Stormwater Financing Study

Public Information Meeting No. 1

Wednesday June 27, 2012

6:30 – 9:00 pm

Living Arts Centre of Mississauga
4141 Living Arts Drive

Please complete the sign-in sheet and review display materials.
The project team is available to answer your questions and address any concerns.

Your input is valued!
Please fill out a comment sheet.

Stormwater Financing Study

Stormwater Management

Stormwater management is a service that keeps a low profile, but ***without adequate funding can lead to serious problems that will only get worse unless steps are taken now***

- Stormwater runoff is generated when precipitation from rain and snowmelt flows over land and does not percolate into the ground
- Hard surfaces such as rooftops and parking areas increase runoff and pollutants into waterbodies compared to natural conditions
- Controlling the amount of runoff and quality of water entering the creeks, rivers and Lake Ontario, our source of drinking water, is a main focus of the City's stormwater management program

Possible Causes of Stormwater Problems in Municipalities

- Urbanization: Growth and development alters the amount of runoff and pollution
- Aging infrastructure: Pipes, culverts and outfalls have limited life expectancy
- Changing design standards: Systems designed to old standards may be inadequate with respect to current and future regulatory requirements
- Lack of long term planning: Appropriate resources, facilities, and improvement projects must be proactively planned to address needs and problems
- Limited maintenance: Facilities must be actively operated; watercourses maintained; and streets, catchbasins, culverts and outfalls cleaned
- Poor design or faulty construction: Developer plans must be thoroughly reviewed and sites adequately inspected during construction
- Climate Change: Facilities respond to rainfall events that are becoming more intense and with greater frequency

New Development

Aging Infrastructure

Aging Infrastructure

Flooding

Culvert Blocked with Debris

The City is responsible for managing all aspects of stormwater. However, the City's ability to effectively and adequately perform its duties are limited by available funding.

Stormwater Financing Study

Study Background & Project Organization

Study Background – Program Goals

Council recognized that sustainable funding is needed to satisfy the City's current and future stormwater management program needs and authorized in Summer of 2011 that a Stormwater Financing Study be initiated. The City contracted AECOM in February 2012 to undertake the study with the main objective of determining the most equitable and fair approach to satisfying these current and long term requirements.

Project Organization

Undertaken by: Staff Working Team under the direction of a Steering Committee including senior City management

Advised by: Stormwater Financing Stakeholder Group (representatives from stakeholders including ratepayer groups, the business and development communities, tax-exempt properties and others such as conservation authorities) as well as the general public

The recommended implementation plan is to be presented to Council in October . The schedule is shown below.

	2012										
Task / Description	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1. Existing Stormwater Management Program	■	■	■	■							
2. Future Stormwater Management Program		■	■	■	■						
3. Funding Options			■	■	■	■	■				
4. Stakeholder Meetings and Draft Report		■	■	■	■	■	■	■	■		
5. Final Report									■		

Stormwater Financing Study

Highlights of Study Tasks

The consulting team has been tasked to identify, review and evaluate alternative funding mechanisms to support the City's stormwater management program and to recommend the preferred funding approach. To achieve this goal, the following steps are being undertaken by the project team:

- Compile and quantify the cost of the City's existing stormwater management program including operations and maintenance, asset management, planning and monitoring activities and capital plans
- Develop and evaluate various stormwater management program options based on varying levels of service and recommend a program that will meet the desired levels of service, targets for compliance with regulations and other future pressures
- Review available stormwater financing options
- Recommend the preferred option that offers a fair and equitable method for allocating the costs of the stormwater management program
- Develop a strategy to implement the recommendations

In addition to the above, an integral part of this study is the formation of a Stormwater Financing Stakeholder Group (SFSG). Members from this group of participants include representatives from stakeholders such as ratepayer groups, business and development communities, tax-exempt properties and others such as conservation authorities. They will be asked to represent the views of their organizations or sector and provide advice and input on issues such as overall community goals and priorities of the City's stormwater management program and feedback on setting an affordable/sustainable level of service and expenditures to meet these needs.

Another important component of the public consultation program is tonight's Public Information Meeting. The City wishes to engage its citizens, business owners and other members of the community with the goal of providing an inclusive, traceable and useful opportunity for dialogue between City staff and stakeholders. Your insight and input is both a valuable and necessary step towards this goal and we encourage you to provide written comments to be communicated to City officials.

