Stormwater Management

Financing Study

City of Brampton
Project # TPB178004

Prepared for:

City of Brampton

2 Wellington Street, Brampton, Ontario L6Y 4R2

Prepared by:

Wood Environment & Infrastructure Solutions

In Association with:

Watson & Associates Economists Ltd.

February, 2020

"Draft Report issued November, 2018"

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February 18, 2020

Michael Heralall, P.Eng.
Senior Manager, Environment

City of Brampton
2 Wellington Street
Brampton, ON L6Y 4R2

Dear Sir,

Re: Stormwater Management Financing Study, City of Brampton

We are pleased to submit the Stormwater Management Financing Study to the City of Brampton. The report summarizes the study of the City's current program for providing stormwater management services, the derivation of a proposed future program, and the assessment of the alternative funding models available to the City. Sincerely,

Wood Environment & Infrastructure Solutions a Division of Wood Canada Limited

Per: Brian Bishop, M.Eng., P.Eng.
Senior Associate

Per: Jean Haggerty
Senior Associate

Watson & Associates Economists Ltd.

Per: Peter Simcisko, BA (Hons), MBE
Senior Project Coordinator

BB/JH/PS/cc/kf

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Executive summary

The City of Brampton initiated this Stormwater Management Financing Study in order to assess its current program for stormwater management, identify gaps in the program, prioritize the various proposed program elements and level of service, and investigate the methods for funding a proposed program.

The City and public recognize the need to maintain the municipal infrastructure, and that stormwater is an integrated piece of the City's infrastructure. With aging infrastructure, there is an anticipated gap growing in the funding currently available and the funding that will be required to not only maintain the existing assets, but to plan for the operation and maintenance of future stormwater management assets.

The City of Brampton owns, operates and maintains over 1,800 km of storm sewers, 37,000 catch basins, 25,000 manholes, and 247 stormwater management facilities (i.e. stormwater ponds and oil & grit separators). In addition, the City owns and maintains over 400 kilometers of watercourses. Management of this infrastructure portfolio encompasses design, construction, operation and maintenance. The replacement value of the stormwater infrastructure is $1.12 billion as of 2019.

The City is currently spending approximately $6.0 million on stormwater management of the assets listed above. A consultation and engagement process was followed, with a Steering Committee comprising members of City and Region of Peel staff, plus consultation with a Stormwater Advisory Group comprised of stakeholders from residential, commercial, institutional groups, as well as the conservation authorities. A public information centre was also held, and surveys and comment forms were distributed at numerous public functions over the course of the study, resulting in approximately 100 forms of public feedback.

A proposed future program of approximately $22.0 million has been recommended by the City Steering Committee and the Stormwater Advisory Group. Based on an examination of available options for financing the program, the City and Stormwater Advisory Group recommended a used fee based on the various types of development, as opposed to the current approach of funding stormwater management services from property taxes.

The City will next undertake a detailed analysis of the rate structure during the implementation phase, from which a final schedule of charges will be derived.

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1.0 Introduction

1.1 Project Background and Scope

Stormwater from rainfall and snowmelt either infiltrates into the ground, or runs above the surface. Stormwater runoff is generated from all surfaces, however the more impervious the surface, the less the stormwater can soak into the ground, and more will become runoff. An urban environment has increased amounts of impervious surfaces which increases both the amount of stormwater runoff, and the rate at which the runoff is transported off the surfaces. Stormwater management (SWM) is the application of practices that are designed to provide protection from flooding and erosion, and protect and maintain the water quality of rivers and streams. The stormwater management system collects, transports, stores and treat stormwater runoff to meet service and environmental objectives. The system includes storm sewers, catchbasins, manholes, stormwater ponds, rivers and streams, flood channels and water quality treatment facilities.

The City of Brampton owns, operates and maintains over 1,800 km of storm sewers, 37,000 catch basins, 25,000 manholes, and 247 stormwater management facilities (i.e. stormwater ponds and oil & grit separators). In addition, the City owns and maintains over 400 kilometers of watercourses. Management of this infrastructure portfolio encompasses design, construction, operation and maintenance. The replacement value of the stormwater infrastructure is $1.12 billion as of 2019.

The City and public recognize the need to maintain the municipal infrastructure, and that stormwater is an integrated piece of the City's infrastructure. With aging infrastructure, there is an anticipated gap growing in the funding currently available and the funding that will be required to not only maintain the existing assets, but to plan for the operation and maintenance of future stormwater management assets. The City is also going to be obligated to address its asset management needs, under new Provincial legislation. Stormwater management systems will also face future pressure arising from climate change and future regulatory requirements, and will likely require strategic, timely capital investments to maintain required levels of service. Across Ontario, Canada, and North America, municipalities facing these funding pressures for infrastructure management have explored, and in many cases adopted funding models that provide a dedicated funding source for their stormwater infrastructure.

Stormwater infrastructure in the City of Brampton currently funded from various sources such as the City's general property tax levy and development fees. . It has been suggested that these funds will not be adequate to meet the needs of constructing new infrastructure or sufficient to maintain and rehabilitate current infrastructure.

The City retained Wood and Watson & Associates (Watson) to undertake a Stormwater Management Financing Study (Study) to identify, review, and evaluate alternative funding approaches. The Study will:

- Quantify the financial pressures on stormwater services
- Investigate alternative funding mechanisms for addressing funding gaps under various levels-of-service scenarios
- Recommend a preferred funding alternative that is transparent, fair, equitable and which does not have a prohibitive administrative burden; and
- Develop a strategy for the City to implement the plan.

The Study is an important step in further defining the City's stormwater infrastructure management plan, which will allow for the prioritization of investments, building community support, and identifying the appropriate options for meeting the program's financial needs. The primary objective of this effort is to provide the City Council and stakeholders with sufficient information to make an informed decision regarding the appropriate funding model for the City's Stormwater Management Services.

1.2 Study Process

The project is being executed in two phases. This report documents Phase One of the project, which was to present a well-developed, publicly vetted stormwater program and funding model to Council for consideration. Phase One includes the establishment of an appropriate level of service, review of funding strategies and rate structure options, a recommended approach and an estimate of stormwater fees to be charged.

Phase Two includes finalizing the details of a ten year stormwater program, consideration of implementation policies (credits, legal exemptions), establishing the final rate fee structure and amount to support the program needs, operational considerations such as bill delivery and management, and delivery of a Stormwater Financing Implementation Report.

The study has been steered by a steering committee comprised of members of City of Brampton staff, and a representative from the Regio of Peel. The committee members are as follows:

City Steering Committee (5 meetings)

Michael Heralall, City of Brampton
Michael Won, City of Brampton
Dave Sutton, City of Brampton
John Zingaro, City of Brampton
Sean Hewitt Region of Peel

In addition to the City steering committee, a Stormwater Advisory Group was formed, consisting of ten to twelve members from the public and government, representing ratepayers, commercial landowners, institutions and conservation authorities.

Stormwater Advisory Group (participants – 5 meetings)

Organization	Stakeholder Type
RioCan	Business
Churchville Ratepayers Association	Residential
TRCA	Conservation Authority
Orlando Corporation	Business
Morguard	Business
Dufferin-Peel Catholic District School Board	School
CVCA	Conservation Authority
Brampton Environmental Advisory Committee	Government
SmartReit	Business
Candevcon	Business
William Osler Health System	Hospital

Stormwater Advisory Group (invitees – declined to participate)

Organization	Stakeholder Type
Sheridan College	Institutional
Church of Jesus Christ of Latter Day Saints	Institutional
Building Owners and Management Association	Business
Brampton Board of Trade	Business
Bramalea Christian Fellowship	Institutional
Guruvayurappan Temple of Brampton	Institutional
Kennedy Road Tabernacle	Institutional
Building Industry and Land Development Assoc.	Business
Citizens for a Better Brampton	Public
Peel District School Board	Institutional

Throughout this study, the City Steering Committee and the consulting team have worked together with a Stormwater Advisory Group to ensure meaningful stakeholder input on key issues. This project involved the engagement of the public as a key element of confirming social acceptance to any changes in stormwater funding levels and financing strategies. A comprehensive outline of the engagement activities that were undertaken as part of the study process is presented in Chapter 2.

1.3 Program Goals and Objectives

At the onset of the study, the Stormwater Services Goals and Objectives were established with input from the Stormwater Advisory Committee. These goals and objectives guided the undertaking and were presented to the public for their input at the public information session. The following paragraphs summarize the goals and objectives.

Goal Statement: *The goal of the Stormwater Management Program is to protect public health and safety and the City's valuable natural and man-made resources by minimizing the impacts of stormwater runoff through on-going system assessments, proactive maintenance and operation of the City's assets, and well-considered investment in system upgrades and expansion.*

Key Objectives:

- Services provided by the City should be clearly defined, be based on an assessment of actual need, and be provided as efficiently as possible
- The City should seek to move from reactive management of stormwater system components to a proactive, priority-based asset management program
- The program should be realistic and achievable and establish clear lines of accountability and decision making.
- The stormwater program plan should be coordinated with on-going planning and growth initiatives to identify efficiencies and should include public participation as a fundamental component.
- Program funding strategies should be a balanced approach and tied to level of service and sustainable financial program goals.

2.0 Communication and Engagement

2.1 Communication and Engagement Plan

Historically, the majority of stormwater infrastructure is underground and stormwater management has been something that is unseen by most citizens. The management and investment municipalities make to their stormwater management systems has been reactive and dispersed throughout multiple departments or addressed through capital funding. However, given the aging infrastructure needs and the increasing intensity of storm events, municipalities must develop a proactive approach for their stormwater management programs. This proactive approach requires financial resources, often in the form of property taxes or user fees.

A robust plan was developed to communicate and engage with the citizens of Brampton on the Study. A copy of the final Communication and Engagement Plan for the Study is presented in Appendix A.

The Communication and Engagement Plan provides details on the Study background and how the plan will be administered. Additional information is also provided regarding the purpose and objectives of the Study, the associated principles of engagement, overall roles and responsibilities, stakeholder identification as well as the tracking and evaluation of activities. The Communication and Engagement Plan divided the Study into four key engagement steps: (1) Planning and Relationship Building, (2) Existing Stormwater Management Program, (3) Recommended Future Stormwater Management Program, and (4) Follow-up.

2.2 Summary of Engagement Activities

2.2.1 Step 1, Planning and Relationship Building

A City Steering Committee (CSC) was established at the onset of the Project. The CSC included key City staff from a variety of departments to provide valuable insights and comments on the Study, as well as one representative from the Region of Peel. The initial plan was presented to and discussed with the CSC. A joint interview was conducted with the CSC to gain a better understanding of the existing stormwater program and functions undertaken by various departments.

The Plan also included the development a Stormwater Advisory Group (SAG). The SAG was composed of interested persons invited from across Brampton and representing various stakeholders including neighborhoods, business, and commercial interests. To support this, Terms of Reference were developed to define the roles and responsibilities of the committee members and identify the level of involvement. Five meetings were scheduled and held between August 2017 and February 2018.

To assist in addressing citizen questions, a Frequently Asked Questions (FAQs) document was developed. The FAQs provided answers to anticipated questions and was updated throughout the Study to address additional reoccurring questions. The FAQs were posted to the City's website and are presented in Appendix A.

2.2.2 Step 2, Existing Stormwater Management Program

During Step 2, several CSC meetings were conducted to review all aspects of the City's existing stormwater management program.

The introductory meeting with the SAG occurred on August 17, 2017. This meeting provided an overview of the Study purpose, goals, and objectives. Copies of all SAG agenda, presentations and meeting notes are presented in Appendix B.

The second SAG meeting was held on September 14, 2017. The focus of this meeting was to review options for the future levels of service for the City's future stormwater management program. The Level of Service analysis is provided in detail in Section 4.

2.2.3 Step 3, Recommended Future Stormwater Management Program

During Step 3, several additional CSC meetings were conducted to develop the City's future stormwater management program.

The third SAG meeting was held on October 19, 2017. The focus of this meeting was to discuss the recommended level of service options for the City's future stormwater management program, as well as various revenue and funding approaches. The fourth SAG meeting was held on November 16, 2017, where the funding framework for the City's future stormwater management program was discussed. The final SAG meeting was held on February 22, 2018. The purpose of this meeting was to discuss budget projections based on the level of service recommendations provided by the SAG previously.

On May 9, 2018, a public meeting was held at Brampton City Hall. Notices were issued by the City and posted to the City's website, released via social media (Twitter), and published in the Brampton Guardian on April 26, 2018. Comment forms were provided at the public meeting and posted on the City's website. The public meeting consisted of an open story board format with City staff and Project Team members present to discuss the Study with the attendees. The display boards presented an overview of stormwater management, the City's current stormwater management program, and the City's proposed stormwater management program, budget forecast and rate structure. Two attendees signed the attendance sheet. One completed comment form was received, which indicated all stormwater management issues and services were of high importance.

City staff attended the Mount Pleasant Village Market on September 27, 2018 to further engage the public on the Study and distribute surveys. One completed survey was received, which advocated for a stormwater charge distribution where residents and business/commercial operations pay their fair share based on their property size.

City staff also provided comment forms and display boards at recreation centers with the highest volume of resident use. These were

- Cassie Campbell
- South Fletchers
- Brampton Soccer Centre
- Century Gardens
- Earnscliffe
- Ching Wellness Centre
- Gore Meadows

These comment forms are attached in Appendix C.

In addition, the City created an online survey via Surveymonkey, and this was made available to solicit public input throughout 2018. A summary of the questions and responses received are presented in Appendix C.

A copy of all public meeting materials, including the notice, presentation, comment forms and surveys, are presented in Appendix C.

2.2.4 Step 4, Follow-up

In preparation for the development of a strategy to implement the findings of the Study, several municipalities who have undertaken similar projects were contacted, and a meeting was held with the City of Mississauga. These findings were discussed with Brampton's Strategic Communications Department. The following recommended follow-up/implementation strategy is proposed. This strategy is staggered to build awareness and reduce the influx of calls that the City should expect as part of the implementation.

Study Follow-up

After approval from Brampton City Council, the Strategic Communications Department will issue a news release and post to social media (City website, Twitter) regarding the approval of the stormwater rate. This information should include a basic Study background, where more information is available, the schedule for implementation, how citizens will be billed and contacts for further information.

It is recommended that this step be completed within two weeks of approval by City Council.

Pre-Implementation Notification

In advance of issuing further information to the public, a communication plan should be developed that includes an update of the City's website with relevant information, including an information brochure, FAQs, by-law, rate schedule, implementation timeline, Study background information, related forms (such as credit program, vacant land, etc.) and contact information.

An information brochure should be developed along with updated FAQs and posted to the City's website. Links to the brochure and FAQs should be issued via Twitter. The brochure should be issued to each household and affected business in hardcopy or if an electronic means is used then a prominent link should be included. The updated FAQs should be made available to Council and staff (in particular those answering phones, such as Service Brampton, or addressing inquiries) to ensure consistent messaging.

Following the existing branding, the brochure should include:

- What is stormwater management?
- Brampton's stormwater management program of services
- Stormwater Rate (including how it is being implemented)
- Tips for Reducing Stormwater Runoff
- Contacts

The FAQs should be updated in response to the types of questions the City receives; however, it should aim to answer the following questions:

- What is the stormwater rate?
- Why is the stormwater rate needed?
- When and how will the stormwater rate be billed?
- What are the stormwater rates and how are they calculated?
- Will the stormwater rate be included in my pre-authorized payment plan withdrawal?
- What steps can I take to reduce my rate or can I receive a credit?
- Does the rate increase annually?
- I am a property owner but lease to tenants – who is charged and who pays?

- I am a residential property but charged a commercial rate.
- My property classification has changed.
- I own a residential condominium unit, what rate am I charged.
- My development is new and has advanced mechanisms to address stormwater runoff already, why do I have to pay?

The City may also wish to consider developing an information video to further messaging, similar to that developed by the City of Mississauga (http://www.mississauga.ca/portal/stormwater/charge).

It is recommended that this step be completed approximately 2-4 months in advance of the first billing.

Implementation

The developed brochure should be issued with the first bill that includes the stormwater rate. Ideally, the bill should clearly identify the 'stormwater rate' and provide footnotes, which identify where more information can be found (i.e., website link). The updated FAQs should be made available to City Council and staff (in particular those answering phones, such as Service Brampton, or addressing inquiries) to ensure consistent messaging. Specific technical and financial questions should be forwarded to individuals in the respective departments.

Further information should be provided on reporting an error, requesting to review where individual property classification and/or assessments conflict with the rate, and how to help manage stormwater on individual properties.

3.0 Current Services Review

3.1 City of Brampton Stormwater System

The City of Brampton owns, operates and maintains over 1,800 km of storm sewers, 37,000 catch basins, 25,000 manholes, and 247 stormwater management facilities (i.e. stormwater ponds and oil & grit separators). In addition, the City owns and maintains over 400 kilometers of watercourses spanning four watersheds (Credit River, Etobicoke Creek, Mimico Creek, and Humber River).

In addition, there are numerous private stormwater management components that are present on private property, and which taken together, provide this important environmental service. Private stormwater management systems are outside the City's jurisdiction and warrant no consideration in this Study. Private stormwater management systems are subject to Ministry of Environment, Conservation and Parks regulations and guidelines.

The stormwater management system is authorized, planned, designed and maintained according to various legislative and regulatory requirements. These include:

Legislation

- Ontario Water Resources Act (quality, quantity, and erosion control)
- Ontario Emergency Management and Civil Protection Act (as stormwater system has a role to play in mitigating floods)
- Canadian Fisheries Act (water quality and temperature)
- Ontario Water Opportunities Act (asset management)
- Conservation Authorities Act (flooding and erosion, watercourse/wetland/woodlot protection)

Guidelines

The City design guidelines are required to be followed for stormwater management infrastructure. Additional design guidelines which may apply include: Region of Peel, Credit Valley Conservation, Toronto Region Conservation Authority, Ministry of Environment, Conservation and Parks, Ministry of Transportation, Ministry of Natural Resources and Forestry, and the Department of Fisheries and Oceans.

3.2 Current Stormwater Management Program

Stormwater infrastructure management in the City of Brampton is spread across the operations and budgets of several City departments. There is no designated stormwater division and responsibility for the operation and maintenance of the City's stormwater-related services is currently supported primarily by staff from divisions within the Departments of Public Works and Engineering, and Planning and Development Services. Corporate Services also provides administrative services related to the stormwater program in the areas of finance and budgeting, information technology, and legal support.

The stormwater management program involves planning and designing, capital construction, operations and maintenance. Typical activities are:

- Asset planning
- Operation and maintenance of stormwater ponds
- Design and implementation of new capital stormwater projects
- Camera inspections and condition assessments of storm sewer systems

- Rehabilitation and renewal of storm sewers
- Engineering review of development applications that includes stormwater infrastructure to ensure compliance with engineering criteria and standards and achievement of environmental objectives.
- Watercourse rehabilitation, and implementation of erosion and flood protection works

3.2.1 Current Program Overview

To facilitate the assessment of the existing program for the City of Brampton, reports on assets, annual budgets, and other stormwater-related studies were reviewed. Approximately twenty (20) City staff were asked to answer questions about stormwater-related services currently being provided and to note areas of specific concern. A combination of individual responses and Department-based responses were collected. Based on a review of City staff responses and follow-up interviews in March and April 2017, current stormwater-related services were identified and a detailed estimate of operations and maintenance and capital program costs based on labour time, contracted services, and overhead costs were developed.

A. Labour Time

The estimated total staff time to provide the current level of stormwater services is 17.5 full time equivalents (FTE). The following list provides additional details on staff engaged in stormwater-related services by division, title and the typical amount of their time they spend annually on stormwater services.

- Public Works and Engineering
  - Development Engineering
    - Engineering Technologist – 1 FTE
    - Technicians – 3.5 FTE
    - Construction Inspectors – 3 FTE
    - Supervisor – 0.9 FTE
  - Roads Maintenance Operations
    - Maintenance Person – 1 FTE
    - Contract Administration Operations Technician – 0.25 FTE
    - Contracted Services, Manager – 0.25 FTE
  - Parks
    - Parks Maintenance staff – 3 FTE
  - Capital Works
    - Project Engineer – 1.75 FTE
    - Technologist, Program Planning – 1.7 FTE
- Planning and Development
  - Planning Policy and Growth Management
    - Planner – 0.9 FTE
- Corporate Services
  - Information Technology
    - GIS Technician – 0.25 FTE

B. Contracted Maintenance Services

In addition to City staff working on stormwater operation and maintenance services, the City also regularly contracts out stormwater maintenance activities. These contracts are typically managed by the Roads Maintenance staff. The stormwater contracted services and the estimated annual expenditures for 2017 included the following:

- Street sweeping - $662,200
- Sweepings Waste Recyling - $100,000
- Catch Basin Cleaning - $588,000
- Storm Sewer Flushing - $150,000
- Minor Pond Maintenance (trash removal, mowing)- $116,000
- Underground Locates - $200,000
- Closed Circuit TV Inspections - $138,000

C. Capital Improvements

Over the past several years, the City has set aside capital improvement funds to address stormwater pond restoration and long-term stormwater management needs. In the 2017 Capital Budget, $2.5M has been targeted for major stormwater pond dredging and restoration projects and $200,000 authorized for additional stormwater management studies. For 2018, there was no capital budget set aside for stormwater pond restoration.

D. Indirect Support Functions

A number of City divisions or departments provide indirect support for stormwater management services. The City has reported annually the costs associated with these support functions as part of the Financial Information Return administered by the Ministry of Municipal Affairs and Housing. The following services are captured in the City's calculation of Program Support Costs:

- Budgeting
- Compensation Management
- Facilities and Property Management
- Fleet
- Health & safety
- HR Counselling
- IT Application Delivery & Data Management
- Infrastructure Tool Access (Data & Voice)
- Insurance/Risk Management Administration
- Labour and employee relations
- Mailroom
- Payroll
- Program Accounting
- Purchasing
- Printing & Graphic

E. Third party Stormwater Support Services

Third parties including the Toronto and Region Conservation Authority (TRCA), the Region of Peel, the Ministry of Environment, Conservation and Parks (MECP), and the Ministry of the Environment and Climate Change (MOECC) play supporting roles in local stormwater management including permit review and assistance with spill control and clean-up, flow monitoring, and public outreach and coordination.

3.2.2 Current Program Assessment

For ease in tracking and reporting on current stormwater program activities, program functions have been grouped into four (4) categories:

1. Stormwater System Operation and Maintenance – cleaning of stormwater ponds, repairing and replacement of stormwater pipes, catch basins, manholes, and sewer outfalls
2. Asset Management - maintaining an inventory of all stormwater assets and updating mapping and assessment data on major stormwater system components
3. Stormwater Planning and Management - assessing and prioritizing long-term stormwater management needs
4. Capital Project Management - performing engineering, design, and project management of capital stormwater system improvements

The following sections give a more detailed description of the current major stormwater responsibilities and operations in the City, grouped by function as listed.

A. System Operations & Maintenance (O&M)

The City has an extensive stormwater infrastructure system with some assets having been installed over 50 years ago. To ensure the on-going proper operation of this system, and to extend the useful life of the infrastructure, critical maintenance activities such as storm sewer flushing, pond maintenance, street sweeping, and catch basin cleaning are required. Specific services currently provided, either by City staff or through contracted service agreements, include:

- Storm sewer flushing and inspection
- Catch basin cleaning and repairs
- Culvert inspection and maintenance
- Street sweeping
- Inspection and routine maintenance of City-owned stormwater ponds
- City-owned storm pond grass cutting
- Watercourse management and ditch maintenance (tree removal and vegetation cutting)
- Investigation and tracking of stormwater-related complaints
- Utility locates request
- Pre-storm system maintenance including clearing grates in advance and during storm runoff and post-storm emergency response support
- Sewer outfall inspections
- Slope maintenance and stabilization
- Engineering and technical support for capital improvement projects

B. Asset Management

To maintain and protect stormwater infrastructure, the City manages an inventory of assets and monitors current levels of service and life cycle trends. These assessments are used to plan and schedule appropriate rehabilitation and reconstruction activities and to forecast capital budgetary needs, both short term and long term. Stormwater-related asset management services include:

- Mapping of the stormwater conveyance system in GIS. The database of pipes and system components was originally developed by manually entering data from as-built drawings and is updated with digital information from new and redevelopment activities.
- Performing an on-going conditions assessment using closed circuit cameras (CCTV) to inspect the interior of the stormwater system components. The plan is to complete the conditions assessment within 4-5 years.
- Using GPS to locate infrastructure and to identify and track problem areas.

The City's stormwater assets include approximately:

- 1,800 km of storm sewers
- 25,000 manholes
- 37,000 catch basins
- 247 stormwater management facilities (180 ponds and oil & 67 grit separators)

The storm sewers within Brampton discharge to numerous creeks within the urban area of the City. Accordingly, the creeks are part of the stormwater conveyance system which requires maintenance, but are not included in the asset valuation which tracks man-made system components.

The City's stormwater infrastructure had an estimated replacement value of approximately $1.06B in 2017. Within the industry, considering a 100-year useful life for most infrastructure, it is recommended as a best practice that one-percent of total asset value be invested annually in capital rehabilitation or replacement. This capitalization should be set aside to provide funding to ensure on-going effective performance of the systems in place. If this standard were to be followed in the City, the capital infrastructure funding would need to be set at roughly $11M annually. Note that the existing asset values do not include new infrastructure or upgrades to existing infrastructure which are the result of new development.

Table 3.1. Stormwater Infrastructure Value by Type

Stormwater Asset Type	Replacement Value
Storm Sewers, Manholes, Catchbasins[1]	$827,000,000
Stormwater Management Facilities[3]	$225,000,000
Oil and grit Separators	$2,700,000
Total Replacement Cost	**$1,054,700**

Notes:
1. Storm Lines include all sewer and catch basin leads; asset value from City 2017 data.
2. Sixty-seven (67) owned, with a $40k replacement cost per unit.
3. Storm pond (180 – 104 owned, 56 built, 20 undocumented) asset value from City 2017 data, with a replacement cost of $1,250,000 per facility.

C. Stormwater Planning and Engineering

Stormwater planning and engineering services cover a broad range of tasks, from reviewing stormwater plans as part of a new development through enforcing design standards and managing major stormwater master planning activities. Specific planning and engineering services currently provided by the City include:

- Management of drainage and watershed planning studies
- Establishment and enforcement of drainage design standards and floodplain protection issues.

- Review and approval of development site plans, and subdivisions, to ensure infrastructure is being designed and installed in compliance with local design standards
- Oversight of water quality protection issues related to erosion and sediment control, illicit discharges, spills and hazardous waste management.
- Coordination of local policy and growth initiatives related to stormwater management (low impact development and implementing more sustainable development approaches).

D. Capital Improvements

Over the past decade, the City has undertaken several major studies on watershed management and stormwater pond retrofit needs, as well as a city-wide Stormwater Management Master Plan. Using the information from the Stormwater Master Plan (2008) and Stormwater Retrofit Study (2015), it is estimated that there is an existing capital backlog of at least $64M and that as part of the existing annual budget process, the highest priority projects will be scheduled first as funding is available.

City staff is responsible for implementing approved capital infrastructure projects and over the past several years the City has undertaken several stormwater pond restoration projects per year. In 2017, $2.5M has been budgeted to support the restoration of up to five (5) major stormwater pond dredging and restoration projects.

3.3 Summary of Current Program Cost and Sources of Funding

3.3.1 Summary of Cost of Existing Services

Based on the data gathered outlined above and the information gathered as a result, the current budget for public stormwater services in Brampton is estimated at approximately $6.5M. The table below provides a breakout of the estimated costs of labour, contracted services and capital budgets for FY 2017:

Table 3.2. Estimated Cost of Current Program

Activity	Current (2017) Cost
Operations & Maintenance	
O&M Contracted Services	
Street Sweeping	$ 642,000
Sweeping Waste Recycling	$ 100,000
Catch Basin Cleaning	$ 588,000
Storm Sewer Flushing	$ 150,000
Pond Maintenance	$ 116,000
Underground locates	$ 200,000
CCTV	$ 138,000
O&M Labour Costs	
Road Operations	$ 108,884
Parks	$ 157,903
Engineering & Planning	
Engineering & Planning Labour Costs	
Development Engineering/Construction	$ 724,258
Planning/Growth Management	$ 79,221

Activity		Current (2017) Cost
	Roads Design	$ 288,062
	IT/GIS Mapping Support	$ 27,500
Capital Improvements		
	Stormwater Pond Restoration	$ 2,500,000
	Stormwater Management Study	$ 200,000
	Totals	**$ 6,019,828**

As noted in section 3.2.1 above, the City also allocates Program Support Costs to stormwater services. The Program Support Costs have been estimated at $444,684, based on the City's 2016 Financial Information Return adjusted for inflation.

3.3.2 Sources of Funding

The City's stormwater program is currently funded predominantly from the general tax levy. There is a relatively small portion of Development Engineering/Construction costs that are assumed to be recovered through engineering fees imposed by the City. These fees are estimated to offset approximately 1.4% of the annual costs of stormwater services, with the remaining 98.6% of costs being recovered through property taxes.

3.4 Preliminary Identification of Stormwater Program Needs, Gaps and Priorities

Through interviews with staff and review of existing documents, a preliminary list of potential program gaps and known limitations within the existing stormwater management program in Brampton was identified. To assist with further defining specific areas which needed enhancement, a list of program objectives was developed. These objectives were discussed with the Steering Committee and the Stormwater Advisory Group, before being finalized as follows:

- The City should seek to move from reactive management of stormwater system components to a *proactive, priority-based asset management program*
- Services provided by the City should be *clearly defined*, be *based on an assessment of actual need*, and be provided *as efficiently as possible*
- The program should be *realistic and achievable* and establish *clear lines of accountability* and decision making
- The stormwater program plan should be *coordinated with on-going planning and growth initiatives* to identify efficiencies and should include *public participation* as a fundamental component
- Program funding *should be fair, equitable, and transparent* and tied to level of service and sustainable financial program goals

By discussing these issues and reviewing options, the following specific program priorities were developed. It is assumed that additional staff or other resources will be required to address these program needs, as discussed in the next section on the future program plan.

- Implement a more proactive maintenance program with a focus on creeks, Oil and Grit separators, catch basins, stormwater ponds, and outfalls

- Use closed circuit TV to inspect the remaining portions of the drainage system to assess conditions, identify problem areas, and prioritize repair and replacement needs. Use an Asset Management system to manage the data and provide a framework for setting and communicating priorities.
- Increase investment to decrease the stormwater pond cleaning and restoration backlog
- Adopt a financial plan and invest in system-wide capital improvement needs now to avoid more expensive "maintenance by emergency," And implement priority capital improvements in a timely manner.
- Upgrade design standards to address more practical, sustainable practices such as low impact development and use of "green" best management practices (promoting stormwater reuse and infiltration)
- Educate the public about the services provided and the importance of effective stormwater management
- Provide more staff training and develop standard operating procedures to ensure efficient, quality services

4.0 Future Program – Level of Service Review

4.1 Future Stormwater Program Plan and Projected Annual Expenditures

Review of the current services, as described in the section above, has shown gaps between existing levels of service (LOS) and the desired level of service needed to support a sustainable program that effectively protects public health and safety and existing public and private investment. To better quantify the operational and financial impacts of increasing the LOS to meet known needs, a matrix was developed that provided options for enhancing the stormwater program of services. The matrix looks at program gaps or needs, including information on existing LOS, risks associated with maintaining the existing LOS, required minimum LOS, and program gaps and needs to achieve various levels-of-service beyond the minimum. In general, a Low level of service meets the basic needs for the City, with less frequent maintenance and less staff. This is also typically checked against Regulations for any legislated minimum level of service, which the City would typically choose to meet. Medium Level of Service typically involves a more frequent inspection or maintenance program, and more staff time requirements. High Level of Service typically involves an even higher level of maintenance, more inspection and more frequent cycles for maintenance, with the added cost of addition staff. Depending on the gaps identified, and prioritizing of program elements, the City may select a combination of Low, Medium, and High Level of Service.

This matrix was reviewed with the City's Steering Committee and the citizens' Stormwater Advisory Group, and the result was specific recommendations for enhancing twelve areas of service. The matrix is attached in Appendix D. The information below summarizes the recommendations on the desired future level of service and projected annual cost to implement. Note that the recommended LOS is not necessarily the highest or optimal LOS, rather it is based on the prioritizing of the program elements, and takes into consideration such factors as regulations and municipal/asset management best practices.

PROGRAM NEED	RECOMMENDED LEVEL OF SERVICE
A. Stormwater Operations and Maintenance (O&M)	
A.1. *Regular inspections of stormwater infrastructure*. Currently there is no dedicated inspection staff for existing infrastructure.	MEDIUM LOS: Add one inspector and one temporary staff (student) dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $120,000.
A.2 *Regular Pond Maintenance:* Stormwater management ponds require regular monitoring and cleaning (not including dredging) to insure they are functioning properly. Currently the maintenance program for stormwater management facilities (ponds) is limited by resources. Dedicating additional resources for regularly scheduled inspections, monitoring, and maintenance will ensure their function and longevity.	HIGH LOS: Increase baseline level of service to establish a pond monitoring and inspection program with the goal of evaluating each pond on a 5-year cycle (approximately 36 ponds per year). Assign a priority based on monitoring and inspection and undertake minor maintenance (not including dredging) on an additional 26 ponds per year (for a total of 36 per year). Estimated additional cost: $195,500

PROGRAM NEED	RECOMMENDED LEVEL OF SERVICE
A.3. *Provide proactive maintenance to support maximum system capacity and longevity. The* City currently has about 38,000 catch basins and current cleaning contracts provide cleaning of approximately 6,000 per year (or a cleaning cycle of once every 6.3 years.). Though city staff do provide some additional cleaning in problem areas, increasing the level of service provided by the contactors would allow a more proactive approach to long term catch basin maintenance.	LOW LOS: Increase the annual budget to fund catch basin cleaning system of 30% of the system per year (11,400 catch basins). Increasing the level of service to cleaning the basins on a 3.3-year cycle would cost an additional $540,000 per year.
A.4. Implement a City-wide CCTV inspection program - inspections	LOW LOS: 4% of system to be inspected per year (approximately 75 km out of 1.830 km of pipe) - budget $120,000
A.5. Implement a City-wide storm sewer pipe repair program. Industry standard guidelines recommend setting aside 1% of asset value per year to cover maintenance and repair over the expected life of the asset (100 years for pipe).	MEDIUM LOS: Budget $7,750,000 (representing 1.0% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement when needed.
A.6.*Ensure increase in O&M is commensurate with estimates of growth*: The current replacement value of the City's stormwater infrastructure has been estimated at over $1B. Having made this significant investment, the City now needs to support a program that will extend the life of these assets. With a population of 627,500 in 2016, Brampton's population is expected to reach 842,300 people by 2031 (an average increase of 2.2% per year) and with that growth will come additional stormwater infrastructure needs.	LOW LOS: Increase identified basic funding level by 2.2% per year ($132,000) to help alleviate costs related to growth - to be adjusted annually
B. STORMWATER PLANNING AND ENGINEERING	
B.1. *Add GIS Analyst for Stormwater Tracking and Mapping.* In support of asset management, CCTV data management, planning, and field operations, add dedicated GIS resources for updating and maintaining mapping and related geo-databases.	MEDIUM LOS: Assign a full-time stormwater GIS analyst to manage and update stormwater GIS data on existing and new assets. Estimated cost $68,000 per year.
C. CAPITAL IMPROVEMENTS	
C.1. *Stormwater Pond Cleaning:* The City currently undertakes major maintenance of stormwater ponds (dredging and disposal of accumulated sediments) based on priorities derived from estimates of sediment removal efficiency. This initiative has received funding of $2 - $2.5M per year since 2011, and this level of	MEDIUM LOS: Dedicate an additional $3,500,000 annually for pond cleaning. This would allow for the current inventory of ponds to be cleaned once every 15 years.

PROGRAM NEED	RECOMMENDED LEVEL OF SERVICE
investment represents the minimum LOS for pond cleaning.	
C.2. Stormwater Retrofit *Capital Investments:* The findings from several recent studies demonstrate the need for significant investment in erosion control and water quality protection. This will be achieved through implementation of stormwater pond retrofits in uncontrolled areas, or areas not meeting current regulatory targets. The current identified backlog is over $64 M ($47M for WQ retrofits, $17M for temperature retrofits).	LOW LOS: Dedicate $2,560,000 annually to reduce the retrofit Capital Improvement Program (CIP) backlog. At this rate, existing known CIP needs would be addressed in 25 years.
C.3.*Watercourse Capital Improvements*: The City has over 400 km of streams and watercourses under its ownership. These consist of natural and engineered channels, and maintaining the system in a state of good repair requires investment in erosion protection and restoration.	LOW LOS: Budget $800,000 per year for watercourse maintenance. The 50-year LOS would support approximately 400m of creek work (repair/stabilization) per year (as per the estimate in the SWM Master Plan).
C.4. *Stormwater capital program coordinator*: To address capital improvements at an increased pace, the City will need a balance of dedicated staff, supportive stakeholders, and available capital funding. The stormwater program will need to be integrated with other infrastructure projects to ensure efficiency and to maximize sharing of resources. To lead this integrated effort, a stormwater coordinator needs to be identified and given the responsibility to manage the work in an efficient, fiscally responsible way.	LOW LOS: Assign a full time stormwater coordinator to manage an integrated stormwater capital program. The new staff would also be responsible supporting/presenting at public participation opportunities. Estimated cost $90,000
D. STORMWATER PROGRAM FINANCIAL ADMINISTRATION	
D.1 *Stormwater Education and Outreach*: It is a priority in the City to support public engagement and education and it is a key component for setting priorities and building community understanding and support. As the stormwater program takes on new challenges, a coordinated, consistent, and accessible outreach and education program will be critical to gaining and maintaining community support	HIGH LOS: Assign a full-time stormwater outreach coordinator to plan and implement outreach and education plans. Estimated cost $80,000 per year plus materials ($6,000) for $86,000

The total estimated cost, without adjusting for inflation, to implement the enhanced level of services recommended above, would be approximately $16M. Note: this falls within the potential overall range of between $10.3 M (if all Low LOS were selected) and $25.1 M (if all High LOS were selected).This would be in addition to the $6.5M cost of current services. The table below details the additional cost in relation to the current program spending.

5.0 Future Program – Forecast Operating and Capital Expenditures

5.1 Future Stormwater Program Plan and Projected Annual Expenditures

Table 5.1. Brampton Projected Stormwater Program Costs

Activity	Current (2017) Cost	Additional Cost of Recommended LOS
Operations & Maintenance		
O&M Contracted Services		
Street Sweeping	$ 642,000	
Sweeping Waste Recycling	$ 100,000	
Catch Basin Cleaning	$ 588,000	$ 540,000
Storm Sewer Flushing	$ 150,000	
Pond Maintenance	$ 116,000	$ 195,000
Underground locates	$ 200,000	
CCTV	$ 138,000	$ 120,000
Storm Sewer Repair program		$ 7,750,000
O&M Labour Costs		
Road Operations	$ 108,884	
Parks	$ 157,903	
Infrastructure Inspections		$ 120,000
Engineering & Planning		
Engineering & Planning Labour Costs		
Development Engineering/Construction	$ 724,258	
Planning/Growth Management	$ 79,221	
Roads Design	$ 288,062	
IT/GIS Mapping Support	$ 27,500	
GIS Analyst		$ 68,000
Stormwater Program Coordinator		$ 158,000
Stormwater Outreach/Education Coordinator		$ 60,000
Capital Improvements		
Stormwater Pond Restoration	$ 2,500,000	$ 3,500,000
Stormwater Management Study	$ 200,000	
Retrofit Capital projects		$ 2,560,000
Watercourse Capital improvements		$ 800,000
Growth Fund (2.2%)		$ 132,000
Totals	**$ 6,019,828**	**$ 16,003,000**

Developing and implementing a more sustainable stormwater program is not expected to happen overnight. Changes need to be integrated into the existing programs and staff and funding resources need to be acquired. Moving to the recommended level of service is expected to realistically take 5 years or more. To demonstrate the potential impacts to annual program costs over a multi-year horizon the Table below shows how the City could implement the recommendations over a five-year planning period.

In addition to the LOS adjustments identified in preceding sections of this report, the table below incorporates estimated costs related to financial administration of the stormwater program and estimated administrative charges that the City of Brampton could expect to support billing services. Billing operation charges include additional Call Centre staff in the first year of the program rollout, and temporary employees to handle data entry and initial setup of the billing system in the first two years of the program rollout. It is intended to partner with the Region of Peel to provide billing and collection, and cost sharing of existing Region of Peel employees that currently handle the stormwater charge billing for the City of Mississauga.

City of Brampton
Stormwater Services Budget Forecast
Constant (2017) Dollars

	Current (2017)	Additional Cost of Recommended LOS	LOS Reference	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
OPERATING EXPENDITURES													
Program Administration & Support													
Stormwater Program Financial Administration	-	257,000		257,000	257,000	257,000	257,000	257,000	257,000	257,000	257,000	257,000	257,000
Billing (Region of Peel water bill)	-			**780,000**	**375,000**	**325,000**	325,000	325,000	325,000	325,000	325,000	325,000	325,000
Allocation of Program Support	444,684			444,684	444,684	444,684	444,684	444,684	444,684	444,684	444,684	444,684	444,684
Operations & Maintenance - Labour Costs													
Road Operations	108,884	-		108,884	108,884	108,884	108,884	108,884	108,884	108,884	108,884	108,884	108,884
Parks	157,903	-		157,903	157,903	157,903	157,903	157,903	157,903	157,903	157,903	157,903	157,903
Infrastructure Inspections	-	120,000	A.1	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Operations & Maintenance - Contracted Services													
Street Sweeping	642,000	-		642,000	642,000	642,000	642,000	642,000	642,000	642,000	642,000	642,000	642,000
Sweeping Waste Recycling	100,000	-		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Catch Basin Cleaning	588,000	540,000	A.3	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000	1,128,000
Storm Sewer Flushing	150,000	-		150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Pond Maintenance	116,000	112,500	A.2	228,500	228,500	228,500	228,500	228,500	228,500	228,500	228,500	228,500	228,500
Underground locates	200,000	-		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
CCTV	138,000	120,000	A.4	258,000	258,000	258,000	258,000	258,000	258,000	258,000	258,000	258,000	258,000
Engineering & Planning Labour Costs													
Development Engineering/Construction	724,258	-		724,258	724,258	724,258	724,258	724,258	724,258	724,258	724,258	724,258	724,258
Planning/Growth Management	79,221	-		79,221	79,221	79,221	79,221	79,221	79,221	79,221	79,221	79,221	79,221
Roads Design	288,062	-		288,062	288,062	288,062	288,062	288,062	288,062	288,062	288,062	288,062	288,062
IT/GIS Mapping Support	22,500	-		22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500
GIS Analyst	-	68,000	B.1	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000
Stormwater Program Coordinator	-	158,000	C.4	**90,000**	**90,000**	**158,000**	158,000	158,000	158,000	158,000	158,000	158,000	158,000
Stormwater Outreach/Education Coordinator	-	60,000	D.1	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Growth Fund (2.2% - $132k annually)	-	132,000	A.6	132,000	264,000	396,000	528,000	660,000	792,000	924,000	1,056,000	1,188,000	1,320,000
Total Operating	**3,759,512**	**1,567,500**		**6,039,012**	**5,766,012**	**5,916,012**	**6,048,012**	**6,180,012**	**6,312,012**	**6,444,012**	**6,576,012**	**6,708,012**	**6,840,012**
CAPITAL EXPENDITURES													
Storm Sewer Repair Program	-	7,750,000	A.5	**1,550,000**	**3,100,000**	**4,650,000**	**6,200,000**	**7,750,000**	7,750,000	7,750,000	7,750,000	7,750,000	7,750,000
Stormwater Pond Restoration	2,500,000	3,500,000	C.1	**4,000,000**	**4,500,000**	**5,000,000**	**5,500,000**	**6,000,000**	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000
Stormwater Management Study	200,000	-		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Retrofit Capital projects	-	2,560,000	C.2	**1,000,000**	**1,400,000**	**1,800,000**	**2,200,000**	**2,560,000**	2,560,000	2,560,000	2,560,000	2,560,000	2,560,000
Watercourse Capital improvements	-	800,000	C.3	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000
Total Capital	**2,700,000**	**14,610,000**		**7,550,000**	**10,000,000**	**12,450,000**	**14,900,000**	**17,310,000**	**17,310,000**	**17,310,000**	**17,310,000**	**17,310,000**	**17,310,000**
Grand Total Capital & Operating	**6,459,512**	**16,177,500**		**13,589,012**	**15,766,012**	**18,366,012**	**20,948,012**	**23,490,012**	**23,622,012**	**23,754,012**	**23,886,012**	**24,018,012**	**24,150,012**

6.0 Funding Framework

Creating a rational relationship/nexus between the stormwater management services and the manner in which they are funded is foundational to creating a stable, legally defensible, equitable and adequate funding strategy. In assessing the potential revenue streams for stormwater services, the evaluation of data and the selection of a preferred methodology is a critical step in choosing an equitable way to distribute stormwater fees across a community.

