MISSISSAUGA

Stormwater

2019–2022 Business Plan
& 2019 Budget

Foreword

Our Vision for the Future

Mississauga will inspire the world as a dynamic and beautiful global city for creativity and innovation, with vibrant, safe and connected communities; where we celebrate the rich diversity of our cultures, historic villages, Lake Ontario and the Credit River Valley. A place where people choose to be.

Mississauga City Council approved **Our Future Mississauga**; a Strategic Plan to achieve this vision over a forty year timeframe. The City engaged over 100,000 people to develop this Vision Statement. To achieve this vision the City has identified five Strategic Pillars for Change: **move**, **belong**, **connect**, **prosper** and **green**. Each year the City proposes various initiatives that are aligned with the Strategic Pillars and are intended to bring us closer to fulfilling our vision for the future. The City has over 300 lines of business which are consolidated into the 17 Services Areas (including the Stormwater Program) that are outlined in this Plan. The 2019-2022 Business Plan and 2019 Budget detail how and where the City plans to allocate resources to deliver programs and services.

The City is committed to providing programs and services cost-effectively. In this Plan we have outlined measures that will help us assess the quality, efficiency and customer satisfaction that our services achieve. The results help inform decisions on resource allocation and direct program offerings, and improve service delivery to ensure our vision is efficiently realized.

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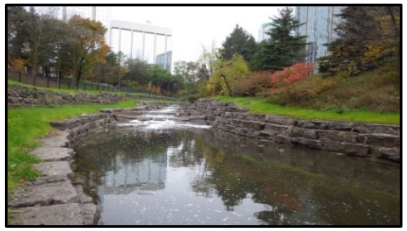


Executive Summary of Stormwater

Mission: The Stormwater Service Area plans, develops, constructs, maintains and renews a stormwater system which protects property, infrastructure and the natural environment from erosion and flooding and enhances water quality.

Services we provide:

- Storm sewer, pond and watercourse inspections and maintenance
- Dredging and rehabilitation of Stormwater Management (SWM) facilities to maintain water quality and quantity controls
- Stormwater asset management, capital programming and project delivery
- Storm Sewer By-law enforcement
- Rainfall monitoring
- Outreach and education program

Interesting facts about this service:

- The City has over 2,100 kilometres of storm sewer pipes in its stormwater drainage system. If laid out end-to-end these pipes would connect the City of Mississauga to the territory of Nunavut
- The stormwater drainage system also includes over 51,000 catch basins, over 250 kilometres of ditches, 32 creeks and 62 stormwater management facilities that help to collect, drain and clean the City's rainwater runoff before it enters Lake Ontario
- At an estimated 2018 replacement value of $2.13 billion, the stormwater drainage system is one of the largest assets owned and operated by the City of Mississauga

Highlights of the Business Plan include:

- Continuation of the dedicated Stormwater Charge, which funds the City's increasing stormwater management needs including infrastructure renewal and pressures as a result of flooding events
- The proposed 2019 Stormwater Charge Rate, effective April 1, 2019, is $106.10 per stormwater billing unit, a two per cent increase from 2018
- Continued transition from an interim to a sustainable service level through increasing contributions to the Pipe Reserve Fund
- Ongoing implementation of capital projects and infrastructure needs identified through planning and flood evaluation studies
- Ongoing development of an integrated and enhanced Asset Management Plan to ensure the cost-effective management of all Stormwater infrastructure
- Continued preparation of flood evaluation studies and master drainage plans
- Continued design and implementation of erosion control projects in various creeks
- Cooksville Creek flood relief and improvement projects continue to move forward to implementation
- Mitigation measures continue to be assessed and implemented for the Lisgar community to address basement water infiltration issues

Net Investment ($000's)	2019	2020	2021	2022
Operating	11,958	12,086	12,050	12,144
Capital	33,378	41,047	49,407	45,307

Full Time Equivalents	23.5	23.5	23.5	23.5

Focus of the Business Plan

The Business Plan for the Stormwater Service Area focuses on improving stormwater conveyance, quality and flow control to adapt to extreme storm events and address the pressures of aging infrastructure.

The Stormwater Service Area was established as a standalone Service Area in 2016 with the introduction of the Stormwater Charge. The impetus for the Stormwater Charge was the need to increase the City's investment in its stormwater infrastructure and supporting programs with a fair and dedicated source of funding. During the development of the Stormwater Charge program, it was recognized that the Charge would initially be set at a point to fund an interim service level and that over time, the Charge would increase to attain a sustainable service level that would allow for all Stormwater program needs to be fully funded. The 2019-2022 Business Plan continues this transition from an interim to a sustainable service level.

The transition continues with increased contributions to the storm Pipe Reserve Fund and the ongoing development of a comprehensive and integrated Asset Management Plan. This plan will ensure that cost-effective and service-efficient decisions are made to meet the Service Area's infrastructure needs and to plan for future demand. This plan will include the development of inventories and assessment programs for storm sewers and technology to effectively manage all stormwater infrastructure.

The Stormwater Asset Management Plan includes managing the City's storm sewer network effectively and efficiently

In 2019, the Stormwater Service Area will continue with several capital project designs, flood evaluation studies and master drainage plans. Planning and flood evaluation studies are essential for the identification of infrastructure needs and the recommendation of future capital projects. Over the coming years, the Service Area will deliver several flood relief and improvement projects, such as storm sewer renewal, erosion control and water quality enhancements.

Erosion control projects improve the condition of the City's watercourses

The 2019-2022 Business Plan includes the implementation of several key infrastructure projects. The Cooksville Creek flood relief and improvement projects continue to progress, including the construction of several underground stormwater management facilities. The assessment, rehabilitation and renewal of numerous storm sewer pipes will occur as well as erosion control works along various watercourses across the City. Several projects and initiatives are also included in the Stormwater capital program to address basement water infiltration issues in the Lisgar community.

Core Services

Vision, Mission, Goals of Service and Service Delivery Model

Vision

To deliver world class stormwater networks while upholding community standards and enhancing quality of life.

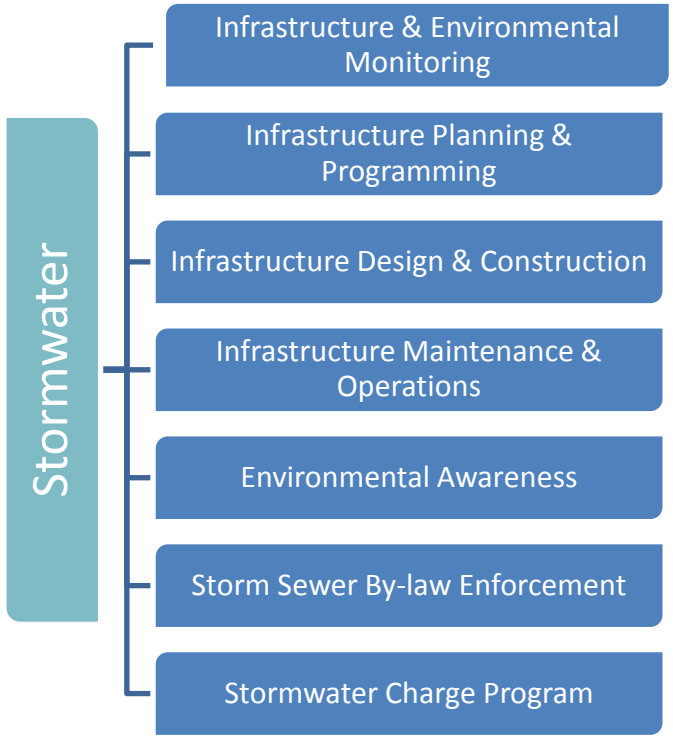
Mission

The Stormwater Service Area plans, develops, constructs, maintains and renews a stormwater system which protects property, infrastructure and the natural environment from erosion and flooding and enhances water quality.

Goals of Service

- **Establish** a sustainable service level for Stormwater
  - Develop and maintain an integrated Asset Management Plan to better manage all stormwater infrastructure
  - Increase contribution to Pipe Reserve Fund
  - Enhance Storm Sewer By-law enforcement
  - Plan and deliver projects effectively
- **Deliver** mitigation and improvement projects
  - Flood relief
  - Erosion control
  - Water quality enhancement

Service Delivery Model



Current Service Levels and Trends

Service Levels

The Stormwater Service Area provides the following services annually:

Infrastructure and Environmental Monitoring

- Regular inspections and condition assessments of stormwater infrastructure assets (e.g., watercourses, stormwater facilities and storm pipes)
- Management of the City's rain gauge network
- Stormwater quality monitoring at inlets and outlets of stormwater facilities

Infrastructure Planning and Programming

- Timely completion of district, watershed or City-wide studies to inform infrastructure needs to support growth and maintain expected levels of service
- Annual development of the 10-year Capital Plan for infrastructure investments

Infrastructure Design and Construction

- Timely delivery of stormwater capital projects

Infrastructure Maintenance and Operations

- Regular inspections and maintenance of stormwater infrastructure assets (e.g., catch basins, ditches and storm sewer outfalls)

Environmental Awareness

- Delivery of outreach and education programs for residents and businesses regarding stormwater management best practices
- Development and maintenance of the online and print resources for stormwater and environmental awareness

Storm Sewer By-law Enforcement

- Investigation of inquiries, spills and sanitary cross connections, and proactive enforcement of By-law

Stormwater Charge Program

- Administration of the Stormwater Charge and processing of technical exemptions and credit applications

Issues and Trends

Several trends put pressure on our ability to deliver the described services:

- Frequent extreme storm events and increased public expectations add pressure to improve stormwater conveyance, quality and flow control
- Aging stormwater infrastructure and asset management regulation compliance increase the need to develop and implement an integrated Asset Management Plan
- Future City development adds pressure to plan and deliver effective and timely stormwater services
- Changes to legislation and conservation authority requirements increase operating and capital pressures

Erosion of Cooksville Creek after a storm event

Performance Measures and Results

The City of Mississauga is committed to delivering services economically and efficiently. The City's performance measures are used to help assess how well we are doing at achieving our goals and where we need to improve operations. The results also inform decision making and strengthen accountability.

Balanced Scorecard

A Balanced Scorecard identifies and measures four key areas of an organization's performance: Financial, Customer, Employee, and Business Process. By paying attention to all four areas, an organization can retain balance in its performance and ensure that it is moving toward the attainment of its goals.

Below are descriptions of the measures this Service Area's Balanced Scorecard takes into account. The Balanced Scorecard that follows shows trends since 2015 and expected outcomes up to 2022.

Financial Measures

Unit cost of catchbasin cleaning is a measure of the City's ability to manage catchbasin cleaning operating pressures while maintaining service levels. Catchbasins are an integral component of the stormwater pipe network and require regular cleaning. In accordance with the existing service level, 33 per cent of the City's catchbasins must be cleaned each year.

