

City of Thunder Bay

Thunder Bay Stormwater Financing Strategy Report

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Executive Summary

Project Background and Approach

In 2016, the City of Thunder Bay’s Council adopted the Stormwater Management Plan which will guide the City’s stormwater management actions for the next 20 years. In 2016, the City of Thunder Bay (“the City”) also completed an Asset Management Plan. The findings of the Stormwater Management Plan and Asset Management Plan, together, identified an annual \$5.7M gap in stormwater investment. In 2017, the City decided to conduct a Stormwater Financing Strategy – to review and recommend a sustainable and fair funding source to address the Infrastructure Gap and support stormwater initiatives and future goals. Another motivating factor is Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure¹, which requires municipalities to have sustainable funding mechanisms in place by 2024.

The Stormwater Financing Strategy was designed to answer the following questions:

- How does the City currently pay for stormwater, where do the funds come from, and is it fair?
- What is the fairest way to generate increased, sustainable funds for stormwater, while balancing what the community can afford and the ease of implementing changes?
- How should the City implement the preferred financing strategy?

The resulting project approach can be summarized by the following steps.

1. Evaluate current expenditures and funding sources
2. Evaluate the “sources” of stormwater in the City
3. Identify and evaluate funding options and alternatives
4. Determine the appropriate and affordable level of service for future stormwater program projects and activities
5. Solicit feedback from a Stormwater Advisory Committee, Internal Steering Committee, Stakeholders, and the Public
6. Review findings and feedback and recommend a preferred option
7. Present Study findings and preliminary recommendations to Council and the public in early 2019

1. This Regulation came into effect after the Request for Proposal for this Strategy was issued.

Stormwater Needs and Expenditures

The City currently funds its stormwater program through three sources; namely: taxes (general municipal levy, sewage & drainage special area levy); sewer rate charge; and grants. In 2018, the stormwater program costs were \$5,910,000, where \$5,070,000 was funded through property tax revenue and \$840,000 was funded through sewer rates. This resulted in the average urban detached home contributing \$68 towards stormwater (\$48 from taxes and \$20 from the sewer rate charge).

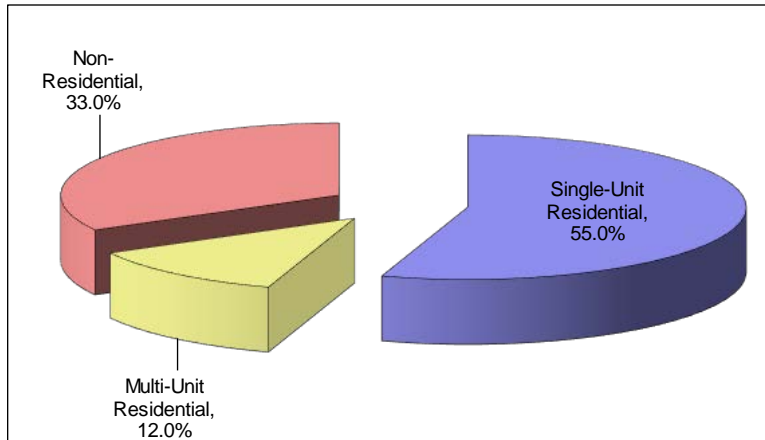
For the City to address the \$5.7M stormwater funding gap, it would need to spend \$12,140,000 per year on stormwater Operations & Maintenance, capital improvements and contributions to the Conservation Authority. It was understood that the City may not be able to achieve \$12M in funding in the short term so additional funding levels (and associated lower levels of service) were identified that may be more achievable and affordable. These funding levels are:

- \$3,990,000 – portion of the City's 2018 stormwater management program that is funded through property taxes and the sewer rate charge for Operations & Maintenance activities
- \$5,910,000 – total 2018 budget from all sources except the sewer rate charge for capital projects
- \$9,030,000 – average of \$5,910,000 and \$12,140,000
- \$12,140,000 – required budget based on the 2016 Stormwater Management Plan and is expressed in 2018 dollars

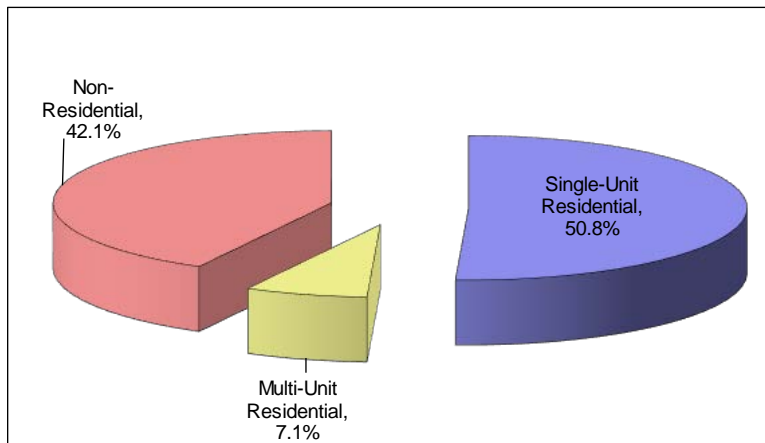
Key Findings

This study reviewed a range of financing mechanisms that have been used to support municipal stormwater management programs throughout North America, including Property Tax, Development Fees and Stormwater User Fees. For this study, a parcel database was compiled for all 44,296 properties in Thunder Bay. Residential properties currently contribute 67% of the tax levy funding for the City's stormwater management program and 33% of the funding is contributed by non-residential properties. The impervious area distribution however indicates that 58% of the City's stormwater runoff comes from residential areas and the remaining 42% from non-residential properties. A stormwater user fee that allocates funds based on imperviousness would result in a redistribution of 9%, or approximately \$360,000 based on current revenues. That is, the average residential property would pay 9% (approximately \$7.00 annually) less towards stormwater management in the City, whereas the average non-residential property would pay 9% more compared to current taxation.

Tax Revenue Distribution



Impervious Area Distribution



The public consultation process consisted of one Public Information Centre, an online comment form, a page on the City’s website, social media, two Council Education Sessions, attendance at Neighbourhood Ward meetings, four Stormwater Advisory Committee Meetings, one-on-one stakeholder engagement meetings, and presentations at annual Developers/Consultants meetings. Most survey respondents feel they already pay enough in taxes, but some said that they would support a new stormwater fee if it was fair. Tax exempt properties expressed concerns. Rural properties wanted to be treated differently as they feel they do not receive the same services as urban areas. Ironically it was determined that residential properties are subsidizing stormwater expenditures in rural areas.

Conclusions

The current financing mechanism does not meet all of the City’s stormwater management program needs. This conclusion echoes the precursor 2016 Stormwater

Management Plan and 2016 Asset Management Plan studies that identified a stormwater funding gap of between \$3M as of 2015 and \$6M per year based on 2015 to 2019 expenditure.

Stormwater program funding options were initially screened in consideration of the unique constraints and opportunities in Thunder Bay. Based on direction from City staff and guidance provided by the Advisory Committee, the options were short-listed into a set of six viable alternatives (i.e., two taxation options and four stormwater user fee options) to support the City's future stormwater management program.

These funding options were further evaluated with detailed financial and technical analyses that considered a wide range of parcels, housing types, and development densities across the City of Thunder Bay. Base charges were identified for each of the six options and representative property charges for the various property classifications were developed and results compared as part of the evaluation.

As the project progressed, preliminary results of the funding analysis were shared with City staff and communicated to the Advisory Committee. Based on feedback provided, the funding options as well as the analytical methods used to evaluate options, were refined in order to assist City staff in the decision-making process.

Based on current forecasts, the City was planning to increase their stormwater management program by less than \$200,000 annually in the short-term. City staff felt that the cost of implementing and administering a stormwater fee would be more justified when the City decides to significantly increase their stormwater program as the cost to implement a new user fee is too high compared to current expenditure levels. City staff also understood that, given the new Asset Management Regulation, defining sustainable funding levels would need to be done for all asset types and implementing changes to stormwater financing in isolation may not align with the future holistic plan that includes all infrastructure assets. This ultimately led to a staff administrative update to Council in May 2019, which recommended no changes to the current stormwater financing mechanism at this time.

In the interim, the City will continue to pursue additional funding sources (e.g., grants) for stormwater capital projects to reduce the infrastructure gap. Capital expenditures were identified as the largest portion of the infrastructure gap in both the Stormwater Plan and Financing Strategy.

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1. Introduction

This section summarizes the study goals and objectives, the individual study tasks, project team organization and key highlights.

1.1 Background

The City of Thunder Bay maintains stormwater infrastructure that includes pipes, inlets (e.g., catch basins), service connections, swales, ditches, watercourses, culverts, storage and treatment facilities (e.g., ponds, green infrastructure, etc.) as well as overland flow routes and outlets to receiving waters. The management of these assets includes: the design and construction of new assets such as stormwater management treatment facilities; stream rehabilitation and flood mitigation work; operations, maintenance and rehabilitation of existing infrastructure; monitoring and other activities to comply with environmental regulations; emergency response and clean-up; street sweeping; and the enforcement of by-laws. This City also supports the Lakehead Regional Conservation Authority through the annual levy payment which helps maintain the operational and maintenance as well as capital works on Neebing McIntyre floodway. By managing the quality and quantity of stormwater reaching our infrastructure, streams, rivers and lakes, the City's overall stormwater system protects the health and safety of the public and the natural environment.

Despite investments in the City's stormwater infrastructure, stormwater related issues such as flooding, poor water quality and stream erosion are persistent. 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 become more rigorous in addressing the environmental impacts of stormwater. These requirements are also compounded by the impacts of climate change and will affect future capital replacement costs. While the current Asset Management Plan is based on replacing existing infrastructure for similar infrastructure, it may be necessary to install larger infrastructure at a higher cost which is not accounted for in the current plan.

As part of the City of Thunder Bay's ongoing infrastructure management program the City has embarked upon several initiatives. Two key studies were recently completed that identified the infrastructure funding needs required to support the City's long-term stormwater management program, namely:

- City of Thunder Bay Stormwater Management Plan (EOR, June 2016): This plan identified recommended studies and inventories, capital projects and Operations & Maintenance programs at an estimated total cost of **\$12.14M** to be implemented over the next twenty years.
- Asset Management Plan for the Corporation of the City of Thunder Bay (2016): Stormwater management system assets received a “D” grade on the Infrastructure Scorecard, and current funding for stormwater assets and found there was a **\$3.3M annual funding gap**.

Continued underfunding of the City’s stormwater management program will only widen the gap between future needs and available funding. Further, continuing the status quo poses a threat by not addressing the risk of flooding/erosion damage or the negative environmental impacts on waterways and groundwater supplies.

The City has experienced financial challenges under the present funding system which consist of both property taxes and rate charges from water billing. Stormwater revenue drawn from tax funds must compete with many other City services and is often inadequate to provide the service levels demanded by federal/provincial regulatory agencies, citizens, businesses, other community organizations, and a changing climate. In order to support the City’s stormwater management program in the future, alternative funding options beyond the current property tax and water rate system need to be explored.

In November of 2017, a consulting team led by AECOM was retained by the City to undertake a Stormwater Financing Strategy, with the task of identifying, reviewing and evaluating alternative funding mechanisms to support the municipal stormwater management program in Thunder Bay and to recommend the preferred funding approach.

1.2 Goals and Objectives

The overall goal of this study is to identify the most appropriate revenue source(s) to support the City’s stormwater management program. Among the guiding principles to evaluate funding options is the desire to be:

- Financially sustainable: the revenue stream is stable, self-supporting, and dedicated specifically to stormwater management.
- Equitably allocated: program costs are paid with funds that are generated in a fair and impartial manner.

- Fully supportive: provides a secure and long-term funding source to support the current and future stormwater program needs of the City.
- Environmentally friendly: encourages stewardship by offering financial incentives to property owners who provide on-site controls to reduce stormwater runoff and pollutant loads.
- Publicly supported: study findings and recommendations have been vetted through a focused public and stakeholder consultation process.

To achieve these goals, the main objectives of the funding study include:

- Identify and evaluate the current stormwater expenditures and existing revenue sources, as well as sources of stormwater in the City;
- Determine the appropriate and affordable level of service for future stormwater program projects and activities;
- Identify, evaluate and seek feedback on funding options and alternatives;
- Recommend the preferred funding approach; and
- Develop an implementation strategy and plan.

1.3 Project Team

The project team was led by Aaron Ward (Project Manager – Engineering & Operations Division) and guidance was provided by a City of Thunder Bay Internal Steering Committee. Technical guidance and assistance for this study was provided by an engineering consulting team that included the following firms:

- AECOM Canada Ltd. was the lead firm, responsible for the overall project management, co-ordination, and support of the technical analyses. AECOM has conducted similar stormwater rate studies in Ontario, Alberta, and British Columbia as well as other stormwater management policy development, stormwater inventory and drainage assessments, water and wastewater rate studies, and creek and pond rehabilitation projects.
- Don Stone Inc. performed the parcel analysis and database development for this study. Don Stone has established himself as a leader in the development and implementation of stormwater rates, having conducted stormwater funding studies for over 180 communities throughout North America.
- Computational Hydraulics International assisted with the technical analyses, presentations, and reporting.

1.4 Approach and Key Highlights

The project team's approach to achieve the stated goals and objectives is summarized as follows:

- Engage affected or interested stakeholders about stormwater management funding in Thunder Bay to ensure community needs and objectives are reflected in funding recommendations.
- Evaluate the existing stormwater program revenue needs and determine future revenue needs to provide an appropriate level of service that meets the City's objectives for flood and environmental protection and regulatory requirements and satisfies public service expectations.
- Investigate a range of viable funding options to support the desired service levels and determine the financial impacts (i.e., average annual charge) for representative property owners throughout the City.
- Identify the preferred funding mechanism and recommend an implementation strategy for Council approval, if required.

The scope of work for this study was divided into the following tasks:

- **Task 1** – Research and Data Collection: The project team collected, and reviewed asset/inventory and financial information related to the City's stormwater management program. This information was used to quantify the cost of the existing stormwater management program including Operations & Maintenance, capital projects, asset management, planning, and monitoring activities.
- **Task 2** – Levels of Service and Funding Options: The team updated future needs from the 2016 stormwater management Plan (EOR) and the necessary activities that are not currently being performed but will likely form part of the future stormwater management program. This was used to identify a range of service levels to address future pressures and achieve regulatory requirements. Alternative options that have been used to provide funding for similar municipal stormwater management programs throughout Canada and the U.S. were reviewed and evaluated.
- **Task 3** – Recommended Program and Funding Strategy: The team identified a preferred funding option(s), including the development of a strategy to implement the recommendations.
- **Task 4** – Community Engagement and Reporting: Throughout the study, the team informed members of the community, provided access to accurate and

timely information, as well as solicited feedback and encouraged public and private sector contributions from stakeholders throughout Thunder Bay. Technical input was provided for City communications and website materials were also developed over the course of the study.

An outcome of the project included submittal of a study report documenting the analysis, community engagement, study findings, recommendations, and an implementation strategy. A key highlight of this study was the community engagement process. The following summarizes the public consultation undertaken as part of this study. More details are provided in Section 5 of this report.

1.4.1 Stormwater Advisory Committee

To assist with the public engagement process undertaken as part of this study, the project team was involved in the formation of a Stormwater Advisory Committee and facilitation of group meetings. City staff identified many potential organizations throughout Thunder Bay to include in the Stormwater Advisory Committee. Based on the consultant team's experience, a number of possible interests, concerns, and opportunities have been noted for general categories of citizens and business owners to include within the Stormwater Advisory Committee, including:

- Single Unit Residential Homeowners
- Multi-Unit Residential Property Owners or Managers
- Commercial / Industrial Property Owners or Managers
- Tenants (Residential and Non-Residential Properties)
- Business Associations / Chamber of Commerce
- Property Developers/Realtors
- Governmental Agencies
- Tax-Exempt and Institutional Property Owners or Managers

Staff contacted a total of 41 organizations and members of the general public to solicit membership in the Stormwater Advisory Committee and of these, 13 organizations committed to participating. There were 17 different people from the 13 organizations attending meetings, sometimes different staff from the same organization. Members included representatives from residential associations, the business and development communities, tax-exempt properties and other interested parties. Group members were asked to represent the views of their organizations or sector and provide input on issues such as priorities of the City's stormwater management program and setting an appropriate level of service and expenditure to meet these needs. The Terms of

Reference defining the role of the stakeholder members is included in **Appendix A Stormwater Advisory Committee Terms of Reference**.

Table 1 shows the member organizations that comprised the advisory group, along with meeting attendance. A series of four facilitated Stormwater Advisory Committee meetings (meeting 3 was split into two meetings – 3A and 3B) were held at City Hall and Victoriaville Civic Centre:

- **Meeting #1:** held January 23, 2018 (City Hall) and attended by 11 member organizations, along with eight City staff and three AECOM consultants;
- **Meeting #2:** held June 28, 2018 (Victoriaville Civic Centre) and attended by nine member organizations, along with four City staff and two AECOM consultants;
- **Meeting #3A:** held November 19, 2018 (Victoriaville Civic Centre) and attended by eight member organizations, along with four City staff and two AECOM consultants; and
- **Meeting # 3B:** held December 10, 2018 (Victoriaville Civic Centre) and attended by six member organizations, along with one City staff and three AECOM consultants.

Table 1: Stormwater Advisory Committee Members

Organization	Name	Attended Meeting #1	Attended Meeting #2	Attended Meeting #3A	Attended Meeting #3B
Confederation College	Sandra Stiles	Yes	Yes	Yes	No
Di Gregorio Developments	Enzo Di Gregorio	Yes	No	No	No
EarthCare	Rena Viehbeck	Yes	No	No	No
Eco Superior	Will Vander Ploeg	No	Yes	Yes	Yes
Eco Superior	Ellen Mortfield	Yes	Yes	No	Yes
Eco Superior/ Thunder Bay District School Board	Jamie Saunders	Yes	No	No	No
Lakehead Region Conservation Authority	Simon Shankie	Yes	No	No	No
Lakehead Region Conservation Authority	Tammy Cook	Yes	Yes	Yes	No
Lakehead Region Conservation Authority	Gail Willis	No	No	Yes	Yes
Lakehead University	Steve Girvin	Yes	No	No	No
Red Sky Métis Independent Nation	Kayla Searle	Yes	Yes	Yes	Yes
Resident	Valerie Cameron	No	Yes	Yes	Yes

Organization	Name	Attended Meeting #1	Attended Meeting #2	Attended Meeting #3A	Attended Meeting #3B
SHIFT	David Noonan	Yes	No	No	No
Thunder Bay Chamber of Commerce	Charla Robinson	No	Yes	No	No
Thunder Bay Community Economic Development Commission	Jessi Ruberto	No	Yes	Yes	No
Thunder Bay Community Economic Development Commission	Richard Pohler	Yes	No	No	No
Zanette Realty	Robert Zanette	Yes	Yes	Yes	No

1.4.2 Other Community Engagements

In addition to the Stormwater Advisory Committee, the Project Team has undertaken additional efforts to communicate the City’s unique stormwater needs, desired service levels, and available funding methodologies to support its stormwater program, including:

- An introductory presentation to City Council on January 22, 2018;
- One Public Information Centre was held on January 23, 2018 and included a display of poster boards, a comment form and a formal presentation;
- An online version of the comment form was shared through the Study webpage and advertised on social media. A total of 131 responses were recorded and reviewed by City staff and the project team;
- City staff attended and presented at five Councillor Ward meetings in 2018 with approximately 90 people total in attendance;
- City staff offered to meet directly with numerous organizations and met with five stakeholder organizations; and
- City staff presented at the City’s Annual Developer/ Consultant meeting in March 2018 with greater than 40 people in attendance.

More detail about the community engagement is provided in Section 6. **Appendices B through E** contain materials presented at each Stormwater Advisory Committee meeting along with meeting minutes. **Appendix F** contains materials from the Public Information Centre and a summary report, including written and online comments that were received. **Appendix I** contains the presentations delivered to Stakeholders for the one-on-one meetings. **Appendix J** contains the presentations delivered at the Ward meetings.

1.5 Report Organization

The objective of this report is to present the work and findings of this Study for the City of Thunder Bay to enable them to decide on a funding mechanism that will sustainably meet the financial and operational needs of the stormwater management program. The remaining sections in this report include the following:

- Section 2 presents an overview of municipal stormwater management programs and specific details of the City's program;
- Section 3 summarizes the various stormwater funding mechanisms and presents the options that were carried forward for detailed evaluation;
- Section 4 describes the analysis of funding options that were identified in Section 3;
- Section 5 outlines the community engagement features of this study; and
- Section 6 gives the conclusions and recommendations.

2. Municipal Stormwater Management Programs

This section provides an overview of municipal stormwater management programs, typical needs and issues as well as the specific details on the City's stormwater management program.

2.1 Background

Managing stormwater involves controlling the quantity and quality of runoff resulting from rainfall and snowmelt. Urbanization dramatically changes the runoff response characteristics of natural land surfaces and a variety of problems can result when stormwater management systems and facilities are not properly managed. Stormwater problems are most evident in areas that are prone to chronic flooding or erosion, but less discernible are the long-term impacts to water quality, stream stability, and the environment in general.

Stormwater management systems represent valuable public assets that provide many benefits for many users. The municipal stormwater management system includes storm sewers, roadside ditches, watercourses, culverts, swales, catch basins, outfalls, ponds and other water quality treatment facilities. By controlling floodwaters and preventing pollutants from reaching our streams, rivers and lakes, these systems protect the health and safety of the public and the environment as well as minimize flooding and erosion threats to public and private property. In so doing, clean and healthy water resources support public drinking water supplies and can attract local investment through increased land values. Furthermore, clean and healthy water resources support recreational activities, tourism, business and manufacturing, as well as aquatic and terrestrial habitats that rely on water.

Municipal stormwater management refers to all the services provided by a local unit of government to properly and effectively manage stormwater within the community (i.e., collect, convey, transport, store, treat, and discharge to a downstream receiving waterbody or waterbodies). A typical municipal stormwater management program includes several components as illustrated in **Figure 1**, including:

- Design, permitting, and construction of new capital projects
- Operation and maintenance of stormwater management assets, including inspections, cleaning and repairs

- Asset management, valuation, and planning
- Rehabilitation, renewal, retrofit, reconstruction or upgrade of existing facilities
- Emergency response, recovery, and clean-up for flooding events, system failures (e.g., pipe collapses, streambank slope instabilities), spills and other water quality violations
- Engineering and support services for review and regulation of proposed developments, inspection, monitoring, environmental compliance programs, record maintenance and document management
- Support for public education and community involvement programs
- Administration, staffing, computer resources, equipment, etc.
- Enforcement of by-laws and detection of illicit discharges and cross-connections

Figure 1: Components of a Municipal Stormwater Management System



In general, municipalities are responsible for managing all aspects of stormwater within their jurisdiction, including operations and maintenance of stormwater management assets located within the public right-of-way limits or easements. The City of Thunder Bay does not maintain assets that are located on private property, within provincial road rights-of-way, or that fall under the jurisdiction of another agency, such as the federal government or Conservation Authorities. For example, the Neebing McIntyre Floodway,

which is owned and operated by the Lakehead Region Conservation Authority, but Lakehead Region Conservation Authority receives an annual levy from the City of Thunder Bay for related flood and erosion works the Lakehead Region Conservation Authority undertakes with City.

Typical municipal drainage and stormwater management problems can generally be classified into the categories outlined below.

- **Flooding:** This is probably the most visible of stormwater problems. Serious flooding presents a threat to public safety and can damage public and private property, disrupt business, result in insurance premium increases or loss of coverage, and otherwise hamper normal activities within a community. Stormwater management assets are designed to safely collect, convey or store runoff as a result of rainfall and snowmelt events. However, the intensity, timing and frequency of these events is subject to change as a result of climate variability. During frequent rainfall events, runoff is collected in the minor system of storm sewers, swales, and roadside ditches. During the rare events in which the minor system capacity is exceeded, runoff is also conveyed through the major system that includes curb and gutter drainage in the public road right-of-way and other surface overland flow routes and storage in detention facilities or floodplain areas.
- **Pollution:** Road salt, oil/grease, metals, nutrients, chemical spills, illegal dumping, sediment and urban debris can degrade water quality, impacting the natural environment including aquatic and terrestrial habitat as well as affecting drinking water supplies. Stormwater management systems are designed to improve the water quality of discharge of urban runoff to receiving waterbodies, but need to be properly planned, constructed, operated, and maintained in order to do so.
- **Erosion:** Water traveling over a bare or unprotected surface will erode the soil material, increasing sediment loads discharged to the watercourse. In addition, water traveling too fast in watercourses can erode the stream bank/bottoms thereby decreasing the downstream water quality as well as threaten the stability of the streambank, which can jeopardize both public and private property if not addressed properly. Stormwater management systems are designed to control the movement of stormwater in such a way as to minimize the erosion of streambanks, adjacent hill slopes, and exposed structures.
- **Debris/Deterioration:** During rainfall events, debris, trash and other deleterious material on land surfaces can be transported through the stormwater management system. As a result, this material may create a

barrier to flow and increase the flooding potential, or it may flow to downstream watercourses and impact water quality. The conveyance capacity of stormwater infrastructure can also be impacted by deteriorating drainage systems. Routine inspection and maintenance of the stormwater collection system and other facilities, as well as an appropriate emergency response/recovery program is necessary to minimize these problems.

Despite substantial investments in municipal stormwater management systems and facilities, there will always be a need to invest in new capital improvement projects as well as maintain and renew the existing stormwater system. Ongoing stormwater work is required to address the following issues:

- **Urbanization:** Growth and development adds new impervious area to landscapes, which alters the amount of runoff and pollution discharged to the stormwater management system. Additional impacts may include the compaction of soil, removal of native vegetation, and the alteration of natural drainage systems.
- **Aging Infrastructure:** Pipes, culverts, pond control structures, hardened streambanks, outfalls, etc. have a limited life expectancy and must be repaired or replaced eventually. Structural deficiencies result when aging infrastructure has exceeded its service life. Additional performance issues can emerge exist as systems and use expands and the maximum hydraulic capacity of the systems is exceeded.
- **Regulatory Requirements and Design Standards:** Regulatory requirements are always changing (e.g., increased design standards due to more stringent regulatory requirements, greater understanding of the watershed, or new information about climate projections, etc.). As a result, systems designed to previously accepted criteria may be inadequate with respect to current standards. Also, the level of protection to be provided by stormwater management facilities is often dictated through studies and governing agencies for water quality and habitat protection. Therefore, when an existing system/ facility is replaced, it is not likely that the same system (i.e., pipe sizes) can be reinstalled. The facility will likely have to be updated/ upsized to comply with current standards, which results in a higher capital cost compared to when it was installed, and a higher cost than what is included in the Asset Management Plan.
- **Climate Change:** The impacts of climate change may include an increase in the frequency and severity of extreme rainfall events, increasing temperatures, and more rapid snowmelt events throughout Ontario. Consequently, municipalities may expect more frequent exceedances of past

and existing stormwater design criteria. Future infrastructure planning, design, and construction projects based on adapting to climate change will place further financial stress on municipalities and their ability to fund stormwater services.

- **Planning:** To avoid future problems, municipalities must proactively plan its stormwater management program to ensure the appropriate resources, measures, and improvement projects address needs and problems. In addition, facilities and stormwater management assets must be inventoried and evaluated at regular intervals, in keeping with best practices for municipal asset management. Also, funding must be available as the projects are required.
- **Development:** New development and re-development must be properly reviewed by the municipality and adequately inspected during construction to ensure that: the proposed development does not negatively impact the stormwater system (including natural assets); the stormwater infrastructure has been adequately designed; all infrastructure has been built to the agreed upon design; and all infrastructure performs adequately before acceptance by the City.
- **Maintenance:** To avoid problems, municipalities must actively and routinely inspect all assets (including pipes, ponds, ditches watercourses etc.), operate facilities, and clean and repair assets as required (including catch basins, inlets/outlets, streets/gutters, watercourses, pipes, ditches, etc.). Municipalities have an obligation to maintain stormwater management facilities to meet the Environmental Compliance Approval requirements pursuant to provincial legislation.

Like other public works, stormwater management assets have a specific design capacity and service life, regular Operations & Maintenance needs, and their performance decreases with age and additional demands placed on the system. As a result, stormwater assets must be inventoried, assessed, valued, and managed according to sound asset management principles in order to plan an appropriate schedule for replacement, renewal, and rehabilitation.

Of all the public works provided by a municipality, stormwater management services are often the least understood by members of the community. Storm pipes are underground and out of sight, and detention facilities and ponds are presumed to be natural features, such that their function is not easily recognized. As a result, there is little public awareness of a municipality's stormwater management services, program needs, and expenditures. Stormwater management systems often only attract attention during periods of rainfall, particularly when systems fail, or rainfall exceeds the design capacity

resulting in property flooding or road inundation. Further, property owners have widely varying perceptions concerning how their properties generate stormwater runoff and pollution, since usage of the municipal stormwater management system is not based on demand in the same manner as water and sanitary systems (e.g., turning on a tap, flushing a toilet). This may result in the misconception that property owners cannot control the discharge of stormwater runoff from their property into the municipal stormwater management system.

2.2 Regulatory Requirements

Stormwater regulations and design standards are continually evolving, resulting in many existing stormwater management systems and facilities that do not meet current federal or provincial requirements, or municipal design standards for the construction of new assets and/or long-term maintenance. More stringent federal and provincial requirements for water quality and quantity control are also being proposed, further widening the gap to bring these publicly owned systems into compliance.

There are several policies and practices in the City of Thunder Bay that could potentially be impacted by stormwater management policy changes.

To achieve full regulatory compliance, the City recognizes the need to increase its stormwater management related level of service and performance standards, which is a key driver for this study. Furthermore, increased levels of service are needed in the extent and frequency of Operations & Maintenance activities and in the implementation of the City's capital improvements programs to accelerate currently planned and backlogged projects.

Traditionally, there have been limited regulatory requirements for the design of stormwater assets and there are very few performance measures or "benchmarks" compared to water and sewage systems. Design criteria prior to the mid-1990s were focused on flood control objectives only. Water quality, erosion, and other environmental hazards began to be addressed since the 1990s through new permitting and approvals processes.

The following summarizes the pertinent regulatory requirements from the various levels of government and other agencies.

2.2.1 Ontario Regulation 588/17

Many municipalities begin investigating alternative funding sources once they have completed an asset management plan and/or a stormwater management master plan and realize the magnitude of work that should be undertaken. Sometimes a large

flooding event provides additional impetus for municipalities to examine their stormwater program funding options. Another motivating factor is **Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure**², which requires municipalities to have sustainable funding mechanisms in place by 2024. **Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure** is summarised in the following table.

Table 2: Ontario Regulation 588/17: Dates and Regulatory Requirements

Deadline Date	Regulatory Requirement
July 1 st 2019	All Municipalities are required to prepare their first Strategic Asset Management Policy.
July 1 st 2021	All municipalities are required to have an Asset Management Plan for its entire core municipal infrastructure.
July 1 st 2023	All municipalities are required to have an asset management plan for infrastructure assets not included under their core assets.
July 1 st 2024	All Asset Management Plans must include information about the levels of service that the municipality proposes to provide, the activities required to meet those levels of service, and a strategy to fund activities

2.2.2 Provincial and Federal Legislation

The Ontario Water Resources Act (RSO 1900 and amendments) prohibits activities that introduce pollutants into natural waterbodies, such as creeks, rivers and lakes:

“Every person that discharges or causes or permits the discharge of any material of any kind into or in any waters .. that may impair the quality of the water... is guilty of an offence” (Section 16.(1)).

The Ontario Water Resources Act gives the Ontario Ministry of the Environment, Conservation and Parks authority to regulate water supply, sewage disposal and to control sources of water pollution, which includes surface waters and groundwater in Ontario. The Ontario Ministry of the Environment, Conservation and Parks issues Environmental Compliance Approvals under Section 53 of the Ontario Water Resources Act for the treatment and disposal of sewage by municipal and private systems, which includes stormwater management facilities. Stormwater is defined as “sewage” under the Ontario Water Resources Act. Stormwater facilities constructed prior to the mid-1950s (when the Ontario Water Resources Act was first applied) would not have received approval. A Director, as defined in the Ontario Water Resources Act, has the power to order the owner of a sewage works (e.g., a municipality owning a stormwater management pond or a storm sewer system) that may discharge deleterious material

2. This Regulation came into effect after the Request for Proposal for this Strategy was issued.

into a watercourse to carry out works or activities to reduce or alleviate the water quality impairment. This power has not been applied to municipalities for normal operation of storm sewer and stormwater management systems, although it could be.

Current practices demonstrate that although regulatory agencies (e.g., Ontario Ministry of the Environment, Conservation and Parks and Conservation Authorities) encourage retrofit controls, they have not enforced a formal requirement. However, a formal obligation for retrofit controls could be applied through the discretionary powers of Ontario Ministry of the Environment, Conservation and Parks. The main impetus has been that municipal staff has accepted the premise that watercourses are part of the natural environment and must be protected and rehabilitated as part of their infrastructure management responsibility. These are embodied in stormwater management guidelines discussed later in this section.

Provincial Water Quality Objectives are numerical and narrative criteria which serve as chemical and physical indicators representing a satisfactory level for Ontario's surface and groundwaters under the Ontario Water Resources Act, based on public health and aesthetic considerations. The Provincial Water Quality Objectives are intended to provide guidance in making water quality management decisions and are often used as the starting point in deriving requirements included in Environmental Compliance Approvals. They are also used to assess ambient water quality conditions, infer use impairments, assist in assessing spills, and monitoring the effectiveness of remedial actions.

The **Ontario Clean Water Act**, 2006 ensures communities can protect their municipal drinking water supplies through developing collaborative, locally driven, science-based protection plans. Under this Act, communities are required to identify existing and potential threats to their water supplies and take action to reduce or eliminate the significant threats and risks. This will require municipalities to work in collaboration with the regional governments and Conservation Authorities, which may lead to programs and criteria to be developed and incorporated into City policies.

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 Brownfields Act incorporates a number of technical documents that specify soil and groundwater remediation criteria and laboratory analytical protocols. These protocols address landfilling operations for dredged sediment from stormwater management facilities, for which the City of Thunder Bay would be responsible for sediment sample collection and laboratory chemical analysis costs.

The **Ontario Emergency Management Act**, revised and amended from the Emergency Plans Act through Bill 148 in 2002, legally mandates that municipalities implement risk-based emergency management programs and as part of this, perform hazard and impact risk assessment, including assessment of weather-related risks, to critical infrastructure. These emergency management programs consist of emergency plans, training programs and exercises, public education and any other element prescribed by regulation. Municipalities are required to review and, if necessary, update these emergency management plans on an annual basis. This regulation has particular application to a municipality's stormwater management program given its role in drainage and mitigating the effects of weather-related flooding.

The **Ontario Water Opportunities Act**, 2010 is intended to guide clean water technology, services and conservation efforts, as well as promote innovative and cost-efficient solutions for drinking water, sewage and stormwater system challenges. Under this Act, municipalities and other water service providers are required to prepare municipal water sustainability plans. Grant funding programs have also been initiated to stimulate innovative municipal water sustainability research, planning and commercialization of new technologies, as well as support public education and awareness about water conservation.

Although stormwater management is not specifically addressed, the Ontario Sustainable Water and Sewage Systems Act, 2002 was also 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, collectively known as "rates".

The **Canadian Environmental Protection Act**, 1999 was enacted for the purpose of "pollution prevention and the protection of the environment and human health in order to contribute to sustainable development". In 2001, Environment Canada determined that road salts were entering the environment in large amounts and posed a risk to plants, animals, birds, fish, lake and stream ecosystems and groundwater. The report recommended that salt be designated as toxic under the Act. Furthermore, Environment Canada assembled a working group that developed the "Code of Practice for the Environmental Management of Road Salts" released in 2004. This document recommends that road authorities prepare salt management plans that identify actions they will take to improve their practices in salt storage, general use on roads and snow disposal. In Thunder Bay, the storm sewer systems are closely associated with the road network, and therefore salt management practices directly relate to the quality of stormwater runoff.

Subsection 36(3) of the **Canadian Fisheries Act** (R.S., 1985, c. F-14) prohibits the deposit of a deleterious substance into water frequented by fish. A deleterious

substance includes harmful chemicals but also sediment and water at an increased temperature. This can have an impact on the design and maintenance of the stormwater system including roadways, catch basins, manholes, ditches and ponds to reduce the amount of sediment discharged and to ensure outflow water temperature is not overly heated.

The preceding legislation addresses activities and services related to the City's stormwater management program. Regarding the legal authority to implement a stormwater service fee, the **Municipal Act**, SO 2001, s. 391, authorizes municipalities to pass by-laws for the recovery of both capital and operating costs for their stormwater management program. There are additional provincial statutes that set out limitations and procedures for establishing fees for specific services and situations, including:

- **The Building Code Act** (1992) allows fees to be charged for the administration and enforcement of the Building Code
- **The Planning Act** (1990) permits municipalities to establish fees for planning matters
- **The Development Charges Act** (1997) allows fees to be levied to pay for the growth-related capital costs of new development

In addition, the **Ontario Drainage Act**, 1990 allows municipalities to collect funds to make minor improvements, deepening, widening or extending a drain to an outlet. Municipal drain assessments are only intended for water quantity works (i.e., to provide conveyance capacity to the drainage outlet) with costs apportioned based on drainage area and runoff. Water quality/source water improvement projects, planning studies, and other urban drainage issues generally fall under the Ontario Water Resources Act rather than Drainage Act.

2.2.3 Regulatory Agencies

The agencies involved in the administration and approvals for storm drainage and stormwater management systems in Thunder Bay as described below.

2.2.3.1 Ministry of the Environment, Conservation and Parks

The Ministry of the Environment, Conservation and Parks' (formerly the Ministry of the Environment) vision is an Ontario with clean and safe air, land and water that contributes to healthy communities, ecological protection, and environmentally sustainable development for present and future generations. The Ontario Ministry of the Environment, Conservation and Parks develops and implements environmental legislation, regulations, standards, policies, guidelines and programs. The Ministry's

research, monitoring, inspection, investigations and enforcement activities are integral to achieving Ontario's environmental goals. The Ministry's responsibility includes an oversight role for municipal stormwater management, through a number of acts and regulations, but primarily through the Ontario Water Resources Act as noted above.

2.2.3.2 Ontario Ministry of Municipal Affairs and Housing

This provincial ministry sets out land use planning policies through the Provincial Policy Statement and acts as a one-window approval authority on such matters related to the Planning Act. Stormwater management is an important consideration in the subdivision planning process as part of the Planning Act. Further, the Places to Grow Act of 2005 enables the province, through Ministry of Municipal Affairs and Housing, to develop growth plans for any area in the province. As part of this Act, the Growth Plan identifies several policies related to stormwater management (e.g., municipalities are encouraged to implement and support innovative stormwater management actions as part of redevelopment and intensification). The Ontario Ministry of Infrastructure also develops general infrastructure policy and advises on the government's investment priorities in public infrastructure, including stormwater management, under the Building Canada Fund. In specific areas there may be additional planning requirements (e.g., the Greenbelt Plan, 2005 and the Growth Plan for the Greater Golden Horseshoe, 2006). Ministry of Municipal Affairs and Housing has oversight responsibilities for municipal authority and activities, as well as the Building Code.

2.2.3.3 Ontario Ministry of Natural Resources and Forestry

This provincial ministry's role for stormwater management is focused primarily on overseeing the response to floods and emergencies, with local implementation of emergency response plans. Ministry of Natural Resources and Forestry's role in planning is in association with Ministry of Municipal Affairs and Housing to approve Special Policy Areas which are designed to regulate historic towns and residential areas that lie inside floodplain areas and act to restrict further intensification of such areas. Ministry of Natural Resources and Forestry provides an oversight role for the Conservation Authorities Act and is also identified in an Order in Council 1492/1995 as the provincial lead ministry for flooding.

2.2.3.4 Ontario Conservation Authorities

These agencies were established under the Conservation Authorities Act to work collaboratively with the member municipalities to address a broad range of issues to jointly undertake water and natural resource management initiatives, and co-ordinate the preparation of environmental plans on a watershed or sub-watershed basis. Under

the Conservation Authorities Act, authorities permit development within regulated floodplains, as well as review and provide advice to municipalities on development matters affecting water quantity and quality. Many authorities have been designated under the Fisheries Act to comment on activities affecting fish habitats. Further, many Conservation Authorities maintain hydrologic and hydraulic models for the watershed, which can be used to develop stormwater master plans.

The City of Thunder Bay falls within the jurisdiction of the Lakehead Region Conservation Authority.

2.2.3.5 Ontario Ministry of Transportation

This provincial ministry functions both as an owner/developer and a regulator. As an owner/developer, Ontario Ministry of Transportation plans, builds and maintains highways including stormwater management systems. As a regulator, Ontario Ministry of Transportation develops design standards, reviews and approves design reports, and issues permits. Ontario Ministry of Transportation's key statutes pertaining to stormwater are the Public Transportation and Highway Improvement Act, which manages highway drainage and provides authority for construction, alteration and maintenance of roadways, drainage features, and other appurtenances within the highway corridor.

2.2.3.6 Ontario Ministry of Agriculture, Food and Rural Affairs

This provincial agency directs the planning and maintenance of drainage works, as authorized through provincial statutes pertaining to stormwater in the Drainage Act and Tile Drainage Act. These acts establish regulatory jurisdiction to Ontario Ministry of Agriculture, Food and Rural Affairs for managing rural drainage including authority for construction, alteration, and maintenance of designated municipal drains and tile drain systems.

2.2.3.7 Ontario Ministry of Community Safety and Correctional Services

Under the Emergency Management and Civil Protection Act, all provincial government ministries must set up an emergency management program. As a result, this Ministry has developed an Emergency Response Plan and Business Continuity Plan, which includes a stormwater flood response.

2.2.3.8 Canadian Federal Government: Environment and Climate Change Canada, Fisheries and Oceans Canada and Infrastructure Canada

Several federal agencies such as these provide science, monitoring and financial support related to stormwater management. In particular Environment and Climate

Change Canada has several networks and tools to monitor and predict our changing climate. Although there are a few federal acts that touch upon stormwater (e.g., Fisheries Act, Species at Risk Act, and the Canadian Environmental Assessment Act), the regulatory role is left to individual provinces. The federal government is also an important partner in municipal, provincial and federal infrastructure funding partnerships such as the New Building Canada Fund and the Federal Gas Tax Fund.

2.2.4 Agency Guidelines and Requirements

Several design standards, policies, guidelines and other agency requirements for stormwater management have been developed based on federal and provincial legislation and are described below.

Ontario Ministry of the Environment and Climate Change

- Water Management - Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of the Environment (Ministry of the Environment and Climate Change, 1994)
- Guide for Applying for Approval of Municipal and Private Sewage Works (Ministry of the Environment and Climate Change, 2000)
- Stormwater Management Planning and Design Manual (Ministry of the Environment and Climate Change, 2003)

Ontario Ministry of Natural Resources and Forestry

- Natural Channel Systems: Adaptive Management of Stream Corridors in Ontario (Ministry of Natural Resources and Forestry, 2002)
- Natural Hazards: Technical Guides for Rivers and Stream Systems and Hazardous Sites. (Ministry of Natural Resources and Forestry, 2002)
- Watershed management and storm drainage guidelines

Ontario Ministry of Transportation

- Drainage Management Manual (Ontario Ministry of Transportation, 1997)
- Stormwater Management Requirements for Land Development Proposals (Ontario Ministry of Transportation, 1999)

Conservation Authorities

- Low impact development and green infrastructure planning and design
- Protection and management of wetlands

- Regulation of development within floodplains
- Fisheries management plans (with Ministry of Natural Resources and Forestry)
- Special flood protection and erosion control projects
- Various water quality, water supply, geomorphic classifications, groundwater programs and watershed/subwatershed planning studies

2.3 City of Thunder Bay Stormwater Needs and Expenditures

To address long-term stormwater management funding requirements and to meet regulatory requirements, the City of Thunder Bay has embarked upon several initiatives involving surface water resources. Two key studies were completed that identified the infrastructure funding needs required to support the City's long-term stormwater management program, namely:

- The Thunder Bay 2016 Stormwater Management Plan was developed as part of the City's commitment to environmental stewardship and community sustainability. The Stormwater Management Plan was approved in principle by Council in 2016 and will guide the City's stormwater management actions for the next 20 years, which includes priority capital improvement projects to be implemented within this timeframe.
- The Thunder Bay 2016 Asset Management Plan inventoried the City's stormwater assets and determined their replacement value (for the years of 2011 to 2015). The Asset Management Plan also included an assessment of historical funding and future expenditure needs for the City's various road and water-related infrastructure. This assessment culminated in a set of infrastructure scorecards, in which stormwater management system assets received a "D" grade and an annual funding gap was identified.

2.3.1 Stormwater Assets

Stormwater infrastructure assets can be grouped into three broad categories:

- Engineered linear assets, which include collection systems such as storm sewers, culverts, roadside ditches, and swales;
- Pond assets, which include storage/treatment facilities including Green Infrastructure/ Low Impact Development Facilities; and
- Watercourse/natural assets, which include rivers, creeks and streams.

Assets can also be described as either “hard” or “grey” infrastructure (e.g., pipes, pond control structures, and other features made of hard plastic, concrete, asphalt, steel, etc.) or “soft” or “green”(e.g., natural earthen and vegetated features), each with distinctly different construction materials and maintenance needs. Each asset category has an expected service life, which can vary from less than 10 years up to 100 years. The phrase “life cycle cost” refers to all costs incurred over the full life of the asset. These costs start at the time an asset is first considered in the planning stage and extend throughout its entire service life.

The municipal stormwater management system can only be sustainable when it is properly planned, designed, operated, and maintained at an 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. Apart from the City’s capital improvement projects, funds are not specifically dedicated for the regular renewal of pipe assets. While the City needs to be practical and consider affordability issues related to raising additional funds, stormwater asset renewal cannot be ignored, or future generations will be faced with daunting infrastructure problems. Commonly referred to as an infrastructure funding gap, this was identified in the 2016 Asset Management Plan and is described in more detail below.

The City’s physical stormwater management assets are summarized in **Table 3**. The table includes Tangible Capital Assets (TCA’s) such as pipes and pump stations but also “natural assets” such as watercourses that are not considered as TCA’s by the Public Sector Accounting Board (PSAB). The category of “treatment facilities” includes detention facilities, Low Impact Development projects, and oil-grit separators.

Table 3: Stormwater Asset Inventory

Infrastructure or Asset Type	Quantity
Storm Sewer Pipes	330 kilometres
Storm Sewer Catchbasins	11,000
Storm Sewer Manholes	4,200
Storm Sewer Outfalls	380
Culverts (greater than 3 metres span)	16
Culverts (less than 3 metres span)	389
Ditches	486 kilometres
Watercourses	±70 kilometres
Pump Stations	4
Treatment Facilities	45
Bridges	57
Dams	2

As identified in the 2016 Asset Management Plan, the overall replacement value exceeds \$356M (in 2018 dollars), which is equivalent to over \$7,100 per household in Thunder Bay. This total includes storm sewer assets and the larger culverts (i.e., greater than 3 metres span). This total excludes bridges, dams, non-TCAs and the natural environment; all of which play an important part in stormwater management, however some of these assets primarily serve other functions and their specific stormwater value has not been accounted. This total also does not include all current assets, such as ditches, infrastructure valued at less than \$10,000 (e.g., such as catch basins or small culverts), any new infrastructure that is built since 2016, and proposed new treatment facilities that were included in the 2016 Stormwater Management Plan. Based on asset replacement values provided by Canadian municipalities through the National Water and Wastewater Benchmarking Initiative (e.g., \$1,000 per metre for watercourses and \$50 to \$1000 per metre for ditches), including these additional assets, would likely add over \$100M to the overall replacement value.

The Asset Management Plan also assumed a “like for like” replacement of stormwater assets. In reality, we know that many assets (e.g., pipes, culverts etc.) will have to be built bigger and may need to accommodate increasing environmental considerations and regulations. Therefore, the actual cost to replace the existing stormwater assets will be much greater and will only further widen the infrastructure gap. Ontario Regulation 588/17 requests that this be more closely considered.

2.3.2 Current Stormwater Program Costs

As noted above, the 2016 Asset Management Plan identified additional Operations & Maintenance and capital costs as well as a quantification of future funding requirements to renew stormwater management assets continuously over a 100-year life-cycle planning horizon. This evaluation considered rehabilitation and replacement of some of the existing infrastructure only, and did not include all current stormwater assets, such as ditches, culverts, and treatment facilities, nor did it include Operations & Maintenance or construction costs related to new stormwater infrastructure. The Asset Management Plan compared average annual spending versus capital funding over a range of timeframes and identified the following:

- \$3.3M annual funding gap (based on 2011 to 2015 actual expenditures); and
- \$5.1M annual funding gap (based on 2015 to 2019 actual and anticipated expenditures).

The annual gap increase of \$1.8M between the two scenarios above is due to significant investments in new infrastructure from 2015 to 2019. That is, only \$1.1M per year on average was spent on replacement and rehabilitation of existing infrastructure over this timeframe, whereas the average spending was \$2.9M per year from 2011 to 2015.

The 2016 Stormwater Management Plan outlines a recommended path towards sustainable stormwater management in Thunder Bay while addressing future program pressures and challenges, currently unfunded operational needs and increased capital program needs in response to climate change, greater focus on watershed health, etc. Like the 2016 Asset Management Plan, the Stormwater Management Plan identified annual expenditures for the City’s current and future stormwater program. Program costs were comprised of Operations & Maintenance as well as capital construction of infrastructure including storm sewer pipes, ponds, and other stormwater management assets. The 2016 Stormwater Management Plan grouped the various stormwater plan components into functional categories and estimated costs in each year of implementation over a 20-year horizon.

The stormwater management program costs for the first year (2015) and the 20-year average from the 2016 Stormwater Management Plan are tabulated in **Table 4**³. The 20-year average annual expenditure of \$12.14M is expressed in 2018 dollars, which represents an 89% increase compared to the current annual stormwater program costs. In effect, this table identifies a \$5.7M annual funding gap, based on 2015-2034 anticipated expenditures.

Table 4: Program Costs based on the 2016 Stormwater Management Plan

Stormwater Plan Components		Year 1 (2015 \$)	Year 20 Average Spending (2018 \$)
Studies and Inventories			
	Feasibility Studies	\$ -	\$ 240,000
	Natural Resources Inventories	\$ -	\$ 90,000
	Stormwater Infrastructure Inventories & Data Collection	\$ -	\$ 40,000
	Modeling Efforts	\$ -	\$ 30,000
	Sub-Total	\$ -	\$ 400,000
Capital Projects			
	Sub-Total	\$ 3,464,000	\$ 8,020,000
Operations and Programs			
	Administration	\$ -	
	Monitoring Program	\$ 113,000	\$ 130,000
	Inspection & Maintenance Program	\$ 1,640,000	\$ 2,230,000
	Regulations & Enforcement	\$ 53,000	\$ 100,000
	Public Education, Outreach, and Rebate Programs	\$ 160,000	\$ 260,000
	Sub-Total	\$ 1,966,000	\$ 2,720,000
Lakehead Region Conservation Authority Levy			
	Sub-Total	\$ 1,000,000	\$ 1,000,000
	TOTAL	\$ 6,430,000	\$ 12,140,000

3. This table has been further updated by the Project Team and to account for inflation since the 2016 Stormwater Management Plan was completed.

As part of this study, City staff invested significant time and effort tracking the stormwater related expenditures incurred across many departments and financial cost centres. The cost analysis included a review of forecasted budgets (fiscal years 2015-2020) and actual expenditures (fiscal years 2015-2017). **Table 5** summarizes the stormwater program budget for fiscal year 2018. All numbers are rounded to the nearest \$10,000. For each activity, the annual cost is shown in two ways:

- The portion that is funded through taxes and the sewer rate charge (\$3.99M in total); and
- The total cost from all funding sources (\$5.91M in total).

Table 5: 2018 Stormwater Management Program Costs

Stormwater Management Program Item	Annual Expenditure	
	Current	Interim
Operations & Maintenance		
Street Cleaning	\$300,000	\$300,000
Drainage & Flood Control	\$690,000	\$690,000
Catchbasins	\$440,000	\$440,000
Pump Stations	\$40,000	\$40,000
Storm Sewers	\$360,000	\$360,000
Subtotal	\$1,830,000	\$1,830,000
Capital Improvements		
Storm Sewer Separation	\$0	\$0
Stormwater Mgmt. Projects	\$1,060,000	\$2,980,000
Bridges & Culverts	\$100,000	\$100,000
Subtotal	\$1,160,000	\$3,080,000
Other		
Lakehead Region CA Levy	\$1,000,000	\$1,000,000
Subtotal	\$1,000,000	\$1,000,000
TOTAL	\$3,990,000	\$5,910,000

The City’s current funding sources are described in Section 2.3.3 and cost details for the various functional groupings are described in the subsections below.

2.3.2.1 Operations and Maintenance

The City maintains and manages its stormwater management system with the goal of keeping it and the public rights-of-way in a good state of repair, through the investment of resources such as office and field staff, contractors, equipment and materials. The Operations & Maintenance activities listed in **Table 5** include routine inspection, cleaning and minor repair of stormwater facilities including culverts, storm sewer outfalls and headwalls, storm sewer pipes, manholes, catch basins, curb inlets, oil/grit separators, ponds or other treatment facilities, watercourses and ditches, as well as by-law enforcement and outreach activities. Preventative maintenance is performed on a regular basis throughout the City, such as street sweeping, leaf collection, catch basin

inspection and cleaning and ditch cleaning. The City also conducts reactive maintenance for damaged systems, investigates flooding complaints, and responds in the event of accidental spills. All Operations & Maintenance activities are funded through a combination of property tax and the sewer rate charge.

The current system maintenance falls below staff's desired frequency and extent of preventative maintenance activities, where the expenditures reflect largely reactionary work. If the current service level is continued, repair work may only be done to remedy a failure or to prevent an imminent failure. A low level of infrastructure maintenance may provide savings in the short term but will become more costly as the system ages and emergency work becomes more common, ultimately reducing the service level, exposing the City to increased flooding risk, and further widening the funding gap. As shown in **Table 4**, an increased investment in Operations & Maintenance activities is recommended.

2.3.2.2 Capital Improvements

The main objectives of the City's capital improvements program require:

- Diligence in keeping stormwater infrastructure compliant with current standards and in a good state of repair;
- Flexibility to accommodate and adapt to future stormwater infrastructure needs; and
- Proactive planning to enhance levels of service over time, which includes reducing flooding and erosion hazards, improving water quality, adapting to climate change, and other environmental considerations.

Capital works projects are carried out in accordance with City policies and other regulatory requirements as outlined above, and largely originated from recommendations in the 2016 Stormwater Management Plan. Storm sewer separation, where stormwater is separated from sanitary sewer (known as the City's Pollution Prevention Control Program) is not included among stormwater costs, as this program primarily benefits the City's wastewater system and is expected to be completed within the next 10 years. The majority of capital projects summarized in **Table 5** are funded by external grants (62%), with the remainder funded entirely by property taxes.

2.3.2.3 Other Costs

The ±\$1.0M annual payment to the Lakehead Region Conservation Authority levy reflects the City's portion of costs incurred by Lakehead Region Conservation Authority for major stormwater capital projects and programs within the City limits, primarily being

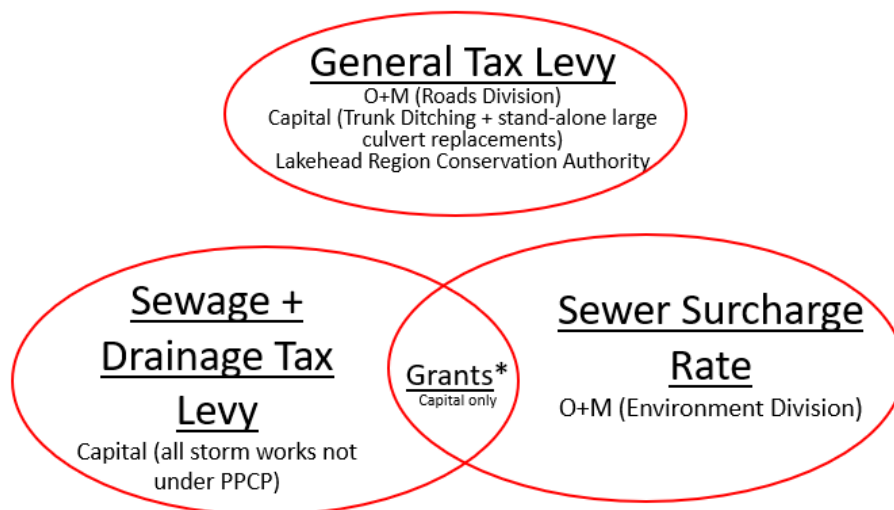
Operations & Maintenance and capital expenditures on the Neebing-McIntyre Floodway, but does include other erosion and flooding related works in the watershed. This item is entirely funded through property taxes.

2.3.3 Funding Sources

As part of the financial analysis described above, City staff also tracked stormwater program revenue by identifying the various funding sources for each stormwater-related activity. Further, staff determined the relative allocation towards properties within the urban/rural servicing areas, which are described in Section 2.3.5.

Currently, revenue for the City's stormwater management program is primarily generated through property taxes, the sewer rate charge, and external funding sources. **Figure 2** shows what general activity each funding type is directed towards. Property taxes comprise both the General tax levy and the Sewage & Drainage tax levy. All property owners within the corporate municipal boundary pay the General levy, with the exception of tax-exempt properties, which is further discussed in Section 3.1 (unorganized communities pay property tax directly to the province). Additional urban and rural taxation service boundaries were implemented upon amalgamation in 1970 for other specific tax levels, such as street lighting. Only properties located within the urban service boundary and those neighbourhoods that are serviced by storm sewer system are required to pay the Sewage & Drainage tax levy. Levy funds collected from these areas as well as external grants are used to fund stormwater capital expenditures. Properties in the rural areas that are not serviced by storm sewer systems do not contribute to the Sewage & Drainage tax levy.

Figure 2: Stormwater Program Funding Sources



The Sewer Rate Charge is included on the City's water/sewer utility bill and is intended to fund the sanitary sewer system, which collects and delivers wastewater from serviced properties to the sewage treatment plant. Like the Sewage & Drainage levy, unserviced rural properties do not contribute to the Sewer Rate Charge. Unlike the levy, which is a function of assessed property value, the Sewer Rate Charge is a function of water use. This charge is calculated as a 90% surcharge on the water component of the bill. In 2018, 4.1% of the Sewer Rate Charge revenue was used to fund stormwater operating expenditures in the City's Environment Division. The remainder of the Sewer Rate Charge revenue is used for capital and operating expenditures related to the City's sanitary sewer collection and treatment systems, including sewer separation projects as part of the Pollution Prevention Control Plan (approximately 5.9% of the revenue in 2018).

Figure 3 shows the results of City staff's cost analysis of stormwater program expenditures by revenue source across the 2015 to 2020 fiscal years. The total expenditures from all funding sources are shown in blue with a corresponding trendline shown in black. The figure indicates that that annual stormwater costs vary widely on a year-to-year basis, and with a general declining trend. The total program funding in 2015 was \$6.43M as shown in **Figure 3**. The total program funding in 2018 was \$5.91M and this value was used in the development of service level scenarios described below.

Funding from the four primary revenue sources is illustrated in **Figure 3**. The most noteworthy trend is the decline in Sewage & Drainage levy funding from properties within the urban service area. This decline was the impetus for investigating servicing costs versus funding allocation in urban and rural areas as part of this study. This is further described in Section 2.3.5 and reflected in the funding Options 2 and 6 that were described and evaluated in Sections 3 and 4.

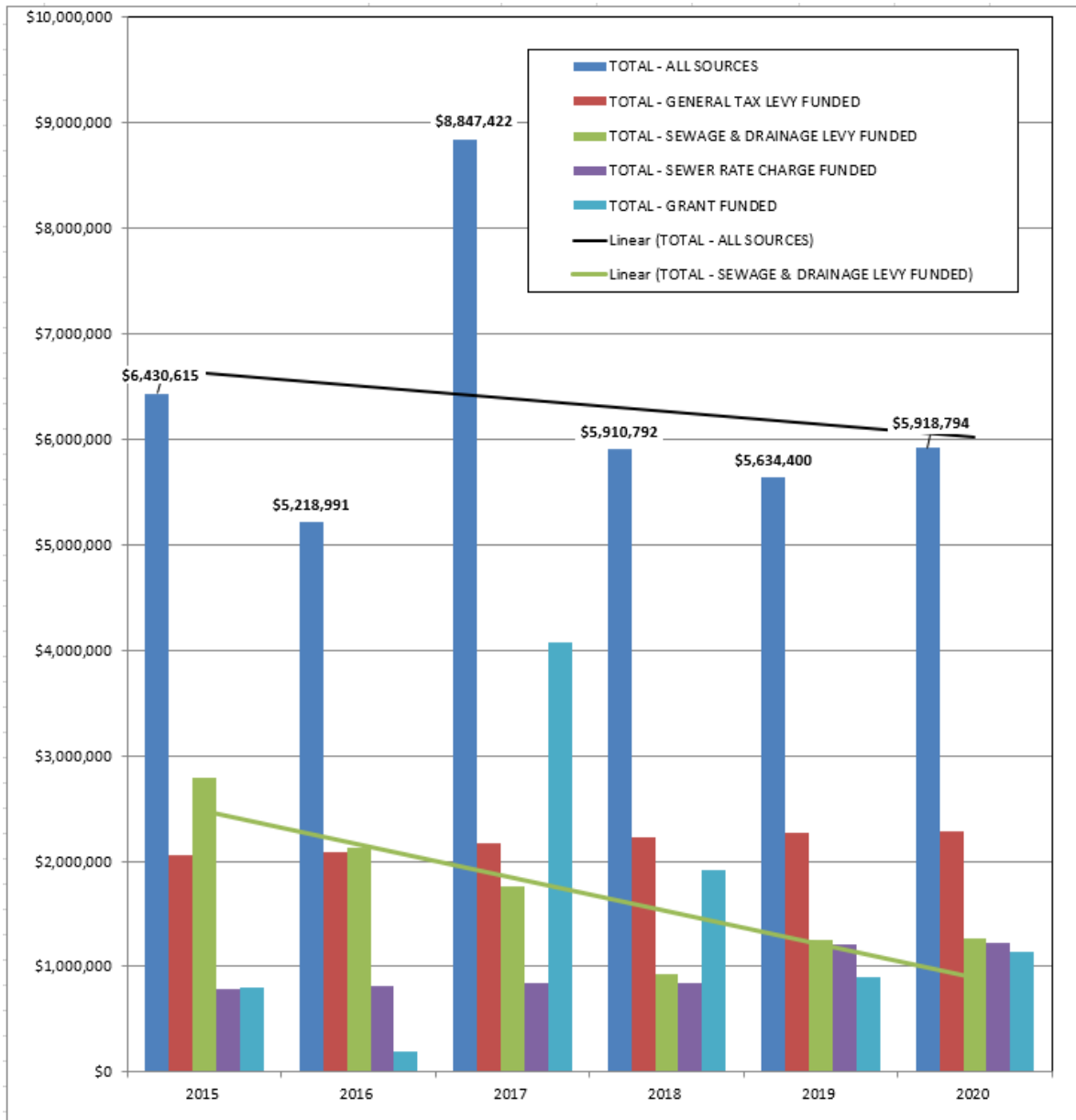
The total City tax revenue was \$182.5M in 2017, which includes all municipal levies and payments in-lieu of taxes. Of this total, 67% was contributed by residential property owners and the remaining 33% from non-residential properties. More details on the tax revenue are provided later in this report.

2.3.4 Service Level Scenarios

Stormwater related needs and pressures are persistent despite previous investments in the City's infrastructure. Current pressures on the stormwater program include increased capital needs (e.g., new priority projects or a reprioritization of projects from a previous capital program) and operational needs (e.g., new Operations & Maintenance activities or an increase in the extent or frequency of existing activities). Staff has recognized that the City's stormwater program is underfunded and cannot meet current and future obligations unless it is enhanced to meet the desired service levels in order

to comply with regulations, to reduce the overall infrastructure life-cycle cost, to continue to protect life, property and the environment and to address other known and anticipated future pressures.

Figure 3: Stormwater Program Expenditures



It should be noted that some future pressures are a relatively new consideration for municipalities, such as uncertainties about future climatic conditions and the need to adapt to the impact of changing weather patterns. This is confirmed by the fact that the Insurance Bureau of Canada has indicated that the majority of claim payouts are now related to severe weather and water damage, supplanting fire and other hazards.

The prioritization and level of funding for all program expenditures such as capital, Operations & Maintenance, and asset renewal, are up to the discretion of City Council. Ideally, budgets and funding methodologies provide a level of service in line with community expectations at a cost that is affordable, and that people are willing to pay. If residents and business owners desire a greater level of service than what is feasible with what they are willing to pay, then the City would aim to engage with the community to determine the optimal balance between costs and levels of service. Throughout North America, public sentiment varies with regard to stormwater service level expectations. Some communities look to minimize public spending as much as possible, while other communities are willing to increase spending to minimize flooding/erosion hazards and to protect water quality and the environment.

The current program costs and future required expenditures for the City of Thunder Bay represent the lower and upper limits, respectively, of the target funding values investigated in this study. Four budgeting levels were developed to reflect a range of budgets between these limits, and these scenarios formed the basis for comparing and evaluating alternative financing mechanisms. The following budget level scenarios were defined for this study as follows:

- The **Current** service level (\$3,990,000 per year) is based on the portion of the City’s 2018 stormwater management program that is funded through property taxes and the sewer rate charge (i.e., excluding external funding sources). This scenario reflects the historical program budgeting, resulting in an underfunded program that does not achieve the Operations & Maintenance and capital needs identified in the 2016 Asset Management Plan and 2016 Stormwater Management Plan studies.
- The Interim service level (\$5,910,000 per year) is the total 2018 budget from all sources.
- The Intermediate service level (\$9,030,000 per year) is the average of the Interim and Required service levels. This represents a “middle ground” scenario that can help alleviate affordability concerns associated with the stormwater funding gap⁴.
- The Required service level (\$12,140,000 per year) was identified in the 2016 Stormwater Management Plan and updated in 2018 dollars as shown in **Table 4**. This scenario reflects a program that achieves the City’s Operations & Maintenance and capital needs.