The public process involved the development and dissemination of material over several months through the City Steering Committee, the Stormwater Advisory Group, and a public information centre, with the goals to educate stakeholders, to build consensus for support of stormwater management investments, and to offer strategies for implementing a change in service funding. Though this consultation process and the development of the preferred LOS and corresponding program it was determined that the City required a segregated funding source to provide sustainable financing for this critical infrastructure. As such the following reviews the various approaches for establishing a segregated funding source and process used to arrive at the preferred funding structure.

6.1 Current Funding Sources

The City's stormwater services, as defined through this Study, are presently funded from three sources:

General Tax Levy – Stormwater services are currently predominantly funded from the general tax levy and reserves.

Development Fees – Stormwater service costs related to the review and inspection activities for development applications are recovered from development fees (i.e. planning applications, engineering fees, zoning compliance fees and building permit fees).

6.2 Alternative Funding Models

An important question with respect to establishing a stormwater funding structure is identifying the underlying charging parameters that most closely relate to the benefits of service received. In this regard, there are several approaches which have been used by municipalities in various North American jurisdictions. A brief commentary is provided for each type of funding structure:

Property Taxes – this is the predominant funding approach used by most municipalities throughout Ontario. The net expenditures for the service are added to the tax levy and recovered from properties based on the assessed value of each property. There is no clear relationship between the benefits of service received by a property and the basis for paying the cost for the service, other than ability to pay.

Flat Rates – Generally, the total cost for the service is divided by the number of properties to provide a "per property" charge. The rate may be varied by type of user to denote some variation in the service received (e.g. modification for non-permeable land area). Dependent on the use of service benefit factors to modify flat rates, the level of service received and cost of service may not necessarily directly correlate.

Land Area – This approach recognizes a relationship between the volume of water which may be derived from the land, and the size of the land. While area is a key factor for the amount of rainfall consumed by a property, this approach does not directly reflect the rate at which the water migrates from the property into the municipal storm system. Similar to the modified flat rate approach above, modifications of land area for storm water run-off produce a charging basis closer to the benefits of service received.

Utility Rate – this approach imposes a charge based upon the metered volumes of water consumed by constituents as measured through water meters. This is used by municipalities that recover stormwater

service costs through water and wastewater rates. While this approach provides a segregated revenue source (i.e. user rate funded vs tax funded) and stormwater is traditionally included within the definition of wastewater, there is little correlation between the benefit of service and cost of service. Moreover, not all benefiting landowners may be included in the recovery of water and wastewater fees, whereby rural or private service customers without municipal water meters would be exempt from such fees.

Run-off Coefficient – The percentage of rainfall that migrates as stormwater run-off from a property (or surface) is called the run-off coefficient. These coefficients are used by engineers as part of a formula for calculating the amount of run-off from a property. Generally, very grassy, vegetated lands have a low run-off coefficient whereas lands with large amounts of hard surfaces (parking lots, buildings, etc.) have a high run-off coefficient. Applying these factors to a flat rate or a land area fee structure would provide a calculation which takes the size of the property (or class of property) and the character of the property into account when determining the charge. Under this approach a run-off coefficient could be developed for various property classes and imposed on a property specific basis based on the constituent land area and calculated impervious area, or on a flat rate basis reflecting the characteristics of the broader property class (e.g. residential, non-residential, etc.).

Impervious Area of the Properties – very similar to the run-off coefficient approach however this approach is based on the actual measured (or sampled) amount of imperviousness for each property as opposed to a property type. To calculate this rate structure, a very detailed analysis of each property must be undertaken by GIS and aerial mapping measurements.

6.3 Survey of Municipal Practice in Ontario

A survey of Ontario municipalities with specific stormwater rates was undertaken to compare rate structure approaches. Table 6.1 contains the survey of 14 municipalities including the municipalities of Aurora, Guelph, Hamilton, Kitchener, London, Markham, Middlesex Centre, Mississauga, Newmarket, Ottawa, Richmond Hill, St. Thomas, Vaughan, and Waterloo. Half of the 14 municipalities surveyed use a tiered flat rate approach, modified for stormwater runoff. Of the remaining municipalities, only one imposes a utility rate. Municipalities that utilize a modified flat rate structure can be segregated into two general types – i.e. those with highly aggregated fees (e.g. residential and non-residential) and those with disaggregated fees (e.g. low-density residential, high density residential, etc.) These two general types can be further subdivided into municipalities that impose the fees based on specific imperviousness characteristics of each property, and those that impose fees based on general imperviousness characteristics of the property type (e.g. residential as a whole).

Table 6.1. Summary of Ontario Municipality Stormwater Rate Structures

Municipality	Type of Rate Based Structure	Rate Categories
Markham	Flat Rate Charge per Property	Residential
	Current Value Assessment	Non-residential
Ottawa	Residential - Flat Rate per Property (by property type, Urban & Rural)	Residential (RS) and Multi-Residential (RA) - Urban/Rural
	Non-Residential - Tiered Flate Fee (based on CVA, Urban/Rural)	ICI - 8 CVA ranges/categories - Urban and Rural
Aurora	Flat Rate Charge per Unit	Residential and condominium properties
		Non-residential and multi-residential properties
Richmond Hill	Flat Rate Charge per Property	Residential and farm properties
		Industrial, commercial, multi-unit, and condominium properties
Hamilton	Utility Rate (based on water consumption)	Residential - 2 tiers (based on monthly consumption)
		Non-residential
London	Flat Rate Charge per Property	Land area 0.4 hectares or less
		Residential land area 0.4 hectares or less without a stormdrain within 90m
	Rate per hectare	Land area above 0.4 hectares
St. Thomas	Flat Rate per Property	Residential & commercial/institutional under 1,800 m^2 land area
	Rate per Hectare	Commercial/institutional over 1,800 m^2 land area & all industrial
Middlesex Centre	Flat Rate per property	Base rate for all properties within settlement areas
	Rate per hectare	Industrial, Commercial and Institutional customers with properties larger than 0.4 hectares (rate applied to all hectares above the 0.4ha threshold)
Vaughan	Flat Rate Charge per Property	3 Residential categories
		Agricultural/vacant
		3 Non-Residential categories
Waterloo	Flat Rate per Property (by property type & size)	3 residenital categories & 3 multi-residential categories
		3 institutional categories & 4 industrial/commercial categories
Newmarket	Rate per square metre of total land area, differentiated by Runoff Level Group	Low runoff level group (e.g. natural areas, vacant properties, golf courses etc.)
		Medium runoff level group (e.g. residential and institutional properties)
		High runoff level group (e.g. Commercial, industrial and mixed-use buildings)
Kitchener	Tiered Flat Fee (based on property type and size of impervious area)	10 residential categories
		6 non-residential categories
Guelph	Flat Rate Charge	Residential - applied to every detached home, townhouse, apartment, and condo
	Rate per Equivalent Residential Unit (ERU) based on impervious area (ERU multiplier = impervious area/188 m2)	Industrial, commercial, and institutional properties
Mississauga	Tiered Flat Fee (based on roofprint area)	5 categories for Single Residential properties
	Rate per m^2 of impervious area (impervious area individually assessed for each property)	Multi-residential & non-residential properties

The following subsections provide a more detailed overview of the funding approaches used by Mississauga, Vaughan, Markham, Richmond Hill and Kitchener.

The City of Mississauga introduced a stormwater charge in 2016. The charge appears on Region of Peel water bills. Residential properties are classified into one of five tiers (smallest – largest) based on the total rooftop area on the property. For non-residential and multi-residential properties, a total number of billing units is calculated by dividing the total hard surface area on a property and dividing it by 267 m^2 (which represents the average hard surface area on a single detached property). The calculated number of billing units is then multiplied by a stormwater rate to obtain the annual charge. Mississauga offers a stormwater credit of up to 50% for non-residential properties that utilize stormwater management technologies and best management practices that reduce the impact of stormwater runoff from their property. The city also provides subsidies for low income seniors and persons with disabilities.

The City of Vaughan introduced a stormwater charge in 2017. Prior to that stormwater services were funded through property taxes and the city's wastewater fee. The stormwater charge appears on the utility bill once a year. Charges were calculated by categorizing similar properties, estimating the total land area associated with each property category and applying a runoff coefficient. All properties pay a flat charge, based on the type of property as determined by the MPAC Property Code. Residential properties are classified into one of three categories, based on the density (i.e. low density, medium density, and high density). Non-residential properties are classified into on of three categories based on the total property size. There is also a category for large non-residential properties that are outside of the city's urban

boundary, and a category for agricultural/vacant properties. The city does not currently offer a stormwater credit program.

The City of Markham introduced a stormwater fee for residential properties in 2015, and for non-residential and vacant properties in 2016. This fee is applied to the final tax bill for each property owner (charges appear as a separate line item on the tax bill of the property). The fee is imposed on a flat-rate basis for all residential properties. Non-residential and vacant properties pay a fee per $100,000 of current value assessment. Properties with a CVA of less than $100,000 and properties owned by the city are exempt.

The City of Richmond Hill introduced a stormwater management rate in 2013. The rate is applied to the water and wastewater bill for properties that use municipal water. Properties that do not use municipal water receive and annual bill specifically for the stormwater management rate. The stormwater management rate is applied on a flat rate basis to all residential (excluding multi-unit) and farmland properties. A higher flat rate applies uniformly to all non-residential, mixed-use, multi-unit, and condominium properties. Residential condominiums are charged the non-residential rate for each water service connection to the property.

The City of Kitchener implemented a stormwater charge in 2011. The stormwater charge appears on the city's monthly utility bills. All landowners that have impervious surfaces on their property receive a utility bill for stormwater services. The stormwater rate is a flat fee per property, varied by type of property. Single detached residential homes pay a flat fee based on the size of the building's footprint. There are three size categories for single detached homes. Residential townhouses, semi-detached dwellings, and residential condominiums pay a flat fee per dwelling unit (the charge per unit is different for ach of these types of properties). Multi-residential properties with two to five dwelling units pay a flat fee per building, based on the number of dwelling units. Multi-residential properties with more than five dwelling units pay a flat fee for each dwelling unit. Non-residential properties are classified into one of six categories based on the amount of impervious area on the property. Kitchener offers both residential and non-residential credits. Residential credits have a maximum credit of 45% and are based on the volume of stormwater which is diverted from being discharged to the municipal stormwater management system. Non-residential and multi-residential properties can also qualify for a credit with a maximum of 45%. Out of this maximum credit, 25% is granted for quantity controls (flood prevention),15% is granted for quality controls (pollution reduction), and 5% is granted for educational programs related to stormwater management.

6.4 Assessment of Alternative Funding Models

6.4.1 Assessment Criteria

"Ease of Calculation" – is a criterion to capture the relative data intensity required to support a given funding calculation. In the presence of good data, any given funding structure can be calculated with relative ease, but the difficulty lies in the ability to obtain and maintain a comprehensive and accurate data source.

"Linkage between Cost Paid and Benefit Derived from Services" measures how closely the amount paid by any given property owner reflects the benefits of service received. Although all City residents benefit from a well-functioning stormwater system, property owners with more impervious areas on their properties produce more stormwater runoff, and hence place higher demands on the City's infrastructure. Under the current funding model utilized by the City, property owners with higher property values pay more for stormwater services, even though there is no clear link between property value and stormwater service benefits. A more direct linkage between the amount paid and the benefit derived from services is considered desirable, and funding structures that provide this are therefore preferred.

"Cost of Administration" – although a funding structure that is well supported by data and provides a tight relationship between the ultimate cost to, and benefits received by, the person paying them may be more desirable, the costs of administering such a funding structure typically rise. This is an important consideration because any increase in the costs of administration would have the effect of diverting funding from actual stormwater system needs. Therefore, the benefit of recovering service costs from benefiting parties needs to be measured against the costs of implementation.

"Users' Control over Charging Mechanism" – this metric considers how much control a property owner has over the amount they have to pay. More control in this regard is considered a positive attribute, and therefore funding structures that provide the property owner with a greater degree of control are ranked higher. For example, under a funding model that charges flat rate per property, the property owner would have little control over the charge for service.

6.4.2 Assessment of Alternatives

Table 6.2 provides the spectrum of options for stormwater cost recovery and the ranking of each relative to various service criteria discussed in the previous section.

Table 6.2. Spectrum of Options for Stormwater Cost Recovery

Funding Model	Basis of Calculation	Ease of Calculation	Linkage between Amount Paid and Benefit Derived from Services	Cost of Administration	Users' Control over Charging Mechanism
Property Taxes	Tax rate applied to assessed value	Easy	Low	Low	Medium
Flat Rate per Property	$/property	Easy	Low	Low	Low
Utility Rate	$/m^3 of water consumption	Easy	Low	Low	High
Run-off Coefficient by Property Type	$/unit (varied by type)	Medium	Medium	Medium	Low
	$/m^3 of water consumption	Medium	Medium	Medium	High
Impervious Area Sampling by Property Type	$/unit (varied by type)	Medium	Medium	Medium	Low
	$/m^3 of water consumption	Medium	Medium	Medium	High
Run-off Coefficient by Actual Land Area per Property	$/impervious acre	Hard	High	Medium/High	Medium

Funding Model	Basis of Calculation	Ease of Calculation	Linkage between Amount Paid and Benefit Derived from Services	Cost of Administration	Users' Control over Charging Mechanism
Impervious Area Sampling by Actual Land Area per Property	$/impervious acre	Hard	High	Medium/High	Medium
Actual Impervious Area per Property	$/impervious acre	Hard	High	High	High

Generally, moving from the top to the bottom of the table tightens the relationship between the amount paid and benefits derived from the service. However, the costs to populate and maintain the "denominator" for the calculation also increases as you progress down the table.

Property Taxes

Property taxes are presently utilized by the City to fund the vast majority of the stormwater service needs. Property taxes are considered easy to calculate since this is a funding model currently in use and hence data is readily available to support assessment calculations. Similarly, the cost of administration is considered low since the City already maintains a tax database and has the resources in place to maintain and update it as needed. Property assessment is not considered a good proxy for the benefits that a given property receives from the City's stormwater system. However, property owners have some control over how much they pay, as they may choose a property with a different assessment.

Flat Rate per Property

Charging a uniform flat rate per property would be the easiest approach both computationally and administratively. Data on the number of properties is readily available through the City's tax database, and determining an appropriate flat fee would simply entail dividing the net costs of the stormwater system by the number of properties. From an administrative perspective, a flat rate approach would be quite inexpensive, as each year the number of properties would simply be adjusted for any subdivisions/severances that take place. However, this type of funding structure provides no direct link between the amount paid and the benefits derived from the stormwater system, as it does not capture any property characteristics and simply treats every property the same. Additionally, property owners would not have any control over how much they pay, since every property owner would be paying the same amount.

Utility Rate

Similarly to property taxation, utility billing is an established mechanism available to the City of Brampton via the Region of Peel, and therefore consumption data is readily available to support assessment calculations. Cost of administration is also considered low, since this would be no different than the current annual updates to water and wastewater rates. Volumetric utility rates provide customers with a high degree of control over how much they pay, by giving them the option of adjusting water consumption patterns. A weak area of the utility rate approach is its disconnect from system benefits. There is little evidence of a correlation between water usage and imperviousness of properties.

Run-off Coefficient by Property Type

This funding structure would group properties into categories (e.g. low-density residential, commercial, industrial, etc.) and subsequently runoff coefficients would be applied to the assumed land area within each category to come up with an estimate of impervious area within each category, and within the City as a whole. The relative share of total impervious land would drive the share of system costs that are borne by each property category. The share of costs attributed to a category would then be spread evenly over the number of properties within it or, alternatively, over the estimated volume of water consumption for that category. As such, all properties within a single category (e.g. low-density residential) would pay the same fee (either per property or per unit of water consumption), but this amount would be different from the amount paid by other property categories. Such an approach recognizes that there are distinct physical differences between different types of development and property types. For example, residential properties tend to have a smaller proportion of impervious area relative to commercial properties. Users' control over the charging mechanism in this case depends on whether the charge is applied by property (low degree of control) or by unit of water consumption (high degree of control). There is an improvement of the linkage between costs and benefits as compared to the funding structures described above. Data requirements and calculations are considered somewhat more difficult, since impervious area needs to be calculated for each property category. Administratively it becomes somewhat more difficult and expensive to maintain such a funding structure, because the relative distribution of costs between property categories would need to be recalculated each year to account for the effects of continued development in the City.

Impervious Area Sampling by Property Type

This approach is very similar to applying run-off coefficients by property type. However, instead of making assumptions on appropriate run-off coefficients, imperviousness characteristics would be determined for each property category by means of statistical sampling from the City's GIS. The ranking of this approach would be the same as for the above (run-off coefficient by property type) albeit there is a possibility that the link between costs and benefits would be slightly improved.

Run-off Coefficient by Actual Land Area per Property

Taking the Run-off Coefficient by Property Type approach a step further, this method would apply run-off coefficients to each individual property's land area, thereby estimating each property's impervious area. Summing the impervious areas of all properties would facilitate the calculation of a charge per impervious acre, which would then be applied to each property's estimated impervious area. The data requirements to support these calculations are greater, as the land area of each property would have to be known. Although the City's tax database contains size information for most properties, there are also properties with missing size parameters. There would be additional effort, requirements and costs associated with assessing the properties with missing size information, and annual costs of maintaining and updating the property database could potentially be significant. However, since each property's size would be taken into account individually, the linkage between the cost paid and the benefits derived from the system would potentially be greatly improved. Furthermore, property owners would exercise some control over the charging mechanism through their choice of property.

Impervious Area Sampling by Actual Land Area per Property

Borrowing elements from the previous two funding structures discussed, this approach would apply run-off coefficients determined through statistical sampling to each property's actual land area.

Actual Impervious Area per Property

As the heading suggests, this approach would require actual measurement of the impervious area of each property, either physically, through GIS, or through a combination of both. Each property owner would then pay an amount directly proportionate to the amount of impervious area on his or her property, and consequently the link between costs and benefits would be very strong. Property owners would also have a high degree of control over the amount they are required to pay, since they have direct control over pertinent site characteristics such as the amount of paved cover (size of driveway, patio, etc.). On the other hand, the desirable attributes of this rate structure come at a significant cost from an initial data acquisition and rate calculation perspective, as well as from the annual data maintenance perspective.

6.4.3 Recommended Funding Model

Similar to other components of this Study, stakeholder consultation played an important role in the assessment of alternative funding options. All of the various options were discussed in Steering Committee meetings, and subsequently presented to the Stormwater Advisory Group for their input. To formalize the feedback received, the SAG were given handouts where members were asked to rank each of the funding options in terms of the criteria presented in Table 6.2. A sample handout provided to SAG members to complete is included in Appendix B. The ranking exercise produced indeterminate results for the Stormwater Advisory Group, as the two respondents that completed the ranking forms provided inverse rankings relative to each other.

Based on the criteria for selecting a funding model (transparency, fairness, equitability), a hybrid funding model emerged as the preferred option, consisting of a tiered flat rate for residential properties and a rate based on measured impervious area for non-residential properties. Therefore, all subsequent financial analysis was carried out on this basis.

7.0 Rate Analysis

7.1 Introduction

Rates in their simplest form can be defined as total costs to maintain the utility function divided by the total expected amount of a charging parameter to be generated for the period. The charging parameter could, for example, be the volume of water consumption, number of properties, or hectares of impervious area. Total costs are usually a combination of operating costs (e.g. staff costs, distribution costs, maintenance, administration, etc.) and capital-related costs (e.g. past debt to finance capital projects, transfers to reserves to finance future expenditures, etc.). These operating and capital expenditures will vary over time. Examples of factors which will affect the expenditures over time are provided below.

Operations

- Inflation;
- Increased maintenance as system ages;
- Changes in costs reflecting level of service investments; and
- Changes to Provincial legislation.

Capital Related

- Replacement capital needed as system ages;
- New capital emplaced or built as areas expand;
- Financing of capital costs is a function of policy regarding reserves and direct financing from rates (pay as you go), debt, and user pay methods (e.g. Development Charges).

Chapter 6 summarizes the process undertaken to arrive at the preferred funding structure for stormwater services. The following sections describe the analysis undertaken to calculate the range of potential impacts resulting from the preferred funding model. It is noted that additional work will be required to develop detailed rate calculations for the City's preferred funding structure. More specifically, the City will need to undertake GIS work to determine the impervious area of each non-residential property, and to sample the impervious area associated with various types of residential properties. As such, this chapter provides an estimate of potential impacts of the rate structure, and these estimates will need to be further refined once the GIS work is completed.

7.2 Financial Model

7.2.1 Operating and Capital Expenditure Forecast

The detailed operating and capital expenditure forecasts provided in Chapter 5 were presented in constant (2017) dollars to better demonstrate the effects of the various LOS recommendations affecting annual stormwater program expenditures. However, inflationary pressures over time will also impact expenditures, and therefore inflationary adjustments were applied in the rate calculations. For operating expenditures an annual inflation rate of 2.04% was applied, reflective of the average annual increase in the Canadian Consumer Price Index over the period 1997-2017. Capital expenditures were indexed at a rate of 3.50% annually, commensurate with the average annual increase in the Non-residential Building Construction Price Index over the period 1997-2017.

7.2.2 Operating Revenue

The City has operating revenue sources such as new development infrastructure inspections, administrative fees, and plans review fees that contribute towards operating expenditures. These operating revenues have been projected over the forecast period and included in the rate determination calculations. These revenue sources are relatively small, totalling approximately $87,000 in 2017 (2.3% of annual stormwater operating expenditures), and are projected to increase based on inflation.

7.2.3 Sources of Capital Funding

Reserve Funds

The City does not currently have an established reserve fund dedicated to stormwater infrastructure. It is recommended that the City establish a dedicated stormwater reserve fund, regardless of the funding model which ultimately may be utilized. This would allow the funds to be segregated for their intended use for stormwater management, so that these funds do not need to compete with other corporate initiatives. Additionally, a dedicated reserve fund would provide for a stable funding base, eliminating variances in annual funding requirements. This is accomplished by allowing an accumulation of funds during periods of lower capital replacement needs, and enabling draws on the reserve fund during periods of higher capital replacement needs.

As identified in section 5.1, moving to the proposed level of service is expected to realistically take 5 years or more. Consequently, the capital funding requirements are expected to grow gradually over the next five years. However, through consultation with the City Steering Committee it was determined that the financial model should provide for funding the full program costs from year one. The resultant excess revenues relative to expenditures would be contributed into the dedicated stormwater reserve fund to help offset future capital expenditures. Therefore, the financial model provides for $26.4 million of contributions to the dedicated stormwater reserve fund in aggregate over the 2019-2022 period.

Debenture Financing

Although it is not a direct method of minimizing the overall cost to the ratepayer, debentures are used by municipalities to assist in cash flowing large capital expenditures.

The Ministry of Municipal Affairs regulates the level of debt incurred by Ontario municipalities, through its powers established under the Municipal Act. Ontario Regulations 403/02 provides the current rules respecting municipal debt and financial obligations. Through the rules established under these regulations, a municipality's debt capacity is capped at a level where no more than 25% of the municipality's own purpose revenue may be allotted for servicing the debt (i.e. debt charges).

It should be noted, however, that the issuance of debt should be managed at levels sustainable by the municipality. Issuance of large amounts of debt in any one year can have dramatic impacts on taxes and rates. Hence, proper management of capital spending and the level of debt issued annually must be monitored and evaluated over the longer-term period.

Within the context of the City's stormwater program, projections show that, with a dedicated stormwater charge, debt financing would not be required over the forecast period.

Development Charges

The City does not currently impose development charges in respect of stormwater services. However, the City may wish to consider this funding mechanism if capital expenditures to accommodate new development arise in the future.

7.2.4 Growth Forecast

In preparing the rate forecasts for a 10-year period, a number of assumptions were necessary to project the service demands and changes in charging parameters. In modeling the status quo option (i.e. funding stormwater services from property taxes), current value assessment (CVA) was estimated for each year of the forecast period. Based on consultation with City staff, weighted assessment was projected to increase at a rate of 7.4% annually.

To estimate the potential impacts of imposing a stormwater charge based on imperviousness characteristics, a forecast of property numbers by type was required. As the City of Brampton undergoes development, vacant developable lands become subdivided and in turn as lots are developed ultimately result in residential or non-residential property types. To model this relationship, the residential unit growth forecast and non-residential gross floor area (GFA) forecast from the City's 2014 Development Charges Background Study was utilized. Residential units were converted into land area by applying assumptions of units per acre for low, medium, and high density residential units. Similarly, for non-residential development, land coverage assumptions were applied to projected GFA growth to estimate land area growth within each non-residential category, i.e. commercial, industrial, and institutional. The total annual increase in developed land area was then subtracted from the agricultural/vacant property type, and the number of properties in this classification was reduced by the same proportion.

7.3 Stormwater Rates

In order to provide the City with an estimate of ratepayer impacts resulting from the stormwater program, detailed calculations were undertaken for a potential stormwater charge based on the imperviousness characteristics of different property types. The analysis also provides a comparison to the impact that could be expected if the City maintained its current funding approach of utilizing the property tax levy.

7.3.1 Property Classification

City staff provided the 2016 tax database, which includes all properties within the City of Brampton. The tax database includes 162 unique property codes, and each roll number is assigned one of these property codes. These 162 property codes were mapped to seven broad property types, including:

- Commercial
- Industrial
- Institutional
- Agricultural/Vacant
- Residential (Low Density)
- Residential (Medium Density)
- Residential (High Density)

A detailed mapping of the property codes into broader property types is provided in Appendix E.

Once the property codes were classified by property type, the total land area of each parcel was extracted from the City's tax database. There were a number of parcels with missing land area, and in these cases land area was imputed based on average land area of other properties with the same property code. Runoff coefficients were subsequently applied to the total land area within each property type category in order to estimate the impervious area for each of the property types. Runoff coefficients measure the proportion of rainwater that runs off a property as a result of not being able to absorb into the ground. Thus, property types that tend to have larger building footprints or large paved areas relative to the parcel size have higher runoff coefficients, reflective of the fact that they generate more runoff. The more runoff a property generates, the larger the cost it imposes on the municipal stormwater system.

A high level summary of the seven property types, and the number of units within each of category is provided in Table 7.1. The table also summarizes the total land area within each category, runoff coefficients, and resulting impervious area estimates.

Table 7.1. Property Classification

Property Type	Land Area (acres)	Run-off Coefficient	Estimated Impervious Area (acres)	Share of Total Impervious Area	# of Billable Units
Commercial	2,750	0.75	2,063	11%	2,045
Industrial	7,089	0.75	5,317	27%	2,381
Institutional	1,282	0.75	962	5%	167
Agricultural/Vacant	26,125	0.10	2,613	13%	12,254
Residential (Low Density)	17,019	0.45	7,659	39%	117,298
Residential (Medium Density)	1,291	0.55	710	4%	21,171
Residential (High Density)	497	0.55	274	1%	182
Total	**56,055**		**19,596**	**100%**	

It is noted that as a result of growth within the City of Brampton as described in Section 7.2.4 and the corresponding shift of land from undeveloped (agricultural/vacant) to the various developed property types, the relative share of impervious land area within each property type category will vary over time. The relative share of impervious land area for each property type is summarized in Figure 7-1 below:

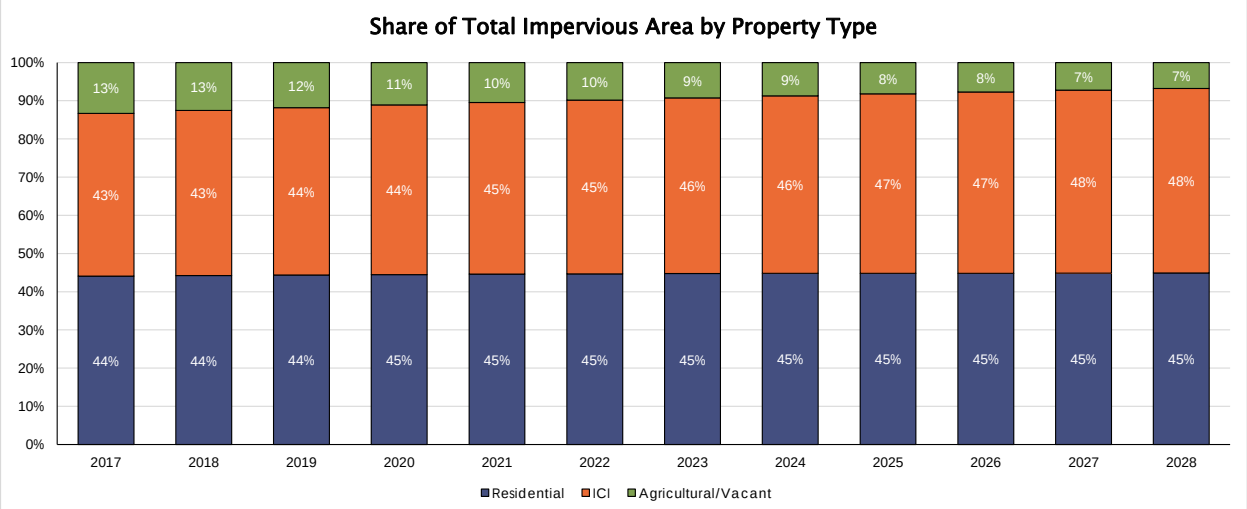

Figure 7.1. Relative Share of Impervious Land Area by Property Type

The net costs of the stormwater service are recovered from the various property types based on the ratios of impervious land identified in the above table. For residential properties, these costs are subsequently divided by the number of properties within the given property type classification (e.g. low density residential, etc.) to arrive at an estimated rate per property. This modified flat rate would be imposed on each property in the property type classification uniformly to fund the annual stormwater program costs. For non-residential properties, the costs are divided by the estimated amount of impervious area to arrive at an estimated rate per unit of impervious area (e.g. $/impervious acre).

7.3.2 Stormwater Rate Impacts

This section provides an overview of the assumptions and a summary of rate projections for a dedicated stormwater charge based on imperviousness characteristics of properties. Detailed calculations are provided in Appendix F.

Tables 7.2 and 7.3 provide annual stormwater bill impacts that could be expected by different property types. The tables show the bill impacts under the current property tax funding model and bill impacts with a dedicated stormwater charge.

The assumptions utilized for each property type are summarized below:

- Residential (Low Density) – assumes current value assessment (CVA) of $538,900, reflective of a typical single family detached home in 2018
- Residential (Medium Density) – assumes CVA of $375,900, reflective of a typical freehold townhouse
- Residential (High Density) – assumes CVA of $37.8 million, reflective of a condominium building with 148 units (estimated number of units in this type of building).
- Small Non-residential Property – assumes CVA of $1.1 million, with 0.15 acres of impervious area (e.g. a relatively small stand-alone building with parking lot, such as a bank branch or a fast food restaurant)
- Large Non-residential Property – assumes CVA of $32.2 million, with 9.46 acres of impervious area (e.g. a large commercial plaza with associated large parking areas and potentially some stand-alone buildings)

Table 7.2. Stormwater Services Annual Rates

Property Type	Annual Bill under Property Tax Funding Model		Annual Bill with a Dedicated Stormwater Charge									
	Current (2017)	2019	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential												
Low Density - per unit	$ 37.83	$ 124.89	$ 77.12	$ 78.19 *1.4%*	$ 79.58 *1.8%*	$ 80.83 *1.6%*	$ 82.23 *1.7%*	$ 83.65 *1.7%*	$ 85.09 *1.7%*	$ 86.58 *1.7%*	$ 88.16 *1.8%*	$ 89.89 *2.0%*
Medium Density - per unit	$ 26.39	$ 87.12	$ 38.31	$ 38.69 *1.0%*	$ 39.25 *1.4%*	$ 39.75 *1.3%*	$ 40.33 *1.5%*	$ 40.92 *1.5%*	$ 41.53 *1.5%*	$ 42.16 *1.5%*	$ 42.83 *1.6%*	$ 43.59 *1.8%*
High Density - per building	$ 2,652.40	$ 8,756.56	$ 1,767.76	$ 1,796.95 *1.7%*	$ 1,833.12 *2.0%*	$ 1,858.63 *1.4%*	$ 1,890.24 *1.7%*	$ 1,926.17 *1.9%*	$ 1,958.16 *1.7%*	$ 1,994.96 *1.9%*	$ 2,030.35 *1.8%*	$ 2,072.06 *2.1%*
Non-residential												
Annual Fee per Acre of Impervious Area			$ 1,182.03	$ 1,198.92 *1.4%*	$ 1,220.54 *1.8%*	$ 1,240.18 *1.6%*	$ 1,261.96 *1.8%*	$ 1,284.00 *1.7%*	$ 1,306.49 *1.8%*	$ 1,329.63 *1.8%*	$ 1,354.16 *1.8%*	$ 1,381.07 *2.0%*

Table 7.3. Annual Bill Impact on Sample Non-residential Properties

Property Type	Annual Bill under Property Tax Funding Model		Annual Bill with a Dedicated Stormwater Charge									
	Current (2017)	2019	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Small Non-residential Property (0.15 ac impervious area)	$ 100.16	$ 330.66	$ 177.30	$ 179.84 *1.4%*	$ 183.08 *1.8%*	$ 186.03 *1.6%*	$ 189.29 *1.8%*	$ 192.60 *1.7%*	$ 195.97 *1.8%*	$ 199.45 *1.8%*	$ 203.12 *1.8%*	$ 207.16 *2.0%*
Large Non-residential Property (9.46 ac impervious area)	$ 2,931.94	$ 9,679.44	$ 11,181.98	$ 11,341.81 *1.4%*	$ 11,546.31 *1.8%*	$ 11,732.14 *1.6%*	$ 11,938.17 *1.8%*	$ 12,146.63 *1.7%*	$ 12,359.38 *1.8%*	$ 12,578.34 *1.8%*	$ 12,810.36 *1.8%*	$ 13,064.97 *2.0%*

Based on the comparison of annual bills for a cross section of City customers provided in Tables 7.2 and 7.3:

- All customers would see a 230% increase in the stormwater portion of their annual property tax bill under the current funding model. This reflects the increase in the stormwater program funding as determined through the LOS recommendations relative to the City's current program funding.
- For low-density residential customers, annual stormwater bills would increase from $37.83 currently to $77.12 (104% increase) with a dedicated stormwater charge. This reflects their lower proportion of impervious area relative to commercial, institutional and industrial properties within the City.
- For medium-density residential customers, annual stormwater bills would increase from $26.39 currently to $38.31 (45% increase) with a dedicated stormwater charge. This reflects their lower proportion of impervious area relative to low-density residential, commercial, institutional and industrial properties within the City.
- For high-density residential customers (condominium buildings with 148 units), annual stormwater bills would decrease from $2,652.40 currently to $1,767.76 (33% decrease) with a dedicated stormwater charge. This reflects their lower proportion of impervious area relative to other property types within the City.
- For small non-residential customers, annual stormwater bills would increase from $100.16 currently to $177.30 (77% increase) with a dedicated stormwater charge.
- For large non-residential customers, annual stormwater bills would increase from $2,931.94 currently to $11,181.98 (281% increase) with a dedicated stormwater charge.
- After 2019, all properties could expect their annual stormwater bill to increase by 1-2% annually over the forecast period.

7.4 Municipal Comparison

At this time, most municipalities continue to fund stormwater management needs within the property tax rate. However, many of the largest municipalities that are facing funding pressures for sustaining the stormwater management system have either implemented or are considering implementing separate user rates to recover costs related to stormwater management. Table 7.4 below lists Ontario municipalities that recover stormwater management costs through dedicated funding mechanisms and typical annual charges for a selection of property types. These municipalities are home to 32 % of the population of Southern Ontario, and 29 % of the population of Ontario as a whole.

Table 7.4. Municipal Comparison – Typical Annual Stormwater Charges (2018)

Municipality	Residential (Single Detached)	Non-Residential (Small)	Non-Residential (Large)
Aurora	$60.12	$763.56	$763.56
Guelph	$55.20	$176.17 (based on 600 m^2 impervious area)	$11,240.54 (based on 38,283 m^2 impervious area)
Hamilton[1]	$80.50 (265 m^3 annual water consumption & 20 mm meter)	$283.70 (1,000 m^3 annual water consumption & 25 mm meter)	$1,262.67 (4,706 m^3 annual water consumption & 50 mm meter)
Kitchener	$164.76 (Residential Medium - footprint between 106-236m^2)	$315.19	$15,625.80 (based on 38,283 m^2 impervious area)
London	$189.96 ($142.68 if no storm drain within 90m)	$189.96	$7,541.94
Markham	$47.00	$308.00 (based on $1.10 million of current value assessment)	$9,016.00 (based on $32.2 million of current value assessment)
Middlesex Centre[2]	$178.56	$178.56	$2,390.48
Mississauga	$104.00	$233.71 (based on 600 m^2 impervious area)	$14,911.73 (based on 38,283 m^2 impervious area)
Newmarket	$51.75 (based on 709$m^2$ total property area)	$147.83 (based on 1,012$m^2$ total property area)	$6,357.81 (based on 43,503m^2 total property area)
Ottawa	$116.85	$966.44 (based on $1.1 million of current value assessment)	$12,824.25 (based on $32.2 million of current value assessment)
Richmond Hill	$67.84	$197.10	$197.10
St. Thomas	$111.36	$111.36	$7,317.56
Vaughan	$49.20	$43.93	$17,333.47
Waterloo	$134.28 (Residential - Medium)	$344.76	$13,141.56

[1] 2018 Combined Wastewater & Stormwater Rates allocated by relative share of 2018 budgeted operating, capital, and debt servicing expenditures

[2] Stormwater rates are imposed in 'settlement areas' as defined in the municipality's Official Plan.

As shown by the range of rates in the above table, each fee is unique and set to reflect a community's specific priorities, needs, and land use, making it difficult to set expectations using neighboring rates. However, it is clear that the preliminary calculated stormwater charges for the City of Brampton, as presented in section 7.3.2, fall well within the range of charges imposed by surveyed municipalities.

The following graphs demonstrate the relative positioning of the City's 2019 calculated stormwater charge relative to comparator municipalities. Three comparison graphs are provided, one for each of the property types considered in the survey.

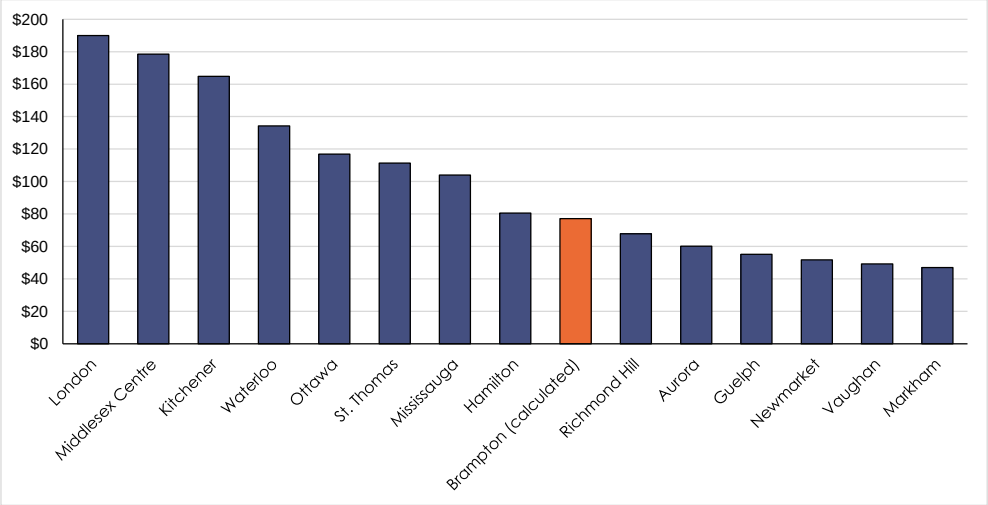

Figure 7.2. Comparison of Annual Stormwater Charges for an Average Single Family Detached Dwelling

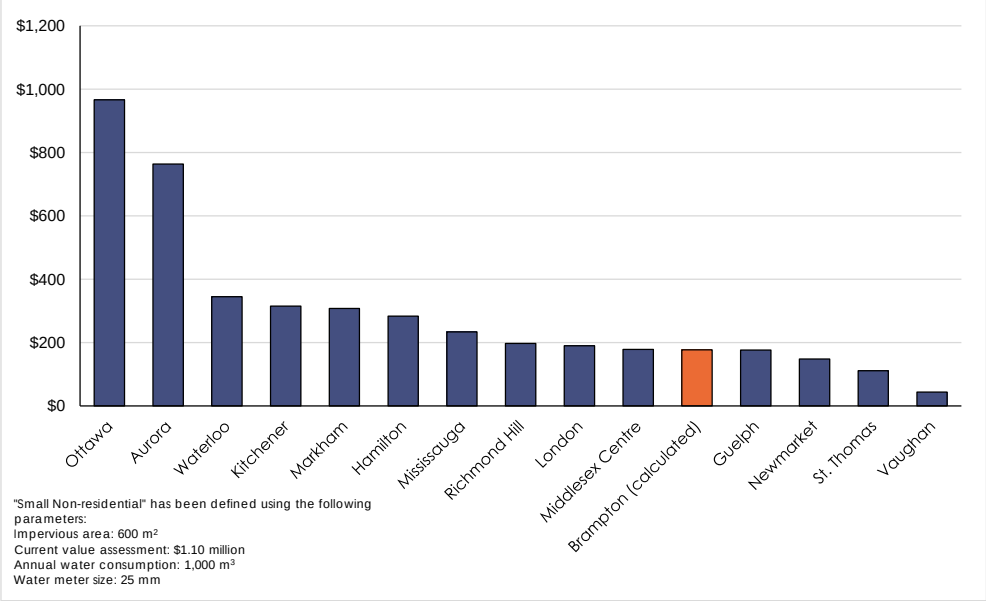

Figure 7.3. Comparison of Annual Stormwater Charges for a Small Non-Residential Property

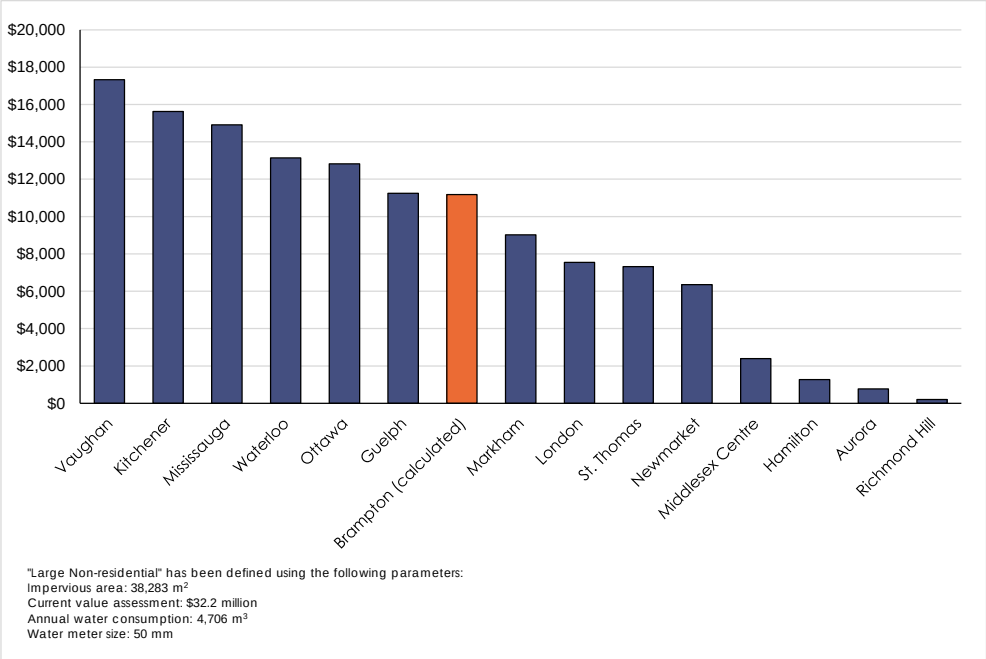

Figure 7.4. Comparison of Annual Stormwater Charges for a Large Non-Residential Property

7.5 Recommendations

Discussions with City staff, the City Steering Committee, the Stormwater Advisory Group and the general public revealed a variety of opinions on the most appropriate rate structure. However, there was general consensus that the City should pursue some form of user fee rather than continuing with the current approach of funding stormwater services from property taxes.

One of the most compelling reasons for introducing a user fee is that the costs related to stormwater management would be more fairly distributed amongst benefitting properties. To illustrate this point, Figure 7-5 provides a comparison of how stormwater costs are shared between residential and non-residential properties under the City's current cost recovery model (i.e. property taxes) versus a user fee model that considers actual impervious area of properties. Based on the City's 2016 Financial Information Return, approximately 22% of property tax revenues come from non-residential properties, and 78% come from residential properties. However, preliminary estimates of impervious areas in the City show that approximately 56% of impervious land area is found on non-residential properties and 44% is found on residential properties. As such, the City's current approach of funding stormwater services through the general tax levy does not fairly distribute costs between these two high-level property classifications and, as a result, residential properties are effectively subsidizing non-residential properties.