Cost to maintain Watercourses per kilometre is a measure that indicates the amount spent on labour, contracts and equipment for minor watercourse maintenance per kilometre of watercourse. Watercourses are a significant asset maintained by the Stormwater Service Area and preserving their function and health are critical for drainage and the environment. This measure is subject to fluctuation due to storm event impacts.

Customer Measures

Number of Outreach and Education events demonstrates the commitment to engaging residents about Stormwater. *Number of Stormwater inquiries per 1,000 people* demonstrates how engaged residents are with stormwater infrastructure and issues. Both measures support the Service Area's targets for outreach and education and increased resident engagement.

Requests for review resolved within service level and credit applications reviewed within service level are Stormwater Charge-related measures that indicate the City's ability to serve customers in a timely and an effective manner. For these measures, there is an internal target of 90 per cent or better.

Employee Measures

Overall job engagement indicates the extent to which employees feel engaged in decision making at the City.

Job satisfaction measures the extent to which employees value, enjoy, and believe in what they do.

Overall team engagement indicates the extent to which employees feel positively about their team environment.

Internal Business Process Measures

Watercourses in fair or better condition and quality control ponds in fair or better condition are measures that indicate the City's ability to manage lifecycle asset management programs for watercourses and ponds. These measures are derived from condition ratings assessed during field inspections. Condition assessments of creeks and ponds assist in prioritizing maintenance activities and capital projects as well as long term planning. The internal target is to improve each measure by one per cent annually.

Progress towards achieving a sustainable Service Level is a measure that indicates the City's ability to reach an annual contribution to the Pipe Reserve Fund equal to one per cent of the replacement value of the City's storm pipes, while fully funding the operating and capital programs. Annual increases to the Pipe Reserve Fund allow the fund to grow and reach a sustainable level.

Balanced Scorecard

Measures for Stormwater	2015 (Actual)	2016 (Actual)	2017 (Actual)	2018 (Plan)	2019 (Plan)	2020 (Plan)	2021 (Plan)	2022 (Plan)
Financial:								
Unit cost of catchbasin cleaning	$17	$17	$37	$35.0	$35.7	$36.4	$37.1	$37.9
Cost to maintain Watercourses per kilometre	$473	$1,719	$823	$839	$856	$873	$891	$909
Customer:								
Number of outreach and education events	45	101	84	110	100	100	100	100
Number of Stormwater inquiries per 1,000 people	--	3.6	2.4	2.3	2.35	2.4	2.45	2.5
Requests for review resolved within service level	N/A	87%	100%	90%	90%	90%	90%	90%
Credit applications reviewed within service level	N/A	84%	95%	90%	90%	90%	90%	90%
Employee:								
Overall Job Engagement[1]	75%			76%			77%	
Job Satisfaction[1]	77%			78%			79%	
Overall Team Engagement[1]	84%			85%			86%	
Internal Business Process:								
Watercourses in fair or better condition	76%	77%	78%	79%	80%	81%	82%	83%
Quality control stormwater ponds in fair or better condition	77%	80%	81%	82%	83%	84%	85%	86%
Progress towards achieving a sustainable Service Level (through contributions to Pipe Reserve Fund)[2]	N/A	17%	22%	26%	31%	35%	39%	43%

[1] Results obtained from the Employee Engagement Survey which is completed once every three years (2015, 2018, 2021).

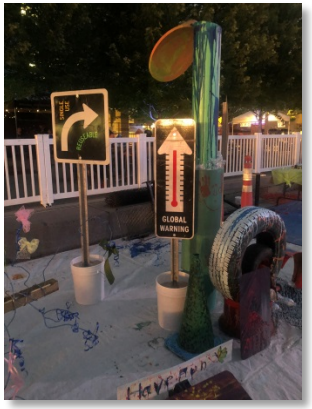
[2] Percentage indicates progress towards achieving an annual contribution equal to one per cent of the replacement value of the City's pipe infrastructure.

Awards and Achievements

- **Excellence in Customer Service**, Corporate Award presented to the Storm Sewer Locate Coordinator
- **The Brenda Sakauye Environment Award**, Corporate Award presented to the Stormwater Outreach Team
- Nominated for **"Friends of the Credit" Conservation Award** for the Low Impact Development Asset Program
- Completed the construction of the **Matheson Boulevard Stormwater Pond.** This facility provides stormwater quality and quantity control for approximately 20 percent of the Cooksville Creek watershed area and reduces the 100-year storm flow by approximately 80 per cent, meaning it makes a significant contribution towards minimizing flood risk within this watershed
- Completed the construction of the **Eastgate Park Stormwater Management Facility.** This facility will support flood mitigation and improve capacity in the downstream system within the Cooksville Creek watershed

Installation of storage chambers at Eastgate Park

- Staff hosted the 2nd annual **ArtworkX**, a two-part event in association with National Public Works Week and the After Dark Earth Market. The event offers residents the chance to learn about stormwater infrastructure, participate in fun art activities and experience a live art performance. This year, the City won the National Public Works Week award from the Ontario Public Works Association for its work in 2017



Art created during the ArtworkX event

- Completed culvert replacements and the installation of an **Enhanced Grass Swale** as a Low Impact Development along Burnhamthorpe Road East

Burnhamthorpe Road East Boulevard

The 2019-2022 Business Plan Outlook

Planning for the Future

The Stormwater Service Area is planning for the future by recognizing the pressures and challenges ahead resulting from extreme storm events and aging stormwater infrastructure. There is an increasing need to plan and deliver effective and timely stormwater services while addressing legislative compliance and conservation authority requirements.

Extreme storm events drive the need to invest in stormwater infrastructure

The Stormwater Service Area strives to build a resilient stormwater system and establish a sustainable service level. Planning for the future includes the development of a comprehensive asset management plan, increasing contributions to the Pipe Reserve Fund and effective delivery of capital projects and studies.

The basis of the Stormwater Charge was realizing the need to increase the City's investment in its stormwater infrastructure and supporting programs. During the development of the Stormwater Charge program, it was recognized that the Charge would initially be set to fund an interim service level and that over time, the Charge would increase to attain a sustainable service level that would allow for all stormwater program needs to be fully funded. The 2019-2022 Business Plan continues this transition from an interim to a sustainable service level.

Additionally, an increase in the contribution to the Pipe Reserve Fund is proposed this year to allow for large storm sewer replacement projects that will be undertaken as necessary in future years.

Installation of storm pipe infrastructure

In 2017, the Province of Ontario introduced and enacted the *Asset Management Planning for Municipal Infrastructure Regulation*. The Regulation requires all municipalities to prepare and publish a Strategic Asset Management Policy by July 1, 2019 and to develop enhanced Asset Management Plans for core infrastructure – which includes all stormwater infrastructure – by July 1, 2021. This year, the Stormwater Service Area began the first phase of developing an Asset Management Plan and Strategy involving the review of stormwater assets, supporting tools and processes. Ongoing development of a comprehensive Asset Management Plan will improve the organization and management of stormwater infrastructure assets.

Various master drainage plans and flood evaluation studies were initiated in 2018 while several others are proposed in the 2019-2028 Capital Program. These plans and studies will identify infrastructure needs and pressures to be prioritized for the latter part of the 10-year Capital Program.

Engaging Our Residents and Businesses

The Stormwater Service Area continues to develop the Outreach and Education Program with the following goals:

- Educate the public about stormwater, how the City manages stormwater, the relationship between private property and the municipal stormwater management system, and how the Stormwater Charge is being utilized
- Educate homeowners on stormwater best management practices for their properties and provide information about complementary programs
- Educate businesses and multi-residential properties about stormwater best management practices, the City's stormwater credit program and pollution prevention
- Educate youth, school children and community groups about stormwater management issues and best practices through in-class presentations and other events

The program focuses on providing information that helps the public understand how their properties drain, common issues that can put homes or businesses at risk of flooding, and actions that can be taken to reduce flooding risks and benefit the environment. Such actions include disconnecting downspouts; choosing environmentally friendly alternatives to fertilizers, pesticides and winter salt; using native groundcover and plant species; improving lot grading; proper disposal of pet waste and litter; introducing permeable paving materials, rain gardens and rain barrels; tree planting, and other best practices. The City has partnered with Credit Valley Conservation to ensure that business and multi-residential properties can access the Greening Corporate Grounds program.

Face-to-face interactions, training and demonstrations are key features of the outreach program in order to increase the level of public engagement and the likelihood of changing personal behaviours and attitudes. Staff also developed online videos, brochures, outreach events and stormwater-themed comic books, as well as updating existing channels such as the stormwater website and the outreach booth display. All outreach approaches complement and link to stormwater incentives and programs offered by local partners such as Credit Valley Conservation, Toronto and Region Conservation Authority and the Region of Peel.

Engaging our residents, businesses and future generations is an integral part of the Stormwater Service Area. In 2018, staff are on pace to attend over 30 community events to discuss the Stormwater Program with residents, as well as to deliver over 25 in-class stormwater presentations to 1,550 participants.

Staff will report back to Council in early 2019 on the progress of the Outreach and Education Program. In the interim, it is anticipated that public engagement will continue through:

- Development of new ways to enhance the Stormwater Outreach and Education Program, including new campaigns, targeting flood-prone areas, and enhancing in-school presentations
- Educating businesses on stormwater credit opportunities, as well as on pollution prevention, and compliance with the Storm Sewer By-law
- Continued development and expansion of online supports and resources, including social media and online videos
- The development of quantitative measurement tools to assess the effectiveness of outreach approaches

Stormwater information booth at community outreach event

Finding Efficiencies

Lean Program

The City's Lean Program focuses on strengthening the organization's culture of continuous improvement and instills Lean concepts and principles as a way of work in every Service Area. The program focuses on maximizing customer value and minimizing waste along with empowering staff at all levels to problem-solve on a daily basis.

The Stormwater Service Area has completed several continuous and small improvement projects. Staff are able to identify issues and recognize solutions to improve the effectiveness and efficiency of service delivery.

In 2018, staff completed improvements to the planning and maintenance processes within the Watercourse Management Program. Initiated in 2017, this Lean initiative focused on the classification process of watercourse erosion control projects and the refinement of the criteria used to designate projects as either capital or maintenance related. This initiative garnered a one-time cost avoidance of $1.3 million and an avoidance of $123,000 per year. Additional benefits included the reduction of project lead time, lower lifecycle costs and increased internal capacity, all without compromising the quality of work.