4. The intent is that 3rd party Funding, such as Federal and Provisional grants would make up the difference to achieve the gross total of required stormwater management expenditure.

The program funding requirements are shown in **Table 6**. This table follows the format of **Table 5** but includes Operations & Maintenance and Capital subtotals from the 2016 Stormwater Management Plan (shown in **Table 4**).

Table 6: Stormwater Program Funding Requirements by Funding Level

Stormwater Management Program Item	Annual Expenditure			
	Current	Interim	Intermediate	Required
Operations & Maintenance				
Street Cleaning	\$300,000	\$300,000		
Drainage & Flood Control	\$690,000	\$690,000		
Catchbasins	\$440,000	\$440,000		
Pump Stations	\$40,000	\$40,000		
Storm Sewers	\$360,000	\$360,000		
2016 SMP (20-year average)	n/a	n/a		\$2,720,000
Subtotal	\$1,830,000	\$1,830,000	\$2,280,000	\$2,720,000
Capital Improvements				
Storm Sewer Separation	\$0	\$0		
Stormwater Mgmt. Projects	\$1,060,000	\$2,980,000		
Bridges & Culverts	\$100,000	\$100,000		
2016 SMP (20-year average)	n/a	n/a		\$8,420,000
Subtotal	\$1,160,000	\$3,080,000	\$5,750,000	\$8,420,000
Other				
Lakehead Region CA Levy	\$1,000,000	\$1,000,000		\$1,000,000
Subtotal	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
TOTAL	\$3,990,000	\$5,910,000	\$9,030,000	\$12,140,000

2.3.5 Rural vs Urban

When considering differences with respect to stormwater on rural vs urban properties there are two primary differences:

- a) Rural properties are usually serviced by roadside drainage ditches and culverts only whereas urban properties are usually serviced by any combination of roadside drainage, ditches, culverts and storm sewer system; and
- b) Rural properties tend to be larger and may have larger impervious footprint than urban properties, however the ratio of imperviousness (i.e., percentage of the property covered by impervious materials) is generally lower.

Rural and Urban areas within the City of Thunder Bay are defined differently depending who you ask:

- General Public Assumptions
- The Official Plan
- The City's Revenue Division.

For this Strategy it is important that we are all talking about the same thing when referring to rural and urban properties. In Thunder Bay, Urban properties pay the general municipal tax levy, the sewage & drainage tax levy and the sewer rate charge, whereas rural properties pay the general municipal tax levy only.

For this study, the distinction between Urban and Rural properties in Thunder Bay is shown in **Table 7** and the urban / rural service areas for the Sewage & Drainage tax levy from the City’s Revenue Division are shown in **Figure 4**. Urban properties are distinguished as those receiving sewer service, illustrated in brown.

Table 7: Urban vs Rural Differences

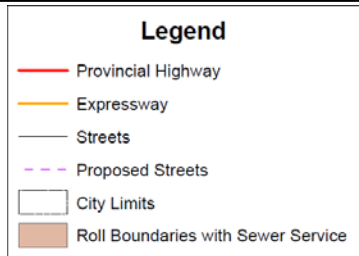
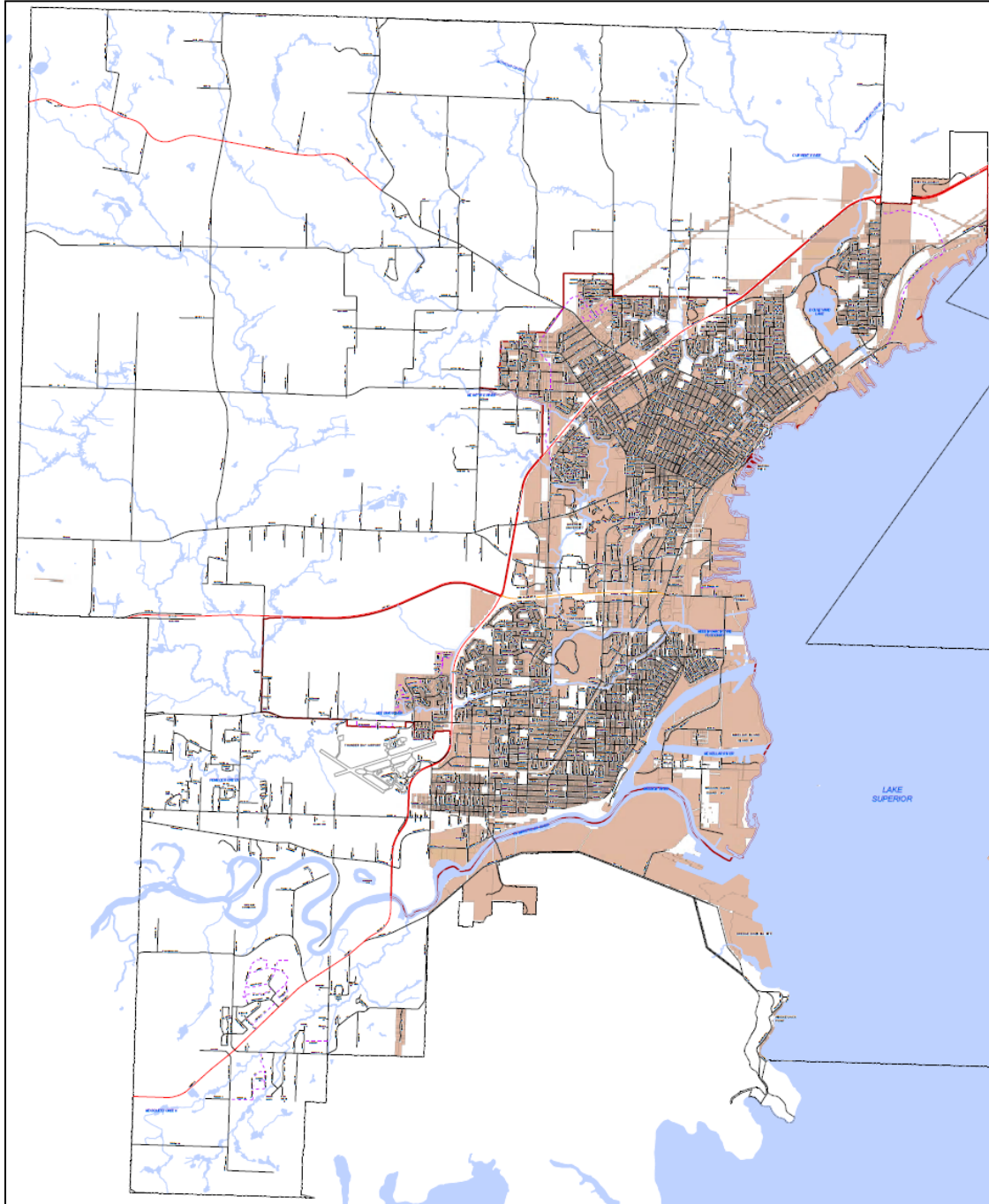
	Drinking Water	Sewage Collection	Stormwater Drainage
URBAN	Municipal Service	Municipal Service	Storm sewers and/or roadside drainage
	Municipal Service	Private Septic	Storm sewers and/or roadside drainage
RURAL	Municipal Service	Private Septic	Roadside drainage only
	Private Well	Private Septic	Roadside drainage only

The sewage & drainage levy is known as a special area tax levy, like charges for transit, garbage collection, street lighting. The shaded areas in **Figure 4** represent the properties that contribute to the Sewage & Drainage levy.

An analysis was undertaken to evaluate the amount of revenue that rural and urban properties contribute to the stormwater program under existing conditions through taxation and levies and compare that to the amount of service they receive.

The key finding of this evaluation was that Urban properties are currently subsidizing the stormwater expenditures in rural areas.

Figure 4: Thunder Bay – Rural and Urban Areas



Urban vs. Rural expenditures were reviewed with Operations staff and against Capital projects. The following summarizes the findings of that review:

- a) The annual rural stormwater management expenditures are approximately **\$575,000** (10% of overall 2018 stormwater management expenditures), which includes ditching and culvert summer / winter maintenance, capital works including trunk ditching and large culvert replacement in rural areas, and a small portion of the Conservation Authority levy.
- b) The annual rural contribution to stormwater revenue is approximately **\$275,000**.
 - Rural properties only contribute through the general municipal tax levy.
 - Only **1.33%** of the general municipal tax levy is directed to stormwater works.
 - Only 13% of all parcels in the City are considered Rural (5,800 / 44,000).
 - Based on Municipal Property Assessment Corporation assessed values, Rural properties make up 13% of the overall assessed value.
- c) Therefore, Urban properties are subsidizing Rural stormwater expenditures by approximately **\$300,000** annually.

The recommendation to address this inequitable situation would be to make changes to the **Property Tax (with Urban/Rural special area levies)** to separate **Urban vs. Rural** expenditures and charge based on actual annual expenditure within those areas. This option was recommended by the Stormwater Advisory Committee and is discussed further in subsequent sections.

3. Stormwater Funding Options

This section identifies the available funding options that have been used to support municipal stormwater management programs throughout North America. In addition, the advantages and disadvantages of various options are given along with the identification of a set of funding options that recognize the unique needs and issues of the City of Thunder Bay.

There are three general types of funding mechanisms used by Ontario municipalities to generate revenue for their stormwater programs. These include:

- **Taxes** are mandatory levies authorized through provincial legislation, identified on property tax bills, and revenue is collected by the local government. General tax levies are not related to any specific benefit or public service, whereas special area levies have specific designations and limitations for use (i.e., street lighting, transit, etc.);
- **Fees and charges** are allocated to offset the cost of a specific service and payable by those who benefit from the service. These charges are generally identified on utility bills or as a payment made as part of the land development process (e.g., water/sanitary bills, hydro bills, development charges, etc.); and
- **Other** means and financing practices.

The specific funding options and their corresponding advantages and disadvantages are described in the following sections. For the purposes of this report, funding options are distinguished by two types of property uses:

- Existing properties that are currently served by publicly-owned assets and infrastructure; and
- Development properties that are planning to modify the existing landscape or otherwise impact publicly-owned assets and infrastructure. All development-related funding options are included together in Section 3.2.

3.1 Tax Levies

There is a long history of funding public works and services through taxation based on the assessed value of the land and buildings that comprise real property. Generally, the revenue collected from tax levies is intended for use in serving the greater public good, such as providing libraries, recreation centres, etc. This follows a basic taxation

principle that associates the taxpayer's ability to pay with an appropriate income tax rate. By extension, those with higher value properties presumably can afford to pay higher property taxes (i.e., assessed value reflects one's ability to pay). This section describes the common funding methods that are derived from the assessment base.

3.1.1 General Tax Fund

Property taxes are the most significant revenue source to support municipal stormwater programs in Canada. Property tax funds are determined according to the assessed property value multiplied by the applicable tax rate, which varies by land use zoning, building type, and taxing status. Municipalities often collect property tax revenue on behalf of the provincial governments (e.g., for public school boards) and the upper tier or regional government (e.g., for health services), if applicable. The municipality's portion of property tax goes into a general tax fund which covers the operating and capital expenditures of many public services across several departments.

Property tax rates are established on an annual basis by municipalities to meet their projected funding needs and in consideration of the total current value assessment of all taxable properties within their jurisdiction. Provincial legislation defines the permissible exemptions and capping adjustments that limits tax payments for selected property types or ownership classifications. Tax-exempt properties include local government (e.g., municipal, regional, provincial, and federal buildings) as well as institutions (e.g., public schools, colleges, hospitals, and churches) and other charitable organizations.

While tax-exempt properties generally do not contribute funds to the municipality's stormwater program, some municipalities receive a fee or tax-like payment from exempt properties. For example, the federal government administers the Payments in Lieu of Taxes program which distributes funds on behalf of eligible tax-exempt institutions to property taxing authorities to compensate for selected services such as police/fire protection, stormwater, solid waste disposal, and roads. In Ontario, provincial legislation authorizes a "heads and beds" charge to institutions (e.g., hospitals, post-secondary schools, and correctional facilities), where payments of \$75 per person per year or per bed per year are made under this program. For example, a 400-bed hospital would contribute \$30,000 as a payment in lieu of tax to be retained by the municipality.

With the general tax fund, money to support the stormwater program comes from the municipality's overall tax levy and is allocated as an annual budget envelope to each department or service category according to Council priorities.

3.1.2 Dedicated Tax Levy

Special area levies allow a portion of property taxes to be allocated for specific public works or services. A dedicated levy can be administered to build a special purpose fund for specific services with a distinct tax rate assigned on the annual tax bill. In Thunder Bay, special area levies are collected for sewage and drainage, transit, street lighting and solid waste/recycling collection. Specific By-laws have been created in Thunder Bay that relate to each of these special area levies. With a dedicated tax levy, money to support these programs is available in a more predictable manner, and on a longer-term basis, than the general tax fund. Funds are specifically earmarked and therefore not subject to the same level of negotiation during annual operating budget deliberations.

In Thunder Bay, the City has implemented several dedicated tax levies, and these are collected in accordance with the designated urban/rural service areas and associated By-laws. The Sewage & Drainage tax levy is collected from urban service areas and rural areas that have storm sewer systems in their neighbourhood and is used to pay for stormwater expenditures as described in Section 2.3.5.

3.1.3 Local Improvement Charges

Special assessments can also be levied as a supplementary charge on the tax bill to properties that benefit from specific capital improvement projects as per the Local Improvement Regulation, Ontario Regulation 322/12. The allocation of charges is generally based on the lot frontage dimension of properties rather than assessed value. To enact a local improvement charge, a petition must be signed by two-thirds of the property owners (i.e., that represent a cumulative area comprising at least 50% of the benefitting lands).

For stormwater purposes, local improvement charges are most suitable for erosion/watercourse protection works or retrofit applications at a neighbourhood scale such as green infrastructure projects. While funds may be dedicated solely for stormwater capital projects, they would not be enough to support the overall stormwater program.

3.1.4 Advantages and Disadvantages

Funding a municipal stormwater program through tax levies offers several advantages, including:

- Property tax-based revenues are already accepted as the primary existing source of revenue for municipal works and services;

- The funds from a dedicated stormwater tax levy would be directed specifically to the stormwater program;
- Funds can be used to fund all components of the program (except in the case of local improvement charges which can fund capital works only); and
- The billing system is well established.

Funding the stormwater program solely through property taxes offers several disadvantages, including:

- Property taxes based on a property's assessed value or lot frontage does not correlate with its runoff contribution, so the fairness and equity of this revenue source may be low;
- The general tax fund is not a stable and dedicated funding source as needs can change year-by-year
- There is an annual competition for general tax funds to support other community services and can therefore prove difficult to sustain the stormwater program when there are higher Council priorities;
- There is no incentive for property owners to reduce stormwater runoff and pollutant discharge; and
- Tax-exempt properties do not contribute any funding to the stormwater program (or only a few properties contribute very little through payments in lieu of taxes).

3.2 Development-Related Charges and Levies

This section presents funding options to recover the stormwater servicing costs that is attributable to growth and development by private interests, including new development or infill/re-development. Servicing costs related to the municipal stormwater program may include oversizing of existing systems or facilities downstream of the development, or new facilities built as part of the development that will later be owned/operated by the municipality.

3.2.1 Development Charges

Development charges are also known as development impact fees in other jurisdictions across North America. Through the Development Charges Act, 1997, municipalities in Ontario are authorized to pass by-laws for the recovery of costs incurred to provide services to new and re-development projects. These charges reflect a one-time cost prior to construction and can only be used to fund eligible capital costs, and only for the

services for which they were collected. Charges can be allocated either by the number of units built, the amount of impervious surface added, or by gross property area based on zoning and runoff potential (e.g., a single family development would pay less per hectare than a commercial or industrial development).

Revenue derived from development charges can be applied to projects throughout the municipality and are intended to help cover the initial capital cost of infrastructure required to service growth demands. Funds may be used to cover the capital costs of many stormwater systems and facilities including:

- Erosion control and restoration works for watercourses;
- Flood control and conveyance works, including channelization, culvert and storm sewer improvements/oversizing;
- Stormwater quality control facilities and retrofits; and
- Studies and monitoring.

The City of Thunder Bay has passed a by-law that allows development charges. However, the program has not yet been implemented per direction from past Councils that expressed concern this might discourage development.

3.2.2 Other Charges and Levies

Development charges are by far the most popular and largest revenue generator, among all the growth-related funding options available to Ontario municipalities. There are other mechanisms available to help recover a portion of development impact costs.

Some municipalities in Ontario have adopted a cash-in-lieu program to augment their development charges program. Contributions to off-site stormwater facilities can be allocated in the form of cash-in-lieu fees within infill/re-development areas where on-site facilities are considered infeasible (e.g., by presenting an undue maintenance burden on the municipality). In some cases, it has been used exclusively for new development to build reserve funds in anticipation of future development, however this may lead to inequities between old, infill, and new developments.

Like development charges, the rates for cash-in-lieu programs may be based on the area of development or number of dwelling units, and area-specific rates can be determined for different geographic locations within the community. Unlike development charges however, revenue derived from cash-in-lieu charges can be applied to both capital as well as operations and maintenance costs for stormwater facilities.

Other development related funding options include:

- Special development levies and business improvement districts;
- Tax increment financing;
- Development application fees, site plan/permit review fees, etc.; and
- Development servicing/subdivision agreements or other legal contracts between the municipality and the developer.

3.2.3 Advantages and Disadvantages

Funding a municipal stormwater program through development-related charges and levies offers several advantages, including:

- Existing residents typically favour the concept that “development pays for development”;
- Acceptance by the development community, however this may not be the case given that development charges are not currently collected in Thunder Bay; and
- Charges are based on contributing area, which is more equitable than property value or frontage.

Funding the stormwater program through development-related charges and levies offers several disadvantages, including:

- Charges are limited by the amount of development occurring within the municipality and funds can only be used to support growth-related projects, not the entire program;
- Dependence on growth and growth rates (i.e., if the growth rate declines, so does the revenue collected); and
- Development charges are limited to the capital costs associated with future development and cannot be used for operations and maintenance (except in the case of cash-in-lieu charges).

3.3 User Fees and Charges

From a legal perspective, user fees and charges are separate and distinct from taxes. As noted above, property tax is a levy on a property for general services to support the

public good. Property tax is payable by the property owner, even if the owner does not use a certain service that is funded by the tax levy. Contrarily, a fee is a levy on a person who contributes to, or benefits from, the use of a specific service, such as a water bill, hydro bill, gas bill, etc. The fee is payable by the service user (i.e., property owner, tenant, or property manager).

Table 8 highlights the key differences between funds that are generated through property taxes (i.e., the general tax fund) and through user fees (i.e., an enterprise fund). The purpose of each fund and the assignment of who pays the fund charges are compared along with the following items:

- **Charge allocation:** This item identifies the charge basis for individual properties. With a user fee, charges that generate revenue into an enterprise fund must be allocated based on either usage/demand (for a consumption service, such as potable water or electricity) or on the contribution to/burden placed on the system (for a disposal service, such as wastewater or stormwater) in a fair, proportionate, and consistent manner.
- **Charge reduction:** This item identifies the mechanism by which a property owner or service user has an opportunity to reduce their charge. With a user fee, the strongest motivation is to lower their charge by reducing usage, however an additional financial incentive may be available through a rebate/credit program.

Table 8: Comparison Between Property Taxes and User Fees

Item	Property Taxes	User Fees
Fund Purpose	To raise revenue for general services, functions and activities	To recover/ offset the costs of specific services, functions and activities
Payment Obligation	Compulsory for taxable property owners	Compulsory for service users
Charge Allocation	Product of property value assessment and municipal tax rate	Proportionate to service usage/ demand or contribution
Charge Reduction	Property value re-assessment	Reduce service usage/ demand or contribution; Qualify for rebates, credits or other incentives
Fund Segregation	Not required	Required
Fund Distribution	Based on priorities; Proportioned according to Council's discretion	Based on needs; Proportioned according to service delivery costs

- **Fund segregation:** The money in an enterprise fund must be segregated, accounted, and reported separately from the monetary contributions of funding sources.
- **Fund distribution:** The money spent from an enterprise fund must be distributed back into the program that it supports, ideally in proportion to the effort/expense of each of cost centre.

3.3.1 Water Rate Surcharge

Historically, the earliest type of user fee for a public works utility was potable water, a consumption-based service. Stormwater and wastewater were originally plumbed and serviced using the same collection networks and treatment facilities, although sewer separation is the current goal for municipalities with these legacy combined sewerage systems. Not surprisingly, the earliest form of a user fee for a disposal-based service was wastewater.

Many Ontario municipalities fund all or a portion of their wastewater programs (which may include stormwater operations) through a rate surcharge added on the water utility bill. One such example is the City of Hamilton, whose stormwater program is funded through a combination of the water rate, wastewater surcharge, property taxes, and development charges. In 2010, the City investigated the feasibility of moving its stormwater services, functions, and activities into a new stormwater user fee. The City of Hamilton has experienced financial challenges under its present funding system, particularly during wetter than average years. The cost to convey and treat stormwater and combined sewage flows drastically increases during wet years due to higher energy, chemical, operations and maintenance costs. Stormwater revenue drawn from the water rate had to compete with other sanitary sewer related needs and revenue drawn from the tax levy had to compete with many other City services and was often inadequate to meet Hamilton's desired level of service. Given the high treatment costs during wet periods, the City had a fundamental need for a stable, dedicated, and self-supporting funding mechanism; one that eliminates the current reliance on volatile metered water revenue.

Tracking revenue transfers can also be complicated for municipalities that use a water rate surcharge to offset stormwater program costs. In addition, the fairness and equity of allocating stormwater costs based on water consumption might be challenged as it bears little relation to the amount of stormwater runoff generated from a property. Further, since the wastewater charge and any related surcharges are based on water metering, there may be many properties that do not contribute to municipal servicing costs (e.g., parking lot without a water service or properties with private wells). The City

of Thunder Bay has a Sewer Rate Charge on its water/sewer utility bill. Funds collected from this are used to fund a portion of the stormwater operating expenditures. *

3.3.2 Stormwater User Fees

A stormwater user fee is a financing mechanism that allocates charges to individual properties and is administered in a similar fashion as a water/wastewater rate. This is also known as a stormwater utility. The basic calculation is simply the municipal stormwater program expense divided by the number of billing units within the municipality. The cost numerator (i.e., required revenue) was discussed in Section 2 and the billing unit denominator is described below. Many of the popular billing unit methods use a fixed amount impervious area as the basis of charge. Before summarizing the billing unit methods in Section 3.3.2.2, it is instructive to first define impervious area.

3.3.2.1 Impervious Area (Hard Surface Area)

Impervious area is defined as surface cover materials that are highly resistant to the infiltration or uptake of water in response to rainfall, snowmelt. While primarily comprised of rooftops and paved areas, impervious area is more generally associated with buildings, infrastructure, and the conveyance or accommodation of vehicular and pedestrian traffic. Impervious surface cover materials may include concrete, asphalt, stone/brick, and compacted gravel/soils. For the purposes of a stormwater user fee, the definition of impervious area is limited to land development that increases runoff due to any disturbance of the natural landscape.

Several factors influence the amount and quality of stormwater that runs off a parcel including rainfall, hard surface area, soil type, topography, and site servicing characteristics. While rainfall is the most significant factor, the allocation of charges in a variable stormwater rate is not based on rainfall intensity or changes in rainfall patterns attributable to climate change or other future uncertainties. Rather, it is common in North America to assume that rain falls equally on all properties within the City's jurisdiction. Of the other factors, impervious area has the strongest correlation to stormwater runoff, it can also be measured directly, and variations on individual properties can be tracked and billed accordingly. As a result, impervious area is commonly used to allocate charges in variable rate stormwater user fees (described in Section 3.3.2.5).

The basic objective of municipal stormwater programs is to maintain characteristics of streamflow and water quality in the receiving watercourses/waterbodies as near as possible to natural, undisturbed conditions, while protecting property, human life and

infrastructure. Current regulatory requirements follow this principle by defining a common baseline which represents undeveloped land. Unaltered receiving watercourses will adapt to achieve an equilibrium state in response to the runoff from natural, undisturbed lands (e.g., in terms of its flow carrying capacity, sediment/nutrient transport and deposition characteristics, etc.). Therefore, if all land in a watershed remains undeveloped, there would not be a need for a municipal stormwater program to manage stormwater quantity or quality.

Since impervious area is intended to quantify development that increases runoff potential compared to natural, undisturbed conditions, there are some exclusions that apply, including:

- Impermeable surfaces such as frozen ground, shallow bedrock, or hardpan soil layers on undeveloped property (however, mining operations that expose natural rock formations or hardpan soil layers would be included);
- Natural or constructed waterbodies, since the impervious area definition comprises surfaces that are not normally inundated with water; and
- Temporary structures, storage containers, or stockpiles, since the impervious area definition is meant to capture the underlying surface cover material, rather than small/transient facilities and materials that reside on top of the permanent base.

Stormwater facilities that are specifically designed, constructed, and maintained to reduce runoff discharged into the municipal stormwater management system may be eligible for a charge reduction, or rebate, under a stormwater user fee credit policy. One special case for exclusions includes surface cover materials that have been specifically designed, constructed, and maintained to infiltrate stormwater runoff (e.g., bioretention cells, rain gardens, porous pavement). In addition to qualifying for a stormwater credit (i.e., if the facility captures runoff from upstream impervious areas), the fee calculation would not include the area of any permeable materials.

Further, it is common for stormwater user fees in North America to exclude certain properties from paying a stormwater charge, either through a legal or technical exemption. Legal exemptions include property categories for which the City does not have the legislative authority to charge a user fee. Technical exemptions typically include:

- Public transportation rights-of-way that are considered to be part of the City's stormwater management system; and
- Properties for which the entire drainage area is not connected to the City's stormwater management system, either directly through a pipe, swale or ditch, or indirectly through an overland flow route.

3.3.2.2 Billing Unit Methods

To determine the billing unit denominator in the basic user fee calculation noted above, there are many ways to allocate stormwater-related costs to property owners. The following billing unit methods have been used throughout North America:

- **Flat Fee:** The charge does not vary according to usage of the property (e.g., a charge of \$10 per month per water meter account) or per hectare of land.
- **Tiered Flat Fee:** This extends the Flat Fee by offering different ratepayer categories (e.g., \$5 per month per residential property, and \$1,000 per year per commercial/industrial property).
- **Runoff Coefficient:** The charge varies by property size and an assumed coefficient that reflects stormwater runoff potential by property type (e.g., residentially zoned properties are assigned a runoff coefficient of 0.35 and industrially zoned properties are assigned a runoff coefficient of 0.75).
- **Intensity of Development Factor:** Similar to the Runoff Coefficient billing method, however adjustment factors are applied to account for the property's development status (e.g., a factor of 0.0 for undeveloped properties, 1.0 for fully developed properties, and a factor between 0.0 and 1.0 for properties considered to be underdeveloped within their zoning category).
- **Equivalent Residential Unit:** A statistical sampling of measured impervious area for residential dwelling units is performed to determine the average Equivalent Residential Unit size (i.e., square meters of impervious area per dwelling unit). The average impervious area for all types of residential dwelling units becomes the base billing unit. Charges for residential properties are based on assigning one stormwater billing unit to each residential dwelling unit, regardless of density. Given the wide variability in impervious area statistics for non-residential properties, the impervious area for each non-residential property should be measured. The charge for non-residential properties is then determined by dividing the measured impervious area by the average Equivalent Residential Unit size.
- **Single Family Unit:** A statistical sampling of measured impervious area for single-family detached homes is performed to determine the average Single Family Unit size (i.e., square meters of impervious area per detached home). The average impervious area for single-family detached homes becomes the base billing unit with one stormwater billing unit assigned to each single-family detached home and fractional billing units assigned to other residential property types. Multi-family residential properties such as apartments, condominiums, and townhouses have a smaller footprint than single-family detached homes and are therefore charged less. The charge for non-

residential properties is determined by dividing the measured impervious area by the average Single Family Unit size.

- **Tiered Residential Rate (e.g., Tiered Single Family Unit):** The Tiered Single Family Unit billing unit method extends the Single Family Unit method by accounting for the wide variability in impervious area among single-family residential properties by assigning three tiers to single-family detached homes (e.g., small, medium and large). The number of categories for multi-family residential properties can also be extended to distinguish high-rise apartments and condominiums from low-rise ones, for example.
- **Level-of-Service/Geography Base:** The Equivalent Residential Unit and Single Family Unit billing unit methods can be extended to include separate rate structure calculations that vary by service level provided within distinct geographical boundaries that have different levels of service. This is a preferred option for regional governments or municipalities that feature large unserved areas.
- **Impervious Area Measurement:** The most accurate of all billing unit methods is to measure the impervious area of all properties within a given jurisdiction. This is a preferred option for municipalities that are highly urbanized.

The billing methods above are listed in increasing order of accuracy with respect to allocating charges among property types based on relative contribution of stormwater runoff and pollutant loading. The first four methods are the easiest to set up and administer, however they are the least fair and equitable indicators of the property's contribution to the municipal stormwater management system. The final five methods are based on measured impervious area. The cost to administer and manage a stormwater user fee increases with increasing billing accuracy. The final two billing unit methods often feature prohibitively high administration costs and are usually only considered by municipalities that have had a stormwater user fee program or utility in place for many years.

For the purposes of this report, the phrase "rate structure" refers to the combination of the charge allocation to individual property owners (i.e., billing unit method) as well as the overall administration and management of the resulting revenue fund. Common rate structures for Ontario municipalities are summarized in the remainder of this section.

It should be mentioned that there are many hybrid user fees that have been implemented across North America, and so the lines can become blurred between the rate structure types defined in this report. As an example, provincial legislation in British Columbia allows municipalities to charge properties an ad valorem fee for stormwater (i.e., charge allocation based on property value) in the same manner as a tax levy, and yet the resulting revenue fund can be administered in the same manner as an enterprise fund. It is also noteworthy that property types are commonly referred to as

“customer categories” with respect to stormwater user fees, and so the same terminology is used in this report.

3.3.2.3 Flat Fee

A flat fee is a type of rate structure in which a base charge is applied uniformly throughout a municipality without any distinction between property customer categories. That is, all properties are charged the same fee regardless of zoning/land use, building type, tax-exempt status, assessed value, frontage, total parcel size, or other distinguishing feature of the property. The base charge would be determined by calculating the required program revenue, assuming an appropriate collection rate, and dividing by the total number of billing units. Billing units can be based on the number of existing tax or utility accounts, such that the base charge is calculated on a per property or per water meter basis, for example.

The primary advantage of a flat fee compared to a variable rate (described in Section 3.3.2.5) is its simplicity which allows for lower administration costs and efforts related to billing implementation and ongoing data management. The primary disadvantage is that in many cases, a flat fee is less fair and equitable than property tax. For example, with a charge based on the number of water meters, a large park or conservation area with a single water meter for its restroom facility would be assessed the same charge as a large retail building development with extensive rooftop and paved parking areas that is also served by only one meter. With an area-based charge, a 1-hectare open park space would be assessed the same charge as a 1 hectare retail building with extensive rooftop and paved parking areas.

Further, although not tested in Canadian courts, U.S. state supreme courts have ruled against some flat fee stormwater utilities on the basis that there was not adequate justification (i.e., no rational nexus) for the fee charged in accordance with the service provided.

3.3.2.4 Tiered Flat Fee

A tiered fee is a type of rate structure in which a base charge is separately applied to different customer categories. A separate flat fee could be applied to each customer category (e.g., a residential flat rate of \$5 per property and a non-residential flat rate of \$500 per property). A tiered fee could also be based on a distinguishing feature of the property and vary by customer category (e.g., a residential flat rate of \$5 per dwelling unit and a non-residential flat rate of \$500 per water meter). Further, there may be some variability within a customer category. For example, a stormwater utility might charge a flat fee for residential properties but charge a range of fees depending on the water meter size that services non-residential properties.

3.3.2.5 Variable Rate

A variable rate is a type of rate structure in which the base charge distinguishes individual properties within a given customer category, and as described in Section 3.3.2.1, impervious area is used as the indicator of variability in this report. A variable rate stormwater user fee therefore allocates municipal stormwater program costs to customers in relation to the amount of impervious area on individual properties. The fee charged directly correlates to the amount of stormwater runoff volume and pollutant loading that is contributed to the municipal stormwater management system.

Consequently, this fee directly correlates to the benefit received by a property in using the municipality's stormwater services.

To summarize, a stormwater user fee based on impervious area offers a more fair and equitable funding mechanism than other funding sources because charges allocated to each parcel of land are based on contribution to, and benefit derived from, the municipal stormwater program. Commercial and industrial properties typically generate much more runoff and stormwater pollution per square meter than residential properties, and therefore are charged a proportionally greater fee.

The use of impervious area as the basis for setting a stormwater rate is supported by many standard manuals of practice issued by local governments, regulatory agencies, and professional organizations throughout North America. These manuals confirm the use of impervious area as a technically sound, fair and equitable basis for allocating municipal program costs.

Legal precedents in the U.S. have demonstrated the viability of a variable rate stormwater user fee. Specific court cases have been decided that reaffirm the use of impervious area as the necessary variable to allocate system cost to individual properties. However, most court cases have been brought against local governments with the principal consideration being whether the stormwater charge is a user fee or a tax. In every example where a governmental entity has delineated the programmatic nature of the revenue requirements throughout the system and confirmed that those expenditures were providing nearly uniform service, the court has ruled in support of the stormwater fee for that jurisdiction. The allocation of system-wide costs based on impervious area has been supported in each instance. Example court findings are as follows:

- Supreme Court of Georgia; Decided- June 28, 2004; S04A0696-McLeod et al. v. Columbia County;
- District Court of Appeal First District, State of Florida; Case Number 1D99-4548; City of Gainesville, Appellant, v. State of Florida Department of transportation, Appellee; Opinion filed March 5, 2001;

- Supreme Court of Washington; Teter et al. v. Clark County; Case Number 51173-0; August 8, 1985; and
- Supreme Court of Colorado; Zellinger et al. v. The City and County of Denver; Case Number 84SA508; September 8, 1986.

3.3.2.6 Canadian Examples

Stormwater user fees are a relatively new concept in Ontario, but they have been successfully implemented throughout Canada since 1994 and throughout the U.S. since 1974. It has been estimated that there are currently 30 stormwater user fees in Canada and 1,680 in the U.S. as referenced in the document by C. Warren Campbell, “Western Kentucky University Stormwater Utility Survey 2018”. Other municipalities in Ontario are known to be investigating the feasibility of a stormwater user fee. Canadian stormwater user fees are summarized in **Table 9**.

Table 9: Stormwater User Fees in Canada

Municipality	Start Date	Fee Type	Typical Charge	
			Monthly	Annual
Nova Scotia				
Halifax	2013	Variable Rate (impervious area)	\$5.30	\$64
Ontario				
Aurora	1998	Tiered Fee	\$5.28	\$63
Guelph	2017	Variable Rate (equivalent dwelling)	\$4.60	\$55
Kitchener	2011	Tiered Fee	\$13.73	\$165
London	1996	Tiered Fee	\$15.83	\$190
Markham	2015	Tiered Fee	\$3.92	\$47
Middlesex Centre	2017	Tiered Fee	\$14.88	\$179
Mississauga	2016	Variable Rate (equivalent detached)	\$8.67	\$104
Newmarket	2017	Variable Rate (property size)	\$3.33	\$40
Orillia	2017	Tiered Fee	\$0.88	\$11
Ottawa	2017	Tiered Fee	\$4.44	\$53
Richmond Hill	2013	Tiered Fee	\$5.19	\$62
St. Thomas	2000	Tiered Fee	\$9.28	\$111
Vaughan	2017	Tiered Fee	\$4.17	\$50
Waterloo	2011	Tiered Fee	\$11.19	\$134
Saskatchewan				
Regina	2001	Tiered Fee	\$16.12	\$193
Saskatoon	2002	Variable Rate (equivalent detached)	\$4.40	\$53
Alberta				
Calgary	1994	Flat Fee	\$15.05	\$181
Edmonton	2003	Variable Rate (impervious area)	\$16.26	\$195
Lloydminster	2017	Tiered Fee	\$13.00	\$156
St. Albert	2003	Tiered Fee	\$16.11	\$193
Strathcona County	2007	Flat Fee	\$8.50	\$102
British Columbia				
Langley Township	2003	Variable Rate (ad valorem)	\$8.34	\$100
Pitt Meadows	2009	Variable Rate (ad valorem)	\$8.57	\$103
Richmond	2006	Tiered Fee	\$13.12	\$157
Surrey	2002	Tiered Fee	\$18.58	\$223
Victoria	2016	Variable Rate (impervious area)	\$20.25	\$243
West Vancouver	2007	Flat Fee	\$27.12	\$325
White Rock	2004	Variable Rate (impervious area)	\$38.83	\$466

All municipalities listed are incorporated as City governments, with the following exceptions:

- Regional Municipality of Halifax (Nova Scotia);
- Town of Aurora (Ontario);
- Municipality of Middlesex Centre (Ontario);
- Town of Richmond Hill (Ontario); and
- District of West Vancouver (British Columbia).

The start date shown in the table above indicates the first year of implementation (i.e., commencement of billing). For variable rates, the primary differentiator between properties within the same customer category is shown in parentheses, including:

- Property size: based on gross parcel area;
- Impervious area: per square meter of impervious area (or property size times the runoff factor);
- Equivalent dwelling: based on impervious area per residential dwelling unit;
- Equivalent detached: based on impervious area per detached home; or
- Ad valorem: based on property value and administered as a user fee.

The final two columns in the table above show typical charges for representative or “average” detached homes (current as of August 2018). Note that user fees in the City of Markham (Ontario), Strathcona County (Alberta), and the City of Pitt Meadows (British Columbia) do not fully fund their respective stormwater programs, only certain components. It is also noteworthy that current charges in Newmarket, Ottawa, and Richmond Hill (all in Ontario) are part of a multi-year phase-in period (i.e., user fee revenue does not yet fully fund their respective stormwater programs).

3.3.3 Advantages and Disadvantages

Funding a municipal stormwater program through user fees and charges offers several advantages, including:

- Dedicated funding source for all stormwater management program components;
- Fair and equitable charge allocation that is based on individual property contributions to runoff volume and pollutant loading;

- Costs for municipal stormwater services are more equitably distributed to all privately and publicly-owned developed properties within the municipality, regardless of tax-exempt status or water utility servicing;
- With a credit program, provides a financial incentive for property owners to reduce stormwater runoff and pollutant discharge;
- Stable and self-supporting funding source to allow long-range planning, large-scale capital improvements, and leverage for debentures or funding partnerships; and
- Mechanism to ensure privately-owned stormwater facilities are properly maintained.

Funding the stormwater program through user fees and charges offers several disadvantages, including:

- Additional implementation costs (e.g., stormwater rate study, database management, billing and customer service);
- The possibility that a new fee may not be well-received by the public; and
- Potential poor uptake in credit/rebate programs by average runoff contribution (i.e., ICI properties).

Implementation costs for database management are typically less for municipalities that have high-quality, established Geographic Information Systems. Billing costs could be minimized through the use of existing billing systems such as electricity, water/wastewater, etc. Further, public reception can be enhanced through a structured public consultation and education program. Typically, these issues are explored in detail during the feasibility or implementation phases of a stormwater user fee study.

3.4 Other Options

This section summarizes funding mechanisms that have traditionally been used to fund a portion of municipal stormwater programs. That is, these options are typically used to augment the funding sources described above.

3.4.1 Grants

Funding opportunities for stormwater projects are possible through grants to municipalities from a variety of sources. Grant programs are often very competitive, based on project merits, and in many cases require matching funds. Grants also tend to be time-limited and not a reliable or sustainable funding source. Most grants fund

studies and/or capital works and are therefore not applicable for Operations & Maintenance funding. To be successful, the municipality must therefore be proactive to take advantage of the grant program. Communities with an identified revenue stream will be in a better position to compete for and use the grant funds as they become available.

Grant funding options available to Ontario municipalities for infrastructure investment generally include:

- Earmarked money from the provincial capital budget including direct grants or gas tax revenues allocated to Ontario municipalities;
- Infrastructure investment programs such as the Ontario Rural Infrastructure Investment Initiative and the Ontario Community Infrastructure Fund;
- The federal government, through the Federation of Canadian Municipalities, has established grant funding under the Green Municipal Fund that could be used to support municipal governments and their partners in developing communities that are more environmentally, socially and economically sustainable (note: eligible projects may include feasibility studies, field tests, sustainable community plans, and capital projects that demonstrate leadership in sustainable development and serve as examples for other communities); and
- Research grants, typically in conjunction with a local university or other partners.

Other specific grant funding opportunities for stormwater may be available through the following:

- Climate Change Adaptation Program (Federal);
- Gas tax funds (Federal);
- New Building Canada Fund – Provincial-Territorial Infrastructure Component (Federal);
- Recreational Fisheries Conservation Partnerships Program (Federal);
- Casino tax funds (Provincial);
- Showcasing Water Innovation Program (Provincial);
- Trillium Foundation (Provincial);
- Rural Water Quality Program (Provincial);
- Drinking Water Stewardship Program (Provincial);

- EcoSuperior (Private);
- Green Communities Canada (Private);
- RBC Blue Water Community Action Grants (Private);
- Evergreen Canada (Private);
- Watersheds Canada (Private);
- CN Econnexions (Private); and
- Great Lakes and St. Lawrence Cities Initiative (Private).

3.4.2 Service Fees, Penalties and Fines

Many Ontario municipalities have set service fees to offset some of the costs of administrative support functions related to the stormwater program (e.g., building permits, service connections, planning applications, and by-law enforcement/inspection fees). Further, many municipalities have established a fee system that includes penalties or fines for sewer use by-law infractions or other violations relating to stormwater management.

3.4.3 Public-Private Partnerships

Public-private partnerships involve contractual agreements between the municipality and a private sector entity, including both for-profit and not-for-profit organizations. These partnerships and collaborations continue to evolve in Ontario and offer many opportunities for public education and engagement. Despite concerns about the privatization of publicly-owned assets, such partnerships might be attractive to municipalities as they ostensibly offer cost-efficiencies and can help offload undesirable risks and front-ending costs.

3.4.4 Debentures

The previous options described above presume that stormwater program expenditures are paid with funds that are currently available (i.e., financing is conducted on a “pay as you go” basis). Debentures are a means of borrowing money, such that the debt incurred is amortized approximately over the life of the asset. Debentures are typically used for large stormwater capital improvement projects, as municipalities are not generally allowed to run deficits in their operations and maintenance budgets.

3.4.5 Credits and Incentive Programs

Credit/rebate programs provide financial incentives to property owners who implement green infrastructure (also known as Low Impact Development) and other measures on their properties. Credits can be cumulative for measures that provide flooding and erosion protection, water quality treatment, and other environmental enhancements or non-structural best practices. These are common with municipalities that fund their program through stormwater user fees. Credits are typically requested through an application process and often require certification that eligible stormwater facilities have been properly designed, installed, operated, and maintained. While municipalities generally offer credits for all types of green/Low Impact Development facilities, in some cases the credit only rewards facilities that exceed the current stormwater design guidelines and permitting requirements. Some credit programs also require that landowners grant access to municipal staff for inspection of facilities prior to awarding a credit.

Credit programs can help to change the actions and behaviours of developers, property and business owners towards reducing stormwater runoff and pollutant loading to the municipal stormwater management system. For instance, municipalities can require annual maintenance records of on-site measures, such as ponds, before awarding a credit. This can encourage owners to maintain private facilities that otherwise might not be properly maintained and therefore not functioning as designed. This is beneficial to both parties; the property owner is rewarded with a reduced user fee, and the loading on the municipality's stormwater system is reduced. Further, this allows a mechanism for inspecting Low Impact Development facilities on private property.

There are attractive environmental and social benefits for residents and business owners who adopt green infrastructure on their properties. By giving property owners more opportunities to actively participate in environmental stewardship activities, particularly when co-ordinated with other community-wide green initiatives, it helps to foster improved community character and overall quality of living.

There are drawbacks however, including the additional start-up costs related to credit program implementation as well as ongoing administrative/staffing costs related to enforcement (i.e., inspection/tracking of credit applications). Details on credit and rate administration costs are discussed later in this report. Another concern is that any credit amount given to property owners must be treated as unrecognized revenue from a cost-accounting perspective (i.e., the higher the uptake, the greater the overall rate needs to be to achieve the revenue requirement). Another concern that has been identified is the poor uptake of stormwater credits, particularly in high-density areas (i.e., within ICI land uses) where source controls on private property could result in substantial load

reductions on the City's stormwater management system. The low uptake results from the expectation of a reasonable return on investment for installing on-site source controls. Reasonable payback periods (e.g., in the range of 5-10 years) cannot be achieved without awarding significant credits, and as noted above, this would have a significant impact on the overall revenue.

3.5 Evaluation of Funding Options

This section outlines the advantages and disadvantages of various funding mechanisms, considering the unique needs and issues of the City of Thunder Bay.

When comparing and evaluating funding options there are many factors to consider. In general, an ideal funding source would have the following characteristics:

- Consistent with provincial and federal legislation;
- Applicable for use on a city-wide basis and across all land use types and customer categories;
- Provides a sustainable, stable, dedicated and self-supporting funding source to achieve the municipality's stormwater program goals and objectives;
- Revenue meets the requirements for the desired operational, capital, and customer funding levels;
- Program benefits are equitably distributed, and program costs are equitably allocated;
- Appropriate reserve funding levels are maintained;
- Specifically, for the case of user fees, sound policies are in place for credits, adjustments and appeals, and rate study recommendations are publicly supported; and
- Reasonable implementation costs (e.g., billing systems and administration).

3.5.1 Suggested Evaluation Criteria

The following evaluation criteria are useful when identifying a preferred funding option:

- **City-Wide Applicability:** This category indicates the geographical extent across which a funding option can be applied. A desirable funding option would apply city-wide. An undesirable funding option would be restricted to certain locations within the municipality.

- **Meets Entire Revenue Needs:** This category indicates whether or not the funding method satisfies the revenue requirements of the stormwater program. A desirable funding option would fully fund the municipality's priority capital improvement projects, operations and maintenance activities, engineering/support, and overall administration of the program. An undesirable funding option would only partially fund the program.
- **Fair & Equitable Allocation:** This category indicates whether the funding method charges the property owner according to individual contribution to the stormwater program expenditures. A desirable funding option would allocate costs in a systematic and consistent manner that represents the relative contribution of stormwater runoff and pollutant loading. An undesirable funding option would allocate costs in a haphazard or inconsistent manner that does not reflect individual contributions to the municipality's stormwater management system.
- **Dedicated Funding Source:** This category identifies those options where funds are dedicated solely to stormwater program expenditures and in a sustainable manner. A desirable funding option would be fully dedicated to the needs of the stormwater program, able to endure highly variable cost fluctuations over a long-term timeframe. An undesirable funding option would authorize a fixed funding envelope for a single budget year.
- **Effort to Administrate:** This category identifies the relative effort and resources (low, medium, or high) for municipal staff to administer and manage the funding option. A desirable funding option would result in low administrative costs. An undesirable funding option would result in high administrative costs.
- **Public Accountability:** This category helps to define the relative scale to which stormwater program expenditures and revenue are monitored and communicated. A desirable funding option would continually monitor its financial position (including costs incurred and income earned on a frequent basis), and it would also report these at a high level of detail and in a transparent and easily accessible manner. An undesirable funding option would only report the minimum required financial data (e.g., a budget summary table in the appendix of a Council report).
- **Environmental Benefits:** This category identifies the relative scale of environmental benefits provided by the funding option. A desirable funding option would offer financial incentives to those property owners who reduce their stormwater runoff and pollutant loads on-site, or otherwise promote good housekeeping practices or environmental stewardship initiatives. An

undesirable funding option would not motivate property owners to reduce the amount of stormwater that they discharge into the municipality's stormwater management system.

- **Social Benefits:** This category identifies the relative scale of social benefits provided by the funding option. This is highly subjective as it is meant to focus on the collective good of the community rather than individual or private interests and may therefore involve a wide range of value systems and worldviews. In a general context, socially beneficial options would inspire citizens and business owners to act in the best interests of society to protect against risks to public health, safety, and welfare or otherwise have a positive influence on the quality of life (e.g., developing a reputation as good societal stewards, improving community pride, or engaging people in awareness/outreach of social causes). One opinion of a funding option that provides high social benefit is a mechanism that minimizes the use of tax funds for stormwater services (e.g., moving it off the tax base onto a user fee), thereby leaving more available tax funds to support health/safety, law enforcement, or other public service needs.

3.5.2 Comparison of Funding Options

Eight funding options comprising the various mechanisms of property tax, development charges, and stormwater user fees were evaluated and compared in this study.

Table 10 shows the comparison with respect to the criteria presented above. For the first criterion, most options collect and apply funds from across the City, without geographic limits. Exceptions include local improvement charges and development charges which only apply to directly benefitting properties. The sewer rate charge is identified in the table as only partly meeting this criterion, as its geographic limits are defined by the City's servicing boundary.

The second criterion, meeting revenue needs, is affected in a similar way, since fund expenditures are limited to directly benefitting properties with local improvement and development charges. With a sewer rate charge, revenue would primarily be used to fund the wastewater program, leaving only a portion of the funds for the stormwater program, typically operations or other activities that share sanitary sewer related work crews and equipment.

Table 10: Comparison of Stormwater Funding Options

Funding Option	City -Wide Applicability	Meets Entire Revenue Needs	Fair & Equitable Allocation	Dedicated Funding Source	Effort to Administrate	Public Accountability	Environment al Benefits	Social Benefits
General Tax Fund	Yes	Yes	No	No	Low	Low	Medium	Medium
Dedicated Tax Levy	Yes	Yes	No	Yes	Low	Medium	Medium	Medium
Local Improvement Charge	No	No	Partly	Yes	Medium	Medium	Low	Medium
Development Charges	No	No	Partly	Partly	Medium	Medium	Low	Medium
Sewer Rate Change	Partly	No	No	Partly	Medium	Medium	Medium	Medium
User Fee (Flat Fee)	Yes	Yes	No	Yes	Medium	Medium	High	Low
User Fee (Tiered Fee)	Yes	Yes	Partly	Yes	Medium	Medium	High	Medium
User Fee (Variable Rate)	Yes	Yes	Yes	Yes	High	High	High	High

Fairness and equity, in terms of fund allocation, is highest with the variable rate user fee, and moderately so with taxes, sewer rate charges, local improvement and development charges, and a tiered fee. Fairness and equity is low with a flat fee. Dedicated funding is provided by a dedicated tax levy, local improvement charges and stormwater user fees, whereas these are only partly dedicated with development charges and a water rate surcharge, but not at all with general taxes.

Administration effort is lowest with taxes as this funding mechanism is already in place in Thunder Bay. It would take some effort to implement the City’s development charges program. A sewer rate charge is already in place, however any modifications (e.g., increasing the funds transferred to the stormwater program or instituting a new rate surcharge strictly for stormwater) would involve significant initial and ongoing efforts. Administration effort would be highest with a variable rate user fee. The rate administration costs for a user fee are discussed later in this report and include one-time “start-up” implementation costs (estimated in the range of \$350,000 and \$600,000 depending on rate structure) as well as ongoing administration and operational costs (estimated to be \$290,000 per year). The impact on public accountability is closely associated with the administrative effort (i.e., higher administrative effort results in higher accountability and vice versa).

The final two columns indicate the relative degree of social and environmental responsibility. It is common for stormwater user fees of all types to offer credit programs that reward the installation of green infrastructure and Low Impact Development facilities that provide direct environmental benefits. It is also common for water rate surcharge programs to offer rebates and reduced charges through water conservation initiatives, but these have been assigned a medium benefit given the limited impact on the stormwater program.

For this evaluation, a high social benefit rating was assigned to the funding options in which there would be a direct link between the individual contributions from citizens and business owners to the overall funding used to support and maintain a municipal

stormwater program (i.e., when such a program is fully funded and able to meet the needs, mitigate the risks, and fulfill the service demands of the community). The highest social benefit was assigned to a variable rate user fee due its ability to account for variable runoff contributions between properties; that is, giving landowners the ability and the incentive (i.e., with a reduced charge due to reduced impervious area or with a credit) to reduce the loading and cost burden on the publicly-owned stormwater management system. In effect, this directly rewards property owners for being good citizens and community stewards. The lowest social benefit was assigned to taxes and a flat fee, as neither option is able to quantify individual contributions to good citizenry or stewardship of the City's stormwater management program (i.e., with taxes the funds are not distributed in proportion to stormwater program needs, and with a flat fee all properties are charged the same fee without distinguishing individual contributions).

To further evaluate funding options, it is desirable to apply weighting factors to the criteria presented above. Such a scoring system allows alignment of the criteria with the unique opportunities and constraints in the City of Thunder Bay. The generic options presented in Section 3.5.2 have been further refined to the specific options that were evaluated in the funding analysis (Section 4), namely:

- **Option 1 (Status Quo):** Property Tax with the current Sewage & Drainage tax levy in urban areas only; no change to sewer rate charge;
- **Option 2:** Property Tax with a new Sewage & Drainage tax levied in urban and rural areas; no change to sewer rate charge;
- **Option 3:** User Fee with Equivalent Residential Unit billing units;
- **Option 4:** User Fee with Single Family Unit billing units;
- **Option 5:** User Fee with Tiered Single-Family Unit billing units; and
- **Option 6:** User Fee with Single Family Unit billing units and separate rates in urban and rural areas.

Because of the subjective nature of the criteria and weighting factors, the varying perspectives of the consultant team, Internal Steering Committee, and Stormwater Advisory Committee resulted in different evaluation scores, as presented below.

3.5.3 Consultant's Opinion

The consulting team's funding option evaluation is presented in **Table 11**. The first column lists the criteria that were presented in Section 3.5.1. The next column shows the weighting factors that were assigned to each criterion, based on the consultant's understanding of the City's stormwater management priorities and needs. These factors

ranged from 1 to 5, reflective of the relative importance. That is, fairness/equity, dedicated funding, and low administration effort were judged to be the most important (weight = 5), whereas social benefits were judged to be the least important (weight = 1).

In the remaining table columns, a score ranging between 1 and 3 was assigned across all criteria for each of the six funding options. The bottom row tallies the weighted score for each option. In the consultant’s opinion, the preferred option is Option 6 (i.e., user fee that distinguishes separate base charges for urban versus rural service areas).

Table 11: Evaluation of Funding Options (Consultant)

Criteria	Weight (from 1 to 5: unimportant = 1; very important = 5)	Option 1 Property Tax (current Sewage and Drainage Tax Levy)	Option 2 Property Tax (with urban/rural tax levies)	Option 3 Equivalent Residential Unit (ERU) User Fee	Option 4 Single Family Unit (SFU) User Fee	Option 5 Tiered Single Family Unit (Tiered SFU) User Fee	Option 6 User Fee (with urban/rural base charges)
City-Wide Applicability	3	2	2	3	3	3	3
Meets Entire Revenue Needs	3	2	3	3	3	3	3
Fair & Equitable Allocation	5	1	1	1	2	2	3
Dedicated & Long-Term Funding Source	5	1	2	2	2	2	2
Low Additional Effort / Cost to Administrate	5	3	3	2	1	1	1
Accountability to Public	3	1	2	3	3	3	3
Environmental Benefits	4	1	1	3	3	3	3
Social Benefits	1	1	2	2	2	3	3
TOTAL SCORE		45	57	66	66	67	72 PREFERRED

3.5.4 Stormwater Advisory Committee’s Opinion

On December 10, 2018, the Stormwater Advisory Committee filled out the Evaluation Matrix and Option 4 Tiered Single Family Unity User Fee and Option 6 User Fee (with urban/ rural base charges) tied with an overall score of 77. However, it is worth noting that the Stormwater Advisory Committee was not fully aware of the final proposed implementation costs nor the new Asset Management Plan Regulation. Also, only 6 of the original 11 member organizations in the Stormwater Advisory Committee were present to complete the evaluation.

Table 12: Evaluation of Funding Options (Stormwater Advisory Committee)

Criteria	Weight (from 1 to 5: unimportant = 1; very important = 5)	Option 1 Property Tax (current Sewage and Drainage Tax Levy)	Option 2 Property Tax (with urban/rural tax levies)	Option 3 Equivalent Residential Unit (ERU) User Fee	Option 4 Single Family Unit (SFU) User Fee	Option 5 Tiered Single Family Unit (Tiered SFU) User Fee	Option 6 User Fee (with urban/rural base charges)
City-Wide Applicability	5	1	2	3	3	3	3
Meets Entire Revenue Needs	4	1	1	2	2	2	2
Fair & Equitable Allocation	5	1	1	2	2.5	3	3
Dedicated & Long-Term Funding Source	5	1	1	2	2	2	2
Low Additional Effort / Cost to Administrate	3	3	3	1	1	1	1
Accountability to Public	4	1	1	3	3	3	3
Environmental Benefits	3	1	1	2	2	2	2
Social Benefits	4	2	2	1	1	2	2
TOTAL SCORE		43	48	68	70.5	77 PREFERRED	77 PREFERRED

3.5.5 City Staff Opinion

On January 11, 2019, the Internal Steering Committee completed the Evaluation Matrix with Option 5 Property Tax (with urban/rural tax levies) as the preferred option.

Table 13: Evaluation of Funding Options (Internal Steering Committee)

Criteria	Weight (from 1 to 5; unimportant = 1; very important = 5)	Option 1 Property Tax (current Sewage and Drainage Tax Levy)	Option 2 Property Tax (with urban/rural tax levies)	Option 3 Equivalent Residential Unit (ERU) User Fee	Option 4 Single Family Unit (SFU) User Fee	Option 5 Tiered Single Family Unit (Tiered SFU) User Fee	Option 6 User Fee (with urban/rural base charges)
City-Wide Applicability	5	2	2.5	2.5	2.5	2.5	2.5
Meets Entire Revenue Needs	4	3	3	3	3	3	3
Fair & Equitable Allocation	5	2	2.5	2.5	2.5	3	3
Dedicated & Long-Term Funding Source	5	2	2	2	2	2	2
Low Additional Effort / Cost to Administrate	5	3	3	1	1	1	1
Accountability to Public	4	2	2.5	2.5	2.5	2.5	2.5
Environmental Benefits	3	1.5	2	2	2	2	2
Social Benefits	3	2	2	2	2	2	2
TOTAL SCORE		75.5	84 PREFERRED	74	74	76.5	76.5

3.6 Parcel Analysis

From a practical standpoint, fairness and equity can be objectively defined when the revenue source is correlated with the basis of charge. That is, when program funds are collected in proportion to the contribution of runoff, a fair and equitable financing mechanism results. In this study, the parcel analysis is coupled with the funding analysis to evaluate and compare the various user fee options.

3.7 Parcel Classifications

In order to understand where stormwater runoff is generating from and to compare it to where stormwater revenue comes from, it is essential to distinguish property classifications that appropriately characterize the wide range of parcels, housing types, and development densities across the City of Thunder Bay.

A parcel refers to any contiguous property, lot, or land tract under single ownership and does not include publicly owned rights-of-way and easements. For this study, a parcel database was compiled based on tax assessment data, geographic information system data, and aerial photography. All spatial information and data attributes were obtained from the City and organized for the purposes of this study. The various data sources were used to establish the parcel distribution, number of residential dwelling units, current value assessment (CVA), and estimated impervious area for each property classification. These are summarized in **Table 14**.

Table 14: Parcel Summary

Parcel Type	Number of Parcels		Dwelling Units (d.u.)		Assessed Value		Estimated Impervious Area (m ²)		
	Count	%	Count	%	Avg. CVA	%	Total	%	Avg/d.u.
Single-Family Detached	32,679	73.8%	32,679	69.5%	\$216,484	62.2%	9,885,400	49.2%	302.5
Semi-Detached	1,407	3.2%	1,407	3.0%	\$129,861	1.6%	242,000	1.2%	172.0
Duplex	1,012	2.3%	2,024	4.3%	\$192,565	1.7%	281,700	1.4%	139.2
Triplex	346	0.8%	1,038	2.2%	\$171,406	0.5%	93,000	0.5%	89.6
4-Plex	195	0.4%	780	1.7%	\$250,771	0.4%	76,100	0.4%	97.5
5-Plex	56	0.1%	280	0.6%	\$221,665	0.1%	21,800	0.1%	77.7
6-Plex	99	0.2%	594	1.3%	\$354,248	0.3%	70,600	0.4%	118.9
7+ Unit Apartments	246	0.6%	5,811	12.4%	\$1,600,778	2.7%	702,500	3.5%	120.9
Condominium	1,829	4.1%	1,829	3.9%	\$199,634	3.3%	134,800	0.7%	73.7
Townhouse	330	0.7%	330	0.7%	\$205,061	0.7%	45,200	0.2%	137.1
Mobile Home Park	4	0.0%	218	0.5%	\$53,899	1.2%	64,700	0.3%	296.8
Residential Subtotal	38,203	86.2%	46,990	100.0%	\$220,783	74.8%	11,617,800	57.9%	247.2
Industrial/Comm/Institutional	3,051	6.9%	n/a		\$860,445	25.2%	8,460,000		
Miscellaneous/Mixed Use	519	1.2%			included above		incl. above		n/a
Non-Residential Subtotal	3,570	8.1%			\$860,445	25.2%	8,460,000	42.1%	
Undeveloped Subtotal	2,523	5.7%			\$54,553	0.0%	0	0.0%	
Total	44,296	100.0%			\$257,228	100.0%	20,077,800	100.0%	

This information was segregated into 14 land use categories (11 residential, 2 non-residential, and 1 undeveloped). Subtotals and the overall totals are shown at the bottom of the table for all parcels in Thunder Bay. The assessed value data was taken from the 2018 Ontario Municipal Property Assessment Corporation data. The impervious area estimates were based on Municipal Property Assessment Corporation data, the City's 2012 aerial photographs, and augmented by recent orthophotos viewed through online mapping systems. The methodology for estimating impervious area varied somewhat for residential and non-residential properties and is described separately in Section 4.2.

Residential properties include both single unit and multi-unit housing. For the purposes of this study, the following definitions were applied:

- Single unit residential properties include single-family detached, semi-detached, and mobile homes; and
- Multi-unit residential properties include separate housing units for multiple families or groups of inhabitants that are contained in a building or complex of buildings.

There is a further distinction between residential properties and dwelling units. The definitions of the various property classifications are based on the property codes assigned by the Municipal Property Assessment Corporation and may differ from the residential zoning designations currently used by the City for land use planning or taxation purposes. For the purposes of this study, the following definitions were applied:

- **Single-Family Detached Home:** A freestanding residential building not attached to any other dwelling or structure, except its own garage or shed.

There are approximately 32,679 such properties/dwelling units in Thunder Bay.

- **Semi-Detached Home:** A building that is divided horizontally into two separate dwelling units on two distinct properties. Each unit is individually owned and assessed separately by Municipal Property Assessment Corporation. The approximate count is 1,407 properties/dwelling units.
- **Duplex Unit:** A building that is divided horizontally into two separate dwelling units (i.e., two self-contained household units that share a common wall and have separate entrances) under single ownership. Both units are assessed cumulatively as a single property by Municipal Property Assessment Corporation. The approximate count is 1,012 properties and 2,024 dwelling units.
- **Tri-, Quad-, Five-, and Six-plex Units:** Buildings that comprise three, four, five, and six self-contained dwelling units under single ownership and assessed cumulatively by Municipal Property Assessment Corporation. The approximate count is 696 properties and 2,692 dwelling units.
- **Apartment Unit:** A building or complex of buildings with multiple apartments comprised of seven or more self-contained dwelling units under single ownership and assessed cumulatively by Municipal Property Assessment Corporation. The approximate count is 246 properties and 5,811 dwelling units.
- **Condominium Unit:** A building or complex of buildings comprised of three or more self-contained dwelling units that are individually owned and assessed separately by Municipal Property Assessment Corporation. Common areas and facilities within the property are jointly owned and controlled by an association of owners. The approximate count is 1,829 properties/dwelling units.
- **Townhouse/Row House:** A building with three or more self-contained dwelling units that are individually owned (i.e., freehold) and assessed separately by Municipal Property Assessment Corporation. The approximate count is 330 properties/dwelling units.
- **Mobile Home Park:** A complex of mobile home slabs with multiple tenants occupying a specific site, typically self-contained units. The approximate count is 4 properties with 218 dwelling units.

No distinction was made between non-residential properties, except to identify parcels that Municipal Property Assessment Corporation data indicates a mixed-use classification (i.e., combined residential and non-residential uses). The values in **Table**

14 represent the combined totals for all non-residential parcels, regardless of zoning designation.

3.8 Parcel Analysis

Thunder Bay properties were identified and characterized through a parcel analysis by estimating the amount of impervious area⁵ for each property type as was shown in **Table 14**. The parcel analysis reflects an objective measure of the runoff contribution, as indicated by impervious area, which in turn is used to establish the appropriate number of billing units in the rate equation.

3.8.1 Residential Properties

Given the large number of residential properties within Thunder Bay, it is not feasible to measure the impervious area for each parcel. As a result, the study team performed a statistical sampling of selected properties within each residential land use category. The objective of the sampling process was to estimate the average impervious area per dwelling unit in each residential category with a 95% confidence that the value is within 10% of the average impervious area for all residential properties. The impervious area for each sampled parcel was calculated using Geographic Information Systems software to view and manipulate the spatial data provided by the City.

