CITY OF HAMILTON

CORPORATE SERVICES DEPARTMENT
Financial Planning and Policy Division

TO: Mayor and Members General Issues Committee	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: December 5, 2012	
SUBJECT/REPORT NO: Water, Wastewater and Stormwater Rate Structure Review Report (Outstanding Business List Item) (FCS11025(c)) (City Wide)	
SUBMITTED BY: Roberto Rossini General Manager Finance and Corporate Services **SIGNATURE:**	**PREPARED BY:** John Savoia (905) 546-2424, ext. 7298

RECOMMENDATION

(a) That the "Rate Structure Review Recommended Scope of Work" as outlined in Appendix "B" to Report FCS11025(c) be approved with staff to report back to Committee with a recommended rate structure by June 2013;

(b) That a proposed Water/Wastewater User Service Fee and Charges Policy be developed with staff to report back to the Audit, Finance and Administration Committee by June 2013.

EXECUTIVE SUMMARY

At its meeting of April 13, 2011, the General Issues Committee (GIC) approved the following direction:

> *"Staff to report back by June, 2012 with an updated water and wastewater rate structure."*

Due to a number of factors the June 2012 deadline to report back with an updated rate structure was not achievable and a revised Rate Structure Review Timeline was approved by GIC at its meeting of June 6, 2012 (for details refer to Report FCS11025(b)).

Guiding principles were approved with the above direction and have formed the foundation of the rate structure review. Table 1 of Report FCS11025(c) found in the Historical Background section of this report provides a brief description of what the principles are intended to achieve. Some of these principles are not entirely compatible. For example, it is a challenge to develop a rate structure that promotes conservation while also supporting economic development. A successful rate structure will result when an appropriate balance is achieved between the various principles being considered.

The intent of the Review is to ensure current legislation and an appropriate balance of principles and revenue neutrality.

There are a variety of water and wastewater rate structures in use across North America with the commonly used rate structures described in the Historical Background Section of this report.

The aforementioned Revised Rate Structure Review Timeline incorporates the following steps that may culminate with the implementation of an alternative rate structure:

Step	Timeline	Process Step
1	September 2012	Council Workshop – to provide information related to how the City's rate budget and rate structure compares with other municipalities and best practices/guidelines - COMPLETED
2	Sept – Nov 2012	Incorporate feedback from Council workshop to evaluate which alternatives will be included in the detailed impact analysis - COMPLETED
3	November 2012	Report to GIC seeking confirmation of a limited number of rate structure alternatives to be evaluated in the detailed analysis - COMPLETED
4	Nov '12 – Jan '13	Conduct impact analysis of alternative options
5	Jan – March 2013	Consultation of alternative options
6	April – May 2013	Develop a recommended rate structure

7	June 2013	Report to GIC with recommended rate structure for Council's consideration
8	July – Dec 2013	Assuming an approved revised rate structure, coordinate with Horizon required billing system programming changes
9	December 2013	2014 Rate Budget incorporating revised rate structure
10	January 2014	Revised Rate Structure implemented with 2014 rates

Information related to how the City's rate budget and rate structure compares with other municipalities and best practices/guidelines is contained in the Rate Structure Review Report found in a Appendix "A" to Report FCS11025(c). This report provides an evaluation of the City's current rate structure relative to the Review's Guiding Principles identifying the relative strengths and weaknesses of the existing rate structure.

As per Step 3 in the table above, the purpose of this report is to seek confirmation from Council of a scope of work as outlined in Appendix "B" to Report FCS11025(c) for staff to evaluate with detailed analysis a limited number of rate structure alternatives. This detailed analysis will include impact analysis related to specific customer class impacts while maintaining overall revenue neutrality.

Rate structure reviews typically review other water/wastewater service fees and related policies. As such, staff have identified that no existing policy currently exists to guide how and when water/wastewater fees should be charged. Hence, per recommendation (c) of Report FCS11025(c), staff are proposing to develop a Water/Wastewater User Service Fee and Charges Policy and to report back to the Audit, Finance and Administration Committee by June 2013. This proposed policy will act as a framework for setting/reviewing water/wastewater service fees and charges.

Alternatives for Consideration – See Page 15 for details

FINANCIAL / STAFFING / LEGAL IMPLICATIONS (for Recommendation(s) only)

Financial: No financial impacts have been identified with the detailed analysis phase of the Rate Structure Review.

Staffing: No impact to current staffing levels.

Legal: None identified.

HISTORICAL BACKGROUND (Chronology of events)

Many Ontario municipalities have chosen to review their existing rate structures, in order to develop water and wastewater rate structure strategies which would meet full cost recovery required under the Sustainable Water and Sewage Systems Act and the financial plan requirements under the Safe Water Drinking Act. Other factors driving the rate structure reviews include the adoption of universal metering, declining consumption and increasing costs which are all applicable to Hamilton's situation.

The current rate structure is based on a review by the Region of Hamilton-Wentworth completed in the late 1990's.

In April 2011, the General Issues Committee directed staff to review the City's approach to charging for the provision of water and wastewater services and to report back by June 2012.

Approval was provided to move forward with a water and wastewater rate structure review ("Review") by approving guiding principles (refer to Table 1 of Report FCS11025(c) below) that were instrumental in determining options for Council's consideration with respect to alternative rate structures.

TABLE 1

Principle	Description of Intent
fairness and equity	Ensure that consumers are contributing equitably in proportion to the cost of the systems with user fees to be non-discriminating between customers and user sectors.
promote conservation	Water conservation may result in deferred infrastructure investments, thereby postponing capital expenditures for all customers. With less water used, there are the environmental benefits of reduced electricity and treatment chemical usage.
affordability and financial sustainability	Sustainability can be achieved through full cost pricing and a user pay approach. This objective will consider the impact on various consumer sectors to ensure that affordability is monitored.
stabilize revenue	The rate structure should minimize dramatic rate increases or decreases over time with the goal to maintain/improve revenue stability

	while providing a steady and predictable stream of revenues.
be justifiable	The rate structure should be consistent with the rate setting methodologies such as those provided by CWWA and applicable laws, in order to ensure that rates are transparent and justifiable if challenged in court.
be simple to understand and update	The rate structure should be easy for City customers to understand, utilizing a moderate level of educational tools. In addition, the rate structure should be able to be effectively maintained by City staff in future years.
support economic development;	The rate structure can support economic development and business retention in the City.

There are a variety of water and wastewater rate structures in use across North America. Generally, most of these structures fit into one or more of the following categories:

Flat fees: A flat fee is assessed, independent of usage. This fee typically is used when water meters are not in place to measure customers' consumption. As per Environment Canada studies, water utilities have been moving away from flat fees as rate and cost of service studies indicate better ways of distributing costs to customers based upon their respective demands on the system. Typically, the use of flat fees is found with very small utilities and where a business case for metering may not exist. An outcome of the Walkerton Inquiry was a recommendation to the Provincial government that "metering should be mandatory in all sustainable water systems."

Volumetric charge: A volumetric rate is assessed based upon metered usage. The rate structures of most utilities across North America incorporate some type of volumetric rate; however, most also incorporate a base (fixed) charge.

Base plus volumetric charge: A base (fixed) charge is assessed, typically per meter/inlet service size, on each customer bill. In addition, a volumetric charge is also assessed based upon metered usage. Most of the larger utilities in North America have a base and volumetric rate structure and this trend is growing. In addition to the volumetric cost, there is the recognition that the high fixed costs of water and wastewater drives the need for a "base" charge reflecting costs such as: billing, meter services, overhead and infrastructure investment, irrespective of usage. Utilities also recognize that a base charge component provides for a more reliable revenue stream.

Within this type of structure, there are two methods of structuring the volumetric charge:

Uniform (constant) rates: The volumetric rate per unit (e.g., cubic meter) is the same regardless of the level of usage. With approximately 80% of Canadians with water meters on an uniform rate structure, this structure is the most prevalent water and wastewater rate structure because it is easy to communicate and implement and ties relatively well with cost of service.

Inclining/Declining block rates: Volumetric rates can also vary according to the amount, or "blocks", of usage.

> Declining block: the per unit rate decreases as the volume increases. This type of structure is typically used to represent the commodity nature of water and that larger users may place less cost on the system on a per unit marginal cost basis. Although there are a fair number of utilities with this type of structure, there has been a decline in popularity in recent years due to a greater focus on conservation. This type of rate structure potentially supports economic development to attract/retain large industry. An example, of a declining block rate structure is found in the City of London, where it was established over 60 years ago, whereby residential customers pay higher rates than non-residential customers.
>
> Inclining block: the per unit rate increases as the volume increases. This type of structure is considered a "conservation" rate structure and is typically used by communities with water shortage issues to reflect the burden on the limited water supply placed by larger users and/or users with widely varying demands. A number of water utilities utilize this type of structure and its popularity is increasing, particularly in the western United States, as more utilities struggle with water supply issues. However, price elasticity studies' results, presented in research commissioned by the Walkerton Inquiry, indicate that there has been evidence that residential average consumption is not reduced by the pricing structure as water demand is not significantly influenced by price. Additionally, large families and multi-unit structures, without sub-metering, may be adversely impacted by an inclining block rate structure. Once again, the City of London serves an example with a separate residential rate, established in 1991, incorporating an inclining block structure to promote conservation.

Stormwater Funding:

Historically, throughout North America, stormwater infrastructure and operating requirements have largely been funded through general property taxes and less commonly by sewer utility rates or a combination of the two, but a majority of local governments still rely heavily if not exclusively on general property taxes to fund stormwater services. This reliance on property taxes reflects the consideration that

stormwater services provide a public benefit and that it is very difficult to measure direct benefits for each property.

Hamilton's Rate Structure

Through the 1970's and 1980's, the Region of Hamilton-Wentworth (Region) used a declining block structure for its non-residential customers and a uniform rate structure for metered residential customers. By 1993, the Region replaced the non-residential declining block structure with a uniform rate structure and by 2004; over 99% of customers are now metered.

The City of Hamilton currently utilizes a two-part water and wastewater rate structure recovering a portion of the service costs from a fixed basic charge (based on the size of water meter) and a volumetric charge. This type of structure conforms with guidelines published by the Canadian Water Works Association (CWWA) and is used by the majority of municipalities in Ontario – according to a study conducted in 2008 on behalf of the City of Guelph, more than 80 municipalities and utilities in Ontario use the uniform rate structure in some fashion.

Current Fixed Charges:

CWWA recommends that a fixed rate charge be used for costs that are not related to volumes consumed and relate primarily to customers such as meter reading, billing, customer service and meter repair. The Review will need to reconsider the proportion of fixed versus variable costs within the water and wastewater services and assess the appropriateness of fixed rate options relative to the guiding principles. Recouping all possible fixed costs from a fixed charge will likely need to be limited to ensure users can still adopt water efficiency and reduce their rate billings. Furthermore, Hamilton's fixed charge is progressive based on the size of the customer's water meter. The Review should examine whether the basis of the fixed charge should be based on the size of the customer's water service connection.

Hamilton's current fixed charge does include a minimum water consumption allowance per month which, for residential customers, represents the first five cubic metres ($5m^3$) of water consumption. The Review should examine whether the provision of a water consumption allowance within the fixed rate is still appropriate. Based on a recent review, the City of Hamilton is the only municipality in Ontario which provides a minimum water consumption allowance.

Current Volumetric (Variable) Charges:

Costs that are driven largely by volumes consumed (typically water supply, wastewater treatment, distribution, collection, storage and maintenance costs) are suggested to be recovered through a volumetric rate.

The City's existing wastewater rate consists of a 100 per cent surcharge on the water rate. While there is a strong correlation between the volume of water consumed and the volume of wastewater discharged, the costs to build, operate and maintain these two systems vary significantly. As a surcharge on water charges is a common approach to fund wastewater related costs, the Review will study what the surcharge rate may be to reflect the actual cost of providing these sanitary services and adjust the surcharge percentage accordingly.