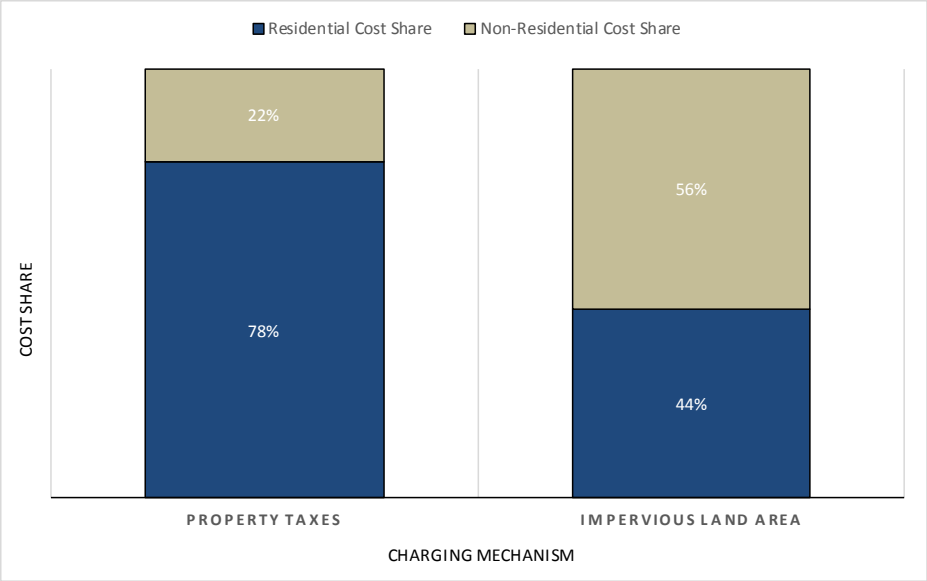

Figure 7.5. Residential vs. Non-Residential Cost Share under Different Charging Mechanisms

Based on an examination of available options, it has been determined that the preferred course of action for the City of Brampton is to pursue a rate model similar to that utilized by the City of Mississauga. To this end, the City has commenced the GIS work necessary to enable detailed rate calculations based on measured impervious area of each individual property. It is expected that this work will be completed in 2019, which would allow for implementation of a new dedicated stormwater by mid-2020.

Appendix A

Communication and Engagement Plan

STORMWATER MANAGEMENT FINANCING STUDY
WITHIN THE CITY OF BRAMPTON

COMMUNICATION AND ENGAGEMENT PLAN

Submitted to:
City of Brampton
2 Wellington Street West, 2nd Floor
Brampton, ON L6Y 4R2

Submitted by:
Amec Foster Wheeler Environment & Infrastructure
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May 23, 2017

TPB178004S

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1.0 INTRODUCTION

1.1 Background

The City of Brampton (City) is located in southern Ontario, within Peel Region. The City retained Wood Environment & Infrastructure Solutions (in partnership with Watson & Associates; Wood /Watson Team) to complete a Stormwater Management Financial Study (Study). As part of the Study, this Communication and Engagement Plan (Plan) has been prepared to provide details around the design and implementation of the Study's engagement activities.

The City currently does not fund stormwater infrastructure from a dedicated source. The City's stormwater infrastructure is programmed through the 10-year Roads Capital Program, which will be inadequate to meet the needs of constructing, operating and maintaining future stormwater infrastructure.

The Study objectives are to:

- Quantify the existing stormwater program and compare it to similar municipalities (such as Mississauga and Vaughan);
- Quantify the future stormwater management infrastructure program needs (existing and enhanced service levels);
- Investigate and recommend a preferred alternative for funding; and
- Develop a strategy to implement the preferred alternative.

1.2 Regulatory Requirements

While there are numerous regulations that apply to stormwater management (such as the *Ontario Water Resources Act* and Provincial Water Quality Objectives), there are no regulations that pertain to the engagement and communication aspects of this Study.

1.3 Communication and Engagement Plan

This Plan is intended to cover communication and engagement for the Stormwater Management Financing Study. The scope covers the activities outlined in the accepted proposal and any other activities that have been mutually agreed upon between the City and Wood/Watson Team. The current activities include:

- Develop a Communication and Engagement Plan;
- Lead and maintain the City Steering Committee (CSC) (5 meetings);
- Form, lead and maintain the Stormwater Advisory Group (SAG) (4 meetings);
- Coordinate notices and public meetings;
- Conduct public meeting (1 meetings);
- Conduct educational sessions (3 sessions – City Council, Executive Leadership Team and other senior representatives/groups);
- Conduct consultation with stakeholder groups (2 meetings);
- Support the preparation of print and broadcast media material; and
- Document all engagement activities.

Administration of the approved Plan will be done through collaboration between the City and the Wood/Watson Team. This Plan will guide communication and engagement activities throughout the Study. The scope will be directly correlated to the level of interest. The Plan will be regularly reviewed and refined to guide the implementation of engagement activities.

Section 2 outlines the engagement principles and approach, roles and responsibilities, identification of stakeholders, activity tracking and management, and evaluation.

Section 3 outlines the proposed activities as well as the objectives, key messaging, activities, and schedule for each of the steps. The steps include:

- Step 1: Planning and Relationship Building;
- Step 2: Existing Stormwater Management Program;
- Step 3: Recommended Future Stormwater Management Program; and
- Step 4: Follow-up.

2.0 ENAGEMENT PRINCIPLES AND APPROACH

For the Stormwater Management Financial Study, involving the stakeholders early in process and throughout the life of the Study is important to:

- Build new or strengthen existing relationships with potentially affected stakeholders;
- Build awareness about stormwater through education;
- Discuss needs, concerns, plans and potential impacts (positive or negative) to gain insights; and
- Align potential disparities between stakeholder perceptions of the Study, stormwater and stormwater management with the City's perceptions and plans.

2.1 Principles of Engagement

Engagement typically involves two-way communication between the proponent (the City), or body acting on its behalf (consultant), and the public. Engagement includes an active approach to providing the public with opportunities to learn more about an issue (in this case stormwater management) and to express their knowledge and views on aspects of a project. The intent of engagement is to raise awareness and understanding about a project and to solicit public comments for consideration to make better, more informed decisions about activities. The principles of public participation presented in Table 1 will guide the engagement for the Study.

The implementation of this Plan on the basis of these principles is envisaged to generate the following overall benefits:

- The provision of first-hand information to interested stakeholders;
- Recognition and integration of stakeholder issues and concerns;
- Better understanding of shared interests;
- Better informed environmentally-sound decisions; and
- Positive working relationships.

Table 1: Principles of Participation

Early Notification	•Information about the Study will be provided to stakeholders in a comprehensive and timely manner to facilitate early and meaningful engagement.
Honest, open and transparent communication	•Pertinent information about the Study will be shared with stakeholders. Stakeholder input will be sought, documented, and will be addressed. If input is not addressed, justification will be provided.
Accessible	•A variety of public participation techniques and methods will be used to distribute information about the Study and to gather stakeholders' feedback. If requested, information will be provided in a language and/or method that facilitates understanding.
Inclusion	•The process will be inclusive and strive to include known and self-identified stakeholders and welcome input received from those individuals and groups with a stake or interest in the Study.
Flexible	•Feedback on the engagement process will be sought from stakeholders to ensure that sufficient opportunities for meaningful input are provided. An evaluation of the engagement process will be conducted on an ongoing basis and changes made as appropriate.
Relationship Building / Capacity Building	•Where acceptable and appropriate to all parties involved, community liaisons and working committees will be struck to facilitate information exchange.
Mutual Respect	•Respect will be given to the differing cultures, values and constraints of each party. There will be follow-through on commitments.
Efficiency	•The engagement process will be designed to make the most effective use of existing processes and resources while optimizing the contributions of all participants.
Timely	•Engagement is most effective if initiated as early as possible before decisions are made. Clear and reasonable timelines should be established for input and comments and these timelines need to be communicated clearly.

2.2 Roles and Responsibilities

The City's responsibilities are to design and implement a communication and engagement plan that meets the needs of the community and upholds the City's commitment to its citizens and businesses.

The City and its consultant team have collaborated to develop this Plan. Collaboratively, the team is also responsible for:

- Identifying and involving interested persons, throughout the process including those likely to be directly affected and any others that may be potentially affected;
- Initiating meaningful engagement with stakeholders in the community to identify information needs and concerns;
- Providing appropriate time for stakeholders to review and comment on information;
- Documenting how input received from participants was (or was not) taken into account;
- Addressing, and where possible resolving, concerns raised through the engagement process; and
- Keeping stakeholders informed of decisions made and how the City will address identified concerns or reasons that concerns were not addressed.

Table 2: Roles and Responsibilities

Name	Study Role	Organization	Responsibilities
Michael Heralall	Project Manager	City of Brampton	• Overseeing the Study • Primary contact for the City and its citizens • SAG Member
Kelly Brooks	Senior Advisor, Communications	City of Brampton	• Overseeing Corporate Communication aspects of the Study
Andrew Reese	Consultant Project Manager/Study Lead	Amec Foster Wheeler Environment & Infrastructure	• Overseeing the Study • Support to Communications and Engagement Plan
Jean Haggerty	Study Co-Lead	Amec Foster Wheeler Environment & Infrastructure	• Support to Communications and Engagement Plan
Ron Scheckenberger	Engineering and Program Develop Lead	Amec Foster Wheeler	• Support to Communications and Engagement Plan
Brian Bishop	Stormwater infrastructure analysis	Amec Foster Wheeler	• Support to Communications and Engagement Plan

Name	Study Role	Organization	Responsibilities
Mary Kelly	Community Engagement Lead	Amec Foster Wheeler	• Overseeing communication and engagement aspects of the Study • Developing and Implementing Communications and Engagement Plan
Krista Maydew	Community Engagement Senior Review and Support	Amec Foster Wheeler	• Senior review of engagement activities • Supporting engagement activities
Andrew Grunda	Funding Model Lead	Watson and Associates	• Leading funding model development
Peter Simcisko	Analyst	Watson and Associates	• Supporting funding model development

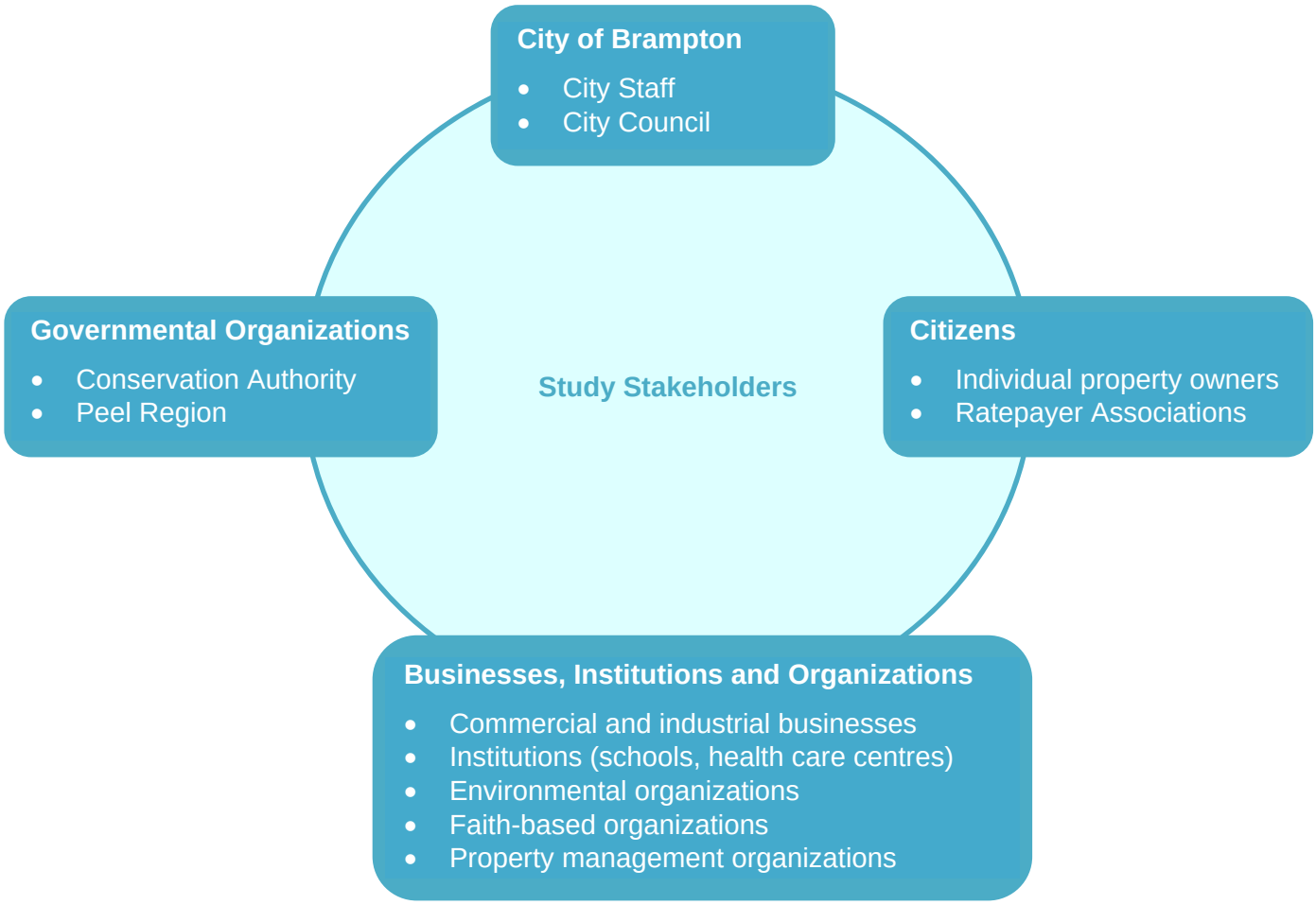
2.3 Identification of Stakeholders

For any one project there can be a broad range of stakeholders, from those who will be directly affected by a proposed project to individuals or organizations with more general concerns about issues related to the project. Stakeholders may have varying degrees of concerns with a project. In the context of this Study, a stakeholder may be any person or group of people with an interest to protect, have a stake in the issue, or knowledge to contribute.

Stakeholders have been identified based on previous experiences and the information acquired from the City as well as from review of available applicable information. Interested stakeholders were identified using the following criteria:

- Proximity to the City of Brampton; if the stakeholders are resident in, have property in or an interest in the City or could be potentially affected;
- Past or current interest in similar projects or developments in the City; if the stakeholders have been involved in consultation processes in current or past projects in the City; and/or
- Those potentially impacted by potential effects from the outcomes of the Study.

These stakeholders fall into the following categories:



The number of stakeholders involved in the Study is expected to be dynamic. Interests and concerns may be addressed and a stakeholder may choose to drop out of a process; conversely, interests or concerns may arise or individuals move and new stakeholders may enter the process at any time. To reflect and manage this dynamism, a record of stakeholders involved in the Study will be maintained and updated regularly.

Appendix A provides a preliminary list of stakeholders.

2.4 Engagement Activity Tracking and Management

A spreadsheet of engagement activities will be maintained for the Study and will include all records of engagement between the City and/or its consultants and local stakeholders. This will be used to generate reports that include:

- Who was engaged and consulted;
- When, where and by what method the activity took place;
- What issues/interests were shared and how are they were addressed; and
- Follow-up actions or commitments arising from engagement activities.

2.5 Evaluation

This Plan and the proposed activities will be evaluated on an ongoing basis to ensure their successful implementation. The City is committed to continual improvement of this Plan and recognizes that it is a living document that will be revised as the Study progresses. Evaluation will be solicited from participants in the process and will be used to improve/refine ongoing activities as appropriate. Evaluations may be conducted using a variety of methods including targeted participant questionnaires, recording verbal feedback from participants and through the City's website.

Evaluation criteria will be developed prior to engagement activities and may be results-based and/or process-based. Results-based criteria measure whether or not a defined objective or goal has been met. Process-based criteria measure how the engagement process was implemented. The types of evaluation criteria used will differ depending on the engagement activity.

3.0 COMMUNICATION AND ENGAGEMENT STEPS

Understanding the nature of public and internal priorities, interests and expectations of the level of involvement is important to ensure that proposed messaging and actions match the identified priorities and/or interests. Given the nature of the Study, the engagement activities will focus on building relationships, educating and sharing knowledge. This will help to manage stakeholder expectations, ensuring that they are appropriate and aligned with the Study objectives.

Engagement activities should correlate with the level of interest and potential to be impacted by the Study outcomes. Near-term engagement activities (prior to the presentation of the future recommended stormwater management program) that could be used to engage stakeholders should include as their focus:

- Sharing relevant stormwater management information;
- Sharing relevant Study information including funding options; and
- Identifying potential concerns.

Table 1 provides a description and intended engagement level of various activities that are proposed for this Study.

Table 3: Summary of Proposed Activities

Activity	Description
Website	The City's website can be used to facilitate the sharing of information in a timely and effective manner. The webpages could contain information including: • Stormwater and its management • The Study • 'Stormwater 101' • Presentations, Documents & Reports • Fact Sheets • Frequently Asked Questions (FAQs) • Have Your Say • Meetings and Events The information used on the website should mirror content/language presented in fact sheets, presentations or other publicly-facing information avenues.
Notifications	Notifications of engagement opportunities as well as information about the Study and stormwater program could be placed in local newspapers (such as the Brampton Guardian). Project information and one formal notice for the public meeting will be posted as a local newspaper ad placement, in City and Councillor newsletters, and to social media and City web-sites.
Fact Sheets	Fact sheets (hard copy or electronic) are excellent tools to provide information. They will be prepared to provide background information on stormwater and its management as well as the Study. It is recommended that

Activity	Description
	these are distributed to citizens and other stakeholders through email (such as City and Councillors' e-Newsletters), twitter and posted to the website. The fact sheets should always be made available in hard copy format at events (such as an open house, a focus group).
Frequently Asked Questions (FAQs)	An FAQ document is useful for addressing the most prevalent questions asked, dispelling myths, and addressing difficult questions. Based on the feedback received to-date, a FAQs document should be developed and posted on the website. This information should be updated as required to reflect new information available.
Social Media and Local News Media	Increasingly, civic populations are engaged through social media. Social media sites provide an accessible way of generating interaction between the City citizens and businesses. Some of the benefits include: • Providing opportunity for direct interaction with a diverse and interested public, • Tracking of issues and interests, • Providing timely and correct information about the Study to respond to misinformation that may be circulating on other media sites, and • Ability to post videos, animations and/or photos of the project site to increase understanding of the Project. Information about the Study could be provided to the local media to further communication, and in this case education. It is recommended that a media point person (City) be appointed for the Study and that this individual(s) receive appropriate media training.
Multi-Stakeholder Committee	A multi-stakeholder community committee (the Stormwater Advisory Group) can provide a forum for in depth discussions of project issues and bring transparency to activities associated with the Study and help to foster good community relations.
Open House	Open houses can be an effective means for communicating important Study information to the general community and seek feedback about their priorities and interests.
Feedback	Feedback from stakeholders about the Study and the methods/activities used to involve the public may be gathered through forms (hard copy and online using SurveyMonkey). Feedback should be evaluated and incorporated into this Plan and associated activities as applicable. Where feedback is consistent from stakeholders, specific activities should address these concerns to ensure transparency of the process.
Other Opportunities for Engagement	Community events to support inclusive and interactive public engagement may include: • Downtown Farmers Market (Saturdays, June 17- October 7, 2017 • Mount Pleasant Market (Thursdays, Summer 2017 • Celebramtpon and the 'Riverwalk' (Saturday, June 10, 2017) • Doors Open Brampton (Saturday, September 30, 2017)

Activity	Description
	• Starting on a Solid Foundation Program • Parks Events (planting events near stormwater ponds; County Court Park neighbourhood event)
Other Outreach Opportunities	Other outreach opportunities include: Internal outreach opportunities available to the City include: • Media releases/matte stories • Social media (Twitter, YouTube, Facebook, Instagram) • Website • City Matters E-Newsletter • Councillor Newsletters • Posters/Fact Sheets • In-house video • TV-Screen Ads (TVs located in City Hall, recreation centres, Garden Square) • City Staff Internal Web Portal and Newsletter External outreach opportunities to consider include: • Region of Peel water bill • Paid advertising (radio, television) • Mobile signs

Stakeholder support plays a critical role in the successful adoption and implementation of stormwater funding mechanisms. To build this support, outreach and focused engagement are critical. Tailing this outreach and engagement to the specific interests and priorities increases the success of adopting and implementing proposed funding mechanisms. To do this, the effort should:

- Proactively engage all stakeholders, both those that support and oppose
- Foster knowledge and information sharing
- Provide forums to education about the need
- Initial focus should be on the goals of the program and move onto funding
- Make a locally compelling case through making it context-specific (i.e., use relevant examples)
- Identify and involve all stakeholders
- Demonstrate cost effectiveness of financial mechanisms

Education will be a critical aspect to the success of the Study. As identified through discussion with City Council and staff, there is limited knowledge about stormwater, how it is connected to the environment or how it is managed. To build awareness, the key messaging to be developed during this initial step will focus education by addressing the following questions:

Key messaging will be in plain language and representative imagery will be developed to assist in conveying the messages visually, as appropriate.

Table 4: Step 1 – Planning and Relationship Building

Objectives	Key Messaging	Activities	Schedule
• **Develop Communications and Engagement Plan** • **Identify stakeholders** • **Develop of relationships with key stakeholders** • **Identify initial list of potential interests and priorities** • **Develop key messaging** • **Develop a 'Storm 101' Public Education Plan and Supporting Resources** • **Develop of the SAG terms, potential committee members and issue invitations**	• What is stormwater? • What does it mean to me? • What is the City's role in managing stormwater? • What are the current costs to local property owners? • How does the City fund its stormwater program and the Study? • What are the benefits to local property owners? • What can I do to help? • What is the Stormwater Management Financing Study? • Why is the City undertaking the Study? • How will citizens and businesses be engaged? • What are potential stormwater challenges facing Brampton? • Are there any issues currently within the City? • What are the community's priorities for managing stormwater needs? • What will happen at the end of the Study? • When will the recommendations/findings be implemented?	Communication and Engagement Plan: develop Plan based on primary and secondary research. Plan includes identification of stakeholders, identification of interests and priorities.	23-May-17
		Communication Tools: in collaboration with the City's Corporate Communications Department, information regarding stormwater and its management, a 'Stormwater 101' Education package, and the Study will be developed for use on the website, fact sheets, and FAQs.	23-May-17
		CSC: conduct meeting #1, tentative dates: • Thursday, June 8	8-Jun-17
		SAG: develop the terms of reference, identify potential list of members through research and engagement, and issue invitations to potential group members. Conduct meeting #1; tentative schedule: • Thursday, June 22	22-Jun-17

Table 5: Step 2 – Existing Stormwater Management Program

Objectives	Key Messaging	Activities	Schedule
• **Implement the Communications and Engagement Plan, and update as required**	• Overview of the City's existing stormwater management program covering operations, inspections, maintenance,	Communication and Engagement Plan: develop Plan based on primary and secondary research. Plan includes identification of	Ongoing

• **Further develop relationships with key stakeholders to identify early their priorities** • **Initiate the SAG meetings to solicit input on the current stormwater program** • **Inform City staff about the Study and current stormwater program through a focus group** • **Inform and consult with the community about the Study and current stormwater program through information sharing**	watershed planning, capital investment, water quality protection, level of service • Current funding mechanism and lifecycle costs • Existing and future gaps • Potential areas of investment; • Benchmarks • Summary of findings	stakeholders, identification of interests and priorities.	
		Communication Tools: in collaboration with the City's Corporate Communications Department, information regarding stormwater and its management and the Study will be developed for use on the website, fact sheets, and FAQs	
		CSC: conduct meeting #2 and #3, tentative dates: • Thursday, July 20 • Thursday, September 21	20-Jul-17 21-Sep-17
		SAG: conduct meeting #2 and #3/4; tentative schedule: • Thursday, July 20 • Thursday, September 21	20-Jul-17 21-Sep-17

Table 6: Step 3 – Recommended Future Stormwater Management Program

Objectives	Key Messaging	Activities	Schedule
• **Implement the Communications and Engagement Plan, and update as required** • **Further develop relationships with key stakeholders to identify their** • **Continue with the SAG meetings to solicit input on the future program** • **Inform City staff about the Study and future**	• Overview of the recommended stormwater management program covering operations, inspections, maintenance, watershed planning, capital investment, water quality protection, level of service • Overview of the funding framework principles and funding sources • Identification of the proposed funding mechanism • Identification of how the proposed program will	Communication and Engagement Plan: develop Plan based on primary and secondary research. Plan includes identification of stakeholders, identification of interests and priorities.	Ongoing
		Communication Tools: in collaboration with the City's Corporate Communications Department, information regarding stormwater and its management and the Study will be developed for use on the website, fact sheets, and FAQs	

program through a focus group • **Inform and consult with the community about the Study and future program through a public open house**	overcome existing and future gaps • Summary of findings	CSC: conduct meeting #4 and #5, tentative dates: • Thursday, October 26 • Thursday, November 23	26-Oct-17 23-Nov-17
		SAG: conduct meeting #5 and #6; tentative schedule: • Thursday, October 26 • Thursday, November 23	26-Oct-17 23-Nov-17
		Public Open House:	Oct-17

Table 7: Step 4 – Follow-up

Objectives	Key Messaging	Activities	Schedule
• **Implement the Communications and Engagement Plan** • **Communicate the aspects of the future program** • **Communicate how feedback on community priorities and interests were considered in the future program** • **Identify how the future program will be implemented**	• Appreciation to stakeholders for their involvement • Overview of the final stormwater management program • How it will be implemented (strategy) • Details on the Financial model (5-year) • Details on the Stormwater Infrastructure Funding Policy • Details on the Stormwater By-law • What this means to property owners • When it comes into effect	Communication and Engagement Plan: develop Plan based on primary and secondary research. Plan includes identification of stakeholders, identification of interests and priorities.	Ongoing
		Communication Tools: in collaboration with the City's Corporate Communications Department, information regarding stormwater and its management and the Study will be developed for use on the website, fact sheets, and FAQs	Ongoing

APPENDIX A

LIST OF STAKEHOLDERS (PRELIMINARY)

Stakeholder Type	Organization
Government - Municipal	City of Brampton, City Council
	City of Brampton, Departments (Economic Development, Engineering, Fire, Parks and Recreation, Planning, Public Works, Transit)
	Region of Peel
Government - Provincial	Credit Valley Conservation Authority
	Toronto and Region Conservation Authority
Brampton Citizens	Residents and property owners
	Citizens for a Better Brampton
Community Organizations	Brampton Environmnetal Advisory Committee
	Churchville Ratepayers Association
Institutional	Brampton Civic Hospital
	Peel District School Board
	Dufferin-Peel Roman Catholic Separate School Board
	Sheridan College
	William Osler Health System
Faith-based organizations	The Church of Jesus Christ of Latter-Day Saints
	Bramalea Christian Fellowship
	Guruvayurappan Temple of Brampton
	Kennedy Road Tabernacle
Businesses (including commercial and industrial	Developers/ Property Management Companies: Candevcon Limited Condo Owners Association of Brampton International Council of Shopping Centres Morguard Investments Limited Morguard- Urban Ecosystems NAIOP Commercial Real Estate Development Association Orlando Corporation Real Property Association of Canada RioCan - RioCan Centre Brampton RioCan- Trinity Common Brampton SmartReit- Brampton
	Building Owners and Management Association
	Building Industry and Land Development Association

APPENDIX B

FREQUENTLY ASKED QUESTIONS (FAQS)

STORMWATER MANAGEMENT INFRASTRUCTURE FINANCIAL STUDY

FREQUENTLY ASKED QUESTIONS

1. What is stormwater?

Stormwater is the water that flows into our sewers, creeks and lakes after it rains or from melting snow. In natural areas, stormwater can soak into the ground where it lands or be absorbed by vegetation. In urban areas, stormwater runs off hard surfaces (such as rooftops, parking areas, and roads), carrying pollution (such as debris, chemicals) into streams and rivers. Stormwater runoff from urban areas is greater in amount (since water cannot get into the natural ground that is covered with houses, roads, parking lots etc), and flows off the land much more rapidly increasing the potential to cause flooding and erosion along the way. Pollutants carried in stormwater enters the natural environment and has negative effects on water quality and the natural environment. Stormwater must be managed to reduce the risk of flooding and erosion, and to minimize harm to the environment.

2. What does it mean to me?

Individuals often do not think much about stormwater until they are directly affected either through disruptions caused by a severe storm event or due to property damage from flooding. But stormwater runoff can impact the community in several ways:

- Flooding from storm events can damage public as well as personal property, impact business operations and even hinder our day-to-day activities.
- Runoff can pick up and transport harmful pollutants such as oil, grease, trash and fertilizers to our water ways.
- Rapid drainage from developed land can cause severe erosion of stream banks and scouring of creeks, further degrading water quality and impacting valuable habitats.

The City's Public Works and Engineering division looks after a stormwater management system that collects, transports, controls and treats stormwater runoff.

3. What is the City's role in managing stormwater?

The City of Brampton is responsible for managing stormwater within the municipality. This includes planning, designing, constructing, operating and maintaining stormwater assets within municipal roadways, public easements and other City lands. The stormwater management program is crucial in protecting public

safety and health and works to reduce flood risk, control erosion and maintain water quality in local natural waterways.

Stormwater, both quality and quantity, are managed by the City's stormwater program. This includes operating and maintaining storm sewers, ditches, inlets, stormwater management facilities (ponds), bridges, culverts, infiltration facilities, oil grit separators, engineered and natural channels, and storm sewer outfalls to streams and watercourses.

The City's stormwater assets include:

- More than 1,800 km of pipes
- Approximately 25,000 manholes
- More than 36,000 catch basins
- 170 stormwater ponds
- 400 km of channels and waterways

The value of the existing stormwater system is approximately $1.1 billion

The City has a responsibility to effectively manage this infrastructure and protect the environment. To meet this responsibility, the City:

- undertakes flood protection projects
- maintains, repairs and restores existing infrastructure
- provides emergency response to flooding, spills and clean-up
- carries our street sweeping
- enforces by-laws to protect the environment and prevent interference with the operation of the stormwater management system

The City has been adapting its policies and practices in order to meet provincial and federal regulatory requirements. The relevant stormwater rules and regulations include the Ontario Water Resources Act, Environmental Protection Act, Provincial Water Quality Objectives, Ontario Emergency Management Act, Ontario Water Opportunities Act, Ontario Sustainable Water and Sewage Systems Act, Canadian Environmental Protection Act and the Canadian Fisheries Act.

4. **What are the current costs to local property owners? How does the City fund its stormwater program, including studies?**

Currently, the annual stormwater operating budget and capital improvement budget are funded through general tax levy and gas tax. The estimated stormwater operating costs in 2016 were $4 million and capital costs were $2 million.

5. What are the benefits to local property owners?

The benefits of an effective stormwater management program include a reduction in flood risk, improved water quality and environment, and reduced stream and creek erosion.

6. What can I do to help?

The biggest influencing factor in the amount of stormwater runoff in the community is the presence of surfaces that do not absorb water, including roofs, driveways, roads and parking lots. By minimizing the paving of land areas and properly maintaining the runoff from these surfaces, you can help manage stormwater.

Maintenance at home can include keeping storm sewer inlets clear as well as the cleaning and maintenance of downspouts, weeping tile, sump pumps, back water valves and sewer lines from your residence to the municipal lines. You can also use rain barrels and plant vegetation to minimize flows draining from your property.

For more information about what you can do check out:

http://www.basementfloodreduction.com/images/Basement_Flood_Handbook_-_ICLR_-_2009.pdf

The City's storm drains do not connect to treatment facilities, but rather drain untreated into local waterways. So it is important to not put anything into the drains or roadside ditches that can pollute local streams or creeks.

Maintain your property – pick up wastes, such as pet and yard wastes, and dispose of them properly. Consider using a local car wash that collects and treats the dirty water before it is released to the environment. Understand the fertilizer and other chemicals you are using – read and follow the instructions. Always dispose of hazardous materials such as paint and motor oil at your local hazardous waste collection centre.

7. What is the Stormwater Management Infrastructure Financial Study?

The goal of the City's Stormwater Management Financing Study (the Study) is to develop a balanced approach to funding stormwater management infrastructure through a level of service review and an examination of funding options.

Study objectives include:

- Quantify the existing stormwater program and compare it to similar municipalities (such as Mississauga and Vaughan);

- Quantify the future stormwater management infrastructure program needs (existing and enhanced service levels);
- Investigate and recommend a preferred alternative for funding; and
- Develop a strategy to implement the preferred alternative.

8. Why is the City undertaking the Study?

The City of Brampton is undertaking the Study to assess the current stormwater program and how it is funded, and explore alternative ways to pay for the City's future stormwater needs. The Study began in April 2017 and is expected to be completed by June 2018.

Stormwater needs continue to grow as the existing infrastructure ages, as new infrastructure is needed to handle development growth and increases in storm events, and as water quality impacts continue. This Study will consider the existing and projected stormwater needs and costs and evaluate alternatives for paying for on-going investment in this critical program.

9. What are potential stormwater challenges facing Brampton?

Typical municipal stormwater problems include:

- Urban growth and development alters the amount of runoff and pollution.
- Infrastructure such as pipes, culverts and outfalls have limited life expectancy.
- Stormwater facilities must be actively maintained throughout their expected life, including watercourses, storm sewers, catch basins, culverts and outfalls.
- Appropriate resources, assets and improvement projects must be proactively planned to address needs and problems.
- Design standards have changed and designs developed under old standards may be inadequate to meet regulatory requirements.
- Development plans must be thoroughly reviewed and sites adequately inspected during construction to ensure the adequacy of design and construction.
- Climate change is affecting the intensity and frequency of storm events that stormwater management programs must respond to.

10. Are there any issues currently within the City?

The majority of the stormwater-related issues the City faces are localized flooding during heavy rain events, ageing pipes and other stormwater infrastructure, and a significant number of stormwater ponds that need to be periodically cleaned of accumulated sediment.

11. What are the community's priorities for managing stormwater needs?

Current priorities include:

- Reducing the risk of flooding
- Improving drainage
- Protecting community health and safety
- Reducing environmental pollution

12. What will happen at the end of the Study?

At the end of the Study, a summary of the findings and a recommended future stormwater management program, including funding model, will be identified. The findings and recommendation will be presented to Brampton citizens and businesses. Based on feedback received, the recommended program may be modified to address input received prior to the presentation to City Council for approval.

13. When will the recommendations/findings be implemented?

It is anticipated that the findings and recommendations will be presented at an open house in early 2018, and that the final recommendation will go before Council in Spring of 2018. If passed by Council, the new stormwater program and selected funding model will go into effect as part of the 2019 budget implementation.

APPENDIX C

SAG TERMS OF REFERENCE

City of Brampton
Stormwater Advisory Group
Terms of Reference

Purpose

The purpose of the Stormwater Advisory Group (SAG) is to have local stakeholders attend regularly scheduled meetings to learn about the City's stormwater management services and challenges and to provide input and feedback during the Stormwater Management Infrastructure Financial Study that will result in a recommended funding model for future investment in the City's stormwater program. The SAG reports to and makes recommendations to City Council and Staff.

Structure

The SAG brings together a diverse group of stakeholders with the objective of sharing information about current challenges the City is facing in stormwater management and about our future needs. The City of Brampton will provide a Secretary from among its consultant to take minutes for each meeting.

Term

The term of the SAG will be for the entirety of the Stormwater Management Infrastructure Financial Study. The SAG will remain in place until the City Council determines that the SAG is no longer required. The SAG will meet 5-6 times. It is anticipated that the tenure of the SAG will be from late-summer 2017 through to Winter 2018. Generally, it is expected that SAG meetings will be held on the second or third Thursday of each month in the evening from 7:00 to 9:00 pm.

Minutes

The City Council shall be provided with copies of all the minutes of the SAG meetings.

Roles and Responsibilities
The primary roles and responsibilities of the SAG are to:

- Listen and ask questions at the SAG meetings to:
  - Gain an understanding of the current stormwater program including what the City currently does to plan, build, operate and maintain these services;
  - Gain an understanding of the future requirements for the stormwater program including the level of service, issues and investment;
  - Gain an understanding of potential funding models and potential impacts on property owners
- Provide viewpoints of the organizations which the member represents;

- Provide input on stormwater program priorities and the establishment of appropriate level of services and associated investments;
- Review and make recommendations to City Council/staff on the future stormwater program; and
- Promote public interest and involvement in the implementation of future stormwater programs.

Recommendations made by the SAG are not binding on Council or the City.

A quorum shall be defined at the onset of the first meeting (determined based on the number of SAG members).

Confidentiality

The SAG will be directly responsible to City Council/staff. Members will honour matters of confidentiality in the course of the SAG's mandate and should not give personal opinions prematurely to the public at large.

Administration

Meetings will occur at City Hall in the evenings. The SAG shall record and retain minutes of all its meetings and any reports made to Council.

Signature: _____

Date: _____

Appendix B

Stormwater Advisory Group Materials

Meeting Agenda

Date: August 17, 2017 @ 7:00 p.m. **Meeting at:** Brampton City Hall – West Tower 2C-2D

File No.: TPB178004

Subject: **City of Brampton Stormwater Management Financing Study**

Stormwater Advisory Group Meeting #1

1. Introductions and Role of the Stormwater Advisory Group
2. SAG Terms of Reference
3. Overview of the Study and Other Planned Community Engagement Activities
4. Stormwater 101 – Stormwater Management Review
5. Review of the City's Current Stormwater Program – Costs, Challenges, Needs, Issues
6. Second SAG Meeting –Program Priorities – date Sept 21 TBC
7. Other Business

3450 Harvester Road
Burlington, ON L7N 3W5
905-335-2353
amecfw.com

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

Meeting Agenda

Date:	Nov. 16, 2017 @ 7:00 p.m.	**Meeting at:**	Brampton City Hall – Boardroom TBC

File No.: TPB178004

Subject: **City of Brampton Stormwater Management Financing Study**

Stormwater Advisory Group Meeting #4

1. Brief Review of SAG Meeting # 3

2. Projected Multi-Year Annual Stormwater Costs

3. Funding Framework

    a. Current Funding
    b. Rate Structure Considerations
    c. Options for Stormwater Cost Recovery (incl. municipal comparison and ranking of options)

4. Next Steps

3450 Harvester Road
Burlington, ON L7N 3W5
905-335-2353
amecfw.com

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

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Stormwater Management Financing Study

Stormwater Advisory Group Meeting No. 4

November 16, 2017

7:00 – 9:00 pm

City Hall, Rm. WT-2A

Welcome
Project Team

- City of Brampton
  - Michael Heralall – Project Manager
- Consultant Team
  - Brian Bishop – Amec Foster Wheeler
  - Emma Malcolm – Amec Foster Wheeler
  - Andrew Grunda – Watson & Associates Economists Ltd.
  - Peter Simcisko – Watson & Associates Economists Ltd.
- Stormwater Advisory Group Members

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amec foster wheeler

Watson & Associates ECONOMISTS LTD.