The number of parcels with single-family detached homes in each ward was identified. The total count is the same number shown in the first row of **Table 14**. The numbers of parcels assessed generally corresponds to the total number of each property types in the City as shown in **Table 14**. To reduce sampling bias, the assessed value and age of these properties was correlated to identify a relationship like the overall characteristics of Thunder Bay. Parcels were selected to represent the fraction that should be collected in each ward by the range of property values. The sample size for impervious area measurements was 412. As a result of this sampling approach, the average impervious area for single-family detached homes (i.e., first row in **Table 14** was determined to be 303 m² (3,260 ft²). The geographic distribution (i.e., by ward) of single-family detached homes and statistical sampling counts are shown in **Table 15**, confirming that the samples appropriately match the proportion of homes by ward.

5. This assessment excluded public Rights of Way (i.e. roads, sidewalks, etc.). This is a common technical exemption made my municipalities that have implemented a stormwater user fee.

Table 15: Distribution of Single-Family Homes and Sampling Counts

Ward	Single-Family Homes		Impervious Area Samples		
	Count	%	Count	%	Δ
1 Current River	4,209	13%	59	14%	1%
2 Red River	5,898	18%	55	13%	-5%
3 McKeller	4,838	15%	44	11%	-4%
4 McIntyre	5,184	16%	90	22%	6%
5 Northwood	3,752	11%	49	12%	0%
6 Westfort	5,639	17%	52	13%	-5%
7 Neebing	3,151	10%	63	15%	6%
Total	32,671	100%	412	100%	0%

For the remaining residential properties, impervious area measurements were generally obtained for up to 300 dwelling units in each representative parcel category. Categories that contained less than 300 dwelling units had all dwelling units measured. The sample counts for all residential properties are shown in **Table 16**.

Table 16: Statistical Sampling Counts for Residential Properties

Parcel Type	Number of Properties	Number of Dwelling Units
Semi-Detached	102	102
Duplex	150	300
Triplex	100	300
4-Plex	76	304
5-Plex	30	150
6-Plex	32	192
7+ Unit Apartments	24	399
Condominium	12	586
Townhouse	26	26
Mobile Home Park	3	218
Total	555	2,577

The average impervious area for each residential parcel category was identified in the final column of **Table 14** and ranged from 74 to 303 m² of impervious area per dwelling unit. The average impervious area for all residential properties was determined to be 247 m² or (2,660 ft²) per dwelling unit. The consultant team has conducted similar parcel analyses for 14 Canadian municipalities, representing 13% of Canada's population. Each analysis included a minimum of 300 impervious area samples of residential properties. The average impervious area per residential property in Thunder Bay is much higher than the national average of 206 m², third highest and not much below the top value of 256 m².

The total estimated impervious area for all residential properties in Thunder Bay was estimated to be approximately 11,617,800 m².

Given the level of effort involved in the statistical sampling as part of this project, a subsequent implementation phase would not need to re-sample residential impervious areas. Some user fee municipalities update their parcel analysis roughly on a 10-year cycle, using new aerial photography, Geographic Information Systems or property assessment data, or utility account information. In cases where there has been a significant change in residential development that might affect the overall average impervious area (e.g., in number of houses, dwelling unit counts, or density), some municipalities have revisited the statistical analysis over a shorter timeframe.

3.8.2 Non-Residential Properties

The bottom right portion of **Table 14** shows the total impervious area estimate for non-residential and mixed-use properties. While the imperviousness of residential properties generally falls within an expected statistical distribution, the range for non-residential properties is highly variable. That is, a sampling of non-residential properties cannot achieve the same statistical confidence as with residential properties.

It was not within the scope of this study to measure all non-residential properties, which is typically done during the implementation phase of a stormwater user fee. As a result, the total impervious area of non-residential parcels was estimated based on identifying zones that were principally non-residential parcels. Large impervious polygons for each non-residential category were developed, excluding the public rights-of-way. The total area of these polygons was reduced to account for permeable areas inscribed within, database inaccuracies (e.g., incorrect property codes), and potential user fee exemptions. Based on the consultant team's experience in nearly 200 stormwater funding studies, this method of estimating the total non-residential impervious area has been found to be within $\pm 15\%$ of the actual value obtained by measuring all parcels. A subsequent implementation phase would need to complete the measurement of impervious areas in order to accurately bill all non-residential properties.

3.8.3 Summary of Parcel Analysis

The parcel analysis of the City's assessment data identified 44,296 individual parcels in the City of Thunder Bay:

- Residential Single-family parcels make-up 73.8% of all parcels, 49.2% of the total impervious area, and 69.5% of dwelling units;
- Residential semi-detached parcels make-up 3.2% of all parcels, 1.2% of the total impervious area, and 3.0% of dwelling units;

- Residential Duplexes comprise 2.3% of the parcels, 1.4% of the impervious area, and 4.3% of the dwelling units;
- Residential Tri-plex comprise 0.8% of the parcels, 0.5% of the impervious area, and 2.2% of the dwelling units;
- Residential Quad-plex comprise 0.4% of the parcels, 0.4% of the impervious area, and 1.7% of the dwelling units;
- Residential Five-plex comprise 0.1% of the parcels, 0.1% of the impervious area, and 0.6% of the dwelling units;
- Residential Six-plex comprise 0.2% of the parcels, 0.4% of the impervious area, and 1.3% of the dwelling units;
- Residential condominiums comprise 4.1% of the parcels, 0.7% of the impervious area, and 3.9% of the dwelling units;
- Residential Townhouse comprise 0.7% of the parcels, 0.2% of the impervious area, and 0.7% of the dwelling units;
- Residential Multi-family developments comprise 0.6% of the total number of parcels, 3.5% of the total impervious area, and 12.4% of the dwelling unit; and
- Residential Mobile Home Park comprise 0.1% of the parcels, 0.3% of the impervious area, and 0.5% of the dwelling units.

The total estimated impervious area for all Residential properties in Thunder Bay was estimated to be approximately 11,618,000 m², or roughly 58% of the total impervious area (excluding public rights-of-way and easements). The total estimated impervious area for all Non-residential properties in Thunder Bay was estimated to be approximately 8,460,000 m², or roughly 42% of the total impervious area (excluding public rights-of-way and easements). Undeveloped parcels constitute approximately 5.7% of the total number of parcels in the City.

4. Funding Analysis

This section describes the analysis of the funding options identified in Section 3 as viable alternatives to support the City's future stormwater management program. Representative property charges for the various property types are developed and the results are compared.

The options that were evaluated in this study were screened from the complete set described in Section 3.5.2, and further refined into a set of six options based upon direction from City staff and guidance provided by the Stormwater Advisory Committee. Preliminary results of the funding analysis were shared with the City and Stormwater Advisory Committee throughout the study and refined as the project progressed, which assisted with the decision-making and selection of preferences and recommendations that were described in Section 3.5.3. The final results are presented in this section.

4.1 Existing Funding Sources

The total stormwater program funding amount in 2018 was \$5,910,000, comprised of the following funding sources:

- General Tax Levy (\$2,220,000) funded from the general tax revenue and includes all municipal levies and payments in-lieu of taxes;
- Sewage & Drainage Levy (\$930,000) collected from properties that are serviced by the City's stormwater management system;
- Sewer Rate Charge (\$840,000) which reflects the portion used to fund stormwater operating expenditures (4.1% in 2018, and note the remaining 95.9% of Sewer Rate Charge funds are spent on the sanitary sewer system and sewer separation projects as part of the Pollution Prevention Control Program); and
- Grants (\$1,920,000) derived from external funding sources (e.g., Federal and Provincial) in 2018 (and note these are not guaranteed in future budget years; the intent is that external funding would make up the difference to achieve the gross total of required stormwater expenditures).

Note that this represents the "status quo", which is Option 1 of the six short-listed funding options.

As discussed below, a set of funding options was developed using a common target revenue for comparison. The target revenue reflects the non-grant funded portion of 2018 stormwater expenditures of \$3,990,000, which includes the taxation amount (general tax + sewage/drainage levies of \$3,150,000) and the Sewer Rate Charge (\$840,000).

4.2 Property Tax and Sewer Rate Charge Options

Increased revenue requirements for the future stormwater program could be funded by increasing the City’s property tax rate or by reallocating funds from other municipal services. For the purposes of this study, the former possibility was investigated, and it was assumed that tax increases would be linearly related to annual funding needs and equally distributed across all tax classes (i.e., without consideration of the City’s specific policies related to tax rates and ratios). Further, debt-financing was not considered to be a sustainable option in this study. That is, all program expenditures are to be financed on a pay-as-you-go basis.

Property tax payments are based on assessed value determined by Municipal Property Assessment Corporation and the corresponding existing tax rate which varies by property class.

Table 17 shows the municipal tax rates and corresponding stormwater allocation for properties within the defined urban service boundary. Taxes within the urban boundary are used to collect revenue for a range of City services including General, Solid Waste, Public Transportation, Sewage & Drainage, and Street Lighting).

Table 17: Municipal Tax Rates (Urban Service Area)

Property Class (Tax Code)	Total 2018 City Tax Rate	Assessed Value	City Tax Payment *	Stormwater Allocation
Industrial (IT)	3.5484%	per \$100,000	\$3,548	\$60
Multi-Residential (MT)	3.4881%	per \$100,000	\$3,488	\$59
Commercial (CT)	3.1078%	per \$100,000	\$3,108	\$52
Residential (RT)	1.4674%	per \$100,000	\$1,467	\$25
Residential (RT)	-	\$150,000	\$2,201	\$37
Residential (RT)	-	\$200,000	\$2,935	\$49
Residential (RT)	-	\$250,000	\$3,668	\$62
Residential (RT)	-	\$300,000	\$4,402	\$74
Residential (RT)	-	\$350,000	\$5,136	\$86
Residential (RT)	-	\$400,000	\$5,870	\$99
Residential (RT)	-	\$450,000	\$6,603	\$111
Residential (RT)	-	\$500,000	\$7,337	\$123

Note: * General Only

The first two columns in the table show the property categories and 2018 City tax rates, which exclude education taxes that the City collects on behalf of the provincial government. The next two columns show the annual City tax payment for the various property classes per \$100,000 of assessed value and for a range of residential assessed values as reference. The final column shows the stormwater program funding allocation for the Current service level (i.e., \$3.15M annual tax-funded expenditures). This represents 1.68% of the total 2018 municipal tax revenue (\$188M), which includes property tax plus payments in-lieu-of taxes).

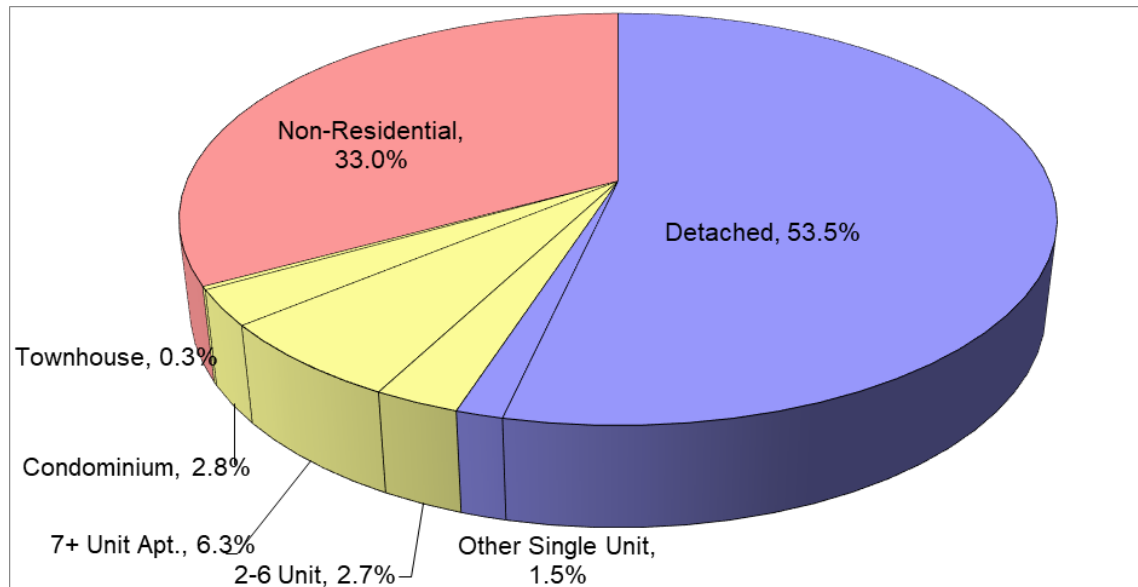
Table 18 shows the municipal tax rates and corresponding stormwater allocation for properties within the defined rural service boundary. Taxes within the rural boundary are used to collect revenue for General and Solid Waste services within Thunder Bay. The 2018 City tax rates in rural areas are lower than the tax rates in urban areas, as they do not include taxation for sewage and drainage, transit, and street lighting.

Table 18: Municipal Tax Rates (Rural Service Area)

Property Class (Tax Code)	Total 2018 City Tax Rate	Assessed Value	City Tax Payment	Stormwater Allocation
Industrial (IT)	3.2203%	per \$100,000	\$3,220	\$54
Multi-Residential (MT)	3.1625%	per \$100,000	\$3,162	\$53
Commercial (CT)	2.8204%	per \$100,000	\$2,820	\$47
Residential (RT)	1.3330%	per \$100,000	\$1,333	\$22
		\$150,000	\$1,999	\$34
		\$200,000	\$2,666	\$45
		\$250,000	\$3,332	\$56
		\$300,000	\$3,999	\$67
		\$350,000	\$4,665	\$78
		\$400,000	\$5,332	\$90
		\$450,000	\$5,998	\$101
		\$500,000	\$6,665	\$112

The distribution of tax revenue by property type, both urban and rural sources combined, is shown in **Figure 5**. Single unit residential properties currently contribute 55% of the tax levy funding for the City’s stormwater management program, followed by 33% non-residential contribution, and 12% from multi-unit residential properties. Therefore all “residential” properties contributed 67% of the total tax revenues.

Figure 5: Tax Revenue Distribution



As noted earlier in this report, the non-grant funded portion of the, stormwater program is currently derived from three internal sources: the general municipal property tax levy, the Sewage & Drainage property tax levy, and the Sewer Rate Charge. It is expected that the stormwater component of the Sewer Rate Charge (4.1% in 2018) will eventually be moved onto the Sewage & Drainage levy, sometime after the City’s Pollution Prevention Control Program is complete. For the purposes of this study, it is assumed that the Sewer Rate Charge funding will continue in the near future, and therefore is included in the target revenue used to evaluate funding options. The two property tax options that were investigated include:

- **Option 1:** Increased taxation on the general levy and Sewage & Drainage levy with no modifications to the current Sewage & Drainage By-law; and
- **Option 2:** Increased taxation with modifications to the current Sewage & Drainage levy By-law, such that the levy is also applied to rural areas at a different rate based on actual expenditures in the rural areas.

4.2.1 Option 1: Existing General Tax, Sewage & Drainage Levy, and Sewer Rate Charge

Table 19 shows the stormwater program cost components for Option 1, which reflects increased taxation to achieve the various service level requirements without modifying the City’s current property taxation policy. Currently, the sewer rate charge and the Sewage & Drainage tax levy are only applied to properties defined as urban as outlined in Section 2.3.5; properties within the rural boundary only fund the stormwater program

through the General tax levy. Revenue from general taxes as well as the Sewage & Drainage tax levy are included under the line item “Taxation”.

Table 19: Cost Components by Service Level (Option 1)

Expenditure / Funding Item	Stormwater Program Service Level			
	Current	Interim	Intermediate	Required
Total Program Cost	\$3,990,000	\$5,910,000	\$9,030,000	\$12,140,000
Sewer Rate	\$840,000	\$840,000	\$1,050,000	\$1,250,000
Taxation	\$3,150,000	\$5,070,000	\$7,980,000	\$10,890,000
Tax Levy Allocation	1.68%	2.70%	4.24%	5.79%
Additional Tax Revenue Required	\$0	\$1,920,000	\$4,830,000	\$7,740,000
Municipal Tax Increase Required	0.00%	1.07%	2.68%	4.30%

The table shows the cost components for the Current service level, which includes \$3.15M funded through taxation and \$0.84M funded through the sewer rate charge for stormwater. As noted above, the taxation amount represents an allocation of 1.68% of the municipal tax revenue towards the City’s stormwater program. The next column shows the Interim service level expenditures, and the increased tax revenue required yields a tax levy allocation of 2.70%, which equates to a municipal tax increase of 1.07% as shown in the bottom row. The remaining columns show the increased tax revenue required and the corresponding tax levy allocations for the Intermediate and Required service levels. All dollars are expressed in current year dollars and benchmarked against the Current service level requirements; inflation is not included in the calculations.

The annual tax-based stormwater charge for Option 1 is summarized in **Table 20**. The program costs and City property tax allocations are shown in the top rows of the table. The remaining rows of the table show statistical averages of the stormwater charges for the various property types throughout the City.

For reference, the first set of columns shows the charges for the 2018 Stormwater Program which represents the “status quo” service level and includes both the taxation and sewer rate charge components as shown. The 2018 municipal tax rates were applied to the average CVA for each representative property listed in the table. Because single-family detached homes represent, by far, the largest number of properties within the City, a range of assessed values and property sizes is given. The range of property sizes is based on the small-medium-large tier system described in Section 4.3.1.3. The range of assessed values is expressed as a percentile (e.g., the 50-percentile or median assessed value identifies the breakpoint at which 50% of all detached homes in Thunder Bay are valued at less than \$188,000 and 50% are valued at more than \$188,000). The average CVA was determined separately for detached homes in the urban (average assessed value = \$201,000) and rural (average assessed value = \$319,000) service area boundaries. Properties located in the rural service area are indicated as " - RURAL", and all others are urban.

Table 20: Annual Stormwater Charge – Current Taxation (Option 1)

Stormwater Program Expenditures ¹	2018 Stormwater Management Program ⁴			Future Stormwater Management Program (Service Levels)																	
				Current ⁶			Interim				Intermediate					Required					
Program Cost ²	\$5,910,000			\$3,150,000	\$840,000	\$3,990,000	\$5,070,000	\$840,000	\$5,910,000			\$7,980,000	\$1,050,000	\$9,030,000			\$10,890,000	\$1,250,000	\$12,140,000		
Municipal Tax Levy Allocation ³	1.68%			1.68%	n/a	n/a	2.70%	n/a	n/a			4.24%	n/a	n/a			5.79%	n/a	n/a		
Representative Property ⁷	Taxation	Rate ⁵	Total	Taxation	Rate	Total	Taxation	Rate	Total	Δ _{Current}	%	Taxation	Rate	Total	Δ _{Current}	%	Taxation	Rate	Total	Δ _{Current}	%
Single Unit Residential																					
Detached (small tier, 10-percentile)	\$27	\$20	\$47	\$27	\$20	\$47	\$44	\$20	\$64	\$17	35%	\$69	\$25	\$94	\$47	99%	\$94	\$30	\$124	\$77	163%
Detached (medium tier, 25-percentile)	\$35	\$20	\$55	\$35	\$20	\$55	\$56	\$20	\$76	\$21	39%	\$89	\$25	\$114	\$59	107%	\$121	\$30	\$151	\$96	175%
Detached (medium tier, 50-percentile)	\$48	\$20	\$68	\$48	\$20	\$68	\$77	\$20	\$97	\$29	43%	\$122	\$25	\$147	\$79	116%	\$166	\$30	\$196	\$128	188%
Detached (medium tier, average)	\$51	\$20	\$71	\$51	\$20	\$71	\$83	\$20	\$103	\$31	44%	\$130	\$25	\$155	\$84	117%	\$177	\$30	\$207	\$136	191%
Detached (medium tier, 75-percentile)	\$61	\$20	\$81	\$61	\$20	\$81	\$99	\$20	\$119	\$37	46%	\$156	\$25	\$181	\$99	122%	\$212	\$30	\$242	\$161	198%
Detached (large tier, 90-percentile)	\$83	\$20	\$103	\$83	\$20	\$103	\$134	\$20	\$154	\$51	49%	\$210	\$25	\$235	\$132	128%	\$287	\$30	\$317	\$214	208%
Semi-Detached (average)	\$33	\$20	\$53	\$33	\$20	\$53	\$53	\$20	\$73	\$20	38%	\$84	\$25	\$109	\$56	105%	\$115	\$30	\$145	\$92	172%
Detached (average) - RURAL	\$82	\$0	\$82	\$82	\$0	\$82	\$131	\$0	\$131	\$50	61%	\$207	\$0	\$207	\$125	153%	\$282	\$0	\$282	\$201	246%
Other (average) - RURAL	\$9	\$0	\$9	\$9	\$0	\$9	\$14	\$0	\$14	\$5	61%	\$22	\$0	\$22	\$13	152%	\$30	\$0	\$30	\$21	245%
Multi-Unit Residential																					
Duplex (average)	\$49	\$20	\$69	\$49	\$20	\$69	\$79	\$20	\$99	\$30	43%	\$124	\$25	\$149	\$80	116%	\$169	\$30	\$199	\$130	189%
Triplex (average)	\$44	\$23	\$67	\$44	\$23	\$67	\$71	\$23	\$94	\$27	40%	\$111	\$28	\$139	\$72	108%	\$152	\$34	\$186	\$119	178%
4-Plex (average)	\$64	\$30	\$94	\$64	\$30	\$94	\$102	\$30	\$132	\$39	41%	\$161	\$38	\$199	\$105	113%	\$220	\$45	\$265	\$171	183%
5-Plex (average)	\$57	\$38	\$95	\$57	\$38	\$95	\$91	\$38	\$129	\$35	36%	\$144	\$47	\$191	\$96	101%	\$196	\$57	\$253	\$158	167%
6-Plex (average)	\$91	\$45	\$136	\$91	\$45	\$136	\$146	\$45	\$191	\$55	41%	\$230	\$56	\$286	\$150	111%	\$313	\$68	\$381	\$246	181%
7+ Unit Apartments (average)	\$977	\$177	\$1,154	\$977	\$177	\$1,154	\$1,573	\$177	\$1,750	\$596	52%	\$2,476	\$222	\$2,698	\$1,543	134%	\$3,378	\$267	\$3,645	\$2,491	216%
Condominium (average)	\$51	\$20	\$71	\$51	\$20	\$71	\$82	\$20	\$102	\$31	44%	\$129	\$25	\$154	\$83	117%	\$177	\$30	\$207	\$135	191%
Townhouse (average)	\$52	\$20	\$72	\$52	\$20	\$72	\$84	\$20	\$104	\$32	44%	\$133	\$25	\$158	\$85	118%	\$181	\$30	\$211	\$139	192%
Duplex (average) - RURAL	\$79	\$0	\$79	\$79	\$0	\$79	\$127	\$0	\$127	\$48	61%	\$200	\$0	\$200	\$121	153%	\$273	\$0	\$273	\$194	246%
4-Plex (average) - RURAL	\$178	\$0	\$178	\$178	\$0	\$178	\$287	\$0	\$287	\$109	61%	\$452	\$0	\$452	\$273	153%	\$617	\$0	\$617	\$438	246%
7+ Unit Apartments (average) - RURAL	\$1,211	\$0	\$1,211	\$1,211	\$0	\$1,211	\$1,949	\$0	\$1,949	\$738	61%	\$3,068	\$0	\$3,068	\$1,857	153%	\$4,187	\$0	\$4,187	\$2,976	246%
Non-Residential																					
Non-Residential (average)	\$310	\$230	\$540	\$310	\$230	\$540	\$499	\$230	\$729	\$188	35%	\$784	\$290	\$1,074	\$533	99%	\$1,070	\$350	\$1,420	\$880	163%
Undeveloped (average)	\$5	\$230	\$235	\$5	\$230	\$235	\$8	\$230	\$238	\$3	1%	\$13	\$290	\$303	\$68	29%	\$17	\$350	\$367	\$132	56%
Tax Exempt (average)	\$1	\$230	\$231	\$1	\$230	\$231	\$1	\$230	\$231	\$0	0%	\$1	\$290	\$291	\$61	26%	\$2	\$350	\$352	\$121	53%
Non-Residential (average) - RURAL	\$443	\$0	\$443	\$443	\$0	\$443	\$712	\$0	\$712	\$269	61%	\$1,118	\$0	\$1,118	\$675	152%	\$1,527	\$0	\$1,527	\$1,084	245%

- Notes: 1. Values are annual costs in present day dollars (inflation is not included).
2. This includes program components that are currently funded by the municipal tax levy, sewer rate (stormwater operations), and external grants where noted (see Note 4). Stormwater capital projects funded by the sewer rate are not included.
3. 2018 municipal tax rates are used (full services within urban boundary).
4. All 2018 funding sources, including municipal tax levy (taxation, \$3.15M), sewer rate funds (\$0.84M), and external grants (\$1.92M).
5. Estimated sewer rate charge for stormwater operations.
6. All 2018 funding sources from tax-based sources (i.e., excluding grants).
7. Properties within the rural service area are indicated as " - RURAL" (average assessed value = \$319,000), all others are located within the urban service area (average assessed value = \$201,000).

The second grouping of columns in the table shows the annual tax payments that would be used to support the Current service level. These are the same as the status quo values because Option 1 does not propose any changes to taxation. The average single-family detached homeowner in the urban service area (fourth row in the table) would pay \$51 per year towards the stormwater program through taxation and \$20 per year through the sewer rate charge; an annual total contribution of \$71. In contrast, the average single-family detached homeowner in the rural service area (eighth row in the table) would pay \$82 per year towards the stormwater program, due to the higher average assessed value.

The remaining columns in the table show the corresponding charges for the other service levels across the various property types. For example, to support the Interim service level, the average urban detached homeowner would pay \$103 per year for stormwater, reflecting a \$31 annual tax increase or 44% compared to the Current service level. Likewise, the average urban detached homeowner would pay \$155 per year for the Intermediate service level, an increase of \$84 or 117% compared to the Current scenario.

4.2.2 Option 2: Modified Taxation (Urban and Rural Levies)

Table 21 shows the stormwater program cost components for Option 2, which reflects increased taxation to achieve the various service level requirements by modifying the City’s current property taxation policy. The Sewage & Drainage tax levied to urban properties would be expanded to rural properties with separate tax rates applied to both.

Table 21: Cost Components by Service Level (Option 2)

Program Expenditure / Funding Item	Stormwater Program Service Level			
	Current	Interim	Intermediate	Required
Total Program Cost	\$3,990,000	\$5,910,000	\$9,030,000	\$12,140,000
Sewer Rate	\$840,000	\$840,000	\$1,050,000	\$1,250,000
Taxation	\$3,150,000	\$5,070,000	\$7,980,000	\$10,890,000
Urban Stormwater Service Cost	\$2,580,000	\$4,500,000	\$7,260,000	\$10,020,000
Rural Stormwater Service Cost	\$570,000	\$570,000	\$720,000	\$870,000
Urban Stormwater Levy	0.02516%	0.04388%	0.07080%	0.09771%
Rural Stormwater Levy	0.05003%	0.05003%	0.06319%	0.07635%

The table shows the cost components for the Current service level. The program costs are the same as were shown in **Table 20**, however, the taxation component has been separated into urban and rural service area costs as determined by City staff. For example, the Current service level taxation amount of \$3.15M per year reflects an annual expenditure of \$2.58M within the urban service area boundary and \$0.57M in

the rural area. When these expenditures are divided by the tax base (i.e., cumulative CVA within each boundary), the resulting urban and rural stormwater levy rates required to equitably fund these expenditures (i.e., urban pays for urban and rural pays for rural) are calculated as shown in the bottom two rows of the table.

It is interesting to note that for every additional \$100,000 spent in the rural areas (beyond the stated program budgets for the various service levels), there would be a corresponding 17.5% rural levy increase (i.e., from 0.05003% to 0.058880% for the Current and Interim service levels). Therefore, the tax rate would fluctuate widely in each given year. For example, if there was a \$ 300,000 capital improvement on one rural street, this would result in an \$84 tax increase for the average residential rural property, regardless of where the work was done in the rural area. This is due to, in general, to fewer rural properties contributing to the capital works.

The annual tax-based stormwater charge for Option 2 is summarized in **Table 22**, presented in the same format as **Table 20**. Unlike Option 1, different charges are evident for the Current service level compared to status quo conditions as a result of modifications to the taxing structure. Under the Current service level, the average single-family detached homeowner in the urban service area would pay \$70 per year towards the stormwater program (slight decrease from Option 1). The average single-family detached homeowner in the rural service area would pay \$160 per year towards the stormwater program (almost a doubling from Option 1).

To support the Interim service level, the average urban detached homeowner would pay \$108 per year for stormwater, reflecting a \$38 annual tax increase or 53% compared to the Current service level. Likewise, the average urban detached homeowner would pay \$167 per year for the Intermediate service level, an increase of \$97 or 137% compared to the Current scenario.

4.2.3 Summary of Findings of Property Tax Revenue Sources VS. Runoff Sources

As noted earlier, one measure of fairness and equity is how well the contribution of funds is correlated with the contribution of runoff, as indicated by impervious area.

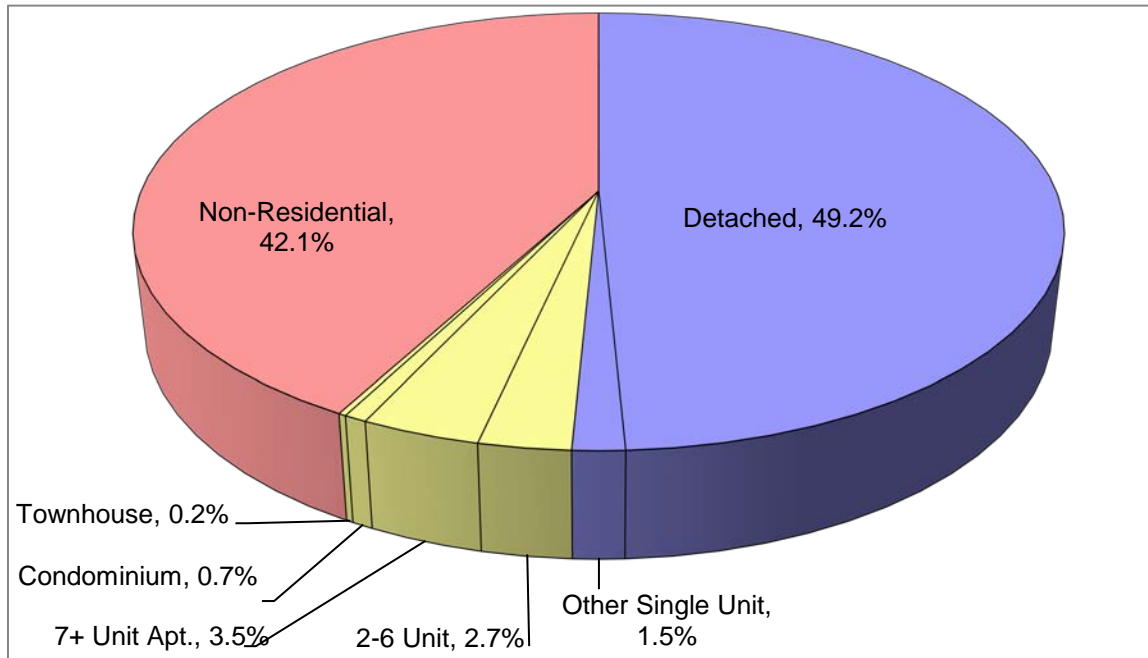
Figure 5 showed the distribution of tax revenue, which reflects the contribution of funds to the existing stormwater management program. **Figure 6** shows the distribution of impervious area by property type, using the same color scheme as **Figure 5**: single-unit residential properties (i.e., single-family detached, semi-detached, and mobile homes) in blue; multiple-unit residential properties in yellow; and non-residential properties in red.

Table 22: Annual Stormwater Charge – Modified Taxation (Option 2)

Stormwater Program Expenditures ¹	2018 Stormwater Management Program ⁴			Future Stormwater Management Program (Service Levels)																	
				Current ⁶			Interim				Intermediate					Required					
Program Cost ²	\$5,910,000			\$3,150,000	\$840,000	\$3,990,000	\$5,070,000	\$840,000	\$5,910,000			\$7,980,000	\$1,050,000	\$9,030,000			\$10,890,000	\$1,250,000	\$12,140,000		
Urban Service Area Cost	\$5,340,000			\$2,580,000	\$840,000	\$3,420,000	\$4,500,000	\$840,000	\$5,340,000			\$7,260,000	\$1,050,000	\$8,310,000			\$10,020,000	\$1,250,000	\$11,270,000		
Rural Service Area Cost	\$570,000			\$570,000	\$0	\$570,000	\$570,000	\$0	\$570,000			\$720,000	\$0	\$720,000			\$870,000	\$0	\$870,000		
Municipal Tax Levy Allocation ³	1.68%			1.68%	n/a	n/a	2.70%	n/a	n/a			4.24%	n/a	n/a			5.79%	n/a	n/a		
Urban Stormwater Levy	n/a			0.0252%	n/a	n/a	0.0439%	n/a	n/a			0.0708%	n/a	n/a			0.0977%	n/a	n/a		
Rural Stormwater Levy	n/a			0.0500%	n/a	n/a	0.0500%	n/a	n/a			0.0632%	n/a	n/a			0.0764%	n/a	n/a		
Representative Property⁷	Taxation	Rate⁵	Total	Taxation	Rate	Total	Taxation	Rate	Total	Δ_{Current}	%	Taxation	Rate	Total	Δ_{Current}	%	Taxation	Rate	Total	Δ_{Current}	%
Single Unit Residential																					
Detached (small tier, 10-percentile)	\$27	\$20	\$47	\$27	\$20	\$47	\$47	\$20	\$67	\$20	43%	\$75	\$25	\$100	\$53	114%	\$104	\$30	\$134	\$87	186%
Detached (medium tier, 25-percentile)	\$35	\$20	\$55	\$34	\$20	\$54	\$60	\$20	\$80	\$26	47%	\$97	\$25	\$122	\$68	124%	\$134	\$30	\$164	\$109	201%
Detached (medium tier, 50-percentile)	\$48	\$20	\$68	\$47	\$20	\$67	\$82	\$20	\$102	\$35	52%	\$133	\$25	\$158	\$91	135%	\$184	\$30	\$214	\$146	218%
Detached (medium tier, average)	\$51	\$20	\$71	\$50	\$20	\$70	\$88	\$20	\$108	\$38	53%	\$142	\$25	\$167	\$97	137%	\$196	\$30	\$226	\$156	221%
Detached (medium tier, 75-percentile)	\$61	\$20	\$81	\$60	\$20	\$80	\$105	\$20	\$125	\$45	56%	\$170	\$25	\$195	\$115	142%	\$235	\$30	\$265	\$184	229%
Detached (large tier, 90-percentile)	\$83	\$20	\$103	\$82	\$20	\$102	\$143	\$20	\$163	\$61	60%	\$230	\$25	\$255	\$153	151%	\$317	\$30	\$347	\$246	241%
Semi-Detached (average)	\$33	\$20	\$53	\$33	\$20	\$53	\$57	\$20	\$77	\$24	46%	\$92	\$25	\$117	\$64	122%	\$127	\$30	\$157	\$104	198%
Detached (average) - RURAL	\$82	\$0	\$82	\$160	\$0	\$160	\$160	\$0	\$160	\$0	0%	\$202	\$0	\$202	\$42	26%	\$244	\$0	\$244	\$84	53%
Other (average) - RURAL	\$9	\$0	\$9	\$27	\$0	\$27	\$27	\$0	\$27	\$0	0%	\$34	\$0	\$34	\$7	26%	\$41	\$0	\$41	\$14	53%
Multi-Unit Residential																					
Duplex (average)	\$49	\$20	\$69	\$48	\$20	\$68	\$84	\$20	\$104	\$36	53%	\$136	\$25	\$161	\$92	136%	\$187	\$30	\$217	\$149	218%
Triplex (average)	\$44	\$23	\$67	\$43	\$23	\$66	\$75	\$23	\$98	\$32	49%	\$121	\$28	\$149	\$83	126%	\$167	\$34	\$201	\$135	205%
4-Plex (average)	\$64	\$30	\$94	\$63	\$30	\$93	\$109	\$30	\$139	\$47	50%	\$176	\$38	\$214	\$121	131%	\$243	\$45	\$288	\$195	211%
5-Plex (average)	\$57	\$38	\$95	\$56	\$38	\$94	\$97	\$38	\$135	\$42	44%	\$157	\$47	\$204	\$110	117%	\$217	\$57	\$274	\$180	192%
6-Plex (average)	\$91	\$45	\$136	\$89	\$45	\$134	\$155	\$45	\$200	\$66	49%	\$251	\$56	\$307	\$173	129%	\$346	\$68	\$414	\$280	209%
7+ Unit Apartments (average)	\$977	\$177	\$1,154	\$403	\$177	\$580	\$702	\$177	\$879	\$300	52%	\$1,133	\$222	\$1,355	\$775	134%	\$1,563	\$267	\$1,830	\$1,251	216%
Condominium (average)	\$51	\$20	\$71	\$50	\$20	\$70	\$88	\$20	\$108	\$37	53%	\$141	\$25	\$166	\$96	137%	\$195	\$30	\$225	\$155	220%
Townhouse (average)	\$52	\$20	\$72	\$52	\$20	\$72	\$90	\$20	\$110	\$38	54%	\$145	\$25	\$170	\$99	138%	\$200	\$30	\$230	\$159	222%
Duplex (average) - RURAL	\$79	\$0	\$79	\$154	\$0	\$154	\$154	\$0	\$154	\$0	0%	\$195	\$0	\$195	\$41	26%	\$235	\$0	\$235	\$81	53%
4-Plex (average) - RURAL	\$178	\$0	\$178	\$349	\$0	\$349	\$349	\$0	\$349	\$0	0%	\$441	\$0	\$441	\$92	26%	\$532	\$0	\$532	\$184	53%
7+ Unit Apartments (average) - RURAL	\$1,211	\$0	\$1,211	\$992	\$0	\$992	\$992	\$0	\$992	\$0	0%	\$1,253	\$0	\$1,253	\$261	26%	\$1,514	\$0	\$1,514	\$522	53%
Non-Residential																					
Non-Residential (average)	\$310	\$230	\$540	\$208	\$230	\$438	\$363	\$230	\$593	\$155	35%	\$586	\$290	\$876	\$438	100%	\$809	\$350	\$1,159	\$721	164%
Undeveloped (average)	\$5	\$230	\$235	\$14	\$230	\$244	\$24	\$230	\$254	\$10	4%	\$39	\$290	\$329	\$85	35%	\$53	\$350	\$403	\$160	65%
Tax Exempt (average)	\$1	\$230	\$231	\$2	\$230	\$232	\$4	\$230	\$234	\$2	1%	\$6	\$290	\$296	\$64	28%	\$8	\$350	\$358	\$126	54%
Non-Residential (average) - RURAL	\$443	\$0	\$443	\$591	\$0	\$591	\$591	\$0	\$591	\$0	0%	\$747	\$0	\$747	\$156	26%	\$902	\$0	\$902	\$311	53%

- Notes: 1. Values are annual costs in present day dollars (inflation is not included).
2. This includes program components that are currently funded by the municipal tax levy, sewer rate (stormwater operations), and external grants where noted (see Note 4). Stormwater capital projects funded by the sewer rate are not included.
3. 2018 municipal tax rates are used for the 2018 program, proposed urban/rural stormwater levies are used for all other scenarios.
4. All 2018 funding sources, including municipal tax levy (taxation, \$3.15M), sewer rate funds (\$0.84M), and external grants (\$1.92M).
5. Estimated sewer rate charge for stormwater operations.
6. All 2018 funding sources from tax-based sources (i.e., excluding grants).
7. Properties within the rural service area are indicated as " - RURAL " (average assessed value = \$319,000), all others are located within the urban service area (average assessed value = \$201,000).

Figure 6: Impervious Area Distribution



Residential properties (which represent 74% of all parcels in Thunder Bay, as shown in the first row of **Table 14**) currently contribute 67% of the tax levy funding for the City's stormwater management program and 33% of the funding is contributed by non-residential properties. The impervious area distribution however indicates that 58% of the City's stormwater runoff comes from residential areas and the remaining 42% from non-residential properties. A stormwater user fee that allocates funds in this proportion would represent a revenue redistribution of 9%. That is, the average residential property would pay 9% less towards stormwater management in the City, whereas the average non-residential property would pay 9% more compared to current taxation.

This is not a significant enough impact to warrant changing the City's current funding mechanism. Based on the consulting team's experience, a shift in revenue that is greater than 10% is worth pursuing strictly on the principle of fairness and equity. When this rule of thumb is achieved, a disproportionate relation between funding source and runoff contribution is indicated and it is easier to demonstrate that one group has a preferential benefit over another. On the contrary, as is the case in Thunder Bay, when the revenue shift is less than 10% it is harder to convince city councillors that current funding mechanism is unfair and inequitable.

4.3 Stormwater User Fee Options

A stormwater user fee involves coupling a parcel analysis with the stormwater program revenue requirements to determine an appropriate base charge for property owners. This section summarizes the parcel analysis, billing unit analysis, and evaluation of user fee options that were investigated in this study. Four user fee options were investigated, including:

- Option 3: User Fee with Equivalent Residential Unit billing units;
- Option 4: User Fee with Single Family Unit billing units;
- Option 5: User Fee with Tiered Single Family Unit billing units; and
- Option 6: User Fee with Single Family Unit billing units and separate rates in urban and rural areas.

With tax Options 1 and 2, the overall target revenue for the Current service level was set at the non-grant funded portion of 2018 stormwater expenditures (\$3,990,000). In Options 3 to 6, the same overall target was used, effectively moving funds from the general municipal property tax levy, the Sewage & Drainage levy, and the Sewer Rate Charge onto a user fee.

4.3.1 Billing Unit Analysis

The parcel analysis in Section 4 was undertaken to quantify the unique characteristics of impervious area throughout Thunder Bay. The results of the parcel analysis reflect runoff contribution by property type and are used in this section to establish the appropriate billing units for each user fee option.

The basic calculation for a stormwater user fee is simply the stormwater program expense divided by the total number of billing units within the municipality. To determine the billing unit denominator, there are a number of methods to allocate stormwater-related costs to property owners as described in Section 3.3.2.2. The four stormwater user fee options investigated are described below.

4.3.1.1 Option 3: Equivalent Residential Unit

With this option, the average impervious area for all types of residential dwelling units represents the base billing unit. Charges for residential properties are based on assigning one stormwater billing unit to each residential dwelling unit, regardless of density. Given the wide variability in impervious area statistics for non-residential properties, the impervious area for each non-residential property must be measured.

The charge for non-residential properties is determined by dividing the measured impervious area by the average Equivalent Residential Unit size.

The first five columns in **Table 23** repeat the parcel and impervious data that were shown in **Table 14**. The average impervious area for all residential properties was determined to be **247 m²** (2,660 ft²) per dwelling unit in Thunder Bay, which defines the average Equivalent Residential Unit size. The third column from the right shows the Equivalent Residential Unit Factor that was applied to each residential property type. Under the Equivalent Residential Unit billing unit method, all residential dwelling units, regardless of property type, would be charged one equivalent residential unit (1 Equivalent Residential Unit) per dwelling unit. The final two columns show the distribution of Equivalent Residential Unit billing units by parcel type. There is a total of 46,990 residential Equivalent Residential Units.

Table 23: Equivalent Residential Unit Billing Unit Analysis Results

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		ERU Factor	ERU Distribution	
			Total	Avg/d.u.		Count	%
Detached	32,679	32,679	9,885,400	302.5	1.00	32,679	40.2%
Semi-Detached	1,407	1,407	242,000	172.0	1.00	1,407	1.7%
Duplex	1,012	2,024	281,700	139.2	1.00	2,024	2.5%
Triplex	346	1,038	93,000	89.6	1.00	1,038	1.3%
4-Plex	195	780	76,100	97.5	1.00	780	1.0%
5-Plex	56	280	21,800	77.7	1.00	280	0.3%
6-Plex	99	594	70,600	118.9	1.00	594	0.7%
7+ Unit Apartments	246	5,811	702,500	120.9	1.00	5,811	7.2%
Condominium	1,829	1,829	134,800	73.7	1.00	1,829	2.3%
Townhouse	330	330	45,200	137.1	1.00	330	0.4%
Mobile Home Park	4	218	64,700	296.8	1.00	218	0.3%
Residential Subtotal	38,203	46,990	11,617,800	247.2		46,990	57.9%
Industrial/Comm/Institutional	3,051	n/a	8,460,000	n/a	n/a	34,223	42.1%
Miscellaneous/Mixed Use	519		incl. above			included above	
Non-Residential Subtotal	3,570		8,460,000			34,223	42.1%
Undeveloped Subtotal	2,523		0				
Total	44,296		20,077,800			81,213	100.0%

For non-residential properties, the number of Equivalent Residential Unit billing units is determined by dividing the impervious area by the Equivalent Residential Unit base area. For the estimated 8,460,000 m² of non-residential impervious area in Thunder Bay, the corresponding number of Equivalent Residential Unit billing units is 34,223 resulting in a total of 81,213 Equivalent Residential Units for all properties.

4.3.1.2 Option 4: Single Family Unit

For the Single Family Unit option, the average impervious area for single-family detached homes becomes the base billing unit with one stormwater billing unit assigned

to each single-family detached home. Higher density residential property types are assigned fractional billing units since apartments, condominiums, and townhouses have a smaller impervious area footprint than single-family detached homes. The charge for non-residential properties is determined by dividing the measured impervious area by the average Single Family Unit size.

Table 24 shows the results from the Single Family Unit analysis, presented in the same format as **Table 23**. Under the Single Family Unit billing unit method, the average impervious area of single-family detached homes is used as the base billing unit. The average impervious area of single-family detached homes was determined to be **303 m²** (3,260 ft²) in Thunder Bay. The Single Family Unit factor shown relates the average impervious area of each residential parcel type to this Single Family Unit size.

Table 24: Single Family Unit Billing Unit Analysis Results

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		SFU Factor	SFU Distribution	
			Total	Avg/d.u.		Count	%
Detached	32,679	32,679	9,885,400	302.5	1.00	32,679	49.2%
Semi-Detached	1,407	1,407	242,000	172.0	0.57	800	1.2%
Duplex	1,012	2,024	281,700	139.2	0.46	931	1.4%
Triplex	346	1,038	93,000	89.6	0.30	307	0.5%
4-Plex	195	780	76,100	97.5	0.32	251	0.4%
5-Plex	56	280	21,800	77.7	0.26	72	0.1%
6-Plex	99	594	70,600	118.9	0.39	233	0.4%
7+ Unit Apartments	246	5,811	702,500	120.9	0.40	2,322	3.5%
Condominium	1,829	1,829	134,800	73.7	0.24	446	0.7%
Townhouse	330	330	45,200	137.1	0.45	150	0.2%
Mobile Home Park	4	218	64,700	296.8	0.98	214	0.3%
Residential Subtotal	38,203	46,990	11,617,800	247.2		38,405	57.9%
Industrial/Comm/Institutional	3,051	n/a	8,460,000	n/a	n/a	27,967	42.1%
Miscellaneous/Mixed Use	519		incl. above			included above	
Non-Residential Subtotal	3,570		8,460,000			27,967	42.1%
Undeveloped Subtotal	2,523		0				
Total	44,296		20,077,800			66,372	100.0%

The final two columns in the table show the distribution of Single Family Unit billing units. For residential properties, the Single Family Units are assigned by multiplying the number of dwelling units by the Single Family Unit factor. There is a total of 38,405 residential Single Family Units. For non-residential properties, the number of Single Family Unit billing units is determined by dividing the impervious area by the Single Family Unit size. For the estimated 8,460,000 m² of non-residential impervious area in Thunder Bay, the corresponding number of Single Family Unit billing units is 27,967, resulting in a total of 66,372 Single Family Units for all properties.

4.3.1.3 Option 5: Tiered Single Family Unit

The Tiered Single Family Unit billing unit method extends the Single Family Unit method by accounting for the wide variability in impervious area among residential properties by assigning three tiers to single-family detached homes (e.g., small, medium, and large). Other municipalities that have implemented a variable rate have increased the number of residential tiers or have extended the analysis of multi-family residential properties to distinguish high-rise apartments and condos from low-rise ones, for example.

The Tiered Single Family Unit billing unit method extends the previous method by accounting for the variability in impervious area among single-family detached homes. Like the Single Family Unit billing unit method, the average impervious area of single-family detached homes is also used as the base billing unit (i.e., **303 m²** or 3,260 ft²). For this study, three tier sizes were identified for the Tiered Single Family Unit option and these are included **Table 25**. The tiers represent the following:

- Single Family (Small): This tier is based on the impervious area of properties within the smallest 10 percentile of single-family homes, with an average of **161 m²** (1,730 ft²);
- Single Family (Medium): This tier is based on the impervious area of properties within the middle 80 percentile of single-family homes, with an average of **303 m²** (3,260 ft²); and
- Single Family (Large): This tier is based on the impervious area of properties within the largest 10 percentile of single-family homes, with an average of **469 m²** (5,040 ft²) or greater.

The final two columns in the table show the distribution of Tiered Single Family Unit billing units. For residential properties, the Tiered Single Family Units are assigned by multiplying the number of dwelling units by the Single Family Unit factor. There is a total of 38,664 residential Tiered Single Family Units. For non-residential properties, the number of Tiered Single Family Unit billing units is determined by dividing the impervious area by the Single Family Unit size. For the estimated 8,460,000 m² of non-residential impervious area in Thunder Bay, the corresponding number of Tiered Single Family Unit billing units is 27,967, resulting in a total of 66,631 Tiered Single Family Units for all properties.

Table 25: Tiered Single Family Unit Billing Unit Analysis Results

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		SFU Factor	SFU Distribution	
			Total	Avg/d.u.		Count	%
Detached (small)	3,268	3,267	524,400	160.5	0.53	1,733	2.6%
Detached (medium)	26,143	26,145	7,908,900	302.5	1.00	26,145	39.2%
Detached (large)	3,268	3,267	1,530,600	468.5	1.55	5,060	7.6%
Semi-Detached	1,407	1,407	242,000	172.0	0.57	800	1.2%
Duplex	1,012	2,024	281,700	139.2	0.46	931	1.4%
Triplex	346	1,038	93,000	89.6	0.30	307	0.5%
4-Plex	195	780	76,100	97.5	0.32	251	0.4%
5-Plex	56	280	21,800	77.7	0.26	72	0.1%
6-Plex	99	594	70,600	118.9	0.39	233	0.3%
7+ Unit Apartments	246	5,811	702,500	120.9	0.40	2,322	3.5%
Condominium	1,829	1,829	134,800	73.7	0.24	446	0.7%
Townhouse	330	330	45,200	137.1	0.45	150	0.2%
Mobile Home Park	4	218	64,700	296.8	0.98	214	0.3%
Residential Subtotal	38,203	46,990	11,696,300	248.9		38,664	58.0%
Industrial/Comm/Institutional	3,051	n/a	8,460,000	n/a	n/a	27,967	42.0%
Miscellaneous/Mixed Use	519		incl. above			included above	
Non-Residential Subtotal	3,570		8,460,000			27,967	42.0%
Undeveloped Subtotal	2,523		0				
Total	44,296		20,156,300			66,631	100.0%

4.3.1.4 Option 6: Single Family Unit with Urban/Rural Service Zones

For the Urban/Rural Single Family Unit user fee option, charges are assigned depending on which service zone the property is located within and the development type, which includes four customer categories:

- Single-family detached homes, each assigned one billing unit (i.e., Single Family Unit factor = 1) and used to determine the average urban/rural Single Family Unit impervious footprint size;
- Other residential properties, with billing units determined by an appropriate urban/rural Single Family Unit factor;
- Developed non-residential properties, with billing units determined in relation to the average urban/rural Single Family Unit size; and
- Undeveloped properties, which are assigned zero billing units.

The residential parcel analysis described in Section 4.2.1 was extended to include sampling that distinguished the average impervious footprint of single-family detached homes in both urban and rural servicing areas. Also, as part of this project, City staff assisted in determining the urban or rural service zone for each property in Thunder Bay. These items allowed an estimate of the total urban and rural impervious area, which was used to determine separate urban and rural stormwater user fee base charges.

For each parcel type the urban/rural impervious area was estimated by assigning a runoff coefficient to each Municipal Property Assessment Corporation land use code. Examples include:

- Municipal Property Assessment Corporation 134 (open space land) = 2% runoff coefficient;
- Municipal Property Assessment Corporation 230 (intensive farm operation) = 15% runoff coefficient;
- Municipal Property Assessment Corporation 301 (single-family detached home) = 25% runoff coefficient;
- Municipal Property Assessment Corporation 309 (freehold townhouse/row house) = 45% runoff coefficient;
- Municipal Property Assessment Corporation 400 (small office building) = 55% runoff coefficient;
- Municipal Property Assessment Corporation 621 (hospital) = 65% runoff coefficient;
- Municipal Property Assessment Corporation 409 (commercial retail, one storey) = 75% runoff coefficient;
- Municipal Property Assessment Corporation 428 (regional shopping centre) = 85% runoff coefficient; and
- Municipal Property Assessment Corporation 481 (parking garage) = 95% runoff coefficient; and

To account for the range of development status within each land use (i.e., from 0% undeveloped to 100% fully developed within its underlying zoning), a land development factor was applied to each parcel type. This factor was adjusted until the residential and non-residential subtotal impervious areas matched the values that were presented in **Table 14**.

The results of the urban/rural billing unit analysis are shown in **Table 26**. The top rows of the table summarize properties within the urban service zone, the middle rows summarize properties within the rural service zone, and the bottom rows tabulate the residential and non-residential subtotals.

Table 26: Urban/Rural Single Family Unit Billing Unit Analysis Results

Parcel Type	Number of Parcels	Est'd Impervious Area (m ²)		SFU Factor	SFU Distribution	
		Total	Avg/parcel		Count	%
Urban Properties						
Detached	28,313	7,546,100	266.5	1.00	28,313	55.6%
Other Residential	7,006	1,261,900	180.1	0.68	4,735	9.3%
Residential Subtotal	35,319	8,808,000	249.4		33,048	64.9%
Non-Residential Subtotal	3,219	4,760,700	n/a	n/a	17,862	35.1%
Undeveloped Subtotal	1	0			0	0.0%
Urban Subtotal	38,539	13,568,700			50,910	100.0%
Rural Properties						
Detached	4,419	2,339,300	529.4	1.00	4,419	35.9%
Other Residential	1,086	470,500	433.2	0.82	889	7.2%
Residential Subtotal	5,505	2,809,800	510.4		5,308	43.2%
Non-Residential Subtotal	241	3,699,300	n/a	n/a	6,988	56.8%
Undeveloped Subtotal	11	0			0	0.0%
Rural Subtotal	5,757	6,509,100			12,296	100.0%
All Properties						
Residential Subtotal	40,824	11,617,800			38,356	60.7%
Non-Residential Subtotal	3,460	8,460,000			24,850	39.3%
Undeveloped Subtotal	12	0			0	0.0%
Total	44,296	20,077,800			63,206	100.0%

The average impervious areas were:

- Urban detached home (i.e., urban Single Family Unit impervious footprint size): 267 m² (2,870 ft²); and
- Rural detached home (i.e., rural Single Family Unit impervious footprint size): 529 m² (5,700 ft²).

When the above values are averaged (weighted by the respective number of urban/rural parcels), this yields the overall single-family detached home impervious area footprint of 303 m² (3,260 ft²) that was used as the basis of charge in Option 4 and Option 5. For the other residential properties, the average impervious area per parcel equates to an urban Single Family Unit factor of 0.7, and a rural Single Family Unit factor of 0.8.

The final two columns in the table show the resulting Urban/Rural Single Family Unit billing units and overall distribution within each servicing zone. The bottom rows show the overall total impervious areas and billing units. As noted, the overall impervious areas match the residential and non-residential subtotals that were shown in **Table 14**.

4.3.2 Base Charges

In this section, the base charge is determined for each stormwater user fee option to generate the required stormwater program revenue for each service level scenario.

There are several factors that may affect the overall base charge determined as part of a user fee, and the following definitions are helpful to clarify these:

- **Adjustments:** These are typically requested through an appeals process in cases where the property owner feels their charge is incorrect (e.g., assigned to the wrong rate category, incorrect impervious area due to misinterpreted surface cover or newly installed materials). If approved, the individual fee would be adjusted accordingly. These adjustments are typically a small percentage of all properties (less than 0.5%) and rarely warrant a change to the overall stormwater rate base charge.
- **Credits:** These are typically requested through an application process and if approved, would result in a reduced fee for individual property owners that have installed, operate and maintain eligible facilities or practices on their property or do not have a connection to the City's stormwater management system. In some jurisdictions, credits can be awarded for reducing the amount of imperviousness on a property if a fee adjustment policy does not already account for this. The overall impact of awarding credits is typically in the range of 1% to 7% of the total stormwater program revenue. Ideally, the total amount of credits awarded would be removed from the revenue requirement in the base charge calculation. When initially setting a rate, it is typical to account for a collection rate that represents 90% to 95% of the required annual revenue to reflect anticipated credits and other unrecognized revenue.
- **Incentives:** These are often included in a credit program, but do not reduce fees charged to individual property owners; rather, they often represent one-time discounts that are offered to offset the purchase price or installation costs of stormwater management facilities implemented by property owners (e.g., rain barrels, rain gardens, etc.). The City can also offer technical assistance for the design, installation, and inspection of facilities. Although these items add to the overall program cost, they are generally a small proportion of the overall budget (less than 0.5%) and rarely warrant a change to the overall stormwater rate base charge.
- **Exemptions:** This includes eligible land uses that are not included in the rate calculation (e.g., public transportation rights-of-way that are considered part of the City's drainage system) or for landowners which the City does not have the legislative authority to charge a user fee. For exemptions, the impervious area of exempt properties would be removed from the assessable total billing units in the base charge calculation. Further details are provided in Section 4.3.5.

- **Subsidies/Grants:** This would include selected properties for which Council may decide to use City tax funds to pay the charge on behalf of the property owners (e.g., economically disadvantaged homeowners, charitable organizations, or places of worship).

4.3.3 Stormwater Program Expenditures

As identified in Section 2.3, the City's current program costs and future required expenditures are identified for a range of scenarios that include:

- Current service level: \$3,990,000 per year, which represents the tax-funded component plus sewer rate charges (for operations) of the City's 2018 stormwater management program;
- Interim service level: \$5,910,000 per year, which represents the 2018 stormwater budget from all funding sources, except sewer rate charges that funded the Pollution Prevention Control Plan;
- Intermediate service level: \$9,030,000 per year, which represents the average of the Interim and Required service levels; and
- Required service level: \$12,140,000 per year, which was identified in the 2016 Stormwater Management Plan and expressed in 2018 dollars.

In addition to the annual stormwater program costs above, the start-up implementation and ongoing administration costs of a stormwater user fee must be accounted for in a way that reflects the incremental costs of changing the current funding/billing systems. The additional implementation and administration costs of the various user fee options have been incorporated into the base charge calculations and expressed as an average annual cost over a 5-year timeframe as follows:

Option 3 (Equivalent Residential Unit):	\$360,000 per year, which includes \$70,000 per year in the first five years for start-up implementation, plus \$290,000 per year for ongoing administration
Option 4 (Single Family Unit):	\$370,000 per year (\$80,000 implementation plus \$290,000 administration)

Option 5 (Tiered Single Family Unit):	\$380,000 per year (\$90,000 implementation plus \$290,000 administration).
Option 6 (Urban/Rural Single Family Unit):	\$410,000 per year (\$120,000 implementation plus \$290,000 administration)

Rate administration costs reflect the incremental costs of a new stormwater charge on the bill (i.e., over and above the current billing and accounting system costs) and does not include items that would be considered part of the stormwater program (such as capital planning, project management, etc.). Generally, these include direct costs for an engineering/accounting specialist as well as indirect costs for computer, training, and other overhead related to the following:

- Billing, customer service, and collections;
- Credit application reviews and site inspections; and
- Database management (e.g., changes to impervious area, rate schedules, credits, owner/address information, etc.).

Further, rate administration costs include the one-time start-up implementation costs and the ongoing administration and operational costs, estimated by the project team based on experience with Ontario municipalities who have undertaken a stormwater user fee. For start-up costs, the estimate comprises of consultant fees (which vary by the funding option complexity) and City labour (including billing system modification, accounting programming, plus the combined efforts of engineering, financial, and legal staff). To convert to an average annual cost, start-up implementation costs were assumed to be treated as internal borrowing over an initial 5-year timeframe.

For ongoing administration costs, it was assumed that 1.5 full-time equivalent of dedicated personnel would be required to manage the user fee program and corresponding credit policy. A consideration of indirect labour efforts across multiple departments, resulted in an additional 0.5 full-time equivalents, for a total of 2.0 at a loaded labour rate of \$125,000 per full-time equivalent and a 10% contingency. For incremental stormwater billing costs (assuming the current system is capable of adding a stormwater charge and potential credit on the utility bill) an estimate of bulk postage costs at 85¢ per bill was applied to 4,000 assumed stormwater-only quarterly bills. This estimate is preliminary and would need to be refined in a subsequent implementation phase. It is assumed that an existing utility billing system would be used. If a new billing system is required, implementation and annual administration costs would be higher.

With all these assumptions, the annual rate administration cost represents between 3% to 10% of the total stormwater program requirements for the various user fee options and service level scenarios. As noted, it is premature in a feasibility study such as this to accurately estimate rate administration costs, but a range of 2% to 5% of the total program costs is typical for other municipalities that have implemented a stormwater user fee. The additional annual operating costs ranged from \$360,000 to \$410,000 per year for Options 3 to 6 and were added to the annual program budgets for the Current, Interim, Intermediate, and Required service levels shown above.

4.3.4 User Fee Exemptions

As noted earlier, the base charge for a stormwater user fee is determined by dividing the annual cost of the municipal stormwater management program by the total number of billing units. For a feasibility study, it is common not to modify values used in this rate equation to account for incentives, adjustments, and subsidies/grants. Since the goal of a user fee credit policy is to reduce the City's program expense, the total credit amount would be removed from the rate revenue requirement (i.e., the numerator in the rate equation). For exemptions however, the impervious area of exempt properties would be removed from the total stormwater billing units (i.e., the denominator in the rate equation).

For municipalities that have implemented a rate, public transportation rights-of-way are considered to be part of the drainage system and therefore not included in the rate calculation. Under pre-development conditions, the natural drainage system can handle stormwater runoff and pollutant loads without the need for engineered collection systems and treatment facilities. With development, the City is responsible for, and incurs expenses for, collecting, conveying, treating, and returning stormwater runoff to the receiving watercourse, while minimizing flooding and erosion hazards, and without harming the environment. The City is also responsible for planning, building, and operating roads to serve development. Drainage systems are an integral part of the roadway and therefore, public transportation rights-of-way are not included in the stormwater rate calculation.

Rate exemptions also include properties that the City does not have the legislative authority to charge a user fee. Sections 9 and 11 and Part XII of the Ontario Municipal Act authorize the City to impose, by by-law, a fee or charge to property owners for services provided by a municipality, including stormwater management. This authority is limited in two respects:

- Section 2 of Ontario Regulation 584/06 provides that a fee or charge cannot be used for capital costs that could otherwise have been raised through the Development Charges process; and

- Where provisions exist in other legislation that expressly exempt entities from paying these charges, then the City cannot legally impose these fees.

The Supreme Court of Canada has clearly stated that there must be a reasonable nexus between fees and charges imposed and services received, otherwise a charge could be construed as an unauthorized tax. Accordingly, a reasonable connection must be established between the amount of the stormwater user fee and the cost of the service being provided. This test would be met by matching stormwater rate revenue with the cost of the City's program, excluding funds from Development Charges. In certain cases, where stormwater management infrastructure has been installed on fee-eligible property, it would be necessary to establish a credit policy to create a reasonable connection between the amount of the charge and the stormwater services provided.

Ontario Regulation 584/06 establishes that the federal and provincial Crown are not required to pay municipal user fees and charges. Further, a common legal opinion in Ontario is that colleges and public schoolboards are not required to pay a stormwater user fee. These common Ontario stormwater user fee exemptions have been incorporated into the base charge calculations below, as an estimated 4% reduction in the total amount of billing units.

4.3.4.1 Tax-Exempt Properties and User Fee Exemptions

It is important to note that tax-exempt status does not exempt the property owner from a user fee. For example, land owned by a religious organization and used as a place of worship, a hospital or a university will be exempt from property taxation but is not considered exempt from user fees or charges under the Municipal Act. Legislation establishing municipalities also does not provide an exemption from municipal user fees and charges. That is, the City of Thunder Bay would be required to pay the stormwater user fee, as it does for water/sewer fees.

Table 27 contains the results of a detailed review of those properties designated as tax exempt by the City. It should be known that tax exemption is typically a function of ownership not property use. Based upon Municipal Property Assessment Corporation property use coding, those properties identified as tax exempt were reviewed as to the type of property use, number of parcels, numbers of dwelling units, and when applicable estimated impervious area. The results of the review were then used to calculate the number of billing units associated with the 3 impervious area funding methodologies cited in the study. In addition, those parcels with ownership "Thunder Bay City" were broke out separately and again the number of parcels, dwelling unit count, estimated impervious area and billing units generated by the 3 basic funding methodologies used.

Table 27: Summary of Tax Exempt Properties

Tax Exempt SW Class	Count	DU's	Est Imp area (m2)	ERU	SFU	SFU Tiered
Miscellaneous/mixed use Total	59	13	27,956.0	125.5	105.4	105.4
Nonresidential Total	603	0	3,772,780.9	15,188.3	12,472.0	12,472.0
Residential Duplex Total	2	4	0.0	4.0	1.8	1.8
Residential Multifamily Total	3	63	0.0	63.0	25.2	25.2
Residential Quad-plex Total	2	8	0.0	8.0	2.6	2.6
Residential SFH Total	96	96	0.0	96.0	96.0	98.8
Undeveloped Total	1,152	0	0.0	0.0	0.0	0.0
Grand Total	1,917	184	3,800,736.9	15,484.9	12,703.0	12,705.8

4.3.5 Option 3: Equivalent Residential Unit

Annual stormwater charges for the Equivalent Residential Unit user fee option are shown in **Table 28** for the various service level scenarios. The total rate funded program costs and base rates are shown in the top rows of the table, followed by average annual charges (rounded to the nearest dollar) estimated for the various parcel types.