In addition to the larger projects, the Stormwater Service area also recognizes the value of small process improvements in its everyday work. Highlights of the many projects and small improvements include:

- Improvements to the Erosion and Sediment Control Permit renewal program, which have enhanced by-law compliance, improved environmental protection and resulted in $11,900 in cost savings
- Improvements to the creek inspection schedule and reporting processes, which have resulted in greater environmental protection
- Digital review of creek inspection reports, which has reduced paper waste
- Revisions to the storm sewer TV inspection contract, which have improved data collection and organization, leading to a cost avoidance of $3,300
- Development of an electronic approval for storm sewer connections, which has reduced printing costs and approval time for approximately 80 applications per year

Completed Initiatives					Total Benefits	
Improvement Type	**2014-2016**	**2017**	**2018**	**Total**	**Type**	**Total**
Small Improvement	7	3	5	15	Cost Savings and Avoidance	$149,785.46
Rapid Improvement			1	1	Customer Service Improvements	6
Project					Safety Improvements	4
Total	7	3	6	16	Environmental Improvements	6

In-Progress Initiative	Goals of the Initiative
Stormwater Charge Data Management	As part of the ongoing initiative of verifying the accuracy of the Stormwater Charge data between the City and the Region of Peel, the Stormwater Service Area aims to improve the efficiency of the data management process with the Region of Peel by altering review procedures and reducing staff time.

Advancing the City's Strategic Plan

belong - ensuring youth, older adults and new immigrants thrive

"Nurture Diverse Cultures – to provide more cultural exchange, understanding and opportunity for small-scale entrepreneurialism."

- Ongoing delivery of outreach and education programs for residents and businesses regarding stormwater management best practices
- Development of new ways to enhance the Stormwater Outreach and Education Program, including new campaigns for diverse audiences and enhancing in-school presentations for youth

connect - completing our neighbourhoods

"Build and Maintain Infrastructure – to deliver infrastructure in a sustainable way."

- Ongoing development of a comprehensive Asset Management Plan to ensure the cost effective management of all stormwater infrastructure
- Effective planning and delivery of capital projects, drainage studies and master plans
- Continuation of regular inspection and maintenance programs to assess conditions of stormwater infrastructure
- Implementation of Cooksville Creek flood relief and improvement projects, including stormwater management facilities
- Implementation of mitigation measures for the Lisgar community to address basement water infiltration

prosper - cultivating creative and innovative businesses

"Meet Employment Needs – to provide the infrastructure and network of services and opportunities that business requires to thrive"

- Create a safe environment and provide reliable stormwater infrastructure for businesses to thrive

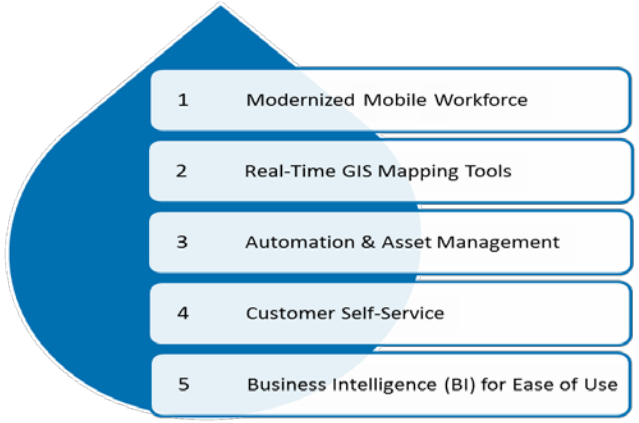
green - living green

"Conserve, Enhance and Connect Natural Environments – to be responsible stewards of the land by conserving, enhancing and connecting natural environments."

- Completion of Low Impact Development (LID) projects such as the Burnhamthorpe Rd. E. enhanced grass swale that mimic natural processes and improve water quality to the receiving drainage system
- Design of erosion control projects within Cooksville Creek, Moore Creek and Mary Fix Creek
- Initiation of flood evaluation studies for Little Etobicoke Creek, Applewood Creek and Serson Creek

Transforming our Business with Technology

The Stormwater Service Area has developed an Information Technology Roadmap which illustrates the transformation of business with technology. Five strategic directions guide the Service Area's current and future Information Technology initiatives.



1. Modernized Mobile Work Force

Streamline Service Request process:

- The development of a digital process to assign Service Requests to staff will allow for better coordination between staff and enhance Operation and Maintenance reporting (Expected Completion Q4, 2018)

Improve inspections and enforcement of Storm Sewer By-law:

- Once the implementation of a storm sewer asset management system is complete, mobile technology opportunities will be identified to improve inspections and enforcement of the Storm Sewer By-law (Future Initiative)

2. Real-Time GIS Mapping Tools

Moving towards new geographic information system (GIS) software:

- In 2017, staff participated and provided input into the City's Geospatial Master Plan. Staff are engaging with IT to implement a GIS software change in accordance with the Master Plan recommendations (Initiated Q1, 2018). Spatial data consolidation will occur once the software implementation is complete (Future Initiative)

3. Automation and Asset Management

Development of sewer asset management program/system:

- Staff continue to research tools and technologies to support asset management processes and develop requirements for automation. Knowledge of programs/systems, benchmarks and lessons learned from other municipalities continue to be collected (Initiated Q1, 2018)
- An integrated asset management system for all Stormwater assets, including watercourse and pond asset inventories that are currently in other databases, will be developed (Future Initiative)

4. Customer Self-Service

Utilize several methods to serve customers:

- Applicants are able to submit online applications through Dynamic Portal for Stormwater Credits, Technical Exemptions and Requests for Review. Residents are able to submit stormwater-related concerns online
- Other self-service processes and alternative ways for the public to connect with staff (e.g., social media) are reviewed to improve overall customer experience (ongoing)

5. Business Intelligence for Ease of Use

Standardize reporting of metrics/performance measures:

- The standardization of data collection continues to be developed in order to maintain accurate reporting. The Stormwater Service Area is an active participant in the National Water & Wastewater Benchmarking Initiative

Maintaining Our Infrastructure

To maintain stormwater infrastructure now and in the future, the 2019-2022 Stormwater Business Plan continues the development of a storm pipe asset management plan; the enhancement of existing asset management plans and integration of all storm assets into a comprehensive system; and, the increased investment in capital and pipe reserves. The plan proposes a new initiative dedicated to the development and efficient delivery of stormwater capital projects and studies related to flood mitigation, infrastructure renewal and improving stormwater quality.

In 2018, several project designs, flood evaluation studies and master drainage plans were initiated by staff.

The design of the Levi Creek watercourse realignment and the design of erosion control projects for Cooksville Creek, Moore Creek and Mary Fix Creek are currently in progress. Additionally, several designs for underground stormwater facilities have commenced to support flood mitigation and improve storage capacity.

Flood Evaluation Studies for the Little Etobicoke Creek, Applewood Creek and Serson Creek watersheds are currently underway. These studies help to identify additional capital needs and pressures within the 10-year Capital Program and assist staff in planning and maintaining infrastructure.

Stormwater infrastructure is also regularly inspected and maintained through the Service Area's operating program. Catchbasins, storm sewers, watercourses, ponds, inlets and outlets are regularly inspected for deficiencies. These condition assessments identify the need for maintenance or infrastructure renewal.

Achievements over the past year include:

- Completed several **Pond forebay dredging** projects to remove sediment and reinstate water quality performance
- Investigated over 150 requests related to spills, sanitary cross connections and **enforcement of the Storm Sewer By-law** in 2017 and 2018

Storm Sewer dye test to confirm sanitary cross connections

- Completed several **Watercourse maintenance and restoration projects** including Little Etobicoke Creek storm outfall reconstruction and erosion control and Cooksville Creek erosion control within Woodington Green

Watercourse bank stabilization at failed storm outfall

Managing Our Human Resources

Our Structure

Stormwater services are delivered with key support provided by multiple departments, divisions and an external partner (Region of Peel):

- Engineering and Construction
- Finance
- Information Technology
- Parks and Forestry
- Region of Peel (Stormwater Charge billing)
- Transportation and Infrastructure Planning
- Works Operations and Maintenance

Having a team of staff making key contributions to the Service Area requires strong internal relationships and communication to effectively organize and deliver our services. Working together, our Service Area staff support Stormwater business goals to establish a sustainable service level and deliver mitigation and improvement projects.

Our Talent

The Stormwater team is comprised of individuals that bring a wealth of expertise and experience from across Canada and around the world, supporting our vision to be a leader in the delivery of stormwater services. The table below provides some of the roles that are dedicated to the Stormwater Service Area and their membership in professional associations:

Our Service Area staff roles include:	Staff are active members of various associations including:
Engineers: Storm Drainage/Environmental/Water Resources Environmental Services Specialist Environmental Coordinator Infrastructure Management Specialist Storm Drainage Coordinators Storm Drainage/Environmental Technologists Stormwater Charge Program Coordinator	American Public Works Association (APWA) Association of Professional Geoscientists of Ontario (APGO) Municipal Engineers Association (MEA) Ontario Association of Certified Engineering Technicians and Technologists (OACETT) Professional Engineers of Ontario (PEO)

Critical Roles/Functions to Achieve Business Goals

Staff continue to work together and support one another to deliver services and achieve the business goals within the Stormwater Service Area. The following functions are critical to achieving the 2019-2022 Stormwater business goals:

- Asset management planning
- Asset management system development
- Monitoring and management of stormwater assets using the asset management plan and system
- Implementing the enhanced Storm Sewer By-law enforcement program
- Effective project management
- Planning and delivery of capital projects, drainage studies and master plans

Critical roles and functions may evolve from 2019 through to 2022 with the development of new and refined asset management plans and enhanced programs.

Talent Needs

Service Area talent is supplied from internal promotions and external hires. Qualified applicants from the labour market as well as co-op students, engineers-in-training (EIT) and the proposed technologist-in-training internship program for 2019 (shared with Roads Service Area) contribute to Stormwater. Historically, our seasonal staff and students have proven to be a good source for candidates for full-time positions. Through these assignments, the students and contract staff gain the necessary experience to qualify for full-time positions. For 2019, a Project Engineer position is requested to develop and efficiently deliver stormwater capital projects and studies related to flood mitigation, infrastructure renewal and improving stormwater quality.

Proposed Full Time Equivalent (FTE) Staffing Distribution by Program

Program	2018	2019	2020	2021	2022
Administration	2.0	2.0	2.0	2.0	2.0
Planning & Operations	22.4	21.5	21.5	21.5	21.5
Total Service Distribution	**24.4**	**23.5**	**23.5**	**23.5**	**23.5**

Note: Numbers may not balance due to rounding.