Stormwater Financing Study

Hydrologic Cycle

Natural Hydrologic Cycle

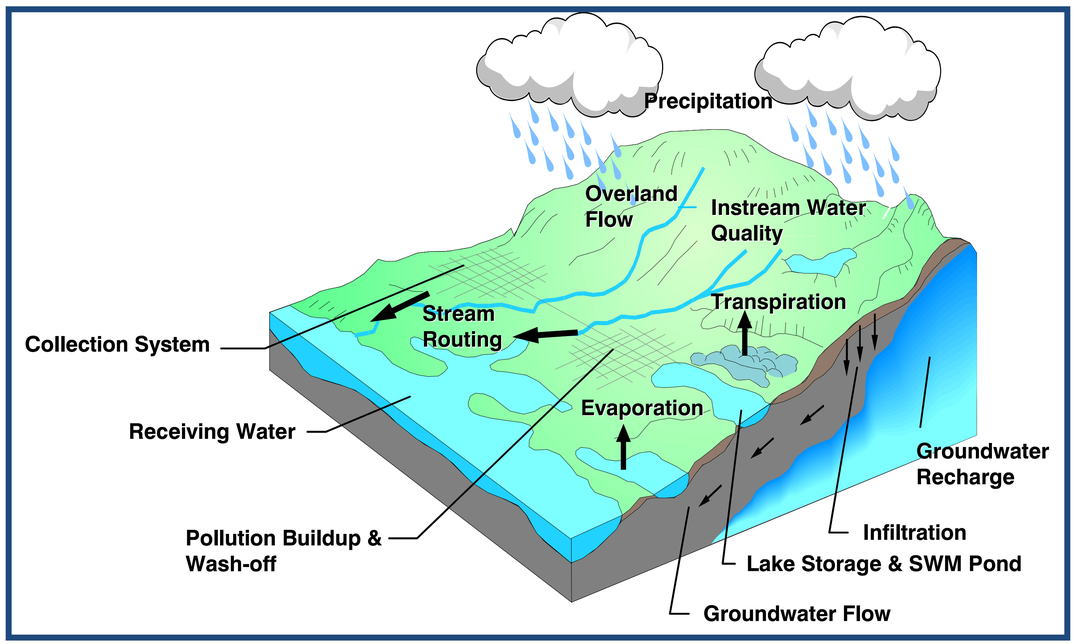
The hydrologic cycle encompasses the movement of water over, under and above the earth's surface, including rain/snow, rivers, lakes, etc. The environment forms itself around this movement of water, and any disruption to the natural cycle inevitably causes a disruption in many other areas of the environment, such as wildlife and vegetation.

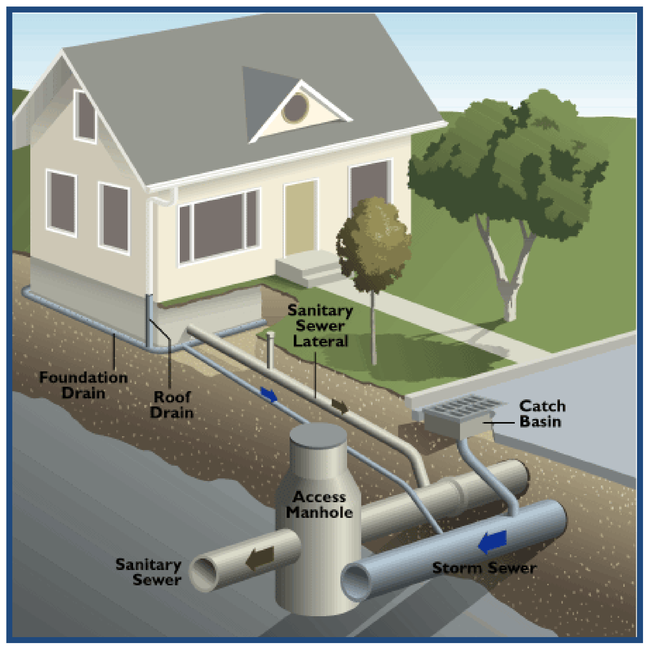
Low Runoff

Urban Hydrologic Cycle

Urbanization affects the hydrologic cycle through the disruption of the natural drainage paths and the increase of impervious surfaces throughout the watershed. These disruptions can significantly alter the environment in the areas which they occur. Stormwater management techniques are used in urban areas to help mitigate the effects of these disruptions, and to attempt to restore the natural water balance and environment.