Table 28: Equivalent Residential Unit Annual Base Charge Analysis Results

Billing Units (ERU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program									
				Current	Interim			Intermediate		Required			
				Program Cost ²									
			Program Cost ²	\$4,350,000	\$6,270,000			\$9,390,000		\$12,500,000			
			Base Rate (\$/ERU/mo)	\$5.20	\$7.50			\$11.20		\$14.90			
			Representative Property	User Fee	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}	%
Single Unit Residential													
1.0	1.0	160.5	Detached (small tier, 10-percentile)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	302.5	Detached (medium tier, average)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	468.5	Detached (large tier, 90-percentile)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	172.0	Semi-Detached (average)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	302.5	Detached (average) - RURAL	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	296.8	Other (average) - RURAL	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
Multi-Unit Residential													
2.0	2.0	278.4	Duplex (average)	\$125	\$180	\$55	44%	\$269	\$144	115%	\$358	\$233	187%
3.0	3.0	268.8	Triplex (average)	\$187	\$270	\$83	44%	\$403	\$216	115%	\$536	\$349	187%
4.0	4.0	390.0	4-Plex (average)	\$250	\$360	\$110	44%	\$538	\$288	115%	\$715	\$466	187%
5.0	5.0	388.5	5-Plex (average)	\$312	\$450	\$138	44%	\$672	\$360	115%	\$894	\$582	187%
6.0	6.0	713.4	6-Plex (average)	\$374	\$540	\$166	44%	\$806	\$432	115%	\$1,073	\$698	187%
23.6	23.6	2,855.9	7+ Unit Apartments (average)	\$1,473	\$2,124	\$651	44%	\$3,172	\$1,699	115%	\$4,220	\$2,747	187%
1.0	1.0	73.7	Condominium (average)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
1.0	1.0	137.1	Townhouse (average)	\$62	\$90	\$28	44%	\$134	\$72	115%	\$179	\$116	187%
2.0	2.0	278.4	Duplex (average) - RURAL	\$125	\$180	\$55	44%	\$269	\$144	115%	\$358	\$233	187%
4.0	4.0	390.0	4-Plex (average) - RURAL	\$250	\$360	\$110	44%	\$538	\$288	115%	\$715	\$466	187%
23.6	23.6	2,855.9	7+ Unit Apartments (average) - RURAL	\$1,473	\$2,124	\$651	44%	\$3,172	\$1,699	115%	\$4,220	\$2,747	187%
Non-Residential													
10.3	n/a	2,532.9	Non-Residential (average)	\$643	\$927	\$284	44%	\$1,384	\$742	115%	\$1,842	\$1,199	187%
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a
10.3	n/a	2,532.9	Non-Residential (average) - RURAL	\$643	\$927	\$284	44%	\$1,384	\$742	115%	\$1,842	\$1,199	187%

Notes: 1. Values are in present day dollars (inflation is not included).
2. This includes an estimate of the annual user fee administration costs.

The base rate calculation assumes a collection rate of 90% (i.e., 10% unrecognized revenue, which includes allowances for credits, billings errors, and non-payments) and is expressed on a monthly basis. This collection rate is a typical value used in the

feasibility stage and would need to be refined during implementation. The potential lost revenue due to credits and incentives would need to be adjusted as the credit policy is being developed. The base charge also accounts for user fee exemptions as described in Section 4.3.2. As a result, the total Equivalent Residential Unit billing units presented in Section 4.3.1.1 was reduced from 81,200 to 77,800 Equivalent Residential Units.

The first two columns in the table show the number of billing units and dwelling units for each property classification. For the Equivalent Residential Unit billing unit method, residential properties are assigned 1 billing unit for each dwelling unit and non-residential properties are assigned billing units based on the measured impervious area divided by the average Equivalent Residential Unit size (247 m²). The remaining columns show the corresponding user fee charges, grouped by service level and compared to the Current service level. Since detached homes comprise 74% of all parcels in Thunder Bay, this category is a useful comparator when evaluating the various options and is shown in bold. The difference in annual charges, compared to the Current service level, is expressed in dollars and as a percentage.

The average detached homeowner (urban or rural) would pay the following with the Equivalent Residential Unit user fee option:

- Current service level: \$62 per year;
- Interim service level: \$90 per year;
- Intermediate service level: \$134 per year; and
- Required service level: \$179 per year.

Although impervious area varies widely between properties, the relative increase to support the greater stormwater revenue requirements, in comparison to the Current service level, would be the same for all ratepayers (i.e., 44% for the Interim program, 115% for the Intermediate program, and 187% for the Required program). The increased user fees are directly proportional to the program revenue requirements shown at the top of the table. Undeveloped properties and the common stormwater exemptions described in Section 4.3.4, would be fee exempt and are shown with a zero charge.

4.3.6 Option 4: Single Family Unit

Annual stormwater charges for the Single Family Unit user fee option are shown in **Table 29**. For the Single Family Unit billing unit method, residential properties are assigned fractional billing units for each dwelling unit and non-residential properties are assigned billing units based on the measured impervious area divided by the average Single Family Unit size (303 m²). To account for user fee exemptions, the total Single

Family Unit billing units presented in Section 4.3.1.2 was reduced from 66,400 to 63,600 Single Family Units.

Table 29: Single Family Unit Annual Base Charge Analysis Results

Billing Units (SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program													
				Current		Interim		Intermediate		Required							
				Program Cost ²	Base Rate (\$/SFU/mo)	User Fee	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}	%		
Single Unit Residential																	
1.0	1.0	160.5	Detached (small tier, 10-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	302.5	Detached (medium tier, average)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	468.5	Detached (large tier, 90-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
0.6	1.0	172.0	Semi-Detached (average)	\$45	\$66	\$20	44%	\$99	\$53	117%	\$131	\$86	189%				
1.0	1.0	302.5	Detached (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.0	1.0	296.8	Other (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
Multi-Unit Residential																	
1.0	2.0	278.4	Duplex (average)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
0.9	3.0	268.8	Triplex (average)	\$68	\$98	\$30	44%	\$148	\$80	117%	\$197	\$129	189%				
1.2	4.0	390.0	4-Plex (average)	\$91	\$131	\$40	44%	\$197	\$107	117%	\$262	\$171	189%				
1.5	5.0	388.5	5-Plex (average)	\$113	\$164	\$50	44%	\$247	\$133	117%	\$328	\$214	189%				
2.4	6.0	713.4	6-Plex (average)	\$181	\$262	\$81	44%	\$395	\$213	117%	\$524	\$343	189%				
9.4	23.6	2,855.9	7+ Unit Apartments (average)	\$711	\$1,026	\$316	44%	\$1,545	\$835	117%	\$2,053	\$1,342	189%				
0.2	1.0	73.7	Condominium (average)	\$15	\$22	\$7	44%	\$33	\$18	117%	\$44	\$29	189%				
0.5	1.0	137.1	Townhouse (average)	\$38	\$55	\$17	44%	\$82	\$44	117%	\$109	\$71	189%				
1.0	2.0	278.4	Duplex (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%				
1.2	4.0	390.0	4-Plex (average) - RURAL	\$91	\$131	\$40	44%	\$197	\$107	117%	\$262	\$171	189%				
9.4	23.6	2,855.9	7+ Unit Apartments (average) - RURAL	\$711	\$1,026	\$316	44%	\$1,545	\$835	117%	\$2,053	\$1,342	189%				
Non-Residential																	
8.4	n/a	2,532.9	Non-Residential (average)	\$635	\$917	\$282	44%	\$1,381	\$746	117%	\$1,835	\$1,200	189%				
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a				
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a				
8.4	n/a	2,532.9	Non-Residential (average) - RURAL	\$635	\$917	\$282	44%	\$1,381	\$746	117%	\$1,835	\$1,200	189%				

Notes:
1. Values are in present day dollars (inflation is not included).
2. This includes an estimate of the annual user fee administration costs.

The average urban or rural detached homeowner would pay the following with the Single Family Unit user fee option:

- Current service level: \$76 per year;
- Interim service level: \$109 per year;
- Intermediate service level: \$164 per year; and
- Required service level: \$218 per year.

4.3.7 Option 5: Tiered Single Family Unit

Annual stormwater charges for the Tiered Single Family Unit user fee option are shown in **Table 30**. With this billing unit method, the single-family detached homeowners in the medium tier (and non-residential property owners) would pay the same as identified above for the Single Family Unit billing unit method. However, small and large tier single-family detached homeowners would pay 50% less (Single Family Unit factor of 0.5) and 50% more (Single Family Unit factor of 1.5), respectively. To account for user

fee exemptions, the total Tiered Single Family Unit billing units presented in Section 4.3.1.2 was reduced from 66,600 to 63,800 Tiered Single Family Units.

Table 30: Tiered Single Family Unit Annual Base Charge Analysis Results

Billing Units (Tiered SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program											
				Current			Interim			Intermediate			Required		
				Program Cost ²	Base Rate (\$/SFU/mo)	Representative Property	User Fee	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}	%	User Fee	Δ _{Current}
Single Unit Residential															
0.5	1.0	160.5	Detached (small tier, 10-percentile)	\$38	\$55	\$17	44%	\$82	\$44	117%	\$109	\$71	189%		
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.0	1.0	302.5	Detached (medium tier, average)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.5	1.0	468.5	Detached (large tier, 90-percentile)	\$113	\$164	\$50	44%	\$247	\$133	117%	\$328	\$214	189%		
0.6	1.0	172.0	Semi-Detached (average)	\$45	\$66	\$20	44%	\$99	\$53	117%	\$131	\$86	189%		
1.0	1.0	302.5	Detached (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.0	1.0	296.8	Other (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
Multi-Unit Residential															
1.0	2.0	278.4	Duplex (average)	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
0.9	3.0	268.8	Triplex (average)	\$68	\$98	\$30	44%	\$148	\$80	117%	\$197	\$129	189%		
1.2	4.0	390.0	4-Plex (average)	\$91	\$131	\$40	44%	\$197	\$107	117%	\$262	\$171	189%		
1.5	5.0	388.5	5-Plex (average)	\$113	\$164	\$50	44%	\$247	\$133	117%	\$328	\$214	189%		
2.4	6.0	713.4	6-Plex (average)	\$181	\$262	\$81	44%	\$395	\$213	117%	\$524	\$343	189%		
9.4	23.6	2,855.9	7+ Unit Apartments (average)	\$711	\$1,026	\$316	44%	\$1,545	\$835	117%	\$2,053	\$1,342	189%		
0.2	1.0	73.7	Condominium (average)	\$15	\$22	\$7	44%	\$33	\$18	117%	\$44	\$29	189%		
0.5	1.0	137.1	Townhouse (average)	\$38	\$55	\$17	44%	\$82	\$44	117%	\$109	\$71	189%		
1.0	2.0	278.4	Duplex (average) - RURAL	\$76	\$109	\$34	44%	\$164	\$89	117%	\$218	\$143	189%		
1.2	4.0	390.0	4-Plex (average) - RURAL	\$91	\$131	\$40	44%	\$197	\$107	117%	\$262	\$171	189%		
9.4	23.6	2,855.9	7+ Unit Apartments (average) - RURAL	\$711	\$1,026	\$316	44%	\$1,545	\$835	117%	\$2,053	\$1,342	189%		
Non-Residential															
8.4	n/a	2,532.9	Non-Residential (average)	\$635	\$917	\$282	44%	\$1,381	\$746	117%	\$1,835	\$1,200	189%		
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a		
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a		
8.4	n/a	2,532.9	Non-Residential (average) - RURAL	\$635	\$917	\$282	44%	\$1,381	\$746	117%	\$1,835	\$1,200	189%		

Notes: 1. Values are in present day dollars (inflation is not included).
2. This includes an estimate of the annual user fee administration costs.

The average urban or rural detached homeowner would pay the following with the Tiered Single Family Unit user fee option:

- Current service level: \$76 per year;
- Interim service level: \$109 per year;
- Intermediate service level: \$164 per year; and
- Required service level: \$218 per year.

4.3.8 Option 6: Single Family Unit with Urban/Rural Service Zones

Annual stormwater charges for the Urban/Rural Single Family Unit user fee option are shown in **Table 31**. With this billing unit method, the billing unit entries shown in the first column depend on the service zone. For the residential properties, these are the Single Family Unit factors that were shown in **Table 26**. For the non-residential properties, the estimated impervious area was divided by the appropriate urban or rural Single Family Unit size.

Table 31: Urban/Rural Single Family Unit Annual Base Charge Analysis Results

Billing Units (Urban / Rural SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program												
				Current		Interim		Intermediate		Required						
				Program Cost ²												
			Program Cost ²	\$4,400,000		\$6,320,000				\$9,440,000				\$12,550,000		
			Urban Service Area Cost	\$3,770,000		\$5,710,000				\$8,690,000				\$11,650,000		
			Rural Service Area Cost	\$630,000		\$610,000				\$750,000				\$900,000		
			Urban Base Rate (\$/SFU/mo)	\$7.20		\$10.80				\$16.50				\$22.10		
			Rural Base Rate (\$/SFU/mo)	\$4.90		\$4.80				\$5.90				\$7.10		
			Representative Property	User Fee	User Fee	Δ_{Current}	%	User Fee	Δ_{Current}	%	User Fee	Δ_{Current}	%	User Fee	Δ_{Current}	%
Single Unit Residential																
1.0	1.0	144.0	Detached (small tier, 10-percentile)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
1.0	1.0	266.5	Detached (medium tier, 25-percentile)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
1.0	1.0	266.5	Detached (medium tier, 50-percentile)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
1.0	1.0	266.5	Detached (medium tier, average)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
1.0	1.0	266.5	Detached (medium tier, 75-percentile)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
1.0	1.0	448.0	Detached (large tier, 90-percentile)	\$86	\$130	\$43	50%	\$198	\$112	129%	\$265	\$179	207%			
0.7	1.0	180.1	Semi-Detached (average)	\$60	\$91	\$30	50%	\$139	\$78	129%	\$186	\$125	207%			
1.0	1.0	529.4	Detached (average) - RURAL	\$59	\$58	-\$1	-2%	\$71	\$12	20%	\$85	\$26	45%			
0.8	1.0	433.2	Other (average) - RURAL	\$47	\$46	-\$1	-2%	\$57	\$10	20%	\$68	\$21	45%			
Multi-Unit Residential																
1.4	2.0	278.4	Duplex (average)	\$121	\$181	\$60	50%	\$277	\$156	129%	\$371	\$250	207%			
2.1	3.0	268.8	Triplex (average)	\$181	\$272	\$91	50%	\$416	\$234	129%	\$557	\$375	207%			
2.8	4.0	390.0	4-Plex (average)	\$242	\$363	\$121	50%	\$554	\$312	129%	\$743	\$501	207%			
3.5	5.0	388.5	5-Plex (average)	\$302	\$454	\$151	50%	\$693	\$391	129%	\$928	\$626	207%			
4.2	6.0	713.4	6-Plex (average)	\$363	\$544	\$181	50%	\$832	\$469	129%	\$1,114	\$751	207%			
16.5	23.6	2,855.9	7+ Unit Apartments (average)	\$1,429	\$2,143	\$714	50%	\$3,274	\$1,845	129%	\$4,385	\$2,957	207%			
0.7	1.0	73.7	Condominium (average)	\$60	\$91	\$30	50%	\$139	\$78	129%	\$186	\$125	207%			
0.7	1.0	137.1	Townhouse (average)	\$60	\$91	\$30	50%	\$139	\$78	129%	\$186	\$125	207%			
1.6	2.0	278.4	Duplex (average) - RURAL	\$94	\$92	-\$2	-2%	\$113	\$19	20%	\$136	\$42	45%			
3.2	4.0	390.0	4-Plex (average) - RURAL	\$188	\$184	-\$4	-2%	\$227	\$38	20%	\$273	\$84	45%			
18.9	23.6	2,855.9	7+ Unit Apartments (average) - RURAL	\$1,111	\$1,088	-\$23	-2%	\$1,338	\$227	20%	\$1,610	\$499	45%			
Non-Residential																
9.5	n/a	2,532.9	Non-Residential (average)	\$821	\$1,231	\$410	50%	\$1,881	\$1,060	129%	\$2,519	\$1,699	207%			
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a			
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a	\$0	\$0	n/a			
4.8	n/a	2,532.9	Non-Residential (average) - RURAL	\$282	\$276	-\$6	-2%	\$340	\$58	20%	\$409	\$127	45%			

Notes:
1. Values are in present day dollars (inflation is not included).
2. This includes an estimate of the annual user fee administration costs.

The additional rows at the top show the urban and rural components of the program cost and the corresponding base rate (i.e., annual service area cost divided by billing units). The same rate administration costs as the Single Family Unit Option 4 have been used, allocated in the same proportion of Urban/Rural service area costs that were shown in **Table 21**. To account for user fee exemptions, the total Urban Single Family Unit billing units presented in Section 4.3.1.2 was reduced from 50,900 to 48,800 and the total Rural Single Family Unit billing units was reduced from 12,300 to 11,800. The urban base rate was applied to all urban properties in the table and the rural base rate was applied to all rural properties, denoted by the suffix “- RURAL” in the Representative Property column.

The average urban detached homeowner would pay the following with the Urban/Rural Single Family Unit user fee option:

- Current service level: \$85 per year;
- Interim service level: \$130 per year;
- Intermediate service level: \$197 per year; and
- Required service level: \$264 per year.

The average rural detached homeowner would pay the following with the Urban/Rural Single Family Unit user fee option:

- Current service level: \$59 per year;
- Interim service level: \$58 per year;
- Intermediate service level: \$71 per year; and
- Required service level: \$85 per year.

4.4 Comparison of Options

In this section the six taxation and user fee options are compared and evaluated with respect to average annual stormwater charges for the representative property types.

To provide a comparative baseline, the individual property charges under Option 1 (Current Taxation and Sewer Rate Charge) were used. These baseline values assume that annual expenditures for the City's stormwater management program would be funded solely through property taxes, the sewage & drainage levy and the sewer rate charge. This does not reflect the status quo funding program (i.e., due to external funding sources such as grants, etc.); however, it is useful for comparing and evaluating the other five funding options.

Table 32 compares the user fee options among the representative properties for the Current service level scenario. The annual stormwater charges shown reflect the base charge allocated to property owners and do not include a consideration for individual credits. Differences in annual charges are expressed in dollars and as a percentage compared to the taxation estimate. Cells are highlighted such that green represents a lower charge compared to Option 1 (Current Taxation), and red represents a higher charge than Option 1.

The charges shown are only meant to reflect the statistical average for each category they represent; individual charges for properties within each category will vary widely.

Table 33 through **Table 35** show the comparison for the other service levels, namely Interim, Intermediate, and Required. Results of the comparison indicate that different property types will either benefit from the corresponding option (green highlighted cell) or not (red highlighted cells) depending on the service level scenario. Note that the numbers in the table represent averages and that actual fee changes to individual properties would vary, depending on their assessed value, rural/urban designation and imperviousness (for non-residential).

The impacts to tax-exempt properties are intuitive. That is, a user fee would result in new charges that have not historically been paid by property owners (except in cases where payments in-lieu-of taxes are currently made). For the remaining multi-residential and taxable non-residential properties in Thunder Bay, impacts will vary on a case-by-case basis. In general terms:

- The taxation option would be preferred by property owners with a relatively low assessed value per square meter of impervious area (or a large impervious footprint per dollar of assessed value), which is reflective of sprawling development; and
- A stormwater user fee option would be preferred by property owners with a relatively high assessed value per square meter of impervious area (or a small impervious footprint per dollar of assessed value), which is reflective of higher density development.

Based on the average statistical results presented in the tables above, the following specific financial impacts are noted:

- A short-term perspective is represented by conditions in which the stormwater management program expenditures are kept close to the Current service level, generally less than \$5M per year. Consistent with the City's recommendation, the Current Taxation (Option 1) or Modified Taxation (Option 2) are the best options for this scenario, when gaged by the overall impacts to property owners across all customer categories (i.e., least number of red highlighted cells in **Table 32**).
- When a mid- to long-term perspective is considered (i.e., with annual program expenditures in the range of \$5M to \$10M as represented by the Interim and Intermediate service level scenarios), the Equivalent Residential Unit User Fee (Option 3) would be desirable when considering the largest number of property owners impacted. The top three property categories in terms of parcel count include urban detached homes (64% of all properties in Thunder Bay), rural detached homes (10%), and urban non-residential properties (7%). The Equivalent Residential Unit User Fee (Option 3) would be favoured significantly (i.e., greater than 10% reduced charge compared to the baseline) by two of these three property categories (urban and rural detached homes).

Table 32: Funding Option Comparison (Current Service Level)

Representative Property	1 - Taxation		2 - Modified Taxation		3 - ERU User Fee			4 - SFU User Fee			5 - Tiered SFU User Fee			6 - Urban/Rural SFU		
	Charge	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%
Single Unit Residential																
Detached (small tier, 10-percentile)	\$47	\$47	\$0	-1%	\$62	\$15	32%	\$76	\$28	60%	\$38	-\$9	-20%	\$85	\$38	81%
Detached (medium tier, 25-percentile)	\$55	\$54	-\$1	-1%	\$62	\$7	13%	\$76	\$21	37%	\$76	\$21	37%	\$85	\$30	55%
Detached (medium tier, 50-percentile)	\$68	\$67	-\$1	-1%	\$62	-\$6	-8%	\$76	\$8	11%	\$76	\$8	11%	\$85	\$17	25%
Detached (medium tier, average)	\$71	\$70	-\$1	-1%	\$62	-\$9	-13%	\$76	\$4	6%	\$76	\$4	6%	\$85	\$14	19%
Detached (medium tier, 75-percentile)	\$81	\$80	-\$1	-1%	\$62	-\$19	-23%	\$76	-\$6	-7%	\$76	-\$6	-7%	\$85	\$4	5%
Detached (large tier, 90-percentile)	\$103	\$102	-\$1	-1%	\$62	-\$41	-39%	\$76	-\$27	-27%	\$113	\$10	10%	\$85	-\$18	-17%
Semi-Detached (average)	\$53	\$53	-\$1	-1%	\$62	\$9	17%	\$45	-\$8	-15%	\$45	-\$8	-15%	\$60	\$6	12%
Detached (average) - RURAL	\$82	\$160	\$78	96%	\$62	-\$19	-24%	\$76	-\$6	-7%	\$76	-\$6	-7%	\$59	-\$23	-28%
Other (average) - RURAL	\$9	\$27	\$18	213%	\$62	\$54	625%	\$76	\$67	778%	\$76	\$67	778%	\$47	\$38	446%
Multi-Unit Residential																
Duplex (average)	\$69	\$68	-\$1	-1%	\$125	\$56	81%	\$76	\$7	10%	\$76	\$7	10%	\$119	\$50	73%
Triplex (average)	\$67	\$66	-\$1	-1%	\$187	\$120	180%	\$68	\$1	2%	\$68	\$1	2%	\$179	\$112	168%
4-Plex (average)	\$94	\$93	-\$1	-1%	\$250	\$156	167%	\$91	-\$3	-3%	\$91	-\$3	-3%	\$239	\$145	155%
5-Plex (average)	\$95	\$94	-\$1	-1%	\$312	\$217	229%	\$113	\$19	20%	\$113	\$19	20%	\$298	\$203	215%
6-Plex (average)	\$136	\$134	-\$1	-1%	\$374	\$239	176%	\$181	\$46	34%	\$181	\$46	34%	\$358	\$222	164%
7+ Unit Apartments (average)	\$1,154	\$580	-\$575	-50%	\$1,473	\$318	28%	\$711	-\$444	-38%	\$711	-\$444	-38%	\$1,409	\$255	22%
Condominium (average)	\$71	\$70	-\$1	-1%	\$62	-\$9	-12%	\$15	-\$56	-79%	\$15	-\$56	-79%	\$60	-\$11	-16%
Townhouse (average)	\$72	\$72	-\$1	-1%	\$62	-\$10	-14%	\$38	-\$35	-48%	\$38	-\$35	-48%	\$60	-\$13	-18%
Duplex (average) - RURAL	\$79	\$154	\$75	96%	\$125	\$46	58%	\$76	-\$3	-4%	\$76	-\$3	-4%	\$94	\$15	19%
4-Plex (average) - RURAL	\$178	\$349	\$170	96%	\$250	\$71	40%	\$91	-\$88	-49%	\$91	-\$88	-49%	\$188	\$10	5%
7+ Unit Apartments (average) - RURAL	\$1,211	\$992	-\$219	-18%	\$1,473	\$262	22%	\$711	-\$500	-41%	\$711	-\$500	-41%	\$1,111	-\$100	-8%
Non-Residential																
Non-Residential (average)	\$540	\$438	-\$102	-19%	\$643	\$102	19%	\$635	\$95	18%	\$635	\$95	18%	\$809	\$269	50%
Undeveloped (average)	\$235	\$244	\$9	4%	\$0	-\$235	-100%	\$0	-\$235	-100%	\$0	-\$235	-100%	\$0	-\$235	-100%
Fee Exempt (average)	\$231	\$232	\$2	1%	\$0	-\$231	-100%	\$0	-\$231	-100%	\$0	-\$231	-100%	\$0	-\$231	-100%
Non-Residential (average) - RURAL	\$443	\$591	\$148	33%	\$643	\$200	45%	\$635	\$192	43%	\$635	\$192	43%	\$282	-\$161	-36%

Table 33: Funding Option Comparison (Interim Service Level)

Representative Property	1 - Taxation Charge	2 - Modified Taxation			3 - ERU User Fee			4 - SFU User Fee			5 - Tiered SFU User Fee			6 - Urban/Rural SFU		
		Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%
Single Unit Residential																
Detached (small tier, 10-percentile)	\$64	\$67	\$3	5%	\$90	\$26	41%	\$109	\$45	71%	\$55	-\$9	-14%	\$130	\$66	103%
Detached (medium tier, 25-percentile)	\$76	\$80	\$4	5%	\$90	\$14	18%	\$109	\$33	43%	\$109	\$33	43%	\$130	\$53	70%
Detached (medium tier, 50-percentile)	\$97	\$102	\$5	5%	\$90	-\$7	-8%	\$109	\$12	12%	\$109	\$12	12%	\$130	\$32	33%
Detached (medium tier, average)	\$103	\$108	\$5	5%	\$90	-\$13	-12%	\$109	\$7	6%	\$109	\$7	6%	\$130	\$27	26%
Detached (medium tier, 75-percentile)	\$119	\$125	\$7	5%	\$90	-\$29	-24%	\$109	-\$10	-8%	\$109	-\$10	-8%	\$130	\$11	9%
Detached (large tier, 90-percentile)	\$154	\$163	\$9	6%	\$90	-\$64	-41%	\$109	-\$45	-29%	\$164	\$10	7%	\$130	-\$24	-16%
Semi-Detached (average)	\$73	\$77	\$4	5%	\$90	\$17	23%	\$66	-\$8	-11%	\$66	-\$8	-11%	\$91	\$17	23%
Detached (average) - RURAL	\$131	\$160	\$28	22%	\$90	-\$41	-32%	\$109	-\$22	-17%	\$109	-\$22	-17%	\$58	-\$74	-56%
Other (average) - RURAL	\$14	\$27	\$13	95%	\$90	\$76	550%	\$109	\$95	689%	\$109	\$95	689%	\$46	\$32	233%
Multi-Unit Residential																
Duplex (average)	\$99	\$104	\$5	5%	\$180	\$81	82%	\$109	\$10	10%	\$109	\$10	10%	\$181	\$83	84%
Triplex (average)	\$94	\$98	\$5	5%	\$270	\$176	189%	\$98	\$5	5%	\$98	\$5	5%	\$272	\$179	191%
4-Plex (average)	\$132	\$139	\$7	5%	\$360	\$228	172%	\$131	-\$1	-1%	\$131	-\$1	-1%	\$363	\$231	174%
5-Plex (average)	\$129	\$135	\$6	5%	\$450	\$321	248%	\$164	\$35	27%	\$164	\$35	27%	\$454	\$324	251%
6-Plex (average)	\$191	\$200	\$10	5%	\$540	\$349	183%	\$262	\$71	37%	\$262	\$71	37%	\$544	\$353	185%
7+ Unit Apartments (average)	\$1,750	\$879	-\$871	-50%	\$2,124	\$374	21%	\$1,026	-\$723	-41%	\$1,026	-\$723	-41%	\$2,143	\$393	22%
Condominium (average)	\$102	\$108	\$5	5%	\$90	-\$12	-12%	\$22	-\$80	-79%	\$22	-\$80	-79%	\$91	-\$11	-11%
Townhouse (average)	\$104	\$110	\$6	5%	\$90	-\$14	-14%	\$55	-\$50	-48%	\$55	-\$50	-48%	\$91	-\$14	-13%
Duplex (average) - RURAL	\$127	\$154	\$27	22%	\$180	\$53	42%	\$109	-\$18	-14%	\$109	-\$18	-14%	\$92	-\$35	-27%
4-Plex (average) - RURAL	\$287	\$349	\$62	22%	\$360	\$73	25%	\$131	-\$156	-54%	\$131	-\$156	-54%	\$184	-\$103	-36%
7+ Unit Apartments (average) - RURAL	\$1,949	\$992	-\$957	-49%	\$2,124	\$175	9%	\$1,026	-\$923	-47%	\$1,026	-\$923	-47%	\$1,088	-\$861	-44%
Non-Residential																
Non-Residential (average)	\$729	\$593	-\$136	-19%	\$927	\$198	27%	\$917	\$188	26%	\$917	\$188	26%	\$1,231	\$502	69%
Undeveloped (average)	\$238	\$254	\$16	7%	\$0	-\$238	-100%	\$0	-\$238	-100%	\$0	-\$238	-100%	\$0	-\$238	-100%
Fee Exempt (average)	\$231	\$234	\$3	1%	\$0	-\$231	-100%	\$0	-\$231	-100%	\$0	-\$231	-100%	\$0	-\$231	-100%
Non-Residential (average) - RURAL	\$712	\$591	-\$121	-17%	\$927	\$215	30%	\$917	\$205	29%	\$917	\$205	29%	\$276	-\$435	-61%

Table 34: Funding Option Comparison (Intermediate Service Level)

Representative Property	1 - Taxation Charge	2 - Modified Taxation			3 - ERU User Fee			4 - SFU User Fee			5 - Tiered SFU User Fee			6 - Urban/Rural SFU		
		Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%
Single Unit Residential																
Detached (small tier, 10-percentile)	\$94	\$100	\$6	7%	\$134	\$41	43%	\$164	\$71	75%	\$82	-\$12	-12%	\$198	\$104	111%
Detached (medium tier, 25-percentile)	\$114	\$122	\$8	7%	\$134	\$21	18%	\$164	\$51	44%	\$164	\$51	44%	\$198	\$84	74%
Detached (medium tier, 50-percentile)	\$147	\$158	\$11	8%	\$134	-\$12	-8%	\$164	\$18	12%	\$164	\$18	12%	\$198	\$51	35%
Detached (medium tier, average)	\$155	\$167	\$12	8%	\$134	-\$21	-13%	\$164	\$9	6%	\$164	\$9	6%	\$198	\$43	28%
Detached (medium tier, 75-percentile)	\$181	\$195	\$14	8%	\$134	-\$46	-26%	\$164	-\$16	-9%	\$164	-\$16	-9%	\$198	\$17	10%
Detached (large tier, 90-percentile)	\$235	\$255	\$19	8%	\$134	-\$101	-43%	\$164	-\$71	-30%	\$247	\$11	5%	\$198	-\$37	-16%
Semi-Detached (average)	\$109	\$117	\$8	7%	\$134	\$25	23%	\$99	-\$11	-10%	\$99	-\$11	-10%	\$139	\$29	27%
Detached (average) - RURAL	\$207	\$202	-\$5	-2%	\$134	-\$73	-35%	\$164	-\$43	-21%	\$164	-\$43	-21%	\$71	-\$136	-66%
Other (average) - RURAL	\$22	\$34	\$12	57%	\$134	\$113	518%	\$164	\$143	656%	\$164	\$143	656%	\$57	\$35	161%
Multi-Unit Residential																
Duplex (average)	\$149	\$161	\$11	8%	\$269	\$120	80%	\$164	\$15	10%	\$164	\$15	10%	\$277	\$128	86%
Triplex (average)	\$139	\$149	\$10	7%	\$403	\$264	190%	\$148	\$9	6%	\$148	\$9	6%	\$416	\$277	199%
4-Plex (average)	\$199	\$214	\$15	7%	\$538	\$339	170%	\$197	-\$2	-1%	\$197	-\$2	-1%	\$554	\$355	179%
5-Plex (average)	\$191	\$204	\$13	7%	\$672	\$481	252%	\$247	\$56	29%	\$247	\$56	29%	\$693	\$502	264%
6-Plex (average)	\$286	\$307	\$21	7%	\$806	\$521	182%	\$395	\$109	38%	\$395	\$109	38%	\$832	\$546	191%
7+ Unit Apartments (average)	\$2,698	\$1,355	-\$1,343	-50%	\$3,172	\$474	18%	\$1,545	-\$1,152	-43%	\$1,545	-\$1,152	-43%	\$3,274	\$576	21%
Condominium (average)	\$154	\$166	\$12	8%	\$134	-\$20	-13%	\$33	-\$121	-79%	\$33	-\$121	-79%	\$139	-\$16	-10%
Townhouse (average)	\$158	\$170	\$12	8%	\$134	-\$23	-15%	\$82	-\$76	-48%	\$82	-\$76	-48%	\$139	-\$19	-12%
Duplex (average) - RURAL	\$200	\$195	-\$5	-2%	\$269	\$69	35%	\$164	-\$35	-18%	\$164	-\$35	-18%	\$113	-\$86	-43%
4-Plex (average) - RURAL	\$452	\$441	-\$11	-2%	\$538	\$86	19%	\$197	-\$255	-56%	\$197	-\$255	-56%	\$227	-\$225	-50%
7+ Unit Apartments (average) - RURAL	\$3,068	\$1,253	-\$1,815	-59%	\$3,172	\$104	3%	\$1,545	-\$1,523	-50%	\$1,545	-\$1,523	-50%	\$1,338	-\$1,730	-56%
Non-Residential																
Non-Residential (average)	\$1,074	\$876	-\$197	-18%	\$1,384	\$311	29%	\$1,381	\$307	29%	\$1,381	\$307	29%	\$1,881	\$807	75%
Undeveloped (average)	\$303	\$329	\$26	9%	\$0	-\$303	-100%	\$0	-\$303	-100%	\$0	-\$303	-100%	\$0	-\$303	-100%
Fee Exempt (average)	\$291	\$296	\$5	2%	\$0	-\$291	-100%	\$0	-\$291	-100%	\$0	-\$291	-100%	\$0	-\$291	-100%
Non-Residential (average) - RURAL	\$1,118	\$747	-\$371	-33%	\$1,384	\$266	24%	\$1,381	\$263	24%	\$1,381	\$263	24%	\$340	-\$778	-70%

Table 35: Funding Option Comparison (Required Service Level)

Representative Property	1 - Taxation Charge	2 - Modified Taxation			3 - ERU User Fee			4 - SFU User Fee			5 - Tiered SFU User Fee			6 - Urban/Rural SFU		
		Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%	Charge	Δ _{Tax}	%
Single Unit Residential																
Detached (small tier, 10-percentile)	\$124	\$134	\$10	8%	\$179	\$55	44%	\$218	\$94	76%	\$109	-\$15	-12%	\$265	\$141	114%
Detached (medium tier, 25-percentile)	\$151	\$164	\$13	8%	\$179	\$28	18%	\$218	\$67	44%	\$218	\$67	44%	\$265	\$114	75%
Detached (medium tier, 50-percentile)	\$196	\$214	\$17	9%	\$179	-\$17	-9%	\$218	\$22	11%	\$218	\$22	11%	\$265	\$69	35%
Detached (medium tier, average)	\$207	\$226	\$19	9%	\$179	-\$29	-14%	\$218	\$11	5%	\$218	\$11	5%	\$265	\$58	28%
Detached (medium tier, 75-percentile)	\$242	\$265	\$22	9%	\$179	-\$63	-26%	\$218	-\$24	-10%	\$218	-\$24	-10%	\$265	\$23	9%
Detached (large tier, 90-percentile)	\$317	\$347	\$30	9%	\$179	-\$138	-44%	\$218	-\$99	-31%	\$328	\$10	3%	\$265	-\$52	-16%
Semi-Detached (average)	\$145	\$157	\$12	8%	\$179	\$34	23%	\$131	-\$14	-10%	\$131	-\$14	-10%	\$186	\$41	28%
Detached (average) - RURAL	\$282	\$244	-\$39	-14%	\$179	-\$104	-37%	\$218	-\$64	-23%	\$218	-\$64	-23%	\$85	-\$197	-70%
Other (average) - RURAL	\$30	\$41	\$11	39%	\$179	\$149	502%	\$218	\$189	636%	\$218	\$189	636%	\$68	\$38	130%
Multi-Unit Residential																
Duplex (average)	\$199	\$217	\$18	9%	\$358	\$158	79%	\$218	\$19	10%	\$218	\$19	10%	\$371	\$172	86%
Triplex (average)	\$186	\$201	\$16	9%	\$536	\$351	189%	\$197	\$11	6%	\$197	\$11	6%	\$557	\$371	200%
4-Plex (average)	\$265	\$288	\$23	9%	\$715	\$450	170%	\$262	-\$3	-1%	\$262	-\$3	-1%	\$743	\$478	180%
5-Plex (average)	\$253	\$274	\$21	8%	\$894	\$641	253%	\$328	\$75	29%	\$328	\$75	29%	\$928	\$675	267%
6-Plex (average)	\$381	\$414	\$33	9%	\$1,073	\$692	181%	\$524	\$143	37%	\$524	\$143	37%	\$1,114	\$733	192%
7+ Unit Apartments (average)	\$3,645	\$1,830	-\$1,815	-50%	\$4,220	\$574	16%	\$2,053	-\$1,593	-44%	\$2,053	-\$1,593	-44%	\$4,385	\$740	20%
Condominium (average)	\$207	\$225	\$19	9%	\$179	-\$28	-13%	\$44	-\$163	-79%	\$44	-\$163	-79%	\$186	-\$21	-10%
Townhouse (average)	\$211	\$230	\$19	9%	\$179	-\$33	-15%	\$109	-\$102	-48%	\$109	-\$102	-48%	\$186	-\$26	-12%
Duplex (average) - RURAL	\$273	\$235	-\$37	-14%	\$358	\$85	31%	\$218	-\$54	-20%	\$218	-\$54	-20%	\$136	-\$136	-50%
4-Plex (average) - RURAL	\$617	\$532	-\$84	-14%	\$715	\$99	16%	\$262	-\$355	-57%	\$262	-\$355	-57%	\$273	-\$344	-56%
7+ Unit Apartments (average) - RURAL	\$4,187	\$1,514	-\$2,673	-64%	\$4,220	\$33	1%	\$2,053	-\$2,134	-51%	\$2,053	-\$2,134	-51%	\$1,610	-\$2,577	-62%
Non-Residential																
Non-Residential (average)	\$1,420	\$1,159	-\$261	-18%	\$1,842	\$422	30%	\$1,835	\$415	29%	\$1,835	\$415	29%	\$2,519	\$1,099	77%
Undeveloped (average)	\$367	\$403	\$36	10%	\$0	-\$367	-100%	\$0	-\$367	-100%	\$0	-\$367	-100%	\$0	-\$367	-100%
Fee Exempt (average)	\$352	\$358	\$6	2%	\$0	-\$352	-100%	\$0	-\$352	-100%	\$0	-\$352	-100%	\$0	-\$352	-100%
Non-Residential (average) - RURAL	\$1,527	\$902	-\$624	-41%	\$1,842	\$315	21%	\$1,835	\$308	20%	\$1,835	\$308	20%	\$409	-\$1,118	-73%

5. Community Engagement and Consultation Program

The subsections below summarize the community engagement and communication activities undertaken as part of this study, including the communications plan objectives, audiences, key messages, and overall community and stakeholder engagement process.

5.1 Approach to Engagement

Members of the general public typically have limited levels of understanding regarding municipal stormwater programs and how they are financed, which can result in negative responses to the proposition of new fees unless they are included in the process and understand the rationale and how it will impact them. To address these concerns, the City of Thunder Bay developed and implemented a Community Engagement and Communication Plan for the Stormwater Management Strategy. Engagement and consultation efforts were undertaken in parallel to the technical tasks to seek input and support for this study.

The approach to engagement and communication for the study helped ensure that people who have the potential to be both directly and indirectly impacted by the study understood the need for change, had an opportunity to voice their comments, concerns and opinions, and were informed of how the potential change(s) might unfold. A wide variety of audiences, including members of the general public, local residents, key stakeholder groups (e.g., school boards, businesses, organizations), and interdepartmental City staff, were engaged throughout the study process through multiple consultation tactics, providing opportunities for a diversity of perspectives to be raised and considered by the Project Team.

All community engagement and communications activities were completed in collaboration with the City's Corporate Strategic Services Division.

5.2 Community Engagement and Communications Plan

To support current and future stormwater management needs while providing sufficient levels of service, and to improve the condition of watercourses, available funding opportunities beyond current property taxes were explored by the City of Thunder Bay through community engagement and communication.

As community engagement and communication are crucial to the success of the study, a Community Engagement and Communication Plan was developed to help the City identify, review and evaluate funding approaches with local community members and stakeholders to support the implementation of the City's 2016 Stormwater Management Plan for Sustainable Surface Water Management, recommend the preferred funding approach and develop the implementation strategy plan.

The Plan was based on communication objectives, as outlined in the subsection below. It included a situational analysis to estimate community concerns and related benefits of the Project and outlined key messaging, strategies and tactics to be used throughout the study.

5.2.1 Communication and Engagement Objectives

The Community Engagement and Communication Plan was developed to engage all potentially impacted and interested stakeholders about stormwater management in Thunder Bay to ensure community needs and aspirations are reflected in the Study. To achieve this goal, the Project Team adhered to the following overarching communication and engagement objectives:

- Build, maintain and enhance a positive reputation for the Project and the City's Project Team;
- Generate a broad awareness of stormwater management financing need and options;
- Leverage stakeholder support and address opposition effectively;
- Address the "impact on me" factor proactively and clearly;
- Respond promptly to stakeholder concerns and proactively work with them to mitigate any issues; and
- Remain inclusive by ensuring all aspects of consultation are compliant with Accessibility for Ontarians with Disabilities Act regulations, ensuring that any interested stakeholder has easy access to all Project information.

5.2.2 Plan Implementation and Tactics

Implementing the study communications plan included the following activities:

- Formation of an Internal Steering Committee which met four times over the course of the study;

- Formation of a Stormwater Advisory Committee which met four times over the course of the study;
- One Public Information Centre and online comment form;
- Development of a page on the City's website;
- Social media;
- One Council Education Session;
- Presentations at five Councillor Ward meetings;
- A presentation at the City's Annual Developer/ Consultant meeting; and
- Five one-on-one and group meetings with individuals and organizations about specific components of the Study.

The remainder of this section provides details about the implementation of the plan, particularly the main points of community contact, the ideas raised and how they have been reflected in the outcomes of this process.

A communication tracking table with feedback to and from the public is included in **Appendix G. Communication Tracking Table.**

5.3 Webpage and Social Media Content

At the outset of the study, a dedicated Stormwater Management Plan webpage was created on the main City of Thunder Bay website to provide more information to interested individuals. The webpage is: <https://www.thunderbay.ca/en/city-hall/stormwater-management-plan.aspx>. The webpage included study background information, links to additional study-related information (e.g., reports, studies, policies and plans), stormwater key messaging, public meeting materials (e.g., poster, display boards, presentation), information on the Project Team and how to get involved in the study and Project Team contact information. The webpage was updated throughout the Study on an as-needed basis to include more information as it became available.

To promote the Study webpage and community contact activities, social media posts were developed and scheduled throughout the study process using the City's Facebook and Twitter accounts.

Webpage and social media content are available in **Appendix H. Webpage and Social Media Content.**

5.4 Internal Steering Committee

An Internal Steering Committee was developed to lead and maintain contact with key internal City Departments and Divisions throughout the course of the study (see Section 1.3 for list of staff). The Internal Steering Committee included Infrastructure and Operations Department staff, Development and Emergency Services Division staff, Corporate Strategic Division staff and Financial Services Division staff.

The Internal Steering Committee met four times.

- **Internal Steering Committee Meeting #1 – January 22, 2018**

The purpose of this meeting was to introduce the project and provide background information.

- **Internal Steering Committee Meeting #2 – November 12, 2018**

The purpose of this meeting was to bring everyone up-to-date on the Study and to present the Evaluation Criteria Matrix in advance of the Stormwater Advisory Committee. Additional discussions included:

- Upcoming meeting with the Stormwater Advisory Committee;
- Upcoming one-on-one meetings with individual stakeholder (St Joseph's Care Group, Confederation College, Thunder Bay Catholic District School Board, Lakehead University and Lakehead District School Board); and
- Updated calculations and financial information related to differences of rural versus urban properties.

The Internal Steering Committee members requested additional time to go through the Evaluation Criteria Matrix in more detail. The completed Evaluation Matrix can be found in Section 3.5.5.

- **Internal Steering Committee Meeting #3 – January 11, 2019**

This Internal Steering Committee meeting was focused ongoing through the Evaluation Matrix in more detail. Results from the evaluation can be found in Section 3.5.5.

- **Internal Steering Committee Meeting #4 – April 4, 2019**

The purpose of the last Internal Steering Committee meeting was to discuss study findings and recommendations from Stormwater Advisory Committee meetings, conduct an evaluation and discuss next steps for Council.

Upon completing their review, Internal Steering Committee members concluded that there was no business case to move forward with implementing a stormwater management utility at this time due to the high initial (one-time) costs and the increased ongoing costs to administer the user fee. Further assessment on the impacts to currently tax-exempt properties, and properties that may be exempt from a user fee, is also required.

5.5 Public Information Centre and Online Comment Form

On January 23, 2018, the City, with support from AECOM, hosted a Public Information Centre for the Stormwater Financing Strategy Study. The purpose of this Public Information Centre was to:

- Reintroduce stormwater management and why it is important;
- Revisit the 2016 Stormwater Management Plan, the storm sewer network grade assigned in the 2016 Asset Management Plan and the City's long-term stormwater management goals;
- Introduce the Financing Strategy Study;
- Provide information about the City's current stormwater management program and funding sources;
- Identify future needs and potential alternative funding sources;
- Describe next steps in the study process; and
- Seek feedback on stormwater management financing issues and concerns.

Community members and stakeholders were invited to attend the Public Information Centre through local newspaper advertisements in the Chronicle Journal on January 13 and January 20, 2018. The Public Information Centre #1 invitation was also the Notice of Commencement. Notices were also distributed via email and mail to the study contact list, distributed internally as part of the City's internal staff newsletter which has 1,200 recipients, and posted to the City's website (www.thunderbay.ca), including the landing pages, and the study webpage (www.thunderbay.ca/stormwatermanagementplan). A poster was also developed to promote the Public Information Centre online via social media on the City's Facebook and Twitter accounts and in hard copy available at the Engineering and Operations office and public libraries throughout Thunder Bay. City Councillors were notified of this meeting and encouraged to notify their constituents. Additionally, a Public Service Announcement ran from January 2018 to Friday, February 8, 2018.

The Public Information Centre was held from 4:00 to 8:00 p.m. with brief presentations at 5:00 and 7:00 p.m. The remaining time followed an open house format, where individuals were able to view the 10 display boards that were set up around the room, have discussions with members of the Project Team and fill out comment forms that included seven questions about the study.

All presentation materials provided at the Public Information Centre were posted to the study website.

Approximately 56 individuals signed in at the Public Information Centre. Twenty-three individuals completed comment forms in-person at the Public Information Centre and an additional 108 individuals submitted comment forms online via the study website and email address. Key points of feedback received include:

- Concerns regarding the replacement of aging infrastructure;
- Concerns regarding existing environmental issues (e.g., flooding, contamination, pollution)
- Concerns regarding the potential increase in costs of stormwater management and taxes;
- Concerns regarding future urban planning;
- Concerns regarding the potential payments required for changes to owned property;
- Interest in building sustainable infrastructure and better maintenance;
- Suggestion to reallocate funds from other departments to cover stormwater management costs;
- Suggestions for the City to provide homeowners with incentives to make changes to their properties to reduce the impacts of heavy rainfall events;
- Suggestion for the City to find other means to manage stormwater (e.g., creation of large rain gardens, larger sewer pipes, building up instead of out); and
- Suggestion for the City to find funds from other reserves versus implementing new taxes.

The Public Information Centre Feedback Summary Report, which includes a summary of participant feedback, and all Public Information Centre materials, including display boards and completed comment forms, are available in **Appendix F. Public Information Centre #1.**

As no changes to current stormwater financing are recommended at the current time and a Stormwater Management utility will not be implemented until an adequate business case can be made (i.e., stormwater expenditures increase substantially), a second Public Information Centre for the study was not held. Public and stakeholder engagement related to stormwater management in Thunder Bay will take place in the future as part of a complete asset management plan for the City as required by Ontario Regulation 588/17.

5.6 One-on-one Stakeholder Meetings

As part of the engagement process for the study, five one-on-one stakeholder meetings were held in the fall of 2018. The purpose of these meetings was to introduce the Stormwater Financing Strategy Study and why it is needed, discuss stormwater management in Thunder Bay, outline community engagement efforts undertaken by the Project Team, host an open discussion with small stakeholder groups and identify next steps. Numerous organizations were contacted for one-on-one meetings, and the following five groups indicated interest and scheduled a meeting:

- Thunder Bay Catholic School Board (Friday, November 30, 2019 WebEx);
- Confederation College (Tuesday, November 20, 2018);
- Lakehead District School Board (Monday, November 19, 2018);
- Lakehead University (Tuesday, November 20, 2018); and
- St. Joseph's Care Group (Monday, November 19, 2018).

One-on-one stakeholder meetings provided the opportunity to learn more about the study, have one-on-one discussions with members of the Project Team, ask questions, and provide their feedback for consideration.

Presentations provided at each one-on-one stakeholder meeting are available in **Appendix I. One-on-one Presentations**

5.7 Stormwater Advisory Committee

A Stormwater Advisory Committee was formed with key stakeholders and ratepayers to solicit feedback on the study components and provide support, input and advice to the Internal Steering Committee. There were 41 organizations/ individuals invited to be part of the Stormwater Advisory Committee, including general business representative and major employers, institutions, single and multi-family residential developers, other developers and home builders, low-income and subsidized housing organizations, special interest groups, Indigenous communities and community organizations.

The Terms of Reference for the Stormwater Advisory Committee is included in **Appendix A. Stormwater Advisory Committee Terms of Reference.**

5.7.1 Stormwater Advisory Committee Meeting #1

On January 23, 2018 from 12:00 p.m. to 2:00 p.m. the City of Thunder Bay, with support from AECOM, hosted the first Stormwater Advisory Committee meeting for the Stormwater Financing Strategy Study. The purpose of this first Stormwater Advisory Committee meeting was to introduce all participants to each other and to the Project Team and to introduce the study and funding options under consideration, along with an overview of stormwater management and associated spending in Thunder Bay.

maria

At this first Stormwater Advisory Committee meeting, 11 member organizations were represented, along with eight City staff and three AECOM consultants. The format included a presentation with question and answer (Q&A) session. Questions, concerns and comments expressed at this meeting were related to:

- Study timeframe;
- Spending per household;
- Magnitude of stormwater management issues;
- City stormwater assets;
- Inclusion of climate change projections in IDF curve;
- Cost and avoidance analysis;
- User fee applications and plans for those who cannot afford to make improvements to properties;
- Purpose/ driving factor for completion of this study; and
- Comparison of stormwater management in Thunder Bay and other similar municipalities.

Following the Q&A session, Stormwater Advisory Committee members agreed to have their e mail addresses shared with the group and noted that afternoon meetings are acceptable.

Complete meeting minutes, including the complete attendance list and detailed Q&A session, and the questionnaire provided to members are available in **Appendix B. Stormwater Advisory Committee Meeting #1.**

5.7.2 Stormwater Advisory Committee Meeting #2

On June 28, 2018 from 12:00 p.m. to 2:00 p.m. the City of Thunder Bay, with support from AECOM, hosted the second Stormwater Advisory Committee meeting for the Stormwater Financing Strategy Study. The purpose of this second Stormwater Advisory Committee meeting was to provide members with a recap of the study and funding options under consideration, along with a summary of the technical work completed to assess these funding options.

Evaluation criteria was provided to members in advance of the meeting, explaining how the criteria may be used to identify a preferred funding option.

At this meeting, nine member organizations were represented, along with four City staff and two AECOM consultants. The format included a presentation with Q&A session. Questions, concerns and comments expressed at this meeting were related to:

- Invitation process for Stormwater Advisory Committee members;
- Use of reserve funds;
- Implications of continuing with the status quo;
- External funding sources;
- Budget discrepancies between Stormwater Advisory Committee meeting #1 and #2; and
- Tax exempt properties and tax rates.

Following Stormwater Advisory Committee meeting #2, Red Sky Metis Independent Nation sent a letter to the Project Team expressing concerns related to the study, mainly due to proposed options not including buildings zoned for residential and commercial use. They also stated that the Single Family Unit model was the most reasonable option for the City but expressed concerns for administering a user fee.

Complete meeting minutes, including the complete attendance list and detailed Q&A session, and a copy of Red Sky Metis Independent Nation's letter to the Project Team is available in **Appendix C. Stormwater Advisory Committee Meeting #2.**

5.7.3 Stormwater Advisory Committee Meeting #3A

On November 19, 2018 from 9:30 a.m. to 12:30 p.m., the City of Thunder Bay, with support from AECOM, hosted the third Stormwater Advisory Committee meeting for the Stormwater Financing Strategy Study. The purpose of this meeting was to provide a recap of the study and funding options under consideration, a summary of technical work

done to assess these funding options, and a discussion about draft evaluation criteria. Members were provided with a draft evaluation criteria matrix in advance of the meeting.

At this meeting, eight member organizations were represented, along with four City staff and two AECOM consultants. The format included a presentation with Q&A session, followed by an open discussion and review of the evaluation matrix. Questions, concerns and comments expressed at this meeting were related to:

- Property tax rates in Thunder Bay compared to other communities in Northern Ontario;
- Target service level of \$12.1M per year justification for this target; and
- Segregation of user fee funds.

Following the Q&A session, to identify the preferred weighting of each criterion in the evaluation matrix, Stormwater Advisory Committee members voted and assigned a number of one to five and then weighted each criterion a second time against each option to determine whether each option meets the criteria. Based on this exercise, Option 4 – Tiered Single Family Unit User Fee was given the most points.

Complete meeting minutes, including the complete attendance list and detailed Q&A session, and a copy of the evaluation matrix are available in **Appendix D. Stormwater Advisory Committee Meeting #3A.**

5.7.4 Stormwater Advisory Committee Meeting #3B

On December 10, 2018 from 12:00 p.m. to 2:00 p.m., the City of Thunder Bay, with support from AECOM, hosted the fourth Stormwater Advisory Committee meeting for the Stormwater Financing Strategy Study as a follow-up telephone call. The purpose of this meeting was to continue the discussion related to the evaluation matrix from Stormwater Advisory Committee meeting 3A to evaluate the various options.

At this meeting, six member organizations were represented, along with one City staff and three AECOM consultants. The format included a read through of the description of each suggested evaluation criteria, followed by a discussion specific to each criterion and the evaluation matrix.

Questions, concerns and comments expressed at this meeting were related to:

- How sewage and drainage will be funded and how these dollars will be allocated to stormwater management;
- How Lakehead University and Confederation College and other school boards pay taxes to the City;

- How churches pay taxes/ contribute to stormwater management funding;
- The process other similar municipalities follow related to tax contribution from local charitable organizations and places of worship;
- The need for better visuals to better explain the study; and
- The need to keep information related to the study high level and in simple language for the public.

Following the Q&A session, the City presented an updated draft evaluation matrix and evaluation criteria guideline document to Stormwater Advisory Committee members who participated in the same exercise as Stormwater Advisory Committee meeting 3A.

Complete meeting minutes, including the complete attendance list and detailed Q&A session, and a copy of the updated evaluation matrix and evaluation criteria guideline are available in **Appendix E. Stormwater Advisory Committee Meeting #3B.**

5.8 Council Information Sessions

5.8.1 Council Information Session

On January 22, 2018 the City of Thunder Bay, with support from AECOM, hosted a Council Session for the Stormwater Financing Strategy Study. The purpose of this session was to provide Councillors and the Mayor with an understanding of the City's work to plan and build capital improvement projects and maintain the City's stormwater management system now and into the future. It was also to provide an understanding of options available to finance the stormwater management program.

5.8.2 Ward Meeting Presentations

In addition to the one-on-one stakeholder meetings, City staff attended five Council Ward meetings following the Public Information Centre in January 2018 to help ensure constituents were provided with the opportunity to participate in the study process. Approximately 90 people attended the Ward meetings.

The presentation provided at each Ward meeting is available in **Appendix J. Ward Meeting Presentation.**

5.8.3 Memo to Council

A Memo was sent to the Mayor and Members of Council on May 21, 2019 to update Council on the conclusion of the Study.

6. Conclusions and Recommendations

In this study, a set of stormwater program funding options was initially screened in consideration of the unique constraints and opportunities in Thunder Bay. Based on direction from City staff and guidance provided by the Advisory Committee, the options were short-listed into a set of six viable alternatives (i.e., two taxation options and four stormwater user fee options) to support the City's future stormwater management program.

These funding options were further evaluated with detailed financial and technical analyses that considered a wide range of parcels, housing types, and development densities across the City of Thunder Bay. Base charges were identified for each of the six options and representative property charges for the various property classifications were developed and results compared as part of the evaluation.

As the project progressed, preliminary results of the funding analysis were shared with City staff and communicated to the Advisory Committee. Based on feedback provided, the funding options as well as the analytical methods used to evaluate options, were refined in order to assist City staff in the decision-making process. This ultimately led to a staff administrative update to Council in May 2019, which recommended no changes to the current stormwater financing mechanism.

This section summarizes the study conclusions and presents recommendations for the City of Thunder Bay to consider in their efforts to ensure sufficient funding to meet the ongoing and evolving needs of its stormwater management program.

6.1 Conclusions

Based on the findings of this study, the following conclusions were made:

- Urban properties subsidize stormwater expenditures in rural areas by approximately \$300,000 annually.
- Residential properties currently contribute 67% of the tax levy funding for the City's stormwater management program and 33% of the funding is contributed by non-residential properties. The impervious area distribution however indicates that 58% of the City's stormwater runoff comes from residential areas and the remaining 42% from non-residential properties. A stormwater user fee that allocates funds based on imperviousness would result in a redistribution of 9%. That is, the average residential property would

pay 9% less towards stormwater management in the City, whereas the average non-residential property would pay 9% more compared to current taxation.

- Based on the current revenue level of approximately \$4M, this would result in a total re-allocation of \$360,000 from residential to non-residential properties. This \$360,000 residential reduction would be spread over all of the 38,203 residential parcels and would therefore result in only a negligible difference to the total residential taxations.
- The current financing mechanism does not meet all the City's stormwater management program needs. This conclusion echoes the precursor 2016 Stormwater Management Plan and 2016 Asset Management Plan studies that identified a stormwater funding gap of between \$3M as of 2015 and \$6M per year based on 2015 to 2019 expenditure.
- A stormwater user fee can generate a financially sustainable, equitably allocated, fully supportive, and environmentally friendly mechanism for supporting the City's stormwater program needs.
- City staff and some members of the Advisory Committee consider the additional administrative costs of a user fee to be prohibitively high based on current revenue and expenditure levels and therefore it is anticipated that a user fee would not be publicly supported at this time.
- A user fee would result in new service charges to tax-exempt property owners, except in the case of user fee-exempt properties (described in Section 4.3.5) or those that currently contribute payments in-lieu-of taxes.
- When comparing charges from different funding mechanisms between taxable properties, the taxation option would be preferred by property owners with a relatively low assessed value per square metre of impervious area (or a large impervious footprint per dollar of assessed value), which is reflective of sprawling development. A funding mechanism based on property tax can therefore encourage sprawling development.
- When comparing charges from different funding mechanisms between taxable properties, a user fee option would be preferred by property owners with a relatively high assessed value per square metre of impervious area (or a small impervious footprint per dollar of assessed value), which is reflective of higher density development. A funding mechanism based on impervious area can therefore encourage higher density development, also referred to as "smart growth".

By undertaking this study, several ancillary benefits have arisen as it has helped staff identify opportunities for:

- Delivering effective and proactive municipal services;
- Identifying potential policy/by-law enhancements and initiatives related to environmental responsibility and risk management; and
- Improving efficiencies and better aligning resources and responsibilities across departments.

6.2 Recommendations

Based on current forecasts, the City was planning to increase their stormwater management program by less than \$200,000 annually in the short-term. City staff felt that the cost of implementing and administering a stormwater fee would be more justified when the City decides to significantly increase their stormwater program as the cost to implement new user fee is too high compared to current expenditure levels. City staff also understood that given the new Asset Management Regulation, defining sustainable funding levels would need to be done for all asset types and implementing changes to stormwater financing in isolation may not align with the future holistic plan that includes all infrastructure assets. This ultimately led to a staff administrative update to Council in May 2019, which recommended no changes to the current stormwater financing mechanism at this time.

In the interim, the City will continue to pursue additional funding sources (e.g., grants) for stormwater capital projects to reduce the infrastructure gap. Capital expenditures were identified as the largest portion of the infrastructure gap in both the Stormwater Plan and Financing Strategy.

Although the City may not need to increase its stormwater expenditures in the short-term, implementing a stormwater rate in the future will allow the City to be better positioned for the anticipated increase in stormwater expenditures. It would also give the City the option of increasing funding to contribute to reserves and prepare for the impending wave of stormwater renewal needs. Because many residents expressed concerns about paying more for municipal services, it is recommended that the City raise greater awareness about infrastructure funding needs before implementing a stormwater rate.

Appendix A

Stormwater Advisory Committee Terms of Reference

Stormwater Financing Study – Stormwater Advisory Committee Terms of Reference for Members

Background

The City of Thunder Bay is committed to involving citizens in projects and processes that contribute to and enhance their quality of life. In September 2017, the City initiated the Stormwater Financing Study to explore alternative ways to pay for its stormwater management program. The City obtained the services of AECOM, an engineering consulting firm, to assist in the completion of this study. It is expected that the study will be completed in the Summer of 2018.

The City's stormwater management system contains valuable infrastructure assets that include storm sewers, catchbasins, inlets and outlets, bridges and culverts, ditches and watercourses, and treatment facilities. The management of these assets includes the design and construction of capital projects such as storm sewers, green infrastructure and treatment facilities, stream rehabilitation and flood mitigation works, operations, maintenance and rehabilitation of existing infrastructure, environmental compliance, emergency response and clean-up, street sweeping and the enforcement of by-laws. By controlling the quality and quantity of stormwater reaching our lakes and rivers, the City's stormwater management systems protect the health and safety of the public and the environment.

The City has consistently invested in its stormwater infrastructure, however it is aging and will require additional operation, maintenance and capital improvement costs over time to sustain sufficient levels of service. Additional improvements are also needed to achieve compliance with new and emerging environmental regulatory requirements. The effects of more frequent, more severe precipitation events are also taxing stormwater infrastructure across Ontario. It's expected that these, and other future pressures and challenges, will leave the stormwater management program competing for limited public funds. All of the above considerations have helped to determine an appropriate level of service for the City's future stormwater program, as described in the 2016 Stormwater Management Plan available on the City's website (http://www.thunderbay.ca/City_Government/News_and_Strategic_Initiatives/Stormwater_Management_Master_Plan.htm).

To support the City's future stormwater management program, alternative funding options beyond current property taxes need to be explored. The City of Thunder Bay has initiated a Stormwater Financing Study to investigate an equitable, self-supporting, and dedicated funding source for stormwater management. As part of this study, a Stormwater Advisory Committee will be formed to provide a forum for key stakeholders to be involved early and throughout the process.

Other interested and affected residents will also be invited to provide feedback at key times during the study at public open houses and via the City's website.

Mandate

The mandate for the Stormwater Advisory Committee is to provide feedback and advice to the Project Team, comprised of City staff and its consultant, on all aspects of the City's current and future stormwater management needs. To further this mandate, participants will be asked to represent the views of their respective constituencies, members or organization as best as they can and to assist the Project Team in its understanding of opportunities and issues through participation in a process of open dialogue and discussions.

Stormwater Advisory Committee Goals and Objectives

The Stormwater Advisory Committee's goal is to provide advice to the Project Team on all aspects of the study, and assist with developing recommendations related to:

- Quantifying the appropriate level of service and corresponding costs to address the City's stormwater management needs; and
- Identifying an equitable, self-supporting and dedicated funding source, along with an implementation plan, that is most appropriate for the City of Thunder Bay.

The Stormwater Advisory Committee will work with the Project Team to accomplish the following objectives:

- Refine the overall goals and priorities of the stormwater management program;
- Identify the problems, issues, and corresponding current and future needs of the program;
- Act as a sounding board for materials to be presented at the public open houses, as well as the feedback received from the general public;
- Determine a desirable level of service and corresponding costs to meet these needs; and
- Recommend the appropriate financing mechanism that fairly distributes the program investment throughout the City.

Project Team Goals and Objectives

Throughout the process, the Project Team will engage in discussion and exchange of information with Stormwater Advisory Committee members, and communicate stakeholder views and preferences in the development of study recommendations.

