0729		
2010								
2009								

Annex 4
Comparative Water Rate History – U.S. Cities
Average Rate for 20 m³/month in U.S. Dollars

Year	Chicago				Pittsburg*				New York			
	Fixed Water Rate	Variable Water Rate	% Increase Fixed Water Rate	% Increase Variable Water Rate	Fixed Water Rate*	Variable Water Rate	% Increase Fixed Water Rate	% Increase Variable Water Rate	Fixed Water Rate*	Variable Water Rate	% Increase - Fixed Water Rate	% Increase Variable Water Rate
2015	0.	2.01		17.3%	20.92	2.7079	7.34%	2.13%	0	3.3831		3.34%
2014	0	1.7138		17.3%	19.49	2.6514	9.80%	10.61%	0	3.2737		5.58%
2013	0	1.4607		16.6%	17.75	2.3970	0.00%	0.00%	0	3.1006		6.94%
2012	0	1.2532		26.9%	17.75	2.3970	7.71%	7.70%	0	2.8993		8.67%
2011	0	0.9876		14.8%	16.48	2.2256	1.92%	1.90%	0	2.668		11.76%
2010	0	0.8601		15.7%	16.17	2.1840	n.a.	n.a.	0	2.3873		13.05%
2009	0	0.7437		n.a.					0	2.1118		

*Pittsburg - fixed rate is actually minimum charge of \$19.55 for use of up to 3.7854 m³.

Year	Boston			
	Fixed Water Rate	Variable Water Rate***	% Increase - Fixed Water Rate	% Increase Variable Water Rate
2015	0	3.9973		5.11%
2014	0	3.80303		4.76%
2013	0	3.63039		3.91%
2012	0	3.49366		6.21%
2011	0	3.28939		2.91%
2010	0	3.196422		3.96%
2009	0	3.074766		n.a.