High Runoff

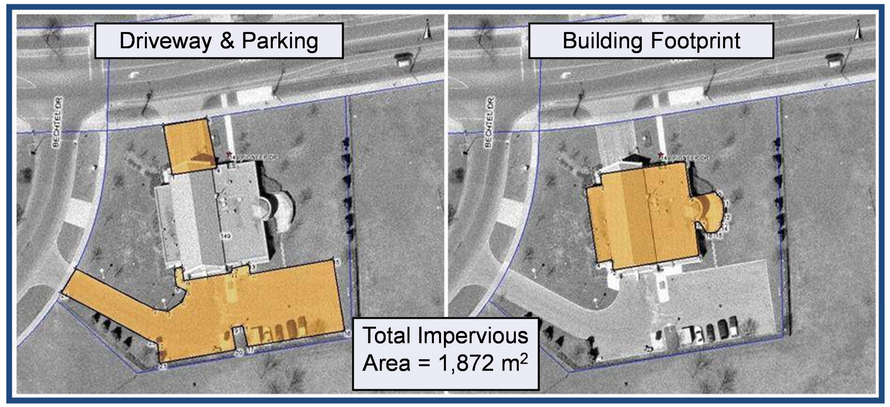




Impervious Area

Impervious area includes surfaces that prevent stormwater from infiltrating into the ground such as roads, parking areas, driveways, sidewalks, building rooftops, and similar structures. These areas generate more runoff, transport it more quickly, and accumulate more pollutants than from an equivalent natural area.

Imperviousness is the percentage of impervious cover within a given area of land, and is often measured through aerial photo interpretation. The impervious areas for a single property are highlighted in yellow in the figure on the right: the building rooftop area or "footprint "(right panel), and all other types of impervious areas (left panel). The sum total is 1,872 m^2 of impervious area on a 3,900 m^2 lot, or 48% imperviousness.



Impacts of Imperviousness

Increased imperviousness can result in a combination of adverse impacts and environmental consequences, including:

- Increased flooding frequency, severity, and extent of inundation during storm events
- Increased sediment and pollutant loads to rivers, lakes, and groundwater resources
- Increased temperature in receiving waterbodies
- Reduced baseflow in streams and reduced groundwater recharge
- Reduced stability of streams and wetland systems (i.e., increased streambank erosion)
- Degraded habitat and reduced biological diversity

Although rainfall is unpredictable, the amount of impervious area can be controlled by landowners. Impervious areas affect the amount of runoff generated by the landowner's property which contributes to the City's stormwater management system.

Stormwater Management Challenges

Types of Stormwater Challenges

Flooding

Flooding is the most visible of stormwater problems. Serious flooding presents a threat to public safety and can damage public and private property, disrupt business, and hamper our everyday activities.

Cooksville Creek Flooding

Credit River Flooding

Water Quality

Road salt, chemical spills, eroded sediments and debris can pollute watercourses. Stormwater management systems can protect water quality when adequately operated and maintained.

Water Quality

Water Quality

Stormwater Management Challenges

Types of Stormwater Challenges

Erosion

Water traveling quickly over an unprotected surface will cause that surface to erode. Controlling the movement of runoff is important to prevent the erosion of stream banks, hill slopes and even structures.

Cooksville Creek – Bank Erosion

Cooksville Creek – Bank Erosion

Debris

Flowing water carries whatever it can and deposits this material when obstructions are in the way. This can cause a build up of debris that blocks water getting through and may cause flooding as a result.

Fletcher's Creek – Woody Debris

Loyalist Creek – Urban Debris

Mississauga's Current Stormwater Assets

Mississauga Stormwater Inventory	Est. Quantity	Unit of Measure	Estimated Useful Life (Years)	Average Network Age	Closing Net Book Value (2011)	Total Replacement Value (2011)
Storm sewers	2,000	km length	100	29	$534 Million	$1.6 Billion
Catch basins	48,000	number				
Stormwater manholes	28,000	number				
Outlets to receiving waters	1,000	number				
Diversion structures (trunk sewers)	100	km length				
Ditches / storm water swales in urban areas	250	km length				
SWM Facilities (Hard and Soft Components)	57	number	25-50	19	$26 Million	$76 Million
Watercourses, Streams, Rivers, and Creeks (31 Separate Creeks)	200	km length	25	18	$21 Million	$58 Million
Total Cost						**$1.7 Billion**