The table below provides a breakdown of charge components of the typical residential water and wastewater bill based on the existing water/wastewater rate structure:

2012 Typical Annual Residential Household Water & Wastewater Bill (based on annual water consumption of 220m^3)	
Minimum (base) Charge: $8.42 x 12 months	$ 101.04
Usage Charge: (220m^3 - 60m^3) x $1.174	187.84
Water Charge	**$ 288.88**
Sewer Surcharge (100% of water charge)	**$ 288.88**
Total Water and Sewer Bill	**$ 577.76**

The City's stormwater program is currently funded through the water/wastewater rates, property taxes and development charges. Beginning in 2004, approximately 85% of the stormwater management costs were transferred from the tax levy to the rate supported budget. The total transfer of $10.2 million to the rate budget was partially off-set by the financial savings resulting from the GST rebate for municipalities effective April 1, 2004. The City has experienced financial challenges under the present funding system particularly, during wetter than average years, with dramatic increased costs associated with wastewater treatment, in particular with combined storm/wastewater areas of the City. The 2012 Rate supported storm budget reflects total planned expenditures of just over $20 million (refer to Report FCS11100/PW11086) – this represents a twofold increase of the stormwater costs funded by the rate supported budget since 2004.

In 2009, Council directed staff to determine the feasibility of introducing a stormwater utility rate, to perform additional public consultation and to bring forward recommendations for Council's consideration in June 2011 (refer to Report PW09099). Subsequently, at its meeting of February 23, 2011, Council directed that the stormwater public consultation activities be cancelled and the rate funding study tabled. Accordingly, staff have not conducted any further analysis related to the development of a new additional stormwater utility fee.

At its meeting of April 13, 2011, the General Issues Committee approved the following direction:

> *"Staff to report back by June, 2012 with an updated water and wastewater rate structure."*

Additionally, there has been some interest to review a potential stormwater funding structure through the following notice of motion that was deferred at the same April 2011 GIC meeting in light of the direction to provide a rate structure review:

> *"That staff be directed to report back to the General Issues Committee on the inequity of the stormwater management rate in terms of the larger users e.g., big box stores, not paying their fair share."*

POLICY IMPLICATIONS

As no existing policy is in place to guide how and when water/wastewater fees should be charged, as per recommendation (b) of Report FCS11025(c), staff are proposing to develop a Water/Wastewater User Service Fee and Charges Policy and to report back to the Audit, Finance and Administration Committee by June 2013.

RELEVANT CONSULTATION

Public Works – Environment and Sustainable Infrastructure Division has been consulted and supports the objectives and recommendations of this report.

City Manager's Office – Legal Services Division has provided input into specific stormwater information provided in Appendix "A" to Report FCS11025(c).

ANALYSIS / RATIONALE FOR RECOMMENDATION

(include Performance Measurement/Benchmarking Data, if applicable)

Information related to how the City's rate budget and rate structure compares with other municipalities and best practices/guidelines is contained in the Rate Structure Review Report found in a Appendix "A" to Report FCS11025(c). This report provides an evaluation of the City's current rate structure relative to the Review's Guiding Principles identifying the relative strengths and weaknesses of the existing rate structure.

By identifying the strengths and weaknesses of the existing rate structure, staff have identified a proposed scope of work related to the next phase of the rate structure review which is to evaluate with detailed analysis a limited number of rate structure alternatives. This detailed analysis will include impact analysis related to specific customer class impacts, as well as, the impact to overall rate revenues.

Proposed Rate Structure Review Scope of Work

(a) Rate Budgeting Methodology

Current Practice

Hamilton's rate budget methodology is relatively unique and needs to be reviewed. Three very distinct service programs - Water, Wastewater and Stormwater – have been budgeted under the rate-supported revenues as if they are one service. This budgeting practice is uncommon as most communities (whether or not stormwater is funded by Rates) typically budget each service as separate distinct utilities as reflected by different rates and adopt related unique increases for each service program. By treating the three services as one, the increasing cost pressures of one component (for example, stormwater) may result in other components' (water and wastewater) services and projects being deferred. In essence, there is no dedicated funding by service program.

Recommended For Detailed Analysis:

Staff propose to continue to discretely identify the expenses for all three rate supported services except going forward to budget both the expenses and revenues for wastewater and storm separate from water revenues. The intention from a rate revenue perspective would be to have the Water service separately budgeted for with Wastewater and Stormwater treated as one service. Having a clear delineation of revenues and expenses between Water program and the Wastewater/Stormwater service programs would allow for more transparency to support the principles of user pay and full cost pricing.

(b) Water Pricing – Fixed Charge Component

Current Practice

Hamilton is unique in that its fixed charge provides for a minimum water allowance so that most residential customers receive the first $5m^3$ of consumption per month (first $15m^3$ per month for accounts with meters > 20mm in size) – so that effectively this minimum water allowance is not charged at the volumetric rate. This is inconsistent with the practice across Ontario as Hamilton is the only municipality that provides an allotment of water consumption with its fixed charge. This unique feature has complicated past efforts to provide detailed billings to customers that would be easy to understand.

Hamilton currently utilizes a two-part water and wastewater rate structure recovering a portion of the service costs from a fixed basic charge and a volumetric charge. This type of structure conforms to guidelines published by the CWWA and is used by the majority of municipalities in Ontario. Currently fixed charges are progressive based on meter size. The difference in charges between meter sizes known as the meter equivalency (ME) ratio has not been reviewed for years and does not strictly follow industry standards.

An analysis of the 2012 Rate Supported Budget was conducted which indicated that approximately 89% of the rate supported costs are fixed in nature. Revenues generated from the fixed charge component to generate approximately 22% of total rate revenues with the balance derived from variable volumetric charges.

Recommended For Detailed Analysis:

Staff propose to analyze the elimination of the minimum consumption allowance and develop options to minimize the financial impact to residential customers through the introduction of a Lifeline Rate that would be applicable to residential customers (details of a Lifeline Rate concept are provided in the Rate Structure Review Report found in a Appendix "A" to Report FCS11025(c)). Essentially, a two tier inclining block structure would be created for residential customers. The first tier pricing would typically apply to only the first block of consumption intended to cover basic essential water requirements. This rate is set at a subsidized rate that is typically at a significantly lower rate than the marginal cost of water. This subsidized first tier pricing of a Lifeline Rate structure is a distinguishing feature as often the marginal cost of water is the rate that would be applied in a uniform rate structure or as the first block rate in a traditional inclining block structure.

It is expected that transitioning to the proposed structure will provide the opportunity to develop a detailed billing layout that will be customer friendly. This would substantially address issues with the current structure so that billings will be simple to understand.

Additionally, staff propose to analyze a modification of existing meter equivalency (ME) ratios, however, likely not full adoption of CWWA ratios. Furthermore a review will be undertaken to consider amending base of fixed charges from meter size to inlet service line size with this potential to have no cost impact on existing rate payers but is intended to address an unintended result of having fixed charges based on meter size whereby, down-size meter requests occur by customers simply as a desire to secure lower fixed charges. However, the City's costs to support the water/wastewater servicing to the property remains unchanged though the cost recovery for this is currently tied to the meter size and thus cost recovery decreases when a meter is down-sized. Having the base of charges identified on inlet service line size would resolve such requests.

As part of the detailed analysis phase, staff will identify the overall impact on rate revenues including what proportion of total revenue that would yielded by the fixed charge component and the variable volumetric components. A fixed charge ratio target of 25-

30% of total revenues is recommended which aligns with the fixed charge average of Ontario municipalities. To target higher fixed allocations beyond 30% in a rate structure would improve financial sustainability, stabilize revenues and help to mitigate high variable rate increases as water consumption continues to decline, however, the ability to promote efficient water consumption would be negatively impacted as customers would have little ability to manage their water/wastewater billings if the fixed charge component was raised significantly beyond current levels.

(c) Water Pricing – Variable Charge (Volumetric Rate) Component

Current Practice

Similar to most other Ontario municipalities, Hamilton currently utilizes a Uniform rate water pricing structure whereby the cost per unit (m3) remains the same regardless of volume consumed. The uniform rate is applied to all customer classes in Hamilton again as is the case with the majority of Ontario comparators.

Recommended For Detailed Analysis:

As previously described, staff are recommending evaluating the introduction of a Lifeline rate which would create essentially an inclining block structure for residential customers.

Recommend no further analysis for ICI variable water pricing by continuing uniform rate structure for this sector as the Lifeline rate concept is typically only applied to residential customers.

(d) Wastewater & Stormwater Pricing

Current Practice

Wastewater

The current wastewater rate structure currently employed in Hamilton (sewer surcharge) mirrors the two-part structure of water with a fixed charge component and a volumetric component. Billing is based on a percentage of water billings in lieu of the more common industry practice to express the wastewater rate in terms of $\$/m^3$ of metered water. Hamilton's current rate of 100% has remained unchanged for many years so to maintain the sewer surcharge at 100% has not reflected the actual costs related to the wastewater system. Common practice is to reflect the actual cost of providing these sanitary services and adjust the wastewater charge accordingly. Hamilton does follow common industry practice to base its wastewater charge on 100% of water consumption.

Stormwater

Hamilton's stormwater program is currently funded mostly through water and wastewater rates (sewer surcharge) and to a lesser extent by property taxes with development charges contributing to stormwater infrastructure related to new development. The 2012 total stormwater program with an approved budget of $23.1 million is funded 87% from the Rate budget and 13% from property taxes.

Recommended For Detailed Analysis:

Study a modified "City of Ottawa" model whereby wastewater and stormwater are budgeted as one service with Rate funding from one combined wastewater/storm rate funding both services expressing this rate as $/m^3 of metered water. It is also recommended to maintain the current funding ratios between Rate and property taxes. Stormwater services such as culvert maintenance currently funded by taxes should continue to do so as much of this work occurs adjacent to properties that oftentimes do not have City sanitary connection and hence, would not otherwise contribute to funding stormwater services.

In alignment with industry best practices, it is recommended to continue mirroring the two-part structure of water with a fixed charge and a volumetric rate for the wastewater/stormwater charge and to apply the charge on 100% of water consumption.

Public Consultation

Oftentimes rate structure reviews completed by other Ontario municipalities have included a public consultation component and given the differing impacts of alternative rate structures on various customer sectors, incorporating some form of public consultation is prudent consideration.

The overall objective of the Review is not to generate increased rate revenues but to identify and evaluate alternate rate structures that would align more closely to the Guiding Principles. Hence, some water/wastewater consumer sectors may experience cost decreases and some others cost increases as there may be a shifting of costs between sectors when a rate structure is changed.

The recommended detailed analysis outlined above will provide cost impacts for consumers with different consumption profiles. Staff anticipates undertaking some form of consultation with those sector groups that are significantly impacted, albeit the aforementioned structure changes recommended for analysis are not expected to have major shifting of water/wastewater costs. For example, should the detailed analysis identify that commercial customers would experience significant cost increases, discussions with groups such as the Chamber of Commerce and the City's existing Large Water Users Group would be undertaken to inform of potential impacts. All resulting

feedback from such consultation would be provided to Committee when staff report back on the results of the detailed analysis phase.

Proposed Water/Wastewater User Service Fee and Charges Policy

User fees and charges are applicable for various water/wastewater related services provided on an individual basis to customers such as water turn on or off, laboratory services, etc. These fees are necessary to recover the full costs of such water/wastewater services otherwise these services would be subsidized by water consumers at large. Similar to water rates, service fees require periodic review and amendments, as necessary, to ensure equitable rates & fees, sustain adequate reserve funds and maintain fiscal balance. User fees and charges constitute over $2 million of the Rate operating budget in 2012 and represent an important revenue source for the City.

A water/wastewater user fee and charges policy is being recommended as currently no policy exists to determine how and when fees should be charged. Policies that require identification of both the cost of the service and the fees/charges to recover such cost allows staff to develop a better understanding of the cost of services and to consider the appropriateness of new/established fees and charges.