The Project Team has the following objectives:

- Foster stakeholder understanding of the City's current and anticipated stormwater management program needs and costs;
- Ensure stakeholder concerns and views are identified, understood, and considered in the decision-making process;
- Address the key issues and concerns raised by Stormwater Advisory Committee members; and
- Achieve agreement, wherever possible, on the relevant issues, policies, and recommendations to be presented to City Council.

Membership

The City of Thunder Bay believes that Stormwater Advisory Committee members should represent the interests of the majority of community stakeholders, enabling a full exploration of views on key issues. Representatives of a cross-section of community interests have been invited to participate, including:

- Residents from neighborhoods or homeowners associations throughout the City;
- Businesses and for-profit organizations such as the Chamber of Commerce, industry, manufacturing and commercial enterprises, developers, and general contractors;
- Institutional and other tax-exempt entities such as places of worship, school boards, higher education and health care facilities; and,
- Environmental organizations.

Three (3) meetings are anticipated at this time. If additional meetings are scheduled, the City may consider including new members to the Stormwater Advisory Committee. The consultation period is anticipated to last throughout the study duration, which is expected to be completed by Summer 2018.

It is the City's intention that the same stakeholder representatives be actively involved throughout the study. This continuity will aid in the effectiveness of the process. In the event a participant is unable to attend one or more meetings, a designated alternate may be assigned to take his/her place. In the event that a participant and alternate are both unable to attend a meeting, the Project Team should be notified prior to the meeting.

Roles and Responsibilities

The overall roles and responsibilities of those involved in this project include:

Project Team

- Provide adequate information to enable participation;
- Provide overviews/presentations on key issues;
- Facilitate and act as a resource for the main discussion and breakout sessions; and
- Identify ways in which stakeholder consultation has influenced the decision-making process.

Note: The Project Team will receive and consider all feedback received from stakeholders. However, decision-making authority ultimately rests with City Council.

To support the consultation process, the Project Team will also be responsible for preparing meeting materials, providing technical assistance, facilitation and reporting of the meetings. Assistance in identifying issues where discussion will be of benefit, exploring stakeholder views, and identifying any common ground are key parts of the facilitation role. The Project Team will draft meeting notes and reports that document discussions and written stakeholder input received during this process, as well as any areas of agreement that are reached. This information will form part of the Project Team report to City Council.

Stormwater Advisory Committee Members

- Participate in all meetings and review materials presented;
- Identify concerns and issues with the City's stormwater management program;
- Provide and present input, advice and feedback on relevant issues;
- Explore potential areas of agreement around key issues; and
- Provide advice on effective ways to involve the public at key points in the project.

Meetings

Stormwater Advisory Committee meetings are to be convened at least three times during the study, from January 2018 to Summer 2018. The first meeting will focus on current and anticipated stormwater management needs and an introduction of possible funding mechanisms, and the second and third meetings will focus on developing a recommended funding approach, including consideration of incentives. Additional meetings may be scheduled if needed. All meetings will be held at a consistent location and time, agreeable to all participants, as determined at the first meeting.

Volunteer Time

Although the City cannot offer payment for participation on the Stormwater Advisory Committee, support services such as any related photocopying can be provided. Refreshments will be provided during meetings and parking fees will be reimbursed where appropriate.

Accountability

Responsibility for the Stormwater Advisory Committee and public engagement program rests with the Project Team. All participants are to be governed according to the policies/procedures of their respective organizations. In the event that agreements are reached during the consultation process, they must be consistent with relevant policies of the respective organizations.

Additional Consultation Opportunities

Individuals who are not available to attend or cannot be accommodated in the Stormwater Advisory Committee sessions are invited to follow the consultation process and submit comments through the City's website and attend the two public open houses.

Contact Information

Should you have any questions about the Stormwater Advisory Committee or the City of Thunder Bay's Stormwater Financing Study, please contact the following:

Aaron Ward , P. Eng. Project Manager, City of Thunder Bay T: 807-625-2444 E: award@thunderbay.ca	Pippy Warburton , P. Eng. Project Manager, AECOM T: 519-650-8629 E: pippy.warburton@aecom.com
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Appendix B

Stormwater Advisory Committee Meeting #1

Minutes of Meeting #1

Date of Meeting: January 23, 2018

Start Time: 12:00 p.m.

Location: City Hall

1. Overview

On Tuesday, January 23, from 12:00 p.m. to 2:00 p.m., the City of Thunder Bay, with support from AECOM, hosted a Stormwater Advisory Committee (SWAC) meeting for the Stormwater Financing Study. The purpose of the SWAC is to provide organizations representing a broad range of interests with the opportunity to learn about and provide input into the study. This first meeting provided an introduction to the study and funding options under consideration, as well as an overview of stormwater management and stormwater management spending in Thunder Bay.

Eleven (11) member organizations were represented, along with eight (8) City staff and three (3) AECOM consultants.

The format of the meeting included a presentation with Q&A. The minutes below outline the questions, comments and feedback received during the SWAC meeting.

2. Attending

Organization	Name
Zanette Realty	Robert Zanette
Di Gregorio Developments	Enzo Di Gregorio
Lakehead Region Conservation Authority	Simon Shankie
Lakehead Region Conservation Authority	Tammy Cook
Eco Superior/ TBDSC	Jamie Saunders
SHIFT	David Noonan
Red Sky Métis Independent Nation	Kayla Searle



Eco Superior	Ellen Mortfield
Thunder Bay Economic Development Commission	Richard Pohler
Lakehead University	Steve Girvin
EarthCare	Rena Viehbeck
Confederation College	Sandra Stiles
City of Thunder Bay	Aaron Ward
City of Thunder Bay	Carly Jaremey
City of Thunder Bay	Jana Roy
City of Thunder Bay	Grant Mason
City of Thunder Bay	Michelle Warywoda
City of Thunder Bay	Mark Smith
City of Thunder Bay	Tom McConnell
City of Thunder Bay	Kerri Marshall
AECOM	Mike Gregory
AECOM	Pippy Warburton
AECOM	Alicia Evans

3. Introduction and Presentation

Aaron Ward (City of Thunder Bay) opened the meeting and invited all attendees to introduce themselves and the organization that they represented. The study presentation was then delivered by Aaron, Mike Gregory (AECOM) and Pippy Warburton (AECOM).

4. Q&A

Throughout the presentation, questions were addressed and comments received. The discussion captured during throughout the meeting is summarized below. Questions are noted with a “Q”, answers with “A”, comments with a “C” and responses with an “R”. Answers were primarily provided by Aaron Ward and Mike Gregory.

Q1: What is the timeframe for this study?



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A1: The goal is to bring forward financing recommendations to Council following the election this year. This study does not impact the current budget.

Q2: Where does Thunder Bay fit in now in terms of Stormwater Management?

A2: In some aspects we are ahead of the curve, and in others we are behind. In terms of current funding/ financing, we are following the approaches taken by other cities in Ontario.

Q3: How do we fit in according to spending per household?

A3: We will be calculating those numbers as part of this study.

Q4: For a plan like this, can we really calculate this per capita? Shouldn't we look at other places that have similar geography?

A4: Spending can be measured in many ways (including per household, per hectare, per kilometer of pipe, etc.). Other cities have different geographies, soil and groundwater conditions, stormwater facilities, social/political/economic priorities, and therefore different funding options available to them. We are looking for a 'made-in-Thunder-Bay-solution'.

Q5: I'd like to understand the magnitude of the stormwater problem. What is the annual precipitation rate and how has that changed over time? Are there statistics available to understand the issue? We'll need this type of information to understand the capital that would be required and the level of investment to give us 100% guarantee against flooding.

A5: Volume II of the City's Stormwater Management Plan (SMP) includes a section on Intensity-Duration-Frequency (IDF) curves, which is the information you are looking for. However, there is no dollar value that will guarantee flooding won't happen. Stormwater management facilities would typically be designed to accommodate the 100-year storm (an event with an expected recurrence interval of once every 100 years), but we have had three such storms in the past eight (8) years. There is no way to design a system to totally prevent flooding.

C1: Regarding the City's stormwater assets, you are missing the urban forest (and wetlands) that carries significant value.

R1: In the SMP there is a dollar value assigned to the wetlands. For this study there are some items that we have not yet incorporated. Other municipalities have included assets such as urban forests in their financing studies, and this is something that we will consider in our study. The question will be whether the urban forests function is primarily for stormwater management or not.



Q6: Are climate change projections for storms incorporated into the IDF curves? And was this included in the SMP?

A6: Yes, in a way. We are now designing to new IDF curves that incorporate climate change, however the situation keeps getting worse. And yes, this was included in the SMP.

Q7: Were outlying municipalities contacted in regards to this committee as we are affected by water outside of our city.

A7: Not for this financing study, as we only have control over what happens within our boundaries. However, we do have working relationships and agreements with most bordering municipalities, and we have coordinated stormwater management and drainage works in the past.

Q8: Given the responsibilities that have been taken on by the other levels of government re: climate change, has there been discussion about establishing stormwater management funding for municipalities?

A8: Until now the majority of money from government has come from the gas-tax. We do not know where future grant money will be coming from. However, yes, we believe that conversation is underway regarding stormwater management funding.

Q9: Is the intent to move the levy into user fee based approach for stormwater funding, because only a portion of the levy is used for stormwater management?

A9: That is only one option to consider. We are looking at what makes sense to allocate to stormwater management financing in this study.

C2: This is a good opportunity to encourage improved development through incentives;

R2: A user fee based on impervious area will provide an incentive for developers to minimize the hard surface area or perhaps use permeable materials as an option. Further to that, existing properties could be given credits for stormwater management maintenance and improvements that reduce the runoff discharged from their property.

C3: There is a challenge for older areas of town where stormwater management does not meet today's standards – you don't want to make it unattractive to develop older areas due to perceived stormwater management remediation costs. Make sure that the plan does not cause unintended problems for older areas and homes.

R3: Other municipalities have provided incentives to help people complete necessary remediation, such as user fee credits, rebate programs, low-cost materials, or in-kind design support. These are options under consideration.



C4: Our head office would love to have a rain garden but it is not feasible in our part of town. A rate would make development unattractive in our area if there is no way to incentivize improvements.

R4: Other communities that have user fees also offer non-structural credits/ incentives, such as for those properties that have an approved stormwater education program, pollution control plan, climate change resiliency plan, etc.

C5: A tax levy that includes an incentive program for improvement initiatives is exactly how the energy programs/ audits work.

Q10: Will an analysis on cost avoidance be done – do the credit/ incentive numbers have a combination of those factors considered? Or is it just capital?

A10: The cities of Kitchener and Mississauga spent a great deal of effort considering their respective stormwater program costs if all new development managed stormwater on site (i.e., zero discharge) as well as a reasonable uptake for existing developments. Independently, they calculated that the maximum individual credit they could award to account for this scenario was between 45-50%.

Q11: How will a user fee be applied to those individuals who cannot make improvements or upkeep their properties, for example those who are elderly or low income?

A11: In some municipalities that have implemented a user fee, only commercial/ industrial properties are eligible for credits, as it was determined that the administrative costs of residential credits would be prohibitive. Some municipalities offer a user fee discount for those that are economically disadvantaged. Again, we are looking for a 'made-in-Thunder-Bay' solution.

Q12: What is driving this study? Is the province downloading responsibility? Or is it a big insurance claim?

A12: Infrastructure across Ontario municipalities is chronically underfunded. There are some municipalities that are reactive and some that are proactive. Thunder Bay is being proactive in our approach to stormwater management. We have unfunded operational needs and capital projects, and with this study we are looking to identify the best way to meet these needs.

C6: This is similar to the University's deferred maintenance. We currently require \$145-165M to bring our existing infrastructure up to current standards without any improvements. The City is in the same situation. The sewers are falling apart and there is no money to fix it.



Q13: The Canadian Lakehead Exhibition (CLE) grounds have a giant impervious surface. They are contributing stormwater but not contributing any funding to stormwater management. How will they be engaged? How will this be considered?

A13: The CLE currently falls under a tax-exempt status, as do many other properties, however, most of these properties provide a “payment-in-lieu” of taxes to the City, and this payment goes towards the general tax revenue based. We will have further discussions about tax-exempt properties at the next meeting

C6: We have a huge amount of impervious area around the mouths of rivers.

R6: We will look at large-scale impervious area owners and engage them in meetings.

Q14: Have other municipalities looked at ratio levy system based on impervious/pervious areas?

A14: The user-fee system is based on impervious/ pervious area ratios.

C7: Someone living near the river with three car parking versus someone living 10 km from a river with woodlot would be contributing to stormwater very differently. Charging them the same would not be equitable.

R7: An option is to look at urban residential differently than rural. This is what we will do for Thunder Bay knowing we have a large rural population.

C8: That’s why a ratio system would work so well as you would be charged more for more impervious area.

C9: The biggest property owner in Thunder Bay is the City, with vacant land that could be used for stormwater management improvements

R9: This was incorporated into the 2016 SWP, which identified over 500 stormwater facilities that could be constructed within City owned lands, roads, parks, vacant lots, etc.

C10: When presenting to the general public, good news stories should be included, because people are going to be concerned about the costs to them

R10: This was the same feedback we received from Council. Thank you for the input.

C11: Imagine if you could tell the homeowner that they could save money on insurance if they invested in this program. Everybody would be happy with this;

R11: While this is a discussion that is taking place in the US, we can’t yet make those claims in Canada.



5. Meeting Adjournment

Following the presentation, the SWAC members were thanked for their attendance and feedback into the study so far. The SWAC members agreed with the following:

- To have their email addresses shared with this group in attendance (including those members who could not attend the meeting)
- Afternoon meetings are acceptable going forward

No further comments or questions were raised. The meeting was adjourned at 2:00 p.m.

City of Thunder Bay Stormwater Financing Study



Stormwater Advisory Committee
Meeting No. 1
January 23, 2018

Project Manager: Aaron Ward, P.Eng.

Consultant Team: Pippy Warburton, P.Eng., Mike Gregory, P.Eng.



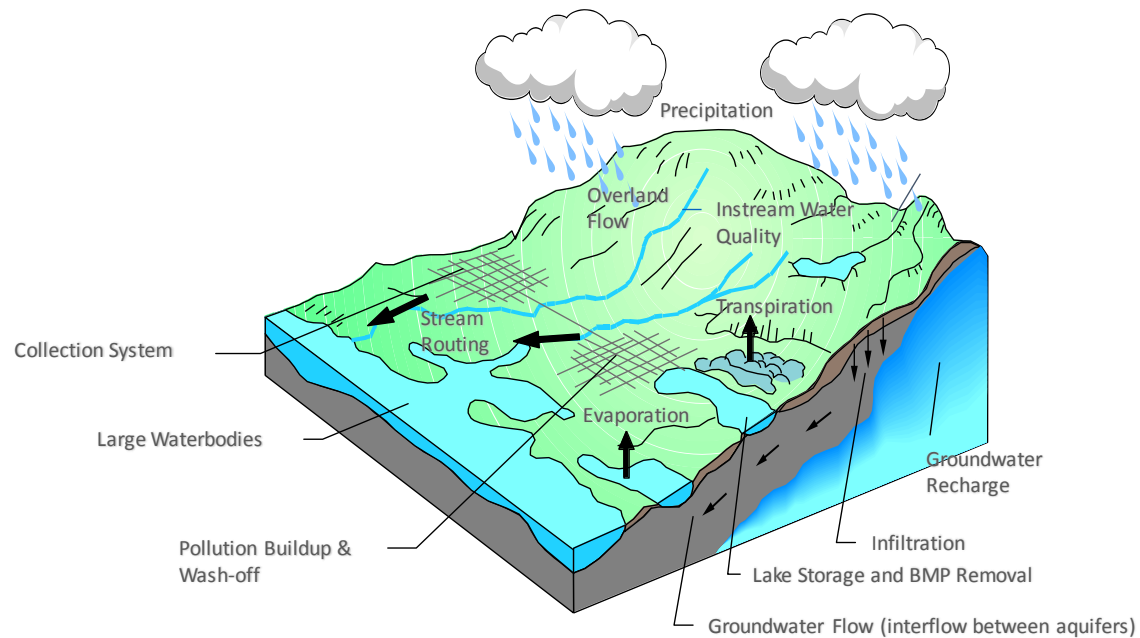
Meeting Purpose and Objectives

- Reintroduce stormwater management: what it is and why it is important
- Revisit the 2016 Stormwater Management Plan, the storm sewer network grade assigned in the 2016 Asset Management Plan, and the City's long-term stormwater management goals
- Introduce the financing study: why it is needed and what is involved
- Provide information about Thunder Bay's current stormwater management program and funding sources
- Identify future needs and potential alternative funding sources
- Describe next steps in the study process
- Seek feedback on stormwater management financing issues and concerns



What is Stormwater Management?

- Capture/collection, storage/treatment and conveyance of water in response to rainfall and snowmelt
- Legislative requirements have evolved significantly from traditional “drainage”
 - Hazard protection
 - Quality treatment
 - Volume reduction
 - Watershed health





2016 Stormwater Management Plan

- Developed as part of the City’s commitment to environmental stewardship and community sustainability
- Adopted by Council in 2016, this plan will guide the City’s stormwater management actions for the next 20 years, based on the following goals:

- ECOSYSTEM HEALTH
- WATERSHED QUALITY
- WATER QUANTITY
- OPERATIONS and MAINTENANCE
- MONITORING and DATA ASSESSMENT

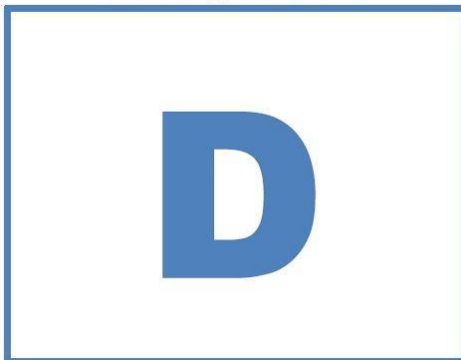
- REGULATION and ENFORCEMENT
- EDUCATION and OUTREACH
- FUNDING and ORGANIZATION
- CLIMATE CHANGE

Report Card

- From the 2016 Asset Management Plan...
 - Average spending from 2011-2015 was \$2.9 million annually
 - Capital funding should amount to \$6.2 million annually

This equates to a **\$3.3 million annual funding gap and grade of D.**

Funding vs Need



Note: this does not include all current stormwater assets, such as ditches, culverts, and treatment facilities, nor does it include the construction of new infrastructure and treatment facilities



Stormwater Management Asset Inventory

– What are Thunder Bay’s stormwater assets?



Storm sewers



Catchbasins



Inlets and outlets



Oil-grit separators



Bridges



Ditches and Culverts



Watercourse



Stormwater treatment facilities, including Green Infrastructure

Stormwater Management Asset Value

- How much are the City’s stormwater assets worth?
- The overall replacement value exceeds **\$540M dollars**. This is equivalent to over \$11,000 per household.

Asset Type	Quantity	Replacement Value (2018)
Storm Sewers ¹	330 km of pipes; 11,000 catch basins; 4,200 manholes; 380 outfalls	\$321,940,000
Pumping Stations ¹		\$7,020,000
Bridges ¹	57	\$179,150,000
Culverts (>3m span) ¹	16	\$15,960,000
Dams ¹	2	\$15,390,000
<i>The information below is not currently included in the Asset Management Plan (AMP), but was identified in the 2016 Stormwater Management Plan to be included in future AMP's. Quantities and values below are preliminary in nature.</i>		
Culverts (<3m span)	389	??
Ditches	486 km	??
Treatment Facilities	45	\$3,600,000
Watercourses	±70 km	??

Total Replacement Value >\$540,000,000

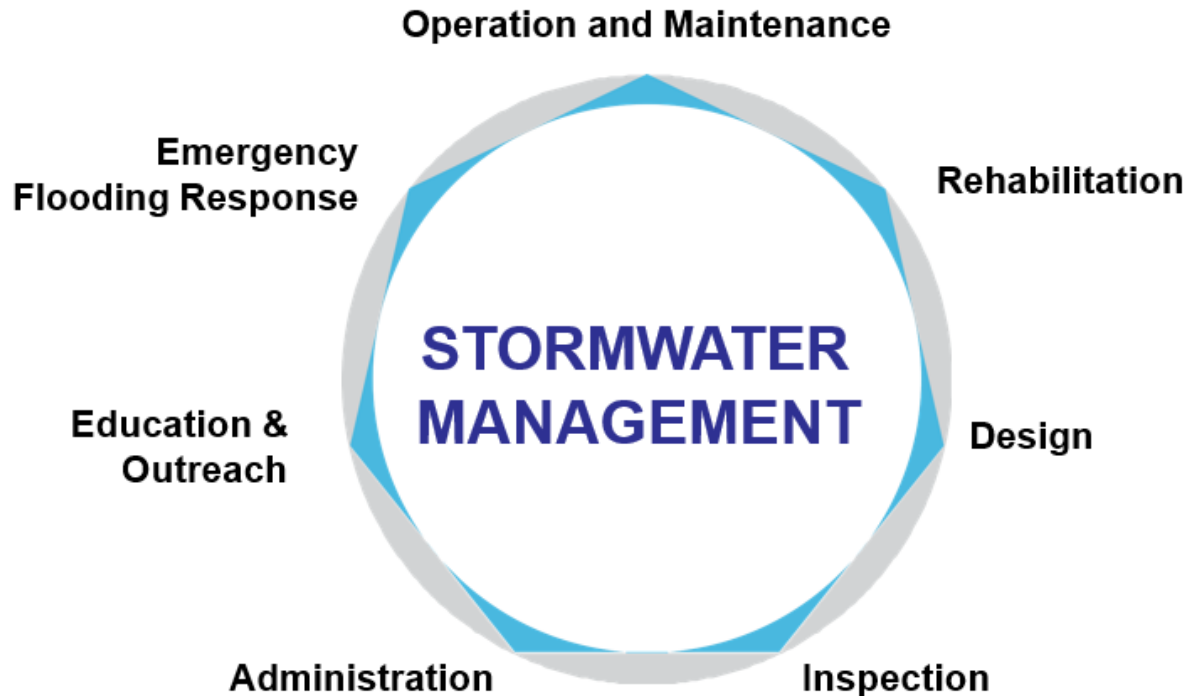
Notes

1. 2016 Thunder Bay Asset Management Plan (AMP).



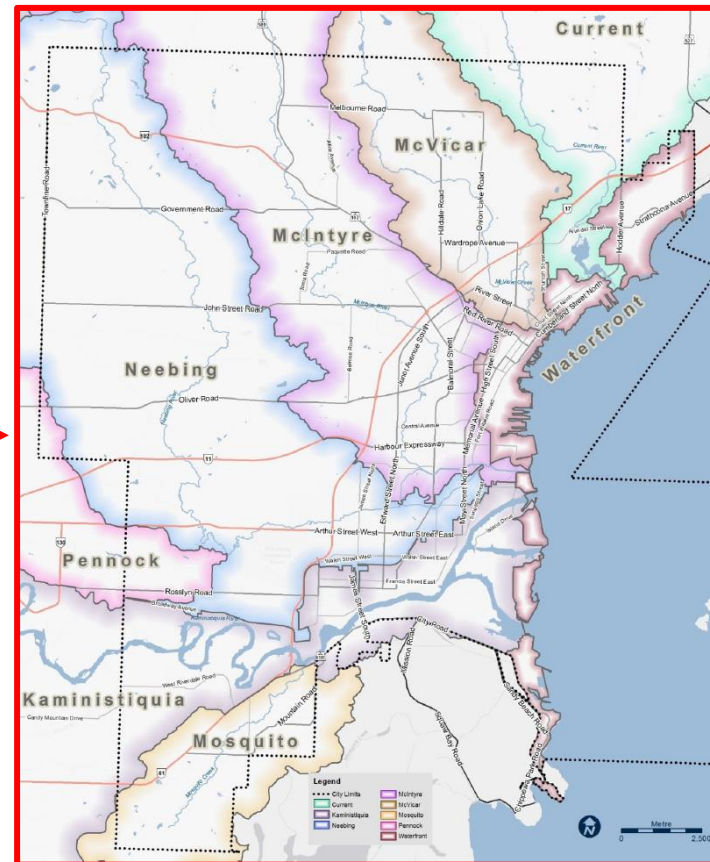
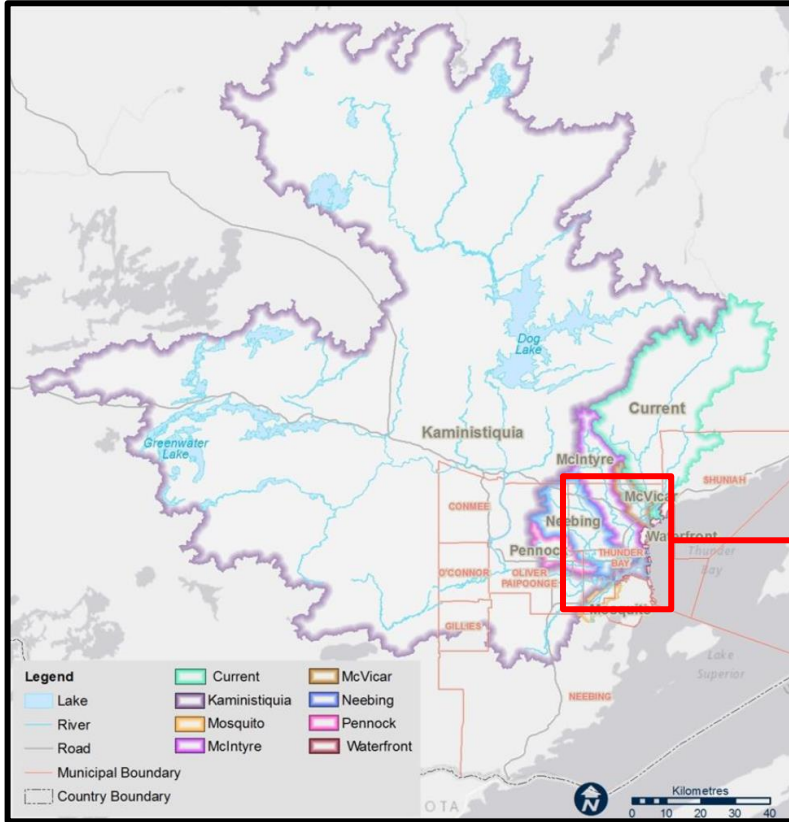
What is Thunder Bay Currently Doing?

- The City is responsible for protecting public health & safety as well as the environment by managing the quality and quantity of stormwater reaching our lakes and rivers





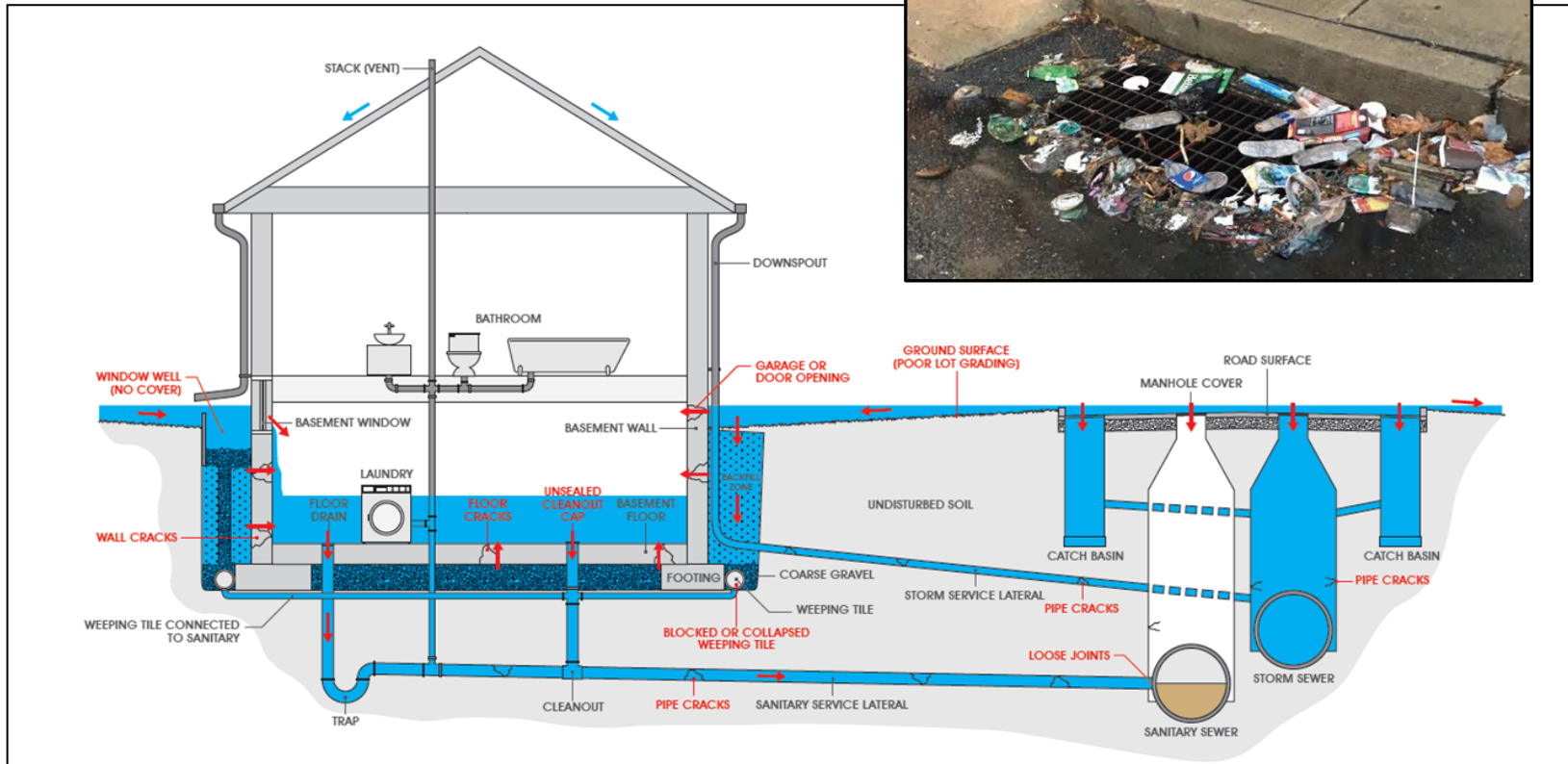
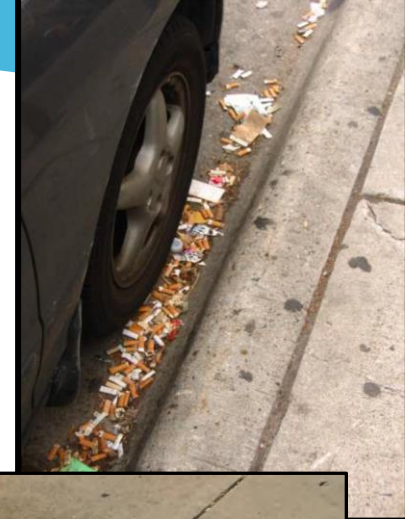
City's Stormwater System in Context





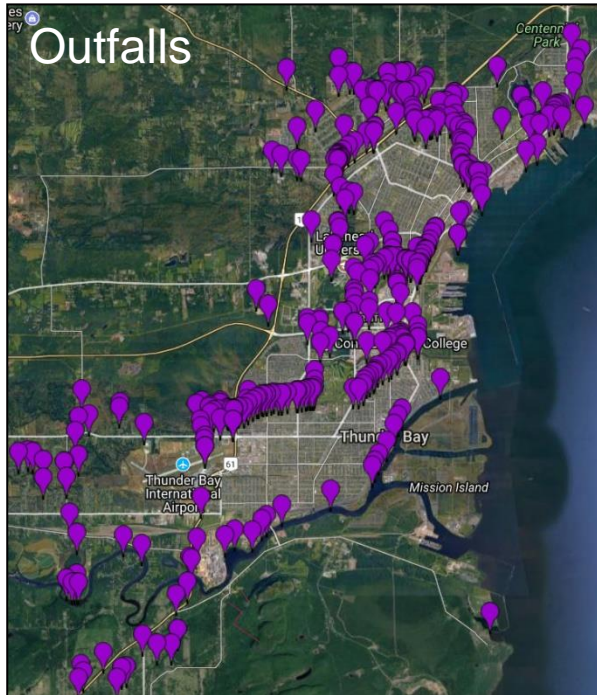
Audience Participation

– Do you know where Thunder Bay’s stormwater goes?



Stormwater Management in Thunder Bay

- Currently, stormwater from 95% of the City (does not include private facilities) is discharged directly into the environment without any water quality treatment





Debris



Erosion

11 11 2004



Water Quality

5/6/1999 1:57pm



Flooding



Local Flooding and Erosion

May 28, 2012

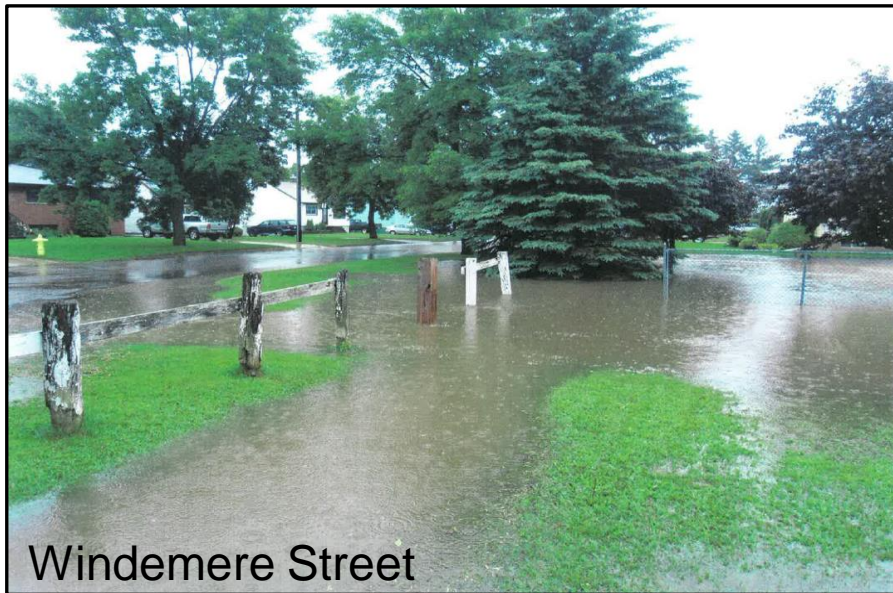


Image from: tbnewswatch.com



Image from: news.national.post





Windemere Street



Empson Avenue



Falconcrest Drive



Fairview Avenue



Prospect
Avenue





Kam River Streambank Erosion
(Victor Street)



McIntyre River (Central Avenue)



Iron Ochre (Nova Drive)





Stormwater Management Solutions

- Source controls: Capture and use runoff before it gets into the collection system
- Conveyance improvements: Move runoff quickly and efficiently
- Storage improvements: Hold runoff before discharging it downstream
- Floodplain management: Redirect/contain damaging flows OR get out of its way



Capital Projects



Operations and Maintenance



Operations and Maintenance



Repair



Debris Removal

17 9:16 AM



*Ditch
Cleaning*



River Dredging



Floodway Dredging



Monitoring



Education and Outreach





Stormwater Financing Study Overview

1. Determine the appropriate and affordable level of service for future stormwater program projects and activities
2. Identify and evaluate funding options and alternatives
3. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
4. Recommend a preferred option and determine the impacts compared to current funding sources
5. Present project findings and study recommendations to Council later this year



Study Highlights

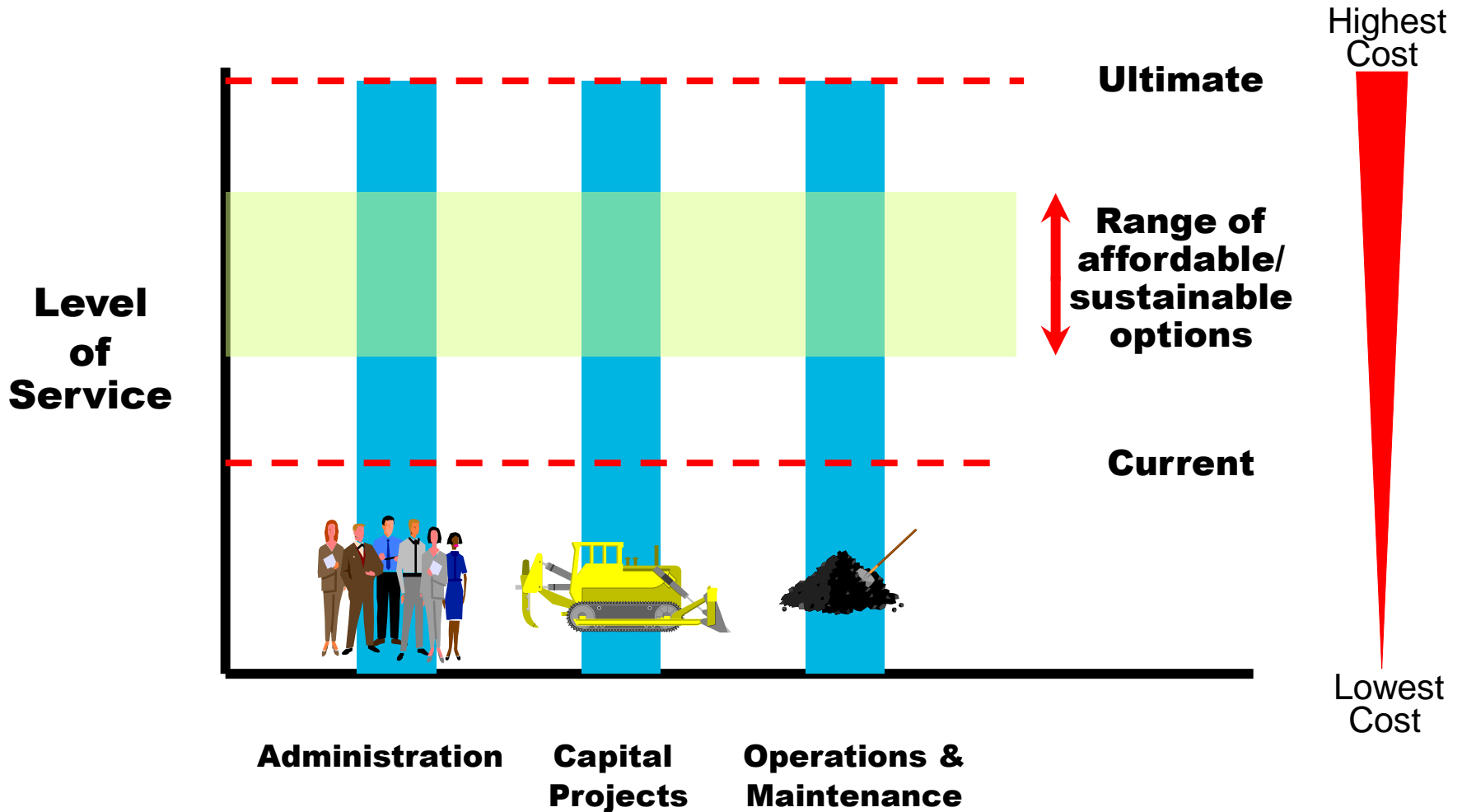
- Range of funding options to be investigated
 - Do nothing (no change to current funding sources)
 - Changes to property tax funding
 - Changes to development charges (for new development)
 - New user-fee funded program
- Led by City Internal Steering Committee
- Advised by Stormwater Advisory Committee as well as the general public and interested stakeholders
- Direction from (and decisions will be made by) City Council



Typical Key Considerations and Issues

- If there have been no recent flooding issues or other challenges, the City's stormwater service may not be a top-of-mind concern to citizens
- Like other infrastructure, stormwater systems need to be maintained over time
- Since cities develop over time, there may be different levels of stormwater management in different areas
- When considering how to best pay for stormwater services (i.e., who pays, how much, for what?), key issues include: cost of service, fairness & equity, and affordability

Level of Service Decisions Affect Program Affordability





Future Stormwater Program Expenditures

- Annual stormwater budgets have to compete with other vital public services. As a result...

the implementation of capital projects and the extent/frequency of Operations & Maintenance (O&M) activities often becomes dependent on the availability of funds, rather than based on need

- 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

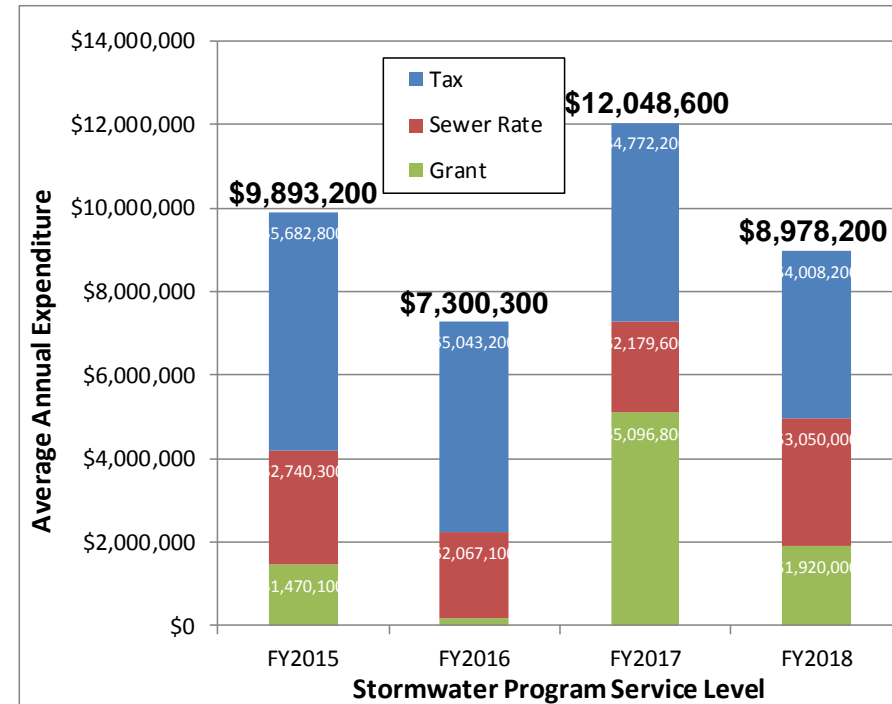


Current Stormwater Program Expenditures

– Annual stormwater program costs (FY2018 budget): **\$9.0M**

- Tax funded portion: \$4.0M
- Rate funded portion: \$3.1M
- Grant funded portion: \$1.9M

Stormwater Management Program Item	Current Funding Source	Annual Expenditure	
		Tax Funded	All Sources
Operations & Maintenance			
Street Cleaning	Tax	\$762,300	\$762,300
Drainage & Flood Control	Tax	\$685,900	\$685,900
Catchbasins	Sewer Rate	\$0	\$443,300
Pump Stations	Sewer Rate	\$0	\$36,100
Storm Sewers	Sewer Rate	\$0	\$360,600
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,448,200	\$2,288,200
Capital Improvements			
Storm Sewer Separation	Sewer Rate + Grant	\$0	\$2,210,000
Stormwater Mgmt. Projects	Tax + Grant	\$1,060,000	\$2,980,000
Culvert Replacement	Tax	\$100,000	\$100,000
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,160,000	\$5,290,000
Other			
Lakehead Region CA Levy	Tax	\$1,400,000	\$1,400,000
Indirect Overhead	Tax	??	??
Subtotal		\$1,400,000	\$1,400,000
TOTAL		\$4,008,200	\$8,978,200





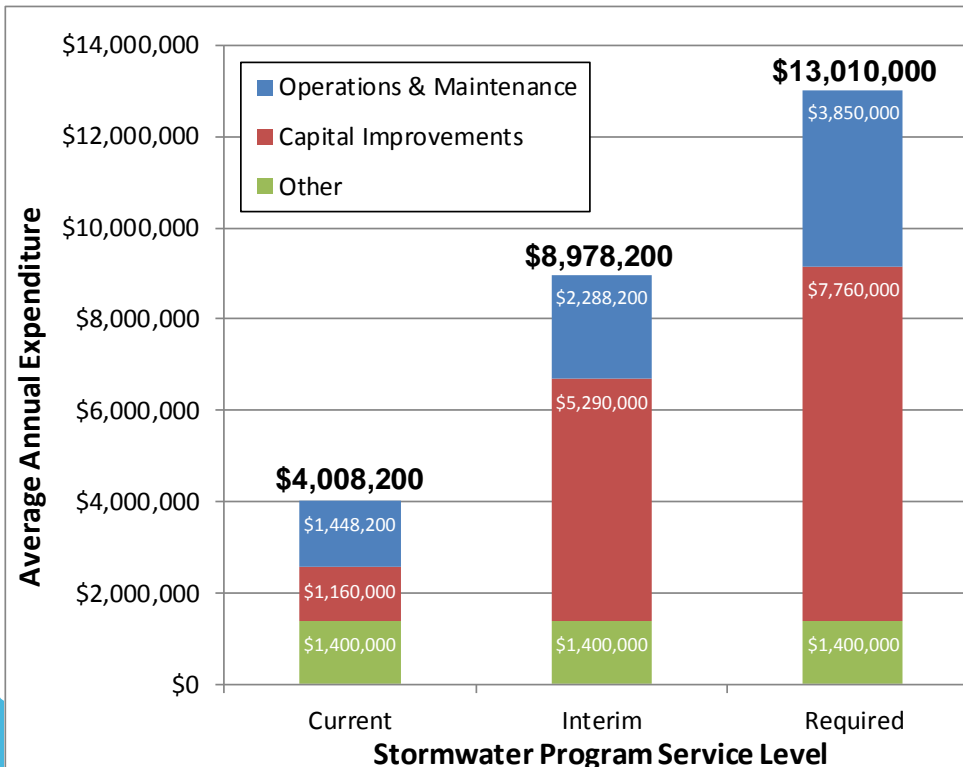
Future Program Requirements

- The 2016 Stormwater Management Plan outlines a recommended path towards sustainable stormwater management in Thunder Bay while addressing future program pressures and challenges
- Currently unfunded operational needs
- Increased capital program needs in response to climate change, greater focus on watershed health, etc.

Stormwater Management Program Item	Annual Expenditure	
	Year 1	Year 1-20
Operations & Maintenance	\$2,608,000	\$3,698,950
Capital Improvements	\$4,487,000	\$7,463,000
TOTAL (\$2016)	\$7,095,000	\$11,161,950
TOTAL (\$2018)	\$7,380,000	\$11,610,000
Other (LRCA Levy)	\$1,400,000	\$1,400,000
TOTAL	\$8,780,000	\$13,010,000

Service Level Scenarios

- Current: Tax-funded portion from proposed FY2018 budget
- Interim: Total amount (all sources) from FY2018 budget
- Required: Identified in the 2016 SMP (in \$2018)



Stormwater Service Level (annual cost)	2016 Census - City of Thunder Bay		
	Land Area (ha)	Population	Households
	per hectare	per capita	per house
Current: \$4,008,200	32,836	107,909	47,182
Interim: \$8,978,200	\$273	\$83	\$190
Required: \$13,010,000	\$396	\$121	\$276



Consultant Team Experience

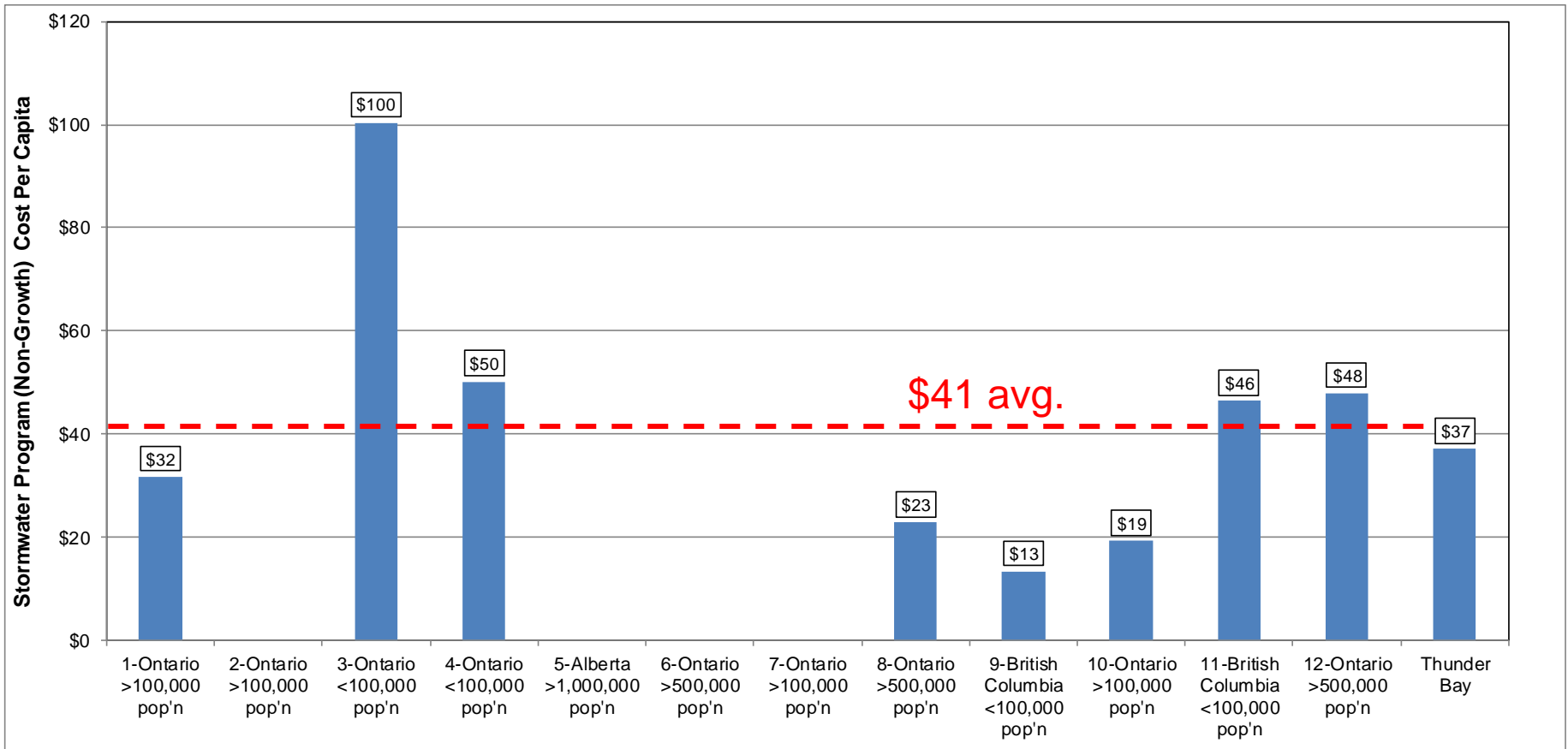
– Stormwater financing studies in Canada, 2005-present

Municipality / Agency	Year Completed	Study Type	Advisory Committee	Credits Explored
Stratford, ON	2007	Feasibility study	Yes	Somewhat
Calgary, AB	2008	Feasibility study	No	No
Credit Valley Conservation, ON	2008	Concept study	n/a	n/a
Kitchener & Waterloo, ON	2009	Feasibility study	Yes	Yes
Hamilton, ON	2010	Feasibility study	No	Somewhat
Kitchener, ON	2010	Implementation	No	Yes
Mississauga, ON	2013	Feasibility study	Yes	Yes
Markham, ON	2014	Feasibility study	No	Somewhat
Mississauga, ON	2014	Implementation	Yes	Yes
Prince George, BC	2014	Feasibility study	No	No
Markham, ON	2015	Implementation	No	Somewhat
Vernon, BC	2015	Feasibility study	No	No
Guelph, ON	2016	Feasibility study	Yes	Yes
Ottawa, ON	2016	Feasibility study	No	No
Guelph, ON	2018	Implementation	Yes	Yes
Thunder Bay, ON	in progress	Feasibility study	Yes	???
Sault Ste. Marie, ON	in progress	Feasibility study	Yes	???



How Does Thunder Bay Compare?

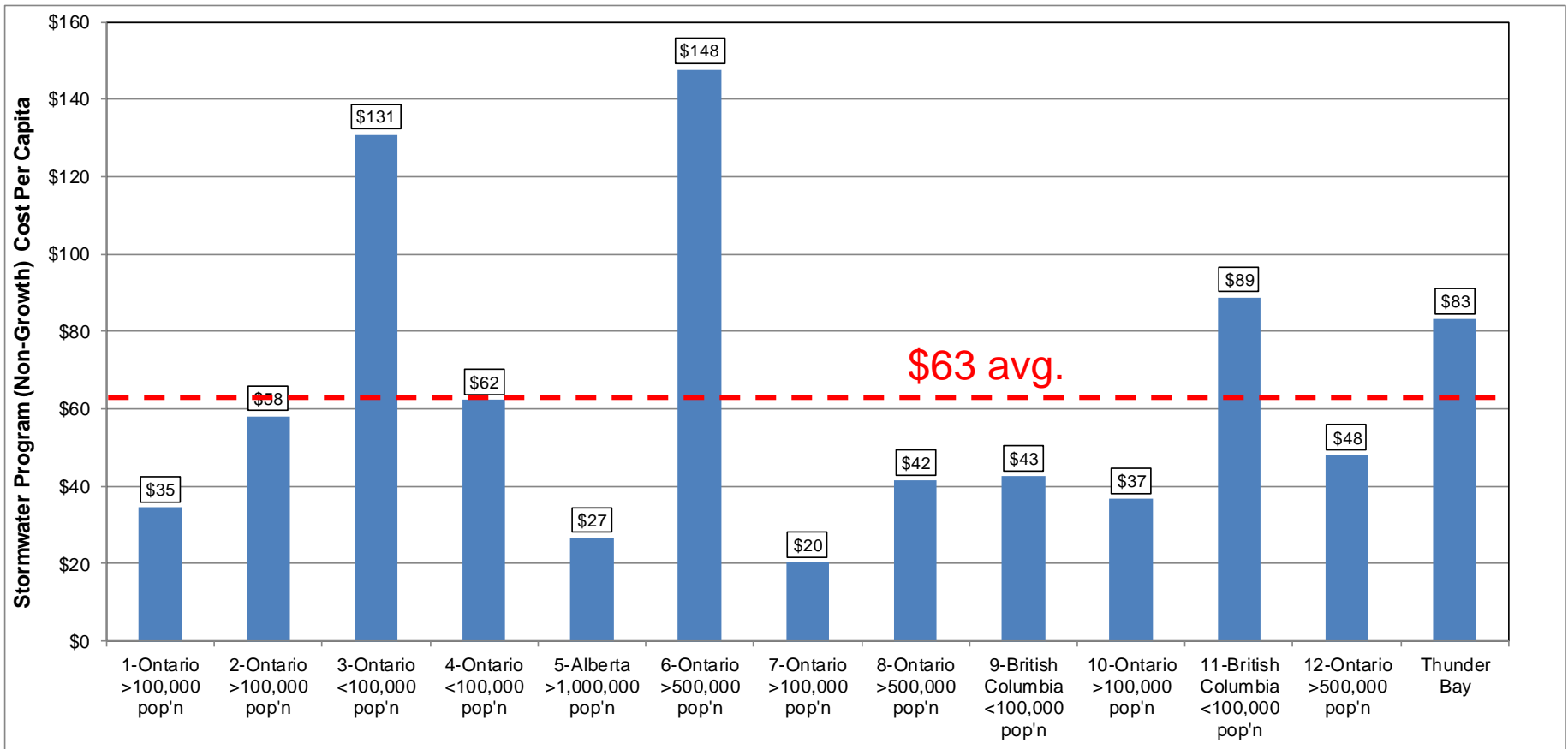
– Current Service Level (tax-funded portion only)





How Does Thunder Bay Compare?

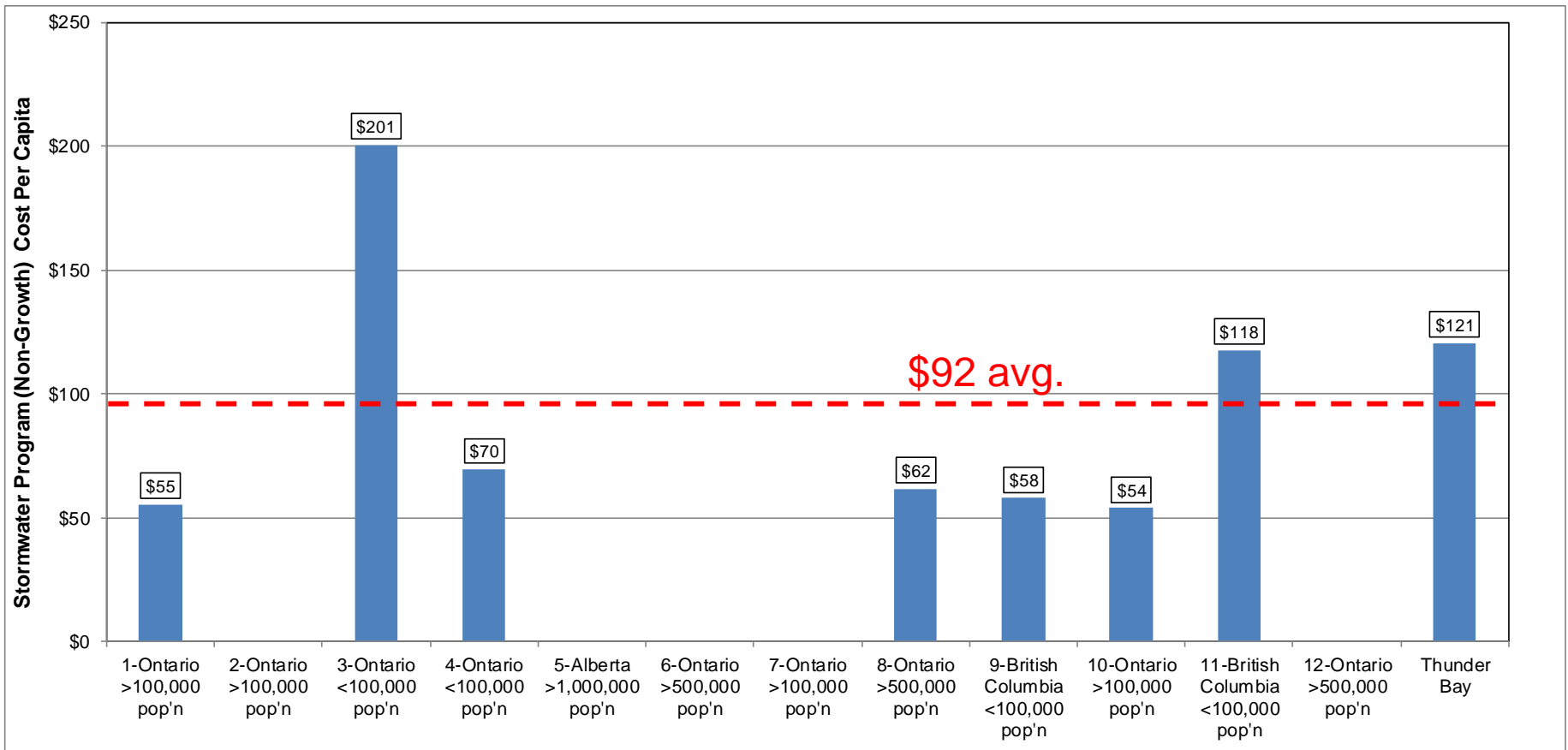
– Interim Service Level (entire program, all funding sources)





How Does Thunder Bay Compare?