Stormwater Financing Study

Provincial and Federal Legislation

- The **Ontario Water Resources Act** (OWRA, RSO 1900 and amendments) prohibits activities that introduce pollutants into waterbodies
- **Provincial Water Quality Objectives** (PWQO) serve as chemical and physical indicators for Ontario's surface and ground waters
- **Ontario Water Opportunities Act, 2010** will conserve and sustain water resources for present and future generations
- The **Ontario Clean Water Act**, **2006** ensures communities are able to protect their municipal drinking water supplies through developing collaborative, locally driven, science-based protection plans
- The Ontario **Brownfields Act**, **2004** addresses the clean-up process for proposed redevelopment in brownfields, which are abandoned, idle or underutilized commercial or industrial properties where past activities have caused known or suspected environmental contamination
- The Ontario **Sustainable Water and Sewage Systems Act**, 2002 was enacted to help ensure clean, safe drinking water and requires that municipalities recover the full costs of providing essential water and sewer services, through a variety of user fees and charges
- The **Canadian Environmental Protection Act**, **1999** is aimed at pollution prevention, protection of the environment and human health in order to contribute to sustainable development
- Subsection 36(3) of the federal **Fisheries Act** (R.S., 1985, c. F-14) prohibits the deposit of a deleterious substance into water frequented by fish

Agency Guidelines and Requirements

A number of design standards, policies, guidelines and other agency requirements have been developed based on federal and provincial legislation and are described below:

- **Ministry of the Environment** (MOE) - Guide for Applying for Approval of Municipal and Private Sewage Works (MOE, 2000); Stormwater Management Planning and Design Manual (MOE, 2003); Water Management - Policies, Guidelines, PWQOs of the Ministry of the Environment (MOE, 1994)
- **Ministry of Transportation** (MTO) - Drainage Management Manual (MTO, 1997); Stormwater Management Requirements for Land Development Proposals (MTO, 1999)
- **Ministry of Natural Resources** (MNR) - Natural Channel Systems: Adaptive Management of Stream Corridors in Ontario (MNR, 2002); Natural Hazards: Technical Guides for Rivers and Stream Systems and Hazardous Sites (MNR, 2002)
- **Conservation Authorities -** Established under the Conservation Authorities Act to work collaboratively with its member municipalities to address a broad range of issues to jointly undertake water and natural resource management on a watershed basis

Stormwater Financing Study

Stormwater Asset Reinvestment

Valuation of Assets & Life Cycle Costs

A table of the City's stormwater assets is included on display board No. 8. This table shows the inventory grouped into three broad categories:

- "Pipe" assets which include the buried storm sewers and tunnels as well as open roadside ditches and swales
- "Pond" assets which include stormwater detention facilities
- Watercourse assets which include rivers, creeks and streams

For each asset category, the table shows the quantity, expected service life, average system age, current estimated book value and replacement value. The total replacement value of all City stormwater assets is estimated to be $1.7 billion dollars.

The phrase "Life Cycle Cost" refers to all of the costs incurred during the full life cycle of the asset. These costs start at the time an asset is first considered and extend throughout its entire service life. As shown in the table, the stormwater assets in Mississauga are designed to be in service for a long time (25 -100 years).

Reinvestment Options

A stormwater management system is only sustainable when it is properly designed, operated and maintained at the appropriate service level. Further, all components have a useful service life and will ultimately fail if assets are not renewed, replaced, or rehabilitated over the long term.

As shown in the table on display board No. 8, the pond and watercourse assets are nearing the end of their useful service life and the City has been taking steps within its current budget allocation to reinvest in these assets through prioritized capital projects.

However, given the relatively young age of the City's stormwater pipe assets (i.e., 30 years in a 100-year service life), there has not been a significant need to reinvest in the storm sewer/ditch collection system. This will be a major issue in the future.