Generally speaking service user fee and charges policies incorporate the following elements:

Establishing Fees – The following concepts are common in developing and implementing service charges:

1. Revenues should not exceed the reasonable cost of providing the service.

2. Cost recover goals should be based on the *total cost* of delivering the service, including direct costs, departmental administration costs, and organization-wide support costs such as accounting, personnel, data processing, vehicle maintenance and insurance.

3. The method of assessing and collecting fees should be as simple as possible so that the administration cost of collection is reduced.

4. The fee/charge structure should be sensitive to the marketplace for similar services, as well as, to smaller, infrequent users of the service.

Other Community Comparison – In setting service fees and charges in water/wastewater, the City should consider fees charged in other jurisdictions. Surveying the comparability of the City's fees to other communities provides useful background information in setting fees for the following reasons:

1. They reflect the market for these fees and can aid in assessing the reasonableness of the City's fees.

2. If analyzed thoroughly, they can serve as a benchmark for how cost-effectively the City provides its services.

However, it should be noted that fee surveys should not be the sole or primary criteria in setting the City's fees as there are many factors that affect how and why other communities have set their fees at their cost levels.

Review Requirements – Service fees and charges should be reviewed on an annual basis to ensure that they keep pace with changes in the cost-of-living and for any changes in methods or levels of service delivery.

As no existing policy currently exists to guide how and when water/wastewater fees should be charged, as per recommendation (b) of Report FCS11025(c), staff are proposing to develop a Water/Wastewater User Service Fee and Charges Policy and to report back to the Audit, Finance and Administration Committee by June 2013.

ALTERNATIVES FOR CONSIDERATION

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Alternative Rate Structure Scope of Work Elements

In order to focus the limited internal resource to complete the Review, staff have provided a recommended scope of work for detailed analysis. The recommendations are based in accordance with the Guiding Principles. Of course, there are further alternative rate structure elements that could be examined further. However to maintain the aforementioned structure review timeline to report back by June 2013 and to complete the review with only internal resources, the following options should be considered to be replacement elements to those elements previously recommended. Current practice or status quo for each element is not presented below but certainly is an option for Committee.

- **Rate Budgeting Methodology**

Staff could identify the expenses and revenues as three separate Rate budgets for three services separately versus the current three services treated as one service. The intention would be to have the Water, Wastewater and rate supported Stormwater service separately budgeted. This approach would certainly align with best practices to budget each rate supported service separately. For example, the City of London does have a fund its stormwater as part of its overall Rate budget and as such, budgets separately its Water, Wastewater and Stormwater programs. However, London has a dedicated stormwater utility fee (Storm Drainage Charge) that has been in place since 1996 so that each of the rate funded services has its own utility fee. Staff do not recommend examining three separate Rate budgets unless Hamilton were to have separate fees for each service. The alignment of a user fee to service(s) is a proper foundation for budgeting.

- **Water Pricing – Fixed Charge Component**

To align with common industry practice, staff could be directed to analyse the elimination of the minimum consumption allowance without any form of cost mitigation as recommended through an examination of potentially introducing a Lifeline Rate. Concerns of the potential impacts with affordability most likely result by simply eliminating the minimum consumption allowance without any mitigating measures.

Another option that could be considered with the fixed charge component would be seek a much higher portion of costs to recover through fixed charges. The Regional Public Works Commissioners of Ontario (RPWCO) has recommended that municipalities review their rate structures with the intent to move towards a 50/50 fixed-variable allocation of water/wastewater billings. Higher fixed allocations in a rate structure would improve financial sustainability; stabilize revenues and help to mitigate high variable rate increases as water consumption continues to decline particularly when more than 85% of Hamilton's rate supported costs are fixed in nature. However, concerns with affordability and promoting conservation are primary drivers for the staff recommendation to strive for a fixed charge ratio target of 25-30% of total revenues which aligns with the fixed charge average of Ontario municipalities.

- **Water Pricing – Variable Charge (Volumetric Rate) Component**

Aside from analysing the potential introduction of a Lifeline rate which would in effect create an inclining block structure for residential customers, staff could alternatively investigate changing from the uniform rate structure for non-residential customers. Typically, a declining block rate structure (where the unit price of water decreases as the volume consumed increases) is considered for ICI consumers to reflect that at a certain

level of consumption the costs of providing the service decreases, i.e. the fixed costs of the utility have already been met. This may be used where large industry has a lower cost of service or to promote economic development, however, this approach does not encourage conservation in the ICI sector. When comparing the cost of ICI water/wastewater services in Hamilton compared to a number of municipalities, Hamilton has consistently been lower than the survey average.

- **Wastewater & Stormwater Pricing**

As the current wastewater rate structure essentially aligns with industry best practices there does not exist any viable alternatives for consideration.

With respect to stormwater funding, as previously noted Council in 2011 directed that efforts regarding the development of a new dedicated stormwater utility fee structure be cancelled. Accordingly, the alternative option that staff could be directed to consider would be to undertake further analysis where stormwater services currently funded by the rate budget (approximately 85% of the total stormwater program) could be shifted fully or partly back to property taxes. Property tax funding of stormwater is clearly the standard funding mechanism in Ontario with few municipalities having shifting stormwater from taxes to a dedicated stormwater fee (notably, London, Kitchener and Waterloo).

Typically when there has been a shift of stormwater funding bases, the shift is done over a number of budget years. For example, both Kitchener and Waterloo are in the midst of a four year shifting of stormwater costs from taxes to their new stormwater fee. Hence, any consideration of shifting Hamilton's stormwater costs back to property taxes should be in the context of a multi-year phase-in transition.

The stormwater costs that were transferred from the tax base to the Rate budget of approximately $10.2 million was completed over 2 budget years beginning in 2004. These transferred costs were previously area rated whereas, the stormwater operational costs related to catch basins/culverts/outfalls remained on the tax base were not area rated. The rate supported stormwater service costs have dramatically increased since the transfer has been made to approximately $20 million in the 2012 Rate budget. It should be noted that a 1% increase to the general 2012 tax levy would yield approximately $6.9 million in tax revenues.

CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

Financial Sustainability

- Financially Sustainable City by 2020
- Effective and sustainable Growth Management
- Delivery of municipal services and management capital assets/liabilities in a sustainable, innovative and cost effective manner
- Full life-cycle costing for capital
- Address infrastructure deficiencies and unfunded liabilities

Environmental Stewardship

- Natural resources are protected and enhanced

Healthy Community

- Adequate access to food, water, shelter and income, safety, work, recreation and support for all (Human Services)

APPENDICES / SCHEDULES

Appendix “A” to Report FCS11025(c) - Rate Structure Review Report
Appendix “B” to Report FCS11025(c) - Rate Structure Review Recommended Scope of Work

Hamilton

Rate Structure Review Report

December 2012

Executive Summary

City Council has directed staff to review water, wastewater (sewer) and stormwater rate structure options. This included a review of the existing rate structures and principles used by the City in rate setting, a review of practices employed across Ontario and best practice research. The scope of the review has included reviewing Hamilton's Rate budgeting practices with those employed across the province.

Sustainable Rate Policy

The Ontario government through legislation has promoted that water and wastewater utilities become financially sustainable by supporting the principles of user pay and full cost pricing. The Province has required municipalities to undertake long-term financing planning for water and wastewater systems built on certain principles including:

- Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services

- Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received

Over the last decade, Hamilton City Council has strongly supported the concepts of user pay and full cost pricing consistent with provincial government policy. This is achieved through a sustainable level of funding by recovering the full cost of services through user fees.

Rate Budgeting

In comparison to the rate budgeting practices of other Ontario municipalities, Hamilton's rate budgeting methodology is relatively unique. Hamilton's current practice is to budget for the three distinct services (water, wastewater (sewer) and stormwater), that are funded by the rate budget, as if they are one service program. Beginning with the 2012 Rate supported budget, expenditures have been identified by the three aforementioned programs, however the revenue streams continue to be budgeted to support the three programs collectively. Hence, as there is no dedicated funding by service, cross subsidization inevitably occurs which may create a scenario where the increasing cost pressures of one service program may result in the other service programs' projects being deferred.

Common industry practice is to budget each service as separate discrete programs with different rates often with differing rate increases. By budgeting for each service as separate service programs with revenues and expenses clearly identified with their own unique rate helps to prevent the cross subsidization between programs. Having a clear delineation of revenues and expenses by service program allows for more transparency to support the principles of user pay and full cost pricing.

User Fee Principles

User Fee versus Tax?

User fees are typically utilized to finance City services that provide a direct benefit to specific users with user fees set to recover the full or partial cost of these services. User fees are based on the "benefit principle" that holds that consumers should pay or contribute for a service in accordance with the benefit that they receive.

Taxes, the principal means of financing government expenditures, are compulsory payments that do not necessarily bear any direct relationship to the benefits of government goods and services received. As such, a tax is used to produce revenues for goods and services that the government deems to be a "public good." Taxes are generally considered where consumption of a good or service has a public benefit and is available to all individuals but paid for by the public as a collective entity.

User Fee General Considerations

- Full cost recovery versus Partial cost recovery - in the case of water and wastewater services full cost recovery through user fees with no tax support are appropriate given that benefits to specific users is identifiable. This is in contrast to other City services such as transit and recreation where user fees are supplemented with partial tax support to fund the respective program delivery as the benefits of these services extend beyond the specific users of these services. For example, use of public transit provides positive environmental impacts that society as a whole benefits from.

- Must be a reasonable connection between the "quantum" of a fee charged and the cost of providing the service - the user fee charge for a service should correlate to the cost of providing the service for which the fee is charged as user fees should not be used to raise general revenues lest they be deemed a tax.

- User fee revenues should not exceed the long term cost of providing service - generally accepted user fee principles suggest user fee revenues should strive to meet the long-term cost of providing the service which not only supports long-term financial sustainability but also avoids a user fee being potentially challenged as an illegal tax should revenues collect in excess of the long-term cost of providing the service.

Guiding Principles

In April 2011, Guiding Principles have been approved by Council and they form the foundation of the rate setting options presented in this report. It was important to establish the principles in advance of undertaking the technical work of rate setting. Once the principles were established and fixed, then the rate setting process was able to evolve from them. It was important to recognize that there needs to be a balance in how the principles are applied; e.g., a uniform water rate is simple, but it may not

necessarily be fair and equitable if customers within the City are not equally responsible for the cost of the system. The process of updating the rate structures must weigh the extent to which each principle controls each component of the structure.

The following table provides a brief description of what the principles are intended to achieve. A successful rate structure will result when an appropriate balance is achieved between the various principles being considered.

Principle	**Description of Intent**
fairness and equity	Ensure that consumers are contributing equitably in proportion to the cost of the systems with user fees to be non-discriminating between customers and user sectors.
promote conservation	Water conservation may result in deferred infrastructure investments, thereby postponing capital expenditures for all customers. With less water used, there are the environmental benefits of reduced electricity and treatment chemical usage.
affordability and financial sustainability	Sustainability can be achieved through full cost pricing and a user pay approach. This objective will consider the impact on various consumer sectors to ensure that affordability is monitored.
stabilize revenue	The rate structure should minimize dramatic rate increases or decreases over time with the goal to maintain/improve revenue stability while providing a steady and predictable stream of revenues.
be justifiable	The rate structure should be consistent with the rate setting methodologies such as those provided by CWWA and applicable laws, in order to ensure that rates are transparent and justifiable if challenged in court.
be simple to understand and update	The rate structure should be easy for City customers to understand, utilizing a moderate level of educational tools. In addition, the rate structure should be able to be effectively maintained by City staff in future years.
support economic development;	The rate structure can support economic development and business retention in the City.

Hamilton's Rate Structure

Through the 1970's and 1980's, the Region of Hamilton-Wentworth (Region) used a declining block structure for its non-residential customers and a uniform rate structure for metered residential customers. By 1993, the Region replaced the non-residential declining block structure with a uniform rate structure and by 2004, over 99% of customers were now metered.