Staffing changes for 2019:

- A decrease of two FTEs due to two contract positions ending for the Clean Water & Wastewater Fund (CWWF)
- An increase of one permanent FTE for a Project Engineer (BR# 5381)
- Part time FTE technical adjustments of 0.17 FTE

Stormwater Budget & Financial Overview

2019 Stormwater Rate and Future Adjustments

The Stormwater Service Area, like other service areas in the City, depends on safe and reliable infrastructure to operate successfully. While some of Mississauga's stormwater infrastructure is relatively new, many of the assets are aging and require significant maintenance or renewal, and therefore require dedicated funding to maintain them in a state of good repair. Additionally, assets that were built many years ago, such as storm sewer pipes, are approaching the end of their service life and will require replacement in the near future. With increased frequency of extreme storm events, the need to invest in our infrastructure to ensure we have a resilient stormwater system is more apparent than ever. This investment in our stormwater infrastructure will provide for properly funded maintenance and capital improvement programming to mitigate flooding, enhance water quality and allow the Stormwater Service Area to continue to provide safe and reliable infrastructure moving forward.

To determine the stormwater rate, service levels and operating and capital needs are set to reflect infrastructure priorities, inflationary pressure and reserve fund contributions needed now to plan for funding challenges foreseen with replacing costly assets (e.g., pipes) in the future. Furthermore, service level changes and the resulting stormwater rate increase reflect a balance between fiscal responsibility and resident service expectations.

The stormwater rate is established on an annual basis during the budget approval process, through a fees and charges by-law subject to Council approval. An increase to the stormwater rate will allow future stormwater capital and operational needs to be addressed. As shown in the table below, an annual rate of $106.10 per stormwater billing unit is proposed to be effective for April 1, 2019.

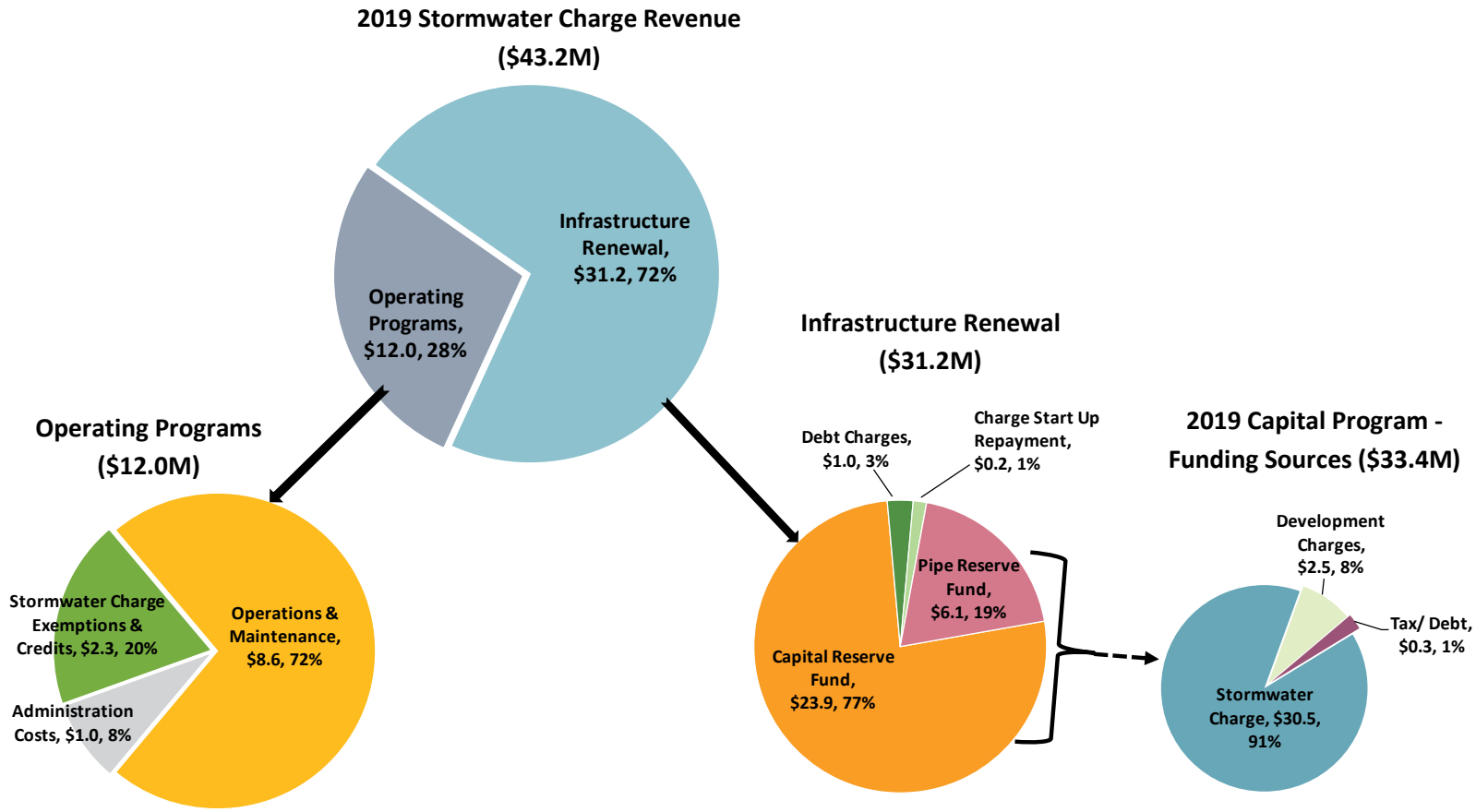
	2016	2017	2018	2019
Stormwater Rate (per billing unit)	$100.00	$102.00	$104.00	$106.10

The April 1 effective date is new for 2019. In previous years, the effective date had been January 1. This change is being made to accommodate the later approval of the 2019 Budget due to the municipal election and to align with water rate changes at the Region of Peel. The April 1 effective date will be maintained going forward.

To learn more about the Stormwater Charge please visit:
www.stormwatercharge.ca

Distribution of Stormwater Charge Revenue ($ Millions)

The pie charts below provide an overview of Stormwater Charge Revenue segregated by the Operating and Infrastructure Renewal Programs for 2019. Furthermore, the 2019 Capital Program is distributed by funding source.



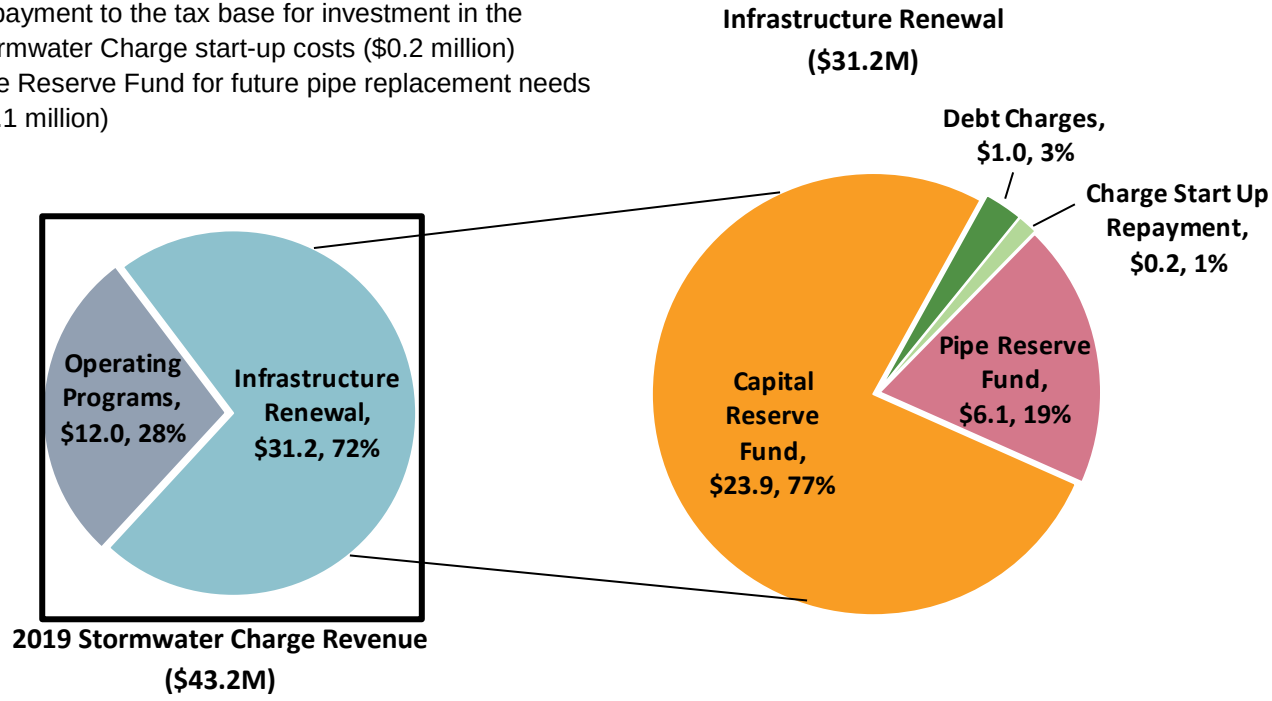
Note: Numbers may not balance due to rounding.

The following pie charts provide an overview of Stormwater Charge Revenue allocated to Infrastructure Renewal Programs for 2019.

Description of Stormwater Infrastructure Renewal Allocations

Infrastructure Renewal – 72 per cent of the total stormwater revenue is to be allocated for infrastructure renewal items as follows:

(i) Capital Reserve Fund ($23.9 million)
(ii) Debt charges associated with the financing of capital projects from previous years ($1 million)
(iii) Repayment to the tax base for investment in the Stormwater Charge start-up costs ($0.2 million)
(iv) Pipe Reserve Fund for future pipe replacement needs ($6.1 million)



Note: Numbers may not balance due to rounding

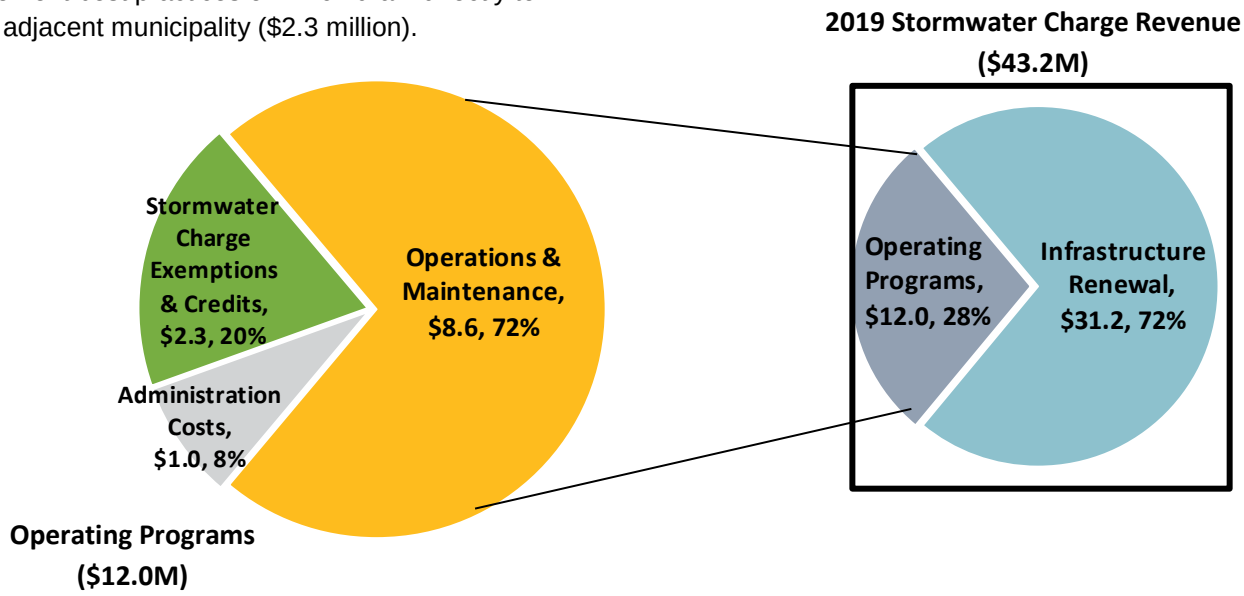
The following pie charts provide an overview of Stormwater Charge Revenue allocated to Operating Programs for 2019.