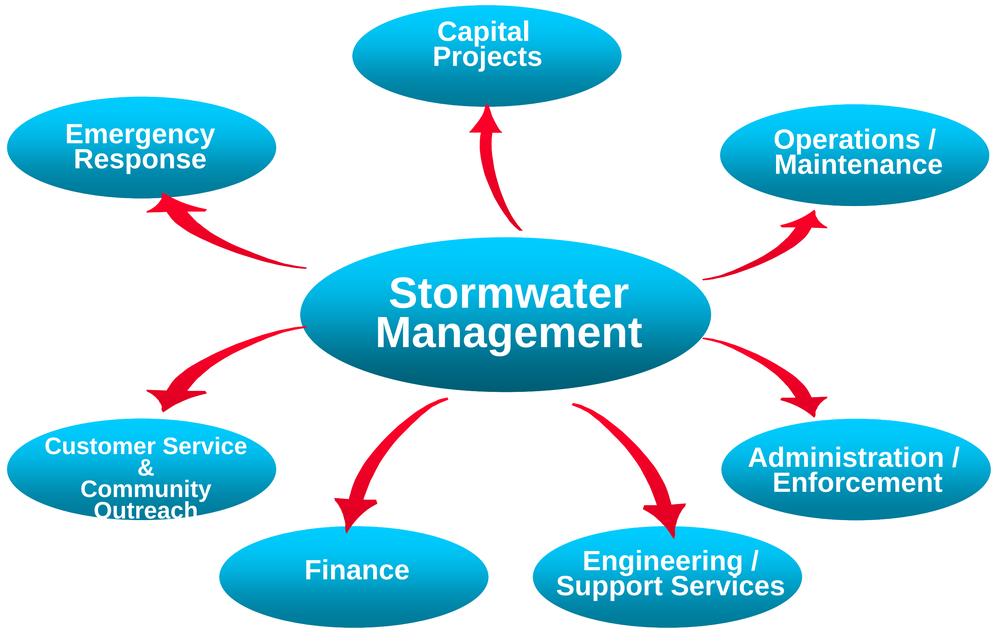
While the City needs to be practical and consider affordability issues related to raising additional funds, storm sewer replacement should not be ignored.

Stormwater Financing Study

Mississauga's Stormwater Management Program

To address stormwater management, the City's program includes:

- Operation and maintenance of stormwater infrastructure
- Rehabilitation, renewal, retrofit, and/or upgrade of stormwater infrastructure
- Design, permitting, construction, and inspection of new capital improvement projects
- Emergency flooding response, recovery, clean-up and by-law enforcements
- Engineering and support services for review and regulation of proposed development
- Inspection, monitoring, and environmental compliance programs
- Administration, staffing, computer resources, equipment, etc.



Operation and Maintenance

Maintaining existing stormwater infrastructure is a large part of the stormwater budget. This vital task includes street cleaning; inspection and maintenance of ponds; inspection, cleaning, and repair of catchbasins (curbside drains), manholes, pipes, outfalls, ditches, channels, culverts, bridges.

Street Sweeper

Debris Removal

Inspection of Outfall

Catchbasin Cleaning

Pond Dredging

Stormwater Program – Capital Projects

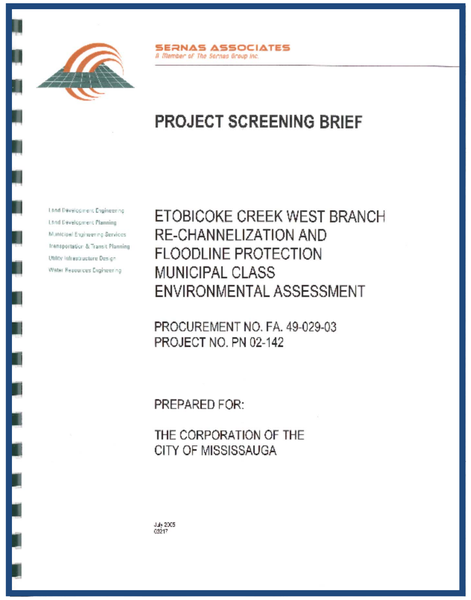
Capital Improvement Projects

Unlike the day-to-day Operations and Maintenance activities, capital budget needs are highly variable. Each project requires planning, design, permitting, construction, and inspection. The City's Capital Works Program is grouped into three categories:

- New Projects
- Reconstruction Projects: Replacement or significant upgrades to existing infrastructure
- Studies

New Bank Stabilization Project

Storm Sewer Reconstruction


SERNAS ASSOCIATES
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PROJECT SCREENING BRIEF

Land Development Engineering
Land Development Planning
Municipal Engineering Services
Transportation & Transit Planning
Utility Infrastructure Design
Water Resources Engineering

ETOBICOKE CREEK WEST BRANCH
RE-CHANNELIZATION AND
FLOODLINE PROTECTION
MUNICIPAL CLASS
ENVIRONMENTAL ASSESSMENT

PROCUREMENT NO. FA. 49-029-03
PROJECT NO. PN 02-142

PREPARED FOR:

THE CORPORATION OF THE
CITY OF MISSISSAUGA

July 2005
03017

Study

Stormwater Program – Planning and Monitoring

Planning and Monitoring

The assessment of the City's existing Stormwater Management Programs and the planning of future programs requires data collection, engineering analysis, and environmental monitoring and analysis.