Agenda

1. Brief Review of SAG Meeting # 3
2. Projected Multi-Year Annual Stormwater Costs
3. Funding Framework
   i. Current Funding
   ii. Rate Structure Considerations
   iii. Options for Stormwater Cost Recovery (incl. municipal comparison and ranking of options)
4. Next Steps

1.1 City Staff Recommended LoS

Targeted Program Elements	Level of Service			
	Low	Medium	High	Maintain
A.1 Regular inspections of stormwater infrastructure				
A.2 Regular stormwater pond maintenance				
A.3 Provide proactive maintenance to support maximum system capacity and longevity				
A.4 Implement a City-wide CCTV inspection program				
A.5 Implement a City-wide storm sewer pipe repair program				
A.6 Ensure increase in O&M is commensurate with estimates of growth				
B.1 Add GIS Analyst for stormwater tracking and mapping				
C.1 Increase Resources for stormwater pond cleaning (new crews and equipment)				
C.2 Increase annual capital investment for stormwater facility retrofits (reduce backlog)				
C.3 Increase annual investment in maintenance of watercourses (reduce backlog)				
C.4 Create stormwater program coordination position (additional staff)				
D.1 Stormwater Education and Outreach				

1.2 LoS Ranking – SAG Votes

Targeted Program Elements	Level of Service			
	Low	Medium	High	Maintain
A.1 Regular inspections of stormwater infrastructure	2	1	2	1
A.2 Regular stormwater pond maintenance	0	4	3	1
A.3 Provide proactive maintenance to support maximum system capacity and longevity	6	1	0	1
A.4 Implement a City-wide CCTV inspection program	6	3	0	0
A.5 Implement a City-wide storm sewer pipe repair program	1	7	0	0
A.6 Ensure increase in O&M is commensurate with estimates of growth	7	1	0	0
B.1 Add GIS Analyst for stormwater tracking and mapping	2	6	0	0
C.1 Increase Resources for stormwater pond cleaning (new crews and equipment)	2	5	1	0
C.2 Increase annual capital investment for stormwater facility retrofits (reduce backlog)	5	2	1	0
C.3 Increase annual investment in maintenance of watercourses (reduce backlog)	5	2	3	2
C.4 Create stormwater program coordination position (additional staff)	3	2	3	0
D.1 Stormwater Education and Outreach	4	1	3	0

1.3 SAG Preferred LoS

Targeted Program Elements	Level of Service			
	Low	Medium	High	Maintain
A.1 Regular inspections of stormwater infrastructure	**2**	1	**2**	1
A.2 Regular stormwater pond maintenance	0	**4**	3	1
A.3 Provide proactive maintenance to support maximum system capacity and longevity	**6**	1	0	1
A.4 Implement a City-wide CCTV inspection program	**6**	3	0	0
A.5 Implement a City-wide storm sewer pipe repair program	1	**7**	0	0
A.6 Ensure increase in O&M is commensurate with estimates of growth	**7**	1	0	0
B.1 Add GIS Analyst for stormwater tracking and mapping	2	**6**	0	0
C.1 Increase Resources for stormwater pond cleaning (new crews and equipment)	2	**5**	1	0
C.2 Increase annual capital investment for stormwater facility retrofits (reduce backlog)	**5**	2	1	0
C.3 Increase annual investment in maintenance of watercourses (reduce backlog)	**5**	2	3	2
C.4 Create stormwater program coordination position (additional staff)	**3**	2	**3**	0
D.1 Stormwater Education and Outreach	**4**	1	3	0

1.4 Overall Recommended LoS

Targeted Program Elements	Level of Service			
	Low	Medium	High	Maintain
A.1 Regular inspections of stormwater infrastructure	**2**	1	**2**	1
A.2 Regular stormwater pond maintenance	0	**4**	3	1
A.3 Provide proactive maintenance to support maximum system capacity and longevity	**6**	1	0	1
A.4 Implement a City-wide CCTV inspection program	**6**	3	0	0
A.5 Implement a City-wide storm sewer pipe repair program	1	**7**	0	0
A.6 Ensure increase in O&M is commensurate with estimates of growth	**7**	1	0	0
B.1 Add GIS Analyst for stormwater tracking and mapping	2	**6**	0	0
C.1 Increase Resources for stormwater pond cleaning (new crews and equipment)	2	**5**	1	0
C.2 Increase annual capital investment for stormwater facility retrofits (reduce backlog)	**5**	2	1	0
C.3 Increase annual investment in maintenance of watercourses (reduce backlog)	**5**	2	3	2
C.4 Create stormwater program coordination position (additional staff)	**3**	2	**3**	0
D.1 Stormwater Education and Outreach	**4**	1	3	0

2.1 Cost of Recommended Levels of Service

Brampton Projected Stormwater Program Costs		
Activity	*Current (2017) Cost*	*Additional Cost of Recommended LOS*
Operations & Maintenance		
O&M Contracted Services		
Street Sweeping	$ 642,000	
Sweeping Waste Recycling	$ 100,000	
Catch Basin Cleaning	$ 588,000	$ 540,000
Storm Sewer Flushing	$ 150,000	
Pond Maintenance	$ 116,000	$ 112,500
Underground locates	$ 200,000	
CCTV	$ 138,000	$ 120,000
Storm Sewer Repair program		$ 7,750,000
O&M Labour Costs		
Road Operations	$ 108,884	
Parks	$ 157,903	
Infrastructure Inspections		$ 120,000
Engineering & Planning		
Engineering & Planning Labour Costs		
Development Engineering/Construction	$ 724,258	
Planning/Growth Management	$ 79,221	
Roads Design	$ 288,062	
IT/GIS Mapping Support	$ 22,500	
GIS Analyst		$ 68,000
Stormwater Program Coordinator		$ 158,000
Stormwater Outreach/Education Coordinator		$ 60,000
Capital Improvements		
Stormwater Pond Restoration	$ 2,500,000	$ 3,500,000
Stormwater Management Study	$ 200,000	
Retrofit Capital projects		$ 2,560,000
Watercourse Capital improvements		$ 800,000
Growth Fund (2.2%)		$ 132,000
Totals	**$ 6,014,828**	**$ 15,920,500**

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2.2 New Costs Phased in over 5 Years

Brampton Projected Annual Stormwater Program Costs - 5 year phase in approach								
			Projected Additional Costs (without inflation)					
	Activity	*Current (2017) Cost*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024-2028*
Operations & Maintenance								
O&M Contracted Services								
	Street Sweeping	$ 642,000						
	Sweeping Waste Recycling	$ 100,000						
	Catch Basin Cleaning	$ 588,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000
	Storm Sewer Flushing	$ 150,000						
	Pond Maintenance	$ 116,000	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500
	Underground locates	$ 200,000						
	CCTV	$ 138,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
	Storm Sewer Repair program		**$ 1,550,000**	**$ 3,100,000**	**$ 4,650,000**	**$ 6,200,000**	**$ 7,750,000**	**$ 7,750,000**
O&M Labour Costs								
	Road Operations	$ 108,884						
	Parks	$ 157,903						
	Infrastructure Inspections		$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
Engineering & Planning								
Engineering & Planning Labour Costs								
	Development Engineering/Construction	$ 724,258						
	Planning/Growth Management	$ 79,221						
	Roads Design	$ 288,062						
	IT/GIS Mapping Support	$ 22,500						
	GIS Analyst		$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000
	Stormwater Program Coordinator		**$ 90,000**	**$ 90,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**
	Stormwater Outreach/Education Coordinator		$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Capital Improvements								
	Stormwater Pond Restoration	$ 2,500,000	**$ 1,500,000**	**$ 2,000,000**	**$ 2,500,000**	**$ 3,000,000**	**$ 3,500,000**	**$ 3,500,000**
	Stormwater Management Study	$ 200,000						
	Retrofit Capital projects		**$ 1,000,000**	**$ 1,400,000**	**$ 1,800,000**	**$ 2,200,000**	**$ 2,560,000**	**$ 2,560,000**
	Watercourse Capital improvements		$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000
	Growth Fund (2.2%)		$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000
	totals	**$ 6,014,828**	**$ 6,092,500**	**$ 8,542,500**	**$11,060,500**	**$13,510,500**	**$ 15,920,500**	**$ 15,920,500**

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2.3 New Costs Phased in over 10 Years

Brampton Projected Annual Stormwater Program Costs - 10 year phase in approach											
		Projected Additional Costs (without inflation)									
Activity	*Current (2017) Cost*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*
Operations & Maintenance											
O&M Contracted Services											
Street Sweeping	$ 642,000										
Sweeping Waste Recycling	$ 100,000										
Catch Basin Cleaning	$ 588,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000
Storm Sewer Flushing	$ 150,000										
Pond Maintenance	$ 116,000	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500
Underground locates	$ 200,000										
CCTV	$ 138,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
Storm Sewer Repair program		**$ 1,550,000**	**$ 1,550,000**	**$ 3,100,000**	**$ 3,100,000**	**$ 4,650,000**	**$ 4,650,000**	**$ 6,200,000**	**$ 6,200,000**	**$ 7,750,000**	**$ 7,750,000**
O&M Labour Costs											
Road Operations	$ 108,884										
Parks	$ 157,903										
Infrastructure Inspections		$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
Engineering & Planning											
Engineering & Planning Labour Costs											
Development Engineering/Construction	$ 724,258										
Planning/Growth Management	$ 79,221										
Roads Design	$ 288,062										
IT/GIS Mapping Support	$ 22,500										
GIS Analyst		$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000
Stormwater Program Coordinator		**$ 90,000**	**$ 90,000**	**$ 90,000**	**$ 90,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**
SW Outreach/Education Coordinator		$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Capital Improvements											
Stormwater Pond Restoration	$ 2,500,000	**$ 1,500,000**	**$ 1,500,000**	**$ 2,000,000**	**$ 2,000,000**	**$ 2,500,000**	**$ 2,500,000**	**$ 3,000,000**	**$ 3,000,000**	**$ 3,500,000**	**$ 3,500,000**
Stormwater Management Study	$ 200,000										
Retrofit Capital projects		**$ 1,000,000**	**$ 1,000,000**	**$ 1,400,000**	**$ 1,400,000**	**$ 1,800,000**	**$ 1,800,000**	**$ 2,200,000**	**$ 2,200,000**	**$ 2,560,000**	**$ 2,560,000**
Watercourse Capital improvements		$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000
Growth Fund (2.2%)		$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000
totals	**$ 6,014,828**	**$ 6,092,500**	**$ 6,092,500**	**$ 8,542,500**	**$ 8,542,500**	**$ 11,060,500**	**$ 11,060,500**	**$ 13,510,500**	**$ 13,510,500**	**$ 15,920,500**	**$ 15,920,500**

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3.1 Factors Affecting Expenditures

Examples of factors which will affect the expenditures over time

Operations

- Increased maintenance as system ages
- Changes in costs reflecting level of service investments
- Growth in infrastructure
- Changes to Provincial legislation
- Corporate support costs
- Inflation

Capital Related

- Replacement capital needed as system ages
- New capital emplaced or built as areas expand
- Financing of capital costs are a function of policy regarding reserves and direct financing from rates, debt and other user pay methods (e.g. Development Charges)

3.2 Current Funding

- **General Tax Levy** – stormwater-related contract and labour costs contained in the City's operating budget; stormwater-related capital costs
- **Development Fees** – stormwater service costs related to the review and inspection activities for development applications

3.3 Funding Trends

- General municipal practice in Ontario is to fund SW costs from the general tax levy
- Recent trend towards dedicated funding sources
  - Dedicated and stable funding sources enable better long-range planning
  - Segregation of revenue directly aligned with service provision
  - Properly designed SW fees are a more equitable way of recovering costs (user pay principle)
  - Can create more awareness of the importance of SW management and associated costs → public support

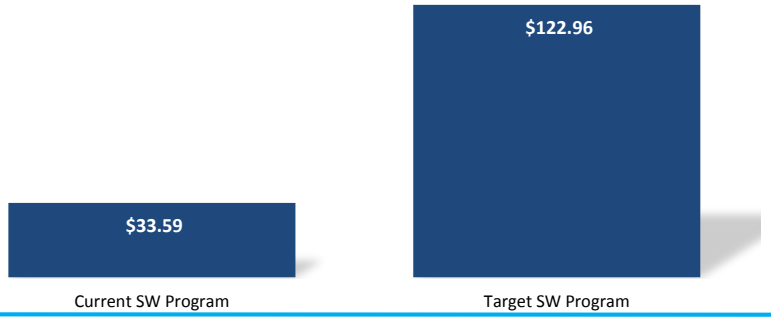
3.4 Rate Basis

- **Rates** – total costs to maintain the utility function divided by the total expected volume of activity (charging parameter)
- **Total Costs**
  - Operating costs (e.g. staff costs, maintenance, administration, etc.)
  - Capital-related costs (e.g. debt to finance capital projects, transfers to reserves to finance future expenditures, etc.)

3.5 Residential Tax Bill Impacts

- 2017 Budgeted Tax Revenue = $447 million
- Increase in SW Program Costs = $16 million
- Tax Levy Increase to Support SW Program = 3.58%
- Average Residential Tax Bill[1] = $2,500

Portion of Annual Tax Bill Attributable to SW
(Residential Single Detached Dwelling)



[1] Based on CVA of $507k for Residential Single Detached.

3.6 Rate Structure Considerations

- Important to identify an appropriate charging parameter over which the costs will be distributed
- This charging parameter should provide a linkage to benefits derived from the service
- Consideration should also be given to other factors
  - Ease of calculation (data availability, reliance on assumptions, etc.)
  - Cost of administration
  - Users' control over charging mechanism

3.7 Options for Stormwater Cost Recovery

- Property Taxes
- Flat Rates
- Utility Rate
- Modified Flat Rate based on Run-off Coefficient or Sampling of Impervious Area
- Modified Land Area Rate (implemented based on property size)
- Actual Impervious Area of Each Property

3.7 Example Set-up

	Property Classification	Site Area (acres)	Impervious Area (acres)
Property 1	Residential	0.18	0.081
Property 2	Residential	0.36	0.076
Property 3	Commercial	0.60	0.480

Property 1

Property 2

Property 3

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Source of Images: Stormwater Services Billing Unit, Durham, North Carolina
https://durhamnc.gov/816/Calculating-Your-Bill

3.7 Options for Stormwater Cost Recovery

- Property Taxes

$$\frac{\text{Total SW Costs (\$)}}{\text{Total CVA (\$)}} = \text{Annual Charge per \$ of CVA}$$

- Flat Rates

$$\frac{\text{Total SW Costs (\$)}}{\text{\# of Properties}} = \text{Annual Charge per Property}$$

- Utility Rate

$$\frac{\text{Total SW Costs (\$)}}{\text{Total Water Consumption } (m^3)} = \text{Annual Charge per } m^3 \text{ of Water Consumption}$$

3.7 Modified Flat Rate – Based on Run-off Coefficient

Residential

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 1	0.18	0.45	0.081
Property 2	0.36	0.45	0.162
Total	**0.54**	**0.45**	**0.243**

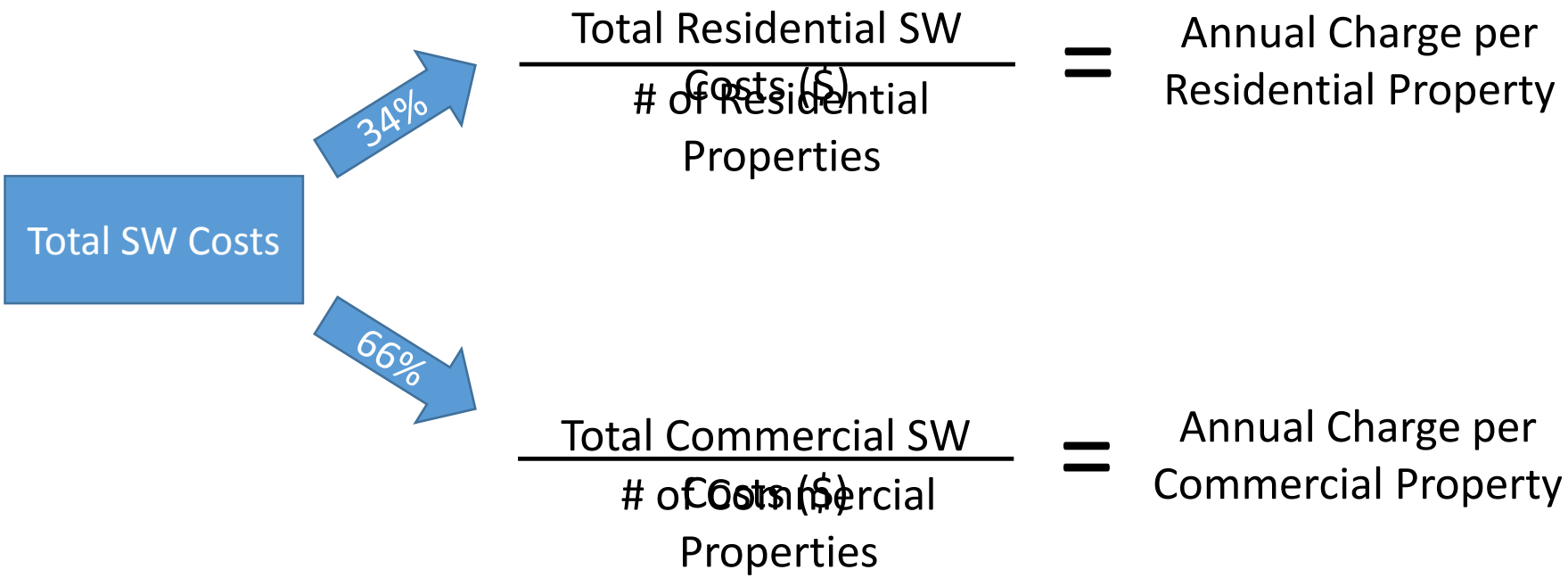
34% of Total Impervious Area

Commercial

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 3	0.64	0.75	0.480

66% of Total Impervious Area

3.7 Modified Flat Rate – Based on Run-off Coefficient



3.7 Modified Flat Rate – Based on Impervious Area Sampling

Residential

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 1	0.18	0.45	0.081
Property 2	0.36	0.45	0.162
Total	**0.54**	**0.45**	**0.243**

Commercial

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 3	0.64	0.75	0.480

Instead of using standard run-off coefficients, the run-off coefficient would be determined based on sampling from the City's GIS

34% of Total Impervious Area

66% of Total Impervious Area

3.7 Run-off Coefficient by Actual Land Area

Residential

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 1	0.18	0.45	0.081
Property 2	0.36	0.45	0.162
Total	**0.54**	**0.45**	**0.243**

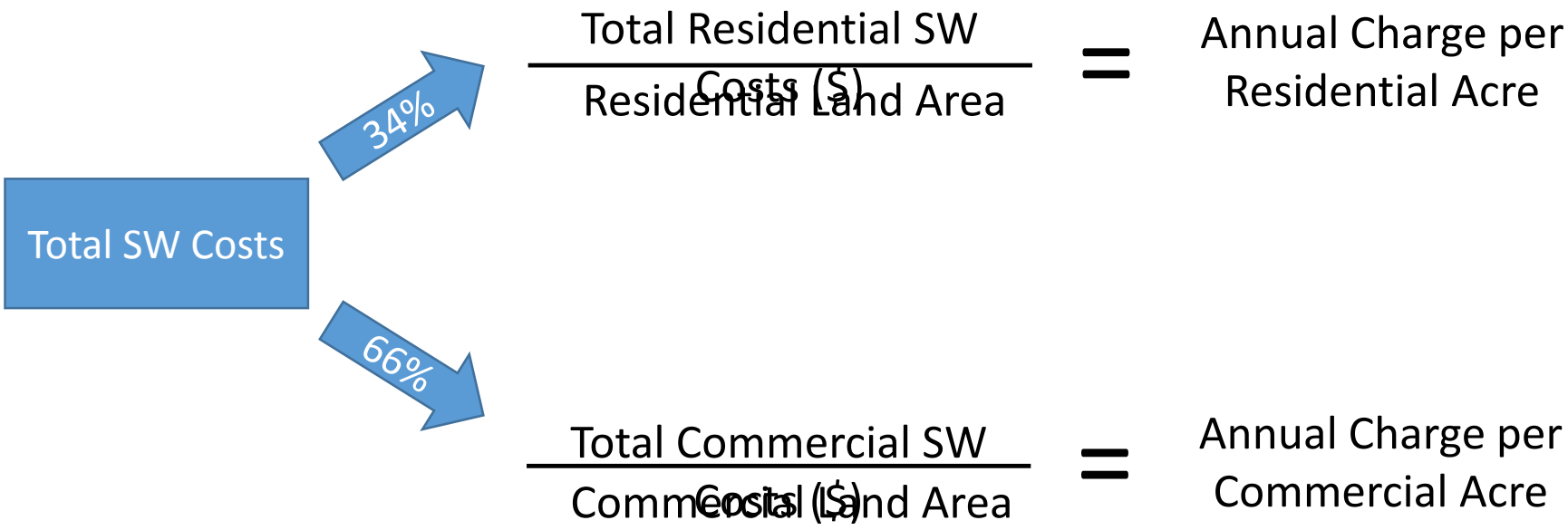
34% of Total Impervious Area

Commercial

	Site Area (acres)	Run-off Coefficient	Estimated Impervious Area
Property 3	0.64	0.75	0.480

66% of Total Impervious Area

3.7 Run-off Coefficient by Actual Land Area



3.7 Measured Impervious Area

$$\frac{\text{Total SW Costs (\$)}}{\text{Total Impervious Acres}} = \text{Annual Charge per Impervious Acre}$$

3.8 Rate Structure Ranking by Criterion

Type of Charge	Rate Options/Basis of Calculation	Ease of Calculation	Linkage between Fee Paid and Benefit Derived from Service	Cost of Administration	Users' Control over Charging Mechanism
Property Taxes	tax rate applied to assesssed value	easy	low	low	medium
Flat Rate per Property	$/property	easy	low	low	low
Utility Rate	$/$m^3$ of water consumption	easy	low	low	high
Run-off Coefficient by Property Type	$/unit (varied by type)	medium	medium	medium	low
Impervious Area Sampling by Property Type	$/unit (varied by type)	medium	medium	medium	low
Run-off Coefficient by Actual Land Area per Property	$/acre	hard	high	medium/high	medium
Impervious Area Sampling by Actual Land Area per Property	$/acre	hard	high	medium/high	medium
Actual Impervious Area per Property	$/impervious acre	hard	high	high	high

3.9 Data Availability to Support Rate Structure

- Runoff Coefficient by Property Type
  - Property classification based on MPAC Property Codes in the City's Tax Roll
  - Some gap filling required for approximately 13% of Roll Numbers without site area information
- Actual Impervious Area Billing Approach
  - Existing GIS data would require some manipulation (calculation of driveways, clipping out public areas/right of ways, ensuring impervious area is not double counted)
  - Approximately 1,200 to 1,800 hours of GIS staff time would be required

3.10 Municipal Comparison of Rate Structures

Tiered Flat Rate

Municipality	Type of Rate Based Structure	Rate Categories
Markham	Flat Rate Charge per Property	Residential
	Current Value Assessment	Non-residential
Ottawa	Residential - Flat Rate per Property (by property type, Urban & Rural)	Residential (RS) and Multi-Residential (RA) - Urban/Rural
	Non-Residential - Tiered Flate Fee (based on CVA, Urban/Rural)	ICI - 8 CVA ranges/categories - Urban and Rural
Aurora	Flat Rate Charge per Unit	Residential and condominium properties
		Non-residential and multi-residential properties
Richmond Hill	Flat Rate Charge per Property	Residential and farm properties
		Industrial, commercial, multi-unit, and condominium properties
Hamilton	Utility Rate (based on water consumption)	Residential - 2 tiers (based on monthly consumption)
		Non-residential
London	Flat Rate Charge per Property	Land area 0.4 hectares or less
		Residential land area 0.4 hectares or less without a stormdrain within 90m
	Rate per hectare	Land area above 0.4 hectares
St. Thomas	Flat Rate per Property	Residential & commercial/institutional under 1,800 m^2 land area
	Rate per Hectare	Commercial/institutional over 1,800 m^2 land area & all industrial
Vaughan	Flat Rate Charge per Property	3 Residential categories
		Agricultural/vacant
		3 Non-Residential categories
Waterloo	Flat Rate per Property (by property type & size)	3 residenital categories & 3 multi-residential categories
		3 institutional categories & 4 industrial/commercial categories
Kitchener	Tiered Flat Fee (based on property type and size of impervious area)	10 residential categories
		6 non-residential categories
Guelph	Flat Rate Charge	Residential - applied to every detached home, townhouse, apartment, and condo
	Rate per Equivalent Residential Unit (ERU) based on impervious area (ERU multiplier = impervious area/188 m2)	Industrial, commercial, and institutional properties
Mississauga	Tiered Flat Fee (based on roofprint area)	5 categories for Single Residential properties
	Rate per m^2 of impervious area (impervious area individually assessed for each property)	Multi-residential & non-residential properties

4. Next Steps

a) Upcoming Study Steps
   i. Detailed Rate Calculations for Preferred Rate Structure
   ii. Consideration of Policy Matters (e.g. exemptions, credits, etc.)

b) SAG Meeting No.5: Potential Dates

   Thursday, January 11, 2018

   OR

   Thursday, January 18, 2018

City of Brampton, ON
Stormwater Management Financing Study

Stormwater Advisory Group Meeting #3

Meeting Summary

Meeting Date: Thursday, November 16, 2017

Time: 7:00 p.m.

Location: Brampton City Hall, WT 2-A

Attendees:

Michael Heralall, City of Brampton
Doug Foster – Brampton Environmental Advisory Committee
Cosimo Stalteri – Orlando Corp
Tonny Johansen – Candevcon Ltd.
Phil James, CVC
Dilnesaw Chekol– TRCA
Andrew Grunda, Watson & Associates
Peter Simcisko, Watson & Associates
Emma Malcolm, Amec Foster Wheeler
Brian Bishop, Amec Foster Wheeler

Summary and Discussion Topics:

1. Introduction

Michael Heralall opened the meeting, welcomed the advisory group members, and introduced the agenda for the evening.

2. Review of Agenda

Peter and Brian provided an overview of the agenda for SAG 4. They noted that the focus of the fourth SAG would be to discuss options for funding the program.

3. Review of SAG 3

Brian provided a brief recap of SAG 3 and an overview of the results of preferred options for the programs Levels of Service (LOS). A review of the City's selected options for the LOS was also shared. Overall the City and the SAG were aligned on their preferred LOS selections. In some cases where there was a tie or a difference (high and low) between the City and SAG preferred LOS selections (A1, C4, D1), a compromise with a medium LOS has been selected as the recommended LOS option for those components of the Project.

4. Program Phase-In Options

Brian presented the group with two options for phasing-in the implementation of the Project; 5-year or 10-year, and the associated costs of the program during those timeframes. Peter discussed the various factors that could affect expenditures over the 5 or 10-year phase-in of the program such as:

- Increased maintenance or changes in the systems;
- Inflation;
- Changes to provincial legislations / regulatory requirements;
- Growth in infrastructure.

5. Program Funding

Peter noted that under the current program, the City is funding Stormwater costs through taxes and development fees. It was noted that Stormwater programs are typically funded by municipalities through taxes, but a recent trend has moved towards establishing a dedicated funding source, the latter of which is being proposed for the City of Brampton.

6. Rate Structure Considerations and Options for Stormwater Cost Recovery

Peter provided an overview of how the rate basis for the program is determined and factors that need to be considered when determining the rate, including:

- Ease of calculations;
- Linkage between fee paid and benefit derived from service;
- Cost of administrations; and
- User control over the charging mechanism.

Peter presented the options establishing or calculating individual user rates for Stormwater cost recovery that were being considered by the City, including:

- Property taxes;
- Flat rates;
- Utility rate;
- Modified flat/utility rate based on run-off coefficient or sampling of impervious area;
- Modified land area rate (implemented based on property size); and
- Actual impervious area of each property.

A ranking of the options for rates was provided based on the considerations discussed above. Peter also presented an overview of what rate structure other local municipalities had selected and the state and availability of the City's current database of property information (type, and size of impervious area for each property).

7. Group Discussion

Q: In other municipalities where a flat rate is being charged, is there a separate bill or is it tied to a water or hydro bill?
A: The fee is generally included on the water bill – which is the most cost-efficient method. Establishing a separate mechanism for billing would be very costly to both the City and users.

Q: In the case of Mississauga, the fee is included on the water bill. The water bills are distributed to owners by legal parcels. This is problematic for ICI properties, where the property may not be divided among renters by legal parcels, or where there is shared impervious areas among renters. This becomes a costly and complicated administration process on the landlords' end.
A: The City is looking to find an approach that meets an "80/20" benefit nexus, where the more accurate rate structure is implemented with the minimal administrative costs for both the City and users.

Q: For new construction, the City already requests that the developer provide information about the impervious area of each property – could the City consider using a modified flat rate based on design criteria and sampling based on zoning?
A: Yes, the City will explore the possibility of using zoning as a parameter for impervious area allocations. One challenge with this may be presented when you consider the age of development, where design criteria and allowable impervious coverage has increased over time (e.g. low density residential from around 35-55%.

Q: Will the City still considering offering credits for green infrastructure?
A: The City is considering different options for user incentivization, including establishing grants, subsidies and credits. The user end-cost of applying for credits has proven to be cost-ineffective in the past. A grant program rather than a credit based program may provide more incentive for individual property owners to retrofit their properties, or work as a neighbourhood collective to implement a retrofitting program.

Q: Is there a risk associated with selecting a 10-year phase-in program? Won't this mean the City is even more behind in dealing with Stormwater?
A: Yes, there are some additional risks with selecting a 10-year phase-in option, however it gives the City additional time to assess the system using the CCTV data and also provides small and medium size business owners additional time to budget for the fee.

8. Next Steps

1. Watson will prepare a preliminary assessment of detailed rate calculations for preferred rate structure
2. The City is going to meet with the Corporate Leadership Team to get their input and feedback on the program
3. SAG 5 will be scheduled for January

City of Brampton
Stormwater Management Financing Study
Stormwater Advisory Group Meeting No. 4
Stormwater Funding Approaches Handout

Type of Charge	Rate Options/Basis of Calculation	Ease of Calculation	Linkage between Fee Paid and Benefit Derived from Service	Cost of Administration	Users' Control over Charging Mechanism	Ranking (1 being Preferred Charging Mechanism)
Property Taxes	tax rate applied to assesssed value	easy	low	low	medium	
Flat Rate per Property	$/property	easy	low	low	low	
Utility Rate	$/$m^3$ of water consumption	easy	low	low	high	
Run-off Coefficient by Property Type	$/unit (varied by type)	medium	medium	medium	low	
Impervious Area Sampling by Property Type	$/unit (varied by type)	medium	medium	medium	low	
Run-off Coefficient by Actual Land Area per Property	$/acre	hard	high	medium/high	medium	
Impervious Area Sampling by Actual Land Area per Property	$/acre	hard	high	medium/high	medium	
Actual Impervious Area per Property	$/impervious acre	hard	high	high	high	

Comments:

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Meeting Agenda

Date: February 22, 2018 @ 7:00 p.m. **Meeting at:** Brampton City Hall – Boardroom CH-4A

File No.: TPB178004

Subject: **City of Brampton Stormwater Management Financing Study**

Stormwater Advisory Group Meeting #5

1. Brief Review of SAG Meeting # 4

2. Summary of Assessment Methodology

3. Draft Rate Structure

    a. Residential versus Non-Residential
    b. Phase-In Options
    c. Future Analysis and Implementation

4. March Public Meeting (March 27th +/-)

5. Next Steps

3450 Harvester Road
Burlington, ON L7N 3W5
905-335-2353
amecfw.com

Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

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Stormwater Management Financing Study

Stormwater Advisory Group Meeting No. 5

February 22, 2018

19:00-21:00

Boardroom CH-4A

Welcome
Project Team

- City of Brampton
  - Michael Heralall – Project Manager
- Consultant Team
  - Brian Bishop – Amec Foster Wheeler
  - Samantha Stokke – Amec Foster Wheeler
  - Peter Simcisko – Watson & Associates Economists Ltd.
- Stormwater Advisory Group Members

Agenda

1. Rate Structure Direction to Date
2. Review of Funding Model Inputs
   a. Projected Multi-Year Annual Stormwater Costs
   b. Property Classification
   c. Growth Forecast
3. Review of Funding Model Outputs
   a. Model Outputs
   b. Municipal Rate Comparison
4. Policy Discussion
5. Next Steps

1. Rate Structure Direction to Date

- City expressed preference for a tiered flat rate for residential properties and a rate based on measured impervious area for non-residential properties
- SAG preference indeterminate
- Preliminary calculations based on City's preferred rate structure
  - Three residential categories (low, medium, high)
  - Estimated $/impervious acre for non-residential

2.1 Stormwater Services Budget Forecast

Brampton Projected Annual Stormwater Program Costs - 5 year phase in approach								
			Projected Additional Costs (without inflation)					
	Activity	*Current (2017) Cost*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024-2028*
Operations & Maintenance								
O&M Contracted Services								
	Street Sweeping	$ 642,000						
	Sweeping Waste Recycling	$ 100,000						
	Catch Basin Cleaning	$ 588,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000	$ 540,000
	Storm Sewer Flushing	$ 150,000						
	Pond Maintenance	$ 116,000	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500	$ 112,500
	Underground locates	$ 200,000						
	CCTV	$ 138,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
	Storm Sewer Repair program		**$ 1,550,000**	**$ 3,100,000**	**$ 4,650,000**	**$ 6,200,000**	**$ 7,750,000**	**$ 7,750,000**
O&M Labour Costs								
	Road Operations	$ 108,884						
	Parks	$ 157,903						
	Infrastructure Inspections		$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
Engineering & Planning								
Engineering & Planning Labour Costs								
	Development Engineering/Construction	$ 724,258						
	Planning/Growth Management	$ 79,221						
	Roads Design	$ 288,062						
	IT/GIS Mapping Support	$ 22,500						
	GIS Analyst		$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000	$ 68,000
	Stormwater Program Coordinator		**$ 90,000**	**$ 90,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**	**$ 158,000**
	Stormwater Outreach/Education Coordinator		$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Capital Improvements								
	Stormwater Pond Restoration	$ 2,500,000	**$ 1,500,000**	**$ 2,000,000**	**$ 2,500,000**	**$ 3,000,000**	**$ 3,500,000**	**$ 3,500,000**
	Stormwater Management Study	$ 200,000						
	Retrofit Capital projects		**$ 1,000,000**	**$ 1,400,000**	**$ 1,800,000**	**$ 2,200,000**	**$ 2,560,000**	**$ 2,560,000**
	Watercourse Capital improvements		$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000	$ 800,000
	Growth Fund (2.2%)		$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000
	totals	**$ 6,014,828**	**$ 6,092,500**	**$ 8,542,500**	**$ 11,060,500**	**$ 13,510,500**	**$ 15,920,500**	**$ 15,920,500**

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2.1 Stormwater Services Budget Forecast (continued)

- Handout #1
- Additional items not discussed during LOS exercise:
  - Stormwater Program Financial Administration
    - Financial Analyst, Business Analyst, SW Technician
  - Billing Administrative Charges
    - Call Centre staff, data entry clerks, cost sharing with Mississauga of existing permanent employees
  - Allocation of Program Support

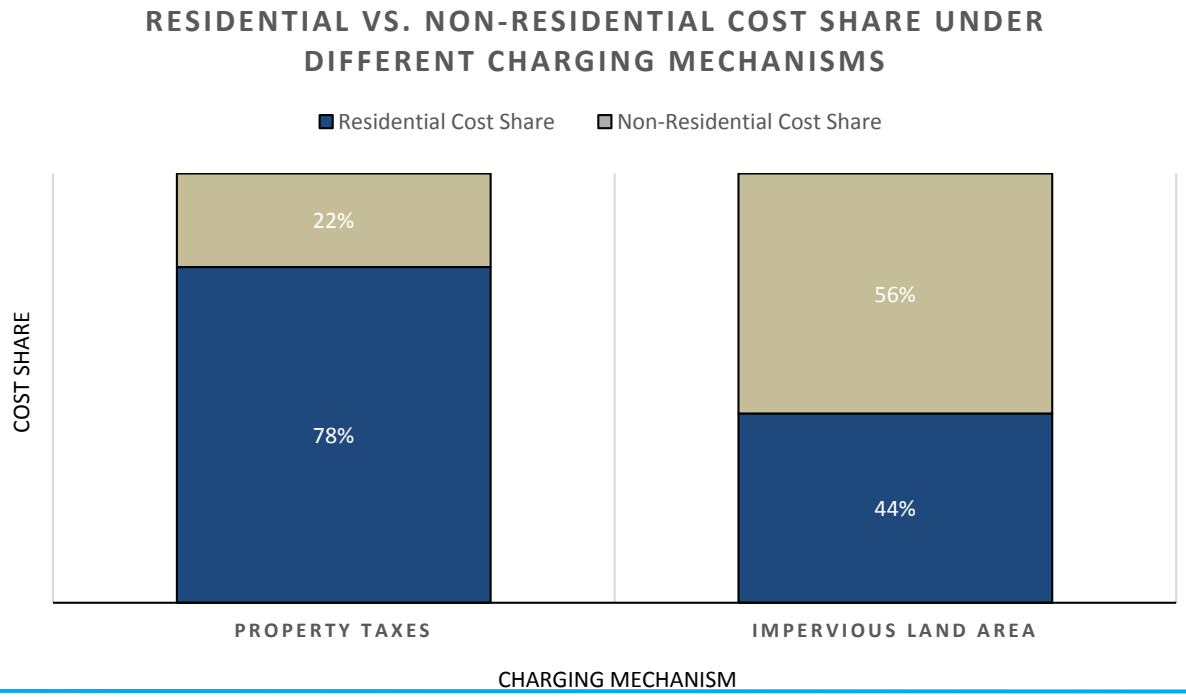
2.2 Property Classification

- Estimated share of impervious land area within each of the 7 major property classifications

Property Type	Land Area (acres)	Run-off Coefficient	Estimated Impervious Area (acres)	Share of Total Impervious Area	# of Billable Units
Commercial	2,750	0.75	2,063	11%	2,045
Industrial	7,089	0.75	5,317	27%	2,381
Institutional	1,282	0.75	962	5%	167
Agricultural/Vacant	26,125	0.10	2,613	13%	12,254
Residential (Low Density)	17,019	0.45	7,659	39%	117,298
Residential (Medium Density)	1,291	0.55	710	4%	21,717
Residential (High Density)	497	0.55	274	1%	182
Total	**56,055**		**19,596**	**100%**	

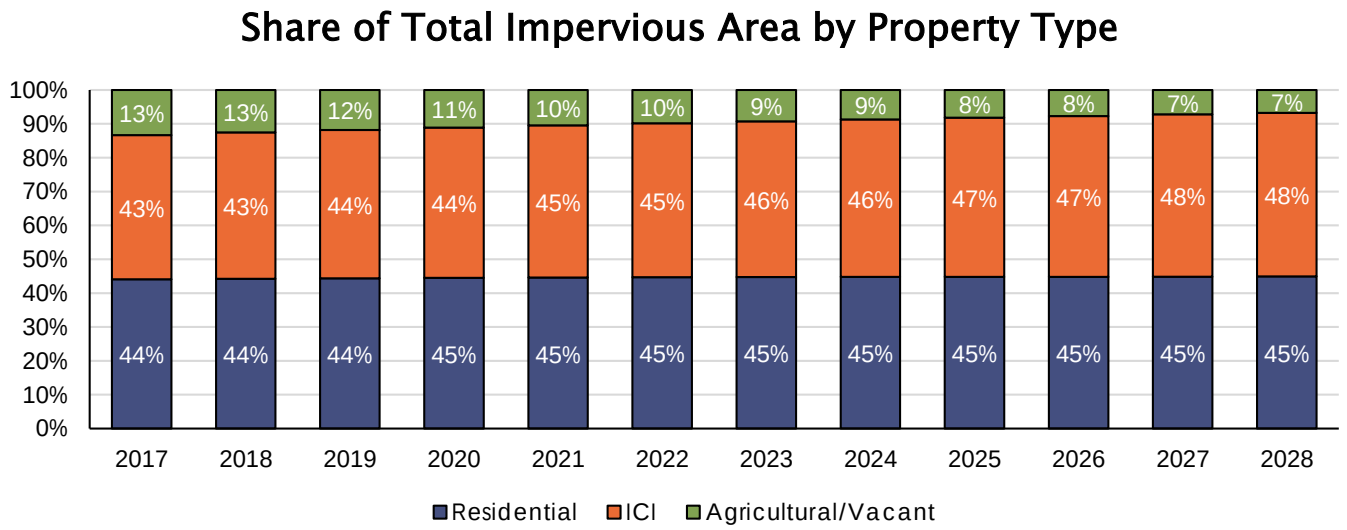
2.2 Property Classification (continued)

- Comparison of cost burden under current funding approach (i.e. property taxes) versus impervious area approach



2.3 Growth Forecast

- Estimate how the share of impervious land area within each of the 7 major property classifications will change over time



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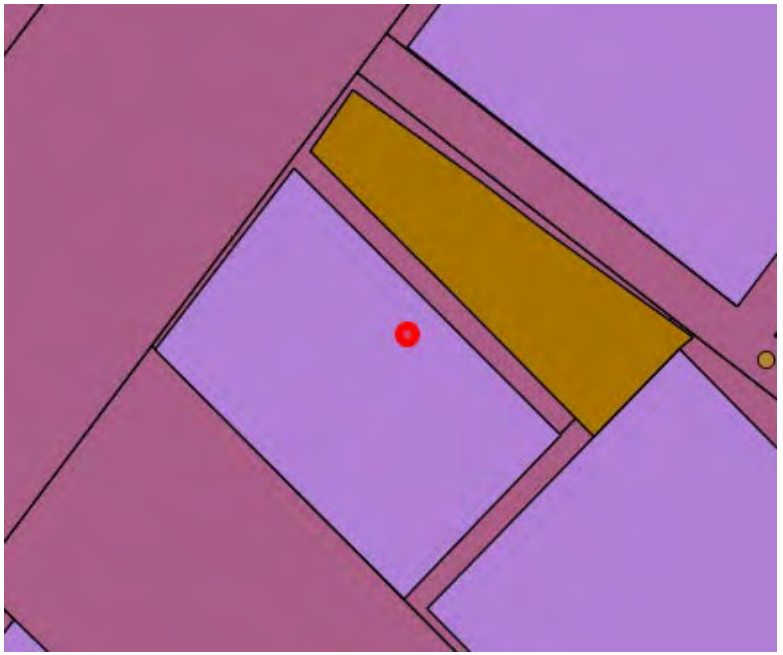
3.1 Funding Model Outputs

- Handout #2
- In consultation with the City's steering committee it is being recommended that the funding requirements are not phased in
  - Capital expenditures still "phased-in" but funding level immediately jumps to optimal level – difference made up for in reserve fund contribution
  - $26.5 million contributed into SW reserve fund over 2019-2022

3.1 Funding Model Outputs (continued)

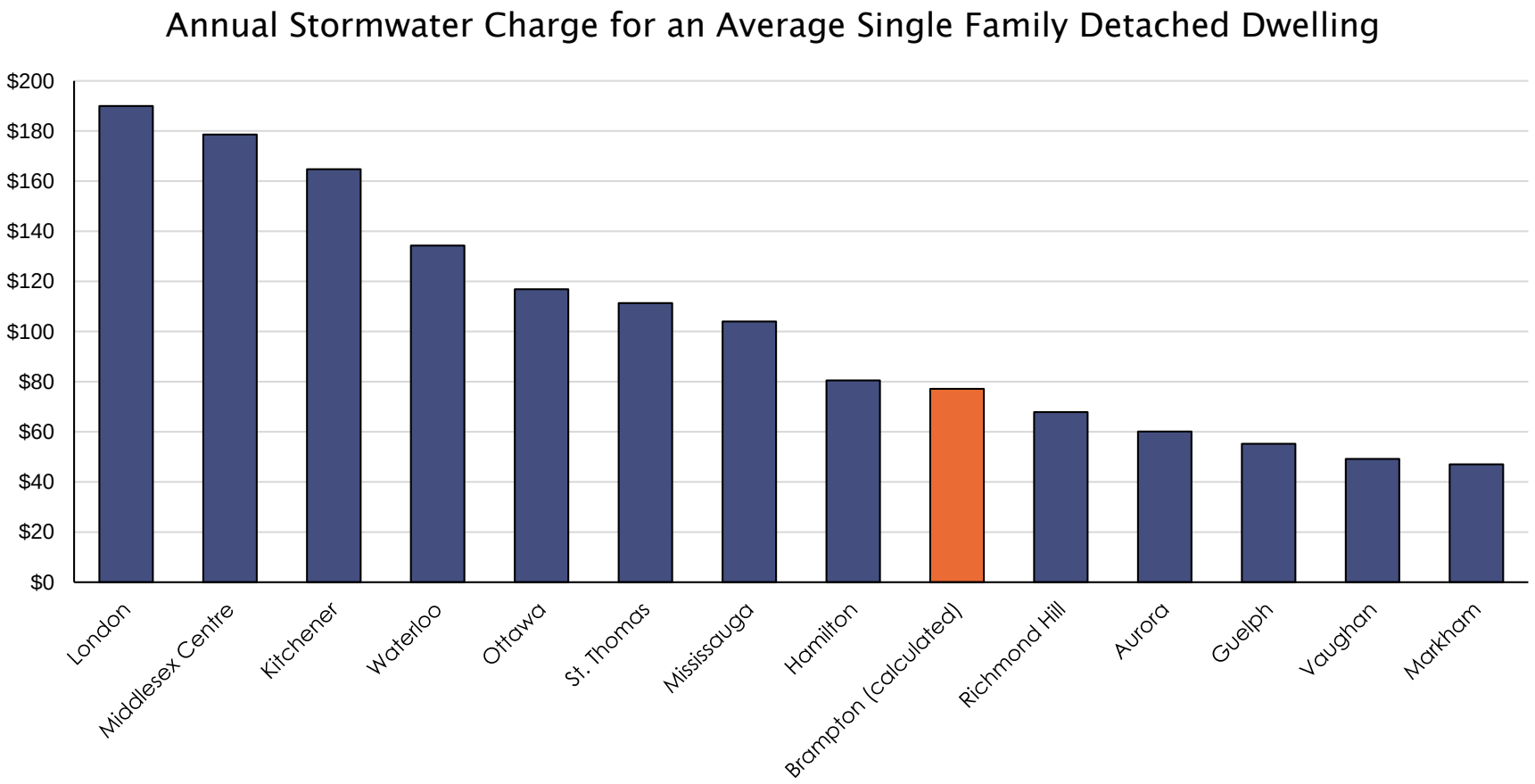
- Small Non-residential
  - 0.15 ac impervious area
  - CVA: $1.10 million



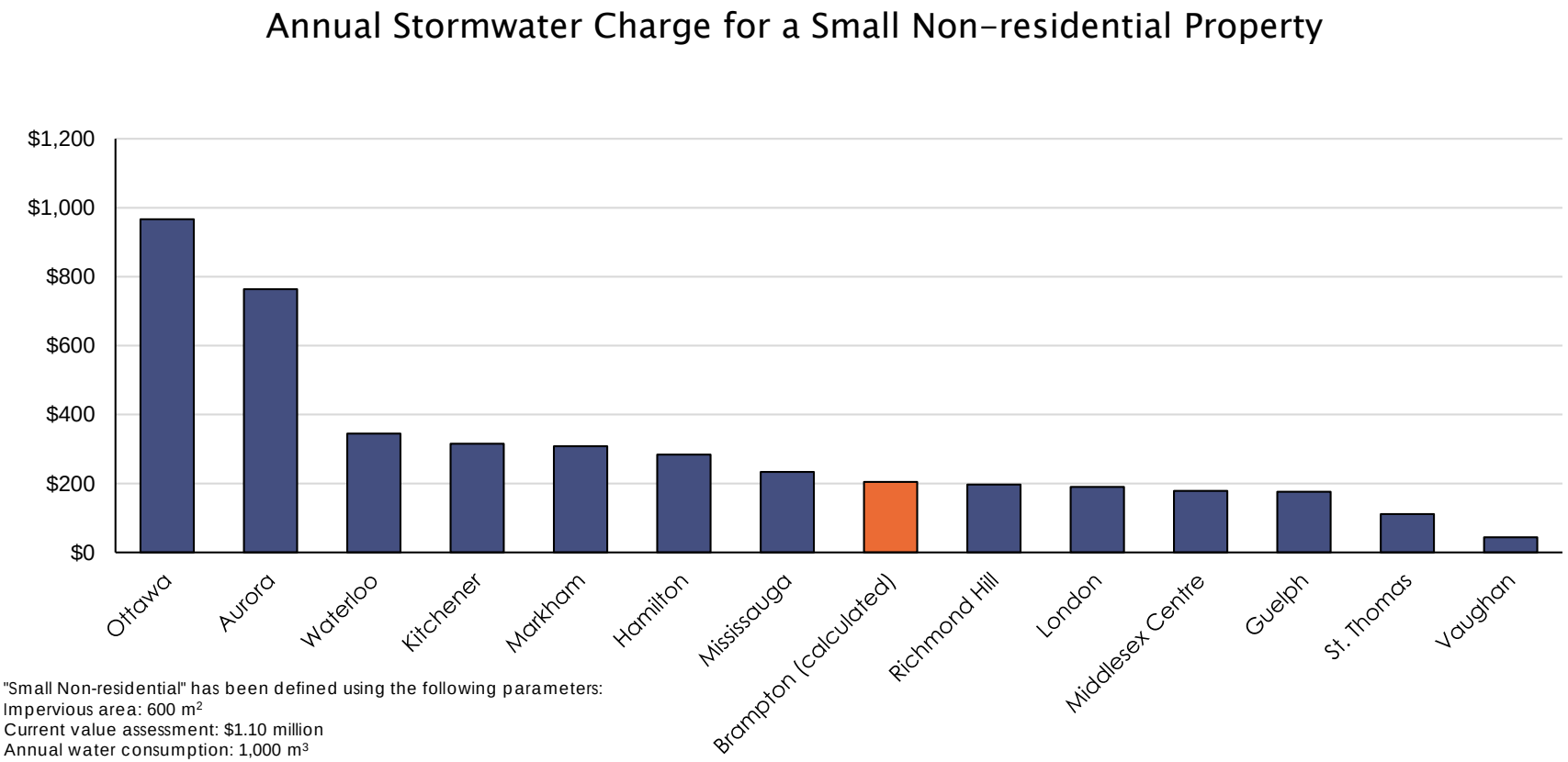
3.1 Funding Model Outputs (continued)

- Large Non-residential
  - 9.46 ac impervious area
  - CVA: $32.2 million

3.2 Municipal Rate Comparison

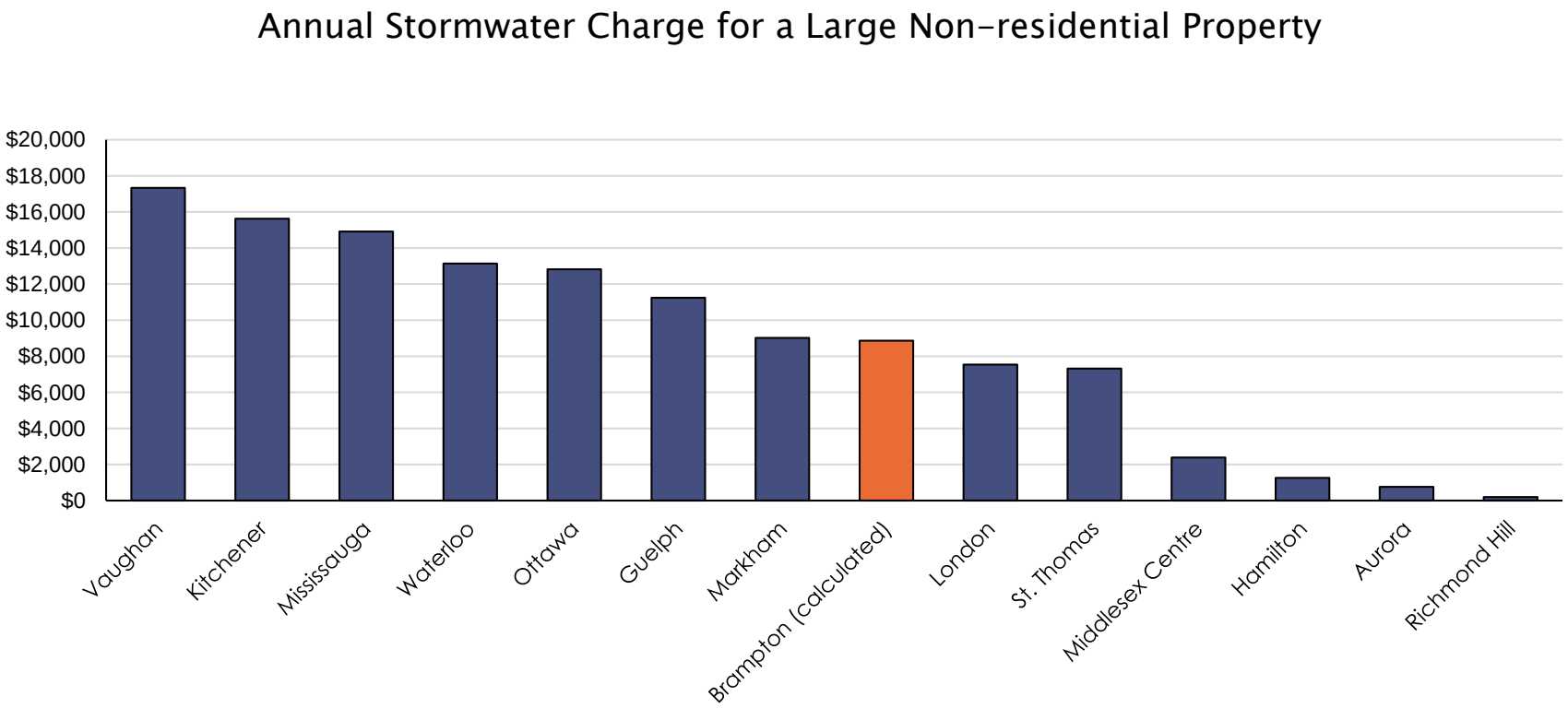


3.2 Municipal Rate Comparison (continued)



"Small Non-residential" has been defined using the following parameters:
Impervious area: 600 m^2
Current value assessment: $1.10 million
Annual water consumption: 1,000 m^3
Water meter size: 25 mm

3.2 Municipal Rate Comparison (continued)



"Large Non-residential" has been defined using the following parameters:
Impervious area: 38,283 m^2
Current value assessment: $32.2 million
Annual water consumption: 4,706 m^3
Water meter size: 50 mm

4. Policy Discussion

- Exemption policies to be discussed and defined
- Modelling presented today assumes that all properties, except schools, would pay
- Credits/Incentive Programs

5. Next Steps

a) Upcoming Study Steps

b) Upcoming Meetings/Presentations

Corporate Leadership Team Meeting

Public Information Centre

City of Brampton, ON
Stormwater Management Financing Study

Stormwater Advisory Group Meeting #5

Meeting Summary

Meeting Date: Thursday, February 22, 2018

Time: 7:00 p.m.