– Required Service Level (future stormwater program needs)





Funding Options

- Taxes: mandatory levies that are not related to any specific benefit or government service (i.e., general services for the public good)
- Fees/Rates: payments made to offset the cost of a specific service and payable by those people who benefit from the service (i.e., a “rational nexus” must be demonstrated)
- Other means: e.g., public-private partnerships, long-term debt-financing strategies, federal or provincial economic stimulus grants for infrastructure investment
- Or any combination of the above



Stormwater Financing Options in North America

- Property Tax
- Development/Growth Related
 - Development charges or impact fees (new development)
 - Fee-in-lieu charges (infill/redevelopment)
- Sewer Rate
- Federal/Provincial Grants
- Stormwater User Fee

Property Tax

- Local property taxes are the most significant revenue source to support municipal stormwater programs in Canada
- Determined based on the property value assessment times the applicable tax rate
- Many municipalities have caps that limit tax payments for selected property types
- Tax-exempt properties include gov't buildings, schools, hospitals, churches, and other charitable organizations



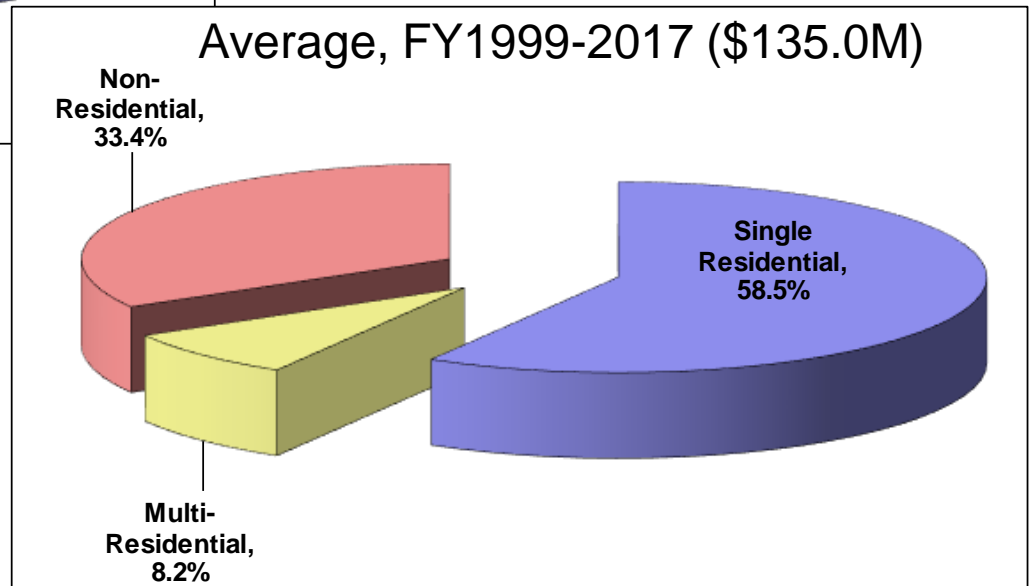
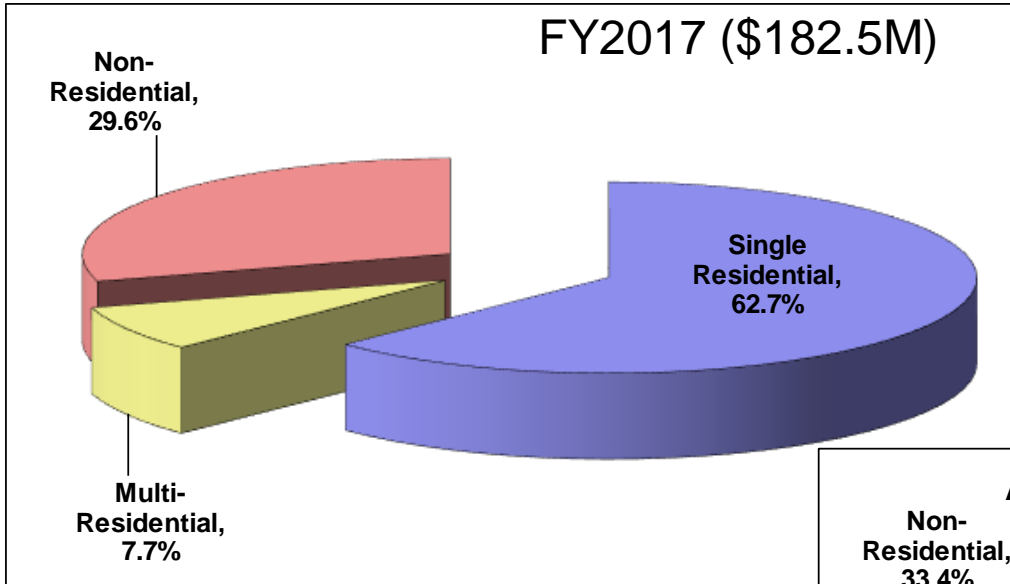
Tax Funding Options

- Dedicate more tax funds towards stormwater; or
- Raise taxes to meet additional stormwater needs

2017 Tax Revenue \$182,496,000	Stormwater Program Service Level		
	Current	Interim	Required
Program Cost	\$4,008,200	\$8,978,200	\$13,010,000
Tax Levy Allocation	2.20%	4.92%	7.13%
Tax Increase Required	0.00%	2.76%	5.00%



Tax Levy Distribution





Property Tax Funding

	Pros	Cons
Tax-Based Funding	<ul style="list-style-type: none">• Already accepted as the primary existing source of revenue for municipalities• Can be used to fund all stormwater management program activities• The billing system is already established	<ul style="list-style-type: none">• Property taxes are based on a property's assessed value, not runoff contribution, so the fairness and equity of this revenue source is low• Not a dedicated* or stable funding source• Annual competition for general tax funds to support other community services• No incentive to adopt source controls to reduce runoff• Tax-exempt properties don't contribute to stormwater program

**Note: A dedicated tax levy for specific stormwater services could be adopted*



Development Charges

- Ontario Development Charges (DC) Act of 1997 authorizes municipalities to pass by-laws to recover costs incurred related to new and re-development projects
- Only used to fund eligible growth-related capital costs, and only for the services for which they were collected
- Often based on the number of residential dwelling units or the building floor area for non-residential developments
- City has enacted a DC by-law, but it has not been implemented yet



Development/Growth Related Funding

	Pros	Cons
Dev't Related Funding	<ul style="list-style-type: none">• Accepted by development community• Based on contributing area, more equitable than property value	<ul style="list-style-type: none">• Limited by developable land within municipality (i.e., not applicable throughout municipality)• Directly dependent on growth and growth rates (i.e., if growth rate declines, so does the revenue collected)• Development charges are generally limited to the capital costs associated with the development



Stormwater User Fee

- Progression of public utilities once funded from general tax support and then shifted to enterprise fund
 - Water – Volume used
 - Wastewater – Volume generated
 - Solid Waste – Quantity generated
 - Stormwater – Runoff contribution
- Variable rate with charge based on total impervious area (hard surfaces):
 - Rooftops
 - Driveways
 - Parking areas
 - Patios
 - Sidewalks



Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
- Flat fee: equal charge to all utility customers (Calgary)
- Tiered flat fee: charges by customer type (London, Aurora, Richmond Hill)
- Variable rate: property owners based on measured impervious area (Kitchener, Waterloo, Saskatoon, Halifax, Guelph)

Municipality	Fee Type (as of 2016)	Start
Nova Scotia		
Halifax	Variable Rate	2013
Ontario		
London	Tiered Flat Fee	1996
Aurora	Tiered Flat Fee	1998
St. Thomas	Tiered Flat Fee	2000
Kitchener	Variable Rate	2011
Waterloo	Variable Rate	2011
Richmond Hill	Tiered Flat Fee	2013
Markham	Tiered Flat Fee	2015
Mississauga	Variable Rate	2016
Saskatchewan		
Regina	Tiered Flat Fee	2001
Saskatoon	Variable Rate	2012
Alberta		
Calgary	Flat Fee	1994
Edmonton	Variable Rate	2003
St. Albert	Tiered Flat Fee	2003
Strathcona County	Flat Fee	2007
British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016



Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none">• Dedicated and stable funding source for all stormwater activities (i.e., sustainable)• Fair and equitable fee based on runoff contribution (assessed to all private and publicly-owned properties in the same manner)• With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge• Mechanism to ensure privately owned stormwater facilities are maintained	<ul style="list-style-type: none">• Additional implementation costs (rate study, database management, billing and customer service*)• Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>



Preliminary Findings – Taxation

– Cumulative value assessment from Municipal Property Assessment Corporation (MPAC)

Thunder Bay - 2017 Cumulative Value Assessment (CVA)

MPAC Property Type	Total CVA	Count	Dist'n	Average CVA
unclassified	5,947,725	30	0.1%	\$198,258
Vacant Land	135,304,577	2,133	4.9%	\$63,434
Farm	14,024,517	90	0.2%	\$155,828
Residential	7,870,976,505	38,531	88.9%	\$204,276
Commercial	1,075,512,051	1,718	4.0%	\$626,026
Industrial	436,096,764	652	1.5%	\$668,860
Institutional	104,036,262	25	0.1%	\$4,161,450
Special & Exempt	107,730,774	140	0.3%	\$769,506
Government	19,819,475	17	0.0%	\$1,165,851
Total 2017 Active CVA	9,769,448,650	43,336	100%	\$225,435
Single-family detached (MPAC 301)		32,671	75%	\$201,256



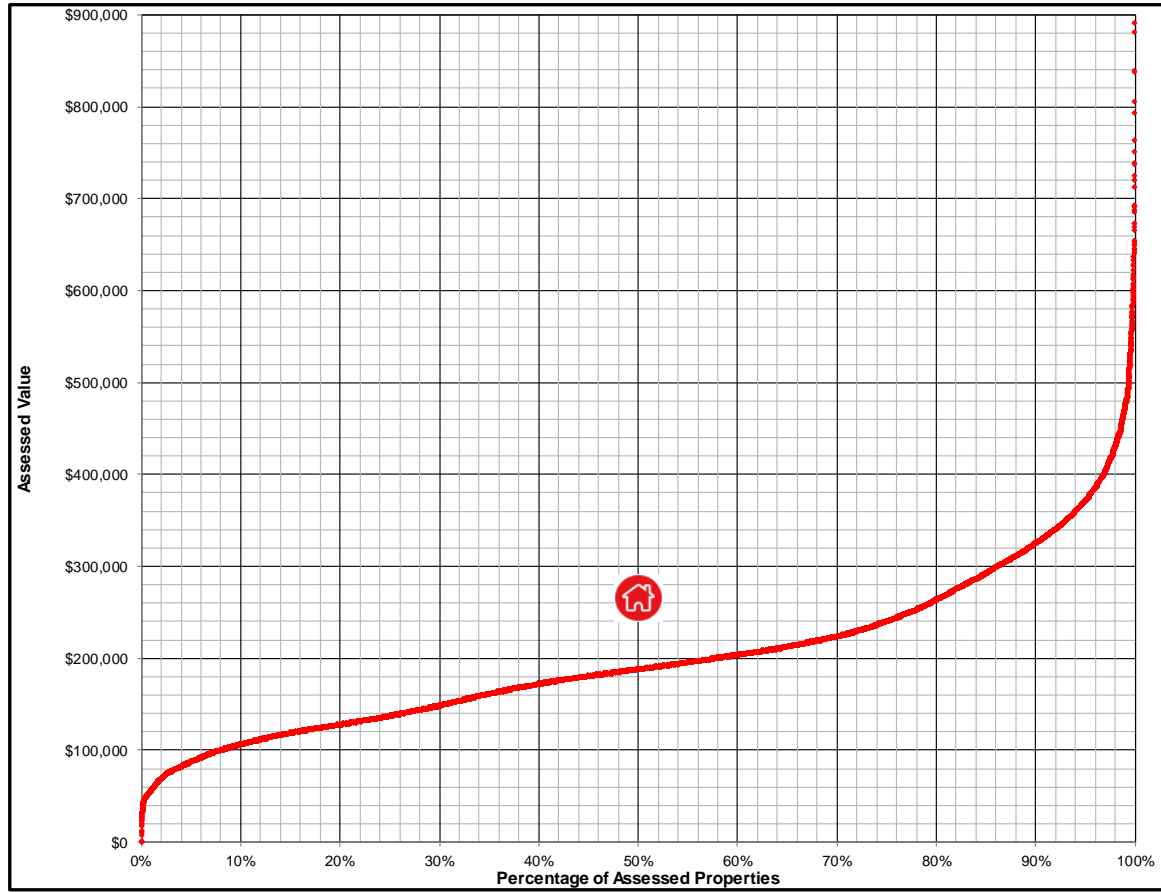
THUNDER BAY
STORMWATER FINANCING STUDY

All Single-Family Detached Homes (MPAC code 301)			
Percentiles (2017 Active CVA)		Other Statistics	
\$106,250	10%	32,671	count
\$127,750	20%	\$0	min
\$148,250	30%	\$1,192,250	max
\$171,750	40%	\$201,256	average
\$188,000	50%	\$188,000	median
\$203,500	60%		
\$223,750	70%		
\$263,500	80%		
\$324,750	90%		
\$371,000	95%		
\$470,320	99%		

**Real Estate Market Report for
Thunder Bay, ON**

House		Updated : Aug 2016	
Median price	\$264,900		
Monthly growth	3.92 %		
Quarterly trend	↑↑↑↑		
Stock on market	0.78%		

source: <http://www.canadianrealestatemagazine.ca/>



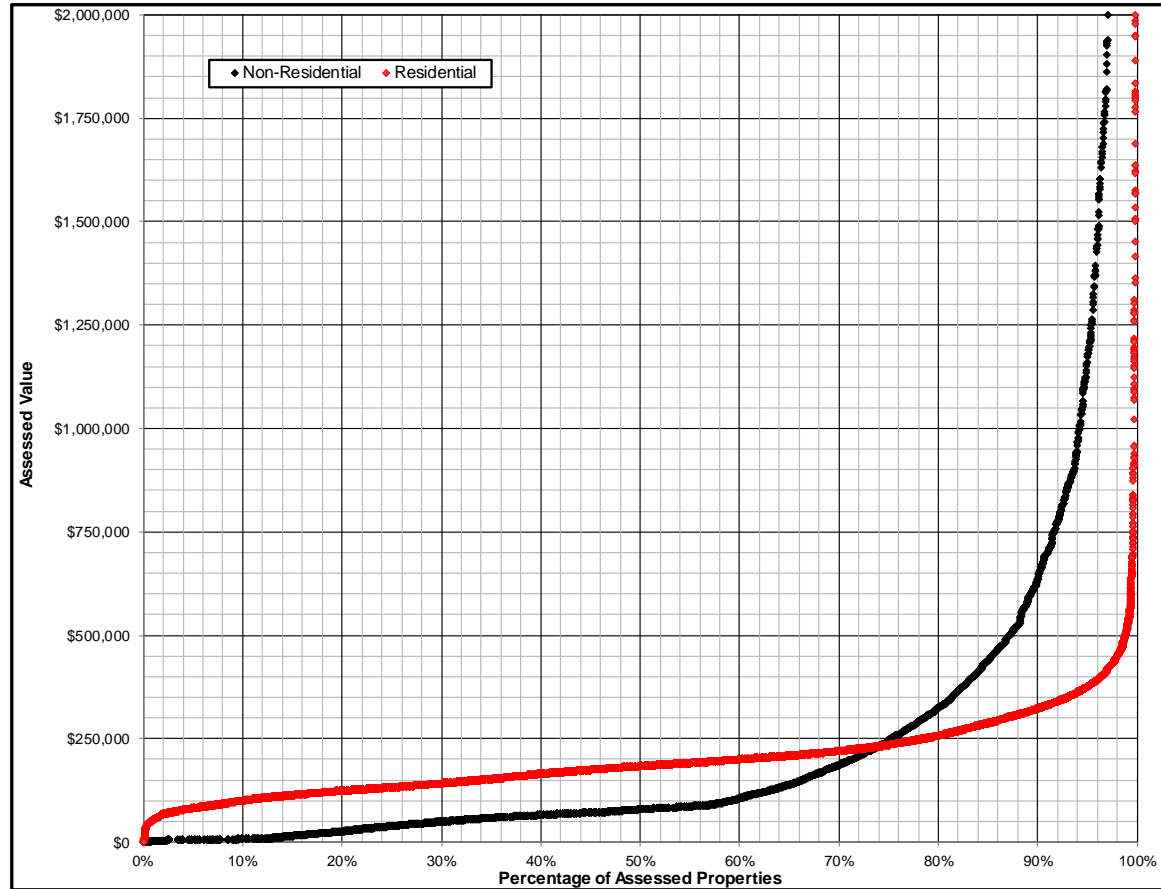
Note: 2 properties with CVA > \$900,000 not shown



THUNDER BAY STORMWATER FINANCING STUDY

All Non-Residential Properties			
Percentiles (2017 Active CVA)		Other Statistics	
\$7,200	10%	4,805	count
\$25,825	20%	\$0	min
\$49,475	30%	\$102,392,003	max
\$65,250	40%	\$395,103	average
\$79,000	50%	\$79,000	median
\$104,999	60%		
\$185,800	70%		
\$324,365	80%		
\$630,800	90%		
\$1,169,168	95%		
\$5,760,720	99%		

All Residential Properties			
Percentiles (2017 Active CVA)		Other Statistics	
\$100,000	10%	38,531	count
\$123,750	20%	\$0	min
\$141,500	30%	\$11,257,000	max
\$164,750	40%	\$204,276	average
\$183,250	50%	\$183,250	median
\$199,750	60%		
\$219,750	70%		
\$257,000	80%		
\$322,750	90%		
\$374,850	95%		
\$512,750	99%		





2017 Tax Rates

<http://www.thunderbay.ca/Assets/City+Government/Revenue/docs/Guide+to+Your+Final+2017+Property+Tax+Bill.pdf>

	Residential	New Multi-Residential	Multi-Residential	Commercial			Industrial		
				Occupied	Excess Land	Vacant Land	Occupied	Excess Land	Vacant Land
Education	0.00179000	0.00179000	0.00179000	0.01140000	0.00798000	0.00798000	0.01140000	0.00798000	0.00798000
General	0.01333479	0.01333479	0.03304737	0.02810387	0.01967272	0.01967272	0.03261069	0.02282748	0.02282748
Garbage	0.00034609	0.00034609	0.00088824	0.00074216	0.00051951	0.00051951	0.00086118	0.00060282	0.00060282
Public Transportation	0.00099100	0.00099100	0.00254341	0.00212512	0.00148758	0.00148758	0.00246591	0.00172613	0.00172613
Sewage & Drainage	0.00002185	0.00002185	0.00005608	0.00004686	0.00003280	0.00003280	0.00005437	0.00003806	0.00003806
Street Lighting	0.00035772	0.00035772	0.00091809	0.00076710	0.00053697	0.00053697	0.00089012	0.00062308	0.00062308
Total Full Service 2017	0.01684145	0.01684145	0.03924319	0.04318511	0.03022958	0.03022958	0.04828227	0.03379757	0.03379757
City - Urban	0.01505145	0.01505145	0.03745319	0.03178511	0.02224958	0.02224958	0.03688227	0.02581757	0.02581757
City - Rural	0.01368088	0.01368088	0.03393561	0.02884603	0.02019223	0.02019223	0.03347187	0.02343030	0.02343030
Tax Code	RT	NT	MT	CT	CU	CX	IT	IU	IX
	Large Industrial ¹				Pipelines	Farm	Managed Forests		
	Occupied		Excess Land						
	Low Band	High Band	Low Band	High Band					
Education	0.01000021	0.01470619	0.00700014	0.01029433	0.01140000	0.00044750	0.00044750		
General	0.03872450	0.05694780	0.02710715	0.03986346	0.03589114	0.00333370	0.00333370		
Garbage	0.00102263	0.00150387	0.00071584	0.00105271	0.00093152	0.00008652	0.00008652		
Public Transportation	0.00292822	0.00430620	0.00204975	0.00301434	0.00266732	0.00024775	0.00024775		
Sewage & Drainage	0.00007360	0.00010824	0.00005152	0.00007576	0.00005881	0.00000546	0.00000546		
Street Lighting	0.00105699	0.00155440	0.00073990	0.00108808	0.00096282	0.00008943	0.00008943		
Total Full Service 2017	0.05380615	0.07912670	0.03766430	0.05538868	0.05191161	0.00421036	0.00421036		
City - Urban	0.04380594	0.06442051	0.03066416	0.04509435	0.04051161	0.00376286	0.00376286		
City - Rural	0.03974713	0.05845167	0.02782299	0.04091617	0.03682266	0.00342022	0.00342022		
Tax Code	LT1	LT2	LU1	LU2	PT	FT	TT		

Notes:
1. Assessment up to 18,500,000 will be taxed at the low band rate. Assessment in excess of 18,500,000 will be taxed at the high band rate.



Tax Payments by Property (Annually and Monthly)

City - Urban boundary (General, Solid Waste, Public Transportation, Drainage, and Street Lighting)

Property Class (Tax Code)	Total 2017 City Tax Rate	Assessed Value	City Tax Payment	Stormwater Allocation	Monthly	
					Tax	SWM
Industrial (IT)	3.6882%	per \$100,000	\$3,688	\$81.1	\$307	\$6.76
Multi-Residential (MT)	3.7453%	per \$100,000	\$3,745	\$82.4	\$312	\$6.87
Commercial (CT)	3.1785%	per \$100,000	\$3,179	\$69.9	\$265	\$5.83
Residential (RT)	1.5051%	per \$100,000	\$1,505	\$33.1	\$125	\$2.76
		\$150,000	\$2,258	\$49.7	\$188	\$4.14
		\$200,000	\$3,010	\$66.2	\$251	\$5.52
		\$250,000	\$3,763	\$82.8	\$314	\$6.90
		\$300,000	\$4,515	\$99.3	\$376	\$8.28
		\$350,000	\$5,268	\$115.9	\$439	\$9.66
		\$400,000	\$6,021	\$132.5	\$502	\$11.04
		\$500,000	\$7,526	\$165.6	\$627	\$13.80

City - Rural boundary (partial services: General and Solid Waste)

Property Class (Tax Code)	Total 2017 City Tax Rate	Assessed Value	City Tax Payment	Stormwater Allocation	Monthly	
					Tax	SWM
Industrial (IT)	3.3472%	per \$100,000	\$3,347	\$73.6	\$279	\$6.14
Multi-Residential (MT)	3.3936%	per \$100,000	\$3,394	\$74.7	\$283	\$6.22
Commercial (CT)	2.8846%	per \$100,000	\$2,885	\$63.5	\$240	\$5.29
Residential (RT)	1.3681%	per \$100,000	\$1,368	\$30.1	\$114	\$2.51
		\$150,000	\$2,052	\$45.1	\$171	\$3.76
		\$200,000	\$2,736	\$60.2	\$228	\$5.02
		\$250,000	\$3,420	\$75.2	\$285	\$6.27
		\$300,000	\$4,104	\$90.3	\$342	\$7.52
		\$350,000	\$4,788	\$105.3	\$399	\$8.78
		\$400,000	\$5,472	\$120.4	\$456	\$10.03
		\$500,000	\$6,840	\$150.5	\$570	\$12.54



Next Steps

- Collect input on the key questions and factor all ideas into the evaluation of the different funding options
- Continue parcel analysis (impervious area measurements)
- Continue to communicate via the City website www.thunderbay.ca/stormwaterplan
- Online survey will be available in February



Next Steps (continued)

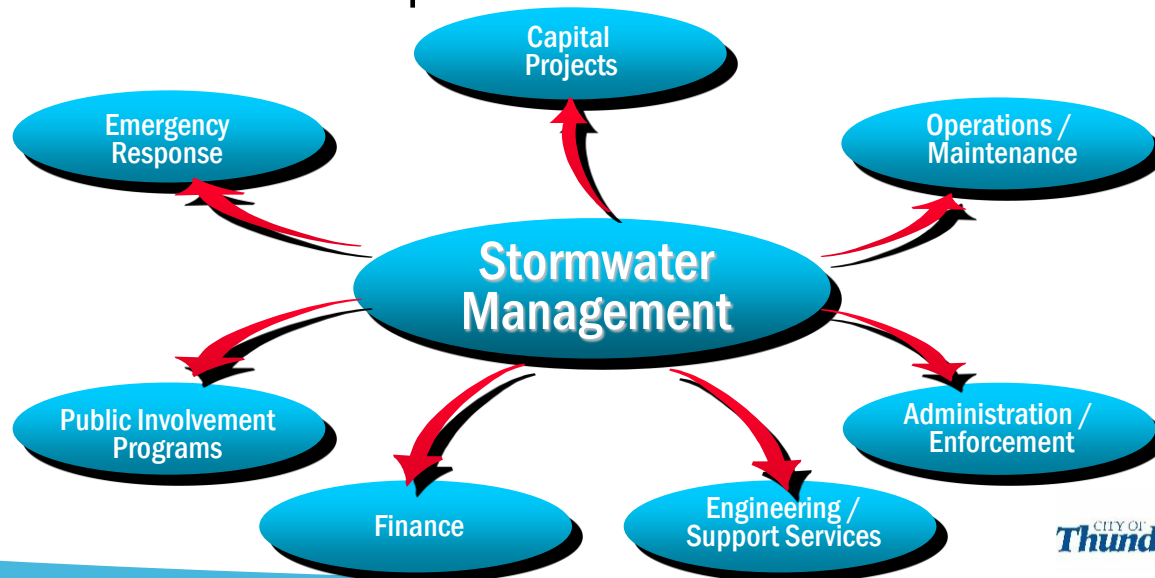
- Upcoming Meetings (dates to be determined)
 - Stormwater Advisory Committee Meeting 2 and 3
 - Public Information Centre No. 2 (meeting No. 1 today 4-8pm, ICC)
 - Additional as required
- Present project findings and study recommendations to Council in the Fall

Questions?



City of Thunder Bay Stormwater Responsibilities and Services

- Manage all aspects of stormwater within its jurisdiction
 - Capital projects including planning, design, and construction
 - Operations & maintenance including monitoring and inspection
 - Other services: administration, emergency response, bylaw enforcement, site plan reviews, public education/involvement, etc.
- Program includes many interrelated municipal activities & functions that span several service departments





Capital Projects





Fee-In-Lieu Charges

- Contributions to off-site stormwater facilities can be allocated in the form of a fee-in-lieu policy
 - Re-development/infill areas; and
 - On-site facilities are considered infeasible (e.g., undue maintenance burden)
- Like DC, rates based on the area of development (or number of dwelling units)
- Unlike DC however, revenue derived from fee-in-lieu charges can be applied to both capital and O&M costs of stormwater facilities
- Also known as Cash-in-Lieu (Mississauga, Brampton, Markham)



Tax Funding Options

Tax-Funded Program Expenditures ¹	Stormwater Management Program (Service Levels)						
	Status Quo	Interim			Sustainable		
Program Cost ²	\$4,008,200	\$8,978,200			\$13,010,000		
Municipal Tax Levy Allocation ³	2.20%	4.92%			7.13%		
Example Property	Charge	Charge	Δ	%	Charge	Δ	%
Single Unit Residential							
Single-Family Detached (average)	\$67	\$149	\$82	124%	\$216	\$149	224%
Semi-Detached (average)	\$40	\$89	\$49	124%	\$129	\$89	224%
Multi-Unit Residential							
Duplex (average)	\$59	\$133	\$73	124%	\$192	\$133	224%
Triplex (average)	\$53	\$119	\$66	124%	\$173	\$119	224%
4-Plex (average)	\$76	\$170	\$94	124%	\$247	\$171	224%
5-Plex (average)	\$67	\$150	\$83	124%	\$217	\$150	224%
6-Plex (average)	\$107	\$239	\$132	124%	\$346	\$239	224%
7+ Unit Apartments (average)	\$1,259	\$2,815	\$1,556	124%	\$4,080	\$2,821	224%
Condominium (average)	\$62	\$139	\$77	124%	\$202	\$139	224%
Townhouse (average)	\$31	\$70	\$39	124%	\$101	\$70	224%
Non-Residential							
Farm (average)	\$13	\$29	\$16	124%	\$42	\$29	224%
Commercial (average)	\$267	\$598	\$331	124%	\$866	\$599	224%
Industrial (average)	\$328	\$734	\$406	124%	\$1,063	\$735	224%
Special/Exempt (average)	\$0	\$0	\$0	n/a	\$0	\$0	n/a
Example Non-Residential Properties							
>>ask for volunteers from SWAC							
>>ask for volunteers from SWAC	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!
>>ask for volunteers from SWAC	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!

Notes:

1. Values are in present day dollars (inflation is not included).
2. This represents the tax-funded component of the program (capital funding from Development Charges is not included).
3. 2017 Municipal tax rates are used (full services within urban boundary).



Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned **Somewhat concerned** **Concerned** **Very concerned**

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes**
- No**
- Don't Know**
- Other:**



THUNDER BAY
STORMWATER FINANCING STUDY

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree **Neutral** **Disagree**

- b. Study recommendations must be publicly supported.

Agree **Neutral** **Disagree**

- c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree **Neutral** **Disagree**

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree **Neutral** **Disagree**

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree **Neutral** **Disagree**

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree **Neutral** **Disagree**

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree **Neutral** **Disagree**

4. Would you be willing to pay more for better stormwater management infrastructure?

- Yes**
- No**
- Don't Know**

Why?



THUNDER BAY
STORMWATER FINANCING STUDY

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):

- a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.
- b. **Expanded or modified Sewage & Drainage Levy** – To provide a dedicated tax stream for stormwater management works, however, this would continue to be based on property assessment values.
- c. **Stormwater User Fees** – A user fee would be based upon the amount of hard surface (roof, driveway, parking lot, etc.) on a particular property. This means that the fee is based on the amount of stormwater that runs off a property and into the public system.
- d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.
- e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing or future maintenance costs. Currently the City does not charge development fees)

f. **Other:**

6. Do you own property in Thunder Bay?

- a. **Yes**
- b. **No**
- c. **I do not own property but am responsible for financial decisions about a property**
- d. **Other:**



THUNDER BAY
STORMWATER FINANCING STUDY

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. **Residential (single-unit)**
- b. **Residential (multi-unit)**
- c. **Business**
- d. **Institution**
- e. **Not-for-Profit**
- f. **Commercial**
- g. **Other:**

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes**
- No**
- Maybe**
- Other:**

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?



Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned Somewhat concerned **Concerned** Very concerned

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned Somewhat concerned Concerned **Very concerned**

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned Somewhat concerned Concerned **Very concerned**

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned Somewhat concerned Concerned **Very concerned**

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned Somewhat concerned Concerned **Very concerned**

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes
- No
- Don't Know
- Other:



THUNDER BAY STORMWATER FINANCING STUDY

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree

Neutral

Disagree

- b. Study recommendations must be publicly supported.

Agree

Neutral

Disagree

- c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree

Neutral

Disagree

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree

Neutral

Disagree

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree

Neutral

Disagree

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree

Neutral

Disagree

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree

Neutral

Disagree

4. Would you be willing to pay more for better stormwater management infrastructure?

Yes

No

Don't Know

Why?



THUNDER BAY STORMWATER FINANCING STUDY

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):

- a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.
- b. **Expanded or modified Sewage & Drainage Levy** – To provide a dedicated tax stream for stormwater management works, however, this would continue to be based on property assessment values.
- c. **Stormwater User Fees** – A user fee would be based upon the amount of hard surface (roof, driveway, parking lot, etc.) on a particular property. This means that the fee is based on the amount of stormwater that runs off a property and into the public system.
- d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.
- e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing of future maintenance costs. Currently the City does not charge development fees)

f. **Other:**

6. Do you own property in Thunder Bay?

- a. **Yes**
- b. ~~No~~

c. I do not own property but am responsible for financial decisions about a property

d. **Other:**



**THUNDER BAY
STORMWATER FINANCING STUDY**

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. Residential (single-unit)
- b. Residential (multi-unit)
- c. Business
- d. Institution
- e. Not-for-Profit
- f. Commercial
- g. Other:

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes
- No
- Maybe
- Other:

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?

A phase-in period + well planned education program is necessary.

Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned Somewhat concerned Concerned **Very concerned**

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned **Somewhat concerned** Concerned Very concerned

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned **Somewhat concerned** Concerned Very concerned

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned Somewhat concerned **Concerned** Very concerned

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes
- No
- Don't Know
- Other:



THUNDER BAY STORMWATER FINANCING STUDY

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree

Neutral

Disagree

- b. Study recommendations must be publicly supported.

Agree

Neutral

Disagree

- c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree

Neutral

Disagree

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree

Neutral

Disagree

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree

Neutral

Disagree

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree

Neutral

Disagree

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree

Neutral

Disagree

4. Would you be willing to pay more for better stormwater management infrastructure?

Yes

No

Don't Know

Why?



**THUNDER BAY
STORMWATER FINANCING STUDY**

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):
- a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.
 - b. **Expanded or modified Sewage & Drainage Levy** – To provide a dedicated tax stream for stormwater management works, however, this would continue to be based on property assessment values.
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 - d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.
 - e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing of future maintenance costs. Currently the City does not charge development fees)

f. Other: Reallocation of existing funding

6. Do you own property in Thunder Bay?

- a. Yes
- b. No
- c. I do not own property but am responsible for financial decisions about a property
- d. Other:



**THUNDER BAY
STORMWATER FINANCING STUDY**

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. Residential (single-unit)
- b. Residential (multi-unit)
- c. Business
- d. Institution
- e. Not-for-Profit
- f. Commercial
- g. Other:

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes
- No
- Maybe
- Other:

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

- incentives / credits

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?



Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned Somewhat concerned Concerned Very concerned

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned Somewhat concerned Concerned Very concerned

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned Somewhat concerned Concerned Very concerned

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned Somewhat concerned Concerned Very concerned

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned Somewhat concerned Concerned Very concerned

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned Somewhat concerned Concerned Very concerned

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes
- No
- Don't Know
- Other:



THUNDER BAY STORMWATER FINANCING STUDY

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree Neutral Disagree

- b. Study recommendations must be publicly supported.

Agree Neutral Disagree

- c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree Neutral Disagree

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree Neutral Disagree

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree Neutral Disagree

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree Neutral Disagree

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree Neutral Disagree

4. Would you be willing to pay more for better stormwater management infrastructure?

Yes

No

Don't Know

Why?



**THUNDER BAY
STORMWATER FINANCING STUDY**

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):

- a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.
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- d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.
- e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing of future maintenance costs. Currently the City does not charge development fees)

f. **Other:** A combination of user fees & development charges.

6. Do you own property in Thunder Bay?

- a. **Yes**
- b. **No**
- c. **I do not own property but am responsible for financial decisions about a property**
- d. **Other:**



**THUNDER BAY
STORMWATER FINANCING STUDY**

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. Residential (single-unit)
- b. Residential (multi-unit)
- c. Business
- d. Institution
- e. Not-for-Profit
- f. Commercial
- g. Other:

Vacant

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes
- No
- Maybe
- Other:

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

I have already taken steps on my property.

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?

It is VERY important that large commercial and industrial contributors pay their fair share. Exceptions to the requirement to pay should be very limited.



Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned Somewhat concerned Concerned **Very concerned**

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned Somewhat concerned Concerned **Very concerned**

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned Somewhat concerned Concerned **Very concerned**

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned Somewhat concerned **Concerned** Very concerned

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes
- No
- Don't Know
- Other:



THUNDER BAY STORMWATER FINANCING STUDY

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree Neutral Disagree

- b. Study recommendations must be publicly supported.

Agree Neutral Disagree

- c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree Neutral Disagree

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree Neutral Disagree

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree Neutral Disagree

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree Neutral Disagree

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree Neutral Disagree

4. Would you be willing to pay more for better stormwater management infrastructure?

- Yes
 No
 Don't Know

Why?



THUNDER BAY STORMWATER FINANCING STUDY

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):

a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.

b. **Expanded or modified Sewage & Drainage Levy** – To provide a dedicated tax stream for stormwater management works, however, this would continue to be based on property assessment values.

c. **Stormwater User Fees** – A user fee would be based upon the amount of hard surface (roof, driveway, parking lot, etc.) on a particular property. This means that the fee is based on the amount of stormwater that runs off a property and into the public system.

d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.

and
e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing of future maintenance costs. Currently the City does not charge development fees)

f. **Other:**

6. Do you own property in Thunder Bay?

a. **Yes**

b. **No**

c. **I do not own property but am responsible for financial decisions about a property**

d. **Other:**



**THUNDER BAY
STORMWATER FINANCING STUDY**

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. Residential (single-unit)
- b. Residential (multi-unit)
- c. Business
- d. Institution
- e. Not-for-Profit
- f. Commercial
- g. Other:

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes
- No
- Maybe
- Other:

planting trees

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

knowing the co-benefits: cleaner water, improved health, cleaner air

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?



**THUNDER BAY
STORMWATER FINANCING STUDY**

Thunder Bay Stormwater Financing Study - Questionnaire

1. Please tell us how concerned you are about the following issues related to the City's stormwater management program (indicate your level of concern for each issue by circling one)

a. Stormwater infrastructure competes with other municipal priorities for funding.

Not at all concerned Somewhat concerned **Concerned** Very concerned

b. Poor stormwater service and infrastructure can result in flooding.

Not at all concerned Somewhat concerned Concerned **Very concerned**

c. Poor stormwater service and infrastructure can result in pollution of our waterways.

Not at all concerned Somewhat concerned Concerned **Very concerned**

d. There is a lack of understanding about the importance of stormwater infrastructure in Thunder Bay.

Not at all concerned Somewhat concerned **Concerned** Very concerned

e. Some areas of Thunder Bay contain aging stormwater infrastructure.

Not at all concerned Somewhat concerned **Concerned** Very concerned

f. Some areas of Thunder Bay are without stormwater infrastructure.

Not at all concerned Somewhat concerned Concerned **Very concerned**

2. Do you think the City is spending enough money on our stormwater service and infrastructure?

- Yes
- No
- Don't Know
- Other:



**THUNDER BAY
STORMWATER FINANCING STUDY**

3. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree **Neutral** **Disagree**

b. Study recommendations must be publicly supported.

Agree **Neutral** **Disagree**

c. Stormwater funding should be sustainable, stable, and dedicated to addressing stormwater needs.

Agree **Neutral** **Disagree**

d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree **Neutral** **Disagree**

e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree **Neutral** **Disagree**

f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree **Neutral** **Disagree**

g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree **Neutral** **Disagree**

4. Would you be willing to pay more for better stormwater management infrastructure?

- Yes**
- No**
- Don't Know**

Why?

Stormwater infrastructure should be sustainable and kept in top operating condition now and in the future. Worth the additional cost now to prevent significant costs in the future from unreliable infrastructure



THUNDER BAY STORMWATER FINANCING STUDY

5. The following options are some of the ways that stormwater infrastructure could be funded. Please tell us how you think the City should fund stormwater service and infrastructure (Please choose one):

a. **Property taxes** – Most City services are paid through property taxes and the amount paid is based on the assessed value and tax rate of the property. The City of Thunder Bay currently uses property taxes to fund stormwater capital and operational needs.

b. **Expanded or modified Sewage & Drainage Levy** – To provide a dedicated tax stream for stormwater management works, however, this would continue to be based on property assessment values.

c. **Stormwater User Fees** – A user fee would be based upon the amount of hard surface (roof, driveway, parking lot, etc.) on a particular property. This means that the fee is based on the amount of stormwater that runs off a property and into the public system.

d. **Shared Equally By Property Type** – All property owners would pay a flat fee. The value of the property or the amount of hard surfaces on the property would not matter.

e. **Development Charges** – Fees would be collected from developers which could be used to fund stormwater infrastructure that is related to growth or upsizing of existing infrastructure under the Development Charges Act. Development charges cannot be used for ongoing of future maintenance costs. Currently the City does not charge development fees)

f. **Other:** *Potentially a combination of (c) and (e). A user fee would improve accountability of proper owner (as long as there are incentives) but new developments should be charged a fee as well*

6. Do you own property in Thunder Bay?

a. Yes

b. No

c. I do not own property but am responsible for financial decisions about a property

d. Other:



THUNDER BAY STORMWATER FINANCING STUDY

7. If you are a property owner or have responsibility for property in Thunder Bay, which type of property is it?

- a. Residential (single-unit)
- b. Residential (multi-unit)
- c. Business
- d. Institution
- e. Not-for-Profit
- f. Commercial
- g. Other:

8. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

- Yes
- No
- Maybe
- Other:

9. Is there anything that would encourage you to take steps on your own property to minimize the impact of heavy rainfall events?

A incentive such as a credit for building a rain garden, using rain barrels or incorporating some form of stormwater management.

10. Do you have additional ideas, questions or concerns that you would like to leave with the study team?

Larger businesses who benefit from large paved areas should be charged additional fee based on the area size and impermeable cover.

Funds should be allocated to proper water quality monitoring program in both rivers and stormwater system to gauge efficiency of infrastructure on local waterways and Lake Superior.

Appendix C

Stormwater Advisory Committee Meeting #2

Minutes of Meeting #2

Date of Meeting: June 28, 2018
Start Time: 12:00 p.m.
Location: Victoriaville Civic Centre

1. Overview

On Thursday, June 28, from 12:00 p.m. to 2:30 p.m., the City of Thunder Bay, with support from AECOM, hosted a Stormwater Advisory Committee (SAC) meeting #2 for the Stormwater Financing Study. The purpose of the SAC is to provide organizations representing a broad range of interests with the opportunity to learn about and provide input into the study. This second meeting provided a recap of the study and funding options under consideration, as well a summary of technical work done to assess these funding options.

Nine (9) member organizations were represented, along with four (4) City staff and two (2) AECOM consultants.

The format of the meeting included a presentation with Q&A. The minutes below outline the questions, comments and feedback received during the SAC meeting.

2. Attending

Organization	Name
Chamber of Commerce	Charla Robinson
Resident	Valerie Cameron
Lakehead Region Conservation Authority	Tammy Cook
Zanette Realty	Robert Zanette
Red Sky Métis Independent Nation	Kayla Searle
Eco Superior	Ellen Mortfield
Eco Superior	Will Vander Ploeg



Confederation College	Sandra Stiles
Community Economic Development Commission	Jessi Ruberto
City of Thunder Bay	Carly Jaremey
City of Thunder Bay	Tom McConnell
City of Thunder Bay	Aaron Ward
City of Thunder Bay	Mark Smith
AECOM	Mike Gregory
AECOM	Pippy Warburton

3. Introduction and Presentation

Aaron Ward (City of Thunder Bay) opened the meeting and invited all attendees to introduce themselves and the organization that they represented. The study presentation was then delivered by Aaron, Mike Gregory (AECOM) and Pippy Warburton (AECOM).

4. Q&A

Throughout the presentation, questions were addressed and comments received. Key discussion items during the meeting are summarized below. Questions are noted with a “Q”, answers with “A”, comments with a “C” and responses with an “R”. Answers were primarily provided by Aaron Ward and Mike Gregory, with additional input from the project team.

Q1: Who were the organizations invited to the SAC?

A1: Approximately 50 people were invited from many groups, including major employers, developers, citizens, and other representatives from a wide range of public & private organizations. Many chose not to participate due to lack of interest or unavailability.

Q2: What was the funding involved in responding to flooding in the Northwood neighbourhood?

A2: The response involved much more than the 2012 storm event itself, flood damage implications continue to this day. Funding that was allocated to the Northwood



subdivision included \$12M from the Enhanced Infrastructure Renewal Program (EIRP) and reserves.

Q3: What are reserve funds and how are they used?

A3: It is a mechanism that allows City staff and Council to address needs without going back to the taxpayer (deliberately allocated or topped up with surplus funding).

C1: We got caught in 2012 and 3 major floods in past 10 years and the speaker thought that EOR's study recommended too much work to address this, leading the City to large amounts of deferred capital.

R1: With the 2016 Stormwater Plan, EOR answered the question of what is needed. The question now is about affordability and the method of allocating costs. Mark added that the two key issues are: 1) How much should the City spend; and more importantly; 2) Where should the money come from? There are infrastructure gaps everywhere in the City, so we can only bring Council to a certain point (that is, they cannot look at stormwater needs in isolation from all of the City's needs).

Q4: Is the City looking at the risk of continuing with the status quo? That is, what are the implications if we don't increase funding for stormwater?

A4: Aaron noted that modeling studies are ongoing that include climate change impacts. Pippy added that the Province requires asset management plans, plus Ontario also promotes the idea that municipalities have sustainable funding.

Q5: There was concern about missing out on external funds (e.g., provincial/federal grants). Does the City have a full-time person pursuing grant funding opportunities?

A5: No, but it was acknowledged that it does take significant resources to track down external funding sources. It was also noted that grant funds are not handed out freely, there are strings attached, shared responsibilities, rigorous reporting, etc.

C2: It is alarming that the budget numbers have changed so much from the first SAC meeting.

R2: The numbers presented in the first meeting (\$9M in stormwater expenditures) were taken from the City's budget books that are publicly available. As City staff went through each line item, there were some functions not directly related to stormwater quantity and quality (e.g., not all street sweeping has a stormwater benefit, and a portion of the conservation authority levy, etc.). This has resulted in a lower base budget of \$5.9M.

Q6: How long will the storm separation take, and won't that increase the volume to rivers?



A6: It is planned to take 5-10 years through the City's Pollution Prevention Control Plan. The remaining areas to be separated represent smaller drainage systems that are not expected to contribute large volumes to the receiving watercourses.

Q7: How are tax exempt properties being reported?

A7: PILT (Payment In-Lieu of Taxes) is included in the total City tax levy. Tax exempt properties are included in the Non-Residential category.

C3: There was concern that tax exempts are unfairly associated with taxable non-residential properties. Please separate these out.

R3: Further information will be presented at the next meeting.

Q8: How do our tax rates compare to other Ontario municipalities?

A8: Further information will be presented at the next meeting. Note following the meeting, Valerie Cameron circulated two documents ("2017-BMA-Municipal-Study.pdf" and "2017 BMA Study Council Presentation.pdf") that show these tax rate comparisons.

5. Meeting Adjournment

Following the presentation, the SAC members were thanked for their attendance and feedback into the study so far. Finally, SAC members were asked to provide feedback prior to our next meeting (expected in September) that answers the following questions:

- Are there other funding options that the project team should consider?
- Are there other service level scenarios for the future stormwater program (i.e., in addition to Current [\$3.15M], Interim [\$5.91M], and Required [\$12.12M]) that should be considered?
- Are there other example properties that we can compare charges for the various options and scenarios?
- Are there other ways that we can present the charge comparisons in tables, charts, etc.?
- Is there any other information that you need to help you understand how you might be financially impacted by changes to stormwater program funding?

No further comments or questions were raised. The meeting was adjourned at 2:30 p.m.

City of Thunder Bay Stormwater Financing Study



Stormwater Advisory Committee
Meeting No. 2
June 28, 2018

Project Manager: Aaron Ward, P.Eng.
Consultant Team: Pippy Warburton P.Eng. and
Mike Gregory, P.Eng.



Meeting Purpose and Objectives

- Recap previous meeting information – answer questions.
- Inform about work that has been undertaken since previous meetings
- Advise on current project status / schedule
- Introduce technical analysis work results
- Discuss implications of technical analysis
- Seek feedback on stormwater management financing issues and concerns
- Describe next steps in the study process

Study Overview



Stormwater Financing Study Overview

1. Determine the appropriate and affordable level of service for future stormwater program projects and activities
2. Identify and evaluate funding options and alternatives
3. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
4. Recommend a preferred option and determine the impacts compared to current funding sources
5. Present project findings and study recommendations to Council later this year

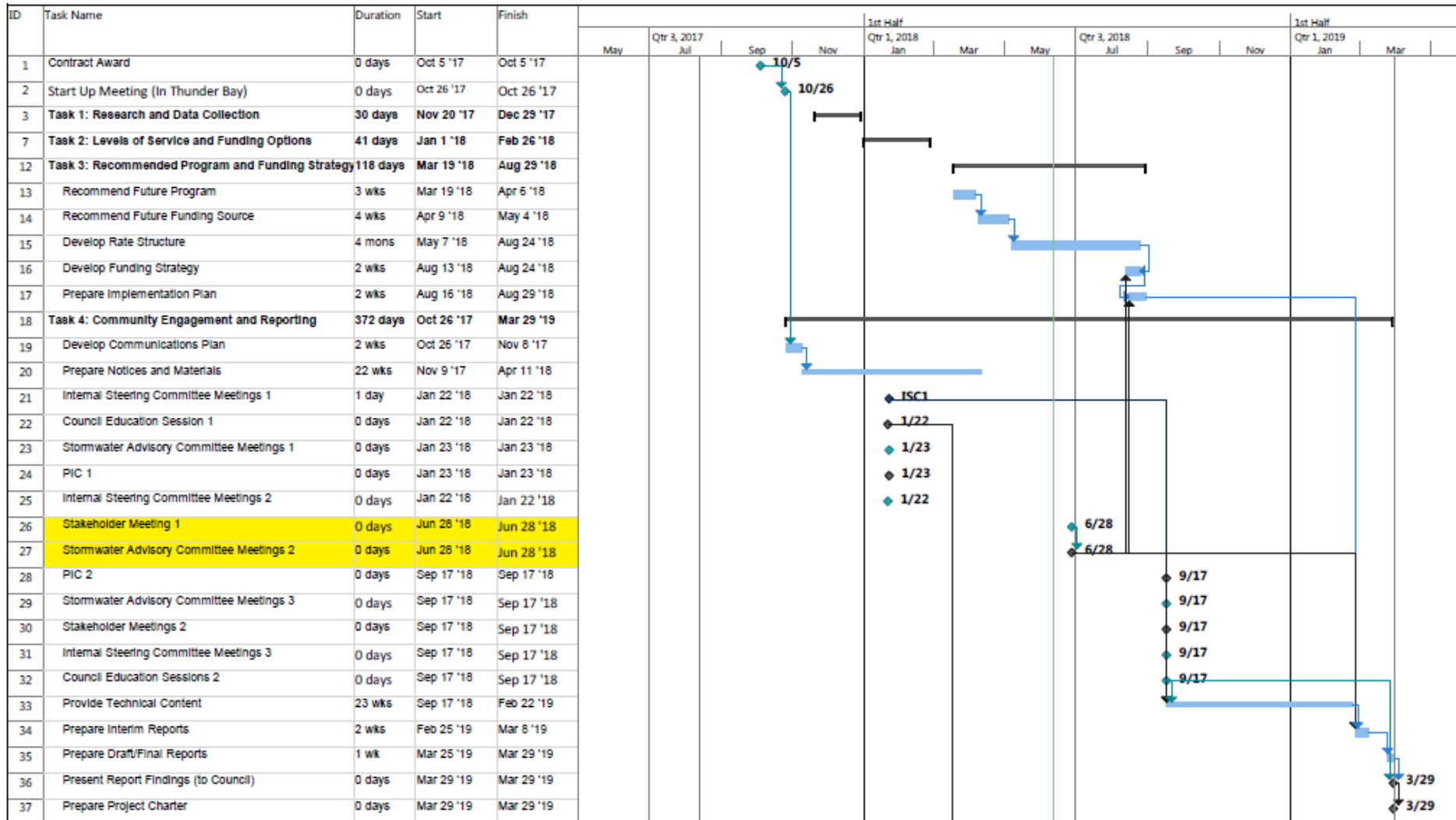
Project Status

Since we last met...

- Attended ward meetings
- Ongoing community engagement
- Parcel Analysis, customer classifications, impervious area calculations
- Financial Analysis – stormwater program budget and revenue requirements
- Identification of service level scenarios and funding options



Current Schedule





Range of Funding Options to be Investigated

- Do nothing (no change to current funding sources)
- Changes to property tax funding
- Changes to development charges (for new development)
- New user-fee funded program

Community Engagement

On-Going Community Engagement

- Councillor Ward Meetings
 - Attended 5 Ward meetings; approximately 90 people in attendance
- PIC #1 on Tuesday, January 23, 2018
 - 56 participants; 131 comment forms: 108 online and 23 in-person
- What We Heard:
 - Majority of respondents feel as though they already pay enough in taxes and are concerned about increased taxes
 - Many respondents are willing to take steps on their own property to reduce stormwater impacts
 - Many suggest finding funds from other reserves and finding new means to manage stormwater (i.e., rain gardens, build up instead of out)



On-Going Community Engagement

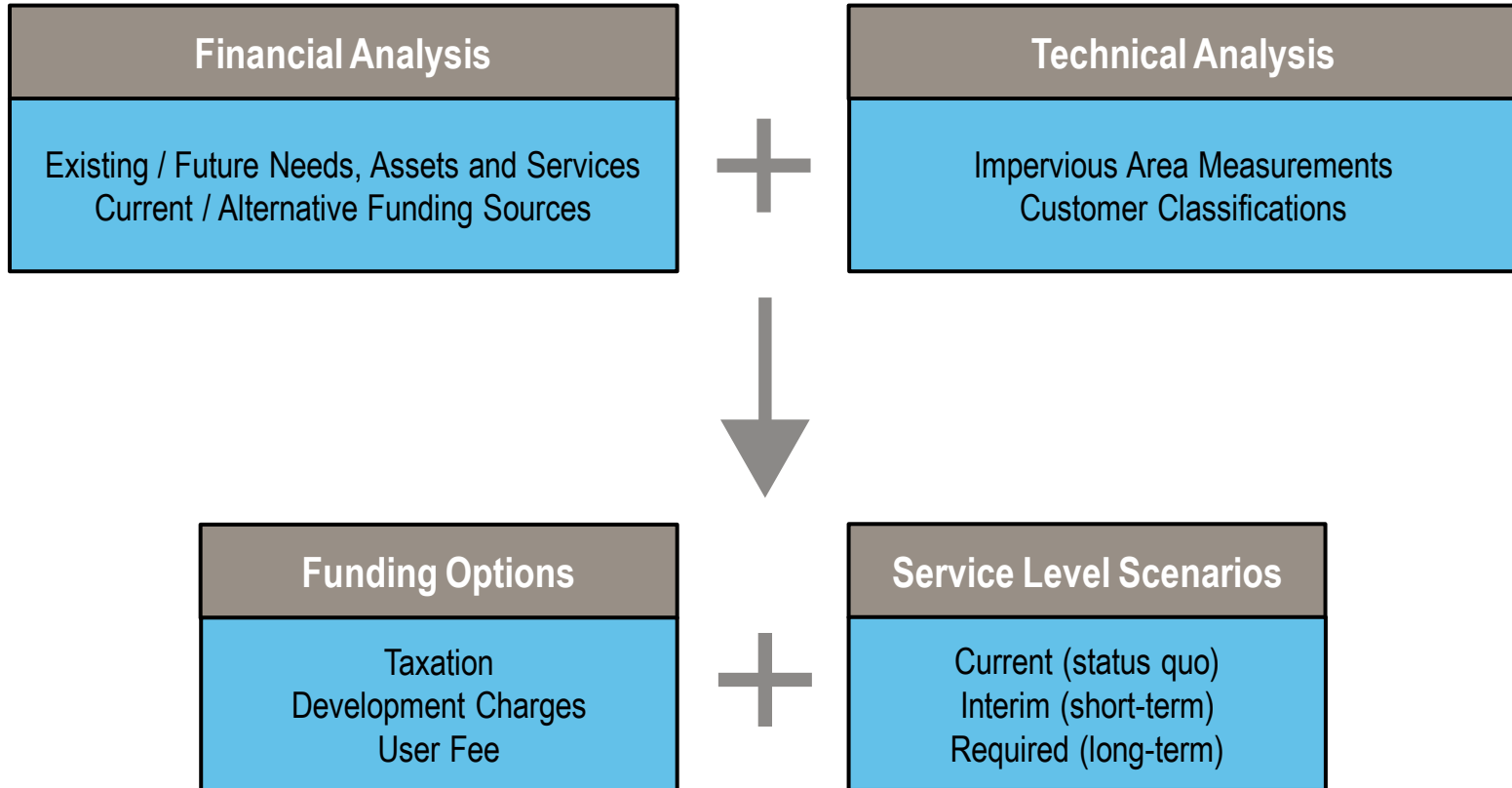
– What We Heard:

- Majority of respondents agree that:
 - Stormwater management should be a priority
 - Stormwater funding should be stable, sustainable, and dedicated to addressing stormwater needs
 - The City should maintain appropriate reserve funding levels for unforeseen events
 - Costs and benefits must be equitably distributed across the community (i.e. everyone pays their fair share)
 - Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system
 - This Stormwater Financing Study recommendations must be publicly supported

Financial and Technical Analyses



Work Process





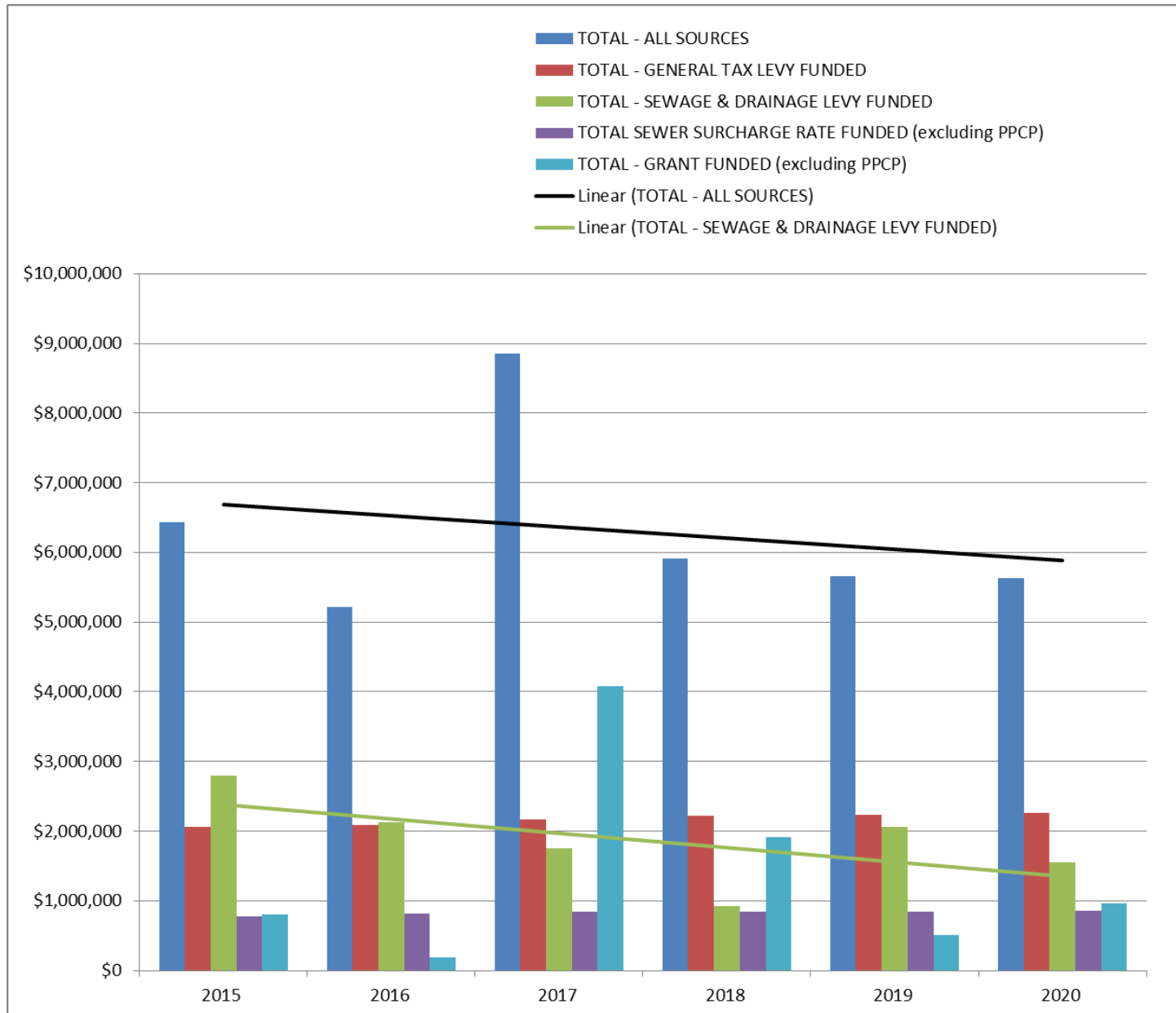
THE Big Equation

$$\textit{Charge} = \frac{\text{“cost of program” (NUMERATOR)}}{\text{“customer allocation” (DENOMINATOR)}}$$

Financial Analysis

$$\textit{Charge} = \frac{\text{“cost of program” (NUMERATOR)}}{\text{“customer allocation” (DENOMINATOR)}}$$

Current Stormwater Funding



Current Stormwater Program Funding Sources

General Tax Levy

O+M (Roads Division)
Capital (Trunk Ditching + stand-alone
large culvert replacements)
Lakehead Region Conservation
Authority

Sewage + Drainage Tax Levy

Capital (all storm
works not under PPCP)

Grants* Capital only

Sewer Surcharge Rate

O+M (Environment Division)
Capital (PPCP only)

- O+M = Operations and Maintenance of existing stormwater infrastructure
- PPCP = Pollution Prevention Control Program (sanitary / storm separation)
- Capital = installation of new and replacement of existing



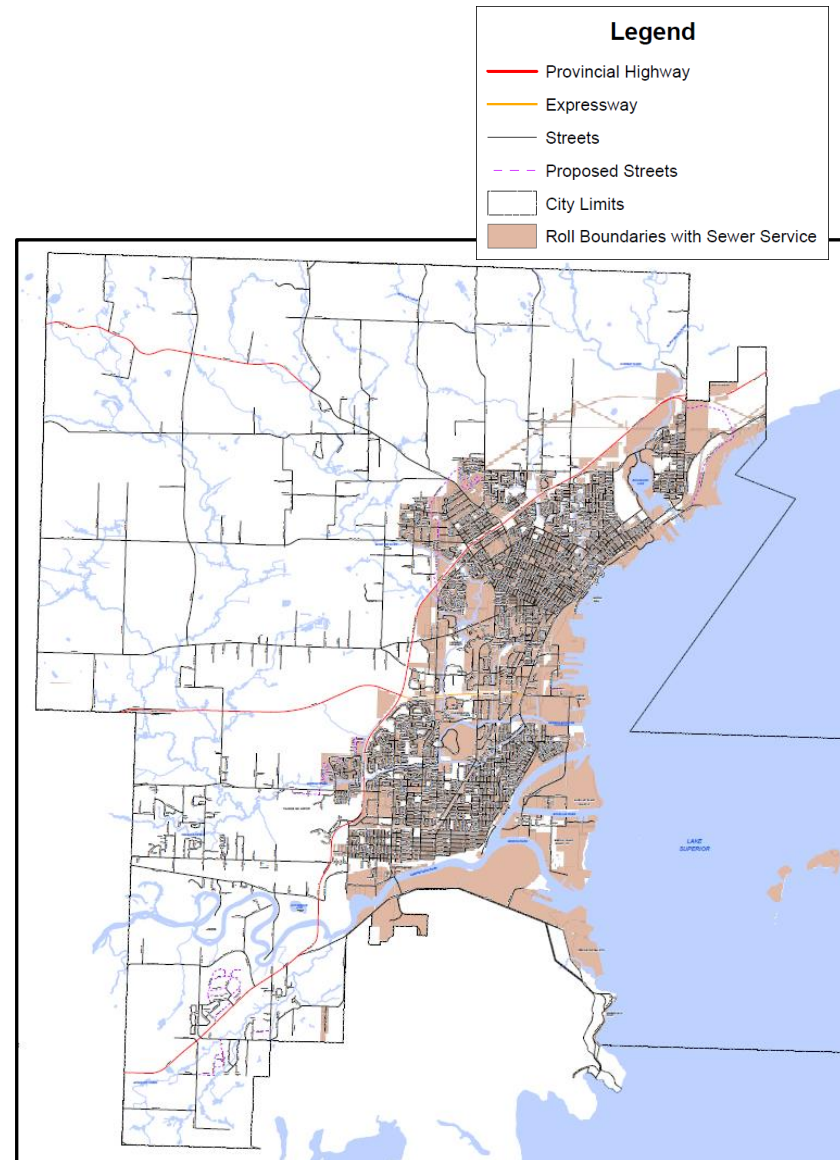
Current Service Levels

– Rural properties

- Stormwater is managed by roadside ditches and culverts
- Municipal tax payments include General + Solid Waste

– Urban properties

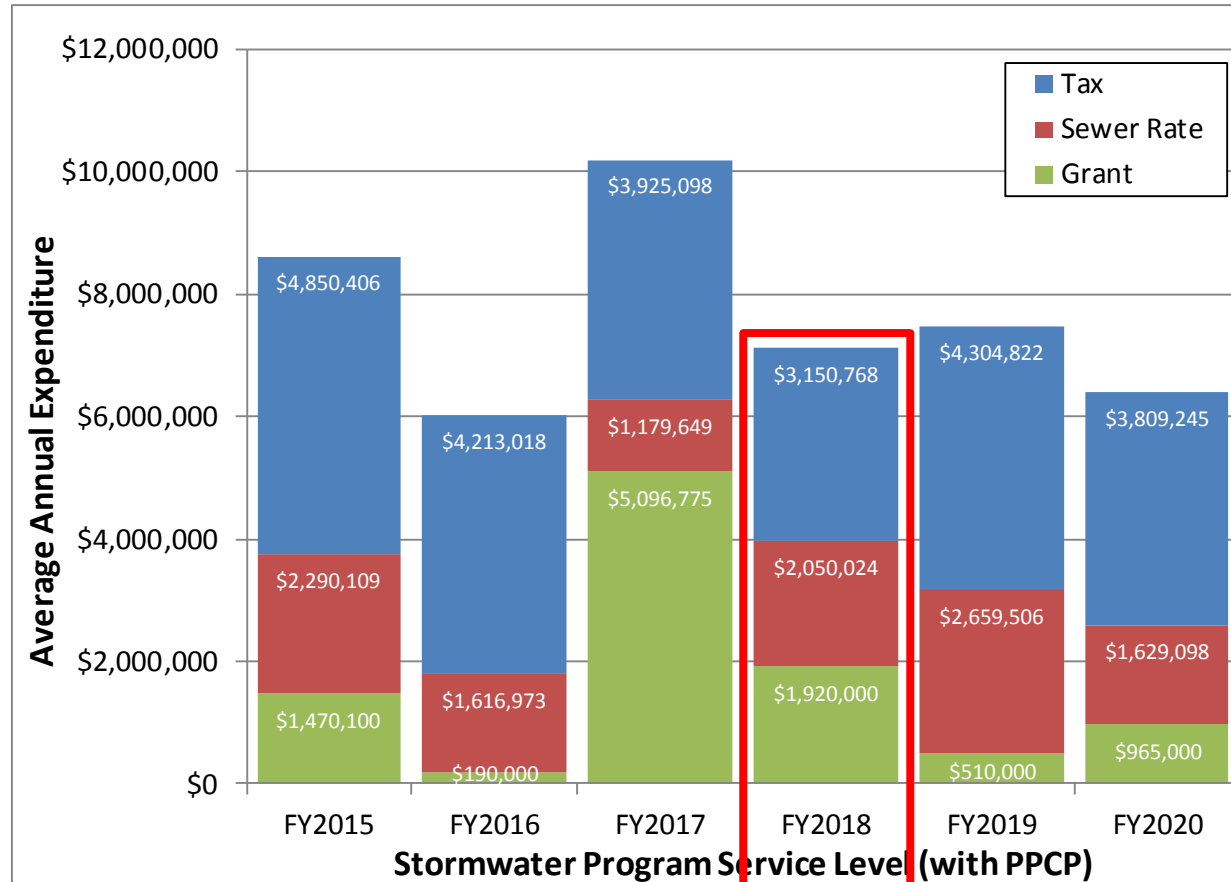
- Stormwater is managed by roadway curb/gutter, catchbasin inlets, and pipes
- Municipal tax payments include General + Solid Waste + **Sewage & Drainage** + Public Transportation + Street Lighting





Stormwater Program Annual Expenditures (by Source)

- Includes storm sewer separation (funded by sewer surcharge rate)
- Tax = general tax levy + Sewage & Drainage levy

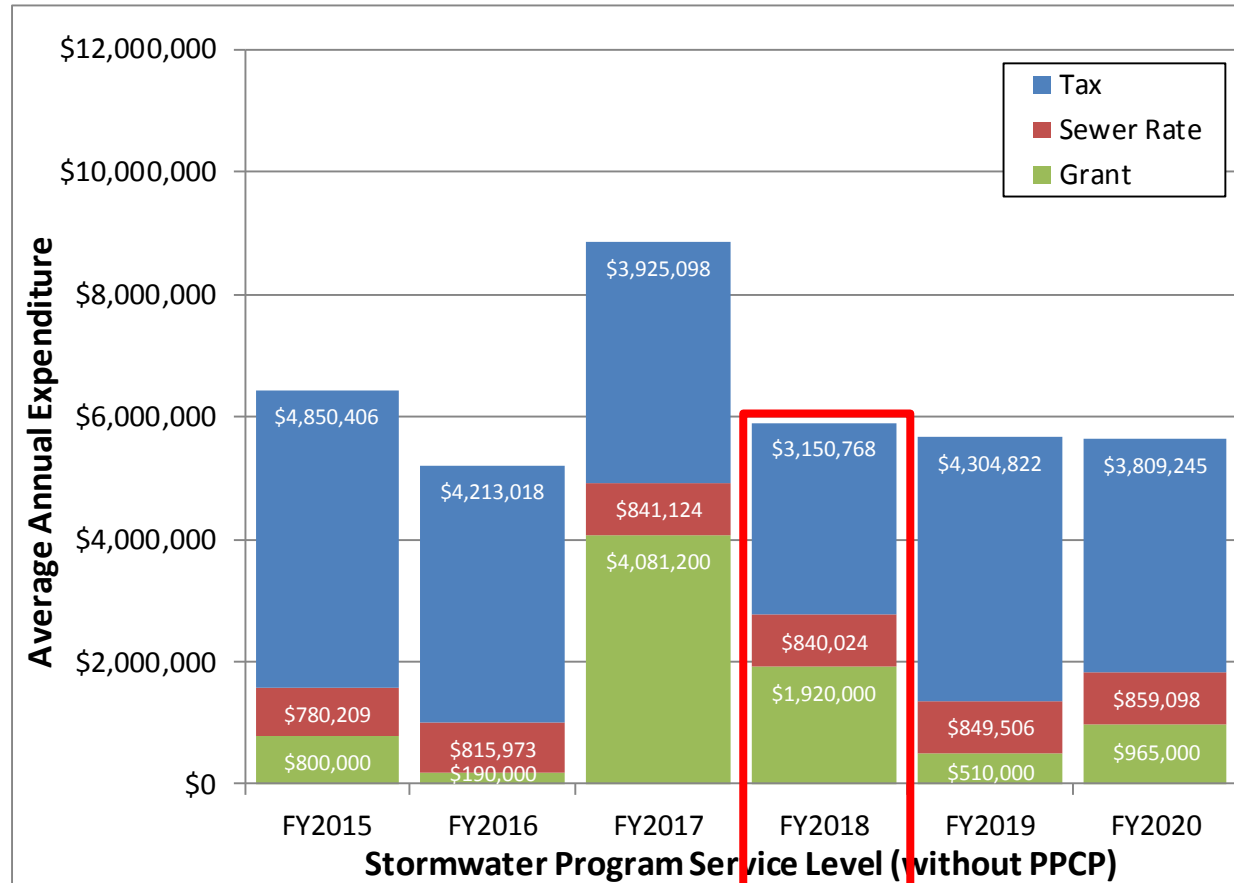


Funding Source (with PPCP)	Annual Expenditure					
	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Tax	\$4,850,406	\$4,213,018	\$3,925,098	\$3,150,768	\$4,304,822	\$3,809,245
Sewer Rate	\$2,290,109	\$1,616,973	\$1,179,649	\$2,050,024	\$2,659,506	\$1,629,098
Grant	\$1,470,100	\$190,000	\$5,096,775	\$1,920,000	\$510,000	\$965,000
TOTAL	\$8,610,615	\$6,019,991	\$10,201,522	\$7,120,792	\$7,474,328	\$6,403,342



Stormwater Program Annual Expenditures (by Source)