Description of Stormwater Operating Programs:

Operations and Maintenance – Provides for the City-wide direct and allocated costs associated with providing the stormwater service. Examples include watercourse maintenance, catch basin cleaning, and storm sewer inspection and repair ($8.6 million).

Administration Costs – Provides for Region of Peel costs for Stormwater Charge billing and customer service support as well as costs for the City to administer the Stormwater Charge ($1.0 million).

Stormwater Charge Exemptions and Credits – Provides for credits and technical exemptions to recognize properties with stormwater management best practices or which drain directly to Lake Ontario or an adjacent municipality ($2.3 million).

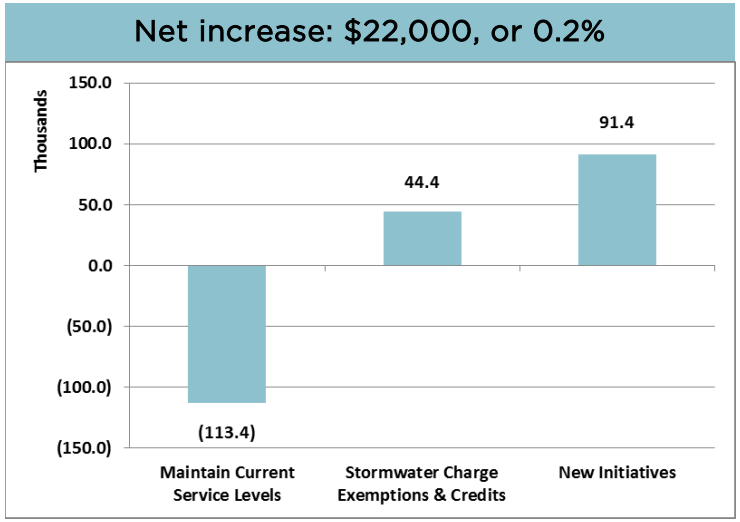


Note: Numbers may not balance due to rounding.

Proposed Operating Budget

This part of the Business Plan sets out the financial resources required to deliver the proposed 2019-2022 Business Plan. Information is provided by major expenditure and revenue category as well as by program. The costs to maintain existing service levels and operationalize prior decisions are identified separately from proposed changes. The budget for 2018 was $11.94 million and the proposed budget for 2019 is $11.96 million.

Proposed Changes to 2019 Net Operating Budget by Category ($000's)



Maintain Current Service Levels

The Stormwater Service Area aims to manage operating pressures while maintaining service levels and remaining in line with inflation. Each year, City staff identify efficiencies and streamline processes through continuous improvement while maintaining service levels and managing additional costs. The change of $113,400 in Maintain Current Service Levels is primarily due to the elimination of contributions to the Operating Reserve. These contributions are no longer required.

Stormwater Charge Exemptions and Credits

The 2019 budget proposes an increase in technical exemptions and program credits based on latest analysis indicating an increased volume of applications.

New Initiatives

Planning and flood evaluation studies are essential for the identification of infrastructure needs and the recommendation of future capital projects. A Project Engineer for Stormwater Capital Projects and Studies (BR# 5381) is proposed in 2019. This Project Engineer will lead flood evaluation and planning studies and ensure the efficient delivery of projects related to flood mitigation, infrastructure renewal and improving stormwater quality.

The following table breaks down the total 2019 Operating Budget, $11.96 million, which is a net operating budget increase of $0.02 million over the 2018 Budget.

Category	Changes to 2019 budget from 2018 ($000's)
2018 Base Budget	**11,936**
Operating Decreases:	
Eliminate Transfer to Reserve	-$100
Decrease in Contractor & Professional Services	-$30
Operating Increases:	
Increased Labour costs	$11
Technical Exemptions and Credits	$44
Other Increases	$6
Total to Maintain Current Service Levels	**11,867**
New Initiatives	91
Total 2019 Operating Budget	**11,958**

Note: Numbers may not balance due to rounding.

Operating Budget Details

The following table identifies the budgeted and forecasted operating expenditures and revenues for 2019-2022, as well as the 2018 Budget and 2017 Actuals by major program within the Service Area.

Proposed Budget by Program

Description	2017 Actuals ($000's)	2018 Budget ($000's)	2019 Forecast ($000's)	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)
Expenditures to Deliver Current Services						
Operations and Maintenance	8,181	8,542	8,500	8,535	8,440	8,475
Administration Costs	951	1,083	1,020	1,024	1,027	1,030
Stormwater Charge Exemptions & Credits	1,021	2,310	2,346	2,403	2,456	2,508
New Initiatives			91	125	127	129
Total Operating Programs	**10,153**	**11,936**	**11,958**	**12,086**	**12,050**	**12,144**
Capital Reserve Fund Contributions	25,666	24,489	24,110	24,077	24,024	23,847
Pipe Reserve Fund Contributions	5,413	5,100	6,100	7,100	8,100	9,100
Debt Charges	1,011	1,000	990	978	964	949
Total Infrastructure Renewal	**32,089**	**30,589**	**31,200**	**32,155**	**33,088**	**33,896**
Stormwater Program	**42,242**	**42,525**	**43,158**	**44,241**	**45,138**	**46,040**

Expenditures Budget - Changes by Year			0%	1%	(0%)	1%
Proposed Net Budget - Changes by Year			1%	3%	2%	2%

Note: Numbers may not balance due to rounding.

Proposed Cost Increase Required to Maintain Current Service Levels

The following table provides detailed highlights of budget changes by major cost and revenue category. It identifies the net changes to maintain existing service levels, taking into account efficiencies, cost savings, and cost increases arising from prior year decisions.

Description	2018 Budget ($000's)	2019 Proposed Budget ($000's)	Change ($000's)	Details ($000's)
Labour and Benefits	**4,966**	**4,976**	**11**	$11 Increase reflects labour adjustments and other fringe benefit changes.
Contractor & Professional Services	3,756	3,726	(30)	($50) Decrease in Regional costs $10 Increase in Spills $10 Increase in Inlet & Outlet Cleaning
Transportation, Equipment Costs & Maintenance	519	526	7	$7 Increase in Catchbasin/Manhole repairs
Finance Other	140	155	15	
Materials, Supplies & Other Services	86	78	(8)	
Occupancy & City Costs, Advertising & Promotions Communication Costs	58	59	0	
Transfers To Reserves and Reserve Funds	100	0	(100)	($100) Decrease in contribution to operating reserve
Stormwater Charge Exemptions & Credits	2,494	2,538	44	$44 Increase in technical exemptions and credit program
Other Revenues	(184)	(192)	(8)	
Total Operating Programs	**11,936**	**11,867**	**(69)**	
Infrastructure Renewal	29,589	30,210	621	$1000 Increase transfers to the Pipe Reserve Fund ($322) Decrease in Capital Program repayment ($57) Net decrease in Capital Program
Debt	1,000	990	(10)	
Total Infrastructure Renewal	**30,589**	**31,200**	**611**	
Total	**42,525**	**43,067**	**542**	

Note: Numbers may not balance due to rounding.

Proposed New Initiatives and New Revenues

This table presents the costs by Budget Request (BR) for proposed new initiatives. Detailed descriptions of each Request can be found in the pages following the table.

Description	BR #	2019 FTE Impact	2019 Proposed Budget ($000's)	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)	2019 to 2022 FTE Impact	2019 to 2022 Capital ($000's)
New Initiatives								
Project Engineer - Stormwater Capital Projects and Studies	5381	1.0	91	125	127	129	1.0	0
Total New Initiatives		**1.0**	**91**	**125**	**127**	**129**	**1.0**	**0**
Total New Initiatives and New Revenues		**1.0**	**91**	**125**	**127**	**129**	**1.0**	**0**

Note: Numbers may not balance due to rounding.
Amounts are net.

Budget Request #: 5381

Proposed Initiative	Department	Service Area
Project Engineer - Stormwater Capital Projects and Studies	Transportation & Works Department	Stormwater

Description of Budget Request

One full-time Project Engineer dedicated to the development and delivery of stormwater capital projects and studies.

Required Annual Operating Investment

Impacts ($000s)	2019	2020	2021	2022
Gross Expenditures	91.4	125.2	127.2	129.4
Reserves & Reserve Funds	0.0	0.0	0.0	0.0
User Fees & Other Revenues	0.0	0.0	0.0	0.0
Tax Levy Requirements	91.4	125.2	127.2	129.4
* Net Change in $		33.7	2.1	2.1
FTEs	1.0	1.0	1.0	1.0

**In each year, all values are cumulative, not incremental.*

Required Capital Investment

Total Capital ($000s)	2018 & Prior	2019	2020	2021	2022 & Beyond
Expenditures	0.0	0.0	0.0	0.0	0.0

Why Staff Recommend this Initiative

Staff recommend this initiative as a pressure has been identified on their ability to deliver stormwater projects and studies to meet expected service levels on flood mitigation, infrastructure renewal, protection of water resources and informing infrastructure needs and supporting growth. This pressure is heightened due to increased frequency of storms, the need to balance service levels with affordability and new and more stringent legislation and requirements.