Guidelines published by the Canadian Water Works Association (CWWA) state that an essential element of water rate pricing is the concept of a two-part rate structure; a volumetric charge and a fixed charge. CWWA recommends that a fixed charge be used for costs that are not related to volumes consumed and relate directly to customers. Costs that are driven by volumes consumed generally include water supply, transmission and distribution costs and cost to maintain the systems and should be recovered through a volumetric charge.

Hamilton conforms to CWWA as it currently utilizes a two-part water and wastewater rate structure recovering a portion of the service costs from a fixed basic charge (based on the size of water meter) and a volumetric charge. A unique feature of Hamilton's fixed basic charge is the inclusion of a minimum consumption allowance which for residential customers represents the first $5m^3$ of water consumed each month. For accounts with meters equal to or greater than 25mm in size the minimum consumption allowance is the first $15m^3$ of water consumed each month.

The City's existing sewer rate consists of a 100 per cent surcharge on the water charge. While there is a strong correlation between the volume of water consumed and the volume of wastewater discharged, the costs to build operate and maintain these two systems vary significantly.

The following table provides a breakdown of the charge components of the typical residential water and wastewater bill based on the existing water/wastewater rate structure:

2012 Typical Annual Residential Household Water & Wastewater Bill (based on annual water consumption of $220m^3$)	
Minimum (base) Charge: $8.42 x 12 months	$ 101.04
Usage Charge: ($220m^3$ - $60m^3$) x $1.174	187.84
Water Charge	**$ 288.88**
Sewer Surcharge	**$ 288.88**
Total Water and Sewer Bill	**$ 577.76**

Assessment of Hamilton's Current Rate Structure

Staff have undertaken an evaluation of Hamilton's current rate structure relative to the Guiding Principles as noted earlier in this report:

Guiding Principle	Assessment	Current Rate Structure Observations
Fairness and Equity	Fair - Requires Improvement	• The fixed monthly charges currently based on meter size and could be updated. • Stormwater structure is not currently directly linked to the use of the service.
Promote Conservation	Very Good	• Low average residential consumption – among lowest usage in Ontario. • City has a number of outreach programs to support conservation and efficient use of water.
Affordability	Excellent	• Lower than average residential costs relative to other Ontario municipalities • Water/sewer costs as % of income stands at 0.8% per 2011 municipal study
Financial Sustainability	Fair - Requires Improvement	• Cost structure is largely fixed but current price structure is mostly variable increasing risk of shortfalls with declining consumption. • Stormwater funding based on water consumption creates financial pressures unique to Hamilton.
Stabilize Revenue	Fair - Requires Improvement	• Consumption trending downward across all sectors with relatively low recovery of costs from fixed monthly charge.
Be Justifiable	Fair - Requires Improvement	• Current uniform rate structure with fixed rate component used by majority of municipalities. Fixed charge not consistent with other jurisdictions and could be revised. • Sewer surcharge % has not been adjusted with each budget cycle. • Majority of stormwater funding based on water consumption unique to Hamilton.
Simple to Understand & Update	Fair - Requires Improvement	• Uniform rate is simple to understand but complexity created with unique inclusion of a minimum consumption charge within the monthly fixed charge
Support Economic Development	Good	• Even without a declining block structure, current non-residential water/sewer costs are in mid-range of Ontario municipalities

Strengths of Hamilton's Current Rate Structure

1. Affordability

Household affordability is primarily a function of income related to the cost of living. Income is often used to estimate a community's socioeconomic status and the related ability of residents to support utility costs. Typically the most prevalent method of assessing household affordability involves determining the annual amount spent on services as a fraction of annual household income.

There are a number of sources which are used in the industry to establish a benchmark upon which affordability is measured. The most common approach is water/wastewater costs as a percentage of average income. The threshold value, which is expressed as a percent, is applied to a measure of income to determine the point at which the cost of water/wastewater becomes unaffordable. There is no one benchmark percentage established in the industry. Depending on the source used, the range typically is from 1.5% - 3.0% of household income, beyond which, affordability is questionable.

Based on an analysis undertaken, as shown in the table below, Hamilton is well below the affordability threshold, indicating that affordability is currently not an issue. The table reflects the 2011 water and wastewater costs based on consumption of 250 m3 for a typical residential property against average household income to calculate the costs as a percentage of income in accordance with the benchmark affordability threshold range noted above.

Water/Wastewater Costs as % of Household Income

Municipality	2011 Avg. Household Income ($)	2011 Residential Water/WW Costs ($) *	2011 Water/WW as a % of Household Income
Mississauga	100,306	355	0.35%
Toronto	89,151	571	0.64%
Burlington	108,632	709	0.65%
Ottawa	94,649	748	0.79%
Waterloo	100,236	802	0.80%
Hamilton	**77,221**	**622**	**0.81%**
Guelph	84,666	794	0.94%
Cambridge	85,014	845	0.99%
London	76,546	771	1.01%
Kitchener	79,920	825	1.03%
Brantford	70,911	892	1.26%
St Catherines	68,364	879	1.29%
Sudbury	74,691	972	1.30%
Windsor	68,121	1,102	1.62%
BMA Study Average	*87,280*	*825*	*0.95%*

Source: BMA Management Consulting Inc. - Municipal Study 2011 * Based on 250m3 p.a.

2. Promote Conservation

The rate structure should encourage the efficient and justifiable uses of water as well as assist in managing system demand. Programs that promote efficient water usage may reduce operating costs and capital investment needs over time, for example, reduced water consumption demands across all sectors in Hamilton over the last number of years has allowed the deferral of the wastewater treatment plant's costly expansion by approximately a decade. If consumption demand had not lessened the expansion would have been required in the near term and water rates would have most certainly been much higher for existing ratepayers.

Water conservation continues to be a priority of Hamilton and a number of strategies have been employed by the City to promote conservation. There are many strategies that a municipality can employ to promote conservation both on the demand and supply side. In fact, many of these strategies have already been implemented to manage water demand which have proven to be effective.

A number of the best practice strategies have been employed to promote the efficient use of water:

- Universal Metering - Virtually all properties in Hamilton are metered. Metering is a critical requirement for a pricing program to manage community consumption and to address unaccounted for water, particularly leakage. Environment Canada research has found that non-metered (flat rate) customers use substantially more water than metered customers – some studies suggest that water use can be as much as 70% more where no metering is in place.

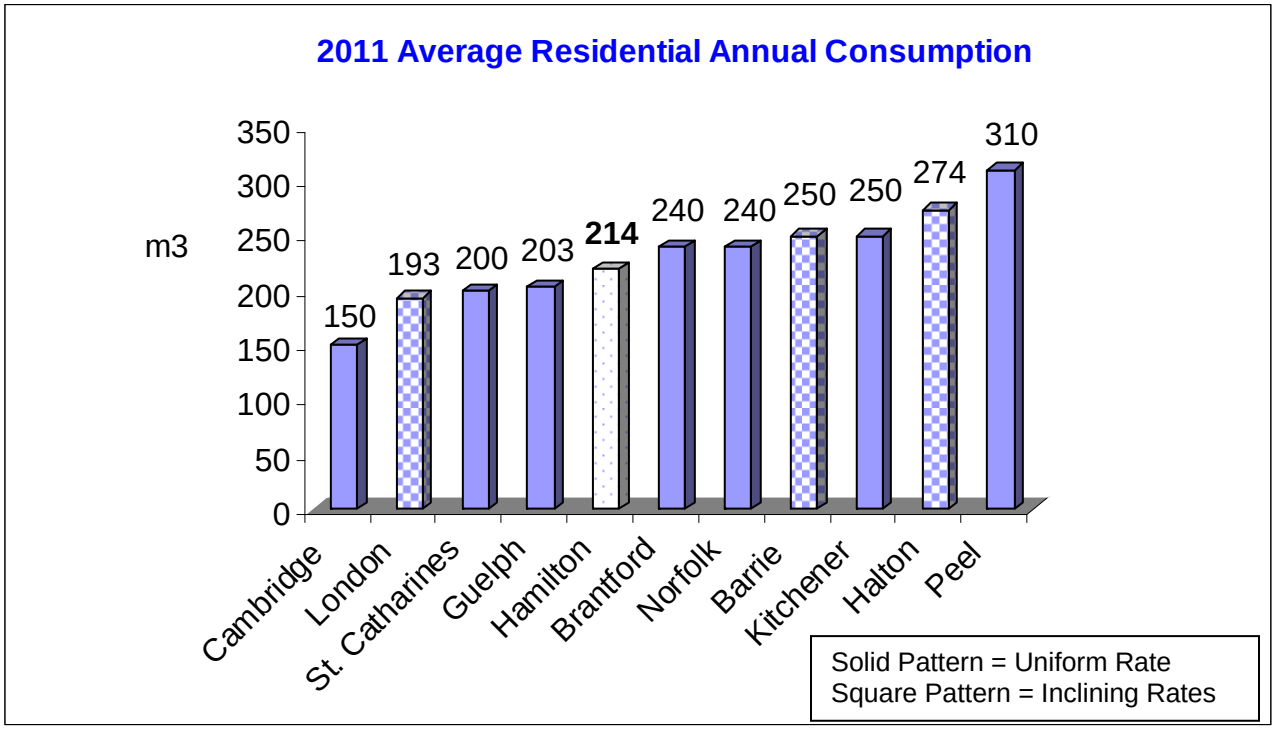
- Information and Education - The City has an active, ongoing general public education program delivered through Water/Wastewater's Customer Service and Community Outreach section including the education of over 7,000 students each year about the importance of water including hosting the annual Children's Water Festival. Horizon Utilities, on the City's behalf, administers the "High Water Read" notification program which allows customers to be notified soon after an incident of high water consumption is detected and to provide leak detection information. In 2011, nearly 10,000 high water notification letters accompanied with a leak detection brochure were issued by Horizon Utilities.

- Watering Use Regulation - The City has maintained summer use water restrictions through the Waterworks Operating Bylaw R84-026, as amended.

- Reuse and Recycling —the City has subsidized the distribution of over 5,000 rain barrels to assist residents who want to save water.

In addition to the aforementioned programs and initiatives, the City promotes conservation by maintaining a relatively low fixed monthly fee. Any changes considered to the fixed monthly charge, where the allocation to fixed remains below average will allow the rate structure to continue to support conservation.

As shown in the following graph, the average residential consumption in Hamilton is lower than a number of other municipalities where information was available. This survey includes municipalities with uniform rates and inclining rate structures.



There have been a number of studies conducted in Canada, the United States and United Kingdom which suggest that water pricing is not a primary force behind decreased residential water consumption which has been experienced over the last decade in all three countries. A study released in 2010 by the Water Research Foundation, who is the world's largest research organization devoted to drinking water research, tracked trends in household water use in North America over the past 30 years with many utilities reporting declining water usage of 0.5-2% annually over the last decade.

The primary drivers of reduced water consumption have been identified as:

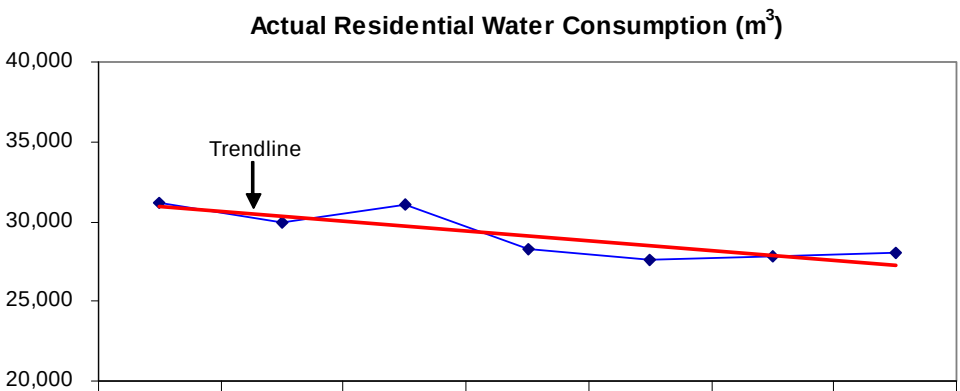
- Increased availability/use of water efficient appliances/fixtures for example:
    - Toilets pre-1988 typically used 20L/flush with dual flush (6.0L/3.8L) and 4.5L High Efficiency Toilets (HET) readily available today
    - Modern front load washers use about 100L/load versus older top load models that typically used approximately 165L/load
- Changes in regulations (ie. local building codes) ensure that new development include modern water efficient fixtures and programs such as LEED further encourage water efficiency through the installation of rainwater harvesting systems.