– Excludes storm sewer separation (\$1.21M in 2018)



Funding Source (without PPCP)	Annual Expenditure					
	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Tax	\$4,850,406	\$4,213,018	\$3,925,098	\$3,150,768	\$4,304,822	\$3,809,245
Sewer Rate	\$780,209	\$815,973	\$841,124	\$840,024	\$849,506	\$859,098
Grant	\$800,000	\$190,000	\$4,081,200	\$1,920,000	\$510,000	\$965,000
TOTAL	\$6,430,615	\$5,218,991	\$8,847,422	\$5,910,792	\$5,664,328	\$5,633,342



Current Stormwater Program Expenditures

– Annual stormwater program costs (FY2018 budget): \$8.98M

- Tax funded portion: \$4.01M
- Rate funded portion: \$3.05M
- Grant funded portion: \$1.92M

Last Meeting

– Annual stormwater program costs (FY2018 budget): \$5.91M

- Tax funded portion: \$3.15M
- Rate funded portion: \$0.84M
- Grant funded portion: \$1.92M

This Meeting



Current vs Future Program Expenditures

Stormwater Management Program Item	Current Funding Source	Annual Expenditure	
		Tax Funded	All Sources
Operations & Maintenance			
Street Cleaning	Tax	\$300,000	\$300,000
Drainage & Flood Control	Tax	\$690,000	\$690,000
Catchbasins	Sewer Rate	\$0	\$440,000
Pump Stations	Sewer Rate	\$0	\$40,000
Storm Sewers	Sewer Rate	\$0	\$360,000
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$990,000	\$1,830,000

Capital Improvements			
Storm Sewer Separation	Sewer Rate + Grant	\$0	\$1,210,000
Stormwater Mgmt. Projects	Tax + Grant	\$1,060,000	\$2,980,000
Bridges & Culverts	Tax	\$100,000	\$100,000
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,160,000	\$4,290,000

Other			
Lakehead Region CA Levy	Tax	\$1,000,000	\$1,000,000
Subtotal		\$1,000,000	\$1,000,000
TOTAL		\$3,150,000	\$7,120,000

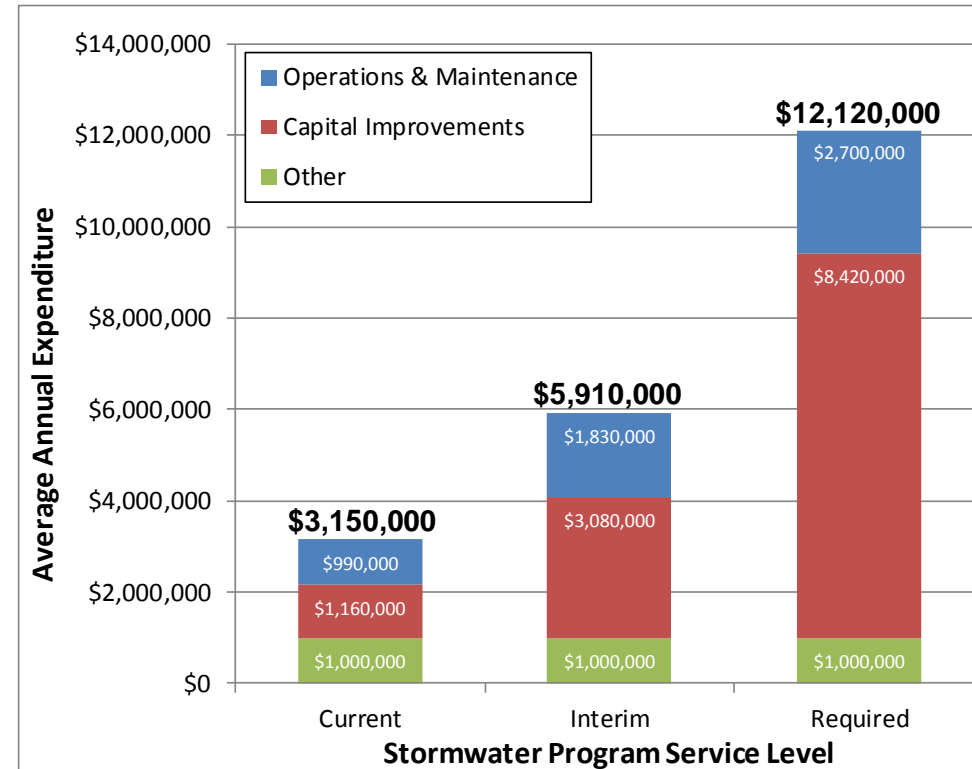
Stormwater Management Program Item	Annual Expenditure		
	Current	Interim	Required
Operations & Maintenance			
Street Cleaning	\$300,000	\$300,000	
Drainage & Flood Control	\$690,000	\$690,000	
Catchbasins	\$0	\$440,000	
Pump Stations	\$0	\$40,000	
Storm Sewers	\$0	\$360,000	
2016 SMP (20-year average)	n/a	n/a	\$2,700,000
Subtotal	\$990,000	\$1,830,000	\$2,700,000

Capital Improvements			
Storm Sewer Separation	\$0	\$0	
Stormwater Mgmt. Projects	\$1,060,000	\$2,980,000	
Bridges & Culverts	\$100,000	\$100,000	
2016 SMP (20-year average)	n/a	n/a	\$8,420,000
Subtotal	\$1,160,000	\$3,080,000	\$8,420,000

Other			
Lakehead Region CA Levy	\$1,000,000	\$1,000,000	\$1,000,000
Subtotal	\$1,000,000	\$1,000,000	\$1,000,000
TOTAL	\$3,150,000	\$5,910,000	\$12,120,000

Service Level Scenarios

- Current: Tax-funded portion from FY2018 budget
- Interim: Total amount (all sources) from FY2018 budget
- Required: Identified in the 2016 SMP (in \$2018)



Stormwater Service Level (annual cost)	Land Area (ha)	Population	Households
	per hectare	per capita	per house
Current: \$3,150,000	32,836	107,909	47,182
Interim: \$5,910,000	\$96	\$29	\$67
Required: \$12,120,000	\$180	\$55	\$125
	\$369	\$112	\$257

Technical Analysis

$$\text{Charge} = \frac{\text{"cost of program"} (NUMERATOR)}{\text{"customer allocation"} (DENOMINATOR)}$$

Approach

- Property types were used to identify 14 stormwater “customer” classifications
- Database developed for ±45,000 properties from MPAC, City data, and other information
- Impervious area measured using aerial photos and other data sources for ±1,000 residential properties and statistics developed to determine the average impervious area per dwelling unit, etc.
- Impervious area estimated (cumulatively) for ±8,000 non-residential properties

Property Type	Classification
Single Unit Residential	Detached
	Semi-Detached
Multi-Unit Residential	Duplex
	Triplex
	4-Plex
	5-Plex
	6-Plex
	7+ Unit Apartments
	Condominium
	Townhouse
	Mobile Home Park
Non-Residential	Industrial/Comm/Institutional
	Miscellaneous/Mixed Use
	Undeveloped

Parcel Type	Number of Properties	Dwelling Units
Detached	412	412
Semi-Detached	102	102
Duplex	150	300
Triplex	100	300
4-Plex	76	304
5-Plex	30	150
6-Plex	32	192
7+ Unit Apartments	24	399
Condominium	12	586
Townhouse	26	26
Mobile Home Park	3	218
Total	967	2,989



THUNDER BAY
STORMWATER FINANCING STUDY



Class: Residential Detached
Total Impervious Area: 313.2 m²
Address_code: URB
MPAC Prop. Code: 301
Description: Single-family detached home (not on water)



THUNDER BAY
STORMWATER FINANCING STUDY



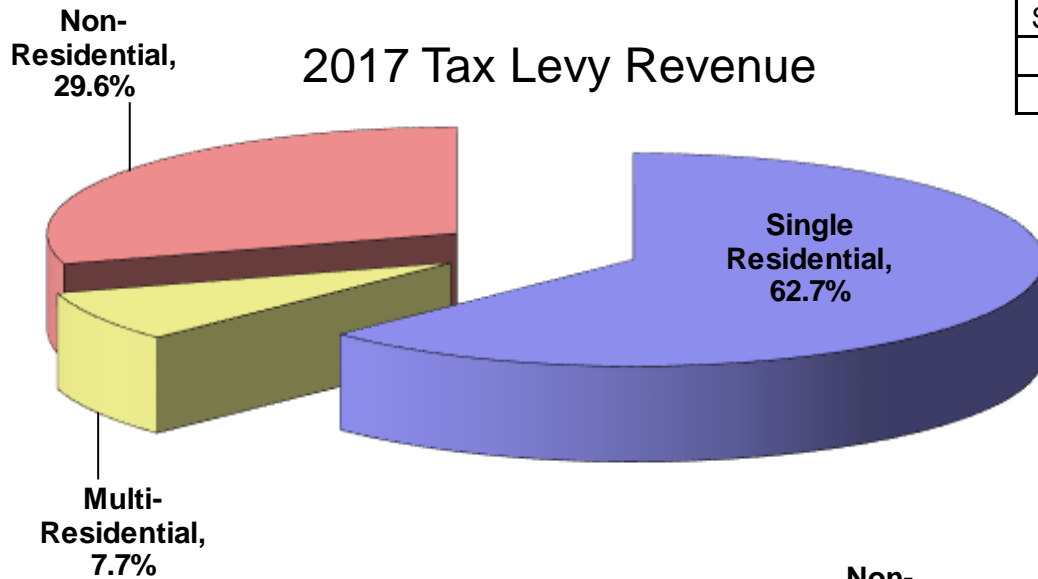
Class: Non-residential
Total Impervious Area: 1,535.4 m²
Address_code: URB
MPAC Prop. Code: 400
Description: Small Office building



Parcel Analysis Results

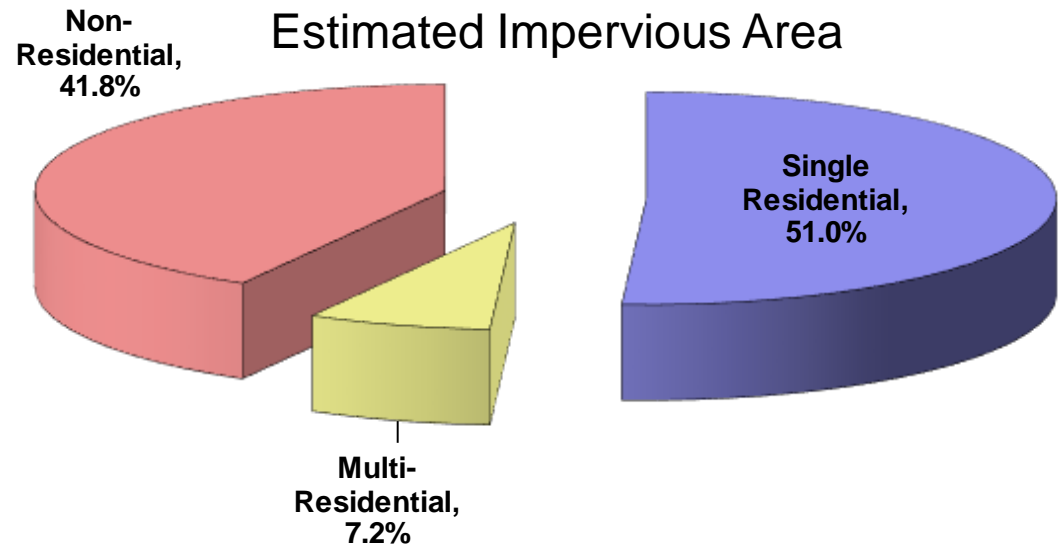
Parcel Type	Number of Parcels		Dwelling Units (d.u.)		Estimated Impervious Area (m ²)		
	Count	%	Count	%	Total	%	Avg/d.u.
Single-Family Detached	33,306	73.5%	33,306	70.2%	10,075,100	49.8%	302.5
Semi-Detached	1,401	3.1%	1,401	3.0%	241,000	1.2%	172.0
Duplex	927	2.0%	1,854	3.9%	258,100	1.3%	139.2
Triplex	347	0.8%	1,041	2.2%	93,300	0.5%	89.6
4-Plex	197	0.4%	788	1.7%	76,800	0.4%	97.5
5-Plex	54	0.1%	270	0.6%	21,000	0.1%	77.7
6-Plex	95	0.2%	570	1.2%	67,800	0.3%	118.9
7+ Unit Apartments	265	0.6%	5,811	12.3%	702,500	3.5%	120.9
Condominium	46	0.1%	1,828	3.9%	134,700	0.7%	73.7
Townhouse	330	0.7%	330	0.7%	45,200	0.2%	137.1
Mobile Home Park	4	0.0%	218	0.5%	64,700	0.3%	296.8
Residential Subtotal	36,972	81.6%	47,417	100.0%	11,780,200	58.2%	248.4
Industrial/Comm/Institutional	4,258	9.4%	n/a		8,460,000	n/a	
Miscellaneous/Mixed Use	479	1.1%			included in		
Undeveloped	3,604	8.0%			total above		
Non-Residential Subtotal	8,341	18.4%			8,460,000	41.8%	
Total	45,313	100.0%			20,240,200	100.0%	

Tax Levy and Impervious Area Comparison



Property Type	Tax Levy Contribution	Impervious Area	Difference
Single-Unit Residential	62.7%	51.0%	-11.7%
Multi-Unit Residential	7.7%	7.2%	-0.5%
Non-Residential	29.6%	41.8%	12.2%
	100.0%	100.0%	0.0%

The allocation of tax funds does not accurately reflect contributions of runoff to the system



Available Funding Options

Taxation
Development Charges
User Fee



Taxes vs. Fees

– Property tax

- Levy on a property for general services
- Payable by property owner

– User fee

- Levy on a person that benefits from a specific service
- Payable by property owner, tenant, or property manager

Item	Property Tax	User Fee
Purpose	Raise revenue for general functions, activities, and services	Defray costs of specific functions, activities, and services
Allocation	Council discretion	Proportionate to service costs
Payment Obligation	Compulsory for all taxable properties	Compulsory for service users



Development/Growth Related Funding

	Pros	Cons
Dev't Related Funding	<ul style="list-style-type: none">• Accepted by development community• Based on contributing area, more equitable than property value	<ul style="list-style-type: none">• Limited by developable land within municipality (i.e., not applicable throughout municipality)• Directly dependent on growth and growth rates (i.e., if growth rate declines, so does the revenue collected)• Development charges are generally limited to the capital costs associated with the development

Comparison of Funding Options

Funding Method	City Wide Applicability	Used for Capital Costs	Used for O&M Costs	Used for Eng'rg/ Support Costs	Fair & Equitable Allocation	Dedicated Funding Source	Effort To Administrate	Environmental Benefits
Property Tax	Yes	Yes	Yes	Yes	No	No	Low	Low
Development Charges	No	New Capital	No	Partly	Partly	Yes	Medium	Medium
User Fee (Flat Fee)	Yes	Yes	Yes	Yes	No	Yes	Medium	High
User Fee (Variable Rate)	Yes	Yes	Yes	Yes	Yes	Yes	High	High

- And note that blended revenue options are feasible (though not recommended)

Funding Option - Taxes

1-Tax

Tax Funding Options

– Reallocate more tax funds towards stormwater

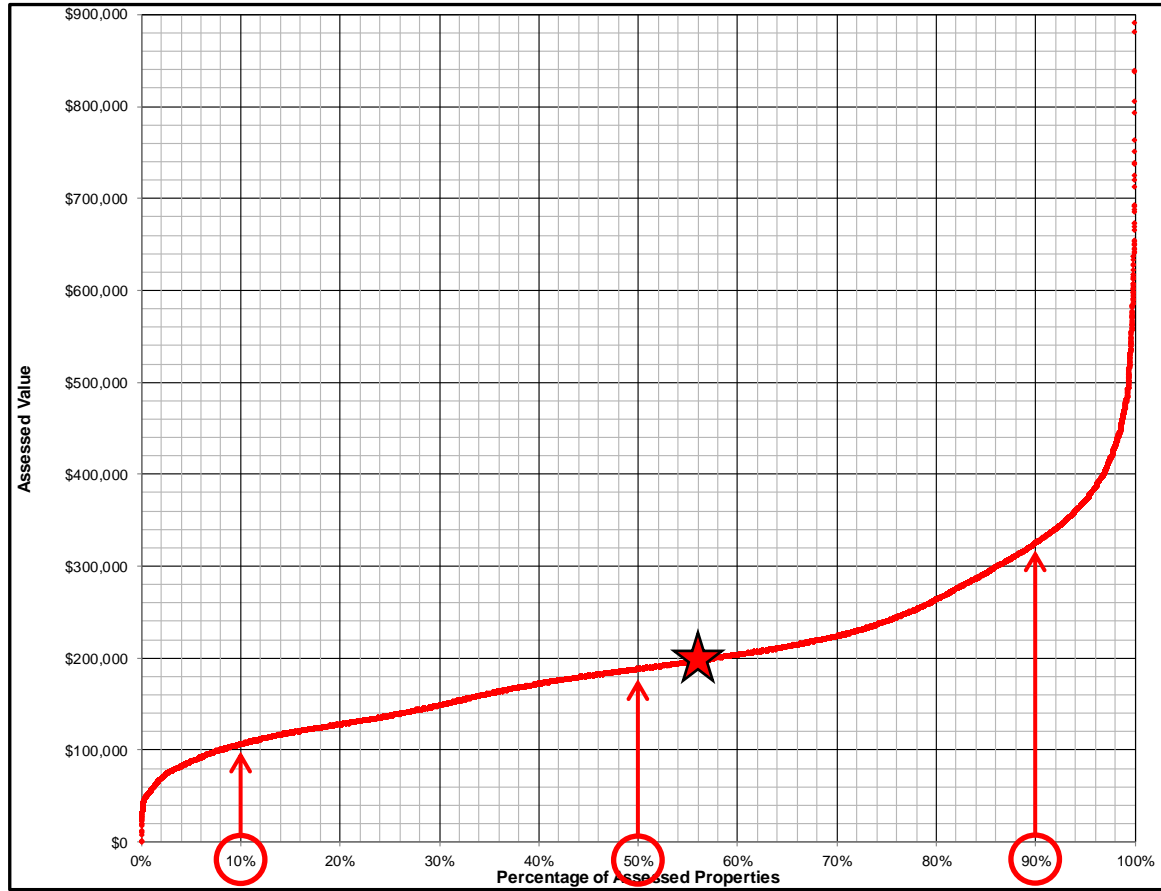
or

– Raise taxes to meet additional stormwater needs

2017 Tax Revenue \$182,496,000	Stormwater Program Service Level		
	Current	Interim	Required
Program Cost	\$3,150,000	\$5,910,000	\$12,120,000
Tax Levy Allocation	1.73%	3.24%	6.64%
Tax Increase Required	0.00%	1.53%	4.98%

Assessed Values – Detached Homes in Thunder Bay

All Single-Family Detached Homes (MPAC code 301)		
Percentiles (2017 Active CVA)	Other Statistics	
\$106,250	10%	32,671 count
\$127,750	20%	\$0 min
\$148,250	30%	\$1,192,250 max
\$171,750	40%	\$201,256 average ★
\$188,000	50%	\$188,000 median
\$203,500	60%	
\$223,750	70%	
\$263,500	80%	
\$324,750	90%	
\$371,000	95%	
\$470,320	99%	



Note: 2 properties with CVA > \$900,000 not shown

Annual Tax Payments by Property Assessed Value

City - Urban boundary (General, Solid Waste, Public Transportation, Drainage, and Street Lighting)

Property Class (Tax Code)	Total 2017 City Tax Rate	Assessed Value	City Tax Payment	Stormwater Allocation
Industrial (IT)	3.6882%	per \$100,000	\$3,688	\$63.8
Multi-Residential (MT)	3.7453%	per \$100,000	\$3,745	\$64.8
Commercial (CT)	3.1785%	per \$100,000	\$3,179	\$55.0
Residential (RT)	1.5051%	per \$100,000	\$1,505	\$26.0
		\$150,000	\$2,258	\$39.1
		\$200,000	\$3,010	\$52.1
		\$250,000	\$3,763	\$65.1
		\$300,000	\$4,515	\$78.1
		\$350,000	\$5,268	\$91.1
		\$400,000	\$6,021	\$104.2
		\$450,000	\$6,773	\$117.2
		\$500,000	\$7,526	\$130.2

The average detached home (\$201,250 assessed value) contributed \$52.40 from the general tax levy towards the City's stormwater program

City - Rural boundary (partial services: General and Solid Waste)

Property Class (Tax Code)	Total 2017 City Tax Rate	Assessed Value	City Tax Payment	Stormwater Allocation
Industrial (IT)	3.3472%	per \$100,000	\$3,347	\$57.9
Multi-Residential (MT)	3.3936%	per \$100,000	\$3,394	\$58.7
Commercial (CT)	2.8846%	per \$100,000	\$2,885	\$49.9
Residential (RT)	1.3681%	per \$100,000	\$1,368	\$23.7
		\$150,000	\$2,052	\$35.5
		\$200,000	\$2,736	\$47.3
		\$250,000	\$3,420	\$59.2
		\$300,000	\$4,104	\$71.0
		\$350,000	\$4,788	\$82.8
		\$400,000	\$5,472	\$94.7
		\$450,000	\$6,156	\$106.5
		\$500,000	\$6,840	\$118.3

Example – Single-Family Detached Home

Example: Detached home (with average assessed value = \$201,250)
Lot Size: 810 m² (with average impervious area = 303 m²)
Number of Dwelling Units: 1



Tax Contribution to City Stormwater Program

- Current: \$201,250 at 1.505% tax rate × 1.73% municipal tax levy = \$52.4/yr
- Interim: \$201,250 at 1.505% tax rate × 3.24% municipal tax levy = \$98.1/yr
- Required: \$201,250 at 1.505% tax rate × 6.64% municipal tax levy = \$201.1/yr

Tax Funding Option – Comparison Based on Statistics

Tax-Funded Program Expenditures	2017 Stormwater Management Program			Future Stormwater Management Program (Service Levels)						
	Current	Interim		Required						
Program Cost	\$4,360,000 (incl. PPCP)			\$3,150,000	\$5,910,000		\$12,120,000			
Municipal Tax Levy Allocation	1.73%			1.73%	3.24%		6.64%			
Representative Property	Taxation	Other ⁴	Total	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Single Unit Residential										
Detached (average)	\$52	\$15	\$67	\$52	\$98	\$46	87%	\$201	\$149	284%
Semi-Detached (average)	\$31	\$15	\$46	\$31	\$59	\$27	87%	\$120	\$89	284%
Multi-Unit Residential										
Duplex (average)	\$47	\$15	\$62	\$47	\$87	\$41	87%	\$179	\$132	284%
Triplex (average)	\$42	\$23	\$65	\$42	\$79	\$37	87%	\$161	\$119	284%
4-Plex (average)	\$60	\$30	\$90	\$60	\$112	\$52	87%	\$230	\$170	284%
5-Plex (average)	\$53	\$38	\$91	\$53	\$98	\$46	87%	\$202	\$149	284%
6-Plex (average)	\$84	\$45	\$129	\$84	\$157	\$73	87%	\$322	\$238	284%
7+ Unit Apartments (average)	\$990	\$164	\$1,154	\$990	\$1,854	\$864	87%	\$3,799	\$2,810	284%
Condominium (average)	\$49	\$15	\$64	\$49	\$92	\$43	87%	\$188	\$139	284%
Townhouse (average)	\$25	\$15	\$40	\$25	\$46	\$21	87%	\$94	\$70	284%
Non-Residential										
Farm (average)	\$10	\$0	\$10	\$10	\$19	\$9	87%	\$39	\$29	284%
Commercial (average)	\$210	\$300	\$510	\$210	\$394	\$183	87%	\$807	\$597	284%
Industrial (average)	\$258	\$300	\$558	\$258	\$483	\$225	87%	\$990	\$732	284%
Special/Exempt (average)	\$0	\$300	\$300	\$0	\$0	\$0	n/a	\$0	\$0	n/a

Tax Funding Option – Comparison of Actual Properties

Tax-Funded Program Expenditures	2017 Stormwater Management Program			Future Stormwater Management Program (Service Levels)						
	Current	Interim		Required						
Program Cost	\$4,360,000 (incl. PPCP)			\$3,150,000	\$5,910,000			\$12,120,000		
Municipal Tax Levy Allocation	1.73%			1.73%	3.24%			6.64%		
Representative Property	Taxation	Other ⁴	Total	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Example Non-Residential Properties										
Shopping centre (Fort William Road)	\$52,708	\$1,327	\$54,035	\$52,708	\$98,714	\$46,005	87%	\$202,302	\$149,594	284%
Shopping centre (River Street)	\$4,426	\$490	\$4,916	\$4,426	\$8,289	\$3,863	87%	\$16,988	\$12,562	284%
Retail complex 1 (Memorial Avenue)	\$2,797	\$63	\$2,859	\$2,797	\$5,237	\$2,441	87%	\$10,734	\$7,937	284%
Retirement home (Arundel Street)	\$2,956	\$398	\$3,354	\$2,956	\$5,537	\$2,580	87%	\$11,347	\$8,391	284%
Retail complex 2 (Memorial Avenue)	\$2,391	\$299	\$2,690	\$2,391	\$4,477	\$2,087	87%	\$9,175	\$6,785	284%
Restaurant (Highway 61)	\$225	\$0	\$225	\$225	\$422	\$197	87%	\$865	\$639	284%
Retail (Memorial Avenue)	\$942	\$40	\$982	\$942	\$1,765	\$823	87%	\$3,617	\$2,675	284%
Athletic club (Egan Street)	\$159	\$132	\$292	\$159	\$299	\$139	87%	\$612	\$452	284%
Medical office (Barton Street)	\$550	\$75	\$625	\$550	\$1,029	\$480	87%	\$2,109	\$1,560	284%
Commercial (Arthur Street)	\$885	\$60	\$945	\$885	\$1,658	\$773	87%	\$3,397	\$2,512	284%
Law office (Alloy Drive)	\$709	\$137	\$846	\$709	\$1,328	\$619	87%	\$2,721	\$2,012	284%
Commercial (Cumberland Street)	\$556	\$75	\$631	\$556	\$1,041	\$485	87%	\$2,134	\$1,578	284%
Retail (Cumberland Street)	\$155	\$31	\$185	\$155	\$290	\$135	87%	\$594	\$439	284%
Medical office (Archibald Street)	\$74	\$16	\$90	\$74	\$139	\$65	87%	\$286	\$211	284%
Dentistry office (Edward Street)	\$61	\$32	\$92	\$61	\$114	\$53	87%	\$234	\$173	284%
Industrial (waterfront)	\$892	\$107	\$999	\$892	\$1,670	\$778	87%	\$3,423	\$2,531	284%
Warehouse (Lithium Drive)	\$2,154	\$91	\$2,245	\$2,154	\$4,034	\$1,880	87%	\$8,266	\$6,113	284%
Warehouse (Rosslyn Road)	\$612	\$0	\$612	\$612	\$1,146	\$534	87%	\$2,349	\$1,737	284%
Industrial (Bare Point Road)	\$224	\$0	\$224	\$224	\$419	\$195	87%	\$859	\$635	284%
Industrial mall (Gorham Street)	\$179	\$39	\$218	\$179	\$335	\$156	87%	\$687	\$508	284%
College (Nakina Drive)	\$1,333	\$2,153	\$3,486	\$1,333	\$2,497	\$1,164	87%	\$5,118	\$3,785	284%
Non-profit office (Amelia Street)	\$66	\$12	\$78	\$66	\$124	\$58	87%	\$255	\$188	284%
Non-profit office (Algoma Street)	\$104	\$13	\$117	\$104	\$195	\$91	87%	\$399	\$295	284%
Place of worship (Sprague Street)	\$1	\$34	\$36	\$1	\$3	\$1	87%	\$6	\$4	284%
Public school (High Street)	\$11	\$245	\$255	\$11	\$20	\$9	87%	\$40	\$30	284%
Public school (Sherbrooke Street)	\$4	\$99	\$103	\$4	\$8	\$4	87%	\$16	\$12	284%

Funding Option – User Fees

2-ERU

3-SFU

4-TSFU

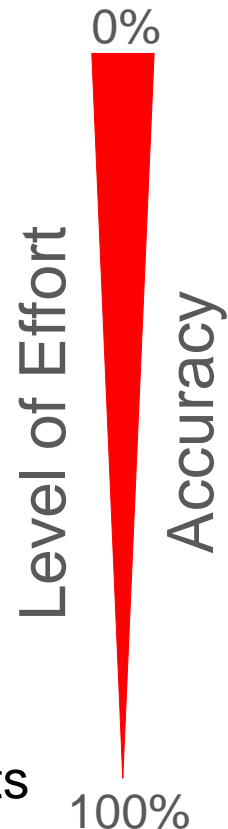
Common Stormwater Rate Methodologies

– Flat Rate

- Flat fee
- Tiered based on zoning

– Variable Rate

- Varies by lot size, development intensity, etc.
- Equivalent Residential Unit (ERU) 2-ERU
- Single Family Unit (SFU) 3-SFU
- Tiered Single Family Unit (Tiered SFU) 4-TSFU
- Tiered based on service level, geography, etc.
- Individual fee for all properties based on annual measurements



Stormwater User Fee Administrative Costs

– Billing costs

- Estimated ±\$100,000 per year
- Likely on the City’s water/sewer bill

– Labor costs

- Vary by service level & user fee type
- Typically ½ to 1½ FTE (with both technical / financial job functions)

– Total is typically ±5% of total program cost

Option	Current	Interim	Required
Tax	n/a	n/a	n/a
ERU	\$180,000 5.7%	\$220,000 3.7%	\$250,000 2.1%
SFU	\$220,000 7.0%	\$260,000 4.4%	\$310,000 2.6%
Tiered SFU	\$240,000 7.6%	\$290,000 4.9%	\$340,000 2.8%



Total Program Costs			
Option	Current	Interim	Required
Tax	\$3,150,000	\$5,910,000	\$12,120,000
ERU	\$3,330,000	\$6,130,000	\$12,370,000
SFU	\$3,370,000	\$6,170,000	\$12,430,000
Tiered SFU	\$3,390,000	\$6,200,000	\$12,460,000

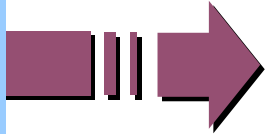
Stormwater Rate Calculation

– ERU = Equivalent Residential Unit

$$\text{Charge} = \frac{\$ \text{Expense}}{\text{Billing Units}} = \$ / \text{Month} / \text{Unit}$$
$$\text{Billing Units (ERU)} = \text{Dwelling Unit Count} + \frac{\text{Non-Residential Impervious Area}}{\text{m}^2 / \text{ERU}}$$

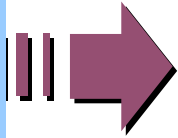
Equivalent Residential Unit (ERU)

- Single Family
- Multi-Family
- Condominiums
- Townhouses



= Base Rate (1 billing unit per residential dwelling unit)

- Governmental
- Commercial
- Institutional
- Industrial



$$\frac{\text{Parcel Impervious Area}}{\text{ERU Base Area}^*} = \text{No. of Billing Units}$$

*Typical size range in Canada = 160-240 m² (1,700-2,600 ft²)

Single-Family Detached Home



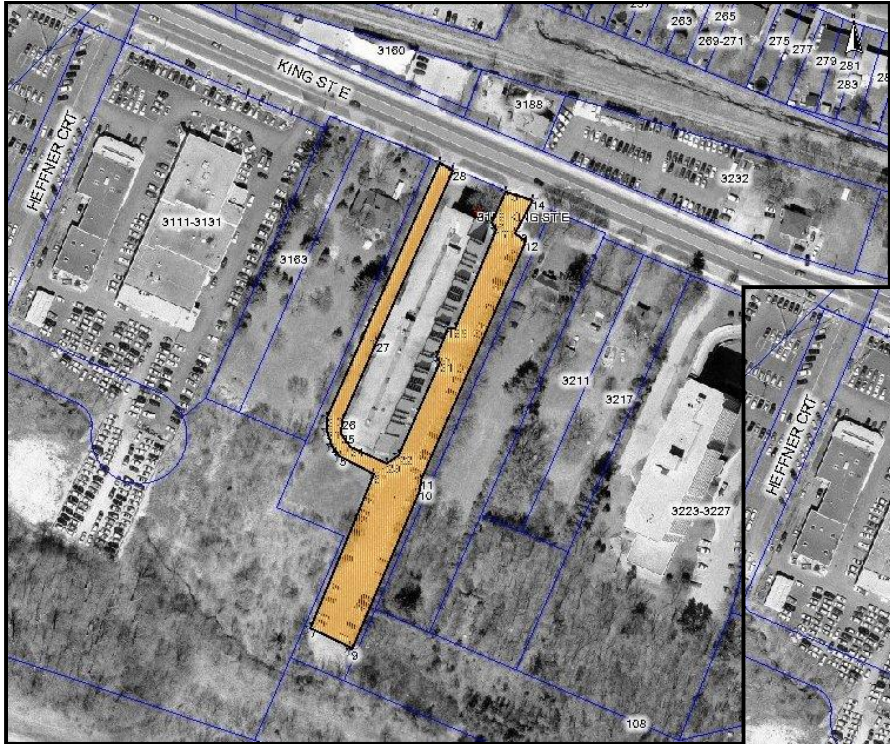
Building impervious area =
137 m²



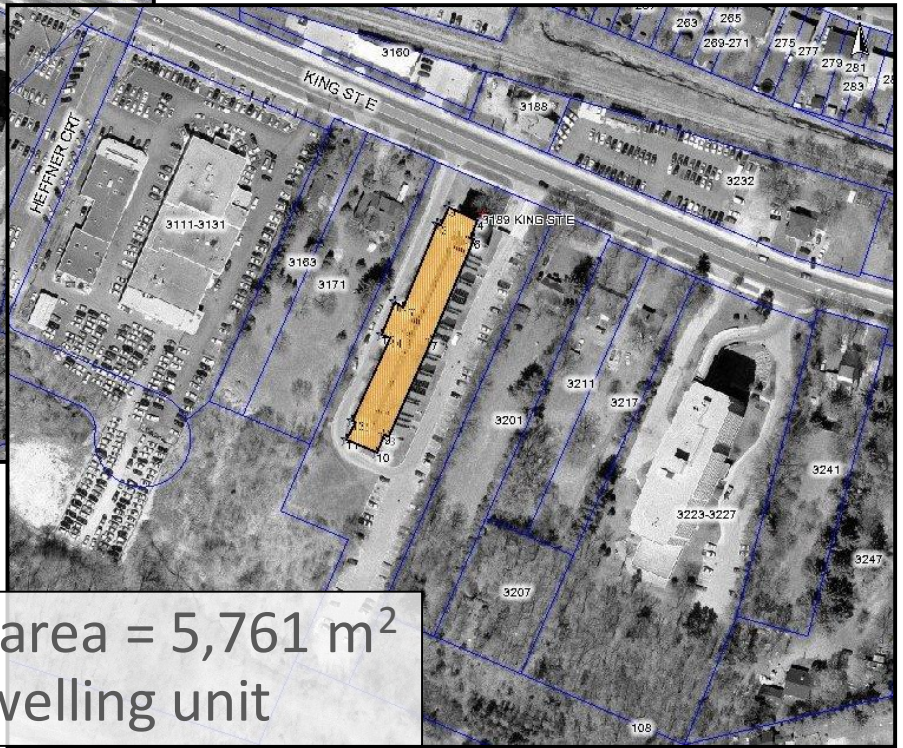
Paved impervious area =
60 m²

Total impervious area = 197 m²

Multi-Family Residential Property



Building impervious area =
1,736 m²



Paved impervious area = 4,025 m²

Total impervious area = 5,761 m²
= 230 m²/dwelling unit

Non-Residential Property

Using ERU base area = 178 m²

Building impervious area =
1,183 m²



Paved impervious area = 689 m²

Total impervious area = 1,872 m²
= 10.5 ERUs



Summary of Example Property Charges

- ERU base area = 178 m²
- Base rate = \$4.40/ERU/month

Property Classification	Impervious Area (m ²)	Dwelling Units	Projected Base Charge	
			ERU	\$ per Month
Single Family	197	1	1.0	\$4.4
Multiple Family	5,761	25	25.0	\$110.0
Non-Residential Property	1,872	n/a	10.5	\$46.3

ERU Analysis

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		ERU Factor	ERU Distribution	
			Total	Avg/d.u.		Count	%
Single-Family Detached	33,306	33,306	10,075,100	302.5	1.00	33,306	40.9%
Semi-Detached	1,401	1,401	241,000	172.0	1.00	1,401	1.7%
Duplex	927	1,854	258,100	139.2	1.00	1,854	2.3%
Triplex	347	1,041	93,300	89.6	1.00	1,041	1.3%
4-Plex	197	788	76,800	97.5	1.00	788	1.0%
5-Plex	54	270	21,000	77.7	1.00	270	0.3%
6-Plex	95	570	67,800	118.9	1.00	570	0.7%
7+ Unit Apartments	265	5,811	702,500	120.9	1.00	5,811	7.1%
Condominium	46	1,828	134,700	73.7	1.00	1,828	2.2%
Townhouse	330	330	45,200	137.1	1.00	330	0.4%
Mobile Home Park	4	218	64,700	296.8	1.00	218	0.3%
Residential Subtotal	36,972	47,417	11,780,200	248.4		47,417	58.2%
Industrial/Comm/Institutional	4,258	n/a	8,460,000	n/a	n/a	34,058	41.8%
Miscellaneous/Mixed Use	479		included in total above			included in total above	
Undeveloped	3,604						
Non-Residential Subtotal	8,341		8,460,000			34,058	41.8%
Total	45,313		20,240,200			81,475	100.0%

Equivalent Residential Unit (ERU) = 248.4 sq.m. (2674 sq.ft.)

Example – Single-Family Detached Home

Example: Detached home (with average assessed value = \$201,250)
 Lot Size: 810 m² (with average impervious area = 303 m²)
 Number of Dwelling Units: 1
 Number of ERU Billing Units: 1.0



	Current	Interim	Required
Stormwater Program Cost	\$3,330,000	\$6,130,000	\$12,370,000
Base Rate (\$/ERU/mo)	\$3.90	\$7.20	\$14.50

ERU User Fee Charge

- Current: 1.0 ERUs × \$3.90/ERU/mo = \$46.8/yr
- Interim: 1.0 ERUs × \$7.20/ERU/mo = \$86.4/yr
- Required: 1.0 ERUs × \$14.50/ERU/mo = \$174.0/yr

ERU User Fee Option – Comparison Based on Statistics

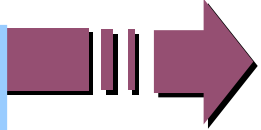
Billing Units (ERU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program							
				Current	Interim			Required			
				Program Cost	\$3,330,000	\$6,130,000			\$12,370,000		
				Base Rate (\$/ERU/mo)	\$3.90	\$7.20			\$14.50		
Representative Property				Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%	
Single Unit Residential											
1.0	1.0	302.5	Detached (average)	\$47	\$86	\$40	85%	\$174	\$127	272%	
1.0	1.0	172.0	Semi-Detached (average)	\$47	\$86	\$40	85%	\$174	\$127	272%	
Multi-Unit Residential											
2.0	2.0	278.4	Duplex (average)	\$94	\$173	\$79	85%	\$348	\$254	272%	
3.0	3.0	268.8	Triplex (average)	\$140	\$259	\$119	85%	\$522	\$382	272%	
4.0	4.0	390.0	4-Plex (average)	\$187	\$346	\$158	85%	\$696	\$509	272%	
5.0	5.0	388.5	5-Plex (average)	\$234	\$432	\$198	85%	\$870	\$636	272%	
6.0	6.0	713.4	6-Plex (average)	\$281	\$518	\$238	85%	\$1,044	\$763	272%	
21.9	21.9	2,651.1	7+ Unit Apartments (average)	\$1,025	\$1,892	\$867	85%	\$3,811	\$2,786	272%	
1.0	1.0	73.7	Condominium (average)	\$47	\$86	\$40	85%	\$174	\$127	272%	
1.0	1.0	137.1	Townhouse (average)	\$47	\$86	\$40	85%	\$174	\$127	272%	
Non-Residential											
7.1	n/a	1,770.0	Farm (average)	\$332	\$613	\$281	85%	\$1,235	\$903	272%	
4.6	n/a	1,140.0	Commercial (average)	\$215	\$397	\$182	85%	\$800	\$585	272%	
12.8	n/a	3,170.0	Industrial (average)	\$599	\$1,106	\$507	85%	\$2,227	\$1,628	272%	
6.9	n/a	1,710.0	Special/Exempt (average)	\$323	\$596	\$273	85%	\$1,201	\$878	272%	

ERU User Fee Option – Comparison of Actual Properties

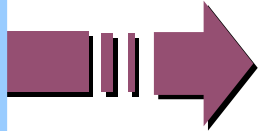
Billing Units (ERU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program								
				Current	Interim			Required				
			Program Cost			\$3,330,000	\$6,130,000			\$12,370,000		
			Base Rate (\$/ERU/mo)			\$3.90	\$7.20			\$14.50		
Representative Property			Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			
Example Non-Residential Properties												
455.3	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,308	\$39,338	\$18,030	85%	\$79,222	\$57,914	272%		
89.3	n/a	22,142.9	Shopping centre (River Street)	\$4,179	\$7,716	\$3,536	85%	\$15,538	\$11,359	272%		
87.2	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,081	\$7,534	\$3,453	85%	\$15,173	\$11,092	272%		
45.3	n/a	11,240.1	Retirement home (Arundel Street)	\$2,120	\$3,914	\$1,794	85%	\$7,882	\$5,762	272%		
34.2	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,601	\$2,955	\$1,354	85%	\$5,951	\$4,350	272%		
24.7	n/a	6,132.1	Restaurant (Highway 61)	\$1,156	\$2,134	\$978	85%	\$4,298	\$3,142	272%		
20.5	n/a	5,087.9	Retail (Memorial Avenue)	\$959	\$1,771	\$812	85%	\$3,567	\$2,608	272%		
13.6	n/a	3,374.9	Athletic club (Egan Street)	\$636	\$1,175	\$539	85%	\$2,366	\$1,730	272%		
12.6	n/a	3,137.1	Medical office (Barton Street)	\$590	\$1,089	\$499	85%	\$2,192	\$1,603	272%		
12.3	n/a	3,050.8	Commercial (Arthur Street)	\$576	\$1,063	\$487	85%	\$2,140	\$1,565	272%		
11.2	n/a	2,779.4	Law office (Alloy Drive)	\$524	\$968	\$444	85%	\$1,949	\$1,425	272%		
11.1	n/a	2,749.8	Commercial (Cumberland Street)	\$519	\$959	\$440	85%	\$1,931	\$1,412	272%		
9.0	n/a	2,233.8	Retail (Cumberland Street)	\$421	\$778	\$356	85%	\$1,566	\$1,145	272%		
3.4	n/a	842.5	Medical office (Archibald Street)	\$159	\$294	\$135	85%	\$592	\$432	272%		
1.2	n/a	285.8	Dentistry office (Edward Street)	\$56	\$104	\$48	85%	\$209	\$153	272%		
253.0	n/a	62,756.1	Industrial (waterfront)	\$11,840	\$21,859	\$10,019	85%	\$44,022	\$32,182	272%		
119.2	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,579	\$10,299	\$4,720	85%	\$20,741	\$15,162	272%		
41.2	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,928	\$3,560	\$1,632	85%	\$7,169	\$5,241	272%		
25.2	n/a	6,238.3	Industrial (Bare Point Road)	\$1,179	\$2,177	\$998	85%	\$4,385	\$3,205	272%		
10.5	n/a	2,612.0	Industrial mall (Gorham Street)	\$491	\$907	\$416	85%	\$1,827	\$1,336	272%		
585.8	n/a	145,271.6	College (Nakina Drive)	\$27,415	\$50,613	\$23,198	85%	\$101,929	\$74,514	272%		
6.2	n/a	1,535.4	Non-profit office (Amelia Street)	\$290	\$536	\$246	85%	\$1,079	\$789	272%		
5.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$248	\$458	\$210	85%	\$922	\$674	272%		
8.3	n/a	2,058.6	Place of worship (Sprague Street)	\$388	\$717	\$329	85%	\$1,444	\$1,056	272%		
61.0	n/a	15,129.0	Public school (High Street)	\$2,855	\$5,270	\$2,416	85%	\$10,614	\$7,759	272%		
30.8	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,441	\$2,661	\$1,220	85%	\$5,359	\$3,918	272%		

Single Family Unit (SFU)

- Single Family
- Multi-Family
- Condominiums
- Townhouses

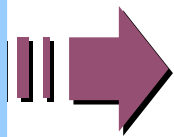


= Base Rate (1 billing unit per single-family detached home)



= Fractional billing units per residential dwelling unit

- Governmental
- Commercial
- Institutional
- Industrial



$$\frac{\text{Parcel Impervious Area}}{\text{SFU Base Area}^*} = \text{No. of Billing Units}$$

*Typical size range in Canada = 230-300 m² (2,500-3,200 ft²)



SFU Analysis

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		SFU Factor	SFU Distribution	
			Total	Avg/d.u.		Count	%
Single-Family Detached	33,306	33,306	10,075,100	302.5	1.00	33,306	49.8%
Semi-Detached	1,401	1,401	241,000	172.0	0.57	797	1.2%
Duplex	927	1,854	258,100	139.2	0.46	853	1.3%
Triplex	347	1,041	93,300	89.6	0.30	308	0.5%
4-Plex	197	788	76,800	97.5	0.32	254	0.4%
5-Plex	54	270	21,000	77.7	0.26	69	0.1%
6-Plex	95	570	67,800	118.9	0.39	224	0.3%
7+ Unit Apartments	265	5,811	702,500	120.9	0.40	2,322	3.5%
Condominium	46	1,828	134,700	73.7	0.24	445	0.7%
Townhouse	330	330	45,200	137.1	0.45	150	0.2%
Mobile Home Park	4	218	64,700	296.8	0.98	214	0.3%
Residential Subtotal	36,972	47,417	11,780,200	248.4		38,942	58.2%
Industrial/Comm/Institutional	4,258	n/a	8,460,000	n/a	n/a	27,967	41.8%
Miscellaneous/Mixed Use	479		included in total above			included in total above	
Undeveloped	3,604						
Non-Residential Subtotal	8,341		8,460,000			27,967	41.8%
Total	45,313		20,240,200			66,909	100.0%

Equivalent Single Family Unit (SFU) = 302.5 sq.m. (3256 sq.ft.)

Example – Single-Family Detached Home

Example: Detached home (with average assessed value = \$201,250)
 Lot Size: 810 m² (with average impervious area = 303 m²)
 Number of Dwelling Units: 1
 Number of SFU Billing Units: 1.0



	Current	Interim	Required
Stormwater Program Cost	\$3,370,000	\$6,170,000	\$12,430,000
Base Rate (\$/SFU/mo)	\$4.80	\$8.80	\$17.80

SFU User Fee Charge

- Current: 1.0 SFUs × \$4.80/SFU/mo = \$57.6/yr
- Interim: 1.0 SFUs × \$8.80/SFU/mo = \$105.6/yr
- Required: 1.0 SFUs × \$17.80/SFU/mo = \$213.6/yr

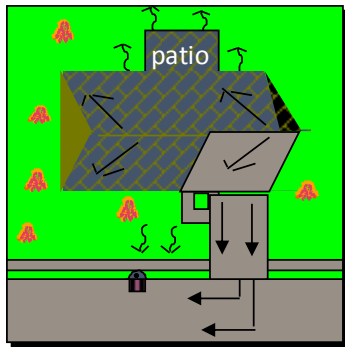
SFU User Fee Option – Comparison Based on Statistics

Billing Units (SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program							
				Current	Interim		Required				
			Program Cost			\$3,370,000	\$6,170,000		\$12,430,000		
			Base Rate (\$/SFU/mo)			\$4.80	\$8.80		\$17.80		
Representative Property			Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%		
Single Unit Residential											
1.0	1.0	302.5	Detached (average)	\$58	\$106	\$48	83%	\$214	\$156	271%	
0.6	1.0	172.0	Semi-Detached (average)	\$35	\$63	\$29	83%	\$128	\$94	271%	
Multi-Unit Residential											
1.0	2.0	278.4	Duplex (average)	\$58	\$106	\$48	83%	\$214	\$156	271%	
0.9	3.0	268.8	Triplex (average)	\$52	\$95	\$43	83%	\$192	\$140	271%	
1.2	4.0	390.0	4-Plex (average)	\$69	\$127	\$58	83%	\$256	\$187	271%	
1.5	5.0	388.5	5-Plex (average)	\$86	\$158	\$72	83%	\$320	\$234	271%	
2.4	6.0	713.4	6-Plex (average)	\$138	\$253	\$115	83%	\$513	\$374	271%	
8.8	21.9	2,651.1	7+ Unit Apartments (average)	\$507	\$929	\$422	83%	\$1,880	\$1,373	271%	
0.2	1.0	73.7	Condominium (average)	\$12	\$21	\$10	83%	\$43	\$31	271%	
0.5	1.0	137.1	Townhouse (average)	\$29	\$53	\$24	83%	\$107	\$78	271%	
Non-Residential											
5.8	n/a	1,770.0	Farm (average)	\$334	\$612	\$278	83%	\$1,239	\$905	271%	
3.8	n/a	1,140.0	Commercial (average)	\$219	\$401	\$182	83%	\$812	\$593	271%	
10.5	n/a	3,170.0	Industrial (average)	\$605	\$1,109	\$504	83%	\$2,243	\$1,638	271%	
5.6	n/a	1,710.0	Special/Exempt (average)	\$323	\$591	\$269	83%	\$1,196	\$874	271%	

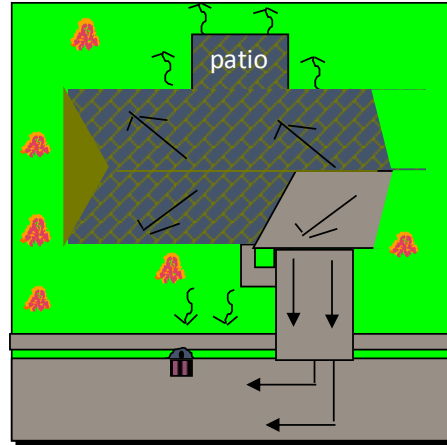
SFU User Fee Option – Comparison of Actual Properties

Billing Units (SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program								
				Current	Interim			Required				
			Program Cost			\$3,370,000	\$6,170,000			\$12,430,000		
			Base Rate (\$/SFU/mo)			\$4.80	\$8.80			\$17.80		
Representative Property			Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			
Example Non-Residential Properties												
372.7	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,468	\$39,357	\$17,890	83%	\$79,609	\$58,141	271%		
73.1	n/a	22,142.9	Shopping centre (River Street)	\$4,211	\$7,719	\$3,509	83%	\$15,614	\$11,404	271%		
71.3	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,107	\$7,529	\$3,422	83%	\$15,230	\$11,123	271%		
37.1	n/a	11,240.1	Retirement home (Arundel Street)	\$2,137	\$3,918	\$1,781	83%	\$7,925	\$5,788	271%		
28.0	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,613	\$2,957	\$1,344	83%	\$5,981	\$4,368	271%		
20.2	n/a	6,132.1	Restaurant (Highway 61)	\$1,164	\$2,133	\$970	83%	\$4,315	\$3,151	271%		
16.8	n/a	5,087.9	Retail (Memorial Avenue)	\$968	\$1,774	\$806	83%	\$3,588	\$2,621	271%		
11.1	n/a	3,374.9	Athletic club (Egan Street)	\$639	\$1,172	\$533	83%	\$2,371	\$1,732	271%		
10.4	n/a	3,137.1	Medical office (Barton Street)	\$599	\$1,098	\$499	83%	\$2,221	\$1,622	271%		
10.1	n/a	3,050.8	Commercial (Arthur Street)	\$582	\$1,067	\$485	83%	\$2,157	\$1,576	271%		
9.2	n/a	2,779.4	Law office (Alloy Drive)	\$530	\$972	\$442	83%	\$1,965	\$1,435	271%		
9.1	n/a	2,749.8	Commercial (Cumberland Street)	\$524	\$961	\$437	83%	\$1,944	\$1,420	271%		
7.4	n/a	2,233.8	Retail (Cumberland Street)	\$426	\$781	\$355	83%	\$1,581	\$1,154	271%		
2.8	n/a	842.5	Medical office (Archibald Street)	\$161	\$296	\$134	83%	\$598	\$437	271%		
0.9	n/a	285.8	Dentistry office (Edward Street)	\$52	\$95	\$43	83%	\$192	\$140	271%		
207.1	n/a	62,756.1	Industrial (waterfront)	\$11,929	\$21,870	\$9,941	83%	\$44,237	\$32,308	271%		
97.5	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,616	\$10,296	\$4,680	83%	\$20,826	\$15,210	271%		
33.7	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,941	\$3,559	\$1,618	83%	\$7,198	\$5,257	271%		
20.6	n/a	6,238.3	Industrial (Bare Point Road)	\$1,187	\$2,175	\$989	83%	\$4,400	\$3,214	271%		
8.6	n/a	2,612.0	Industrial mall (Gorham Street)	\$495	\$908	\$413	83%	\$1,837	\$1,342	271%		
479.4	n/a	145,271.6	College (Nakina Drive)	\$27,613	\$50,625	\$23,011	83%	\$102,400	\$74,786	271%		
5.1	n/a	1,535.4	Non-profit office (Amelia Street)	\$294	\$539	\$245	83%	\$1,089	\$796	271%		
4.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$248	\$454	\$206	83%	\$918	\$671	271%		
6.8	n/a	2,058.6	Place of worship (Sprague Street)	\$392	\$718	\$326	83%	\$1,452	\$1,061	271%		
49.9	n/a	15,129.0	Public school (High Street)	\$2,874	\$5,269	\$2,395	83%	\$10,659	\$7,784	271%		
25.2	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,452	\$2,661	\$1,210	83%	\$5,383	\$3,931	271%		

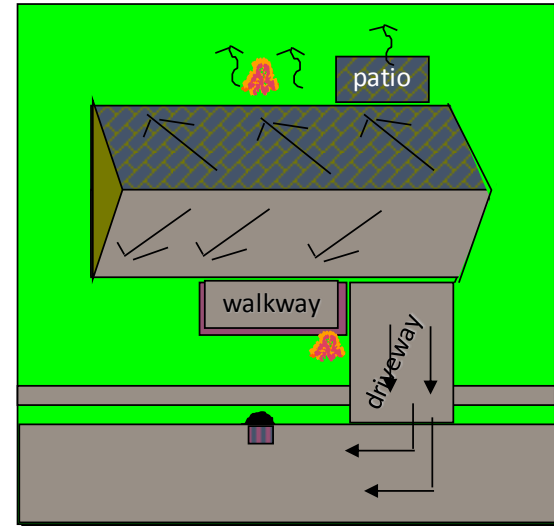
Tiered Single-Family Units



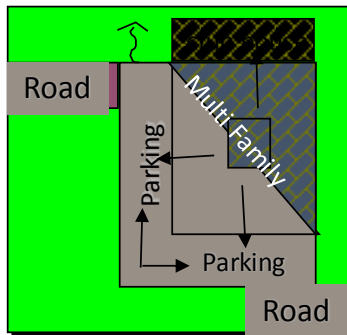
Small single-family detached
161 m² = 0.5 SFU
Lowest 10% (0-161 m²)



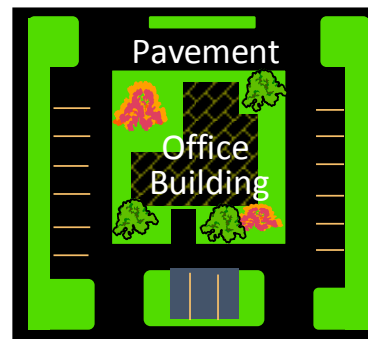
Medium single-family detached
303 m² = 1.0 SFU
Middle 80% (162-468 m²)



Large single-family detached
469 m² = 1.5 SFU
Highest 10% (>469 m²)



Multi-Family
1 Dwelling Unit =
0.2 - 1.0 SFU



$$\text{Number of Billing Units} = \frac{\text{Non-Residential impervious area}}{\text{SFU base area}}$$



Tiered SFU Analysis

Parcel Type	Number of Parcels	Dwelling Units (d.u.)	Est'd Impervious Area (m ²)		SFU Factor	SFU Distribution	
			Total	Avg/d.u.		Count	%
Single-Family (small)	3,331	3,331	534,600	160.5	0.53	1,767	2.6%
Single-Family (medium)	26,644	26,644	8,059,800	302.5	1.00	26,644	39.7%
Single-Family (large)	3,331	3,331	1,560,600	468.5	1.55	5,159	7.7%
Semi-Detached	1,401	1,401	241,000	172.0	0.57	797	1.2%
Duplex	927	1,854	258,100	139.2	0.46	853	1.3%
Triplex	347	1,041	93,300	89.6	0.30	308	0.5%
4-Plex	197	788	76,800	97.5	0.32	254	0.4%
5-Plex	54	270	21,000	77.7	0.26	69	0.1%
6-Plex	95	570	67,800	118.9	0.39	224	0.3%
7+ Unit Apartments	265	5,811	702,500	120.9	0.40	2,322	3.5%
Condominium	46	1,828	134,700	73.7	0.24	445	0.7%
Townhouse	330	330	45,200	137.1	0.45	150	0.2%
Mobile Home Park	4	218	64,700	296.8	0.98	214	0.3%
Residential Subtotal	36,972	47,417	11,860,100	250.1		39,206	58.4%
Industrial/Comm/Institutional	4,258	n/a	8,460,000	n/a	n/a	27,967	41.6%
Miscellaneous/Mixed Use	479		included in total above			included in total above	
Undeveloped	3,604						
Non-Residential Subtotal	8,341		8,460,000			27,967	41.6%
Total	45,313		20,320,100			67,173	100.0%

Equivalent Single Family Unit (SFU) = 302.5 sq.m. (3256 sq.ft.)