Budget Request #: 5381

Details of Service Change

A new FTE, Project Engineer, is proposed for 2019 to be dedicated to the delivery of stormwater capital projects and studies. The objective of this proposal is to ensure that the Stormwater Service Area manages its stormwater assets effectively and provides efficient service level delivery, as would be expected by residents, businesses and Mayor and Council. This is achieved through a higher level of protection against flooding, planning for the renewal of the storm sewer and drainage systems, protecting and enhancing the quality of the City's water resources, and delivering planned projects in a timely manner. The Stormwater Service Area will also be better positioned to carry out new projects stemming from the recommendations of ongoing and future flood evaluation studies.

Service Impact

A Project Engineer will represent an operating budget increase of $91,400 starting in April, 2019. This resource will assist in delivering an increasing number of stormwater capital projects and studies in a timely manner. In this way, as an example, the City will be better positioned to carry out new initiatives stemming from the recommendations of ongoing and future flood evaluation studies. This is an important step towards achieving efficient service delivery in terms of flood mitigation, infrastructure renewal and the protection of the quality of the City's water resources as well as to inform infrastructure needs and support growth. This is especially important given the pressure the City faces with the increased frequency of extreme storm events, the need to balance service levels with affordability and new legislation and conservation authority requirements that have made the delivery of capital projects and studies more challenging and time consuming.

The addition of a Project Engineer will necessitate the need for office space, computer equipment, desk, chairs and other standard office equipment and supplies.

Infrastructure

The City of Mississauga is committed to providing quality stormwater services through safe, reliable infrastructure. **Build and Maintain Infrastructure** is a key strategic goal in the City of Mississauga's Strategic Plan as well as a top priority of the City's Business Plan. These principles are key concepts underlying the Stormwater Charge. When the Charge was initially approved at $100 per stormwater billing unit, it was based on the interim funding level. It was anticipated that funding would increase in the future to respond to increasing infrastructure requirements.

At the core of the City's need to achieve a sustainable stormwater business model is the need to implement sound asset management practices involving:

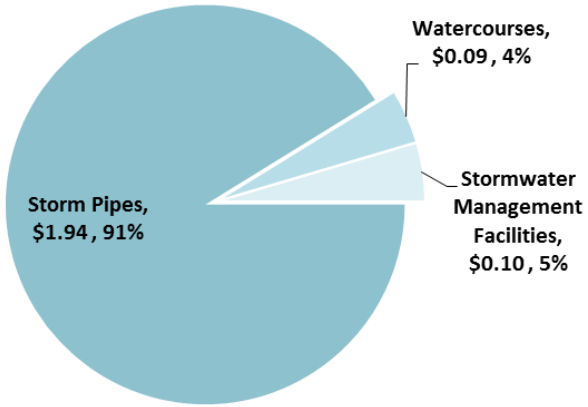
- Developing an inventory of City-owned assets
- Monitoring and reporting of infrastructure condition
- Preparing appropriate asset renewal and maintenance programs
- Developing financial strategies to effectively manage those programs over the lifecycle of stormwater infrastructure

As previously mentioned, one of the business goals of the 2019-2022 plan is to continue to improve asset management practices as they pertain to storm pipes and all stormwater assets. This includes the improvement of inventory data, monitoring, capital and maintenance planning and the financing of storm sewer infrastructure with the development of an asset management system.

Repairing and rehabilitating aging stormwater infrastructure requires an increased focus on the funding needed to renew the City's long term assets. As such, enhanced infrastructure funding strategies and mechanisms are being developed to assist the City in addressing these challenges.

A critical part of the City's Stormwater Charge is the need to provide adequate and sustainable funding for the renewal of the storm pipes, in addition to stormwater management ponds and watercourse erosion control.

Stormwater Infrastructure 2018 Replacement Costs (Estimated $2.13 billion)

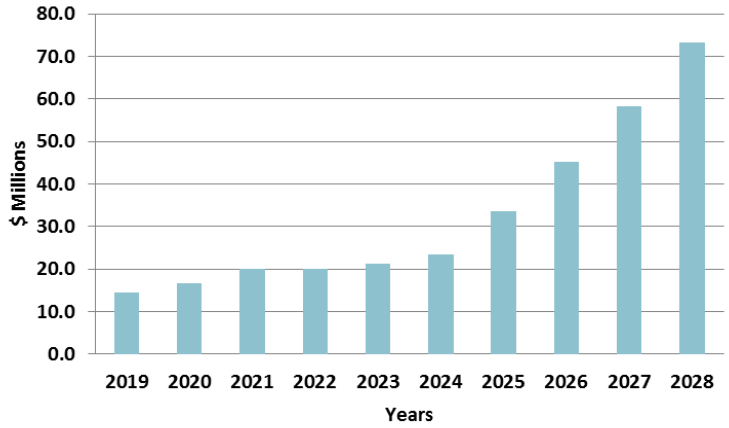


Pipe Program Financing

The stormwater program includes a provision of $6.1 million in 2019 for future pipe replacement needs. The 2019-2022 Business Plan and Budget assumes this provision will increase in each of the next four years, reaching an annual provision of $9.1 million in 2022. This increase is necessary as part of the Service Area's goal to reach a sustainable service level.

The following chart reflects the projected annual closing balances of the Pipe Reserve Fund, with a forecasted balance of $73.2 million in 2028.

Pipe Reserve Fund Closing Balances (2019-2028)



Capital projects pertaining to stormwater pipes are currently being funded from the Pipe Reserve Fund. Work is underway to assess the conditions of storm sewers, program any future repair and rehabilitation needs and identify funding pressures. Continuation of this work to deliver a comprehensive Asset Management Plan is included in this Business Plan. This body of work will provide more accurate information to determine the appropriate level of annual funding required for the Pipe Reserve Fund moving forward.

Renewal of storm sewers is a major focus of the Business Plan

Corroded metal storm sewers require replacement

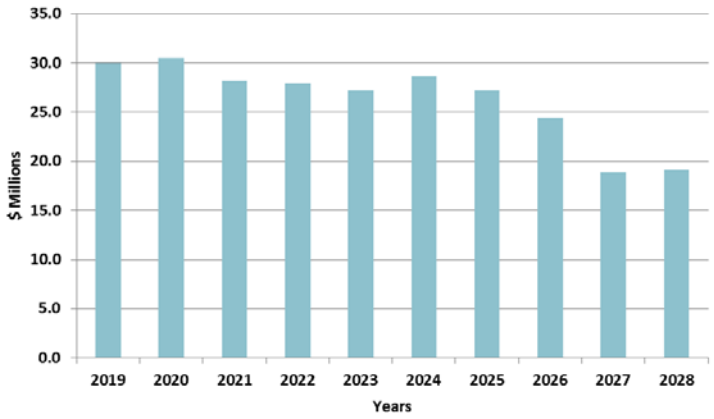
Capital Program Financing

In addition to the funding required for the City's pipe infrastructure, the Stormwater Service Area must address present and future needs that include stormwater ponds, flood relief, watercourse erosion control and drainage studies.

Revenues from the 2019 Stormwater Charge will be $43.2 million and are estimated to increase to $46 million by 2022. Some of this revenue funds the Stormwater Capital Reserve Fund. As shown in the chart, the forecasted closing balances for this Reserve Fund will range between $18 million and $31 million over the 10-year period. Careful planning will ensure that capital priorities will be funded throughout the forecast to 2028, with a positive balance remaining in this Reserve Fund.

Maintaining adequate balances will allow flexibility to address infrastructure needs that arise as the City moves to implement the Stormwater asset management plan, recommendations from future studies and to fund projects that are currently unfunded.

Stormwater Capital Reserve Fund Balance (2019-2028)



Proposed Capital Budget

This section summarizes the forecast 10-year capital requirements for this service. The following table presents the forecast by major program. The next table summarizes the sources of financing for the capital forecast.

Proposed 2019-2028 Capital Budget by Program

Program Expenditures	2019 Proposed Budget ($000's)	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)	2023-2028 Forecast ($000's)	Total 2019-2028 ($000's)
Storm Sewers	12,330	9,788	12,064	14,462	36,932	85,577
Storm Studies	1,700	800	860	600	8,410	12,370
SWM Facilities and Flood Relief Works	12,078	24,329	28,033	22,235	96,985	183,660
Watercourse Erosion Control	7,270	6,130	8,450	8,010	62,756	92,616
Total	**33,378**	**41,047**	**49,407**	**45,307**	**205,083**	**374,223**

Note: Numbers may not balance due to rounding. Numbers are gross.

The proposed Capital Budget in 2019 is significantly higher than that of 2018 and continues to increase over the following years due to the increase in projects and studies related to flood mitigation, infrastructure renewal and improving stormwater quality.

Proposed 2019-2028 Capital Forecast Highlights:

- Storm Sewer Condition Assessment, Rehabilitation and Renewal (2019, ongoing)
- Cooksville Creek Erosion Control, Meadows Boulevard to Rathburn Road East (2019)
- Mississauga Stormwater Management Master Plan (2019)
- Mississauga LRT Storm Sewer Improvements (2019)
- Lisgar Improvements and Dewatering Design (2019, ongoing)
- Storm Pond Rehabilitation and Dredging – various locations (2019, ongoing)
- Construction of Cooksville Creek Flood Storage Facility, Mississauga Valley Boulevard (2019)
- Sheridan Creek Erosion Control, Lushes Avenue to Fletchers Valley Cres. (2020)
- Construction of Cooksville Creek Flood Storage Facility, Sandalwood Park (2020)
- Applewood Creek Erosion Control (2021)
- Mary Fix Creek Flood Evaluation Study (2021)
- Little Etobicoke Creek Channel Widening and Dixie Road Culvert Assessment (2021)

Proposed 2019-2028 Capital Budget by Funding Source

The following table provides the funding sources proposed to fund the capital portion of the proposed 2019-2022 Business Plan and 2019 Budget and the consolidated forecast for 2023-2028.

Funding	2019 Proposed Budget ($000's)	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)	2023-2028 Forecast ($000's)	Total 2019-2028 ($000's)
Tax Capital	338	2,099	0	0	0	2,437
Development Charges	2,523	8,792	16,602	10,406	20,226	58,548
Developer Contributions	0	765	750	750	35	2,300
Recoveries	0	0	0	0	0	0
Subsidies and Senior Govt. Level Grants	0	0	0	0	0	0
Stormwater Charge	30,517	29,391	32,055	34,151	184,823	310,938
Total	**33,378**	**41,047**	**49,407**	**45,307**	**205,083**	**374,223**

Note: Numbers may not balance due to rounding.

Proposed 2019 Capital Budget Detail

The following tables provide a detailed listing of proposed capital projects for 2019.