Monitoring data provides a statistical basis for evaluating the current conditions and assessing any changes in the storm system.

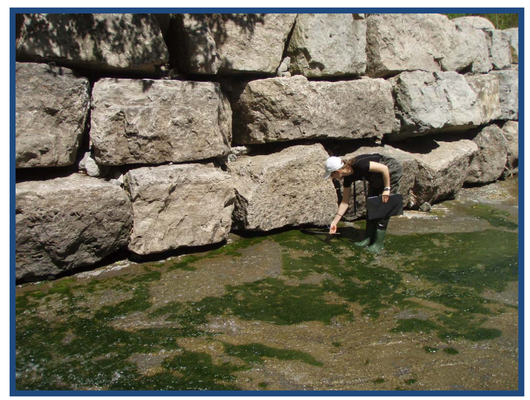
The City completes many Stormwater Monitoring and Planning activities in both the urban and rural areas of the City, including:

- Compliance Monitoring and Reporting
- Flow and Rainfall Monitoring
- Water Quality Monitoring
- Hydraulic Modeling
- Site Inspections
- Stormwater Management Master Planning and Updates
- Plan Review and Inspections
- Financial Lifecycle Costing/Cost of Services Studies and Forecasts

Sewer Flow Monitoring

Rainfall Monitoring Gauge

Sample Collection of Spill



Watercourse Erosion Monitoring

Stormwater Financing Study

Stormwater Program – Other Activities

Mississauga is largely built out and much of the urban area was constructed prior to the adoption stormwater management practices. Some of the ways to improve water quality is through activities such as Low Impact Development projects as well as Public Education. Low Impact Development is a stormwater management strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible.

Bio-retention Facility To Treat Roadway Drainage

Bio-retention Facility To Treat Parking Area

Fish-Shaped Catchbasin Grate

Model For Public Education

Public Events

Yellow Fish Road Program

Stormwater Financing Study

Current Stormwater Expenditures

The table below shows the City's Stormwater Management Program Tax Funded Expenditures-Current Service Level for 2012 itemized in the following categories: Operations & Maintenance and Capital Improvement Projects

Activity	Cost ($)	Description
Operation & Maintenance		
Engineering & Works	5,260,000	Day to day operating costs of Stormwater Management Program
Planning, Monitoring & Support	1,010,000	Support staff required for the planning of future stormwater infrastructure needs
Community Services (estimated)	350,000	Departmental project costs associated with stormwater-related programs
Subtotal	**6,620,000**	
Capital Improvement Projects		
Erosion Control	4,470,000	Watercourse erosion protection and rehabilitation
Flood Relief	1,260,000	Culvert capacity improvements and flood protection berms
Storm Sewer	350,000	Rehabilitation and replacement of existing storm sewers
Studies	1,000,000	Stormwater-related studies
Stormwater Management Facilities (SWM)	280,000	pond dredging/rehabilitation, quantity control facilities and low impact development practices
Channelization	470,000	Watercourse conveyance improvements
Community Services (estimated)	200,000	Departmental project costs associated with stormwater-related programs
Subtotal	**8,030,000**	
Total	**14,650,000**	

Note : The 2012 capital budget also includes $2 million for infrastructure associated with growth. These projects have been funded with development charges revenue.

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Stormwater Program Funding

The City's stormwater program is primarily funded through the following sources:

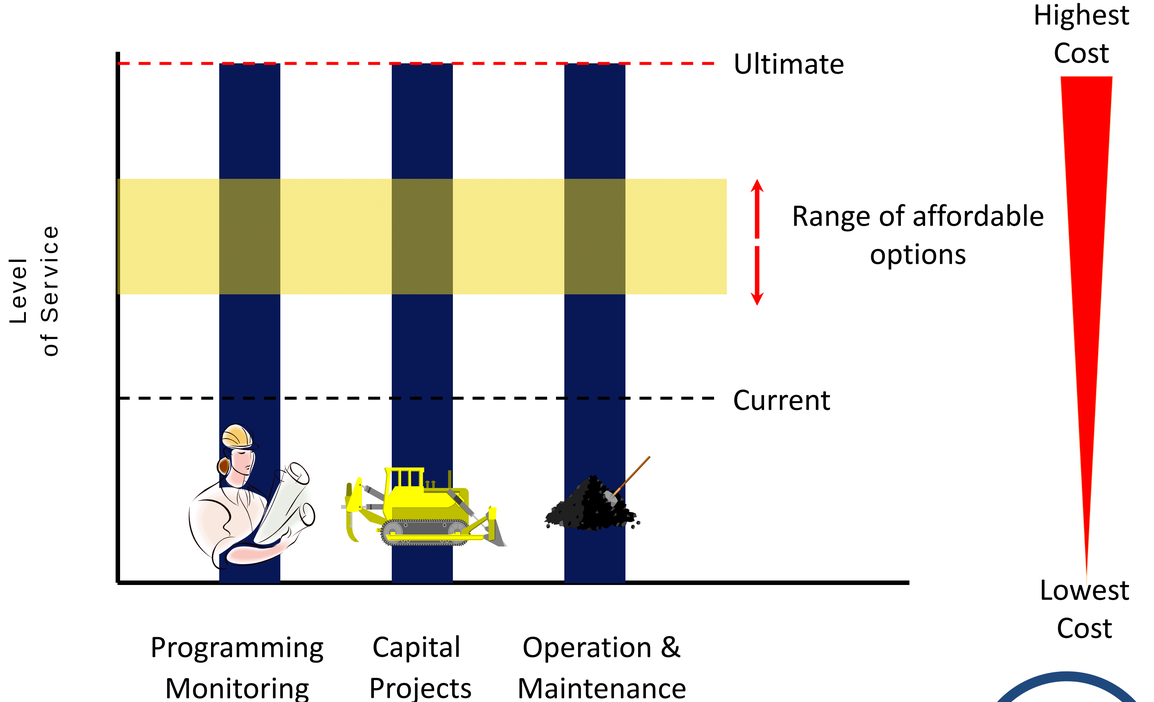
- **Property Taxes**: This method is not equitable among property owners, since the contribution each unit makes to the stormwater program is not related to the amount each unit uses the system, only to property values
- **Development Charges** (DC): Development-related capital projects are funded separately through DCs that are assessed depending on the nature of each project. These DCs are limited in that they can only be used for capital projects related to new development

Despite investments in the City's stormwater infrastructure, stormwater related issues such as flooding, water quality and stream erosion continue to exist. As this infrastructure continues to age, it will incur additional operation, maintenance and capital improvement costs over time to sustain sufficient levels of service. Further, regulatory requirements and design standards continue to evolve and are becoming more rigorous in addressing the environmental impacts of stormwater.

Level of Service

The phrase "Level of Service" applies to all components of the stormwater management program. Examples include: the level of flood protection in a pond design; the extent and frequency of street sweeping; or the timeliness and responsiveness in responding to a flooding complaint or chemical spill. Service level issues to consider include:

- The affordability of the City's stormwater program is directly impacted by decisions related to the level of service required
- Regulatory requirements for stormwater are not yet specifically quantified
- Public feedback on the desired level of service for the City's stormwater program is critical to service delivery



Stormwater Financing Study

Works Undertaken To Date & Contact Information

Works In Progress

To complete the Stormwater Financing Study, the following tasks are currently in progress or completed:

- Finalizing the assessment of the City's current stormwater program
- Developing a sustainable stormwater program
- Completed 2 of 6 meetings with the Stormwater Financing Stakeholder Group
- Continuing to offer and have one-on-one discussions/meetings with interested parties (residents, Mississauga Board of Trade, etc.)
- Hold the first Public Information Meeting on June 27, 2012 (a second Public Information Meeting will be held in early Fall)

Become Involved

If you have any questions, comments or concerns, please contact:

Lincoln Kan, P.Eng.

Manager, Environmental Services

Transportation and Works Department

201 City Centre Drive, Suite 800, Mississauga ON L5B 2T4

Phone: 905.615.3200 ext 4086

Email: Lincoln.Kan@mississauga.ca

Comments received will be compiled and summarized in a report to City Council. Following Council direction the next steps and timeline to complete this project will be determined.

Thank you for your participation today! We hope that you will continue to contribute to this project.