Location: Brampton City Hall, WT 2-A

Attendees:

Michael Heralall, City of Brampton
Grace McLenaghan, City of Brampton
Peter Simcisko, Watson & Associates
Doug Foster, Brampton Environmental Advisory Committee
Marianne Galliford, Churchville Ratepayers Association
Sarah Pengilley, Churchville Ratepayers Association
Tonny Johansen, Candevcon Ltd.
Brian Bishop, Amec Foster Wheeler
Samantha Stokke, Amec Foster Wheeler
Cosimo Stalteri, Orlando Corp
Graeme MacDonald, Credit Valley Conservation Authority
Dan Hipple, Toronto and Region Conservation Authority
Pentti Makela, The Church of Jesus Christ of Latter-Day Saints

Summary and Discussion Topics:

1. Introduction
Michael Heralall opened the meeting and welcomed the advisory group members.

2. Review of Agenda

Peter provided an overview of the agenda for SAG 5 and introduced the new attendees. He noted that the focus of the fifth SAG would be to discuss the funding model output, and noted these were preliminary results and the project team is looking to receive feedback.

3. Rate Structure Direction to Date
Peter presented the City's expressed preference for a tiered flat rate for residential properties and a rate based on measured impervious area for non-residential properties. Residential properties would include three categories: low, medium and high.

4. Stormwater Services Budget Forecast

Peter discussed the budget forecast and spoke to additional operating expenditures not discussed in the Level of Service (LOS) exercise from the third SAG:

- Stormwater Program Financial Administration
  - Financial Analyst, Business Analyst, SW Technician
- Billing Administrative Charges
  - Call Centre staff, data entry clerks, cost sharing with Mississauga of existing permanent employees
- Allocation of Program Support

An overview of the total costs was provided, noting the increase from the current budget of $6.5 million to an additional $16.2 million on an annual basis for the ultimate stormwater program budget.

5. Property Classification

Peter discussed how property classifications and runoff coefficients were calculated. It was noted that non-residential properties have not yet been calculated and would require a significant amount of GIS analysis. The runoff coefficient is currently being calculated using tax roll information. Preliminary results indicated that out of approximately 56,000 acres of land area, 19,000 are impervious area, which was noted to not include roads.

Peter compared the cost share between residential and non-residential properties, noting that currently non-residential properties do not pay as much relative to percent of impervious area.

6. Funding Model Outputs

Following consultation with the City, it was determined to be most appropriate to implement the optimal funding model from the onset. The associated rate impact was noted to be feasible from an affordability stand point. The City will require time to hire necessary staff, during this period revenue would be put into a dedicated stormwater management reserve fund.

Brian discussed the reasoning behind transitioning directly to the optimal funding model. The project team identified it may cause confusion for tax payers to initially receive one rate, which then increases after a certain number of years. The Project Team agreed the implementation of the stormwater charge will be better received if a set rate is provided from the onset.

Peter provided examples of how rates would vary from the current to future model for various sizes of residential and non-residential properties. Overall, the cost burden is being shifted to non-residential properties to correlate more directly with the percent of impervious area.

7. Municipal Rate Comparison

Peter discussed Brampton's stormwater charges in comparison to those of nearby municipalities. Demonstrating the rate comparison for small and large non-residential properties, Peter noted

that Brampton's proposed stormwater management charge falls approximately in the middle compared to surrounding municipalities.

8. Group Discussion

Q: The larger non-residential properties are often the properties that include stormwater management on-site. Does the proposed rate structure account for this?
A: Currently the rate structure does not account for credits or exemptions and assumes all properties, with the exception of schools, will pay the stormwater charge. The potential for credits and exemptions will be assessed and refined in future analysis to reflect these considerations.

Q: Does the rate structure account for parklands, streams or city properties?
A: Yes, it does. City properties are categorized as non-residential.

Q: How will the City determine who pays for road networks that have not yet been handed back to the City by the developer?
A: The lot owner will likely pay.

Q: Will Brampton categorize strip soil the same as paving, or will it be categorized as a different form of impervious area to reflect the lower runoff coefficient?
A: This level of detail will be determined at a later stage in the study.

Q: Were the costs of calculating different rates associated with measuring impervious areas analyzed?
A: Yes, the rate structure model incurs additional upfront costs for calculating impervious areas, while the ongoing administrative costs for the two models remain similar. Credit and exemption programs further incur additional administrative costs. The costs associated with the two models will be further analyzed during the implementation plan.

Q: Peter requested stakeholders provide recommendations for exemption policies the City should apply. Currently only the school board properties are exempt. Feedback from other municipalities is that the administration of credit programs is quite expensive. Is it beneficial to have a credit or exemption program?
A1: Yes, credit programs are a positive addition because they encourage people to improve the stormwater management system. Kitchener has a model that is a merit based system, where applicants submit pictures of stormwater management improvements they have made to their property in order to receive a credit.
A2: There is no business case between the cost of retrofits and a credit program, as the costs of retrofits are too great compared to the credits received. The implementation of this program in other municipalities demonstrated that majority of applicants already had these retrofits in place, therefore the program did not promote property improvements.
A3: Michael indicated additional calculations will be required to determine costs of administrating a credit program before the City can determine whether one will be implemented.
A4: Brian indicated that property retrofits to manage stormwater do reduce runoff, however the reduction is minimal and is typically around 10%, resulting in the majority of runoff entering the sewer system. The aim of a credit program is not to remove the charge, but to slightly reduce the charge.

Q: On certain properties, the stormwater runoff flows directly to a creek rather than the sewer system. Will these properties receive exemptions?
A: Exemptions will be analyzed during the implementation plan, however the creek forms part of the drainage system and does require maintenance.

C: Additional information regarding municipal rate comparisons should be presented to Council, such as the type of programs each municipality has implemented.
A: Michael indicated that the priority remains where Brampton stands in comparison of cost rather than program as each municipality has different programs and priorities, such as the size of the City and the age of its infrastructure.

C: Additional consideration should be given to Low Impact Development (LID). Recommend rewording 'Pond Maintenance' to 'Facility Maintenance' to incorporate LID maintenance.
A: Noted.

Q: A previous statement indicted that Brampton has more stormwater management ponds than Mississauga. Does this signify that Brampton should have more or less stormwater management ponds?
A: Stormwater management is under provincial policy direction and is currently under review. The City works under these parameters and should the Province shift the focus to LID, the City will implement these policies accordingly. It was noted that stormwater management ponds are a function of the landscape and age of City infrastructure, and are dependent on the soil type in the area.

Q: Do the ICI properties and rate comparisons take into consideration exemption costs? If exemptions were brought in, would the remaining rates require adjustments in order to maintain the same level of revenue?
A: Correct, the rate comparisons currently do not account for exemption costs. Yes, were exemption costs to be incorporated the remaining rates would need to be increased. This would be determined through a sensitivity analysis.

Q: Will rural properties be required to pay the equivalent stormwater management charge? Certain rural properties are not serviced by the storm sewer system and runoff flows directly into a creek.
A: Situations such as these will be considered during the categorization of stormwater charges, as the purpose of the charge is to act as a user fee. This may warrant a new category for residential rates and will be determined during the implementation plan. It was noted that while the property may not be contributing to the sewer system, creeks form a part of the drainage network and require maintenance.

9. Next Steps

1. The Project Team will take SAG #5 feedback to the steering committee.
2. A Public Information Centre will be held, prior to the Implementation Plan being developed.
3. Additional information will be posted to the City web portal.
4. Brian provided an option for SAG #6. The SAG determined it was not necessary.

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Stormwater Management Financing Study

Stormwater Advisory Group Meeting No. 1

August 17, 2017

7:00 – 9:00 pm

City Hall, Rm. WT-2C/2D

Agenda

1. Introductions and Role of the SAG
2. SAG Terms of Reference
3. Community Engagement
4. Stormwater Management 101
5. Brampton's Current Stormwater Management Program
6. Second SAG Meeting
7. Other Business

1. Welcome and Introductions
Project Team

- City of Brampton
  - Michael Heralall – Project Manager
- Consultant Team
  - Jean Haggerty – Amec Foster Wheeler
  - Brian Bishop – Amec Foster Wheeler
  - Emma Malcolm– Amec Foster Wheeler
  - Andrew Grunda – Watson & Associates Economists Ltd.
  - Peter Simcisko – Watson & Associates Economists Ltd.
- Stormwater Advisory Group Members

1. Principles of Participation

Honest, open and transparent communication	•Pertinent information about the Study will be shared with stakeholders. Stakeholder input will be sought, documented, and will be addressed. If input is not addressed, justification will be provided.
Accessible	•A variety of public participation techniques and methods will be used to distribute information about the Study and to gather stakeholders' feedback. If requested, information will be provided in a language and/or method that facilitates understanding.
Inclusion	•The process will be inclusive and strive to include known and self-identified stakeholders and welcome input received from those individuals and groups with a stake or interest in the Study.
Flexible	•Feedback on the engagement process will be sought from stakeholders to ensure that sufficient opportunities for meaningful input are provided. An evaluation of the engagement process will be conducted on an ongoing basis and changes made as appropriate.
Mutual Respect	•Respect will be given to the differing cultures, values and constraints of each party. There will be follow-through on commitments.

1. Stormwater Advisory Group

Goals and Objectives:

- Share information about the Study
- Share information about current Stormwater management systems, municipal investment and future planning
- Identify, understand and incorporate stakeholder issues and concerns

Benefits:

- Improves awareness of stormwater management and related issues
- Helps to identify shared priorities and opportunities
- Supports collaborative, positive relationships with the community

2. SAG Terms of Reference

Purpose: The purpose of the Stormwater Advisory Group (SAG) is to build awareness among a diverse group of key stakeholders to enable these stakeholders to provide informed input

Governance: The SAG will report to and make recommendations to the City Council and staff

Schedule: Summer 2017-Winter 2018

Roles and Responsibilities:

- Gain an understanding of the current stormwater program and future requirements
- Gain an understanding of potential funding models and potential impacts on property owners
- Provide viewpoints of the organizations that the member represents
- Review and make recommendations to City Council and staff on the future stormwater program

Structure:

- Made up of representatives from stakeholder groups to reflect diverse interests within the community
- 15-20 members

3. Project Background and Scope

- Background
  - Community has invested in an extensive public stormwater management system (2016 estimated value of $1.08 B)
  - System is aging and experiencing more intense and frequent storm events
  - Stormwater Master Plan and Retrofit Study identified significant need for increased efforts in operations, maintenance, and capital retrofit and erosion control projects
- Purpose of the Stormwater Infrastructure Funding Study
  - Better define and understand existing infrastructure assets and future needs
  - Evaluate potential stormwater management costs and funding impacts
  - Make informed recommendations about stormwater priorities, level of investment, and funding options

3. Project Background and Scope

- Study Tasks/Scope:

a) Summarize current services and annual expenses
b) Establish program goals, objectives and priorities
c) Develop a program of services to address needs that align with objectives and priorities
d) Develop guiding principles for a Funding Framework
e) Evaluate Funding options against principles
f) Identify processes and policies needed to implement recommended funding approach
g) Prepare a five year funding model and final report
h) Engage the community

3. Other Community Engagement Activities

Proposed Key Activities:

- Notify local community about the Study – newspaper ads, City website, social media
- Develop and share Stormwater FAQ
- Host a Public Information Centre
- Conduct education sessions
- Develop and facilitate of Stormwater Advisory Group

4. Stormwater Management 101

What is stormwater?

- Stormwater is rainwater and melted snow that runs off lawns, streets and other land surfaces. Hard surfaces such as pavement and roofs prevent precipitation from naturally soaking into the ground and increase run off.

Why do we need to "manage" it?

- Stormwater runoff if not treated or managed before discharging into local water bodies can result in flooding of roads, homes and businesses; can contribute to stream and creek erosion; can carry pollutants to local water bodies.

4. Stormwater Management 101

A Paradigm Shift in Stormwater Management over the past decade

Past:	Now:
• Stormwater is a nuisance – flood control through rapid discharge	• Focus on protecting infrastructure assets: Aging systems require maintenance and replacement/retrofits
• Transportation safety – ditches, ponds and road drainage	• More emphasis on source controls and retaining on-site
• Separate – do not overload the wastewater plant	• Climate change requires hazard mitigation – increased design standards and adaptation planning
• Protect my property – upstream stormwater quantity controls (ponds)	• Stream restoration and habitat protection more of a priority

4. Stormwater Management 101
Challenges

- Aging Infrastructure and Growing Community
- Legislated and Functional (proactive) Maintenance Needs
- Flood Safety and Mitigation
- Regulatory Requirements
- Water Quality Protection

4. Stormwater Management 101
Challenges

Maintenance Needs

4. Stormwater Management 101
Challenges

Flood Mitigation

4. Stormwater Management 101
Challenges

Water Quality Impacts

5. Brampton's Current Stormwater Management Program

- The public portions of the City's stormwater system include:
  - Over 1830 km of pipes
  - Approx. 23,650 manholes
  - Over 38,300 catch basins
  - 246 stormwater ponds

- Current replacement value is approximately $1.0 B*

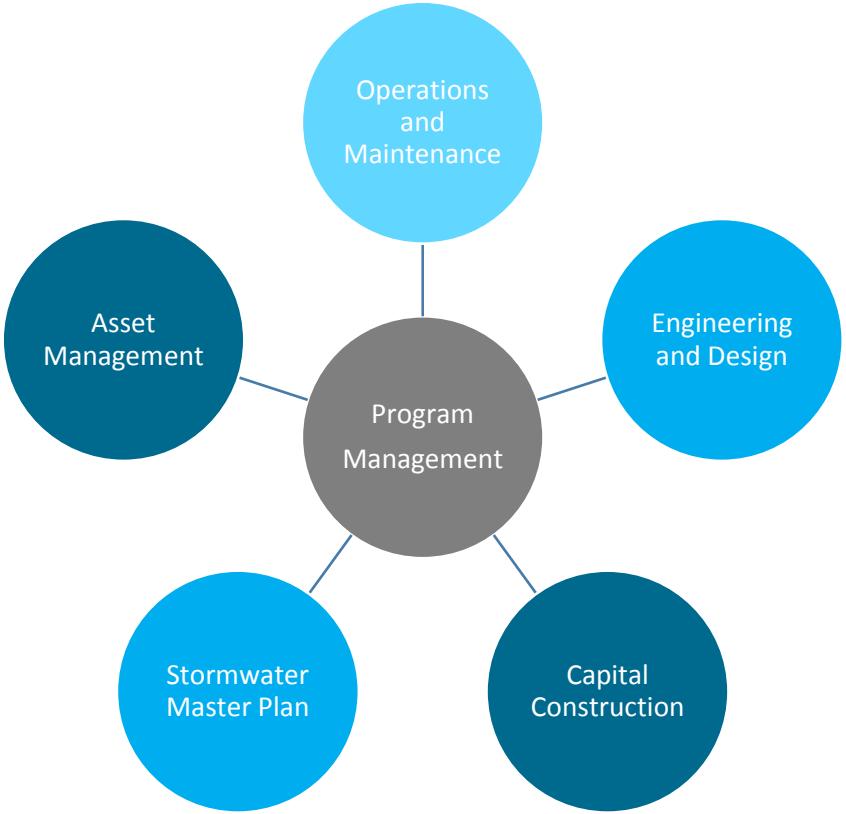
*(excluding additional land for SWM facilities)

5. Brampton's Current Stormwater Management Program

- Stormwater services are primarily managed by:
  - Public Works Department, specifically:
    - *Infrastructure Planning*
    - *Development Construction*
    - *Development Engineering*
  - Roads Maintenance Operations & Fleet Department
  - Capital Works (Road Design & Capital Construction)
- Additional support as needed from:
  - Parks; Corporate Budgets; Corporate Asset management; Purchasing; Finance; HR; and Corporate Communications
- Contracted services in support of maintenance and capital replacement needs

Total City Staff performing stormwater-related services = 17.5 FTEs

5. Brampton's Current Stormwater Management Program



5. Brampton's Current Stormwater Management Program

- Key stormwater program activities include:
  - **Stormwater System Operation & Maintenance**
    - Stormwater asset cleaning, repairs and minor replacements (pipes, catch basins, manholes, outfalls, stormwater ponds)
  - **Asset Management**
    - Inventory, mapping and assessment data on major stormwater system components
  - **Stormwater Planning and Management**
    - Assessment and prioritization of long-term stormwater management needs
  - **Capital Project Management**
    - Engineering, design, oversight of capital system improvements

Current Stormwater Management Program *Operations and Maintenance*

- Extensive stormwater infrastructure system - portions installed over 50 years ago
- Goal: Maximize the functional operation of the system and extend its life through proper O&M
  - Storm sewer flushing, inspection, and cleaning
  - Catch basin and inlet cleaning and repairs
  - Public stormwater pond inspections and maintenance
  - Culvert inspection and maintenance
  - Street sweeping
  - Channel and ditch maintenance (tree removal/vegetation mngt.)
  - Watercourse management – cleaning and maintenance
  - Pre and Post-storm/emergency response to flooding, stream bank stabilization, and water quality issues
  - Investigations in response to complaints from local residents

5. Brampton's Current Stormwater Management Program *Asset Management*

- Asset Management involves the inventory all infrastructure assets and a system of monitoring and identifying life-cycle trends
- Current stormwater activities include:
  - Mapping of the system using GIS – building a database of all pipe and system components including age and materials
  - Conditions assessment – inspection of pipes using closed circuit TV cameras (to be complete over 5 years)
  - Using GPS to locate infrastructure and problem areas
- This information is used in planning and scheduling rehabilitation and reconstruction of the system

Brampton's Current Stormwater Management Program *Stormwater Planning*

- Activities cover a range of planning assessments and technical studies, including:
  - Establishment and enforcement of drainage design standards and floodplain protection issues
  - Management of drainage and watershed planning studies, including the City-Wide Stormwater Master Plan
  - Coordination of local policy and growth initiatives related to stormwater management (low impact designs, sustainable approaches)

5. Brampton's Current Stormwater Management Program *Engineering and Design*

Stormwater-related engineering activities

- In-house design for small projects and oversight of design contracts to upgrade the system
- Plan review of proposed new development for stormwater compliance
- Inspection of new and existing infrastructure
- Oversight of water quality issues – sediment and erosion control, illicit discharges and spill clean-up
- Collection and reporting of field data

5. Brampton's Current Stormwater Management Program *Capital Improvements*

Construction oversight of major stormwater pipes and other stormwater management facility improvements

- Currently approx. $2.5M per year budgeted for stormwater capital projects, mostly related to stormwater pond dredging and repairs
- Stormwater Master Plan and SWM Retrofit plan have identified over $47.5 M in stormwater facility and outfall retrofits and enhancements, and an estimated $40 M in erosion control capital works

5. Brampton's Current Stormwater Management Program *Support Services*

Corporate Services

- Finance – operational and capital budget development and oversight
- Information Technology – GIS mapping and support for asset management data
- Legal – enforcement of by-laws and easement issue support

5. Brampton's Current Stormwater Management Program *Cost of Services*

O&M Contracted Services			
	Street Sweeping	$	642,000
	Sweeping Waste Recycling	$	100,000
	Catch Basin Cleaning	$	588,000
	Storm Sewer Flushing	$	150,000
	Pond Maintenance	$	116,000
	Underground locates	$	200,000
	CCTV	$	138,000
	subtotal	$	1,934,000
O&M Labour Costs			
	Road Operations	$	108,884
	Parks	$	157,903
	subtotal	$	266,787
Total Annual O&M Costs		$	2,200,787

Planning, Engineering & Design Labour Costs			
	Development Engineering/Construction	$	724,258
	Planning/Growth Management	$	79,221
	Roads Design	$	288,062
	IT/GIS Mapping Support	$	22,500
	subtotal	$	1,114,041
Capital Improvements Budget			
	Stormwater Management Pond Restoration	$	2,500,000
	Stormwater Management Study	$	200,000
	subtotal	$	2,700,000
Total Engineering & Capital Works Costs		$	3,814,041

	Total Current Stormwater Services Costs	$ 6,014,828

6. Preliminary Program Needs

- Implement a more Proactive maintenance program with a focus on creeks, new LID, OGS, catch basins, ponds, and outfalls
- Increase investment to decrease pond restoration backlog
- Adopt financial plan to address growing stormwater funding gap for storm sewer system
- Upgrade design standards to address more practical, sustainable practices
- Educate the public about the services provided and the importance of effective stormwater management
- Provide more staff training and SOPs to ensure efficient, quality services

6. Preliminary Program Needs
Key Questions for this Study

a) What key services are required?
   - Based on staff input, professional standards review, and public input, prioritize service needs and establish desired levels of service

b) Over what time period should they be implemented?
   - Develop a 5-10 year plan that grows the program over time and estimates costs of the most critical program needs

c) How should expenses to properly operate and maintain the stormwater system be funded?
   - Based on projected annual costs, compare options for distributing the cost of services

6. Preliminary Program Needs
Drafting Program Goals & Objectives

Draft Program Goal for Discussion

The goal of the Stormwater Management Program is to protect public health and safety and the City's valuable natural and man-made resources by minimizing the impacts of stormwater runoff through on-going system assessments, proactive maintenance and operation of the City's assets, and well-considered investment in system upgrades and expansion.

6. Preliminary Program Needs
Draft Preliminary Program Objectives

i. Services provided by the City should be *clearly defined*, be *based on an assessment of actual need*, and be provided *as efficiently as possible*

ii. The City should seek to move from reactive management of stormwater system components to a *proactive, priority-based asset management program*

iii. The program should be *realistic and achievable* and establish *clear lines of accountability* and decision making

iv. The stormwater program plan should be *coordinated with on-going planning and growth initiatives* to identify efficiencies and should include *public participation* as a fundamental component

v. Program funding *should be fair, equitable, and transparent* and tied to level of service and sustainable financial program goals

7. Next Steps

a) Upcoming Study Steps

- Establish Objectives and Priorities
- Discuss desired levels of service and options for addressing current and future program needs
- Review funding framework recommendations
- Provide feedback on funding levels and options for distributing costs

b) Upcoming SAG Meetings – Tentative Dates

- SAG Meeting No. 1 – Thursday, July 13
- SAG Meeting No. 2 – Thursday, Sept 14
- SAG Meeting No. 3 – Thursday, Oct 12

7. Next Steps – Rate Structure Analysis

As the financial analysis and program development tasks continue, the team is also evaluating potential options for distributing stormwater costs across the community.

- Some typical ways to structure the assessment of stormwater charges:
  - *Flat rate per property* (residential properties pay one rate and non-residential properties a higher rate.) Used when there is little or no data to make the distribution more closely linked with actual stormwater services.
  - *Run-off coefficients by property type*. Typically based on applying standard engineering run-off coefficients per property type and total property land area.
  - *Estimated Impervious surface per property* (based on sampling). Typically based on sampling of impervious surface on a subset of properties in each land use category then applying to all similar land types.
  - *Actual impervious surface area measurements.* Requires actual calculation or measuring the impervious surface per property.
  - *A combination of the above*. It is common to estimate impervious on residential properties and measure impervious on non-residential.

7. Next Steps – Rate Structure Analysis

To evaluate Brampton's options, available data on parcels, land use, and impervious surface is being analyzed.

Preliminary findings:

- **Parcel data from City's MPAC database**
  - There are over 164,000 parcels in the database
  - Approximately 87% include information on property type and site information (lot size or frontage and depth
  - 10% are likely condominiums where it would be easy to calculate total area and divide by number of units
  - 3% do not have usable site area information, but still have property type
- **GIS/Mapping data**
  - Parcel boundaries and numbers are available
  - Information on building footprints, driveways, and parking lots can be calculated based on GIS polygons and measured lengths

7. Next Steps – Rate Structure Analysis

So what does this mean?

- There is sufficient data available to support a rate structure that uses a run-off coefficient and property type (as was done in Vaughan).
    - For Brampton this will require work to assign areas to the parcels which only have property type information for 3% (~5000 parcels) without site area information.

- There is sufficient data to either estimate impervious surface by property type or calculate actual impervious surface. (Mississauga is using a combined of estimated for residential and measuring non-residential).
    - For Brampton this will require combining data from different data layers for footprints, driveways, parking areas, etc. to calculate total impervious per parcel.

- Next step is to determine the effort, cost and time required for these options and make a recommendation on the funding framework.

Vaughan Property Categories
Residential (Low Density) - per unit
Residential (Medium Density) - per unit
Residential (High Density)
Agricultural/Vacant
Non-Residential (<1 acre)
Non-Residential (1-10 acres)
Non-Residential (10+ acres)

City of Brampton, ON
Stormwater Management Financing Study

Stormwater Advisory Group Meeting #1

Meeting Summary

Meeting Date: Thursday, August 17, 2017

Time: 7:00 p.m.

Location: Brampton City Hall, West Tower

Attendees:

Michael Heralall, City of Brampton	Salman Zafar, City of Brampton
Alvin Pilobello, City of Brampton	Brian Bishop, Amec Foster Wheeler
Emma Malcolm, Amec Foster Wheeler	Jean Haggerty, Amec Foster Wheeler
Davika Misir – Brampton Environmental Advisory Committee	Andrew Grunda, Watson & Associates
Gord Brady – RioCan	Tim Mereu – Credit Valley Conservation Authority
Tonny Johansen – Candevcon Ltd.	Cosimo Stalteri – Orlando Corp
Orjan Carlson – Morguard	Eddie Camilleri – William Osler Health System
Brad Willmott – Latter-Day Saints Church	Steve Stevens – RioCan
Dilnesaw Chekol – Toronto and Region Conservation Authority	Marianne Galliford – Churchville Ratepayers Association
Margaret Knowles – Morguard	

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for the meeting and discussion.

Summary and Discussion Topics:

1. Introduction

Michael Heralall opened the meeting, welcomed the advisory group members, and provided an introduction to the Stormwater Management Financing Study. He noted several key aspects of the study including:

- The timeliness and importance of the study for the City of Brampton as it looks for ways to integrate and more sustainably manage its infrastructure
- Stormwater is generally a 'hidden-cost' and the issue tends to be 'out-of-sight'. Though stormwater management has been on the City's agenda for the past 10 years, little progress has been made in implementing recommendations, largely due to funding concerns.

- The aim of this project is to provide a framework for more proactive management integrated with a long-term strategy that provides a 'fair, equitable and sustainable' path forward.

Brian Bishop led a round of introductions of the City Staff, consulting team, and Stormwater Advisory Group (SAG) members. This was followed by a review by Emma Malcolm of the principles of participation for the meetings and the role of the SAG.

2. SAG Terms of Reference (TOR)

Emma reviewed the TOR with emphasis on the goal of the SAG to provide feedback from diverse voices in the community on the stormwater program priorities and potential funding approaches. The SAG will review information developed by the City and its consultants and discuss and provide informed input on recommendations that will be made to City Council and City staff on the future stormwater program. Meetings are scheduled to be held monthly over the next 4-5 months.

3. Overview of the Study and Other Planned Community Engagement Activities

Brian discussed the project background and scope of work which includes the following key tasks:

a) Summarize current services and annual expenses
b) Establish program goals, objectives and priorities
c) Develop a program of services to address needs that align with objectives and priorities
d) Develop guiding principles for a Funding Framework
e) Evaluate Funding options against principles
f) Identify processes and policies needed to implement recommended funding approach
g) Prepare a five-year funding model and final report
h) Engage the community

Emma provided an overview of other community engagement activities that will be used to provide information to local stakeholders on this project, including setting up a stormwater website, developing fact sheets, using social media to notify the community about the study findings and meetings, and hosting public information sessions and education events.

4. Stormwater Management 101

To make sure that everyone in the SAG had the same basic understanding of what stormwater management typically includes, Brian presented information on how stormwater management has changed over the past several decades and the current challenges facing public agencies in meeting increasing demands. Topics covered included aging infrastructure and growing maintenance needs; flood safety and mitigation; and water quality impacts and increasing regulatory requirements. An analysis of information on existing assets estimated the replacement value of the City's extensive stormwater assets (pipes, manholes, catch basins, stormwater ponds, etc.) at just over 1 billion dollars.

5. Brampton's Current Stormwater Management Program

Jean Haggerty next led a discussion on Brampton's current stormwater services and costs.

Brampton does not have a specific stormwater department or division, so stormwater related services are performed by staff from numerous departments, primarily Public Works, Roads Maintenance, and Capital Works. Additional support is provided to a lesser extent from other departments such as Parks, Corporate Asset Management, Finance, and Information Technology (IT). Based on interviews with City staff, a total of approximately 17.5 full-time equivalent (FTE) positions were identified that provide stormwater services.

Stormwater activities in the City have been assigned to one of four main categories to make it easier to discuss the numerous stormwater activities performed. These categories are

- Stormwater System Operation and Maintenance (O&M) – mostly field operations associated with maintaining the functional operation of the existing stormwater system
- Asset Management – the system of maintaining an up-to-date inventory by tracking, mapping and monitoring existing, rehabilitated, or new stormwater assets
- Stormwater Planning – activities cover establishing and enforcing design standards for new or redevelopment projects and managing drainage and watershed planning studies to identify and prioritize local stormwater issues.
- Capital Project Management – including engineering and design of new capital projects, as well as oversight of major stormwater projects (new drainage systems, stormwater pond dredging and repairs).

A SAG member asked "*if watercourses were considered as part of the City's Stormwater managements assets?"* The answer was yes. Watercourses management including cleaning of debris and maintenance of the banks is part of the City's O&M program.

Another member asked "*why the City has stopped providing services for cleaning ditches in rural areas?"* This may be due to limited resources. The maintenance of the ditches is the responsibility of the Roads Operations staff. Michael Heralall will investigate further and provide a response at next meeting.

The current cost (2017) of stormwater services provided by the City is estimated at just over $6M. This includes the costs of contracted O&M services at $1,934,000; internal O&M labour costs at $266,787; Planning and Engineering labour costs of $1,114,041; and budgeted capital projects for stormwater pond restoration and stormwater studies at $2,700,000.

There was a question asked on "*How were the costs presented for current program cost of services determined?* The answer was that actual numbers from this year's budget were obtained from the City with respect to the real-value spent on 3rd party tendered contracts; the salary and overhead costs of staff who are part of the city's Stormwater management team were developed based on the percentage of time each employee spends working on Stormwater related issues, and the capital budget numbers are as reported in the approved 2017 City budget.

To provide some context on an annual stormwater budget of $6M, industry best practice recommends that 1% of the value of the total assets should be budgeted annually for O&M of

the existing system. Since Brampton's assets are estimated at approximately $1B, that means a budget of $10M for O&M would be a reasonable target. Currently Brampton is spending about $2.2M/year on O&M. Also, the findings from the Stormwater Master Plan and Stormwater Management Retrofit Plans have identified over $87M in capital projects (not including storm sewer pipe projects). To begin to address this backlog, additional capital funds will need to be budgeted.

To begin to identify specific areas where there may be gaps in the existing program of services and where additional resources may be needed, staff were asked about their thoughts on current program needs. In general, it was agreed that maintenance activities need to be more proactive; the pond restoration backlog needs to be decreased more quickly; design standards need to be updated to address more practical, sustainable practices; increased staff training and updated standard operating procedures would improve efficiency and quality of services; and more outreach would help educate the public about the services provided and the importance of effective stormwater management.

The next step is to set goals and objectives for the stormwater program so that recommendations made can be evaluated against the community's objectives. A preliminary list of objectives was presented.

Question and comments on the Program Goals & Objectives included:

- *Are we looking to maintain status quo – or plan for future growth and development?* This is a key question. Maintaining the status quo still likely means increased investment to properly maintain the existing system and deal with a backlog of stormwater issues. City planning is considering methods for dealing with growth and the stormwater program needs to take this planning into consideration to inform future program demands.
- In the discussion of stormwater goals, text around "protection of investment" should be included.
- The Region's role in the program goals and objectives should be identified.

6. Next Steps

At the next meeting, scheduled for Thursday, September 14th at 7 PM, we will continue the discussion on program priorities and review level of service options for meeting the objectives. We will also begin the discussion on potential funding options, including a review of existing data on properties in Brampton.

SAG member question "*Will assets and credits be discussed as part of this study?* Yes, this study will include a review of options for providing credits. A number of factors will be considered, such as what activities should be credited (rain barrel or Stormwater management ponds?), does the asset meet new or older design standards, and how much should be credited. We will begin to discuss this further with the SAG in upcoming sessions.

Meeting Agenda

Date: Sept. 14, 2017 @ 7:00 p.m. **Meeting at:** Brampton City Hall – Boardroom TBC

File No.: TPB178004

Subject: **City of Brampton Stormwater Management Financing Study**

Stormwater Advisory Group Meeting #2

1. Review of SAG Meeting # 1
2. Goals and Objectives – Review
3. Areas of Program Focus (Needs and Priorities)
4. Levels of Service – Approach and Options
5. Next Steps

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Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

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Stormwater Management Financing Study

Stormwater Advisory Group Meeting No. 2

September 14, 2017

7:00 – 9:00 pm

City Hall, Rm. WT-2A

Welcome and Introductions
Project Team

- City of Brampton
  - Michael Heralall – Project Manager
- Consultant Team
  - Jean Haggerty – Amec Foster Wheeler
  - Ron Scheckenberger– Amec Foster Wheeler
  - Emma Malcolm– Amec Foster Wheeler
  - Peter Simcisko – Watson & Associates Economists Ltd.
- Stormwater Advisory Group Members

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Watson & Associates ECONOMISTS LTD.

Agenda

1. Summary of SAG Meeting #1
2. Stormwater Program Goals and Objectives - Review
3. Areas of Program Focus
   - Needs and Priorities
4. Stormwater Levels of Service
   - Approach and Options
5. Next Steps

1. Summary of Stormwater Advisory Group (SAG) Meeting 1

Purpose of the Stormwater Infrastructure Funding Study

- Better define and understand existing infrastructure assets and future needs
- Evaluate potential stormwater management costs and funding impacts
- Make informed recommendations about stormwater priorities, level of investment, and funding options

Roles and Responsibilities of the SAG

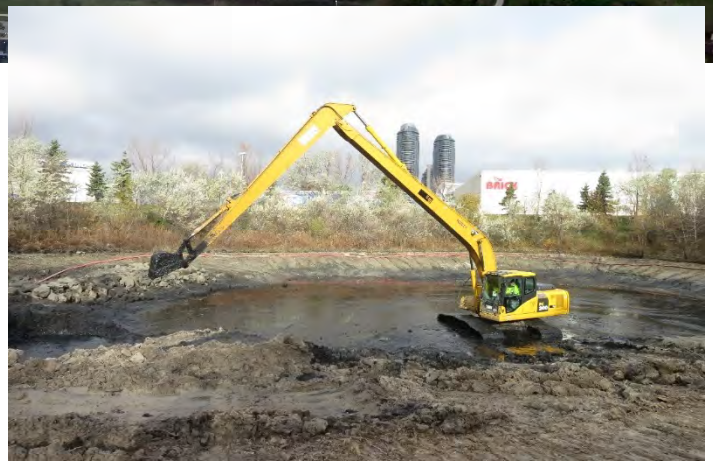
- Gain an understanding of the current stormwater program and future requirements
- Gain an understanding of potential funding models and potential impacts on property owners
- Review and make recommendations to City Council and staff on the future stormwater program
- Provide viewpoints of the organizations that the member represents

1. Brampton's Current Stormwater Management Program

- The public portions of the City's stormwater system include:
  - Over 1830 km of pipes
  - Approx. 23,650 manholes
  - Over 38,300 catch basins
  - 246 stormwater ponds

1. Brampton's Current Stormwater Management Program - *Challenges*

- Pre-existing significant investment (2016 estimated value of $1.08 B)
- System is aging and experiencing more intense and frequent storm events
- Identified need for increased efforts in operations, maintenance, and capital pond restoration, system retrofits and erosion control projects ($87.5M)
- Future stormwater controls need to be designed and managed to address continued growth, changing climate impacts, and water quality protection goals



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1. Brampton's Current Stormwater Management Program

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  - **Asset Management**
    - Inventory, mapping and assessment data on major stormwater system components
  - **Stormwater Planning and Management**
    - Assessment and prioritization of long-term stormwater management needs
  - **Capital Project Management**
    - Engineering, design, oversight of capital system improvements

1. Brampton's Current Stormwater Management Program

- Stormwater services are primarily managed by:
  - Public Works Department, specifically:
    - *Infrastructure Planning*
    - *Development Construction*
    - *Development Engineering*
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  - Capital Works (Road Design & Capital Construction)
- Additional support as needed from:
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- Contracted services in support of maintenance and capital replacement needs

Total City Staff performing stormwater-related services = 17.5 FTEs

1. Brampton's Current Stormwater Management Program *Cost of Services*

O&M Contracted Services			
	Street Sweeping	$	642,000
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Planning, Engineering & Design Labour Costs			
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Capital Improvements Budget			
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	subtotal	$	2,700,000
Total Engineering & Capital Works Costs		$	3,814,041

	Total Current Stormwater Services Costs	$ 6,014,828

2. *Draft Program Goal*

The goal of the Stormwater Management Program is to protect public health and safety, stakeholder investments, and the City's valuable natural and man-made resources by minimizing the impacts of stormwater runoff through on-going system assessments, proactive maintenance and operation of the City's assets, and well-considered investment in system upgrades and expansion.

2. *Draft Program Objectives*

- The City should seek to move from reactive management of stormwater system components to a *proactive, priority-based asset management program*
- Services provided by the City should be *clearly defined*, be *based on an assessment of actual need*, and be provided *as efficiently as possible*

2. *Draft Program Objectives*

- The program should be *realistic and achievable* and establish *clear lines of accountability* and decision making
- The stormwater program plan should be *coordinated with on-going planning and growth initiatives* to identify efficiencies and should include *public participation* as a fundamental component
- Program funding *should be fair, equitable, and transparent* and tied to level of service and sustainable financial program goals

3. *Key Questions for this Study*

a) **What key services are required?**
   - Based on staff input, professional standards review, and public input, *prioritize service needs and establish desired levels of service*

b) **Over what time period should they be implemented?**
   - Develop a 5-10 year plan that grows the program over time and estimates costs of the most critical program needs

c) **How should expenses to properly operate and maintain the stormwater system be funded?**
   - Based on projected annual costs, compare options for distributing the cost of services

3. Operational Objectives

3 Key Operational Objectives

1. Existing infrastructure must be operated and maintained in a manner which keeps the system in good repair
2. Upgrades and retrofits to the system should integrate resiliency planning and be designed and managed to address changing climate conditions and environmental concerns
3. New infrastructure should incorporate more low impact design and green infrastructure solutions in support of a more sustainable long-term stormwater management program.

Operational Objective 1

Existing infrastructure must be operated and maintained in a manner which keeps the system in good repair

3. Priority Needs – Operational Objective 1

a) Invest in a more proactive, routine maintenance program to maintain maximum system capacity and protect system longevity. Staff the program to ensure timely response to community impacts and to most efficiently meet level of service standards.

b) Invest in stormwater system improvement needs now to avoid more expensive “maintenance by emergency” later. Address the backlog of stormwater management pond improvements and other immediate capital improvement needs.

c) Using the CCTV program now underway, identify problem areas and prioritize storm sewer system repair and replacement needs. Use the Asset Management system to manage the data and provide a framework for setting and communicating priorities.

d) Ensure that existing public and private stormwater management facilities are constructed and maintained as designed.

Operational Objective 2

Upgrades and retrofits to the system should integrate resiliency planning and be designed and managed to address changing climate conditions and environmental concerns

3. Areas of Focus – Priority Needs

Operation Objective 2: Upgrade and retrofit integrating resiliency and enhanced design standards

e) Building on the Stormwater Master Plan, Stormwater Management Retrofit Study, and other on-going planning projects, design and implement new capital improvement projects.

f) Continue efforts to develop an integrated water resources plan that will help the City meet provincial environmental sustainability and water quality targets and make informed long-term decisions about water resource protection and drainage related capital improvements.

g) Establish a financial framework for stormwater services to ensure adequate investment in support of an enhanced, sustainable long-term program.

Operational Objective 3

New infrastructure should incorporate more low impact design and green infrastructure solutions in support of a more sustainable long-term stormwater management program.

3. Areas of Focus – Priority Needs

Operation Objective 3: Use LID and GI solutions in support of a more sustainable stormwater management system.

h) Move toward a more low impact design approach by updating and implementing stormwater design standards that promote upstream source controls and address changing climate conditions. Enforce plan review and maintenance requirements as necessary.

i) Educate stakeholders about the importance and costs of stormwater management and water quality protection through enhanced outreach and engagement.

Level Of Service Matrix

4. Levels of Service - Options

- **Basic:** refocus existing resources or add funds to set a baseline as a first step in enhancement to respond to service needs
- **Medium:** addition of staff/contractor/materials to increase capability to address service needs at a moderate approach.
- **High:** addition of staff/contractor/materials to address service needs as the highest priority in an aggressive approach.

Stormwater O&M

A.1. Regular inspections of stormwater infrastructure

BASIC	MEDIUM	HIGH
Add one inspector/coordinator dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $100,000.	Add one inspector/coordinator and one temporary staff (student) dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $120,000.	Add one inspector/coordinator and two temporary staff (students) dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $140,000.