Program: Storm Sewers

Project Number	Project Name	Gross Cost ($000's)	Recovery ($000's)	Net Cost ($000's)	Funding Source
TWSD00322	Storm Sewer Oversizing - Various Locations	270	0	270	Development Charges
TWSD00333	Storm Sewer Renewal	1,200	0	1,200	Stormwater Charge
TWSD00442	Corrugated Metal Pipe Rehab - Various	550	0	550	Stormwater Charge
TWSD00452	Storm Sewer Cross-Connection Rehabilitations - Various Locations	100	0	100	Stormwater Charge
TWSD00465	Mississauga LRT Storm Sewer Improvements	9,034	0	9,034	Development Charges, Stormwater Charge
TWSD00497	Drainage Improvements - Various Locations	500	0	500	Stormwater Charge
TWSD00512	Roadway Rehabilitation Storm Sewer Contributions	676	0	676	Stormwater Charge
Total		**12,330**	**0**	**12,330**	

Note: Numbers may not balance due to rounding.

Program: Storm Studies

Project Number	Project Name	Gross Cost ($000's)	Recovery ($000's)	Net Cost ($000's)	Funding Source
TWSD00125	Mississauga Storm Water Management Master Plan	750	0	750	Development Charges
TWSD00394	Detail Condition Assessments Trunk Storm Sewers	500	0	500	Stormwater Charge
TWSD00462	Serson Creek & Applewood Creek Flood Evaluation Study	250	0	250	Stormwater Charge
TWSD00513	Storm Drainage Improvements - Dundas St. W at Credit River	200	0	200	Stormwater Charge
Total		**1,700**	**0**	**1,700**	

Note: Numbers may not balance due to rounding.

Program: SWM Facilities and Flood Relief Works

Project Number	Project Name	Gross Cost ($000's)	Recovery ($000's)	Net Cost ($000's)	Funding Source
TWSD00104	STM Pond Rehabilitation – Various Locations	420	0	420	Stormwater Charge
TWSD00143	Monitoring and minor modification of Storm Water Management Facilities - Various Locations	80	0	80	Development Charges
TWSD00214	Cooksville Creek Flood Storage Facility - Mississauga Valley	4,190	0	4,190	Development Charges, Stormwater Charge
TWSD00230	Low Impact Development Roads and Stormwater and Sustainable Practices - Various Locations	250	0	250	Stormwater Charge
TWSD00345	STM Pond Rehabilitation – Various Locations	430	0	430	Stormwater Charge
TWSD00346	Lisgar Improvements - Design of Dewatering Utility Trench for three remaining locations and Lining of MH's and CB's	338	0	338	Tax Capital
TWSD00375	STM Pond Rehabilitation – Various Locations	3,580	0	3,580	Stormwater Charge
TWSD00488	Land/Cooksville Creek SWM Pond#2101/City Centre Outlet	2,790	0	2,790	Development Charges, Stormwater Charge
Total		**12,078**	**0**	**12,078**	

Note: Numbers may not balance due to rounding.

Program: Watercourse Erosion Control

Project Number	Project Name	Gross Cost ($000's)	Recovery ($000's)	Net Cost ($000's)	Funding Source
TWSD00120	Cooksville Creek Erosion Control - Downstream of Central Pkwy. E. to Mississauga Valley Blvd.	60	0	60	Development Charges, Stormwater Charge
TWSD00141	Minor Erosion Control Works - Various Locations	80	0	80	Development Charges, Stormwater Charge
TWSD00192	Cooksville Creek Erosion Control - Queen Elizabeth Way to Elaine Trail	2,210	0	2,210	Development Charges, Stormwater Charge
TWSD00251	Cooksville Creek - Meadows Blvd. to Rathburn Rd. E.	3,560	0	3,560	Development Charges, Stormwater Charge
TWSD00309	Sawmill Creek Erosion Control - The Folkway to Erin Mills Pkwy	350	0	350	Development Charges, Stormwater Charge
TWSD00337	Cooksville Creek Erosion Control - Mississauga Valley Blvd to CP Rail	210	0	210	Development Charges, Stormwater Charge
TWSD00490	Cooksville Creek Erosion Control - CP Rail to Kirwin Avenue	720	0	720	Development Charges, Stormwater Charge
TWSD00498	Etobicoke Creek Erosion Control - contributions to TAM for Tomken Rd. bridge.	80	0	80	Development Charges, Stormwater Charge
Total		**7,270**	**0**	**7,270**	

Note: Numbers may not balance due to rounding.

Proposed 2020-2022 Capital Budget by Sub-Program

The following tables provide a listing of capital forecast by sub-program for 2020-2022.

Sub-Program	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)
Storm Sewers			
STM Drainage	500	0	0
STM Storm Oversizing	270	270	270
STM Storm Sewer	9,018	11,794	14,192
Subtotal	9,788	12,064	14,462

Sub-Program	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)
Storm Studies			
STM Studies	800	860	600
Subtotal	800	860	600

Sub-Program	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)
SWM Facilities and Flood Relief Works			
STM Channelization	0	0	2,830
STM Culvert Improvement	0	0	4,220
STM Flood Relief	16,669	12,993	9,415
STM SWM Facilities	7,660	15,040	5,770
Subtotal	24,329	28,033	22,235

Sub-Program	2020 Forecast ($000's)	2021 Forecast ($000's)	2022 Forecast ($000's)
Watercourse Erosion Control			
STM Erosion Control	6,130	8,450	8,010
Subtotal	6,130	8,450	8,010
Total Expenditures	**41,047**	**49,407**	**45,307**

Note: Numbers may not balance due to rounding.

Numbers are net.

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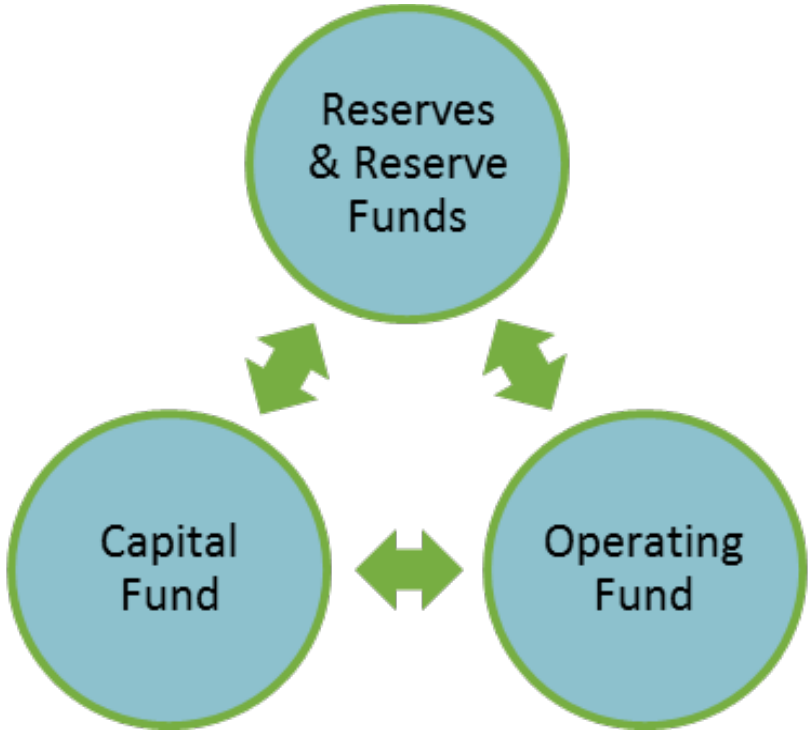
Reserves and Reserve Funds

Reserves and Reserve Funds are established by Council to assist with long term financial stability and financial planning. These funds are set aside to help offset future capital needs, obligations, pressures and costs. They are drawn upon to finance specific purpose capital and operating expenditures as designated by Council, to minimize Stormwater Charge fluctuations due to unanticipated expenditures and revenue shortfalls, and to fund ongoing projects and programs.

The following chart shows the relationship between the different funds:



Existing Core Services

Reserves

The Stormwater **Fiscal Stability Reserve** (formerly named Stormwater Contingency Reserve) is funded entirely from the Stormwater Operating Budget. If needed, these funds will offset any unanticipated fluctuations in revenue or expenses which occur during the year. It will also provide for costs associated with the implementation of the new Regional water billing system.

Reserve Funds

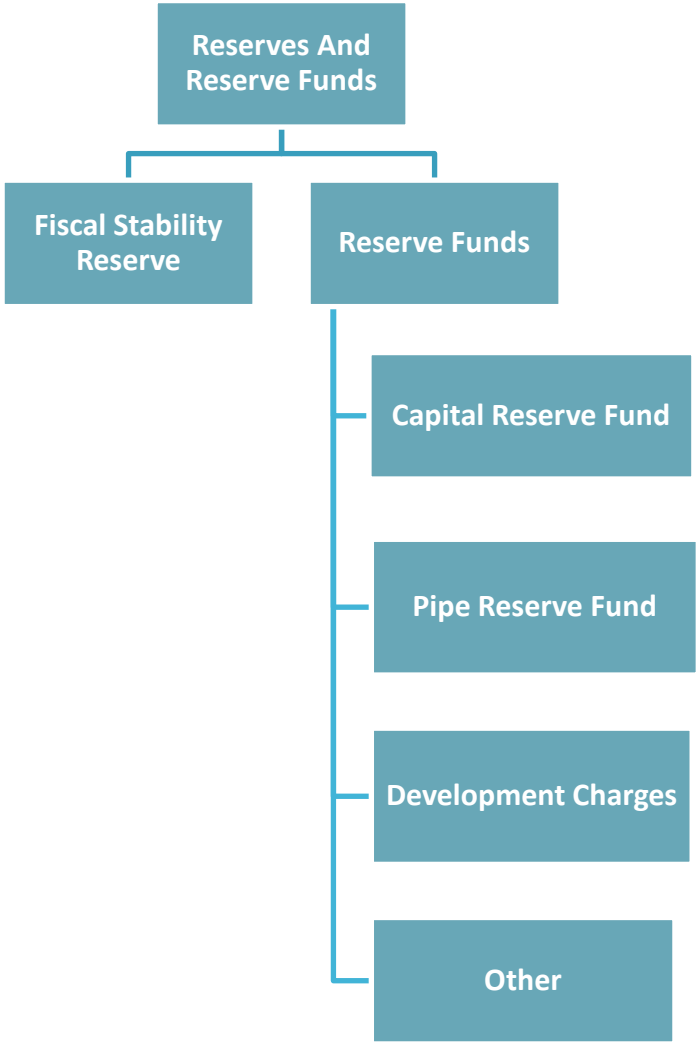
Reserve Funds are segregated, restricted and provide for capital emplacements.

The Stormwater **Capital Reserve Fund** provides funding for infrastructure needs related to ponds and erosion control along watercourses. The Stormwater **Pipe Reserve Fund** provides for the renewal of the City's pipe infrastructure.