One study finding indicated that typical residents living in a home built in 2011 would use 35% less water for indoor purposes than a non-retrofitted home built in 1994.

- Water Metering – over the last 20 years, most water utilities in Canada and the UK have followed the lead of the US with the installation of water meters. Studies have demonstrated that water consumption usage is dramatically affected with the installation of water meters. Additionally, the measurement of all water usage provides a financial incentive to identify and repair leaks that may have otherwise if water billings were not based on metered usage may not have been addressed in a timely fashion.

As reflected in the graph below, water consumption has been declining despite increases in the population serviced by the City's water system:

Water Efficiency - More Homes Using Less Water



	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual
Residential	31,157	29,904	31,116	28,223	27,572	27,776	28,028
# of Accounts @ Y/E	118,188	120,593	122,468	124,293	126,135	127,266	129,027

Hamilton's residential billable consumption has declined significantly over the past number of years; over 10% since 2005 despite growth of nearly 11,000 accounts over same timeframe

Price Elasticity of Water

In basic economic theory, the key principle to explain why conservation-oriented pricing works is referred to as the *price elasticity of demand*. In simple terms, people respond differently to changes in price for different goods and services. Some goods and services are very inelastic, meaning that people's consumption does not change much when the price goes up. Inelastic goods are typically ones that have few substitutes or where having them is a necessity. Given the much higher cost of bottled water, municipal water is not cost effectively substituted.

Research has shown that water demand can, to some extent, be manipulated by price for discretionary uses (lawn watering, car washing, and swimming pools), however, water demand is relatively price inelastic (changes in price do not materially impact demand), particularly when other conservation programs have been implemented, as is the case in Hamilton.

Many home technologies and simple behaviour changes can reduce consumption without significant difficulty or costs. Even for the non-residential sector, research has shown that the response to water price changes is similar to households that begin to change practices and replace old technology.

There have been studies that show that outdoor water use is much more sensitive (elastic) to price changes than indoor water use. Despite this, research suggests that the most likely range for elasticity of residential water demand is – 0.20 to 0.40, which means a 10% increase in price lowers demand by 2 - 4%. However, with the presence of other programs, as is the case in Hamilton, it is reasonable to anticipate that the potential reductions would tend to be at the low end of the range.

Overall the research and Hamilton's experience, provides evidence that water is relatively "inelastic", meaning that when the price increases, consumption decreases, but at a lower rate than the increase in price. As stated by CWWA, while water demand elasticity varies both between user groups and seasonal periods, econometric research indicates that water demand in all user classes and all time periods is predominately inelastic.

3. Support Economic Development

The rate structure should align with other economic development initiatives and should support economic development and business retention in the City. This objective is best achieved by ensuring rates are competitive with neighbouring communities. The following table reflects the cost of water/wastewater services in Hamilton compared to a number of municipalities. As shown below, the cost of water and wastewater in Hamilton is lower than the survey average.

2012 Combined Metered Water/Wastewater Charge Comparison with Other Municipalities

Municipality	Small Commercial 325m3	Mid-Size Com/Ind 2,272m3	Large Com/Ind 22,727m3
Brantford	$ 1,134	$ 7,239	$ 71,058
Cambridge	$ 1,158	$ 7,484	$ 71,790
Durham	$ 903	$ 5,633	$ 42,881
Guelph	$ 1,071	$ 6,347	$ 61,780
Halton	$ 876	$ 5,475	$ 44,027
Kitchener	$ 1,113	$ 7,782	$ 77,842
London	$ 1,093	$ 5,170	$ 44,752
Norfolk	$ 1,597	$ 7,053	$ 58,270
Ottawa	$ 1,020	$ 6,994	$ 69,136
Peel	$ 536	$ 3,749	$ 37,497
St. Catharines	$ 1,138	$ 6,590	$ 63,864
Toronto	$ 809	$ 5,657	$ 56,583
Waterloo	$ 1,095	$ 7,495	$ 74,383
Average	$ 1,026	$ 6,352	$ 59,134
Hamilton	**$ 825**	**$ 6,263**	**$ 54,009**
Comparison to Average *	$ (201)	$ (89)	$ (5,125)
% Comparison Average *	(20%)	(1%)	(9%)

* Negative value represents a favourable comparison for Hamilton.

A common strategy employed to reduce the cost of water/wastewater services to non-residential customers is to adopt a declining block rate structure whereby the cost per unit (m^3 of water) decreases as the volume consumed increases. As previously noted, prior to 1993, the Region of Hamilton-Wentworth used a declining block structure for its non-residential customers which was replaced by the uniform rate structure which applies to all metered customers and still is in use today.

Challenges of Hamilton's Current Rate Structure

1. Allocation of Costs to be Recovered from the Fixed Portion of the Bill

As stated by the Canadian Waterworks Association (CWWA), at the heart of the methodology for setting water and wastewater rates is the concept of a two-part rate structure; a volumetric charge and a fixed charge. Hamilton currently utilizes a two-part water and wastewater rate structure recovering a portion of the service costs from a fixed basic charge (based on the size of water meter) and a volumetric charge. This type of structure conforms with guidelines published by the CWWA and is used by the majority of municipalities in Ontario – according to a study conducted in 2009 on behalf of the City of Cambridge, over 70% of the Ontario municipalities surveyed (80+ Ontario municipalities) have a two part rate structure.

The two-part rate structure recognizes the fact that there are fixed costs and variable costs. A fixed cost is defined as any cost that the City will incur regardless of the amount of actual water consumed by the water system and sewage/stormwater treated by the wastewater system. All variable costs relate directly to the amount or volume of water and wastewater provided and treated respectively in both systems. It is important that an appropriate amount of fixed costs are covered by fixed revenues with the remainder of fixed costs and variable costs to be covered by variable revenues.

The issue is water and wastewater operations are very capital intensive and as such, much of the expenditures are fixed; they do not vary as volumes increase or decrease. An analysis of the 2012 Rate Supported Budget was conducted which indicated that *approximately 89% of the rate supported costs are fixed.* Recent studies in other municipalities confirm the high fixed cost nature of water/wastewater utilities (Fixed Cost %: Sarnia 2009 study: 88%; Peel Region 2009 study: 85%; Cambridge 2010 study: 93%).

With such a high proportion of overall costs being fixed in nature, when water consumption amounts within the City are lower than anticipated and are dropping, as experienced over recent years, the City is unable to reduce the fixed costs to offset the lower than anticipated revenues. Therefore, revenue stability would be enhanced if there was a higher allocation of costs recovered from the fixed monthly charge as these revenues are generated regardless of water consumed. This revenue impact reflects there are challenges when the percentage of fixed costs to operate the rate supported systems is significantly higher than the costs that are variable.

CWWA recommends that a fixed rate charge be used for costs that are not related to volumes consumed and relate primarily to customers such as meter reading, billing, customer service and meter repair. Costs that are driven largely by volumes consumed (typically water supply, wastewater treatment, distribution, collection, storage and maintenance costs) are suggested to be recovered through a volumetric rate.
As previously noted, Hamilton's fixed charge does include a minimum water consumption allowance per month which, for accounts with meters up to 20mm in displacement (largely residential customers) represents the first five cubic metres ($5m^3$)

of water consumption. For meters greater than 20mm in size, the minimum consumption allowance per month is the first fifteen cubic metres ($15m^3$). Currently for 2012 the percentage of fixed costs that are recovered through an average residential bill is approximately 35%. Controlling for the minimum consumption allowance which in effect is a variable revenue component within the fixed charge, the contribution to fixed costs for an average residential bill is actually 11%. For larger consumers, the fixed cost portion typically represents a far smaller % of their annual water/wastewater billings.

Reviewing the 2012 Rate Supported budget indicates that approximately 22% of total budgeted rate revenues result from the fixed portions of total billings. This represents a significant shortfall in the recovery of fixed costs where 89% of the rate supported costs are fixed and the City recovers less than a quarter of total costs through the fixed component of the water/wastewater billings.

These shortfalls must then be funded from the consumption or variable rate which fluctuates with water usage. The shortfall in collecting the fixed costs through the fixed component of the water bill contributes to the deficits that the City has faced in rate supported revenues in recent years. Low fixed charges can create the so-called "pricing death spiral" – water consumption is dropping with revenue declining in turn resulting in budget shortfalls and then a need to raise volumetric water prices.

The City's current rate structure, with a relatively small amount of costs recovered from the fixed monthly charge, is more at risk to revenue instability than a municipality with a higher fixed monthly fee. The range of costs allocated to fixed charges vary significantly across Ontario per the 2011 annual survey conducted by BMA Management Consulting Inc. of 80+ Ontario municipalities from a low of 0% (Kitchener, Peel, Markham, Richmond Hill) to a high of 88% (Sarnia). The survey average was 25%.

As illustrated in the survey and as stated by CWWA, there is no single industry standard, as consideration should be given to all of a municipality's overall goals and objectives. For example, municipalities where conservation is a high priority tend to have a lower allocation of costs to fixed; but this comes at a potential increased risk to revenue stability. Municipalities that allocate a large percentage of costs to be recovered from the fixed portion of the bill increase revenue stability; however, this increases the costs to low volume residential customers, which compromises affordability and reduces the incentive to conserve. Ultimately, the approach is to establish the right balance, in consideration of a number of factors. Recouping all possible fixed costs from a fixed charge has to be limited to ensure users can still adopt water efficiency and reduce their rate billings.

The Regional Public Works Commissioners of Ontario (RPWCO) has recommended that municipalities review their rate structures with the intent to move towards a 50/50 fixed-variable allocation of water/wastewater billings. Higher fixed allocations in a rate structure would improve financial sustainability, stabilize revenues and help to mitigate high variable rate increases as water consumption continues to decline.

2. Inclusion of Minimum Monthly Usage

A minimum allotment of water consumption may be included within a fixed charge albeit it is not an industry norm to do so. The allotment is generally set at a very low level of consumption that most customers would use.

Hamilton is unique in that its fixed charge provides for a minimum water allowance so that most residential customers receive the first $5m^3$ of consumption per month – so that effectively this minimum water allowance is not charged at the volumetric rate. This is inconsistent with the practice across Ontario – study conducted for the County of Brant in 2009 identified that only 2 of the 80+ Ontario municipalities surveyed use this practice (Hamilton and County of Brant). As of January 2011, the County of Brant has eliminated the variable consumption component of their fixed water charge citing the change was being done to improve fairness and equity, conservation and ease of understanding.

The provision of a minimum consumption allowance with the fixed charge has created complexity to an otherwise easy to understand uniform rate structure. During the 2010 Rate budget deliberations, staff were asked to review the current layout of the water/wastewater billing invoice that the City's water/wastewater billing agent, Horizon Utilities, issues to customers. Specifically, it was requested that the water billing line items be expanded to show the fixed and variable charge components that comprise the total water/wastewater charges.

In response to the aforementioned staff direction, an Information Update to Council was provided in August 2010. It noted that the bill layout was changed in January 2002 to provide a breakdown of the fixed and variable consumption charges; however, the bill layout was reverted back to its bundled line items after only eight months. The reason for the reversal was a significant increase in customer calls to Horizon Utilities as many customers found the detailed billings confusing because the fixed charge included the minimum consumption charge.