Stormwater O&M

A.2 Regular Pond Maintenance

BASIC	MEDIUM	HIGH
Establish a pond monitoring and inspection program with the goal of evaluating each pond on a 10-year cycle (approximately 17 per year). Assign a priority based on monitoring and inspection and maintain (not including dredging) of an additional 10 ponds per year (for a total of 27 per year). Estimated cost: $92,500 ($42,500 for monitoring and $50,000 for cleaning/repairs).	Establish a pond monitoring and inspection program with the goal of evaluating each pond on a 7-year cycle (approximately 24 per year). Assign a priority based on monitoring and inspection and maintain (not including dredging) of an additional 10 ponds per year (for a total of 34 per year). Estimated cost: $110,000 ($60,000 for monitoring and $50,000 for cleaning/repairs).	Establish a pond monitoring and inspection program with the goal of evaluating each pond on a 5-year cycle (approximately 34 per year). Assign a priority based on monitoring and inspection and maintain (not including dredging) of an additional 10 ponds per year (for a total of 44 per year). Estimated cost: $130,000 ($85,000 for monitoring and $50,000 for cleaning/repairs).

Stormwater O&M

A.3. Provide proactive maintenance to support maximum system capacity

BASIC	MEDIUM	HIGH
Increase the annual budget to fund catch basin cleaning of 30% of the system per year (11,400 catch basins). Budget an additional $540,000 per year.	Increase the annual budget to fund catch basin cleaning of 40% of the system per year (15,200 catch basins). Budget an additional $920,000 per year.	Increase the annual budget for funding catch basin cleaning of 50% of the system per year (19,000 catch basins). Budget an additional $1,300,000 per year.

Stormwater O&M

A.4 Implement a City-wide CCTV inspection program – inspections and pipe repairs

BASIC	MEDIUM	HIGH
4% of system to be inspected per year - budget $120,000	4% of system to be inspected per year - budget $120,000	4% of system to be inspected per year - budget $120,000
Budget $3,875,000 (representing 0.5% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement.	Budget $7,750,000 (representing 1.0% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement.	Budget $11,625,000 (representing 1.5% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement.

Stormwater O&M

A.5.Ensure increase in O&M is commensurate with estimates of growth

BASIC	MEDIUM	HIGH
Increase identified basic funding level by 2.2% per year	Increase identified medium funding level by 2.2% per year	Increase identified high funding level by 2.2% per year

Stormwater Planning and Engineering

B.1. Add GIS Analyst for Stormwater Tracking and Mapping

BASIC	MEDIUM	HIGH
Assign a part-time (24 hours/week) stormwater GIS analyst to manage and update stormwater GIS data on existing and new assets. Estimated cost $41,000 per year.	Assign a full-time stormwater GIS analyst to manage and update stormwater GIS data on existing and new assets. Estimated cost $68,000 per year.	Software and mainteance for stormwater applications - additional $10,000 plus analyst cost of $68,000 = Total $78,000

Capital Improvements

C.1. Stormwater Pond Cleaning

BASIC	MEDIUM	HIGH
Dedicate an additional $1,500,000 annually to allow cleaning of 8 SWM ponds/year. This would allow for the current inventory of ponds to be each cleaned once approximately every 20 years.	Dedicate an additional $2,500,000 annually to allow cleaning of 10 SWM ponds/year. This would allow for the current inventory of ponds to be each cleaned once approximately every 17 years.	Dedicate an additional $3,200,000 annually for pond cleaning. This would allow for the current inventory of ponds to be each cleaned once approximately every 15 years.

Capital Improvements

C.2. Stormwater Retrofit Capital Investments

BASIC	MEDIUM	HIGH
Dedicate an additional $4,250,000 annually to reduce the retrofit CIP backlog. At this rate ($4.25M per year), existing known CIP needs would be addressed in 15 years.	Dedicate an additional $5,300,000 annually to reduce the retrofit CIP backlog. At this rate ($5.3M per year), existing known CIP needs would be addressed in 12 years.	Dedicate an additional $6,400,000 annually to reduce the retrofit CIP backlog. At this rate ($6.4M per year), existing known CIP needs would be addressed in 10 years.

Capital Improvements

C.3.Watercourse Capital Improvements

BASIC	MEDIUM	HIGH
Budget $800,000 per year for watercourse maintenance.	Budget $800,000 per year for watercourse maintenance.	Budget $800,000 per year for watercourse maintenance.

Capital Improvements

C.4. Stormwater Capital Program Coordinator

BASIC	MEDIUM	HIGH
Continue to use an internal group of existing staff to coordinate and manage the growth and integration of the stormwater program.	Assign a full time stormwater coordinator to manage an integrated stormwater capital program. The coordinator would also be responsible supporting/presenting at public participation opportunities. Estimated cost $90,000	Assign a full time stormwater coordinator to manage an integrated stormwater capital program. The coordinator would also be responsible supporting/presenting at public participation opportunities. Estimated cost $90,000

Stormwater Program Administration

D.1. Stormwater Program Financial Administration

BASIC	MEDIUM	HIGH
Assign a full-time stormwater financial administrator to track, manage, and report on all stormwater financial issues. Estimated cost $90,000 per year.	Create a business unit staffed with a minimum of a full-time financial analyst, a full-time business analyst, and a full-time stormwater technician. Estimated cost $257,000 per year.	Add a 50% IT application developer and full-time database specialist to the moderate LOS business unit. This unit will also include the dedicated GIS analyst referenced in B.1, as well as existing 311 staff for front-end support. Estimated cost $368,000 per year.

Stormwater Program Administration

D.2 Stormwater Education and Outreach

BASIC	MEDIUM	HIGH
Use existing staff from communication and stormwater operations to track and report on stormwater issues and projects. Target activities and community meetings annually to educate stakeholders on the importance of effective stormwater management services and what they can do to support the program. Cost for materials and meetings - $6,000/year	Assign a part-time (24 hours/week) stormwater outreach coordinator to plan and implement outreach and education plans. Estimated cost $54,000 per year plus materials ($6,000)	Assign a full-time stormwater outreach coordinator to plan and implement outreach and education plans. Estimated cost $80,000 per year plus expenses ($6,000)

4. Building a Multi-year Plan

- Using feedback from the levels of service review and priority setting, the next step is incorporating program enhancements over time.
- The goal is a “reasonable” growth in spending to properly operate and maintain an aging and expanding system.

Sample spreadsheet

Projected Stormwater Program Cost										
Category	*FY '18*	*FY '19*	*FY '20*	*FY '21*	*FY '22*	*FY '23*	*FY '24*	*FY '25*	*FY '26*	*FY '27*
Program Administration & MS4 MCMs (labor)	$272,601	$421,185	$431,720	$442,510	$453,573	$464,912	$476,535	$488,448	$500,659	$513,176
Contract Services	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720
Expenses (repairs, equipment, fuel, etc.)	$114,115	$114,000	$116,280	$118,605	$120,977	$123,397	$125,865	$128,382	$130,950	$133,568
Capital Equipment (lease)	$0	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Storm Drain System Rehabilitation	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Capital Improvement Projects	$512,000	$500,000	$400,000	$544,000	$577,000	$624,000	$780,000	$995,000	$1,136,000	$1,136,000
New Capital O&M Costs	$0	$10,380	$20,380	$28,380	$39,260	$50,800	$63,280	$78,880	$98,780	$121,500
Total	**$1,120,436**	**$1,317,285**	**$1,240,100**	**$1,405,215**	**$1,462,530**	**$1,534,829**	**$1,717,399**	**$1,962,430**	**$2,138,109**	**$2,175,964**

Property Classifications for Consideration

- **Residential (Low Density) - per unit**
- **Residential (Medium Density) - per unit**
- **Residential (High Density)**
- **Agricultural/Vacant**
- **Non-Residential (<1 acre)**
- **Non-Residential 1-10 acres)**
- **Non-Residential (10+ acres)**

5. Rate Structure Analysis - Options

Option 1

There is sufficient data to either estimate impervious surface by property type or calculate actual impervious surface. (Mississauga is using a combined of estimated for residential and measuring non-residential).

For Brampton this will require combining data from different data layers for footprints, driveways, parking areas, etc. to calculate total impervious per parcel.

Option 2

There is sufficient data available to support a rate structure that uses a run-off coefficient and property type (as was done in Vaughan).

For Brampton this will require work to assign areas to the parcels which only have property type information for 3% (~5000 parcels) without site area information.

5. Next Steps

a) Upcoming Study Steps

- Finalize recommended levels of service
- Present costs in a 10 year program plan
- Review funding framework recommendations
- Provide feedback on funding levels and options for distributing costs

b) Upcoming SAG Meetings

SAG Meeting No. 3 – Thursday, Oct 12

City of Brampton, ON
Stormwater Management Financing Study

Stormwater Advisory Group Meeting #2

Meeting Summary

Meeting Date: Thursday, September 14, 2017

Time: 7:00 p.m.

Location: Brampton City Hall, West Tower

Attendees:

Michael Heralall, City of Brampton	Vanessa Chau, City of Brampton
Orjan Carlson, Morguard / Urban Ecosystems	Marianne Galliford, Churchville Ratepayers Association
Eddie Camilleri, William Osler Health System	Cosimo Stalteri, Orlando Corp
Phil James, Credit Valley Conservation Authority	Tonny Johansen, Candevcon Ltd.
Pentti Makela, Church of Jesus Christ of Latter-Day Saints	Dan Hipple, Toronto and Region Conservation Authority
Jean Haggerty, Amec Foster Wheeler	Peter Simcisko, Watson & Associates
Emma Malcolm, Amec Foster Wheeler	Ron Scheckenberger, Amec Foster Wheeler

Summary and Discussion Topics:

Michael Heralall welcomed the committee members and provided a reminder of the importance of this project and the key role that the Stormwater Advisory Group (SAG) will play in helping to shape the future stormwater program for the City.

1. Recap of SAG 1 (Program Goals and Objectives)

Jean Haggerty provided a recap of the information presented at the first SAG meeting. It was noted that the City is currently operating an extensive stormwater system with an estimated replacement value of over $1B The current system is being operated and maintained on an annual budget of about $6M. City staff has identified that enhancements need to be made to the system to meet current operations and maintenance (O&M) challenges; to account for future development and growth; and elevated requirements around asset monitoring/management, climate change influences, and new regulations.

The draft program goals and objectives were reviewed and SAG members raised concerns that the program goals do not align with the objective of protecting private stakeholder investments. It was discussed how the program could be developed to better define the roles and

responsibilities of private and public stakeholders in the maintenance of Stormwater facilities, and how incentives could be included to support compliance and private partnerships in the program.

2. Areas of Focus: Operational Objectives and Priorities

In developing recommendations for enhancing the stormwater program, the City staff identified three (3) key operational objectives for the program:

1. Keep the system in good repair by investing in maintenance
2. Invest in upgrades and system retrofits particularly for resilience planning
3. Adopt and enforce new and improved standards and regulations in support of a more sustainable stormwater management system

Nine priorities associated with meeting these operational objectives were presented:

a) Implement a more proactive, routine maintenance program

b) Increase investment in major stormwater system improvements (existing stormwater management ponds and Water Quality system retrofits)

c) Design and implement new capital improvement projects as identified in planning studies

d) Based on Closed Circuit TV (CCTV) findings, identify problem areas and prioritize storm sewer system repair and replacement needs.

e) Ensure that existing public and private stormwater management facilities are constructed and maintained as designed.

f) Promote Low Impact Development (LID) standards that encourage the use of source controls and address changing climate conditions.

g) Develop an integrated water resources plan that will help meet provincial environmental sustainability and water quality targets.

h) Educate the public about the importance and costs of stormwater management and water quality protection

i) Establish a financial framework for stormwater services to ensure adequate investment in support of a sustainable long-term program.

After discussing each of the priorities, the meeting participants were asked to vote on their top five (5) priorities. The following is the list of priorities in the order of most votes to least (number of votes in parentheses):

d. Based on CCTV findings, identify problem areas and prioritize storm sewer system repair and replacement needs (10)

a. Implement a more proactive, routine maintenance program (8)

f. Promote LID standards that encourage the use of source controls and address changing climate conditions (7)

b. Increase investment in major stormwater system improvements (6)

e. Ensure that existing public and private stormwater management facilities are constructed and maintained as designed (6)

i. Establish a financial framework for stormwater services to ensure adequate investment in support of a sustainable long-term program (6)

c. Design and implement new capital improvement projects as identified in planning studies (4)

g. Develop an integrated water resources plan that will help meet provincial environmental sustainability and water quality targets (2)

h. Educate the public about the importance and costs of stormwater management and water quality protection (1)

3. Levels of Service

Jean next discussed the Level of Service (LOS) approach being used to identify specific activities and associated resource options that would provide a framework for a long-term stormwater program plan. A Levels of Service matrix was distributed to the group for review and discussion. Due to time constraints, the group was not able to review all items in the matrix, and it was agreed that the review of the matrix would continue at the third SAG meeting.

Preliminary comments on the LOS matrix included:

- Request to include a column in the matrix that outlines the 'status quo' or baseline expenditures and activities
- Request to include information that identifies risks of not increasing the various levels of service (e.g. new regulatory/compliance requirements, risk to public health and safety, cost of reactive vs proactive management)

Meeting Agenda

Date: October 19, 2017 @ 7:00 p.m. **Meeting at:** Brampton City Hall – Boardroom TBC

File No.: TPB178004

Subject: **City of Brampton Stormwater Management Financing Study**

Stormwater Advisory Group Meeting #3

1. Review of SAG Meeting # 2
2. Stormwater Program Levels of Service – Continue Discussion on Options and Recommendations
3. Outline Multi-Year Revenue Needs Approach
4. Funding Approaches – Stormwater Utility Fee Rate Structure Options
5. Next Steps

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Amec Foster Wheeler Environment & Infrastructure
a division of Amec Foster Wheeler Americas Limited

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Stormwater Management Financing Study

Stormwater Advisory Group Meeting No. 3

October 19, 2017

7:00 – 9:00 pm

City Hall, Rm. WT-2A

Welcome
Project Team

- City of Brampton
  - Michael Heralall – Project Manager
- Consultant Team
  - Brian Bishop – Amec Foster Wheeler
  - Emma Malcolm – Amec Foster Wheeler
  - Peter Simcisko – Watson & Associates Economists Ltd.
- Stormwater Advisory Group Members

Agenda

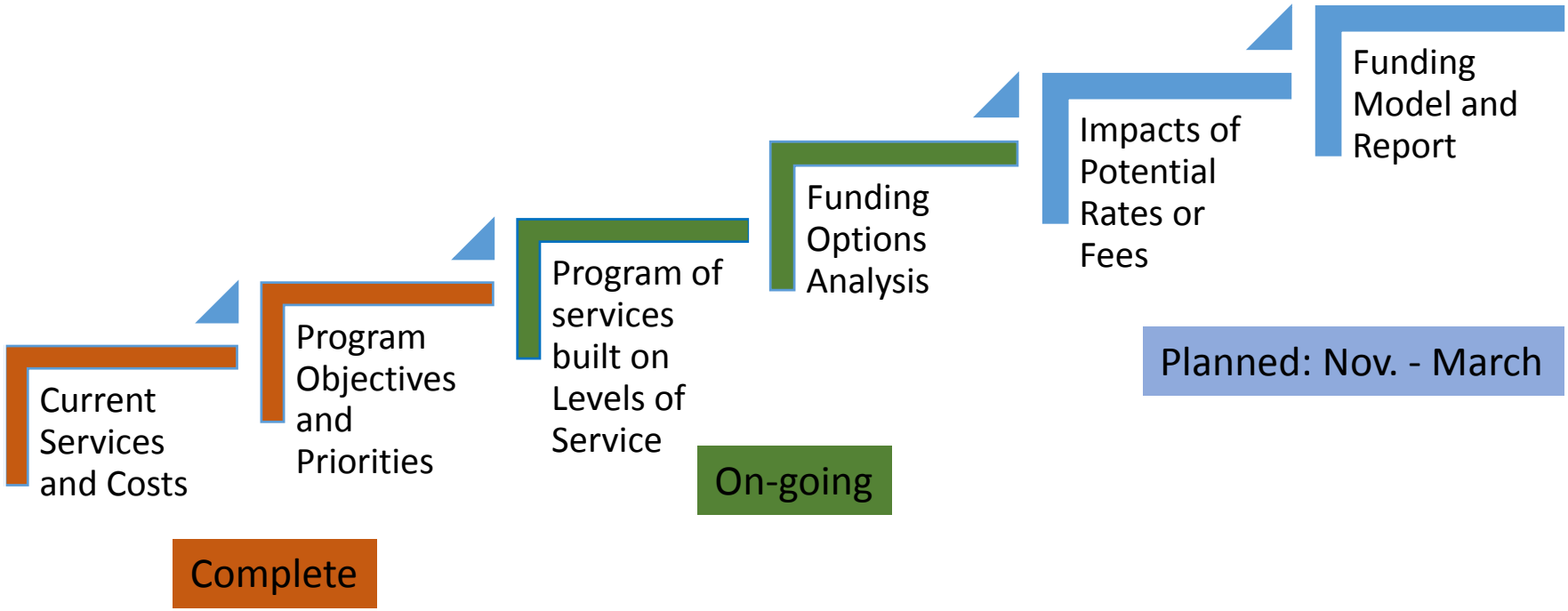
1. Summary of SAG Meeting # 2 Outcomes
2. Where we are in the Process: *Continue Discussion on Options and Recommendations* - Stormwater Program Levels of Service
3. Benchmarking with Other Communities
4. Multi-Year Revenue Needs Approach
5. Funding Approaches – Stormwater Utility Cost Recovery Options
6. Next Steps

1. Summary of SAG Meeting No. 2 Outcomes

Established operational objectives and voted on program priorities.

- **Highest**:
  - Use CCTV to identify and prioritize storm system needs
  - implement more proactive maintenance programs
  - promote standards that address climate change and support LID approaches
- **Mid-range**:
  - Increase investment in major stormwater system improvements
  - Ensure stormwater facilities are constructed/maintained as designed
  - Establish funding to ensure adequate investment for a sustainable program
- **Lowest**:
  - Implement new capital improvement projects (from planning studies)
  - Develop integrated water resource plans to meet environmental and water quality targets
  - Educate the public on stormwater management issues and costs

2. Financing Study – Where we are in the Process



Public Education and Involvement

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Developing the Future Stormwater Program:
Level Of Service Matrix

2. Stormwater Program Levels of Service

- Review of the existing program revealed gaps or needs not currently being addressed. Each gap is identified and 3 options presented for filling those needs based on a *low, medium or high* level of service (LOS) approach.
- Current levels of service, industry standards or best practices, where applicable, and risk of maintaining the status quo are included in the matrix to provide context for selecting the preferred LOS for Brampton.
- Costs in the matrix are for enhancements to the current services and would be in addition to the current stormwater spending of approximately $6M per year.

3. Benchmarking With Other Communities

Ontario Municipal Stormwater Infrastructure and Replacement Value

Municipality	2016 Population	Land Area (square km)	Length of Storm Sewers (km)	Number of SWM Ponds/Facilities	Replacement Value (R.V.)
Brampton	593,600	267	1,675	200	$1.1B
Guelph[(1)]	131,794	87	690	100	$0.6B
Kitchener	233,222	137	690	89	$0.3B
Mississauga	721,600	292	2,000	57	$1.7B
Richmond Hill	195,022	101	590	73	$0.3B
Vaughan	306,300	273	1,041	143	$1.4B
Waterloo	104,986	64	340	55	$0.3B

(1) Value shows the length of drainage system.

3. Benchmarking With Other Communities

Municipality With Stormwater Funding Program	Cost Category	Historical Program Cost	Enhanced Program	Change (%)	Annual Expenditure as a % of (R.V.)
Guelph	Operating & Maintenance	916,000	1,266,703	38%	0.23%
	Capital	1,200,000	2,952,297	146%	0.53%
	Total	2,116,000	4,219,000	99%	0.76%
Kitchener	Operating & Maintenance	1,875,825	5,400,339	188%	1.58%
	Capital	3,250,311	10,186,000	213%	2.98%
	Total	5,126,136	15,586,339	204%	4.56%
Mississauga	Operating & Maintenance	6,600,000	12,300,000	86%	0.72%
	Capital	8,000,000	20,700,000	159%	1.22%
	Total	14,600,000	33,000,000	126%	1.94%
Richmond Hill	Operating & Maintenance	1,545,191	3,497,100	126%	1.01%
	Capital	1,257,844	5,174,200	311%	1.49%
	Total	2,803,035	8,671,300	209%	2.49%
Vaughan	Operating & Maintenance	3,100,000	6,070,000	96%	0.45%
	Capital	1,800,000	7,260,000	303%	0.54%
	Total	4,900,000	13,330,000	172%	0.99%
Waterloo	Operating & Maintenance	1,859,244	6,552,685	252%	2.23%
	Capital	1,342,971	3,950,877	194%	1.34%
	Total	3,202,215	10,503,562	228%	3.57%

4. Multi-Year Revenue Needs Approach

- Using feedback from the levels of service recommendations and the priority setting, the next step is to incorporate program enhancements over time
- The goal is a "reasonable" growth in spending to properly operate and maintain an aging and expanding system. Typically the program's financial goal is phased in over a 3 to 5 year period.

Projected Stormwater Program Cost										
Category	*FY '18*	*FY '19*	*FY '20*	*FY '21*	*FY '22*	*FY '23*	*FY '24*	*FY '25*	*FY '26*	*FY '27*
Program Administration & MS4 MCMs (labor)	$272,601	$421,185	$431,720	$442,510	$453,573	$464,912	$476,535	$488,448	$500,659	$513,176
Contract Services	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720	$121,720
Expenses (repairs, equipment, fuel, etc.)	$114,115	$114,000	$116,280	$118,605	$120,977	$123,397	$125,865	$128,382	$130,950	$133,568
Capital Equipment (lease)	$0	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Storm Drain System Rehabilitation	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Capital Improvement Projects	$512,000	$500,000	$400,000	$544,000	$577,000	$624,000	$780,000	$995,000	$1,136,000	$1,136,000
New Capital O&M Costs	$0	$10,380	$20,380	$28,380	$39,260	$50,800	$63,280	$78,880	$98,780	$121,500
Total	**$1,120,436**	**$1,317,285**	**$1,240,100**	**$1,405,215**	**$1,462,530**	**$1,534,829**	**$1,717,399**	**$1,962,430**	**$2,138,109**	**$2,175,964**

Sample spreadsheet

5. Funding Approaches

- Define current funding approach
- Identify alternative funding models
- Review municipal practices in Ontario
- Evaluate alternative funding models with respect to specific assessment criteria
- Seek stakeholder input (ranking of options)
- Identify preferred funding model

5. Funding Approaches

- *Creating a rational relationship/nexus between the stormwater management services and the manner in which they are funded is foundational to creating a stable, legally defensible, equitable and adequate funding strategy*.

5. Funding Approaches

- Property Taxes
- Flat Rates
- Utility Rates
- Modified Flat Rate based on Run-off Coefficient or Sampling of Impervious Area
- Modified Land Area Rate (implemented based on property size)
- Actual Impervious Area of Each Property

5. Funding Approaches

Assessment Criteria

- Ease of Calculation
- Linkage between Fee Paid and Benefit Derived from Services
- Cost of Administration
- Users' Control over Charging Mechanism

6. Next Steps

a) Upcoming Study Steps

- Present costs in a 10-year program plan
- Provide data on funding options and preferred methods for distributing costs

b) Upcoming SAG Meetings: Potential Dates

SAG Meeting No. 4 – Thursday, November 16, 2017

SAG Meeting No. 5 – Thursday, December 14, 2017

Typical Annual Stormwater Charges (2017)

Municipality	Residential (Single Detached)	Non-Residential (Small)	Non-Residential (Large: > 10 acres)
Guelph	**$48.00**	**$178.72** (based on 700 m^2 impervious area)	**$7,749.19** (based on 30,351 m^2 impervious area)
Vaughan	**$50.00**	**$41.28**	**$16,740.78**
Aurora	**$60.12**	**$763.56**	**$763.56**
Markham	**$47.00**	**$395.76** (based on $1,413,445 of current value assessment)	**$7,921.35** (based on $28,290,520 of current value assessment)
Richmond Hill	**$62.24**	**$180.82**	**$180.82**
Kitchener	**$149.88** (Residential Medium - footprint between 106-236m^2)	**$286.80**	**$14,218.20** (based on 30,351 m^2 impervious area)
Waterloo	**$127.92** (Residential - Medium)	**$328.32**	**$12,515.76**
Mississauga	**$102.00**	**$267.42** (based on 700 m^2 impervious area)	**$11,594.93** (based on 30,351 m^2 impervious area)
Hamilton[1]	**$116.02** (265 m^3 annual water consumption & 20 mm meter)	**$403.35** (1,000 m^3 annual water consumption & 25 mm meter)	**$1,796.33** (4,706 m^3 annual water consumption & 50 mm meter)
London	**$184.44** ($138.48 if no storm drain within 90m)	**$184.44**	**$15,350.40**
St. Thomas	**$102.12**	**$102.12**	**$14,073.60**

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City of Brampton, ON
Stormwater Management Financing Study

Stormwater Advisory Group Meeting #3

Meeting Summary

Meeting Date: Thursday, October 19, 2017

Time: 7:00 p.m.

Location: Brampton City Hall, West Tower

Attendees:

Michael Heralall, City of Brampton
Peter Simcisko, Watson & Associates

Emma Malcolm, Amec Foster Wheeler
Doug Foster – Brampton Environmental Advisory Committee
Tonny Johansen – Candevcon Ltd.
Sarah Pengilley, Churchville Ratepayers Association
Pentti Makela – Latter-Day Saints Church
Brian Bishop, Amec Foster Wheeler
Dan Hipple– Toronto and Region Conservation Authority
Cosimo Stalteri – Orlando Corp
Marianne Galliford – Churchville Ratepayers Association

Attached for reference are the meeting agenda and PowerPoint presentation that served as the basis for the meeting and discussion.

Summary and Discussion Topics:

1. Introduction

Michael Heralall opened the meeting, welcomed the advisory group members, and provided a recap on SAG Meeting # 2.

2. Review of Priorities for the Program

Brian provided a recap of priorities identified by the SAG for the program. The top priorities related to maintaining current assets and preparing for future conditions (growth and environmental). Lower priorities identified by the group include investing in new capital projects and communicating the program to the public.

3. Level of Service (LOS) Matrix

Brian noted that some revisions had been made to the LOS Matrix since SAG # 2. Revisions included identifying the City's preliminary preferred options of level of service, a review of industry best practice and risks associated with maintaining the baseline level of service. The following provides an overview of feedback received from SAG members on the LOS matrix.

- A.1 – What is currently considered by the City as timely, regular inspection? The City currently does not have a consistent plan for implementing inspection program. Increasing inspection to a medium level of service would see this increase from an irregular program to twice per year.
- A.2 – Why would the City select to go above and beyond the industry standard for this? The rationale for the City is to be proactive, and consider a principle of adaptive management. In this case, there is a minimum investment where the City can still increase the LOS to the best standard.
- A.3 – increasing cleaning of catch basins will have a downstream effect, reducing the requirements to clean out Stormwater ponds.
- C.1 – What is being proposed is that there will need to be one season of monitoring to determine how often Stormwater ponds need to be cleared out. This will also need to consider compliance with ECAs and requirements in new subdivisions. What is also being seen is that a lot of what is being excavated from Stormwater ponds is classified as hazardous waste increasing the cost of disposal. It should also be noted the City currently estimates that an additional 150 ponds will need to be created over the next 20 years.
- C.2 / C.3 – Discussed concern related to Species at Risk and the need to consider erosion concerns in a City with so many watercourses. Clarified that $47M would be required to improve water quality through end of pipe retrofits. Need also to consider new water quality regulations from MOECC, and what LOS will be required to meet MOECC objectives.
- Staff requirements: it was discussed by the group how many staff / coordinators would be required for the program. It was discussed that a number of factors will need to be considered moving forward to determine the final staffing requirements for the program.

SAG members were asked to assign a preferred selection to each of the items in the LOS matrix. The results are summarized as follows:

Brampton Stormwater Program
Prioritization Table

Targeted Program Elements	# of SAG Votes for LoS Option			
	Low	Medium	High	Maintain
A.1 Regular inspections of stormwater infrastructure	2	1	2	1
A.2 Regular stormwater pond maintenance	0	4	3	1
A.3 Provide proactive maintenance to support maximum system capacity and longevity	6	1	0	1

A.4 Implement a City-wide CCTV inspection program	6	3	0	0
A.5 Implement a City-wide storm sewer pipe repair program	1	7	0	0
A.6 Ensure increase in O&M is commensurate with estimates of growth	7	1	0	0
B.1 Add GIS Analyst for stormwater tracking and mapping	2	6	0	0
C.1 Increase Resources for stormwater pond cleaning (new crews and equipment)	2	5	1	0
C.2 Increase annual capital investment for stormwater facility retrofits (reduce backlog)	5	2	1	0
C.3 Increase annual investment in maintenance of watercourses (reduce backlog)	5	2	3	2
C.4 Create stormwater program coordination position (additional staff)	3	2	3	0
D.1 Stormwater Education and Outreach	4	1	3	0

	City Staff Preferred LoS
	SAG Preferred LoS
	City Staff & SAG Preferred LoS

4. Benchmarking with Other Communities

In advance of the topics of discussion at the proceeding SAG meetings, a review of comparable municipalities and their respective Stormwater management programs was presented. It was noted that the proposed LOS increases for the City of Brampton were aligned with industry standards and the approaches pursued by neighbouring municipalities.

5. Next Steps

Peter provided an overview of what will be reviewed and discussed at SAG # 4 and SAG # 5. The focus of these discussions will include establishing a multi-year revenue program and options for funding the program.

Appendix C

Public Information Centre Materials and Public Comments

CITY OF BRAMPTOM
STORMWATER MANAGEMENT FINANCING STUDY
PUBLIC INFORMATION CENTRE

The Study

The City of Brampton has initiated a **Stormwater Management Financing Study** to develop a comprehensive stormwater program to manage and fund stormwater infrastructure assets. Stormwater management is an important part of community safety and environmental protection. Due to factors such as climate change, aging infrastructure and a growing community, the City needs to develop a proactive program to manage stormwater infrastructure in a sustainable and fiscally responsible manner to ensure we continue to provide the services our communities expect.

The Study includes an assessment of existing stormwater infrastructure assets and funding, and will propose an optimized stormwater services budget and funding model. This Notice is to advise interested parties that the City is planning a Public Information Centre (PIC) to provide the public with the opportunity to learn about the Study, recent progress and discuss the project with City staff and the Project Team.

Public Information Centre

A Public Information Centre will provide community members with an opportunity to learn more about stormwater management, the findings of the Study and provide input on the proposed new program with the preferred rate structure and funding model.

Date: May 9, 2018
Time: 7:00 p.m. to 9:00 p.m.
Location: City Hall Atrium

The PIC will include a series of poster boards that community members can review. City staff and Project Team members will be available for discussions and to answer questions.

Poster boards will be posted to the City's website at: www.brampton.ca.

Comments Invited

Anyone with an interest in this Study is invited to attend the PIC and participate. Comment forms will be available during the session and online for interested individuals to submit feedback.

If you cannot attend, an electronic version of the poster boards and comment form will be available online at: www.brampton.ca.

The comment period will be open until **May 31, 2018.** Comments and questions can be directed to one of the Project contacts provided below.

If you require further information, or if you have specific comments related to this project, please contact either of the following:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON, L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure Solutions
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Stormwater Management Infrastructure Financial Study

Public Information Centre

May 9, 2018

7:00-9:00 pm

City Hall Atrium

Stormwater Management 101

What is stormwater?

- Stormwater is rainwater and melted snow that runs off lawns, streets and other land surfaces

- Hard surfaces, such as pavement and roofs, prevent precipitation from naturally soaking into the ground and increase run off (i.e., impervious)

Why do we need to “manage” it?

- Stormwater runoff, if not treated or managed before discharging into local water bodies, can:
  - Result in flooding of roads, homes and businesses
  - Can create hazardous conditions and threat to life
  - Contribute to stream and creek erosion
  - Carry pollutants to local waterbodies

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Stormwater Management 101

Over the past decade there has been a change in how we view stormwater management; in the past this view considered:

- Stormwater as a nuisance – flood control through rapid removal
- Transportation safety – ditches, ponds and road drainage
- Focus on system separation – i.e., do not send stormwater to the wastewater plant
- Protect private property – upstream stormwater quantity controls (ponds)

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Stormwater Management 101

With more knowledge of the impacts and importance of stormwater management, current practices have evolved our view to include:

- Focus on protecting infrastructure assets - aging systems require maintenance and replacement/ retrofits
- More emphasis on source controls and retaining stormwater on-site
- Climate change requires hazard mitigation – increased design standards and adaptation planning
- Stream restoration and habitat protection are more of a priority

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Stormwater Management 101

Challenges

- Aging infrastructure, such as pipes
- Growing community
- Legislated (proactive) maintenance needs, such as catch basin cleaning
- Flood mitigation
- Public Safety
- Climate change

New catchbasin installation

Erosion causing failure of a stormwater outfall

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Stormwater Management 101

Flood Mitigation

- Extreme flooding events occurred in 2013 and 2015 across the GTA
- Total costs of damages of the July 8, 2013 flood estimated at $850 million
- Neighbouring municipalities developed dedicated stormwater management charges following recent extreme events to support investment in stormwater infrastructure to deal with changing conditions, and to sustain levels of service and state of good repair (such as Mississauga, Vaughan)
- Investing in stormwater infrastructure is important for public safety, property damage and financial costs

Toronto, 2013

Source: Metro, 2013

Brampton, 2013

Source: Brampton Guardian, 2013

Mississauga, 2015

Source: Ducks, 2015

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Purpose of the Study

Develop a Comprehensive Stormwater Program

- ***Goal:*** design a program **to be protective** of public health and safety, stakeholder investments, and the City's valuable natural and man-made resources **by minimizing the impacts** of stormwater runoff through on-going system assessments, **proactive maintenance and operation** of the City's assets, and well-considered **investment** in system upgrades and expansion.

Determine how the Program will be Funded

- ***Goal:*** fund the program through a **sustainable and equitable funding model** (user-pay principle).

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Brampton's Existing Stormwater System

The public portions of the City's stormwater system include:

- 1,830 km (+/-) of pipes
- 23,650 (+/-) manholes
- 38,300 (+/-) catch basins
- 180 stormwater ponds

Approximate value of stormwater management system:

- $1.01 billion

Source: The City of Calgary, 2015

Source: SHOem Corp, 2018

Source: The City of Brampton, 2018

Source: Hyderabad Spun Pipe Industries, 2015

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Brampton's Current Stormwater Management Program

Key stormwater program activities include:

1. Stormwater System Operation & Maintenance

- Stormwater asset cleaning, repairs and minor replacements (pipes, catch basins, manholes, outfalls, stormwater ponds)

2. Asset Management

- Inventory, mapping and assessment data on major stormwater system components

3. Stormwater Planning and Management

- Assessment and prioritization of long-term stormwater management needs

4. Capital Project Management

- Engineering, design, oversight of capital system improvements

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Brampton's Current Stormwater Management Program

Stormwater services are primarily managed by several divisions with Public Works & Engineering:

- *Environment & Development Engineering*
- *Roads Maintenance, Operations & Fleet*
- *Parks Maintenance & Forestry*
- *Capital Works*

Total # of City Staff supporting stormwater-related services
=
17.5 FTEs
(Full-Time Employees)

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Brampton's Current Stormwater Management Program

- Additional support as needed from:
  - Corporate Budgets
  - Corporate Asset Management
  - Purchasing
  - Finance
  - Human Resources
  - Corporate Communications
- Contracted services in support of maintenance and capital replacement needs

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Brampton's Current Stormwater Management Program *Cost of Services*

O&M Contracted Services		
Street Sweeping	$	642,000
Sweeping Waste Recycling	$	100,000
Catch Basin Cleaning	$	588,000
Storm Sewer Flushing	$	150,000
Pond Maintenance	$	116,000
Underground locates	$	200,000
CCTV	$	138,000
subtotal	$	1,934,000
O&M Labour Costs		
Road Operations	$	108,884
Parks	$	157,903
subtotal	$	266,787
Total Annual O&M Costs	**$**	**2,200,787**

Planning, Engineering & Design Labour Costs		
Development Engineering / Construction	$	724,258
Planning / Growth Management	$	79,221
Roads Design	$	288,062
IT / GIS Mapping Support	$	22,500
subtotal	$	1,114,041
Capital Improvements Budget		
Stormwater Management Pond Restoration	$	2,500,000
Stormwater Management Study	$	200,000
subtotal	$	2,700,000
Total Engineering & Capital Works Costs	**$**	**3,814,041**

Total Current Stormwater Services Cost	**$**	**6,014,828**

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Current Funding and Funding Trends

Current Funding

- **General Tax Levy** - stormwater-related contract and labour costs contained in the City's operating budget; stormwater-related capital costs
- **Development Fees** - stormwater service costs related to the review and inspection activities for development applications

Funding Trends

- General municipal practice in Ontario is to fund stormwater costs from the general tax levy
- Recent trend towards dedicated funding sources
  - Dedicated and stable funding sources enable better long-range planning
  - Properly designed stormwater fees are a more equitable way of recovering costs (user-pay principle)

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Proposed Rate Structure

Residential Properties

- Tiered flat-rate
- Three residential categories based on density (low, medium, high)

Non-residential Properties

- $/impervious hectare
- Based on measured impervious area

Goal: Provide an equitable and sustainable funding source (user-pay principle)

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Stormwater Services Budget Forecast

Projected Annual Stormwater Program Costs (based on a five-year phase in approach)

Expenditures	2017 Budget	2019 Forecast	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast	2024 - 2028
Operations & Maintenance	$2,200,787	$4,643,287	$6,193,287	$7,743,287	$9,293,287	$10,843,287	$10,843,287
Engineering & Planning	$1,114,041	$1,332,041	$1,332,041	$1,400,041	$1,400,041	$1,400,041	$1,400,041
Capital Improvements	$2,700,000	$6,132,000	$7,032,000	$7,932,000	$8,832,000	$9,692,000	$9,692,000
Total	**$6,014,828**	**$12,107,328**	**$14,557,328**	**$17,075,328**	**$19,525,328**	**$21,935,328**	**$21,939,328**

*Projected Cost Without Inflation

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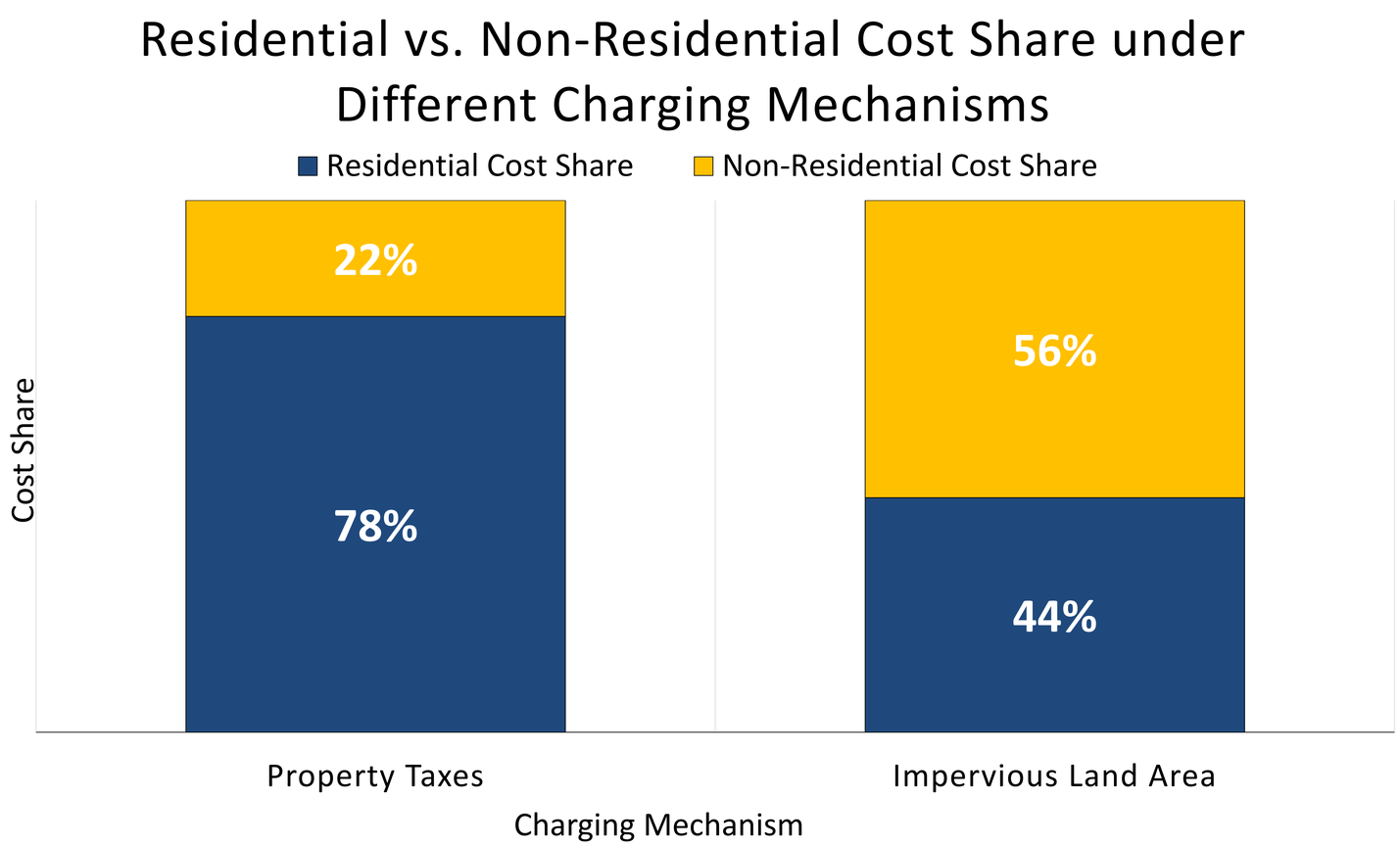
Stormwater Services Cost Share between Residential and Non-residential Properties

Comparison of cost burden under current funding approach (i.e., property taxes) versus impervious area approach



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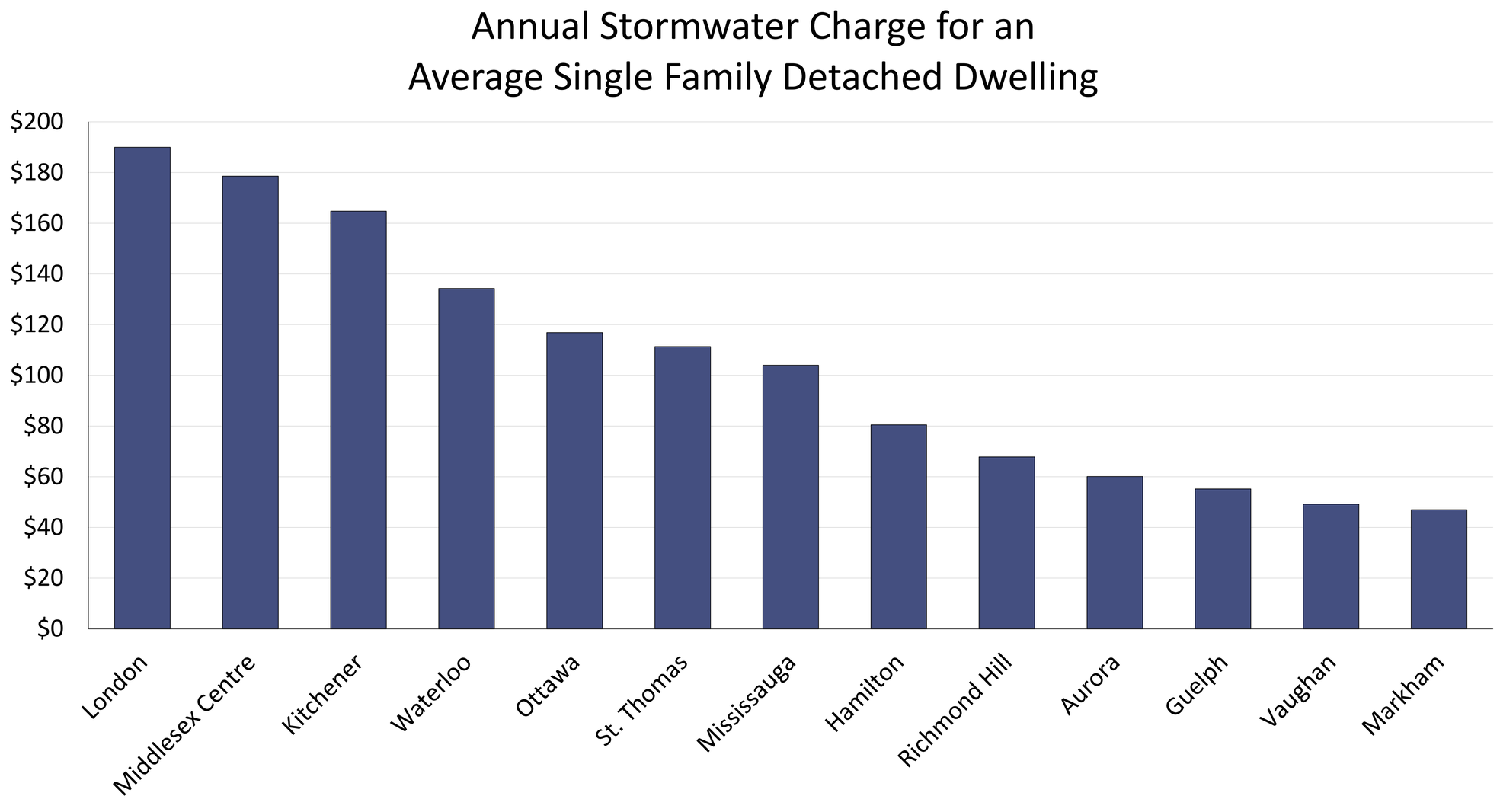
Municipal Rate Comparison