The **Development Charges Reserve Fund** accumulates funds collected under the City's Development Charges By-law as permitted under the *Development Charges Act*, 1997 and funds growth-related projects. These funds are obligatory in nature and reported as deferred revenue on the City's Financial Statements.

Additional Reserve Funds included in this Section are:

- Developer Contributions
- Lot levies
- General Municipal Development
- Excess Debt



Forecast Change

The following table provides a summary of the projected 2019 Reserve and Reserve Funds as compared to 2018. Detailed descriptions of each Reserve and Reserve Fund can be found at the end of this section.

Reserve and Reserve Funds Summary

2019 Operating and Capital Reserve Funds	2018 Projected Balance ($000's)	2019 Projected Balance ($000's)	Change ($000's)	%Change
Stormwater Fiscal Stability Reserve	6,406	6,601	195	3.04%
Capital Reserve Fund	31,561	31,638	77	0.25%
Pipe Reserve Fund	13,378	14,535	1,157	8.65%
Development Charges	33,026	33,451	425	1.29%
Other Reserve Funds	24,308	24,107	(200)	-0.82%
Total	**108,678**	**110,332**	**1,654**	**2%**

Note: Numbers may not add due to rounding

Transfers to Stormwater Reserve and Reserve Funds:

The 2019 Stormwater Operating Program recommends transfers to the Reserve and Reserve Funds totalling $30 million as follows:

- $23.9 million to Stormwater Capital Reserve Fund
- $6.1 million to the Stormwater Pipe Reserve Fund

Transfers from Reserve Funds:

The 2019 Stormwater Capital Program recommends transfer from the Reserves and Reserve Funds to capital totalling $33.0 million as follows:

- $24.3 million from the Stormwater Capital Reserve Fund
- $5.2 million from the Stormwater Pipe Reserve Fund
- $2.5 million from the Development Charges Reserve Fund
- $0.9 million from the Debt Management Stormwater Reserve Fund

Continuity Schedule of Stormwater Reserve and Reserve Funds

RESERVE/RESERVE FUND	Balance January 01, 2018 ($000)	2018 Projected Contributions ($000)	2018 Projected Expenditures ($000)	2018 Projected Interest ($000)	Projected Balance December 31, 2018 ($000)	2019 Projected Contributions ($000)	2019 Projected Expenditures ($000)	2019 Projected Interfund Transfers ($000)	2019 Projected External Sources ($000)	2019 Projected Interest ($000)	Projected Balance December 31, 2019 ($000)
Total Stormwater Operating Reserve											
Stormwater Fiscal Stability Reserve	6,406	100	0	0	6,406	0	0	0	0	195	6,601
Total Stormwater Operating Reserve	**6,406**	**100**	**0**	**0**	**6,406**	**0**	**0**	**0**	**0**	**195**	**6,601**
Total Storm Water											
Capital Reserve Fund	16,833	24,712	(10,829)	845	31,561	23,932	(24,346)	0	0	491	31,638
Pipe Reserve Fund	11,526	5,100	(3,470)	222	13,378	6,100	(5,259)	0	0	316	14,535
Total Storm Water	**28,359**	**29,812**	**(14,299)**	**1,066**	**44,938**	**30,032**	**(29,605)**	**0**	**0**	**807**	**46,173**
Total Deferred Funded											
Development Charges Reserve Fund	28,697	4,307	(1,325)	1,347	33,026	0	(2,523)	0	2,368	580	33,451
Total Deferred Funded	**28,697**	**4,307**	**(1,325)**	**1,347**	**33,026**	**0**	**(2,523)**	**0**	**2,368**	**580**	**33,451**
Total Other Funded											
Debt Management - Storm Water	912	0	0	25	937	0	(912)	0	0	1	26
Major Storm Improvement	17,900	(482)	0	479	17,898	0	0	0	0	544	18,442
Major Watercourses	3,229	0	0	89	3,318	0	0	0	0	101	3,419
Stormwater	2,098	0	0	58	2,155	0	0	0	0	66	2,221
Total Other Funded	**24,139**	**(482)**	**0**	**651**	**24,308**	**0**	**(912)**	**0**	**0**	**712**	**24,107**
Total Non-Tax Supported Reserve Funds	**87,601**	**33,737**	**(15,624)**	**3,064**	**108,678**	**30,032**	**(33,040)**	**0**	**2,368**	**2,294**	**110,332**

Note: Numbers may not add due to rounding

10-Year Forecast Schedule

Stormwater Capital Reserve Fund

The following table summarizes the Stormwater Capital Reserve Fund opening balances, contributions, withdrawals, allocation to projects and closing balance. This Reserve Fund is used to fund stormwater infrastructure capital repair and replacement costs as well as investments required to ensure that the aging infrastructure continues to operate effectively, especially in light of the increasingly frequent extreme storm events resulting from climate change. The infrastructure contribution is fully funded from the Stormwater Charge. This Reserve Fund funds $253 million in projects over the 10-year period. The annual Stormwater Charge is forecast to increase to maintain the proposed capital spending included in this plan.

Stormwater Capital Reserve Fund	2019 ($000's)	2020 ($000's)	2021 ($000's)	2022 ($000's)	2023 ($000's)	2024 ($000's)	2025 ($000's)	2026 ($000's)	2027 ($000's)	2028 ($000's)	2019-2028 TOTAL ($000's)
Opening Balance	31,561	31,638	32,238	30,013	29,811	29,116	30,600	29,279	26,548	21,136	31,561
Infrastructure Contribution	23,932	24,077	24,024	23,847	23,409	23,123	22,834	23,445	23,166	22,916	234,774
Interest Income (Charge)	491	547	513	510	1,070	1,125	1,076	976	777	788	7,872
Total Available Balance	55,984	56,262	56,775	54,370	54,290	53,363	54,510	53,700	50,491	44,840	274,206
Allocation to Projects	24,346	24,024	26,762	24,559	25,174	22,763	25,231	27,152	29,355	23,405	252,772
Closing Balance	**31,638**	**32,238**	**30,013**	**29,811**	**29,116**	**30,600**	**29,279**	**26,548**	**21,136**	**21,435**	**21,435**

Note: Numbers may not add due to rounding

Stormwater Pipe Reserve Fund

The following table summarizes the Stormwater Pipe Reserve Fund opening balances, contributions, withdrawals, allocation to projects and closing balance. Over the next 10 years, $57 million in capital projects are planned for the replacement of the City's pipe infrastructure. This estimate is most likely to change with the completion of the City's asset management plan initiative.

The estimated replacement cost of the pipe inventory is $1.88 billion. In the 2012 Stormwater Financing Study, the sustainable level of recommended funding was $16 million annually. The annual contributions will amount to $6.1 million in 2019 and increase to $15.1 million by 2028. The annual Stormwater Charge will need to increase to maintain the proposed capital spending included in this plan.

Pipe Reserve Fund	2019 ($000's)	2020 ($000's)	2021 ($000's)	2022 ($000's)	2023 ($000's)	2024 ($000's)	2025 ($000's)	2026 ($000's)	2027 ($000's)	2028 ($000's)	2019-2028 TOTAL ($000's)
Opening Balance	13,378	14,535	16,657	19,975	19,972	21,094	23,328	33,533	45,096	58,273	13,378
Infrastructure Contribution	6,100	7,100	8,100	9,100	10,100	11,100	12,100	13,100	14,100	15,100	106,000
Interest Income (Charge)	316	389	511	490	775	857	1,232	1,657	2,141	2,689	11,059
Total Available Balance	19,794	22,024	25,268	29,564	30,847	33,051	36,660	48,290	61,337	76,063	130,437
Allocation to Projects	5,259	5,367	5,293	9,592	9,753	9,724	3,127	3,194	3,064	2,880	57,254
Closing Balance	**14,535**	**16,657**	**19,975**	**19,972**	**21,094**	**23,328**	**33,533**	**45,096**	**58,273**	**73,183**	**73,183**

Note: Numbers may not add due to rounding

Stormwater Development Charges – Stormwater Management

The following tables summarize the Stormwater Development Charges – Stormwater Management Reserve Fund opening balance, contributions, withdrawals, allocation to projects and closing balance. In keeping with the City's Development Charges policy, Development Charges revenues and costs are closely monitored. Projects in the medium and longer term will be re-evaluated as part of the annual budget process.

DCA - Stormwater Management Reserve Fund	2019 ($000's)	2020 ($000's)	2021 ($000's)	2022 ($000's)	2023 ($000's)	2024 ($000's)	2025 ($000's)	2026 ($000's)	2027 ($000's)	2028 ($000's)	2019-2028 Total ($000's)
Opening Balance	33,026	33,451	27,908	14,362	7,243	4,240	6,800	4,262	6,985	8,436	33,026
Development Revenue	2,368	2,697	2,772	3,126	3,217	3,475	3,410	3,443	3,182	3,507	31,197
Interest Income (Charge)	580	552	284	161	105	168	105	172	208	203	2,537
Total Available Balance	35,974	36,700	30,964	17,649	10,565	7,883	10,315	7,877	10,375	12,146	66,760
Allocation Projects	2,523	8,792	16,602	10,406	6,325	1,083	6,053	892	1,939	3,934	58,548
Closing Balance	**33,451**	**27,908**	**14,362**	**7,243**	**4,240**	**6,800**	**4,262**	**6,985**	**8,436**	**8,212**	**8,212**

Note: Numbers may not add due to rounding.

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Appendix 1: Listing of Projects for Multi-Year Funding

The following projects, with multi-year funding, which have or will commence prior to full funding being allocated, are recommended to be approved to a maximum cost as follows:

Project Number	Project Name	Total All Years	Periods
TWSD00309	Sawmill Creek Erosion Control - The Folkway to Erin Mills Pkwy	2,020,000	2019 to 2021
TWSD00488	Land/Cooksville Creek SWM Pond#2101/City Centre Outlet	6,980,000	2019 to 2020
TWSD00214	Cooksville Creek Flood Storage Facility - Mississauga Valley	8,380,000	2019 to 2020
TWSD00465	Mississauga LRT Storm Sewer Improvements	24,103,000	2019 to 2021
		41,483,000	

Note: Numbers may not balance due to rounding. Numbers are gross.

Appendix 2 – Summary of Reserve and Reserve Fund Transfers

Transfers from the Operating Program to the following Reserve and Reserve Funds in 2019 are:

- $23,989,091 to Stormwater Capital Reserve Fund
- $6,100,000 to Stormwater Pipe Reserve Fund
- $177,562 to Tax Capital Reserve Fund

Transfers from the Stormwater Fiscal Stability Reserve for the billing system implemented in conjunction with the Region of Peel and fluctuations in revenues and expenses, will be based on the actual amounts incurred.

Glossary

Please refer to section “V - Glossary” for corporate and Stormwater-related definitions.