The minimum consumption allowance negatively impacts a number of the Principles including:

- Fairness and Equity & Conservation – a variable rate should apply to all water consumption not to amounts beyond a arbitrary threshold
- Ease of Understanding – customers should be able to receive a detailed water/wastewater bill that is easy to understand

3. Service Size Differentials (Meter Equivalency Factor)

A key consideration in reviewing the fixed charge particularly as it relates to fairness and equity principles is to ensure that the differentials by meter size used to recover fixed costs are appropriate. Similar to the majority of municipalities surveyed and, in conjunction with CWWA/AWWA practices, the City currently charges customers different rates based on the size of the service (meter or pipe size) which is referred to a

meter equivalency factor. Equivalent meter ratios for the meters and services are based on representative metering costs. The costs for installing, maintaining and replacing customer meters and services increase with the size of the service and the corresponding equivalent meter ratio increases for this reason. The principle of using the service size as the basis for different fixed charges assumes the larger the service size the greater the demand that is placed on the City's systems from both an infrastructure and service perspective.

Equivalent meter ratios for the meters and services are based on representative metering costs using a 15-20mm meter as a base. While the City is using weighting factors to define the monthly service charges by service size, this has not been updated in a number of years. Many municipalities rely on industry standard meter equivalent ratios set out by CWWA/AWWA to establish the appropriate meter service cost differentials. These are applied to the costs that are recovered from the fixed monthly charge.

The following table provides the current meter equivalency factors being employed by the City and the recommended factors, using CWWA/AWWA standards:

Typical Customer	Meter/Service Connection Size	# Meters In Service	Current Implied Water ME Ratios	CWWA/AWWA ME Ratios	Recommended ME Ratios
Residential	15 mm	8,161	1.0	1.0	1.0
	16 mm	124,054	1.0	1.0	1.0
	20 mm	3,120	1.0	1.5	1.0
Small Commercial & Multi-Residential	25 mm	1,694	5.3	2.5	2.5
	38 mm	922	5.9	5.0	5.0
	50 mm	2,265	7.0	8.0	8.0
	75 mm	-	12.1	15.0	15.0
Large Commercial, Institutional & Industrial	100 mm	379	15.5	25.0	25.0
	150 mm	111	27.4	50.0	50.0
	200 mm	43	47.4	80.0	80.0
	250 mm	15	72.9	115.0	115.0
	Total	140,764			ME = meter equivalency

As illustrated above, the current meter equivalency ratios used by Hamilton for water and wastewater differ than those recommended by CWWA/AWWA. This results in higher costs to the 25-38 mm meters which are typically serving small multi-residential and commercial customers.

As noted, the City has been using meter size as the basis for fixed charges in lieu of service connection size but in reviewing the fixed charges it is recommended that the fixed charges be based on service connection size going forward. An unintended result of having fixed charges based on meter size there have been requests to down-size meters in order to secure lower fixed charges. However, the City's costs to support the water/wastewater servicing to the property remains unchanged though the cost recovery for this is currently tied to the meter size and thus cost recovery decreases. In lieu of basing fixed charges on meter size would be to use inlet service line size instead

given that service line size may be a more appropriate measure of the property's portion of the overall system.

4. Wastewater (Sewer) Rate Structure

Generally sanitary utilities base their charge for wastewater services upon the volume of water consumed recognizing that there is a strong correlation between the volume of water consumed and the volume of wastewater discharged and that it is not practical to install effluent metering. The majority of sanitary utilities use a uniform rate structure with the rationale being the cost to handle each unit of volume for conveyance is the same, independent of the total volume consumed.

Another common wastewater billing practice is the majority assess their wastewater charge on 100% of water consumption. This does cause some dispute from those consumers with increased seasonal water use arguing that not all of their water consumption is discharged into the sanitary system. Despite this criticism, there has been a growing trend to base wastewater charges on 100% water consumption due to a number of reasons:

- Declining water consumption trend has been observed in Hamilton, across Ontario and Canada with the decline reflected in non-essential water usage (lawn watering, car washing, etc) so that in effect the vast majority of consumers do not have much seasonal usage if any
- Most sanitary utilities determine their wastewater rates by basing it on their total wastewater costs, so any method of discounting summer wastewater charges would require an overall rate increase to balance the loss of revenue so in effect the majority of users would simply subsidize the minority of customers who still have significant seasonal water usage
- Having a 100% metered water volume-based wastewater charge can magnify conservation promotion, simply because customers will realize that they will save on both water and wastewater bills if they use less

As with water rates, it is appropriate to have a fixed charge component as part of the wastewater rate structure. Typically, the fixed charge will include customer service related costs associated with billing and collections. Similarly, as wastewater charges are based on metered water readings, again it is appropriate that wastewater fixed charge share in the costs of the water meter reading. Additionally, a portion of costs associated with the collection and treatment of inflow/infiltration (I&I) can be included in this fixed charge. I&I impact on a wastewater system is more related to the number of customer connections and length of the collection system more so than the total volume of wastewater contributed by customers.

In those jurisdictions where all properties serviced by the utility's water system are exclusively serviced by its wastewater system, such utilities often charge a combined water/wastewater charge rather than separate rate structures. In Hamilton's case, approximately 98% of City water customers have City sanitary connection.

Many utilities recognize some high water using industrial/commercial customers may not discharge a significant portion into the City's sewer system as the water is consumed by the user's product or process by allowing programs that rebate a portion of wastewater charges. Hamilton does offer a Wastewater Abatement Program to ICI customers that can demonstrate that they discharge no more than 75% into the City's sanitary system.

Similarly, the majority of wastewater utilities impose high-strength surcharges for biological oxygen demand (BOD) and total suspended solids (TSS). Hamilton offers Overstrength Agreements that allows customers with one of these agreements to avoid the costs of on-site treatment by taking advantage of excess treatment capacity at the City wastewater treatment facility. Overstrength agreements allow the City to recover the costs for treating these overstrength wastes with 2012 budget revenues of $1.94 million.

Hamilton's Current Wastewater Rate Structure

Hamilton's current wastewater charge mirrors the two-part structure used for water pricing with billings comprised of a volumetric rate and a fixed charge. Customers are billed for wastewater based on a percentage of their water bill. The volumetric charge has been commonly referred to as the "Sewer Surcharge" with the current rate being 100% which has been held at that rate for many years. The use of a surcharge percentage for wastewater rates is not common as most Ontario municipalities employ a separate wastewater rate expressed as $/m3 of water consumed

The costs to build operate and maintain the water and wastewater systems are very different with wastewater costs being generally more expensive particularly with increasingly stringent effluent treatment legislated requirements so to maintain the sewer surcharge at 100% of water charges does not reflect the actual costs related to the wastewater system. Common practice is to reflect the actual cost of providing these sanitary services and adjust the surcharge percentage accordingly.

5. Stormwater Rate Funding

Stormwater management is the term generally used to refer to the programmatic approach that local governments use to control the quantity and quality of stormwater runoff within their jurisdictions. Stormwater runoff is water that flows across the land and over hard surfaces before it's routed into drainage systems and then on to our natural areas such as creeks, lakes and wetlands.

Historically, throughout North America, stormwater infrastructure and operating requirements have largely been funded through general property taxes and less commonly by sewer utility rates or a combination of the two, but a majority of local governments still rely heavily if not exclusively on general property taxes to fund stormwater services. This reliance on property taxes reflects the consideration that stormwater services provide a public benefit and that it is very difficult to measure direct benefits for each property.

In Ontario, most municipalities include storm costs in the property tax calculation which results in every property contributing based on their relative assessed value. Essentially each property owner pays a percentage of their property tax rate to support the storm water program, regardless of the amount of runoff their property generates. Under this approach, some entities also benefit from storm water services but don't contribute to funding these services as some entities are exempt entirely from property tax or are only required to make Payments in Lieu of additional municipal and school taxes (PILs). PILs are payments made to Ontario municipalities by the Federal and Provincial governments for the properties they own.

An increasing number of jurisdictions throughout North America have sought to generate funding for stormwater services in different manners in efforts to improve fairness and equity. Stormwater utility fees are intended to allow a charge to be levied that is proportional to the cost of stormwater service for a property. The charge is not based on the value of a residential property but typically on the size of the lot, the land zoning type of the property or the estimated stormwater runoff contribution of the property. As previously noted, a majority of municipalities continue to rely on property taxes to fund stormwater services as stormwater utility fee structures have often been found to be administratively burdensome and costly to implement and maintain. Additionally, there often remains an imperfect link between what a property is charged and the stormwater service benefits received by a property.

Hamilton Stormwater Funding Background

The City is responsible for managing all aspects of stormwater within its jurisdiction through the planning for and controlling of runoff from rain and snow melt. The stormwater infrastructure includes roadways, ditches, storm sewers, storm sewer manholes and catchbasins, stormwater management ponds and other related facilities. The City is responsible for operating and maintaining the various components and are held accountable to a variety of regulatory agencies such as the Ministry of Environment, Ministry of Natural Resources, Fisheries and Oceans Canada and local conservation authorities for providing and maintaining this infrastructure. The purpose of the infrastructure is to collect and manage stormwater in a manner that reduces downstream erosion, flooding and water-quality degradation. The City does not maintain facilities that are located on private property or that fall under the jurisdiction of other governmental entities such as the local conservation authorities.

Hamilton's stormwater program is currently funded mostly through water and wastewater rates (sewer surcharge) and to a lesser extent by property taxes with development charges contributing to stormwater infrastructure related to new development. Prior to 2004, the stormwater program was funded primarily by property taxes on an area rated basis – stormwater operational costs related to catch basins/culverts/outfalls were not area rated.

Beginning in 2004, approximately 85% of the stormwater management costs were transferred from the tax levy to the rate supported budget. The total transfer of $10.2 million to the rate budget was essentially off-set by the financial savings resulting from

the GST rebate for municipalities effective April 1, 2004. The transfer to the rate supported budget was certainly intended to ease some pressures on the property tax levy. Additionally, the transfer recognized that a portion (approximately 36%) of the City's wastewater (sanitary) system was a combined system with stormwater. In the combined system, the sewers, located primarily in the oldest areas of the City, collect both domestic sewage and stormwater runoff. This combined flow is collected, stored and treated prior to discharge from the Woodward Wastewater Treatment Plant (WWTP).

However, the City has experienced financial challenges under the present funding system. Revenue collected from the water and sewer rates is based on water use. There is no relationship between the volume of potable water used by a resident or business and the need for drainage-related services driven by the volume of stormwater generated from a property. The continued reduction in total water consumption since 2004 has resulted in ongoing revenue pressures for both the water and wastewater programs given an increasingly more costly stormwater program. The 2012 Rate approved storm budget reflects total planned expenditures of just over $20 million (refer to Report FCS11100/PW11086) – this represents a twofold increase of the stormwater costs funded by the rate supported budget since 2004.

In 2009, Council directed staff to determine the feasibility of introducing a stormwater utility rate, to perform additional public consultation and to bring forward recommendations for Council's consideration in June 2011 (refer to Report PW09099). However, at its meeting of February 23, 2011, Council directed that the stormwater public consultation activities be cancelled and the rate funding study tabled. Accordingly, staff have not conducted any further analysis related to the development of a new additional stormwater utility fee.

Subsequently, at its meeting of April 13, 2011, the General Issues Committee approved the following direction:

> *"Staff to report back by June, 2012 with an updated water and wastewater rate structure."*

Additionally, some members of Council have indicated their interest to staff for further review of the stormwater funding structure including the following notice of motion that was deferred at the same April 2011 GIC meeting in light of the direction to provide a rate structure review:

> *"That staff be directed to report back to the General Issues Committee on the inequity of the stormwater management rate in terms of the larger users e.g., big box stores, not paying their fair share."*

Current Stormwater Program Funding

As previously noted, the City's stormwater program is currently funded through water/ wastewater rates and property taxes with development charges funding stormwater infrastructure related to the construction of new development (no development charge funding for ongoing operations and maintenance).