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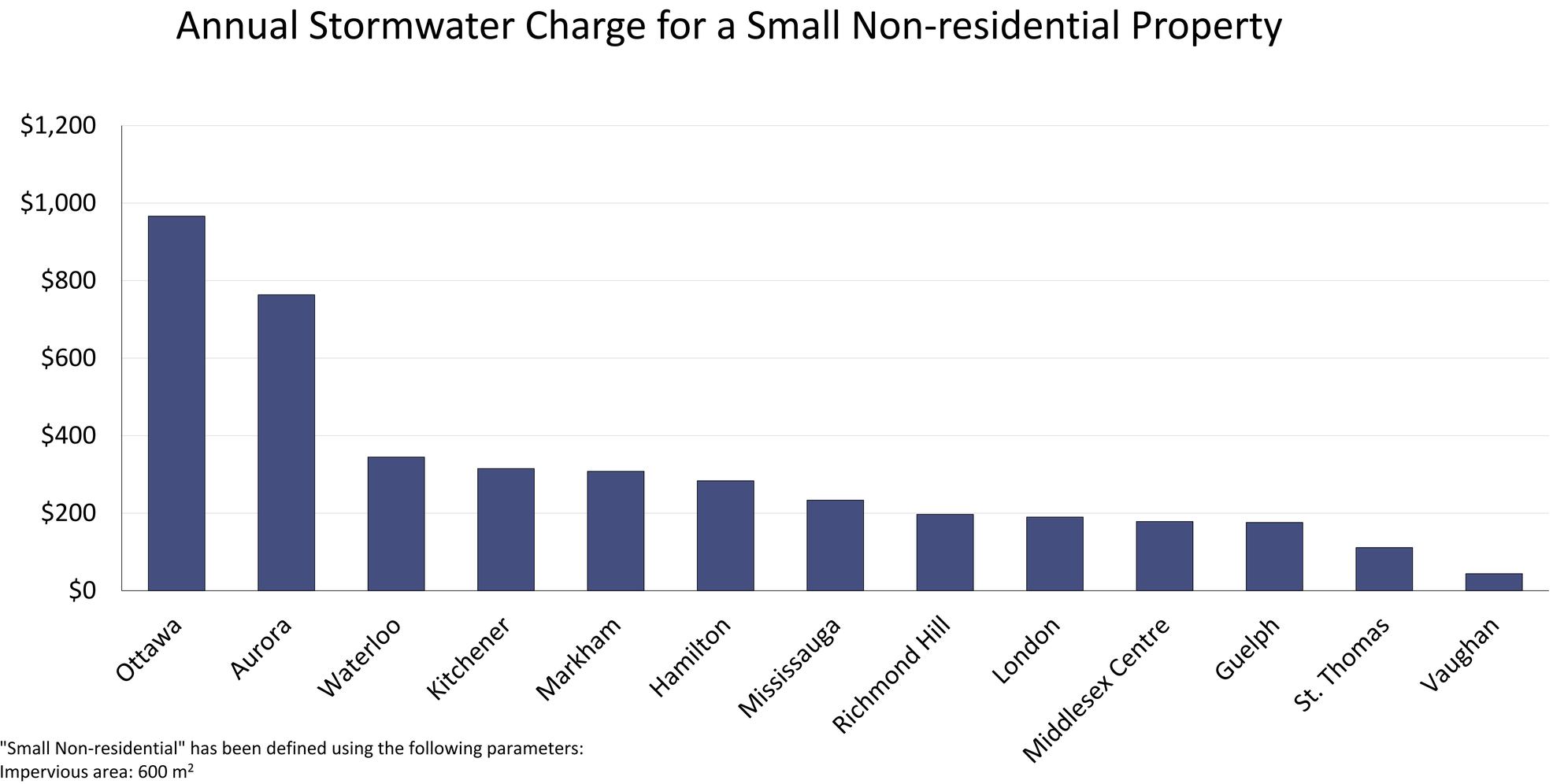
Municipal Rate Comparison



"Small Non-residential" has been defined using the following parameters:
Impervious area: 600 m^2
Current value assessment: $1.10 million
Annual water consumption: 1,000 m^3
Water meter size: 25 mm

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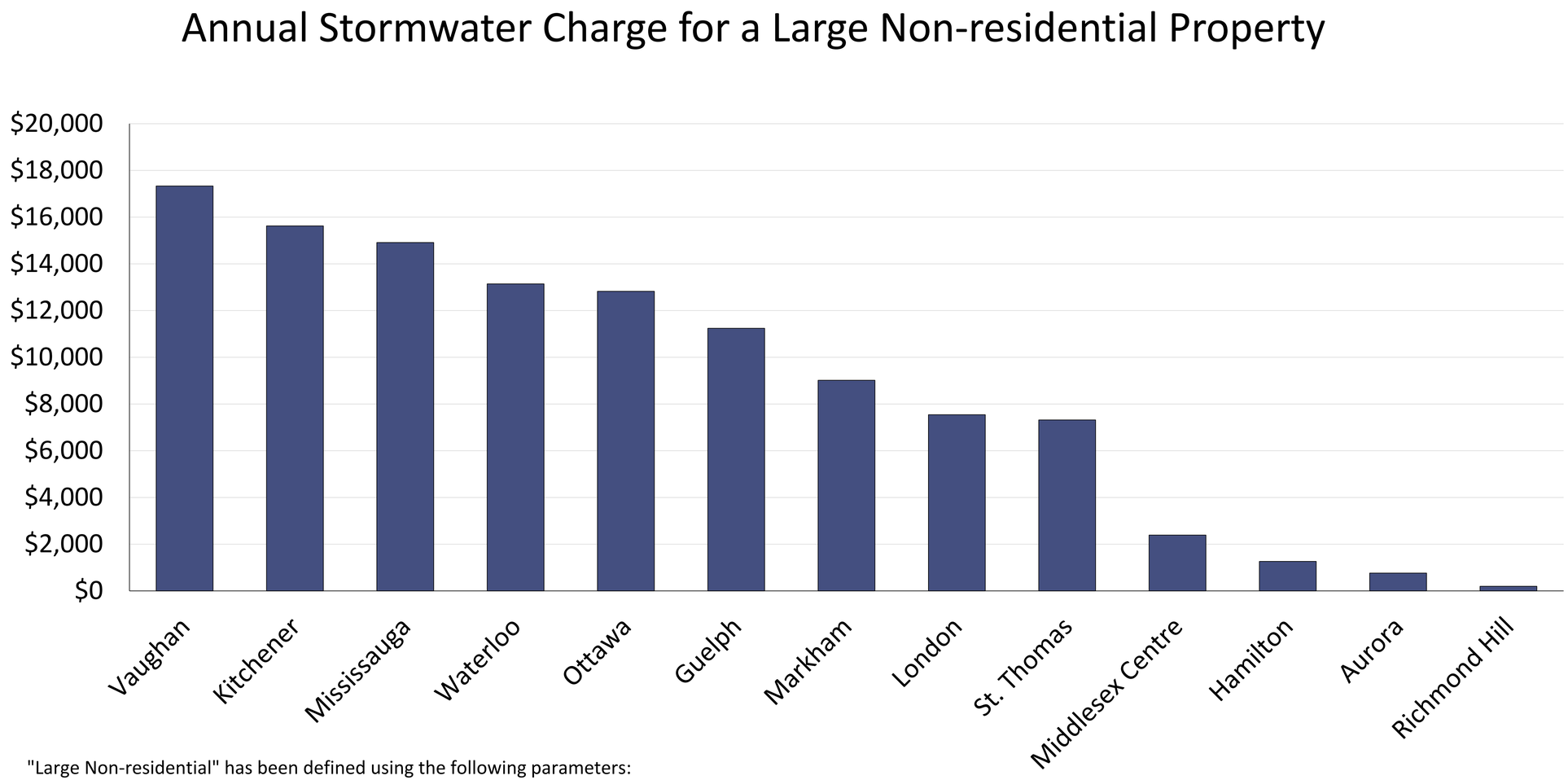
Municipal Rate Comparison



"Large Non-residential" has been defined using the following parameters:
Impervious area: 38,283 m^2
Current value assessment: $32.2 million
Annual water consumption: 4,706 m^3
Water meter size: 50 mm

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Next Steps

- Feedback received from the public will be incorporated into the proposed program
- Exemption policies, credits and incentive programs are being explored
- How will this program affect me?
  - The stormwater rates would appear on each resident's utility bill

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How Can You Get Involved?

- Join our Project Mailing list for timely, relevant updates by adding your name to the sign-in sheet
- Review information shared at this Public Meeting
- Provide input by completing a Comment Form
- Speak with one of the Project Team members:

Michael Heralall, P.Eng.

City of Brampton

Phone: 905.874.3585

E-mail: Michael.Heralall@Brampton.ca

Brian Bishop, M.Eng., P.Eng.

Wood

Phone: 905.335.2353

E-mail: Brian.Bishop@woodplc.com

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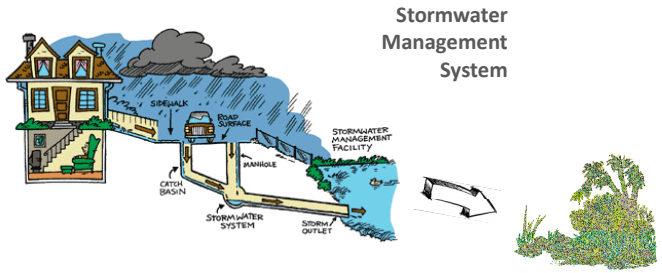
Stormwater Management Financing Study

What is stormwater?

- Stormwater is rainwater and melted snow that runs off lawns, streets and other land surfaces
- Hard surfaces, such as pavement and roofs, prevent precipitation from naturally soaking into the ground and increase run off (i.e., impervious)

Why do we need to "manage" it?

- Stormwater runoff, if not treated or managed before discharging into local water bodies, can:
  - Result in flooding of roads, homes and businesses
  - Can create hazardous conditions and threat to life
  - Contribute to stream and creek erosion
  - Carry pollutants to local waterbodies and cause harm to the environment



What is the purpose of this study?

- Our infrastructure is aging and needs investment in operations and maintenance.
- More infrastructure is needed to support our growing population.
- The study is exploring ways to pay for the necessary investment in our stormwater management system.
- The study will seek ways that are fair, easy to manage and easy to understand.

What are some of the ways stormwater management can be paid for?

- Property taxes
- Debt Financing
- User Fees
- Public-private partnerships

What are other municipalities doing?

- Many municipalities in the GTA, Ontario and across Canada have implemented some form of user fee
- Mississauga, Richmond Hill, Vaughan, Markham, Ottawa, Aurora, Kitchener, Guelph are examples

- 1200+ km of pipe
- 33,000 catchbasins
- 170 stormwater ponds
- 400 km of creeks and streams

TOTAL VALUE = 1.2 Billion

We want to hear from you!

Provide input by completing a comment form, or send your questions and comments to:

Michael Heralall
Manager, Environmental Engineering
City of Brampton
email: Michael.Heralall@Brampton.ca

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COMMENT FORM

Stormwater Management Infrastructure Financial Study
Public Information Centre
May 9, 2018 7:00 – 9:00 pm

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Drop your completed Comment Form in the box provided or mail / fax / e-mail your comments to either of the following individuals by **May 30, 2018**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. Did the information provided give you a clear understanding of the City's stormwater management issues?

_____

_____

2. What issues do you think are most important to managing the City's stormwater?

____ Repair and replace aging infrastructure (e.g., pipes, culverts, outfalls)

____ Active maintenance of stormwater infrastructure (e.g., ponds, culverts)

____ Flood mitigation (i.e., reduce risk to public safety, damage to property)

____ Increase stormwater infrastructure capacity (more severe weather from climate change)

____ Water quality protection (e.g., street sweeping, pond dredging)

____ Other:_____

3. Considering the City's identified program needs, please rank them in order of importance to you (1 = most important, 5 = least importance).

____ Clean and inspect existing infrastructure (e.g., stormwater ponds)

____ Proactive and routine maintenance of facilities (e.g., sewer pipes, watercourses)

____ Invest in priority capital projects (i.e. reduce backlog in infrastructure projects)

____ Stormwater education and outreach to Brampton residents and businesses

4. Considering the Study's service areas, please rank them in order of importance to you (1= most important, 3 = least importance).

____ Operations and Maintenance	____ Engineering and Planning	____ Capital Improvements

5. How do you think Brampton's annual stormwater charge should compare to neighbouring municipalities? The stormwater charge should be:

___ Equal or higher than the average, proactively managing stormwater

___ Equal or below the average, leaving stormwater investment for future generations

___ Approximately average

___ Other: _____

6. How important is it that you are allowed an opportunity to adjust your stormwater charge through credits for stormwater management undertaken on your property?

____ Very Important	____ Important	____ Not Important

7. Is there any additional stormwater management and financing information that you would like to be provided with?

_____

_____

Please use the following space to ask additional questions you may have and the Study Team will address within the following weeks. You can also use this space to provide general comments on the information presented or the overall Study.

_____

_____

_____

_____

Thank-you for your participation. If you wish to be added to our Project Mailing List to be kept informed about the Study please provide your contact information below.

Name: _____

Address: _____

City: _____

Postal Code: _____

Phone: _____

E-mail: _____

Personal information, as defined by the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA), is collected under the authority of the Municipal Act, 2001, and in accordance with the provisions of MFIPPA. Personal information on this Public Information Centre Comment Sheet will be used solely for informing the City of Brampton's Stormwater Management Infrastructure Financial Study.

BRAMPTON
Flower City

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Watson & Associates ECONOMISTS LTD.

COMMENT FORM

Stormwater Management Financial Study

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019:**

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
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Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

____ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

____ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

____ Reducing flooding (i.e., reduce risk to public safety, damage to property)

____ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

__✓__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

__✓__ Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

____ About average

COMMENT FORM

Stormwater Management Financial Study

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019**:

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Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
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1. What issues do you think are most important to managing the City's stormwater?

____ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

__✓__ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

____ Reducing flooding (i.e., reduce risk to public safety, damage to property)

__✓__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

__✓__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify) Educating people about City's swm infrastructure

2. How do you think the City should address its aging stormwater infrastructure?

____ Repair it on an as-needed basis, when structural failure occurs or is imminent

__✓__ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) Seek federal funding; promote it as local economy boost via new jobs

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

__✓__ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

____ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

✓ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

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6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

✓ Very Important ____ Somewhat Important ____ Not Important

Thank-you for your participation. If you wish to be added to our Project Mailing List to be kept informed about the Study please provide your contact information below.

[redacted]

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COMMENT FORM

Stormwater Management Infrastructure Financial Study
Public Information Centre
May 9, 2018 7:00 – 9:00 pm

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Drop your completed Comment Form in the box provided or mail / fax / e-mail your comments to either of the following individuals by **May 30, 2018**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. Did the information provided give you a clear understanding of the City's stormwater management issues?

Yes, we understand this and it is important to us

2. What issues do you think are most important to managing the City's stormwater?

✓ Repair and replace aging infrastructure (e.g., pipes, culverts, outfalls)

✓ Active maintenance of stormwater infrastructure (e.g., ponds, culverts)

✓ Flood mitigation (i.e., reduce risk to public safety, damage to property)

✓ Increase stormwater infrastructure capacity (more severe weather from climate change)

✓ Water quality protection (e.g., street sweeping, pond dredging)

___ Other: _____

3. Considering the City's identified program needs, please rank them in order of importance to you (1 = most important, 5 = least importance).

2 Clean and inspect existing infrastructure (e.g., stormwater ponds)

1 Proactive and routine maintenance of facilities (e.g., sewer pipes, watercourses)

3 Invest in priority capital projects (i.e. reduce backlog in infrastructure projects)

2 Stormwater education and outreach to Brampton residents and businesses

4. Considering the Study's service areas, please rank them in order of importance to you (1= most important, 3 = least importance).

1 Operations and Maintenance	1 Engineering and Planning	1 Capital Improvements

5. How do you think Brampton's annual stormwater charge should compare to neighbouring municipalities? The stormwater charge should be:

1 Equal or higher than the average, proactively managing stormwater

___ Equal or below the average, leaving stormwater investment for future generations

___ Approximately average

___ Other: _____

6. How important is it that you are allowed an opportunity to adjust your stormwater charge through credits for stormwater management undertaken on your property?

___ Very Important	✓ Important	___ Not Important

7. Is there any additional stormwater management and financing information that you would like to be provided with?

No

Please use the following space to ask additional questions you may have and the Study Team will address within the following weeks. You can also use this space to provide general comments on the information presented or the overall Study.

Thank you for being very informative ~~about~~ and listening to our concerns.

Thank-you for your participation. If you wish to be added to our Project Mailing List to be kept informed about the Study please provide your contact information below.

Name: [redacted]
Address:
City:
Postal Code:
Phone:
E-mail:

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From: Heralall, Michael <Michael.Heralall@brampton.ca>
Sent: March-04-19 10:24 AM
To:
Subject: RE: Comment; Stormwater

Good Morning:

Thank you for your informed and detailed comments, and for understanding the importance of stormwater management. The Study team certainly recognizes the distinction between the various property types, and how much stormwater burden each places on the system. Our intent is to rebalance this so that those that place lesser burdens on the system will be considered accordingly. Your comments will help us in understanding what the best solutions would be.

Sincerely,

Michael Heralall, P.Eng.
Manager, Environmental Engineering
City of Brampton
Engineering Division / Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON, L6Y 4R2
Telephone: 905-874-3585

From
To: Heralall, Michael <Michael.Heralall@brampton.ca>
Subject: Comment; Stormwater

Hi, thanks for the public consultation on Stormwater Management Financing.
Regarding distributing costs to residents:

Residents in the Greenbelt in northwest Brampton have large lots with natural absorption of run-off, do not have municipal water/waste water service, and do not burden storm management to the same extent as urban areas. Residential lands in this narrow strip of Greenbelt along the Credit River valley are not ever to be removed from the “permanent” protected country side designation, yet they are paying the same residential tax rate as the rest of the city. Not fair! Compounding that unfairness is potential for shale extraction in this area, another layer of policy protecting these lands from urban development. My own residence in the Greenbelt has 3 acres of mature, managed trees and meadow, and the footprint of the house and paved area is relatively small. Still, I pay over $10,500 in Municipal taxes every year. Some in this neighbourhood pay more. We are on private septic & wells. Credits, or a fair share based on land use might work, but changing MPAC zoning to a lower rural/residential tax rate would be more effective.
I manage a small woodlot with no credits, and pay 300 -400% taxes as the typical Brampton residence who parks 6 cars in a narrow lot pay. I live on a high elevation, with no risk of flooding. Upkeep costs for my private septic and well are bourn by me alone. That’s my fair share of contribution.
Stormwater management is extremely important, especially for a city founded on the Mimico creek bed!

Thanks again for your consideration,

From: Bishop, Brian
To: Stokke, Samantha; Peter Simcisko
Subject: comment
Date: May-10-18 1:23:21 PM
Attachments: image001.png

For your records:

A couple from Heritage Road, north of Steeles (SW part of Brampton) asked a question regarding what the City could do about ongoing erosion in a creek that traverses their back yard. The existing City/CA program of inventorying open watercourses was mentioned. The couple stated that anecdotally, over the last 30 years that they have lived there, the flow has increased and the erosion has increased along with it. It was mentioned that as part of the Stormwater Management Infrastructure Financial Study, the City has identified a need to increase the budget for creek maintenance. Michael gave the couple his card and asked them to call him directly with a request for the City to inspect their creek. It is suspected that this reach of creek is in private ownership, but there has potentially been recent development upstream (Amazon, Maple Lodge Farms).

Brian Bishop, M. Eng., P. Eng.
Senior Associate
Environment and Infrastructure Solutions
3450 Harvester Road, Unit 100
Burlington, Ontario L7N 3W5
Direct: +1 (905) 335-2353
Mobile: +1 (905) 730-3101
brian.bishop@woodplc.com
www.woodplc.com

wood.

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COMMENT FORM

Stormwater Management Financial Study

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____ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

____ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

X Reducing flooding (i.e., reduce risk to public safety, damage to property)

____ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

X Other: (please specify) CLEAR SNOW + ICE ON Roadway that blocks catch basin

2. How do you think the City should address its aging stormwater infrastructure?

X Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) OUR TAXES ARE ALREADY HIGH - YOU Need To Charge an Annual Homeowners Fee $300 yr and also keep the neighbourhood clean + Reasonable

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

X Equal or below average (we should leave stormwater investment for future generations)

____ About average

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____ Other: (please specify)_____

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TAXES

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____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

____ Repair it on an as-needed basis, when structural failure occurs or is imminent

✓ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas → but on an incremental basis

____ Other (please specify) _____

→ why is this the comparator? seems strange when we wouldn't have the level of service!

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[redacted]

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The language in this survey is very value laden. It does not appear to be designed by a research team. Instead, it appears to be written by someone from the Progressive Conservative communications team. Only people versed in PC "spin" would use words like "fair share" and "future generations". Also, narrowing an incredibly complex issue like a government funding formula down to ~~a couple~~ 6 questions appears to be more of a communications exercise than a true consultation.

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____ Reducing flooding (i.e., reduce risk to public safety, damage to property)

✓ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify) Use technologies IoT Sensors to prioritize manage

2. How do you think the City should address its aging stormwater infrastructure?

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1 Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

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Any natural Activity Should be write-off.
It is not creation of humankind..

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___ Other: (please specify) Burn More Jews

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____ Very Important ____ Somewhat Important ____ Not Important

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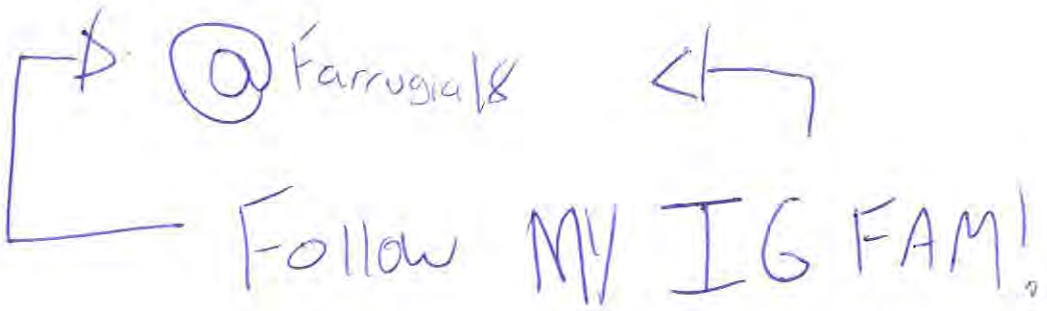

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COMMENT FORM

Stormwater Management Financial Study

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Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

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Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

✓ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

✓ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

✓ Reducing flooding (i.e., reduce risk to public safety, damage to property)

____ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

✓ Repair it on an as-needed basis, when structural failure occurs or is imminent

✓ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

✓ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

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✓ Other: (please specify) I'm No Expert in this area, please let experts/professional decide on this important issue.

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✓ Other (please specify) Again, experts should take the leadership in their area of expertise.

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✓ About average Irrelevant.

We do not have the data / cost.

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__4__ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

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__2__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

__3__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

__✓__ Other: (please specify) Reduce salt run-off into L. Ontario

2. How do you think the City should address its aging stormwater infrastructure?

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✓ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

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___ Other: (please specify) Frequent Inspection of facilities, NOT until Broken

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___ Other (please specify) Money is already paid with water consumption by home owners.

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___ About average Peel water already charged for Storm water fee It is a function of volume of used water

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Control is already in place, City needed better management instead of asking for more. dd

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✓ About average THIS IS NOT Specific enough

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~ (per person amount)

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The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

✓ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

____ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

✓ Reducing flooding (i.e., reduce risk to public safety, damage to property)

✓ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

____ Repair it on an as-needed basis, when structural failure occurs or is imminent

✓ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

✓ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

____ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

____ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

__✓__ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

5. If Brampton introduces an annual stormwater charge, how should the costs for businesses be distributed?

__✓__ All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

__✓__ Very Important ____ Somewhat Important ____ Not Important

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____ Reducing flooding (i.e., reduce risk to public safety, damage to property)

__X__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change) → & reduced drainage due to increased land use

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

↳ how does street sweeping protect the environment??? (less pavement, less sand/salt = more green)

2. How do you think the City should address its aging stormwater infrastructure?

__X__ Repair it on an as-needed basis, when structural failure occurs or is imminent

__X__ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

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it should be part of municipal taxes, not a separate charge or tax

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YOU SHOULD BE REWARDED FOR PERVIOUS PAVING, DISCONNECTING DOWNSPOUTS, RAINWATER BARRELS & MINIMIZING PAVING

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____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

✓ Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas – not aware of the extent of damage, but good to have a reserve dedicated to this - usually when the city is pooling money for projects, they are not used for term, unless needed.

____ Other (please specify) _____

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____ Equal or below average (we should leave stormwater investment for future generations)

✓ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed? - depends on risk.

____ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

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✓ Repair it on an as-needed basis, when structural failure occurs or is imminent

___ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

✓ Other (please specify) Monitor stormwater drains at a fixed time period (Every 10 yrs) and spend accordingly to repair/create drains as needed

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✓ Other: (please specify) Implementing permeable surfaces, so water can go through surface rather than run off.

2. How do you think the City should address its aging stormwater infrastructure?

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COMMENT FORM

Stormwater Management Financial Study

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Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

____ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

__✓__ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

____ Reducing flooding (i.e., reduce risk to public safety, damage to property)

____ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

__✓__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

__✓__ Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

__✓__ Equal or below average (we should leave stormwater investment for future generations)

__✓__ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

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____ ~~About average~~ (from reallocations of the resources (tax dollars)

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___ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas STOP WASTING MONEY ON

___ Other (please specify) FRIVOLOUS PROJECTS AND ON YOURSELVES.

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STOP TRYING TO FIND NEW WAYS TO RAISE TAXES - (SHAME ON YOU)

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_✓_ Other: (please specify) Increase capacity to accomodate increased and changing population needs.

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_✓_ Other (please specify) Start repair/replace now to cover ALL infrastructure eventually.

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DO IT NOW OR AS SOON AS POSSIBLE AVOID COSTLY ERRORS WHEN PIPES BREAK IN WINTER

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Watson & Associates
ECONOMISTS LTD

COMMENT FORM

Stormwater Management Financial Study

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

✓ Repairing and replacing aging infrastructure (e.g. pipes, culverts, outfalls)

✓ Actively maintaining existing stormwater infrastructure (e.g. ponds, culverts)

✓ Reducing flooding (i.e., reduce risk to public safety, damage to property)

✓ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

✓ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

✓ Repair it on an as-needed basis, when structural failure occurs or is imminent

NO Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) I pay my property tax. It is not fair as two adults staying in a house. *

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

____ About average

* IN MY AREA TOO MANY TENANTS - THEY USE ALL THE PERKS. HOUSES ARE NOT REGISTERED - OWNER PAYS THE ~~SAME~~ SAME PROPERTY TAX. SECONDLY water usage - etc. CITY SHOULD CHECK -

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____ Other: (please specify) REQUEST FUNDS FROM PROVINCE / FED GOVT UNDER CLIMATE CHANGE PREPAREDNESS

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You're supposed to be the high paid experts. Why ask Joe Blow. If the City budgeted money maybe we'd have it to allocate to different projects instead of us always having to fork up more money from MORE TAXES.

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4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

___ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

___ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

5. If Brampton introduces an annual stormwater charge, how should the costs for businesses be distributed?

___ All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

___ All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

___ Very Important ___ Somewhat Important ___ Not Important

Thank-you for your participation. If you wish to be added to our Project Mailing List to be kept informed about the Study please provide your contact information below.

Personal information, as defined by the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA), is collected under the authority of the Municipal Act, 2001, and in accordance with the provisions of MFIPPA. Personal information on this Comment Form will be used solely for informing the City of Brampton's Stormwater Management Financial Study.

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Are you planning to incorporate this charge into the sewer charge already existing?

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____ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change) FIX CLIMATE, LESS POLUTION

__✓__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify) CURB GROWTH

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____ Other (please specify) you need to Xtend the by pass + rebuild it /Was originally designed for 100yer storm K

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K check with + partner with Brampton Emergency Measures Office.

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INSTEAD of SPENDING MONEY ON BICYCLE PATHS - FRIVOLOUS FOR THE USERS - SPEND IT ON THE ABOVE NEEDS (USELESS BUNCH)

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1. Rely on existing budgets - NO new taxes OR CHARGES

on our tax bill Line item

Since Doug Ford doesn't care for enviroment.... Keep the city clean and don't ask for more money we pay enough taxes!.... be eficuent

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The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

____ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

____ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

__✓__ Reducing flooding (i.e., reduce risk to public safety, damage to property)

__✓__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

____ Repair it on an as-needed basis, when structural failure occurs or is imminent

__✓__ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

____ About average → (based on footage of house maybe) - ???

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____ About average We already pay user fees in our taxes!

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____ About average No charge to Public Lots of wastage of Money can be Saved

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____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

✓ Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

✓ Equal or below average (we should leave stormwater investment for future generations)

____ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

____ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

__✓__ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

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__✓__ Very Important ____ Somewhat Important ____ Not Important

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__✓__ Other: (please specify) I know what's happening you gonna sign a contract with a co. to collect money for ~~money~~ costs & water recovery & collect more as is we are not getting

2. How do you think the City should address its aging stormwater infrastructure?

__✓__ Repair it on an as-needed basis, when structural failure occurs or is imminent

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__✓__ Other (please specify) Expansion of Brampton has been very recent - talk the infrastructure is brand new, so no collection.

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This is a money grab, all Brampton infrastructure is brand new and is quite capable of handling water coming into the sewers, we pay the highest taxes compared to other municipalities Woodbridge, Richmond hill - Markham. etc & they remove snow from your garage area & don't pile it in your garage area, they also have sidewalks ploughed So enough of money grab.

[redacted]

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Do you think people are made of money?

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Get off your high horse and come down to earth. We are taxed enough.

Don't even dream of such a charge!

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____ Very Important ____ Somewhat Important ____ Not Important

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You civic workers are out to lunch.
We have a real problem in society if civic workers spend time dreaming up new taxes.

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E-mail: michael.heralall@brampton.ca

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Tel: 905.335.2353
Email: brian.bishop@woodplc.com

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__✓__ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

__✓__ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

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__✓__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

__✓__ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

____ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

__✓__ Repair it on an as-needed basis, when structural failure occurs or is imminent

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__✓__ About average

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OLDER PROPERTY OWNERS HARDLY CONTRIBUTE TO THIS PROBLEM

____ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

✓ BIG BOX MALL OWNERS SHOULD BE PAYING THEIR FAIR SHARE FOR PARKING LOT RUN OFF.

5. If Brampton introduces an annual stormwater charge, how should the costs for businesses be distributed?

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✓ ALL COMMERCIAL PROPERTIES SHOULD BE ENCOURAGED TO INSTALL GREEN ROOFS

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

____ Very Important ____ Somewhat Important ✓ Not Important

✓ NEW DEVELOPMENTS SHOULD BE HELD TO A HIGHER STANDARD FOR MANAGING STORM WATER RUN OFF.

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____ About average Don't do it - Taxes already too high

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed? Don't charge Taxes high enough ↓ reduce council size

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commercial charges / not residential

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____ Other (please specify) INFRASTRUCTURE AND A WALL AND MEXICO IS GOING TO PAY FOR IT."

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✓ Other: (please specify) Nothing, Climate $ is a Fraud and a scheme to increase taxes for government!!!

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____ About average —

✓ none of the above. This is a tax grab on a false premise! If you want money, cut your expenses and reallocate the money if you want!

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– via the property taxe that is already Paid. ie No new taxes

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

____ Very Important ____ Somewhat Important ____ Not Important

– Stop this Silly tax. Get out of our Pockets!!

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Personal information, as defined by the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA), is collected under the authority of the Municipal Act, 2001, and in accordance with the provisions of MFIPPA. Personal information on this Comment Form will be used solely for informing the City of Brampton's Stormwater Management Financial Study.

BRAMPTON
Flower City

wood.
Watson & Associates
ECONOMISTS LTD.

COMMENT FORM

Stormwater Management Financial Study

The City of Brampton welcomes your comments on the Stormwater Management Infrastructure Financial Study. Please send your completed forms by mail / fax / e-mail to either of the following individuals by **March 31, 2019**:

Mr. Michael Heralall, P.Eng.
Project Manager
City of Brampton
Public Works & Engineering Dept.
2 Wellington Street West
Brampton, ON L6Y 4R2
Tel: 905.874.3585
E-mail: michael.heralall@brampton.ca

Mr. Brian Bishop, M.Eng., P.Eng.
Consultant Project Manager
Wood (Formerly Amec Foster Wheeler)
Environment & Infrastructure
3450 Harvester Road, Unit 100
Burlington ON, L7N 3W5
Tel: 905.335.2353
Email: brian.bishop@woodplc.com

1. What issues do you think are most important to managing the City's stormwater?

__✓__ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

____ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

__✓__ Reducing flooding (i.e., reduce risk to public safety, damage to property)

__✓__ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

____ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

__✓__ Other: (please specify) when replacing please have a plan to do it the first time correctly - not rip it apart over & over again - waste taxpayer money.

2. How do you think the City should address its aging stormwater infrastructure?

__✓__ Repair it on an as-needed basis, when structural failure occurs or is imminent

____ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

____ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

____ Equal or higher than average (we should be proactive in managing stormwater)

____ Equal or below average (we should leave stormwater investment for future generations)

__✓__ About average

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

✓ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

5. If Brampton introduces an annual stormwater charge, how should the costs for businesses be distributed?

✓ All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

____ Very Important ✓ Somewhat Important ____ Not Important

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brampton.ca Flower City

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1. What issues do you think are most important to managing the City's stormwater?

___ Repairing and replacing aging infrastructure (e.g., pipes, culverts, outfalls)

_✓_ Actively maintaining existing stormwater infrastructure (e.g., ponds, culverts)

___ Reducing flooding (i.e., reduce risk to public safety, damage to property)

___ Increasing the capacity of stormwater infrastructure (to handle increasing severe weather from climate change)

___ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)

___ Other: (please specify)_____

2. How do you think the City should address its aging stormwater infrastructure?

_✓_ Repair it on an as-needed basis, when structural failure occurs or is imminent

___ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas

___ Other (please specify) _____

3. If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

___ Equal or higher than average (we should be proactive in managing stormwater)

___ Equal or below average (we should leave stormwater investment for future generations)

_X_ About average look at basement (illigal) apartments

4. If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

Lot size

X All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

5. If Brampton introduces an annual stormwater charge, how should the costs for businesses be distributed?

✓ All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property etc.

____ All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property etc.

6. If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

✓ Very Important ____ Somewhat Important ____ Not Important

City should inform residents on what can be done.

Thank-you for your participation. If you wish to be added to our Project Mailing List to be kept informed about the Study please provide your contact information below.

- Have casual meetings and invite residents to speak on the topic
- Look at illegal basement apartments and charge accordingly.

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From:	Bishop, Brian
To:	Stokke, Samantha
Cc:	Haggerty, Jean; Peter Simcisko
Subject:	FW: Storm Water Survey Mount Pleasant
Date:	October-01-18 3:58:27 PM
Attachments:	rwilson_9-28-2018_11-01-39.pdf

fyi

From: Heralall, Michael [mailto:Michael.Heralall@brampton.ca]
Sent: October-01-18 3:52 PM
To: Bishop, Brian <brian.bishop@woodplc.com>
Subject: FW: Storm Water Survey Mount Pleasant

Some public input – my team and I went out to a weeknight farmer's market, and we got a few visitors. We handed out the surveys, and this is the first one we have received back.

From: [redacted]
Sent: 2018/09/28 11:05 AM
To: Heralall, Michael <Michael.Heralall@brampton.ca>
Subject: Storm Water Survey Mount Pleasant

Hi Michael:

Thanks for giving me some details on the proposals to amend our current storm water practices/charges.

Attached, please find my responses to your survey.

Regards,
[redacted]

Please answer these questions about stormwater management, or send your comments/questions about the study to Michael.heralall@brampton.ca

What issue(s) do you think are most important to manage Brampton's stormwater?

✓ Repairing and replacing aging infrastructure
___ Actively maintaining existing stormwater infrastructure
___ Reducing flooding
✓ Increasing the capacity of stormwater infrastructure
✓ Managing water quality to protect the environment (e.g., street sweeping, pond dredging)
___ Other: _____

How do you think the City should address its aging stormwater infrastructure? (select one)

___ Repair it on an "as needed" basis, when structural failure occurs or is imminent
✓ Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas
___ Other/Comment: _____

If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

___ Equal or higher than average. We should be proactive in managing stormwater.
___ Equal or below average. We should leave stormwater investment for future generations.
✓ About average

If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

✓ All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property, etc.
___ All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property, etc.

If Brampton introduces an annual stormwater charge, how should the costs for businesses/commercial operations be distributed?

✓ All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property, etc.
___ All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property, etc.

If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

___ Very Important
✓ Important
___ Not Important

Other comments:

_____

_____

If you wish to receive email updates about the study, please provide your email address.

_____

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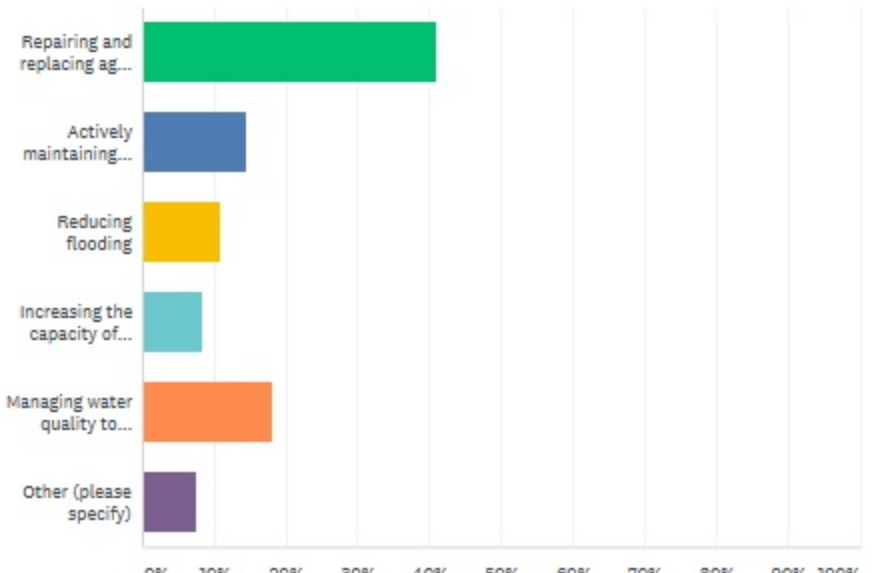
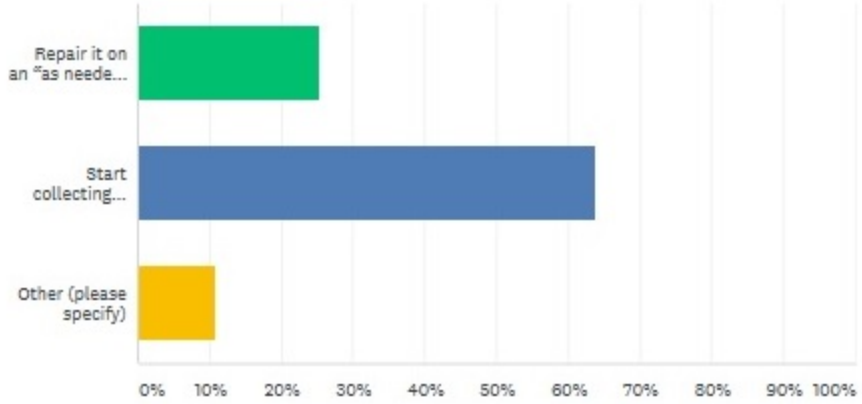
What issue do you think is most important to manage Brampton's stormwater?

Answered: 83 Skipped: 0



How do you think the City should address its aging stormwater infrastructure?

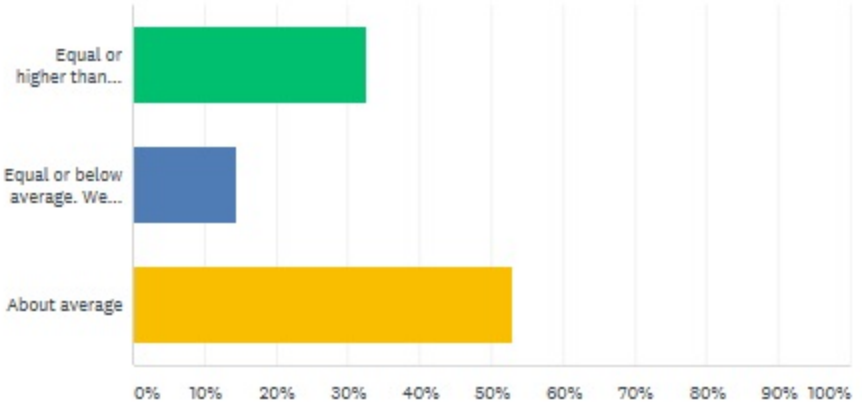
Answered: 83 Skipped: 0



ANSWER CHOICES		RESPONSES	
Repair it on an "as needed" basis, when structural failure occurs or is imminent		25.30%	21
Start collecting money now to renew and rehabilitate infrastructure in the highest priority areas		63.86%	53
Other (please specify)	Responses	10.84%	9
TOTAL			83

If Brampton introduces an annual stormwater charge, how do you think it should compare to neighbouring municipalities? The stormwater charge should be:

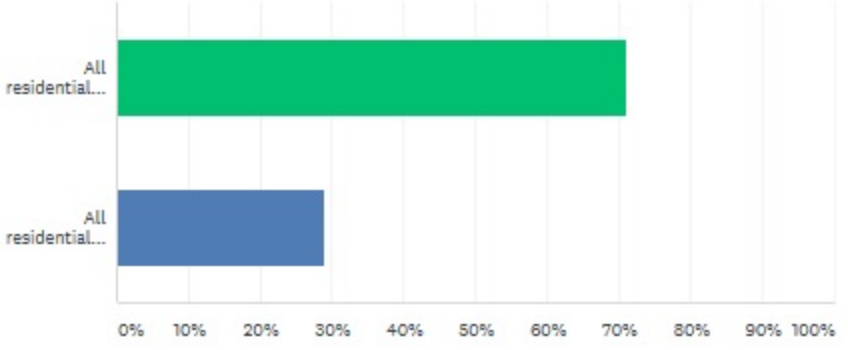
Answered: 83 Skipped: 0



ANSWER CHOICES	RESPONSES	
Equal or higher than average. We should be proactive in managing stormwater.	32.53%	27
Equal or below average. We should leave stormwater investment for future generations.	14.46%	12
About average	53.01%	44
TOTAL		83

If Brampton introduces an annual stormwater charge, how should the costs for residents be distributed?

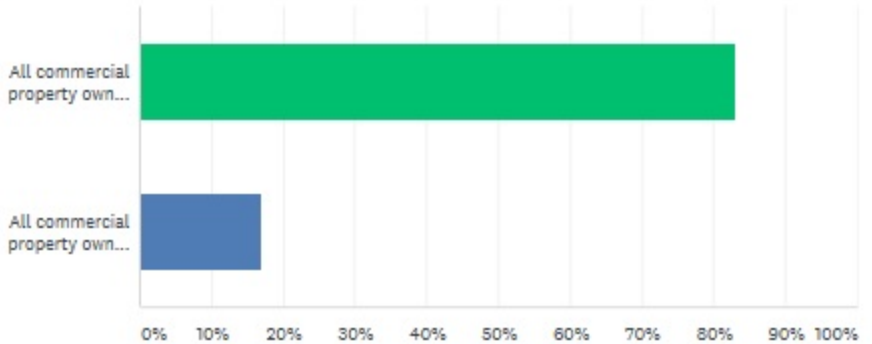
Answered: 83 Skipped: 0



ANSWER CHOICES	RESPONSES	
All residential property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property, etc.	71.08%	59
All residential property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property, etc.	28.92%	24
TOTAL		83

If Brampton introduces an annual stormwater charge, how should the costs for businesses/commercial operations be distributed?