The following table provides the breakdown of operating expenditures and capital financing as reflected in the 2012 rate supported approved stormwater budget:

2012 RATE SUPPORTED STORM BUDGET

OPERATING EXPENDITURES:	**Budget $**
Environmental Services	
Divisional Administration & Support	237,520
Customer Service & Community Outreach	67,516
Service Co-ordination	138,080
Engineering Systems & Data Collection	137,860
Compliance & Regulations	34,210
Laboratory Services	86,900
Environmental Monitoring & Enforcement	152,080
Water Distribution & Wastewater Collection	787,060
Plant Operations & Maintenance	1,677,341
Water & Wastewater Engineering	245,090
Corporate & Departmental Support Services	377,280
Hamilton Harbour Remedial Action Plan	210,000
Financial Charges	56,000
Capital and Reserve Recoveries	(561,096)
Sub-Total Environmental Services	**3,645,841**
Capital and Reserve Impacts on Operating	
Capital Financing	
Storm Contribution to Capital	14,676,000
Contribution for DC Exemptions	3,045,302
Storm Debt Charges	2,478,213
DC Debt Charges Recoveries	(1,473,000)
Sub-Total Capital Financing	**18,726,515**
Transfer to Reserves	**(2,299,280)**
Sub-Total Capital and Reserve Impacts on Operating	**16,427,235**
TOTAL EXPENDITURES	**20,073,076**

The $20 million rate supported stormwater budget reflects that approximately $4 million is funded from development charges with the remaining $16 million funded from water/wastewater rates applicable to properties that have connection to the City's water and/or sanitary system. The sewer surcharge is applied to the billed water consumption with the current 100% surcharge rate having been unchanged for at least the last

decade. Hamilton has historically maintained its surcharge rate fixed at 100%, which has resulted in the increasing annual stormwater costs being funded from the overall water and wastewater revenues and not solely from the wastewater surcharge.

Additionally, there continues to be a portion of the stormwater program funded by property taxes and the 2012 Tax Supported budget reflects nearly $3.1 million to support stormwater services. Consequently, approximately 0.4% of the 2012 tax levy is directed towards supporting the City's stormwater services.

The following table provides the breakdown of the operating expenditures as reflected in the 2012 tax supported approved budget:

2012 Tax Supported Storm Budget	**Current**
Catch Basin Cleaning	$ 150,000
Catch Basin Repair & Maintenance	420,000
Stormwater Rehabilitation (Culverts/Ponds)	2,500,000
Stormwater Total	**$ 3,070,000**

The 2012 total stormwater program with an approved budget of $23.1 million is funded as follows: 87% from the Rate budget and 13% from property taxes.

Ontario Stormwater Funding Practices

Relative to other Ontario municipalities, Hamilton has a rather unique stormwater funding structure that currently utilizes a combination of water/sewer utility fees and property taxes as funding sources. No other Ontario comparator has been identified that utilizes a combination of these funding sources. The majority of Ontario municipalities continue to rely on property taxes to fund their stormwater programs. However, there are a few municipalities that have shifted from property tax funding to a dedicated stormwater rate structure with a summary of practices provided below.

Ontario Stormwater Funding Structures

Funding Source	**Hamilton**	**Ottawa**	**London, Kitchener, Waterloo, Aurora, St. Thomas**	**Majority**
Property Taxes	x			x
Water & Wastewater Fees	x			
Wastewater Surcharge		x		
Dedicated Stormwater Fee			x	

City of Ottawa

Ottawa is the only municipality in Ontario identified that they fund their entire stormwater program via their rate supported budget. Similar to Hamilton, Ottawa uses a volumetric calculation where water users pay based on the cubic metres of water consumed with a surcharge rate (2012 approved rate is 117%) that is applied to the water rate to fund sewer and stormwater services. However, unlike Hamilton, in recent years Ottawa has increased their sewer surcharge rate to meet commitments for implementing stormwater projects – such as their Ottawa River Action plan and the West End Flooding prevention program.

Ottawa, like most other cities in Ontario, has seen water use, and subsequently water and sewer revenues decline over the past decade at a time when the need to support maintenance of an aging infrastructure is increasing and regulatory standards are requiring more stringent quality controls. To minimize the need to continue to raise the water rate to off-set declining water use, the City recently performed a rate structure review of their water, sanitary, and stormwater rate structure to evaluate their short and long term options. As part of that review, the recommendation was made to remove all stormwater costs from the rate supported budget and to recover all stormwater costs on a city-wide basis via property taxes. In 2010, staff were given direction to further examine the options for the recovery of stormwater costs and to date, have not yet reported back to Ottawa Council on this matter.

Specific Sector Stormwater Fees for Hamilton

As noted previously, most of the current stormwater funding in Hamilton comes from the rate revenues which are based on the metered water consumption of those City water users with a City system connection. However, stormwater services are provided throughout the City, albeit at different service levels (ie. open and closed systems), so there are many properties benefiting from stormwater service who currently are not being charged for water/sewer services (for example, parking lots with no service connections). Furthermore, there are properties such as those with large commercial enterprises, which receive the benefit of substantially higher levels of service as measured by runoff generation rates but given relatively lower water consumption are not proportionally supporting the stormwater program through their rate fees relative to the stormwater services the property receives. Therefore, there is a fairness and equity challenge as some properties do not contribute to the funding of stormwater services despite benefiting from it.

In light of above, there has been some interest from Council to examine the potential to apply a unique stormwater fee to specific commercial/industrial properties such as big box commercial sites and commercial parking lots that may generate substantial stormwater runoff and pay little or nothing towards stormwater services as they have modest or no water/wastewater billings.

The City's Legal Services Division was consulted regarding the application of a dedicated user fee for stormwater services for a specific sector and has provided the following analysis for inclusion in this public report:

The City has the authority under the provisions of the Municipal Act, 2001 to enact a fee by-law to recover capital costs and those associated with operating and maintaining the municipal stormwater management system. The City has various means of designing the by-law and calculating the rate and can draw on the models provided by other Ontario municipalities.

The general legal principle dictates that bylaws must operate without discrimination against any one group of ratepayers; however, this principle does not apply where the enabling statute expressly authorizes some form of discrimination. Based on a review of the Municipal Act, 2001, it is permissible under the Act to apply a dedicated stormwater user fee on a specific sector or sub sector as long as it can be fairly and equally applied to all constituents of that class.

If a fee is imposed only on a sector or sub sector, the City can only recover that sector's or sub sector's share of the cost of the stormwater management services. It is not permissible to recover the entire cost of the services from one sector or sub sector.

There may be public policy reasons that warrant against implementing a by-law with such a specific application; for example, since everyone uses and benefits from stormwater services, it may appear unfair and inequitable for one sector or sub sector to be subject to a fee for stormwater services, while the vast remaining sectors are not "paying their share". The threshold for quashing a by-law is high, but that will not necessarily prevent a court challenge to the validity of the by-law and the associated costs in defending against such an application.

Legal Services Division staff can provide further legal advice on this issue in camera should Committee or Council wish to discuss further.

Summary of Water Rate Structure Options

Despite industry trends in rate setting, there is and always will be variation in rate setting practices given that there is no single rate setting approach or rate structure. A variety of rate structures can be used depending on the goals and objectives of the municipality.

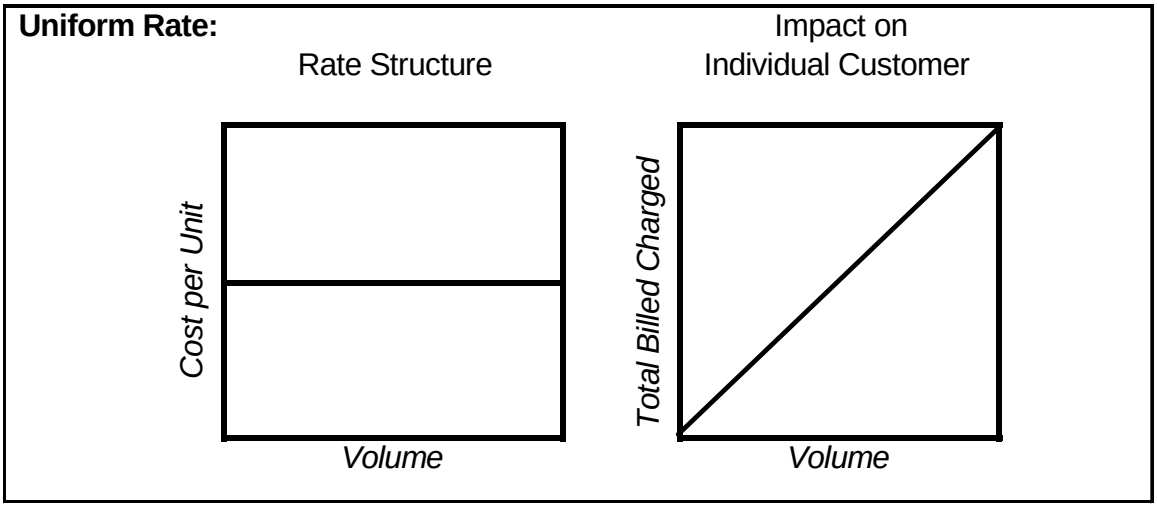
There are a variety of water and wastewater rate structures in use across North America. Generally, most of these structures fit into one or more of the following categories:

Flat (non-metered) fees: A flat fee is assessed, independent of usage. This fee typically is used when water meters are not in place to measure customers' consumption. As per Environment Canada studies, water utilities have been moving away from flat fees as rate and cost of service studies indicate better ways of

distributing costs to customers based upon their respective demands on the system. Typically, the use of flat fees is found with very small utilities and where a business case for metering may not exist. An outcome of the Walkerton Inquiry was a recommendation to the Provincial government that "metering should be mandatory in all sustainable water systems."

Uniform (Constant) Rate Structure: The most common rate structure is the uniform rate for water and wastewater services. A uniform rate structure means that the price per unit remains constant despite consumption and despite the class of user. The cost is calculated by dividing the total cost of the service by the total volume used by customers. This is typically used in conjunction with a fixed monthly cost.

Revenue and rate stability are promoted with this rate structure when reasonably accurate consumption information is available. This is easy to implement and is simple for customers to understand. Assuming that there are no clearly defined capacity based issues or costs associated with capacity, equity is met, such that all ratepayers are treated the same. Conservation is promoted since as water use increases, though the rate stays the same, costs increases. This is the current rate structure employed in the City of Hamilton.

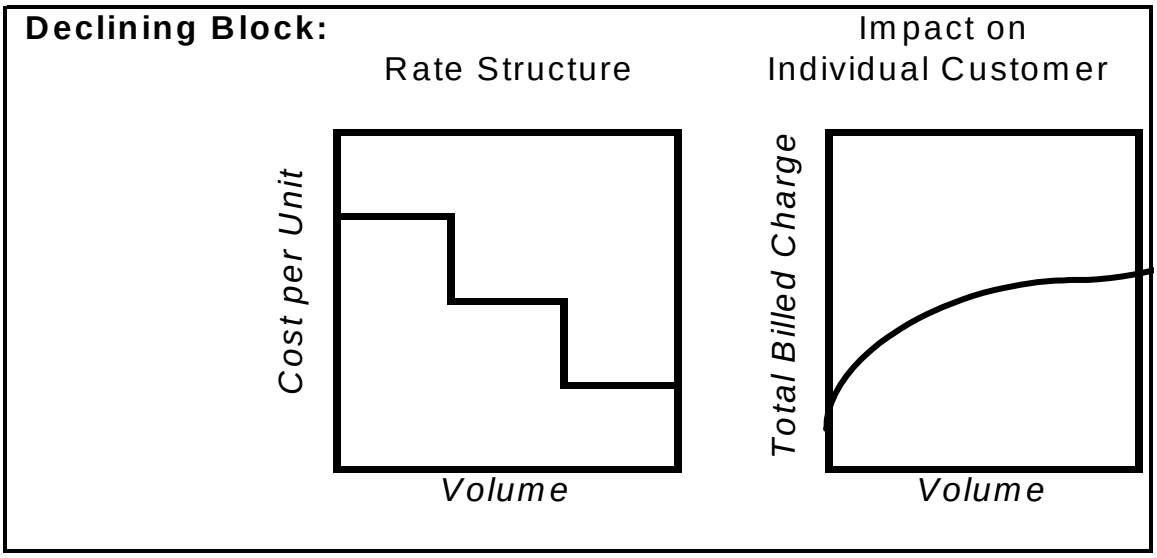


Declining Block Rate Structure: In a declining block rate structure, the unit price of water decreases as the volume consumed increases. This structure charges low volume users the highest rate, which are often residential consumers. This may be used where large industry has a lower cost of service or to promote economic development, however, this approach does not encourage conservation in the ICI sector. This structure is designed to reflect the fact that at a certain level of consumption the costs of providing the service decreases, i.e. the fixed costs of the utility have already been met. A declining rate structure is typically utilized in the commercial class of service where high volumes of water are used in business operations.

Consideration in setting a declining block rate structure includes:

- How many block rates to establish?
- How should the threshold(s) be established?
- What is the impact of discounting rates for large users on smaller users?
- Is it more appropriate to reduce the impact on large users through the fixed, not the volumetric, portion of the bill?
- What is the impact on revenue stability?

The declining block rate structure is used by some municipalities, including the City of London for its ICI sector (water rates), Chatham-Kent, Peterborough, Region of Durham and the City of Kingston.

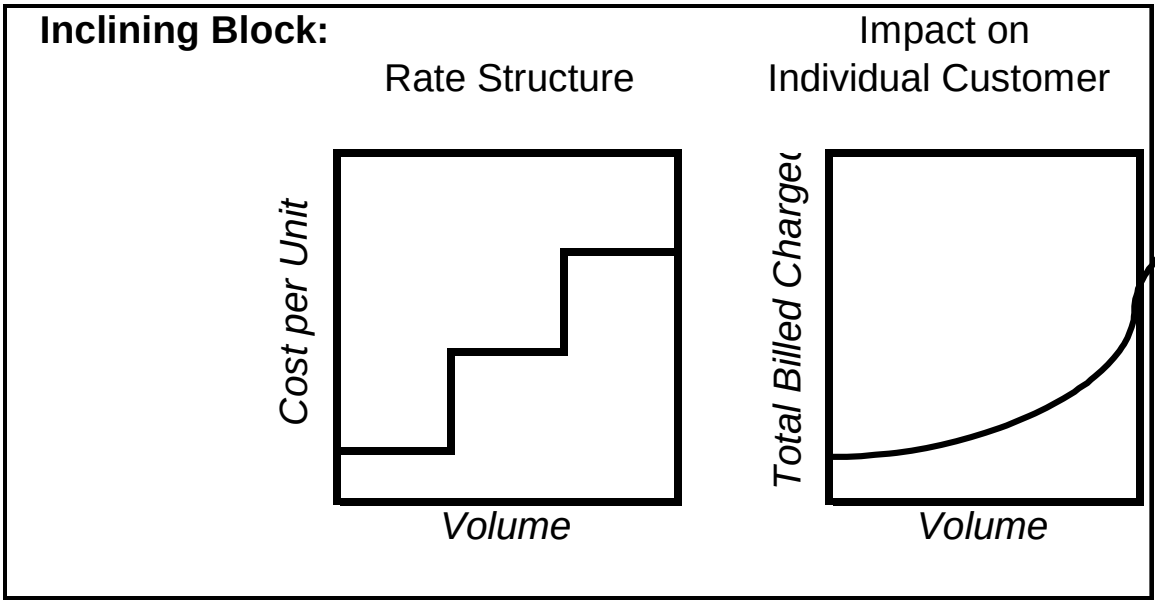


Inclining (Conservation) Rate Structure: The main objective of an increasing block structure is to encourage increased water use efficiency. The rates in an inclining rate structure increase as consumption increases by establishing thresholds or blocks at which the rate would change. For inclining block rate structures, the block (quantity) shift points are generally based upon the unique demand characteristics of each user class and are focused on user demand points to enhance water usage awareness. Customer awareness combined with price incentives, are critical elements in modifying consumption behaviour, hence, pricing alone often does not meet the objective of conservation. Challenges exist in identifying a fair approach for establishing thresholds as average consumption will vary based on family size. Typically, block rate thresholds for residential properties try to establish the first block to reflect indoor water use and the second block to reflect outdoor use.

The cost justification for a progressive rate structure is that because it strives to reduce water demands during peak periods, it reduces the need for obtaining additional water sources and making capital improvements to handle the additional demand. Depending on how the rate blocks are established, inclining rate structures can become quite complicated and subject to claims of unfair allocation of charges and controversy regarding the appropriateness of the blocks that are established. Further, an inclining

rate structure can discourage economic development, and generally can be punitive to the ICI sector as a whole unless the block rate structure is established for the residential class only.

An estimate can be made to capture unique user class block shift points to facilitate the development of cost of service-based revenue collection from specific user classes. Some municipalities elect to establish an increasing block rate structure to encourage conservation, only establishing the block rate structure in the Residential class such as in the case with the City of London. Others use the same inclining block rate structure for all users, (Tillsonburg and Barrie).



Humpback Rate: A humpback rate structure is a hybrid rate structure that uses a combination of increasing and decreasing block rates: rates first increase, then decrease in steps as consumption increases. This approach targets high volume users, and then provides lower cost for really high volume users. The Region of Halton currently uses this type of rate structure.

Seasonal Rates: An interest in water demand management may lead municipalities to consider a seasonal rate structure. Seasonal rates are used to reflect the different consumption requirements between seasons and encourage water conservation during peak summer demand periods. This can be an effective tool to neutralize the impacts of unexpected environmental impacts. Another type of seasonal rate structure is to charge a reduced wastewater charge during summer months to reflect the fact that lawn watering does not enter the treatment plant.

The use of seasonal charges is implemented by some municipalities to deal with peak demands in the summer months. Seasonal charges are normally used in conjunction with a uniform rate system that is in effect from May to September. The economic theory behind surcharges is that prices during peak demand periods should exceed prices during off-peak periods. It is peak use that strains the capacity of the system and

triggers the need for expansion. Therefore, peak users should pay the extra costs associated with system expansion.

Excess Use Rate: An excess use rate structure considers the consumption patterns for each user and charges a premium for the consumption in the peak demand season exceeding a threshold (e.g. a customer's winter use). The advantage to this approach is that it encourages conservation since it is purely consumer-driven and takes into consideration differences in family sizes, (only pay a premium over the user's specific winter month average).

Unlike a seasonal rate which could be punitive towards the ICI sector which may have a fairly regular consumption pattern throughout the year, an excess use rate structure is fairer. However, this approach is administratively more challenging, in that the billing software would need to be programmed to calculate each user's winter average.

Windsor is the only municipality that was identified as using this rate structure where an additional charge (currently $\$0.29/m^3$) is applied to all consumption between May 1st and October 31st in excess of average daily water consumption between November 1st and April 30th.

Time of Use Rate: A time of use rate structure measures usage during specific time periods and charges differential rates (premiums during peak periods). This approach has become the standard in Ontario for electricity pricing and would only be possible for water pricing where electronic read water meters were in place to register measure water use in time periods other than seasons. This is an emerging concept but not implemented in Ontario to date even though an increasingly number of Ontario water utilities have adopted electronic read water metering technology.

Lifeline Rates: A lifeline rate reflects concerns with the ability of residents to pay for water/wastewater services. Although water/wastewater costs are comparatively much lower in relation to other utility costs (eg. electricity, natural gas and cable) and property taxes, it is an essential service. Customers have little choice on the source of potable water supply.

Lifeline rates could be incorporated into an inclining block structure and typically applies to only the first block of consumption intended to cover basic essential water requirements is subsidized. Anything above the first block would be charged at a commercial rate, i.e. based on the marginal cost of service provision.

Strengths of lifeline rates approaches in providing affordable access to basic water/wastewater services for lower/fixed income customers include:

- Lifeline rates are seen as fair and necessary to provide basic levels of service and would be considered as an instrument of social policy and as a way to increase the purchasing power of lower/fixed income customers.

- Lifeline rates are seen as one of many instruments that the government can use to mitigate the burden of increased water/wastewater rates for those customers on low or fixed incomes.

- Restricting the price subsidy to the initial block of consumption offers a less costly alternative to across-the-board price subsidies while preserving universal protection feature.

- Lifeline rates are easy to implement at minimal administrative costs (no means testing) and provide highly predictable support to the lower/fixed income customers

- Lifeline rates also provide an incentive for large consumers to economize on use and thereby further address conservation objectives

However, evidence is mixed whether lifeline rates actually reach their objectives:

- In practice, quantity-based consumption subsidies do a poor job of targeting benefits to the low/fixed income consumers as low/fixed income consumers are not necessarily small consumers.

- Lifeline rates may be regressive if low/fixed income (and more numerous) families consume more than the lower block. This may also be the case when several families are renting a property together.

- Low/fixed income customers may have their water/wastewater costs incorporated into rents as they are tenants and not property owners. In this case, they would therefore not receive the lifeline rate subsidy.

No Ontario municipality has been identified with lifeline rate pricing.

Rate Structures Used In Ontario

The 2011 Municipal Study conducted by BMA Management Consultants provided the following summary of the various rate structures employed by Ontario municipalities:

Structure Type	Residential	Non-Residential
Uniform	66%	66%
Declining	16%	19%
Inclining	11%	6%
Humpback	5%	7%
Flat (non-metered)	2%	2%
Total	100%	100%

City of Hamilton Rate Structure Review Recommended Scope of Work

	Review Component	Status Quo (Current Practice)	Recommended Analysis
1	**Rate Budget Methodology**	• Budget expenses for the three Rate budget services (Water, Wastewater and Stormwater) separately with the revenue funding for these services not budgeted separately. • Industry practice is to budget each service as separate discrete programs each with separate expenses and their own unique rates often with differing rate increases.	• Continue to discretely identify the expenses for all three rate supported services except going forward to budget both the expenses and revenues for wastewater and storm separate from water revenues. - Water service separate with Wastewater and Stormwater treated as one service.
2	**Water Pricing**		
(a)	- **Fixed Charges**	• Hamilton is the only municipality in Ontario that includes the first 5m^3 of consumption each month (>20mm meters first 15m^3) within its fixed charge • This unique inclusion has complicated efforts to provide detailed billings to customers that would be easy to understand • Currently fixed charges are progressive based on meter size. The difference in charges between meter sizes known as the meter equivalency (ME) ratio has not been reviewed for years and does not follow industry standards • Review of 2012 rate budget indicates over 85% of costs are fixed in nature • Fixed charge revenues contributed 22% of total 2012 Rate budget revenues with remainder from volumetric charges	• Analyze the elimination of minimum consumption allowance and develop options to minimize the impact to residential customers through the introduction of a Lifeline Rate applicable to residential customers • Given above examine a changed detailed bill layout to develop a customer friendly water bill • Consider amending base of fixed charges from meter size to inlet pipe size and analyze modification of ME ratios with likely not full adoption of CWWA ratios • Identify impact of above to achieve recommended fixed charge revenue target of 25 - 30% of total rate revenues
(b)	- **Variable Charges (Volumetric Rate)**	• Similar to most other Ontario municipalities, Hamilton currently utilizes a Uniform rate water pricing structure whereby the cost per unit (m3) remains the same regardless of volume consumed. • The uniform rate is applied to all customer classes in Hamilton.	• The introduction of a Lifeline rate would create essentially an inclining block structure for residential customers. • Recommend no further analysis for ICI variable water pricing by continuing uniform rate structure for this sector.

	Review Component	Status Quo (Current Practice)	Recommended Analysis
3	**Wastewater & Stormwater Pricing**	• Mirrors two-part structure of water with Fixed charge and a volumetric rate • Billing based on a % of water bill in lieu of common practice to express rate as $/m3 of metered water (current rate of 100% unchanged for many years). • Follow common industry practice to base charge on 100% of water consumption • Unique stormwater funding sources of both rates and taxes (approximately 85%:15% funding share ratio)	• Study a modified "City of Ottawa" model whereby wastewater and stormwater are budgeted as one service with one surcharge rate funding both services expressing rate as $/m3 of metered water • Continue industry standard to base charge on 100% of water consumption • Continue to maintain funding sources of both rates and taxes with existing approximate funding share ratios