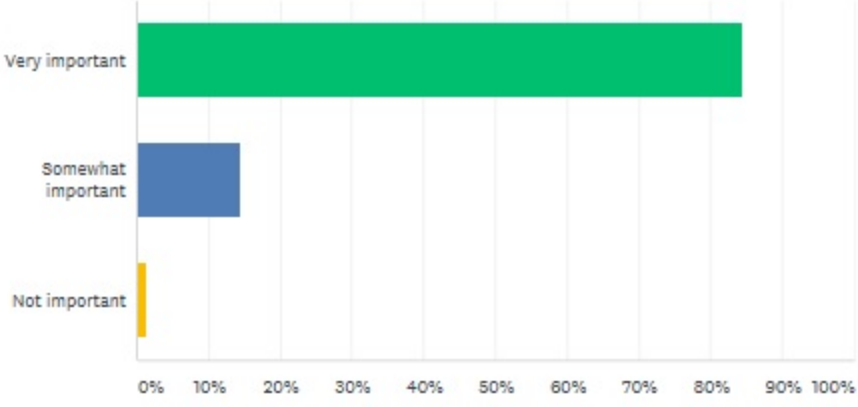
Answered: 83 Skipped: 0



ANSWER CHOICES	RESPONSES	
All commercial property owners should pay their fair share based on the size of their property/building, stormwater improvements made to their property, etc.	83.13%	69
All commercial property owners should pay the same amount, regardless of the size of their property/building, stormwater improvements made to their property, etc.	16.87%	14
TOTAL		83

If you improve your property to help manage stormwater, how important is it that you receive credits to adjust your stormwater charge?

Answered: 83 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very important	84.34%	70
Somewhat important	14.46%	12
Not important	1.20%	1
TOTAL		83

Appendix D

Level of Service Summary

City of Brampton, ON: Potential Level of Stormwater Service Options Matrix - FOR DISCUSSION

The City of Brampton currently provides general stormwater management services across the city. Services include operating and maintaining the existing infrastructure (such as catch basin cleaning, ponds maintenance, street sweeping, facility inspections) and managing stormwater planning and engineering projects (master planning, capital contracts, stormwater regulations). Review of the current services has shown gaps between existing levels of service (LOS) and the desired service level needed to support a sustainable program that effectively protects public health and safety and existing public and private investment. The following matrix provides options for enhancing the stormwater program of services by addressing current program gaps or needs, including information on current and minimum LOS and risks associated with maintaining current service levels.

PROGRAM GAP OR NEED	ASSOCIATED OBJECTIVE	CURRENT SERVICE LEVELS AND NOTES	LEVEL OF SERVICE OPTIONS			MINIMUM LOS	Risk associated with maintaining current LOS
			LOW	MEDIUM	HIGH		
A. Stormwater Operations and Maintenance (O&M)							
A.1. *Regular inspections of stormwater infrastructure*	The City should seek to move from reactive management of stormwater system components to a proactive, priority-based asset management program.	Currently there is no dedicated inspection staff for existing stormwater infrastructure. Inspections are typically performed in response to complaints or done by existing staff as time allows. A dedicated inspector/coordinator should be the minimum level of resource available to enable timely, regular inspection of stormwater infrastructure. Temporary staff (students) are retained for 6 months at a time. **Note This does not include an upcoming watercourse inspection being undertaken with CWA funding** LESS THAN MINIMUM LOS	Add one inspector dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $100,000.	Add one inspector and one temporary staff (student) dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $120,000.	Add one inspector and two temporary staff (students) dedicated to regularly scheduled inspections of stormwater management ponds, outfalls, watercourses, culverts, roadside ditches and oil/grit separators. Estimated annual cost: $140,000.	There is currently no Regulatory minimum LOS. Industry practice is to inspect all facilities annually at a minimum for attributes affecting hydraulic performance, inlets and outlets, debris, and sediment build-up.	The risk of not performing regular field inspections is that obvious problems go unreported and can result in infrastructure failures or system underperformance impacting the effectiveness of flood control and water quality protection, resulting in costly emergency actions (emergency repairs typically cost 30-40% more than planned repairs and replacement).
A.2 *Regular Pond Maintenance:* Stormwater management ponds require regular monitoring and cleaning (not including dredging) to insure they are functioning properly. Currently the maintenance program for stormwater management facilities (ponds) is limited by resources. Dedicating additional resources for regularly scheduled inspections, monitoring, bathymetry measurements and maintenance could improve their function and longevity.	The City directs available resources to priority-based storm pond maintenance, but resources are insufficient to keep up with growing list of priority pond cleanings identified. Backlog will continue to build with each year.	Currently the City does general pond maintenance service that allows the cleaning, minor repairs and maintenance (does not include dredging) on approximately 10 ponds per year ($75,000). Assuming the current routine maintenance of 10 ponds per year (on average) is the baseline level of service to be provided, routine maintenance of the 180 existing ponds will be done on a eighteen (18) year cycle. Add to this the projection that an additional 170 ponds could come on-line over the next 20 years (from the SW Master Plan), the level of service will need to increase to keep the ponds operating effectively and prevent flooding. Assumes the average cost for monitoring and maintenance is $7,500 per pond. LESS THAN MINIMUM LOS	Increase baseline level of service to establish a pond monitoring and inspection program with the goal of evaluating each pond on a 10-year cycle (approximately 18 per year). Use inspection information to assign a priority and perform maintenance (not including dredging) on an additional 8 ponds per year (for a total of 18 per year). Estimated increased cost: $60,000	Increase baseline level of service to establish a pond monitoring and inspection program with the goal of evaluating each pond on a 7-year cycle (approximately 25 per year). Assign a priority based on monitoring and inspection and maintain (not including dredging) an additional 15 ponds per year (for a total of 25 per year). Estimated additional cost: $112,500	Increase baseline level of service to establish a pond monitoring and inspection program with the goal of evaluating each pond on a 5-year cycle (approximately 36 per year). Assign a priority based on monitoring and inspection and maintain (not including dredging) an additional 26 ponds per year (for a total of 36 per year). Estimated additional cost: $195,000	There is currently no Regulatory minimum LOS, however the Ministry of the Environment and Climate Change (MOECC) guidelines suggest that SWM facility forebays need to be cleaned every 10-15 years.	Industry best practices recommend inspection of ponds every 5 years to check structural integrity and operating capacity. Allowing ponds to fill with sediment or not addressing pipe or other structural problems diminishes pond capacity resulting in the potential for major system failures and increased local flooding risk. It also hinders the pond from being able to meet water quality requirements, and may in some instances violate the MOECC conditions of approval.

A.3. *Provide proactive maintenance to support maximum system capacity and longevity. The* City currently has about 38,000 catch basins and current cleaning contracts provide cleaning of approximately 6,000 per year (or a cleaning cycle of once every 6.3 years.). Though city staff do provide some additional cleaning in problem areas, increasing the level of service provide by the contactors would allow a more proactive approach to long term catch basin maintenance.	The City should seek to move from reactive management of stormwater system components to a proactive, priority-based asset management program.	The current budget for contracted catch basin cleaning is $588,000 and this supports cleaning approximately 6,000 catch basins per year. This results in a level of service of cleaning approximately 15% per year or a cleaning all basins on a 6.3 year cycle. For estimating purposes, each increase of 1,000 basins cleaned per year would cost about $100,000. The current estimated replacement value for the City's catch basins is $111M, so following the industry target of dedicating 1% of value to annual maintenance would suggest a annual goal of $1.1M. MEETS 50% MINIMUM LOS	Increase the annual budget to fund catch basin cleaning system of 30% of the system per year (11,400 catch basins). Increasing the level of service to cleaning the basins on a 3.3 year cycle would cost an additional $540,000 per year.	Increase the annual budget to fund catch basin cleaning system of 40% of the system per year (15,200 catch basins). Increasing the level of service to cleaning the basins on a 2.5 year cycle would cost an additional $920,000 per year.	Increase the annual budget for funding catch basin cleaning system of 50% of the system per year (19,000 catch basins). Increasing the level of service to cleaning the basins on a 2 year cycle would cost an additional $1,300,000 per year.	There is currently no Regulatory minimum LOS, however there is legislation coming (Infrastructure and Asset Management Act by 2021) that will set a minimum threshold. Industry practice is to maintain assets in a state of good repair, and a benchmark is spending 1% of the total asset value on annual O&M.	Industry standards recommend establishing a maintenance schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at anytime will be more than 50 percent full. At 50% full, capacity is significantly diminished, affecting ability of stormflows to enter the system. As catch basins fill with sediment at different rates in different locations, a more realistic goal for Brampton would be to inspect and clean on a three year cycle, taking note of those basins that are found to be more than 50% full and scheduling inspection/cleaning of those basins more often. This would also reduce the sediment loading to the ponds.
A.4. Implement a City-wide CCTV inspection program - inspections	Physical condition assessment and identification of priority areas.	The closed circuit TV (CCTV) inspection of the sewer system is in its first year and includes is a contract for $138,000 to begin the inspection program. The cost per metre of pipe inspected is approximately $1.65/m. The base level of service assumes the entire system will be inspected every 25 years. **This does not include the baseline inspection of entire system that needs to be completed within the next 5 - 7 years as part of asset management requirements**. Thereafter, approx. 4% of the system will be assumed to need inspection each year. Total cost of baseline inspection will be spread out over 25 years, but will be front-loaded in reality. MEETS MINIMUM LOS	4% of system to be inspected per year (approximately 75 km out of 1.830 km of pipe) - budget $120,000	6% of system to be inspected per year - budget $180,000	8% of system to be inspected per year - budget $240,000	There is currently no Regulatory minimum LOS, however the industry standard suggests up to a 25 year cycle on pipes that have a projected 100 year lifespan.	The goal is to develop a complete inventory and condition assessment of the system to allow identification and prioritization of problem areas and to meet asset management requirements. This will be done over the next 5-7 years and the cost will be covered as part of the City Asset Management program. Once the baseline information is established, the goal is to update the stormwater system conditions information on a 25 year basis. The risk of not performing scheduled inspections is that unknown problems may develop that result in system blockages or failures that could have been dealt with by cleaning and repairing the pipes (which would only be evident through CCTV inspection). Instead, if the problems go undetected, they could result in potential increased flooding and possible need for costly emergency pipe repairs and replacement to protect public health and safety at 30-40% increased cost.
A.5. Implement a City-wide storm sewer pipe repair program	The City should seek to move from reactive management of stormwater system components to a proactive, priority-based asset management program.	Currently there are no dedicated resources for planned pipe replacements. This fund would cover minor repairs (pointing, lining, etc.) as well as replacement of some pipe sections. Project management and field inspection time will also be needed to be budgeted to oversee these services if contracted. The estimated replacement cost of the City's storm sewer system is $775M.	Budget $3,875,000 (representing 0.5% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement when needed.	Budget $7,750,000 (representing 1.0% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement when needed.	Budget $11,625,000 (representing 1.5% of estimated storm sewer system replacement cost) to contribute to a pipe repair fund. This fund will be tapped for major and minor pipe repairs, as well as pipe replacement when needed.	There is currently no Regulatory minimum LOS, however there is legislation coming (Infrastructure and Asset Management Act by 2021) that will set a minimum threshold. Industry practice is to maintain assets in a state of good repair, and a benchmark is spending 1% of the total asset value on annual O&M.	Industry standard guidelines recommend to set aside 1% of asset value per year to cover maintenance and repair over the expected life of the asset (100 years for pipe). With a estimated replacement value of $775M, an investment of 1% per year is $7,750,000. The risk of not establishing a dedicated fund to support storm sewer repairs and replacements is that identified problems will get put on hold awaiting annual budgeting allocations, potentially resulting in further deterioration of problems and increased risk of failure and associated flooding and public safety concerns. Emergency repairs typically cost 30-40% more than planned repairs.

		LESS THAN MINIMUM LOS					
A.6.*Ensure increase in O&M is commensurate with estimates of growth* : The current replacement value of the City's stormwater infrastructure has been estimated at over $1B (collection, conveyance, and treatment components). Having made this significant investment, the City now needs to support a program that will extend the life and effectively manage the operation of these assets. With a population approaching 627,500 in 2016, Brampton's population is expected to reach 842,300 people by 2031 (an average increase of 2.2% per year) and with that growth will come additional stormwater infrastructure needs.	Ensure growth in O&M investments keeps pace with growth in system needs.	Currently there is no target or LOS associated with yearly growth for stormwater services. It is assumed that the $6M currently budgeted for stormwater-related services (2017) is the minimum level of service (LOS) to be provided and the options provided would be enhancements to that LOS. MEETS MINIMUM LOS	Increase identified basic funding level by 2.2% per year ($132,000) to help alleviate costs related to growth - to be adjusted annually	Not recommending exceeding the industry minimum LOS.	Not recommending exceeding the industry minimum LOS.	There is currently no Regulatory minimum LOS, however the industry standard is to match infrastructure spending to your growth.	As population increases, development of roads, schools, commercial and residential property also increases, requiring additional stormwater infrastructure. Including a 2.2% growth factor for maintenance funding allow maintenance levels of services to stay constant with growth. By not building in growth as part of funding considerations, the levels of service will not be able to keep up with the additional infrastructure the City gains with new development, resulting in decreasing service levels over time.
B. STORMWATER PLANNING AND ENGINEERING							
B.1. *Add GIS Analyst for Stormwater Tracking and Mapping.* In support of asset management, CCTV findings, planning, and field operations, dedicate GIS resources to updating and maintaining mapping and related geo-databases.	The stormwater program plan should be coordinated with on-going planning and growth initiatives to identify efficiencies.	The current LOS for stormwater GIS services includes the use of 25% of a GIS analyst from the IT Division to support stormwater related GIS needs ($27,500/yr.). A GIS analyst dedicated to the stormwater program should be the minimum level of service to support mapping and stormwater database management. Assumes the cost of one full time, mid-level GIS analyst will be $68,000 per year with benefits. MEETS 50% PROPOSED MINIMUM LOS	Assign a part-time (24 hours/week) stormwater GIS analyst to manage and update stormwater GIS data on existing and new assets. Estimated cost $41,000 per year.	Assign a full-time stormwater GIS analyst to manage and update stormwater GIS data on existing and new assets. Estimated cost $68,000 per year.	Not recommending exceeding the industry minimum LOS.	There is currently no Regulatory minimum LOS. Proposed minimum LOS is a full-time analyst dedicated to SWM.	As asset management information, including CCTV inspection, results and infrastructure inventories are developed, there will be an increased need to populate databases and apply GIS mapping tools. Up-to-date maps and databases increase efficiencies in planning, scheduling maintenance and in responding to field calls. Having a dedicated stormwater GIS analyst available, for mapping, inspection, and new infrastructure updates, will ensure timely data input and asset management.
C. CAPITAL IMPROVEMENTS							
C.1. *Stormwater Pond Cleaning:* The City currently undertakes major maintenance of stormwater ponds (dredging and disposal of accumulated sediments) based on priorities derived from estimates of sediment removal efficiency. This initiative has received funding of $2 - $2.5M per year, and this level of investment will represent the minimum LOS for pond cleaning.	Program funding should be tied to level of service and sustainable financial program goals.	Assumes that the $2.5M (average per year) currently budgeted for pond cleaning is the minimum level of service (LOS) to be provided and provides for funding an average of 5 ponds per year. The options presented would be enhancements to that LOS with the goal of achieving a cleaning frequency of 15 years/pond on average. The average cost of cleaning a pond, based on past contract prices, is $500,000. MEETS MINIMUM LOS	Dedicate an additional $2,000,000 annually to allow cleaning of 9 SWM ponds/year. This would allow for the current inventory of 180 ponds to be each cleaned once approximately every 20 years.	Dedicate an additional $3,500,000 annually for pond cleaning. This would allow for the current inventory of ponds to be cleaned once every 15 years.	Dedicate an additional $5,000,000 annually for pond cleaning. This would allow for the current inventory of ponds to be cleaned once every 12 years.	There is currently no Regulatory minimum LOS, however MOECC guidelines suggest that SWM facility forebays need to be cleaned every 10-15 years, and main cells cleaned once they reach 50 % filled with sediment, which may be less frequent.	An analysis of the City's stormwater ponds, prepared as part of the City's State of the Local Infrastructure report in 2016, identified the condition of 15% of the ponds as very poor and 18% poor. When a system is new, major maintenance is typically set for every 20 years, but due to the age and condition of the existing inventory, the desired level of service needs to be accelerated to address identified needs and prevent pond failures. It is recommended that an LOS of cleaning every 15 years be the target for Brampton.

C.2. Stormwater Retrofit *Capital Investments:* The findings from several recent studies demonstrate the need for significant investment in erosion control and water quality protection. This will be achieved through implementation of stormwater pond retrofits in uncontrolled areas, or areas not meeting current regulatory targets. The current identified backlog is over $64 M ($47M for WQ retrofits, $17M for temperature retrofits).	Program funding should be tied to level of service and sustainable financial program goals.	Currently there is no consistent budget for funding stormwaterretrofit projects. Using the information from the SW Master Plan (2008) and Stormwater Retrofit Study (2015), it is assumed that there is an existing backlog of at least $64M worth of retrofit projects and that as part of the existing annual budget process, the highest priority projects will be scheduled first. By setting an annual level of investment, the City still has the flexibility to adjust the priority list annually to ensure the most efficient and effective spending of funds. The funding levels suggested include costs for project management staff and activities. LESS THAN MINIMUM LOS	Dedicate $2,560,000 annually to reduce the retrofit Capital Improvement Program (CIP) backlog. At this rate, existing known CIP needs would be addressed in 25 years.	Dedicate an additional $3,200,000 annually to reduce the retrofit CIP backlog. At this rate, existing known CIP needs would be addressed in 20 years.	Dedicate an additional $4,250,000 annually to reduce the retrofit CIP backlog. At this rate ($6.4M per year), existing known CIP needs would be addressed in 15 years.	There is currently no Regulatory minimum LOS. Proposed minimum LOS is 25 years to clear the current backlog.	The $64M backlog was identified in 2015 and little progress has been made in addressing these projects due to current funding limitations. Further delay in addressing these projects could result in deteriorating water quality and erosion problems and significant challenges to meeting water quality regulatory targets. Planning to fund these projects over a 25 year period would allow meaningful progress to be made and minimize further problems.
C.3.*Watercourse Capital Improvements* : The City has over 400 km of streams and watercourses under its ownership. These consist of natural and engineered channels, and maintaining the system in a state of good repair requires investment in erosion protection and restoration.	Invest in ongoing preventative maintenance of the river and stream system that is the ultimate receiver of stormwater discharge to minimize flooding and erosion.	Currently there is no dedicated funding for watercourse maintenance and improvements. The 2008 Master Plan recommended $40M in non-site-specific erosion control works on City watercourses, to be done over 50 years, hence $800k per year. The City is currently developing a prioritization scheme for the watercourse needs. The 50-year LOS would support approximately 400m of creek work (repair/stabilization) per year (SWM Master Plan). LESS THAN MINIMUM LOS	Budget $800,000 per year for watercourse maintenance. This will address the current estimated backlog over 50 years	Budget $1,600,000 per year for watercourse maintenance. This will address the current estimated backlog over 25 years	Budget $2,000,000 per year for watercourse maintenance. This will address the current estimated backlog over 20 years	There is currently no Regulatory minimum LOS. Proposed minimum LOS is a 50 year program.	As identified in the SW Master Plan in 2008, the City's watercourses (natural infrastructure)need maintenance to protect against erosion and instability. By not investing in the on-going need for erosion protection and restoration, bank failures will impact stormwater quality, channel capacity, and potentially private property , resulting in potentially larger investments to deal with emergency repairs.
C.4. *Stormwater capital program coordinator* : To address capital improvements at an increased pace, the City will need a balance of dedicated staff, supportive stakeholders, and available capital funding. The stormwater program plan will need to be integrated with other infrastructure projects to ensure efficiency and to maximize sharing of resources. To lead this integrated effort, a stormwater coordinator needs to be identified and given the responsibility to manage the capital backlog in an efficient, fiscally responsible way.	The stormwater program plan should be coordinated with on-going planning and growth initiatives to identify efficiencies and should include public participation as a fundamental component.	There is currently no funding for a dedicated stormwater program coordinator. The current level of service relies on existing staff to support project management of current limited stormwater services. A new or revised position should be considered to serve as a full time coordinator as this program grows. Estimated cost for a program manager position, including all benefits, is $90,000 per year. LESS THAN PROPOSED MINIMUM LOS	Assign a full time stormwater coordinator to manage an integrated stormwater capital program. The coordinator would also be responsible supporting/presenting at public participation opportunities. Estimated cost $90,000	Assign a full time stormwater coordinator and a stormwater technician to manage an integrated stormwater capital program. The new staff would also be responsible supporting/presenting at public participation opportunities. Estimated cost $158,000	Assign a full time stormwater coordinator and two stormwater technicians to manage an integrated stormwater capital program. The new staff would also be responsible supporting/presenting at public participation opportunities. Estimated cost $226,000	There is currently no Regulatory minimum LOS. Proposed minimum LOS is a full-time SWM coordinator.	As the City focuses more on stormwater management works arising from the implementation of respective plans, the workload will increase significantly and it will be important to have leadership to ensure the program plan is implemented efficiently and that the public is kept informed on progress and how their money is being invested. Not adding a stormwater leadership position will likely mean that duties are split across departments, as is currently done, and will lack a dedicated point person and may result in difficulties in executing and coordinating an integrated plan and public message.
D. STORMWATER PROGRAM FINANCIAL ADMINISTRATION							

D.1 *Stormwater Education and Outreach* : It is a priority in the City to support public engagement and education and it is a key component for setting priorities and building community understanding and support. As the stormwater program takes on new challenges, a coordinated, consistent, and accessible outreach and education program will be critical to gaining and maintaining community support	The stormwater program should include public participation and education as a fundamental component.	Currently there are no communication staff that are dedicated to stormwater management; support for the limited stormwater public outreach activities is provided by Strategic Communications staff. As the stormwater program levels of service expand, regularly scheduled news items, website and media updates, and public meetings should be planned to educate stakeholders about the stormwater program general activities and on specific projects that impact localized areas of the City. The messaging and outreach should be consistent and coordinated with other activities impacting the City. Assumes a full-time stormwater outreach coordinator position at $80,000 per year with full benefits (however is expected to reduce effort and be reallocated over time). LESS THAN MINIMUM LOS	Use existing staff from communication and stormwater operations to track and report on stormwater issues and projects. Target several environmental activities and community meetings annually to educate stakeholders on the importance of effective stormwater management services and what they can do to support the program. Cost for materials and meetings - $6,000/year	Assign a part-time (24 hours/week) stormwater outreach coordinator to plan and implement outreach and education plans. Estimated cost $54,000 per year plus materials ($6,000)	Assign a full-time stormwater outreach coordinator to plan and implement outreach and education plans. Estimated cost $80,000 per year plus expenses ($6,000)	There is currently no Regulatory minimum LOS. Proposed minimum LOS is a full-time SWM outreach coordinator.	Growing the stormwater program from a basic service level to a more enhanced level will allow improvements in service across the city including the undertaking of significant capital projects. Outreach to the community on what projects are prioritized, how their funding is being managed and the impacts that projects will have on the community may become a full time job. Having communication staff with knowledge and understanding on the stormwater services and challenges, actively promoting education and outreach will help gain and maintain critical community support. Once the public becomes more informed about the stormwater program and impacts of new projects, it may be possible to cut this position back to part-time (in 2-3 years).

Total additional expenditures by LOS

Brampton draft LOS Cost Matrix	estimated annual cost		
	Low	Medium	High
Program Need			
A.1. Regular Inspections of SWM infrastructur	$100,000	$120,000	$140,000
A.2. Pond Maintenance (non-dredging)	$60,000	$112,500	$195,000
A.3. Maintenance - Catch basins	$540,000	$920,000	$1,300,000
A.4 City-wide CCTV inspections	$120,000	$180,000	$240,000
A.5 Storm sewer repair/replacement	$3,875,000	$7,750,000	$11,625,000
A.6 O&M Growth fund	$132,000	$132,000	$132,000
B.1 GIS Analyst	$41,000	$68,000	$68,000
C.1. Storm Pond Cleaning	$2,000,000	$3,500,000	$5,000,000
C.2 Retrofit Capital investment	$2,560,000	$3,200,000	$4,250,000
C3. Watercourse Capital Improvements	$800,000	$1,600,000	$2,000,000
C4. Stormwater Capital Coordinator	$90,000	$158,000	$226,000
D.1. Stormwater education and outreach	$6,000	$60,000	$86,000
	$10,324,000	$17,800,500	$25,262,000

Recommended enhancement to current storr	$15,961,000

Appendix E

Property Classification

Classification of MPAC Property Codes into Stormwater Fee Categories

Property Code	Description	Classification	Total Site Area (acres)	Roll #s with Site Area	Roll #s without Site Area	Total Adjusted Site Area (acres)	Total Roll #s
100	Vacant residential land not on water	Agricultural/Vacant	3,613.96	7,145	79	3,653.92	7,224
101	Second tier vacant lot – refers to location not being directly on the water but one row back from the water	Agricultural/Vacant	0.08	1	-	0.08	1
102	Conservation Authority Land	Agricultural/Vacant	2,407.49	44	-	2,407.49	44
103	Municipal park (excludes Provincial parks, Federal parks, campgrounds)	Agricultural/Vacant	2,868.75	587	10	2,917.62	597
105	Vacant commercial land	Agricultural/Vacant	525.38	154	2	532.20	156
106	Vacant industrial land	Agricultural/Vacant	556.89	152	-	556.89	152
112	Multi-residential vacant land	Agricultural/Vacant	40.76	17	-	40.76	17
125	Residential development land	Agricultural/Vacant	738.55	74	-	738.55	74
127	Townhouse block - freehold units	Residential (Medium Density)	103.00	201	-	103.00	201
130	Non-buildable land (walkways, buffer/berm, storm water management pond, etc)	Agricultural/Vacant	1,404.99	2,220	198	1,530.30	2,418
134	Land designated and zoned for open space	Agricultural/Vacant	813.97	269	14	856.33	283
140	Common land	Agricultural/Vacant	1.64	1	-	1.64	1
169	Vacant land condominium (residential)-defined land that's described by a condominium plan	Agricultural/Vacant	4.57	56	-	4.57	56
200	Farm property without any buildings/structures	Agricultural/Vacant	3,901.06	149	-	3,901.06	149
201	Farm with residence - with or without secondary structures; no farm outbuildings	Agricultural/Vacant	189.53	15	-	189.53	15
210	Farm without residence - with secondary structures; with farm outbuildings	Agricultural/Vacant	543.00	13	-	543.00	13
211	Farm with residence - with or without secondary structures; with farm outbuildings	Agricultural/Vacant	1,276.55	42	-	1,276.55	42
220	Farm without a residence but having a commercial/industrial operation	Agricultural/Vacant	378.19	5	-	378.19	5
221	Farm with a residence - with commercial/industrial operation	Agricultural/Vacant	174.10	8	-	174.10	8
231	Intensive farm operation - with residence	Agricultural/Vacant	19.97	2	-	19.97	2
232	Large scale greenhouse operation	Agricultural/Vacant	17.49	1	-	17.49	1
240	Managed forest property, vacant land not on water	Agricultural/Vacant	24.62	1	-	24.62	1
244	Managed forest property, residence not on water	Agricultural/Vacant	34.94	1	-	34.94	1
260	Vacant residential/commercial/industrial land owned by a non-farmer with a portion being farmed	Agricultural/Vacant	2,633.89	73	-	2,633.89	73
261	Land owned by a non-farmer improved with a non-farm residence with a portion being farmed	Agricultural/Vacant	2,687.07	88	-	2,687.07	88
301	Single-family detached not on water)	Residential (Low Density)	14,805.28	89,716	2,063	15,145.72	91,779
302	More than one structure used for residential purposes with a least one of the structures occupied permanently	Residential (Medium Density)	12.44	24	-	12.44	24
303	Residence with a commercial unit	Commercial	25.51	84	-	25.51	84
304	Residence with a commercial/industrial use building	Commercial	9.88	1	-	9.88	1
305	Link home	Residential (Medium Density)	240.18	3,338	160	251.70	3,498
309	Freehold townhouse/rowhouse	Residential (Medium Density)	527.90	10,094	348	546.10	10,442
311	Semi-detached residential	Residential (Low Density)	1,816.01	25,195	173	1,828.48	25,368
313	Single family detached on water – year round residence	Residential (Low Density)	14.89	41	-	14.89	41
322	Semi-detached with both units under one ownership	Residential (Low Density)	3.32	8	-	3.32	8
332	Duplex	Residential (Low Density)	24.33	101	-	24.33	101
333	Residential property with three self-contained units	Residential (Medium Density)	7.74	51	-	7.74	51
334	Residential property with four self-contained units	Residential (Medium Density)	6.44	29	-	6.44	29
335	Residential property with five self-contained units	Residential (Medium Density)	2.14	11	-	2.14	11
336	Residential property with six self-contained units	Residential (Medium Density)	3.42	13	-	3.42	13
340	Multi-residential, with seven or more self-contained units	Residential (High Density)	216.69	102	-	216.69	102
341	Multi-residential, with seven or more self-contained residential units, with small commercial unit(s)	Commercial	10.38	2	-	10.38	2
350	Row housing, with three to six units under single ownership	Residential (Medium Density)	1.90	6	-	1.90	6
352	Row housing, with seven or more units under single ownership	Residential (High Density)	63.51	23	1	66.27	24
360	Rooming or boarding house – rental by room/bedroom , tenant(s) share a kitchen, bathroom and living quarters.	Residential (Medium Density)	1.73	12	-	1.73	12
365	Group Home as defined in the Municipal Act, 2001	Residential (Medium Density)	10.09	30	-	10.09	30
367	THIS PROPERTY CODE IS NOT LISTED ON THE MPAC WEBSITE		28.02	4	35	-	39
369	Vacant land condominium (residential - improved) – condo plan registered against the land.	Agricultural/Vacant	61.53	792	24	63.39	816
370	Residential condominium (≤2 storeys)	Residential (Medium Density)	-	-	-	319.22	-
370	Residential condominium (>2 storeys)	Residential (High Density)	-	-	-	181.28	-
374	Cooperative housing - non-equity	Residential (High Density)	33.06	7	-	33.06	7
376	Condominium locker unit	Exclude	-	-	12	-	12
377	Condominium parking space unit	Exclude	-	-	41	-	41
380	Residential common elements condominium corporation	Residential (Medium Density)	25.33	15	-	25.33	15
381	Mobile home – one or more mobile home on a parcel of land, which is not a mobile home park operation.	Residential (Low Density)	2.50	1	-	2.50	1
400	Small office building, generally single tenant or owner-occupied under 7,500 sq ft	Commercial	9.13	19	1	9.61	20
401	Small medical/dental building, generally single tenant or owner-occupied under 7,500 square feet	Commercial	0.71	3	-	0.71	3
402	Large office building, generally multi-tenanted, over 7,500 square feet	Commercial	246.38	49	1	251.41	50
403	Large medical/dental building, generally multi-tenanted, over 7,500 square feet	Commercial	17.11	13	-	17.11	13
405	Office use converted from house	Commercial	52.35	44	3	55.92	47
406	Retail use converted from house	Commercial	2.07	10	1	2.27	11
408	Freestanding Beer Store/LCBO-not associated with power/shopping centre	Commercial	1.31	2	-	1.31	2
409	Retail - one storey, generally over 10,000 square feet	Commercial	19.65	12	-	19.65	12
410	Retail - one storey, generally under 10,000 square feet	Commercial	37.91	59	1	38.56	60
411	Restaurant-conventional	Commercial	2.03	4	-	2.03	4
412	Restaurant - fast food	Commercial	1.97	5	-	1.97	5
413	Restaurant - conventional, national chain	Commercial	1.57	2	-	1.57	2
414	Restaurant - fast food national chain	Commercial	18.13	15	-	18.13	15
416	Concert hall/live theatre	Commercial	1.88	3	-	1.88	3
417	Entertainment complex - with a large cinema as anchor tenant	Commercial	10.01	1	-	10.01	1
420	Automotive fuel station with or without service facilities	Commercial	82.22	52	3	86.96	55
421	Speciality automotive shop/auto repair/collision service/car or truck wash	Commercial	79.26	59	1	80.61	60
422	Auto dealership	Commercial	76.87	22	-	76.87	22
423	Auto dealership -independent dealer or used vehicles	Commercial	56.13	12	-	56.13	12
425	Neighbourhood shopping centre with more than two stores attached and under one ownership, with anchor - generally less than 150,000 square feet	Commercial	225.35	25	-	225.35	25
426	Small box shopping centre less than 100,000 square feet. Minimum three box stores with one anchor (large grocery or discount store	Commercial	48.63	4	-	48.63	4
427	Big box shopping/power centre, > 100,000 sq ft with 2 or more main anchors,such as discount or grocery stores,with a collection of box or strip stores and in a commercial concentration concept	Commercial	159.00	6	-	159.00	6
428	Regional shopping centre	Commercial	135.46	3	-	135.46	3
429	Community shopping centre	Commercial	104.50	6	-	104.50	6
430	Neighbourhood shopping centre with more than two stores attached and under one ownership, without anchor - generally less than 150,000 square feet	Commercial	356.05	136	3	363.90	139
432	Banks and similar financial institutions, including credit unions - typically single-tenanted, generally less then 7,500 square feet	Commercial	7.21	17	-	7.21	17
433	Banks and similar financial institutions, including credit unions - typically single-tenanted, generally greater then 7,500 square feet	Commercial	1.54	2	-	1.54	2
434	Free-standing supermarket	Commercial	12.63	2	-	12.63	2
435	Large retail building centre - generally greater than 30,000 square feet	Commercial	89.94	9	-	89.94	9
436	Free-standing large retail store, national chain - generally greater than 30,000 square feet	Commercial	18.58	2	-	18.58	2
438	Neighbourhood shopping centre with offices above	Commercial	21.07	8	-	21.07	8
444	Full service hotel	Commercial	2.12	1	-	2.12	1
445	Limites service hotel	Commercial	20.70	10	-	20.70	10
450	Motel	Commercial	2.17	1	-	2.17	1
470	Multi-type complex - defined as a large multi-use complex consisting of retail/office and other uses (multi res/condominium/hotel	Commercial	5.87	7	-	5.87	7
471	Retail or office with residential unit(s)above or behind -less than 10,000 square feet gross building area (GBA), street or onsite parking, with six or less apartments, older downtown core	Commercial	10.08	44	-	10.08	44
475	Commercial condominium	Commercial	-	-	2,372	69.99	2,372
476	Commercial condominium (live/work)	Commercial	-	-	9	1.43	9
477	Retail with office(s) - less than 10,000 square feet gross building area (GBA with offices above	Commercial	2.75	13	-	2.75	13
478	Retail with office(s) - greater than 10,000 square feet gross building area (GBA with offices above	Commercial	2.47	2	-	2.47	2
480	Surface parking lot - excludes parking facilities that are used in conjunction with another property	Commercial	18.55	14	-	18.55	14
481	Parking garage - excludes parking facilities that are used in conjunction with another property	Commercial	0.53	1	-	0.53	1
482	Surface parking lot - used in conjunction with another property	Commercial	39.94	9	-	39.94	9
490	Golf course	Agricultural/Vacant	941.04	17	-	941.04	17
496	Communication buildings	Commercial	7.17	5	-	7.17	5
510	Heavy manufacturing (non-automotive)	Industrial	119.14	7	-	119.14	7
511	Pulp and paper mill	Industrial	16.76	1	-	16.76	1
512	Cement/asphalt manufacturing plant	Industrial	6.90	2	-	6.90	2
514	Automotive assembly plant	Industrial	243.80	1	-	243.80	1
516	Automotive parts production plant	Industrial	83.32	5	-	83.32	5
520	Standard industrial properties not specifically identified by other Industrial Property Codes	Industrial	1,612.88	459	-	1,612.88	459
521	Distillery/brewery	Industrial	12.53	1	-	12.53	1
527	Abattoir/slaughter house/rendering plants	Industrial	66.81	1	-	66.81	1
528	Food processing plant	Industrial	105.15	5	-	105.15	5

Classification of MPAC Property Codes into Stormwater Fee Categories

Property Code	Description	Classification	Total Site Area (acres)	Roll #s with Site Area	Roll #s without Site Area	Total Adjusted Site Area (acres)	Total Roll #s
529	Freezer plant/cold storage	Industrial	41.65	6	-	41.65	6
530	Warehousing	Industrial	1,898.80	268	-	1,898.80	268
531	Mini-warehousing	Industrial	46.46	9	-	46.46	9
540	Other industrial (all other types not specifically defined)	Industrial	464.05	89	-	464.05	89
544	Truck terminal	Industrial	114.80	8	-	114.80	8
545	Truck terminal	Industrial	490.46	7	-	490.46	7
558	Hydro One Transformer Station	Industrial	48.57	3	-	48.57	3
560	MEU Transformer Station	Industrial	6.88	13	1	7.41	14
561	Hydro One Right-of-Way	Industrial	77.04	2	-	77.04	2
565	Private Generating Station (Fossil Fuels and Cogen)	Industrial	49.00	1	-	49.00	1
575	Industrial condominium	Industrial	8.95	71	1,248	181.35	1,319
580	Industrial mall	Industrial	641.96	131	-	641.96	131
588	Pipelines - transmission, distribution, field and gathering and all other types including distribution connections	Industrial	-	-	4	-	4
589	Compressor station - structures and turbines used in connection with transportation and distribution of gas	Industrial	1.61	5	-	1.61	5
590	Water treatment/filtration/water towers/pumping station	Industrial	67.19	11	-	67.19	11
591	Sewage treatment/waste pumping/waste disposal	Industrial	0.86	2	-	0.86	2
592	Dump/transfer station/incineration plant/landfill	Industrial	35.93	1	-	35.93	1
596	Recycling facility	Industrial	45.25	2	-	45.25	2
597	Railway right-of-way	Industrial	332.60	3	-	332.60	3
598	railway buildings and lands describes as assessable in the Assessment Act	Industrial	228.25	10	-	228.25	10
599	GO transit station/rail yard	Industrial	48.73	8	-	48.73	8
601	Post secondary education - university, community college, etc.	Institutional	81.99	1	-	81.99	1
605	School (elementary or secondary, including private	Exclude	1,236.87	162	-	-	162
608	Day care	Institutional	20.94	6	-	20.94	6
610	Other educational institutional (e.g. schools for the blind, deaf, special education, training	Institutional	65.16	2	-	65.16	2
611	Other institutional residence (e.g. convents)	Institutional	0.47	2	-	0.47	2
621	Hospital, private or public	Institutional	39.40	2	-	39.40	2
623	Continuum of care seniors facility	Institutional	7.08	1	-	7.08	1
625	Nursing home	Institutional	26.14	8	-	26.14	8
626	Old age/retirement home	Institutional	20.57	5	-	20.57	5
627	Other health care facility	Institutional	0.64	1	-	0.64	1
631	Provincial correctional facility	Institutional	193.02	2	-	193.02	2
700	Place of worship - with a clergy residence	Institutional	106.32	11	-	106.32	11
701	Place of worship - without a clergy residence	Institutional	210.50	78	1	213.20	79
702	Cemetry	Commercial	257.34	22	-	257.34	22
705	Funeral home	Commercial	3.42	3	-	3.42	3
710	Recreational sport club - non-commercial (excludes golf clubs and ski resorts)	Institutional	277.02	21	-	277.02	21
711	Bowling alley	Commercial	4.72	2	-	4.72	2
718	Exhibition grounds/fair grounds	Commercial	14.65	1	-	14.65	1
720	Commercial sport complex	Commercial	7.79	2	-	7.79	2
721	Non-commercial sports complex	Institutional	153.14	5	-	153.14	5
725	Amusement park	Commercial	170.00	1	-	170.00	1
730	Museum and/or art gallery	Institutional	4.14	2	-	4.14	2
731	Library and literary institutions	Institutional	2.45	2	-	2.45	2
733	Convention, conference, congress centre	Commercial	8.27	1	-	8.27	1
734	Banquet hall	Commercial	29.38	4	-	29.38	4
735	Assembly hall, community hall	Commercial	29.99	10	-	29.99	10
736	Clubs, private and fraternal	Commercial	23.53	7	-	23.53	7
748	Transit garage	Commercial	51.18	2	-	51.18	2
761	Armoury	Institutional	0.54	1	-	0.54	1
805	Post Office or depot	Institutional	3.88	1	-	3.88	1
810	Fire Hall	Institutional	52.52	10	-	52.52	10
812	Ambulance Station	Institutional	0.91	2	-	0.91	2
815	Police Station	Institutional	12.80	3	-	12.80	3

Appendix F

Detailed Rate Calculation

City of Brampton
Stormwater Management Financing Study
Stormwater Services Funding

Table F-1: Stormwater Services Budget Forecast
Inflated $

Description	Current (2017)		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Operating Expenditures	3,759,512		6,287,733	6,125,870	6,413,357	6,690,107	6,975,476	7,269,699	7,573,019	7,885,684	8,207,950	8,540,078
Operating Revenue (Engineering Fees)	(87,374)		(90,972)	(92,827)	(94,719)	(96,650)	(98,620)	(100,630)	(102,682)	(104,775)	(106,911)	(109,090)
Capital Expenditures	2,700,000		8,087,544	11,086,758	14,285,939	17,695,407	21,276,795	22,021,205	22,791,659	23,589,069	24,414,377	25,268,561
Contribution to SW Reserve Fund	-		9,981,152	8,051,300	5,576,680	2,862,143	-	-	-	-	-	-
Net Recoverable	**6,372,138**		**24,265,457**	**25,171,102**	**26,181,256**	**27,151,008**	**28,153,651**	**29,190,274**	**30,261,996**	**31,369,978**	**32,515,417**	**33,699,549**

Table F-2: Stormwater Services Reserve Fund Continuity
Inflated $

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Opening Balance	-	10,056,011	18,318,535	24,211,818	27,458,605	27,870,484	28,288,541	28,712,869	29,143,562	29,580,716
Transfers to (from)	9,981,152	8,051,300	5,576,680	2,862,143	-	-	-	-	-	-
Interest	74,859	211,225	316,603	384,643	411,879	418,057	424,328	430,693	437,153	443,711
Ending Balance	10,056,011	18,318,535	24,211,818	27,458,605	27,870,484	28,288,541	28,712,869	29,143,562	29,580,716	30,024,426

Table F-3: Stormwater Services Annual Rates

Property Type	Annual Bill under Property Tax Funding Model		Annual Bill with a Dedicated Stormwater Charge									
	Current (2017)	2019	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential												
Low Density - per unit	$ 37.83	$ 124.89	$ 77.12	$ 78.19	$ 79.58	$ 80.83	$ 82.23	$ 83.65	$ 85.09	$ 86.58	$ 88.16	$ 89.89
				1.4%	*1.8%*	*1.6%*	*1.7%*	*1.7%*	*1.7%*	*1.7%*	*1.8%*	*2.0%*
Medium Density - per unit	$ 26.39	$ 87.12	$ 38.31	$ 38.69	$ 39.25	$ 39.75	$ 40.33	$ 40.92	$ 41.53	$ 42.16	$ 42.83	$ 43.59
				1.0%	*1.4%*	*1.3%*	*1.5%*	*1.5%*	*1.5%*	*1.5%*	*1.6%*	*1.8%*
High Density - per building	$ 2,652.40	$ 8,756.56	$ 1,767.76	$ 1,796.95	$ 1,833.12	$ 1,858.63	$ 1,890.24	$ 1,926.17	$ 1,958.16	$ 1,994.96	$ 2,030.35	$ 2,072.06
				1.7%	*2.0%*	*1.4%*	*1.7%*	*1.9%*	*1.7%*	*1.9%*	*1.8%*	*2.1%*
Non-residential												
Annual Fee per Acre of Impervious Area			$ 1,182.03	$ 1,198.92	$ 1,220.54	$ 1,240.18	$ 1,261.96	$ 1,284.00	$ 1,306.49	$ 1,329.63	$ 1,354.16	$ 1,381.07
				1.4%	*1.8%*	*1.6%*	*1.8%*	*1.7%*	*1.8%*	*1.8%*	*1.8%*	*2.0%*

Table F-4: Annual Bill Impact on Sample Non-residential Properties

Property Type	Annual Bill under Property Tax Funding Model		Annual Bill with a Dedicated Stormwater Charge									
	Current (2017)	2019	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Small Non-residential Property (0.15 ac impervious area)	$ 100.16	$ 330.66	$ 177.30	$ 179.84	$ 183.08	$ 186.03	$ 189.29	$ 192.60	$ 195.97	$ 199.45	$ 203.12	$ 207.16
				1.4%	*1.8%*	*1.6%*	*1.8%*	*1.7%*	*1.8%*	*1.8%*	*1.8%*	*2.0%*
Large Non-residential Property (9.46 ac impervious area)	$ 2,931.94	$ 9,679.44	$ 11,181.98	$ 11,341.81	$ 11,546.31	$ 11,732.14	$ 11,938.17	$ 12,146.63	$ 12,359.38	$ 12,578.34	$ 12,810.36	$ 13,064.97
				1.4%	*1.8%*	*1.6%*	*1.8%*	*1.7%*	*1.8%*	*1.8%*	*1.8%*	*2.0%*