Example – Single-Family Detached Home

Example: Detached home (with average assessed value = \$201,250)

Lot Size: 810 m² (with average impervious area = 303 m²)

Number of Dwelling Units: 1

Number of Tiered SFU Billing Units: 1.0



	Current	Interim	Required
Stormwater Program Cost	\$3,390,000	\$6,200,000	\$12,460,000
Base Rate (\$/SFU/mo)	\$4.80	\$8.80	\$17.70

SFU User Fee Charge

- Current: 1.0 Tiered SFUs × \$4.80/SFU/mo = \$57.6/yr
- Interim: 1.0 Tiered SFUs × \$8.80/SFU/mo = \$105.6/yr
- Required: 1.0 Tiered SFUs × \$17.70/SFU/mo = \$212.4/yr



Tiered SFU Option – Comparison Based on Statistics

Billing Units (Tiered SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program						
				Current	Interim		Required			
			Program Cost	\$3,390,000	\$6,200,000		\$12,460,000			
			Base Rate (\$/SFU/mo)	\$4.80	\$8.80		\$17.70			
			Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Single Unit Residential										
1.0	1.0	302.5	Detached (average)	\$58	\$106	\$48	83%	\$212	\$155	269%
0.6	1.0	172.0	Semi-Detached (average)	\$35	\$63	\$29	83%	\$127	\$93	269%
Multi-Unit Residential										
1.0	2.0	278.4	Duplex (average)	\$58	\$106	\$48	83%	\$212	\$155	269%
0.9	3.0	268.8	Triplex (average)	\$52	\$95	\$43	83%	\$191	\$139	269%
1.2	4.0	390.0	4-Plex (average)	\$69	\$127	\$58	83%	\$255	\$186	269%
1.5	5.0	388.5	5-Plex (average)	\$86	\$158	\$72	83%	\$319	\$232	269%
2.4	6.0	713.4	6-Plex (average)	\$138	\$253	\$115	83%	\$510	\$372	269%
8.8	21.9	2,651.1	7+ Unit Apartments (average)	\$507	\$929	\$422	83%	\$1,869	\$1,362	269%
0.2	1.0	73.7	Condominium (average)	\$12	\$21	\$10	83%	\$42	\$31	269%
0.5	1.0	137.1	Townhouse (average)	\$29	\$53	\$24	83%	\$106	\$77	269%
Non-Residential										
5.8	n/a	1,770.0	Farm (average)	\$334	\$612	\$278	83%	\$1,232	\$898	269%
3.8	n/a	1,140.0	Commercial (average)	\$219	\$401	\$182	83%	\$807	\$588	269%
10.5	n/a	3,170.0	Industrial (average)	\$605	\$1,109	\$504	83%	\$2,230	\$1,625	269%
5.6	n/a	1,710.0	Special/Exempt (average)	\$323	\$591	\$269	83%	\$1,189	\$867	269%

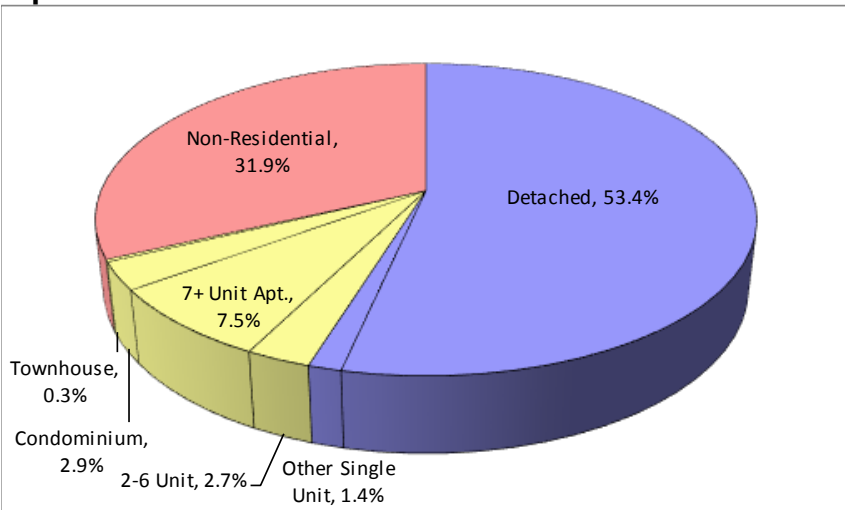
Tiered SFU Option – Comparison of Actual Properties

Billing Units (Tiered SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program						
				Current	Interim			Required		
			Program Cost	\$3,390,000	\$6,200,000			\$12,460,000		
			Base Rate (\$/SFU/mo)	\$4.80	\$8.80			\$17.70		
Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			
Example Non-Residential Properties										
372.7	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,468	\$39,357	\$17,890	83%	\$79,161	\$57,694	269%
73.1	n/a	22,142.9	Shopping centre (River Street)	\$4,211	\$7,719	\$3,509	83%	\$15,526	\$11,316	269%
71.3	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,107	\$7,529	\$3,422	83%	\$15,144	\$11,037	269%
37.1	n/a	11,240.1	Retirement home (Arundel Street)	\$2,137	\$3,918	\$1,781	83%	\$7,880	\$5,743	269%
28.0	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,613	\$2,957	\$1,344	83%	\$5,947	\$4,334	269%
20.2	n/a	6,132.1	Restaurant (Highway 61)	\$1,164	\$2,133	\$970	83%	\$4,290	\$3,127	269%
16.8	n/a	5,087.9	Retail (Memorial Avenue)	\$968	\$1,774	\$806	83%	\$3,568	\$2,601	269%
11.1	n/a	3,374.9	Athletic club (Egan Street)	\$639	\$1,172	\$533	83%	\$2,358	\$1,718	269%
10.4	n/a	3,137.1	Medical office (Barton Street)	\$599	\$1,098	\$499	83%	\$2,209	\$1,610	269%
10.1	n/a	3,050.8	Commercial (Arthur Street)	\$582	\$1,067	\$485	83%	\$2,145	\$1,563	269%
9.2	n/a	2,779.4	Law office (Alloy Drive)	\$530	\$972	\$442	83%	\$1,954	\$1,424	269%
9.1	n/a	2,749.8	Commercial (Cumberland Street)	\$524	\$961	\$437	83%	\$1,933	\$1,409	269%
7.4	n/a	2,233.8	Retail (Cumberland Street)	\$426	\$781	\$355	83%	\$1,572	\$1,146	269%
2.8	n/a	842.5	Medical office (Archibald Street)	\$161	\$296	\$134	83%	\$595	\$433	269%
0.9	n/a	285.8	Dentistry office (Edward Street)	\$52	\$95	\$43	83%	\$191	\$139	269%
207.1	n/a	62,756.1	Industrial (waterfront)	\$11,929	\$21,870	\$9,941	83%	\$43,988	\$32,059	269%
97.5	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,616	\$10,296	\$4,680	83%	\$20,709	\$15,093	269%
33.7	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,941	\$3,559	\$1,618	83%	\$7,158	\$5,217	269%
20.6	n/a	6,238.3	Industrial (Bare Point Road)	\$1,187	\$2,175	\$989	83%	\$4,375	\$3,189	269%
8.6	n/a	2,612.0	Industrial mall (Gorham Street)	\$495	\$908	\$413	83%	\$1,827	\$1,331	269%
479.4	n/a	145,271.6	College (Nakina Drive)	\$27,613	\$50,625	\$23,011	83%	\$101,825	\$74,211	269%
5.1	n/a	1,535.4	Non-profit office (Amelia Street)	\$294	\$539	\$245	83%	\$1,083	\$789	269%
4.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$248	\$454	\$206	83%	\$913	\$666	269%
6.8	n/a	2,058.6	Place of worship (Sprague Street)	\$392	\$718	\$326	83%	\$1,444	\$1,053	269%
49.9	n/a	15,129.0	Public school (High Street)	\$2,874	\$5,269	\$2,395	83%	\$10,599	\$7,725	269%
25.2	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,452	\$2,661	\$1,210	83%	\$5,352	\$3,901	269%

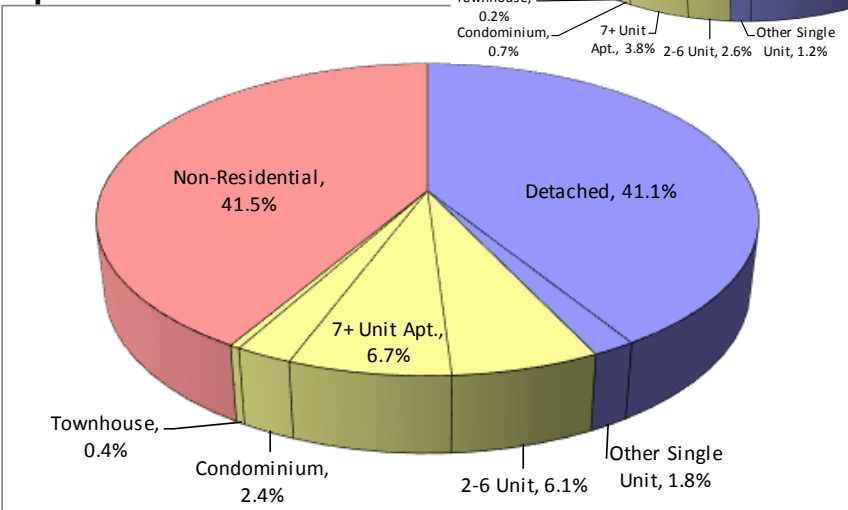
Revenue Distributions (Interim Service Level)

Estimated Impervious Area

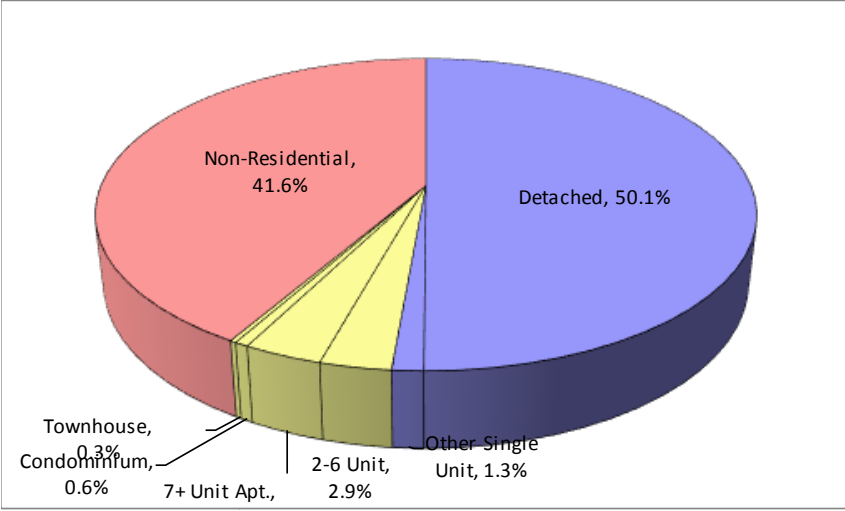
Option 1-Tax



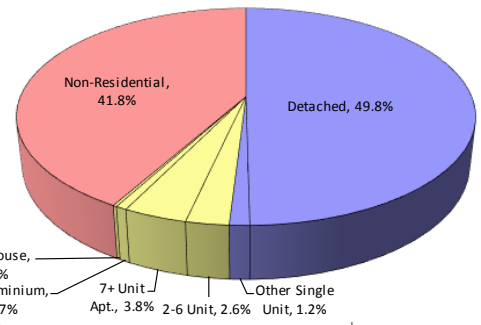
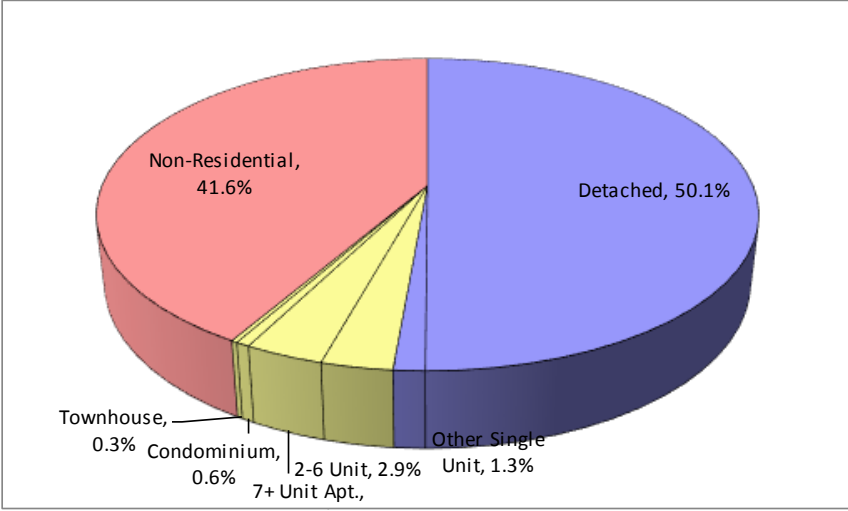
Option 2-ERU User Fee



Option 3-SFU User Fee



Option 4-Tiered SFU User Fee




Average Residential Rate Categories

Tax Option – Interim Service Level


1-Tax

Single-Family
Detached
Tax rate = 1.505%



\$98/year

Semi-Detached
Tax rate = 1.505%



\$59/year

Duplex
Tax rate = 1.505%




\$44/year/unit

3-, 4-, and 5-Plex
Tax rate = 1.505%




\$26/year/unit

6-Plex
Tax rate = 1.505%



\$26/year/unit

7+ Unit Apartments
Tax rate = 3.745%



\$85/year/unit

Condominium
Tax rate = 1.505%



\$92/year/unit

Townhouse
Tax rate = 1.505%




\$46/year/unit

Average Residential Rate Categories


ERU Option – Interim Service Level

Single-Family
Detached
ERU factor = 1.0




\$86/year

Semi-Detached
ERU factor = 1.0



\$86/year

Duplex
ERU factor = 1.0/unit




\$86/year/unit

3-, 4-, and 5-Plex
ERU factor = 1.0/unit



\$86/year/unit

6-Plex
ERU factor = 1.0/unit




\$86/year/unit

7+ Unit Apartments
ERU factor = 1.0/unit




\$86/year/unit

Condominium
ERU factor = 1.0/unit



\$86/year/unit

Townhouse
ERU factor = 1.0/unit




\$86/year/unit

Average Residential Rate Categories


SFU Option – Interim Service Level

Single-Family
Detached
SFU factor = 1.0



\$106/year

Semi-Detached
SFU factor = 0.6



\$63/year

Duplex
SFU factor = 0.5/unit



\$53/year/unit

3-, 4-, and 5-Plex
SFU factor = 0.3/unit



\$32/year/unit

6-Plex
SFU factor = 0.4/unit



\$42/year/unit

7+ Unit Apartments
SFU factor = 0.4/unit



\$42/year/unit

Condominium
SFU factor = 0.2/unit



\$21/year/unit

Townhouse
SFU factor = 0.5/unit



\$53/year/unit

Average Residential Rate Categories

Tiered SFU Option – Interim Service Level

Single-Family Detached (Small)
SFU factor = 0.5

Single-Family Detached (Medium)
SFU factor = 1.0

Single-Family Detached (Large)
SFU factor = 1.5

Semi-Detached
SFU factor = 0.6

Duplex
SFU factor = 0.5/unit



\$53/year

\$106/year

\$158/year

\$63/year

\$53/year/unit

3-, 4-, and 5-Plex
SFU factor = 0.3/unit

6-Plex
SFU factor = 0.4/unit

7+ Unit Apartments
SFU factor = 0.4/unit

Condominium
SFU factor = 0.2/unit

Townhouse
SFU factor = 0.5/unit



\$32/year/unit

\$42/year/unit

\$42/year/unit

\$21/year/unit

\$53/year/unit

Considerations When Assessing Impacts

- Statistical averages shown represent customer classifications as a whole
- Impacts to individual property owners will vary widely (26 of 8,341 non-residential properties were shown)
- Tax funding favors properties with a high I:A ratio
- User fee options favor properties with a low I:A ratio



$$\text{I:A ratio} = \frac{\text{Impervious footprint (m}^2\text{)}}{\text{Assessed value (\$)}}$$



Considerations When Assessing Impacts (continued)

- In general, customer preferences would likely be...
 - Tax Option #1: owners of semi-detached homes, duplex→six-plex, townhouses, and non-residential properties
 - ERU Option #2: owners of detached homes and condos
 - SFU Option #3: owners of (larger) detached homes, apartment buildings, and condos
 - Tiered SFU Option #4: owners of (smaller) detached homes, apartment buildings, and condos

Discussion



THUNDER BAY
STORMWATER FINANCING STUDY

Open Discussion

Next Steps

- Collect input on the key questions and factor all ideas into the evaluation of the different funding options
- Continue to communicate via the City website www.thunderbay.ca/stormwaterplan
- Upcoming Meetings
 - Stormwater Advisory Committee Meeting 3 (date TBD)
 - Public Information Centre No. 2 (currently sometime in September)
 - Stakeholder Meetings (Universities / Colleges / First Nations)
- Present project findings and study recommendations to the *NEW* Council in the new year.

Questions?



Comparison of User Fee Options (Handouts)

Comparison – Current Service Level

	Funding Option	1-Tax	2-ERU User Fee				3-SFU User Fee				4-Tiered SFU User Fee			
	Program Cost	\$3,150,000	\$3,330,000				\$3,370,000				\$3,390,000			
	Representative Property	Charge	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference
Single Unit Residential														
	Detached (small tier, 10-percentile)	\$28	\$47	\$19	1.69X	69%	\$58	\$30	2.08X	108%	\$29	\$1	1.04X	4%
	Detached (medium tier, 25-percentile)	\$36	\$47	\$11	1.31X	31%	\$58	\$22	1.61X	61%	\$58	\$22	1.61X	61%
	Detached (medium tier, 50-percentile)	\$49	\$47	-\$2	0.96X	-4%	\$58	\$9	1.18X	18%	\$58	\$9	1.18X	18%
	Detached (medium tier, average)	\$52	\$47	-\$6	0.89X	-11%	\$58	\$5	1.1X	10%	\$58	\$5	1.1X	10%
	Detached (medium tier, 75-percentile)	\$62	\$47	-\$16	0.75X	-25%	\$58	-\$5	0.92X	-8%	\$58	-\$5	0.92X	-8%
	Detached (large tier, 90-percentile)	\$85	\$47	-\$38	0.55X	-45%	\$58	-\$27	0.68X	-32%	\$86	\$2	1.02X	2%
	Semi-Detached (average)	\$31	\$47	\$15	1.49X	49%	\$35	\$3	1.1X	10%	\$35	\$3	1.1X	10%
Multi-Unit Residential														
	Duplex (average)	\$47	\$94	\$47	2.01X	101%	\$58	\$11	1.24X	24%	\$58	\$11	1.24X	24%
	Triplex (average)	\$42	\$140	\$98	3.35X	235%	\$52	\$10	1.24X	24%	\$52	\$10	1.24X	24%
	4-Plex (average)	\$60	\$187	\$127	3.13X	213%	\$69	\$9	1.15X	15%	\$69	\$9	1.15X	15%
	5-Plex (average)	\$53	\$234	\$181	4.45X	345%	\$86	\$34	1.64X	64%	\$86	\$34	1.64X	64%
	6-Plex (average)	\$84	\$281	\$197	3.34X	234%	\$138	\$54	1.65X	65%	\$138	\$54	1.65X	65%
	7+ Unit Apartments (average)	\$990	\$1,025	\$35	1.04X	4%	\$507	-\$483	0.51X	-49%	\$507	-\$483	0.51X	-49%
	Condominium (average)	\$49	\$47	-\$2	0.96X	-4%	\$12	-\$37	0.24X	-76%	\$12	-\$37	0.24X	-76%
	Townhouse (average)	\$25	\$47	\$22	1.91X	91%	\$29	\$4	1.17X	17%	\$29	\$4	1.17X	17%
Non-Residential														
	Farm (average)	\$10	\$332	\$322	32.76X	3176%	\$334	\$324	32.93X	3193%	\$334	\$324	32.93X	3193%
	Commercial (average)	\$210	\$215	\$5	1.02X	2%	\$219	\$9	1.04X	4%	\$219	\$9	1.04X	4%
	Industrial (average)	\$258	\$599	\$341	2.32X	132%	\$605	\$347	2.34X	134%	\$605	\$347	2.34X	134%
	Special/Exempt (average)	\$0	\$323	\$323	n/a	n/a	\$323	\$323	n/a	n/a	\$323	\$323	n/a	n/a
Example Non-Residential Properties														
	Shopping centre (Fort William Road)	\$52,708	\$21,308	-\$31,400	0.4X	-60%	\$21,468	-\$31,241	0.41X	-59%	\$21,468	-\$31,241	0.41X	-59%
	Shopping centre (River Street)	\$4,426	\$4,179	-\$247	0.94X	-6%	\$4,211	-\$216	0.95X	-5%	\$4,211	-\$216	0.95X	-5%
	Retail complex 1 (Memorial Avenue)	\$2,797	\$4,081	\$1,284	1.46X	46%	\$4,107	\$1,310	1.47X	47%	\$4,107	\$1,310	1.47X	47%
	Retirement home (Arundel Street)	\$2,956	\$2,120	-\$836	0.72X	-28%	\$2,137	-\$819	0.72X	-28%	\$2,137	-\$819	0.72X	-28%
	Retail complex 2 (Memorial Avenue)	\$2,391	\$1,601	-\$790	0.67X	-33%	\$1,613	-\$778	0.67X	-33%	\$1,613	-\$778	0.67X	-33%
	Restaurant (Highway 61)	\$225	\$1,156	\$931	5.13X	413%	\$1,164	\$938	5.17X	417%	\$1,164	\$938	5.17X	417%
	Retail (Memorial Avenue)	\$942	\$959	\$17	1.02X	2%	\$968	\$25	1.03X	3%	\$968	\$25	1.03X	3%
	Athletic club (Egan Street)	\$159	\$636	\$477	3.99X	299%	\$639	\$480	4.01X	301%	\$639	\$480	4.01X	301%
	Medical office (Barton Street)	\$550	\$590	\$40	1.07X	7%	\$599	\$49	1.09X	9%	\$599	\$49	1.09X	9%
	Commercial (Arthur Street)	\$885	\$576	-\$310	0.65X	-35%	\$582	-\$303	0.66X	-34%	\$582	-\$303	0.66X	-34%
	Law office (Alloy Drive)	\$709	\$524	-\$185	0.74X	-26%	\$530	-\$179	0.75X	-25%	\$530	-\$179	0.75X	-25%
	Commercial (Cumberland Street)	\$556	\$519	-\$37	0.93X	-7%	\$524	-\$32	0.94X	-6%	\$524	-\$32	0.94X	-6%
	Retail (Cumberland Street)	\$155	\$421	\$266	2.72X	172%	\$426	\$272	2.75X	175%	\$426	\$272	2.75X	175%
	Medical office (Archibald Street)	\$74	\$159	\$85	2.14X	114%	\$161	\$87	2.17X	117%	\$161	\$87	2.17X	117%
	Dentistry office (Edward Street)	\$61	\$56	-\$5	0.92X	-8%	\$52	-\$9	0.85X	-15%	\$52	-\$9	0.85X	-15%
	Industrial (waterfront)	\$892	\$11,840	\$10,948	13.28X	1228%	\$11,929	\$11,037	13.37X	1237%	\$11,929	\$11,037	13.37X	1237%
	Warehouse (Lithium Drive)	\$2,154	\$5,579	\$3,425	2.59X	159%	\$5,616	\$3,462	2.61X	161%	\$5,616	\$3,462	2.61X	161%
	Warehouse (Rossllyn Road)	\$612	\$1,928	\$1,316	3.15X	215%	\$1,941	\$1,329	3.17X	217%	\$1,941	\$1,329	3.17X	217%
	Industrial (Bare Point Road)	\$224	\$1,179	\$956	5.27X	427%	\$1,187	\$963	5.3X	430%	\$1,187	\$963	5.3X	430%
	Industrial mall (Gorham Street)	\$179	\$491	\$312	2.74X	174%	\$495	\$316	2.77X	177%	\$495	\$316	2.77X	177%
	College (Nakina Drive)	\$1,333	\$27,415	\$26,082	20.56X	1956%	\$27,613	\$26,280	20.71X	1971%	\$27,613	\$26,280	20.71X	1971%
	Non-profit office (Amelia Street)	\$66	\$290	\$224	4.37X	337%	\$294	\$227	4.43X	343%	\$294	\$227	4.43X	343%
	Non-profit office (Algoma Street)	\$104	\$248	\$144	2.38X	138%	\$248	\$144	2.38X	138%	\$248	\$144	2.38X	138%
	Place of worship (Sprague Street)	\$1	\$388	\$387	262.6X	26160%	\$392	\$390	264.79X	26379%	\$392	\$390	264.79X	26379%
	Public school (High Street)	\$11	\$2,855	\$2,844	271.19X	27019%	\$2,874	\$2,864	273.04X	27204%	\$2,874	\$2,864	273.04X	27204%
	Public school (Sherbrooke Street)	\$4	\$1,441	\$1,437	338.79X	33779%	\$1,452	\$1,447	341.16X	34016%	\$1,452	\$1,447	341.16X	34016%

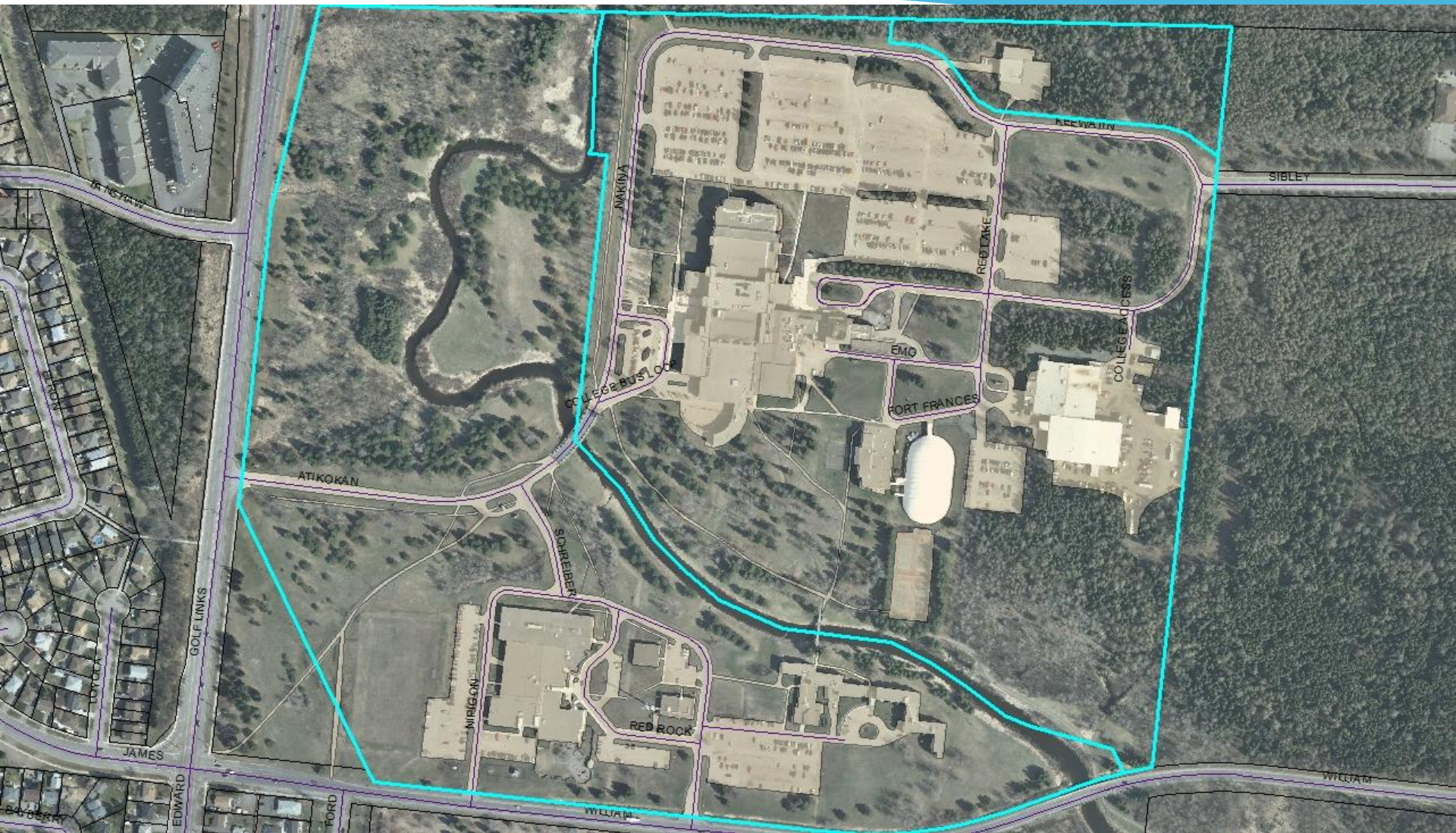
Comparison – Interim Service Level

Funding Option	1-Tax	2-ERU User Fee				3-SFU User Fee				4-Tiered SFU User Fee			
Program Cost	\$5,910,000	\$6,130,000				\$6,170,000				\$6,200,000			
Representative Property	Charge	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference
Single Unit Residential													
Detached (small tier, 10-percentile)	\$52	\$86	\$35	1.67X	67%	\$106	\$54	2.04X	104%	\$53	\$1	1.02X	2%
Detached (medium tier, 25-percentile)	\$67	\$86	\$20	1.29X	29%	\$106	\$39	1.58X	58%	\$106	\$39	1.58X	58%
Detached (medium tier, 50-percentile)	\$92	\$86	-\$5	0.94X	-6%	\$106	\$14	1.15X	15%	\$106	\$14	1.15X	15%
Detached (medium tier, average)	\$98	\$86	-\$12	0.88X	-12%	\$106	\$7	1.08X	8%	\$106	\$7	1.08X	8%
Detached (medium tier, 75-percentile)	\$117	\$86	-\$31	0.74X	-26%	\$106	-\$11	0.9X	-10%	\$106	-\$11	0.9X	-10%
Detached (large tier, 90-percentile)	\$158	\$86	-\$72	0.55X	-45%	\$106	-\$53	0.67X	-33%	\$158	\$0	1X	0%
Semi-Detached (average)	\$59	\$86	\$28	1.47X	47%	\$63	\$5	1.08X	8%	\$63	\$5	1.08X	8%
Multi-Unit Residential													
Duplex (average)	\$87	\$173	\$86	1.98X	98%	\$106	\$18	1.21X	21%	\$106	\$18	1.21X	21%
Triplex (average)	\$79	\$259	\$181	3.3X	230%	\$95	\$17	1.21X	21%	\$95	\$17	1.21X	21%
4-Plex (average)	\$112	\$346	\$234	3.08X	208%	\$127	\$15	1.13X	13%	\$127	\$15	1.13X	13%
5-Plex (average)	\$98	\$432	\$334	4.39X	339%	\$158	\$60	1.61X	61%	\$158	\$60	1.61X	61%
6-Plex (average)	\$157	\$518	\$361	3.3X	230%	\$253	\$96	1.61X	61%	\$253	\$96	1.61X	61%
7+ Unit Apartments (average)	\$1,854	\$1,892	\$38	1.02X	2%	\$929	-\$925	0.5X	-50%	\$929	-\$925	0.5X	-50%
Condominium (average)	\$92	\$86	-\$5	0.94X	-6%	\$21	-\$71	0.23X	-77%	\$21	-\$71	0.23X	-77%
Townhouse (average)	\$46	\$86	\$40	1.88X	88%	\$53	\$7	1.15X	15%	\$53	\$7	1.15X	15%
Non-Residential													
Farm (average)	\$19	\$613	\$594	32.29X	3129%	\$612	\$593	32.24X	3124%	\$612	\$593	32.24X	3124%
Commercial (average)	\$394	\$397	\$4	1.01X	1%	\$401	\$8	1.02X	2%	\$401	\$8	1.02X	2%
Industrial (average)	\$483	\$1,106	\$623	2.29X	129%	\$1,109	\$626	2.29X	129%	\$1,109	\$626	2.29X	129%
Special/Exempt (average)	\$0	\$596	\$596	n/a	n/a	\$591	\$591	n/a	n/a	\$591	\$591	n/a	n/a
Example Non-Residential Properties													
Shopping centre (Fort William Road)	\$98,714	\$39,338	-\$59,376	0.4X	-60%	\$39,357	-\$59,357	0.4X	-60%	\$39,357	-\$59,357	0.4X	-60%
Shopping centre (River Street)	\$8,289	\$7,716	-\$574	0.93X	-7%	\$7,719	-\$570	0.93X	-7%	\$7,719	-\$570	0.93X	-7%
Retail complex 1 (Memorial Avenue)	\$5,237	\$7,534	\$2,297	1.44X	44%	\$7,529	\$2,292	1.44X	44%	\$7,529	\$2,292	1.44X	44%
Retirement home (Arundel Street)	\$5,537	\$3,914	-\$1,623	0.71X	-29%	\$3,918	-\$1,619	0.71X	-29%	\$3,918	-\$1,619	0.71X	-29%
Retail complex 2 (Memorial Avenue)	\$4,477	\$2,955	-\$1,522	0.66X	-34%	\$2,957	-\$1,520	0.66X	-34%	\$2,957	-\$1,520	0.66X	-34%
Restaurant (Highway 61)	\$422	\$2,134	\$1,712	5.06X	406%	\$2,133	\$1,711	5.06X	406%	\$2,133	\$1,711	5.06X	406%
Retail (Memorial Avenue)	\$1,765	\$1,771	\$6	1X	0%	\$1,774	\$9	1.01X	1%	\$1,774	\$9	1.01X	1%
Athletic club (Egan Street)	\$299	\$1,175	\$877	3.94X	294%	\$1,172	\$874	3.93X	293%	\$1,172	\$874	3.93X	293%
Medical office (Barton Street)	\$1,029	\$1,089	\$59	1.06X	6%	\$1,098	\$69	1.07X	7%	\$1,098	\$69	1.07X	7%
Commercial (Arthur Street)	\$1,658	\$1,063	-\$595	0.64X	-36%	\$1,067	-\$591	0.64X	-36%	\$1,067	-\$591	0.64X	-36%
Law office (Alloy Drive)	\$1,328	\$968	-\$360	0.73X	-27%	\$972	-\$356	0.73X	-27%	\$972	-\$356	0.73X	-27%
Commercial (Cumberland Street)	\$1,041	\$959	-\$82	0.92X	-8%	\$961	-\$80	0.92X	-8%	\$961	-\$80	0.92X	-8%
Retail (Cumberland Street)	\$290	\$778	\$488	2.68X	168%	\$781	\$492	2.7X	170%	\$781	\$492	2.7X	170%
Medical office (Archibald Street)	\$139	\$294	\$154	2.11X	111%	\$296	\$156	2.12X	112%	\$296	\$156	2.12X	112%
Dentistry office (Edward Street)	\$114	\$104	-\$10	0.91X	-9%	\$95	-\$19	0.83X	-17%	\$95	-\$19	0.83X	-17%
Industrial (waterfront)	\$1,670	\$21,859	\$20,189	13.09X	1209%	\$21,870	\$20,199	13.09X	1209%	\$21,870	\$20,199	13.09X	1209%
Warehouse (Lithium Drive)	\$4,034	\$10,299	\$6,265	2.55X	155%	\$10,296	\$6,262	2.55X	155%	\$10,296	\$6,262	2.55X	155%
Warehouse (Rossllyn Road)	\$1,146	\$3,560	\$2,413	3.11X	211%	\$3,559	\$2,412	3.1X	210%	\$3,559	\$2,412	3.1X	210%
Industrial (Bare Point Road)	\$419	\$2,177	\$1,758	5.2X	420%	\$2,175	\$1,756	5.19X	419%	\$2,175	\$1,756	5.19X	419%
Industrial mall (Gorham Street)	\$335	\$907	\$572	2.7X	170%	\$908	\$573	2.71X	171%	\$908	\$573	2.71X	171%
College (Nakina Drive)	\$2,497	\$50,613	\$48,116	20.27X	1927%	\$50,625	\$48,127	20.27X	1927%	\$50,625	\$48,127	20.27X	1927%
Non-profit office (Amelia Street)	\$124	\$536	\$411	4.31X	331%	\$539	\$414	4.33X	333%	\$539	\$414	4.33X	333%
Non-profit office (Algoma Street)	\$195	\$458	\$263	2.35X	135%	\$454	\$259	2.33X	133%	\$454	\$259	2.33X	133%
Place of worship (Sprague Street)	\$3	\$717	\$714	258.86X	25786%	\$718	\$715	259.21X	25821%	\$718	\$715	259.21X	25821%
Public school (High Street)	\$20	\$5,270	\$5,251	267.33X	26633%	\$5,269	\$5,250	267.28X	26628%	\$5,269	\$5,250	267.28X	26628%
Public school (Sherbrooke Street)	\$8	\$2,661	\$2,653	333.97X	33297%	\$2,661	\$2,653	333.97X	33297%	\$2,661	\$2,653	333.97X	33297%

Comparison – Required Service Level

Funding Option	1-Tax	2-ERU User Fee				3-SFU User Fee				4-Tiered SFU User Fee			
Program Cost	\$12,120,000	\$12,370,000				\$12,430,000				\$12,460,000			
Representative Property	Charge	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference	Charge	Δ _{Tax}	Difference
Single Unit Residential													
Detached (small tier, 10-percentile)	\$106	\$174	\$68	1.64X	64%	\$214	\$107	2.01X	101%	\$106	\$0	1X	0%
Detached (medium tier, 25-percentile)	\$137	\$174	\$37	1.27X	27%	\$214	\$77	1.56X	56%	\$212	\$75	1.55X	55%
Detached (medium tier, 50-percentile)	\$188	\$174	-\$14	0.93X	-7%	\$214	\$26	1.14X	14%	\$212	\$25	1.13X	13%
Detached (medium tier, average)	\$201	\$174	-\$27	0.87X	-13%	\$214	\$12	1.06X	6%	\$212	\$11	1.06X	6%
Detached (medium tier, 75-percentile)	\$240	\$174	-\$66	0.73X	-27%	\$214	-\$26	0.89X	-11%	\$212	-\$27	0.89X	-11%
Detached (large tier, 90-percentile)	\$325	\$174	-\$151	0.54X	-46%	\$214	-\$111	0.66X	-34%	\$319	-\$6	0.98X	-2%
Semi-Detached (average)	\$120	\$174	\$54	1.44X	44%	\$128	\$8	1.06X	6%	\$127	\$7	1.06X	6%
Multi-Unit Residential													
Duplex (average)	\$179	\$348	\$169	1.95X	95%	\$214	\$35	1.19X	19%	\$212	\$33	1.19X	19%
Triplex (average)	\$161	\$522	\$361	3.24X	224%	\$192	\$31	1.19X	19%	\$191	\$30	1.19X	19%
4-Plex (average)	\$230	\$696	\$466	3.03X	203%	\$256	\$27	1.12X	12%	\$255	\$25	1.11X	11%
5-Plex (average)	\$202	\$870	\$668	4.31X	331%	\$320	\$119	1.59X	59%	\$319	\$117	1.58X	58%
6-Plex (average)	\$322	\$1,044	\$722	3.24X	224%	\$513	\$190	1.59X	59%	\$510	\$187	1.58X	58%
7+ Unit Apartments (average)	\$3,799	\$3,811	\$11	1X	0%	\$1,880	-\$1,920	0.49X	-51%	\$1,869	-\$1,930	0.49X	-51%
Condominium (average)	\$188	\$174	-\$14	0.93X	-7%	\$43	-\$145	0.23X	-77%	\$42	-\$145	0.23X	-77%
Townhouse (average)	\$94	\$174	\$80	1.85X	85%	\$107	\$13	1.13X	13%	\$106	\$12	1.13X	13%
Non-Residential													
Farm (average)	\$39	\$1,235	\$1,196	31.73X	3073%	\$1,239	\$1,200	31.82X	3082%	\$1,232	\$1,193	31.64X	3064%
Commercial (average)	\$807	\$800	-\$6	0.99X	-1%	\$812	\$5	1.01X	1%	\$807	\$0	1X	0%
Industrial (average)	\$990	\$2,227	\$1,237	2.25X	125%	\$2,243	\$1,253	2.27X	127%	\$2,230	\$1,240	2.25X	125%
Special/Exempt (average)	\$0	\$1,201	\$1,201	n/a	n/a	\$1,196	\$1,196	n/a	n/a	\$1,189	\$1,189	n/a	n/a
Example Non-Residential Properties													
Shopping centre (Fort William Road)	\$202,302	\$79,222	-\$123,080	0.39X	-61%	\$79,609	-\$122,694	0.39X	-61%	\$79,161	-\$123,141	0.39X	-61%
Shopping centre (River Street)	\$16,988	\$15,538	-\$1,450	0.91X	-9%	\$15,614	-\$1,374	0.92X	-8%	\$15,526	-\$1,462	0.91X	-9%
Retail complex 1 (Memorial Avenue)	\$10,734	\$15,173	\$4,439	1.41X	41%	\$15,230	\$4,496	1.42X	42%	\$15,144	\$4,411	1.41X	41%
Retirement home (Arundel Street)	\$11,347	\$7,882	-\$3,465	0.69X	-31%	\$7,925	-\$3,422	0.7X	-30%	\$7,880	-\$3,467	0.69X	-31%
Retail complex 2 (Memorial Avenue)	\$9,175	\$5,951	-\$3,224	0.65X	-35%	\$5,981	-\$3,194	0.65X	-35%	\$5,947	-\$3,228	0.65X	-35%
Restaurant (Highway 61)	\$865	\$4,298	\$3,433	4.97X	397%	\$4,315	\$3,450	4.99X	399%	\$4,290	\$3,426	4.96X	396%
Retail (Memorial Avenue)	\$3,617	\$3,567	-\$50	0.99X	-1%	\$3,588	-\$29	0.99X	-1%	\$3,568	-\$49	0.99X	-1%
Athletic club (Egan Street)	\$612	\$2,366	\$1,755	3.87X	287%	\$2,371	\$1,759	3.88X	288%	\$2,358	\$1,746	3.85X	285%
Medical office (Barton Street)	\$2,109	\$2,192	\$83	1.04X	4%	\$2,221	\$112	1.05X	5%	\$2,209	\$100	1.05X	5%
Commercial (Arthur Street)	\$3,397	\$2,140	-\$1,257	0.63X	-37%	\$2,157	-\$1,240	0.64X	-36%	\$2,145	-\$1,252	0.63X	-37%
Law office (Alloy Drive)	\$2,721	\$1,949	-\$772	0.72X	-28%	\$1,965	-\$756	0.72X	-28%	\$1,954	-\$767	0.72X	-28%
Commercial (Cumberland Street)	\$2,134	\$1,931	-\$203	0.9X	-10%	\$1,944	-\$190	0.91X	-9%	\$1,933	-\$201	0.91X	-9%
Retail (Cumberland Street)	\$594	\$1,566	\$972	2.64X	164%	\$1,581	\$987	2.66X	166%	\$1,572	\$978	2.65X	165%
Medical office (Archibald Street)	\$286	\$592	\$306	2.07X	107%	\$598	\$313	2.09X	109%	\$595	\$309	2.08X	108%
Dentistry office (Edward Street)	\$234	\$209	-\$25	0.89X	-11%	\$192	-\$41	0.82X	-18%	\$191	-\$43	0.82X	-18%
Industrial (waterfront)	\$3,423	\$44,022	\$40,599	12.86X	1186%	\$44,237	\$40,813	12.92X	1192%	\$43,988	\$40,565	12.85X	1185%
Warehouse (Lithium Drive)	\$8,266	\$20,741	\$12,475	2.51X	151%	\$20,826	\$12,560	2.52X	152%	\$20,709	\$12,443	2.51X	151%
Warehouse (Rossllyn Road)	\$2,349	\$7,169	\$4,819	3.05X	205%	\$7,198	\$4,849	3.06X	206%	\$7,158	\$4,808	3.05X	205%
Industrial (Bare Point Road)	\$859	\$4,385	\$3,526	5.11X	411%	\$4,400	\$3,541	5.12X	412%	\$4,375	\$3,517	5.09X	409%
Industrial mall (Gorham Street)	\$687	\$1,827	\$1,140	2.66X	166%	\$1,837	\$1,150	2.67X	167%	\$1,827	\$1,139	2.66X	166%
College (Nakina Drive)	\$5,118	\$101,929	\$96,811	19.92X	1892%	\$102,400	\$97,282	20.01X	1901%	\$101,825	\$96,707	19.9X	1890%
Non-profit office (Amelia Street)	\$255	\$1,079	\$824	4.23X	323%	\$1,089	\$835	4.28X	328%	\$1,083	\$828	4.25X	325%
Non-profit office (Algoma Street)	\$399	\$922	\$523	2.31X	131%	\$918	\$519	2.3X	130%	\$913	\$514	2.29X	129%
Place of worship (Sprague Street)	\$6	\$1,444	\$1,439	254.38X	25338%	\$1,452	\$1,447	255.84X	25484%	\$1,444	\$1,439	254.4X	25340%
Public school (High Street)	\$40	\$10,614	\$10,574	262.7X	26170%	\$10,659	\$10,618	263.81X	26281%	\$10,599	\$10,558	262.32X	26132%
Public school (Sherbrooke Street)	\$16	\$5,359	\$5,343	328.18X	32718%	\$5,383	\$5,366	329.62X	32862%	\$5,352	\$5,336	327.77X	32677%

**EXTRA SLIDES IF NEEDED --
DO NOT PRINT HANDOUTS**



Address_code: URB
Prop Code: 601
Description: Post secondary education - university, community college, etc.

SW Class: Nonresidential
Total Impervious Area m²: 145,271.6



Description: Restaurant - conventional

SW Class: Nonresidential
Total Impervious Area m²: 6,132.1



Description: Small Office building (generally single tenant or owner occupied under 7,500 s.f.)
SW Class: Nonresidential
Total Impervious Area m²: 1,535.4



Description: Single family detached (not on water)

SW Class: Res SFH
Total Impervious Area m²: 155.8
ERU: 1.0
SFU: 1.0
SFU Tiered: .53



PC Description: Single family detached
(not on water)

SW Class: Res SFH
Total Impervious Area m²: 313.2
ERU: 1.0
SFU: 1.0
SFU Tiered: 1.00



PC Description: Single family detached
(not on water)

SW Class: Res SFH

Total Impervious Area m²: 698.6

ERU: 1.0

SFU: 1.0

SFU Tiered: 1.55



Technical Analysis – Parcel Analysis

Urban and Rural Distribution

Land Use	Number of Parcels	City Wide			
		RU	URB	UNK	DU
Residential SFH	33,306	4392	28281	633	33,306
Residential Semi Detached	1,401	0	1400	1	1,401
Residential Duplex	927	9	875	43	1,854
Residential Tri-plex	347	0	343	4	1,041
Residential Quad-plex	197	1	190	6	788
Residential Five-plex	54	0	54	0	270
Residential Six-plex	95	0	94	1	570
Residential Condominium	46	1	39	6	1,828
Residential Townhouse	330	0	329	1	330
Residential Multifamily	265	0	224	41	5,811
Residential Mobile Home Park	4	4	0	0	219
	36,972	4407	31829	736	47,418
Nonresidential estimate	4,258	196	2427	1635	
Miscellaneous/mixed use	479	108	328	43	
Undeveloped	3,604	741	1213	1650	
	8,341	1045	3968	3328	
	45,313	5,452	35,797	4,064	

Appendix D

**Stormwater Advisory Committee
Meeting #3A**



Minutes of Meeting #3A

Date of Meeting: November 19, 2018
Start Time: 9:30 a.m.
Location: Victoriaville Civic Centre

1. Overview

On Monday, November 19th, from 9:30 a.m. to 12:30 p.m., the City of Thunder Bay, with support from AECOM, hosted the Stormwater Advisory Committee (SAC) meeting #3 for the Stormwater Financing Study. The purpose of the SAC is to provide organizations representing a broad range of interests with the opportunity to learn about and provide input into the study. This third meeting provided a recap of the study and funding options under consideration, a summary of technical work done to assess these funding options, and a discussion about draft evaluation criteria.

Eight (8) members were present, along with four (4) City staff and two (2) from the AECOM consultant team.

The format of the meeting included a presentation with Q&A, followed by an open discussion and review of the evaluation matrix. The minutes below outline the questions, comments and feedback received during the SAC meeting.

2. Attending

Organization	Name
Resident	Valerie Cameron
Lakehead Region Conservation Authority	Tammy Cook
Zanette Realty	Robert Zanette
Lakehead Region Conservation Authority	Gail Willis
Red Sky Métis Independent Nation	Kayla Searle
Eco Superior	Will Vander Ploeg
Confederation College	Sandra Stiles
Thunder Bay Community Economic Development Commission	Jessi Ruberto
City of Thunder Bay	Chantal Harris
City of Thunder Bay	Kathleen Cannon
City of Thunder Bay	Aaron Ward
City of Thunder Bay	Jana Roy
AECOM	Mike Gregory
AECOM	Pippy Warburton

3. Previous Meeting Minutes Review

Previous meeting minutes were reviewed and comments/questions were solicited. SAC #2 meeting provided a recap of the study and funding options under consideration, as well as a summary of technical work done to assess the funding options.

4. Introduction and Presentation

Aaron Ward (City of Thunder Bay) opened the meeting and invited all attendees to introduce themselves and the organization that they represented. Pippy Warburton (AECOM) followed with a study overview and schedule, and Mike Gregory (AECOM) followed with the technical / financial analysis and findings.

5. Q&A

Throughout the presentation, questions were addressed and comments received. Key discussion items during the meeting are summarized below. Questions are noted with a “Q”, answers with “A”, comments with a “C” and responses with an “R”.

C1: The BMA Management Consulting Inc. taxation report suggested Thunder Bay property taxes were higher than the average among Northern Ontario communities. In fact, p. 314 residential comparison places Thunder Bay in the ‘High’ category. High taxes were also an issue during the municipal election.

C2: It was noted that taxes were also high for commercial properties.

R1 / R2: Out of the current funding sources – general tax, grants, Sewage & Drainage Levy, and the sewer surcharge rate – tax-exempt properties pay the latter item. The City of Thunder Bay only collects taxes from properties within the corporate municipal boundary. Unorganized communities pay directly to the province.

Aaron (City of Thunder Bay) commented on the rural versus urban taxation area: 26% of general tax revenue for stormwater is spent in rural areas, whereas only 13% of the general tax revenue for stormwater is generated by rural properties. The expenditure / collection ratio is further diluted by the large rural coverage area (approximately 240km² of rural area and over 200km of rural roads).

Q1: How confident are you that \$12.1 million a year is the target service level?

A1: Aaron (City of Thunder Bay) replied by breaking down the cost items (capital, maintenance, repair / replacement, and new assets) as determined in the Asset Management and Stormwater Management Plans (SWM Plan).



In general, the SWM Plan calls for a +/- \$6 million increase in stormwater expenditures beyond what was spent in 2018. This is generally broken down as follows:

- \$4.5 million increase in annual capital expenditures.
 - o An annual \$3.3 million capital funding gap is identified to replace our existing infrastructure.
 - o \$1.2 million would be for “new” stormwater works and facilities. The SWM Plan identified over \$116 million dollars of “new” facilities.
- \$1 million increase in annual operation and maintenance expenditures, including monitoring programs and rebate (incentive) programs.
- \$0.5 million increase in studies, modeling, updating asset inventories, etc.

The Project Team led a discussion about how co-funding / grant applications are now beginning to require climate adaptation plans as well as increased involvement by the insurance industry, new pending legislation and design standards. Flooding is not only trending as the highest form of natural disaster (in terms of claimable insurance payouts), but lack of homeowner coverage leads to increased stress. These are all examples of the intangibles and benefits of a self-sustaining and dedicated funding mechanism, and it is wise to consider not just the annual tax bills but factor in insurance costs when determining impacts of a new funding source. Aaron mentioned the future insurance industry outlook from the “Intact Insurance Center”, suggesting that municipalities that can demonstrate flood resiliency may be able to leverage lower home insurance premiums.

C3: There needs to be more explanation of why we need this ‘required amount’ in moving ahead with the next round of public consultation.

C4: We should highlight the Asset Management Plan mandate and sustainable funding suggestion.

Q2: Can you explain the segregation of funds in a user fee – also known as a stormwater utility?

A2: All revenue generated by the user fee must be spent on stormwater program costs and cannot be diverted to another City expense, i.e., stormwater funds generated through a user fee cannot be used for a road widening project, they must be spent on stormwater works.

The Project Team facilitated a discussion on how better stormwater management practices and behaviors can be effectively improved through education of landowners. The common misconception is that stormwater is conveyed to the wastewater treatment



plant for pollutant removal, whereas it is mostly discharged directly into the lake and rivers, untreated. Education initiatives can include stronger communication campaigns, but also through targeted messaging at schools. Kids can then bring the message home, allowing parents to reflect on the repercussions / impacts on downstream receiving waters.

6. Evaluation Matrix

A draft evaluation matrix and draft evaluation criteria guideline – featuring a range of criteria with which to compare/ evaluate the various funding options – was presented and reviewed. To identify the preferred weighting of each criterion, the group voted and assigned a number of one (1) to five (5) (with five (5) being the most important), and then weighted each criterion a second time against each option in terms of whether the option meets the criteria, somewhat meets the criteria or doesn't really meet the criteria. Based off this initial conversation, Option 4 'Tiered Single Family Unit User Fee' was given the most points (see results next page).

The group agreed to reconvene within the next couple of weeks to continue a discussion on the evaluation matrix as the consultant team would expand on the evaluation criteria guideline document. A template spreadsheet will be sent to SAC members in advance of the discussion.

7. Meeting Adjournment

Following the presentation, the SAC members were thanked for their attendance and feedback into the study so far. SAC members were asked to provide feedback and their draft evaluation matrix by November 30th, 2018, and agreed to meet again in person to review this. The next SAC meeting is scheduled for Monday, December 10th at 12:00pm EST.

No further comments or questions were raised. The meeting was adjourned at 12:00 p.m.



Preliminary Evaluation Matrix Results

EVALUATION Meets Criteria = 3 Somewhat Meets Criteria = 2 Doesn't Really Meet Criteria = 1												
Criteria	1	2	3	4	5	Weight	Option 1 Property Tax (current Sewage & Drainage tax levy)	Option 2 Equivalent Residential Unit (ERU) User Fee	Option 3 Single Family Unit (SFU) User Fee	Option 4 Tiered Single Family Unit (Tiered SFU) User Fee	Option 5 Property Tax (with urban/rural Sewage & Drainage levies)	Option 6 User Fee (with urban/rural base charges)
1.City-Wide Applicability			3	2	2	27	2	3	3	3	3	
2.Meets Entire Revenue Needs	1		3	3		22	3	3	3	3	3	
3.Fair & Equitable Allocation			2	2	4	34	1	1	2	3	1	
4.Dedicated & Long-Term Funding Source			2	3	3	33	1	3	3	3	2	
5.Effort / Cost to Administrate	2	2	1		1	14	3	2	2	1	2	
6. Accountability to Public			2	3	2	28	1	3	3	3	2	
7.Environmental Benefits			1	2	3	26	1	3	3	3	1	
8.Social Benefits			3	2	1	22	1	2	2	3	2	
EVALUATION							20	38	42	46	27	0

Stormwater Funding Options – Suggested Evaluation Criteria

The following evaluation criteria might be used to identify a preferred funding option:

- 1) City-Wide Applicability: This category indicates the geographical extent that a funding option can be applied.
 - a. A desirable funding option would apply City-wide.
 - b. An undesirable funding option would be restricted to certain locations within the City.

- 2) Meets Entire Revenue Needs: This category indicates whether or not the funding method satisfies the revenue requirements of the stormwater program.
 - a. A desirable funding option would fully fund the City’s priority capital improvement projects, operations and maintenance activities, engineering/support, and overall administration of the program.
 - b. An undesirable funding option would only partially fund the program.

- 3) Fair & Equitable Allocation: This category indicates whether or not the funding method charges the property owner according to individual contribution to the stormwater program expenditures.
 - a. A desirable funding option would allocate costs in a systematic and consistent manner that represents the relative contribution of stormwater runoff and pollutant loading.
 - b. An undesirable funding option would allocate costs in a haphazard or inconsistent manner that does not reflect individual contributions to the City’s stormwater management system.

- 4) Dedicated & Long-Term Funding Source: This category identifies those options where funds are dedicated solely to stormwater program expenditures and in a sustainable manner.
 - a. A desirable funding option would be fully dedicated to the needs of the stormwater program, able to endure highly variable cost fluctuations over a long-term timeframe.
 - b. An undesirable funding option would authorize a fixed funding envelope for a single budget year.

- 5) Effort to Administrate: This category identifies the relative effort and resources (low, medium, or high) for City staff to administer and manage the funding option.
 - a. A desirable funding option would result in low administrative costs.
 - b. An undesirable funding option would result in high administrative costs.

- 6) Public Accountability: This category helps to define the relative scale to which stormwater program expenditures and revenue are monitored and communicated.

- a. A desirable funding option would continually monitor its financial position (including costs incurred and income earned on a frequent basis), and it would also report these at a high level of detail and in a transparent and easily accessible manner.
 - b. An undesirable funding option would only report the minimum required financial data (e.g., a budget summary table in the appendix of a Council report).
- 7) Environmental Benefits: This category identifies the relative scale of environmental benefits provided by the funding option.
- a. A desirable funding option would offer financial incentives to those property owners who reduce their stormwater runoff and pollutant loads on-site, or otherwise promote good housekeeping practices or environmental stewardship initiatives.
 - b. An undesirable funding option would not motivate property owners to reduce the amount of stormwater that they discharge into the City’s stormwater management system.
- 8) Social Benefits: This category identifies the relative scale of social benefits provided by the funding option. This is highly subjective as it is meant to focus on the collective good of the community rather than individual or private interests and may therefore involve a wide range of value systems and worldviews. In a general context, socially beneficial options would inspire citizens and business owners to act in the best interests of society to protect against risks to public health, safety, and welfare or otherwise have a positive influence on the quality of life (e.g., developing a reputation as good societal stewards, improving community pride, or engaging people in awareness/outreach of social causes).
- a. One opinion of a funding option that provides high social benefit is a mechanism that minimizes the use of tax funds for stormwater services (e.g., moving it off the tax base onto a user fee), thereby leaving more available tax funds to support health/safety, law enforcement, or other public service needs.

City of Thunder Bay Stormwater Financing Study



Stormwater Advisory Committee
Meeting #3
November 19, 2018

Project Manager: Aaron Ward, P.Eng.
Consultant Team: Pippy Warburton P.Eng. and
Mike Gregory, P.Eng.



Meeting Purpose and Objectives

- Recap previous meeting information – answer questions.
- Inform about work that has been undertaken since previous meetings
- Advise on current project status / schedule
- Update on community engagement
- Discuss draft evaluation criteria
- Present technical analysis work results and preferred option
- Seek feedback on recommendations and preferred option
- Describe next steps in the study process

Study Overview

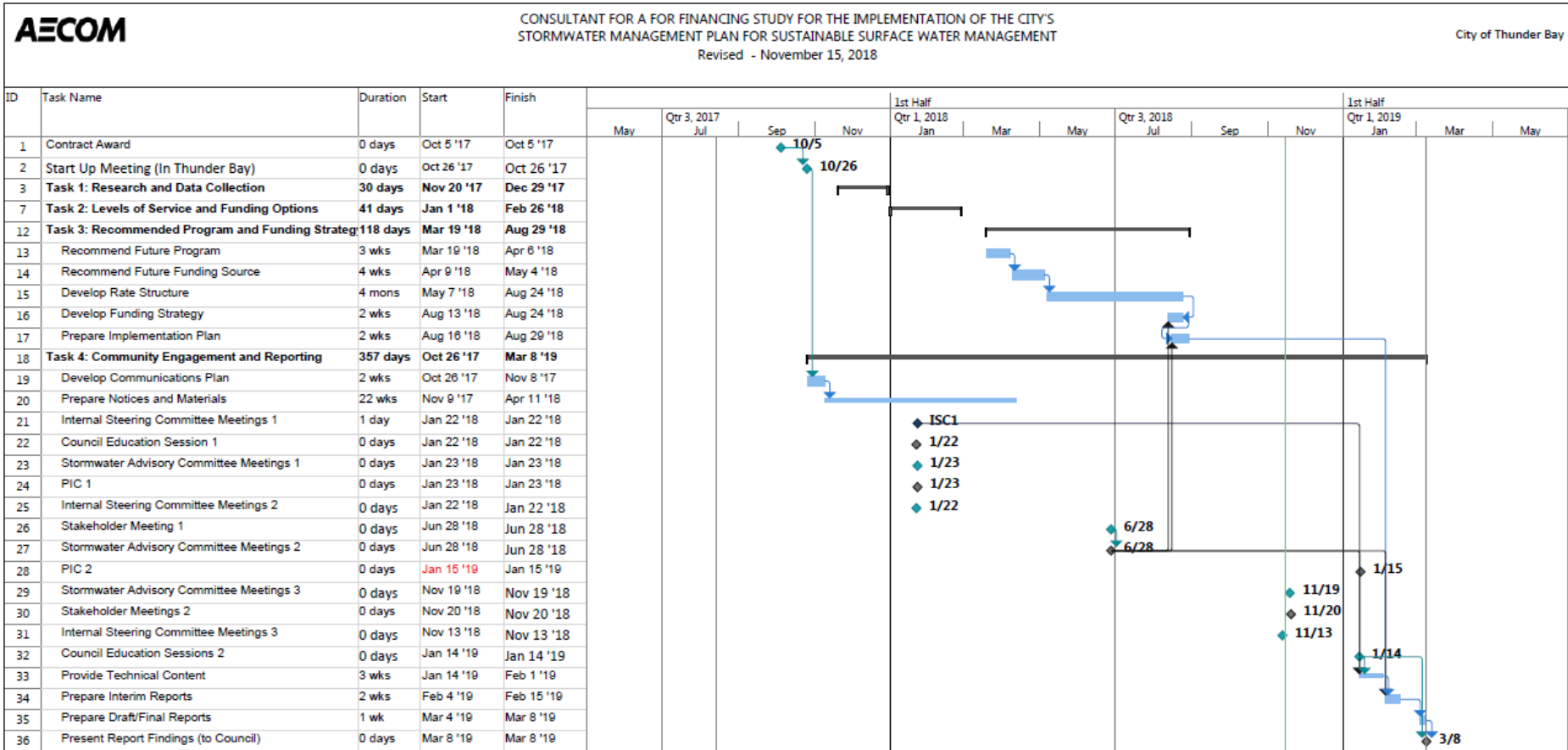


Stormwater Financing Study Overview

1. Determine the appropriate and affordable level of service for future stormwater program projects and activities
2. Identify and evaluate funding options and alternatives
3. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
4. Recommend a preferred option and determine the impacts compared to current funding sources
5. Present project findings and study recommendations to Council in early 2019



Current Schedule & Project Status





Summary of Previous Meetings

- SAC Meeting #1: January, 2018
- Open House #1: January, 2018
- SAC Meeting #2: June, 2018
- SAC Meeting #3: **Today**

Are there additional comments or questions since last meeting?

Community Engagement

On-Going Community Engagement

- Councillor Ward Meetings
 - Attended 5 Ward meetings after first PIC; approximately 90 people in attendance
- Stormwater Advisory Committee Meetings (x3)
- PIC #1 on Tuesday, January 23, 2018
 - 56 participants; 131 comment forms: 108 online and 23 in-person
- One-on-One Stakeholder Meetings (starting this week & on-going)

Review Previous Minutes & Draft Evaluation Criteria

Review Previous Minutes Draft Evaluation Criteria

1. City-Wide Applicability
2. Meets Entire Revenue Needs
3. Fair & Equitable Allocation
4. Dedicated & Long-Term Funding Source
5. Effort to Administrate
6. Public Accountability
7. Environmental Benefits
8. Social Benefits

How would the Advisory Committee like to see and weight these (i.e. matrix table?)

Any other criteria?

Let's "park this" until after we review the updates...

Technical Analysis Update & Overview

SAC #1 Meeting Overview

- Reintroduced stormwater management
- Revisited the 2016 Stormwater Management Plan, the 2016 Asset Management Plan, and the City's long-term stormwater management goals
- Introduced the financing study
- Provided information about Thunder Bay's current stormwater program and funding sources
- Identified future needs and potential alternative funding sources
- Sought feedback on stormwater management financing issues and concerns

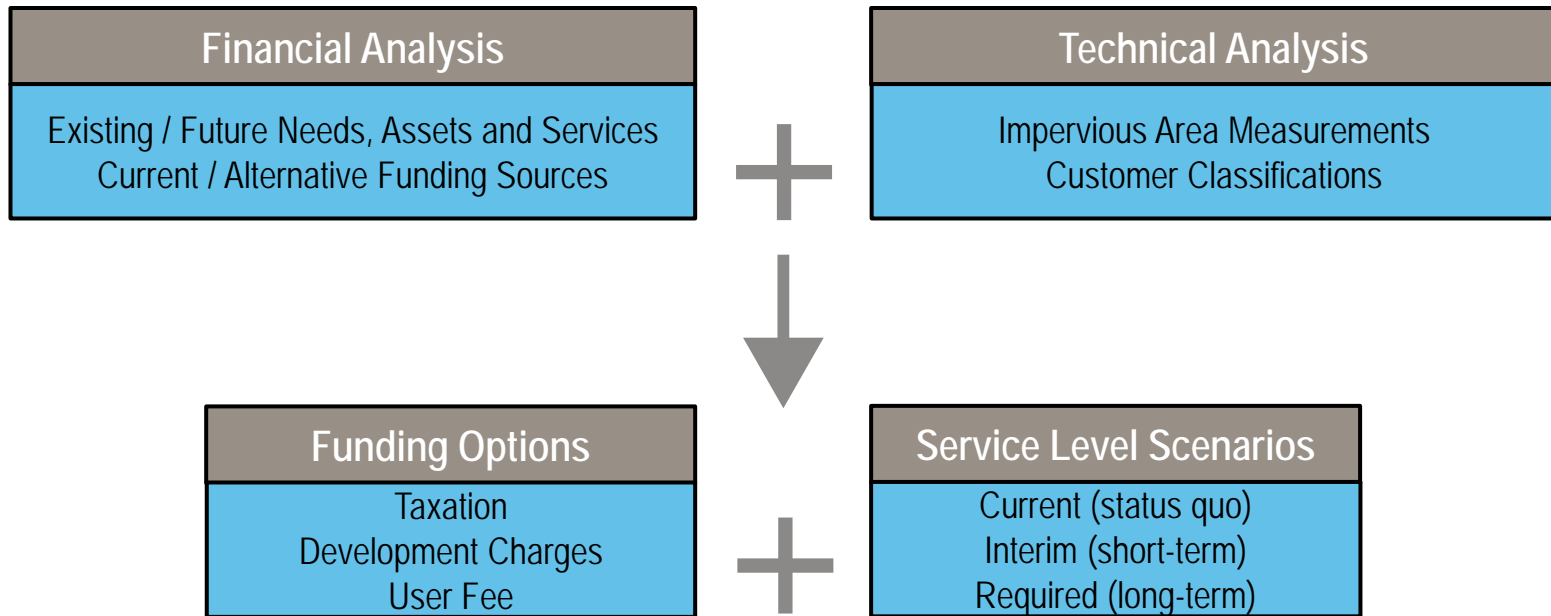


SAC #2 Meeting Overview

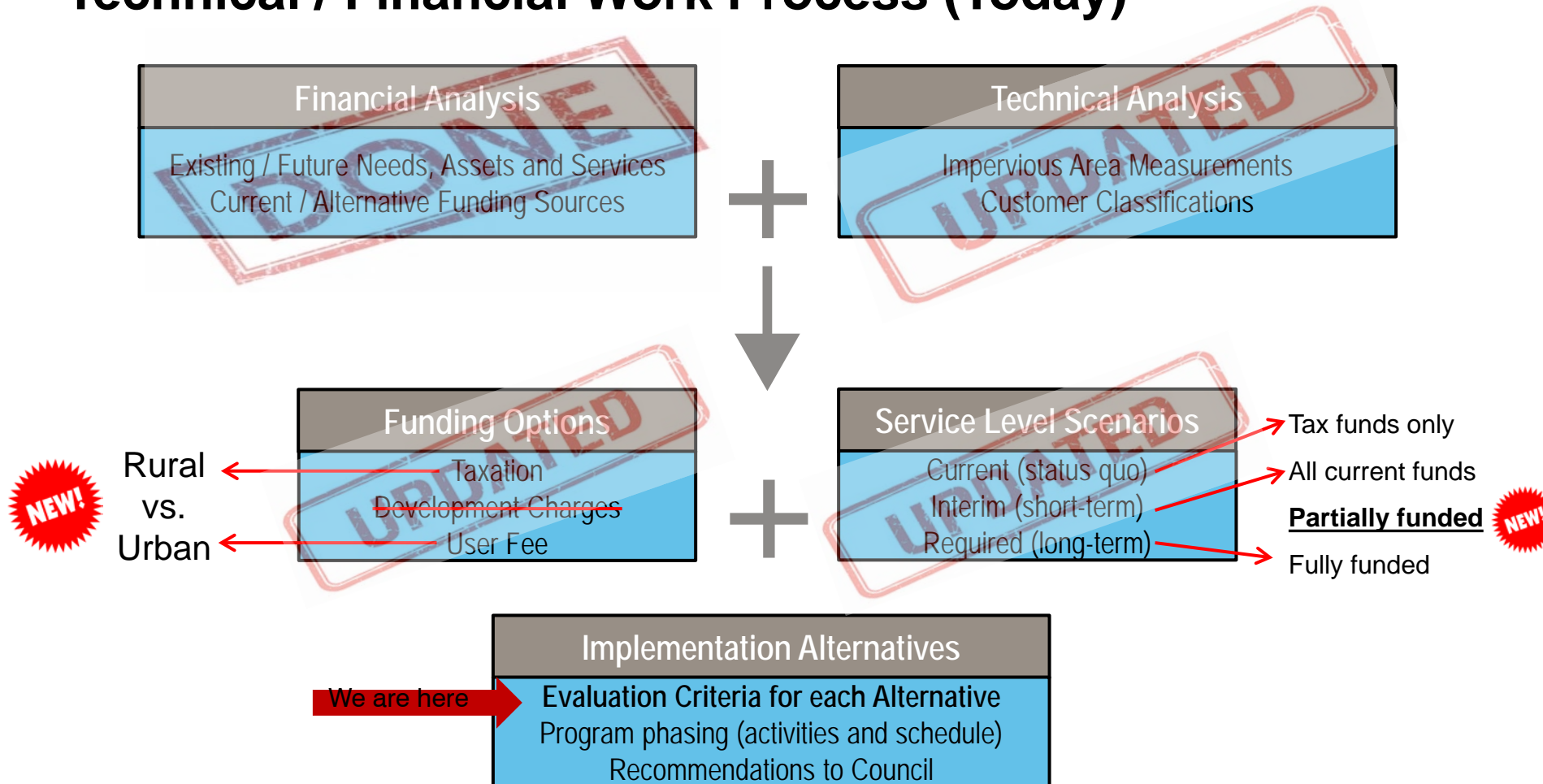
- Informed about work & additional outreach efforts that have taken place since SAC #1
- Advised on current project status / schedule
- Discussed financial / technical analysis updates
- Presented impacts of preliminary alternative funding options
- Sought feedback on stormwater management financing issues and concerns



Technical / Financial Work Process (SAC #2)



Technical / Financial Work Process (Today)





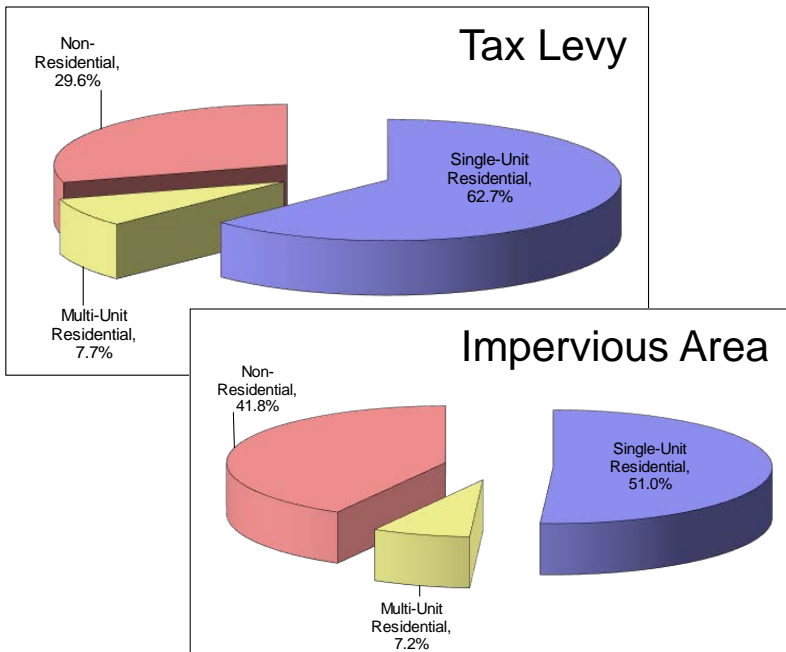
Parcel Analysis – Updated (no more “unknown” parcels)

Parcel Type	Number of Parcels		Dwelling Units (d.u.)		Estimated Impervious Area (m ²)		
	Count	%	Count	%	Total	%	Avg/d.u.
Single-Family Detached	32,679	73.8%	32,679	69.5%	9,885,400	49.2%	302.5
Semi-Detached	1,407	3.2%	1,407	3.0%	242,000	1.2%	172.0
Duplex	1,012	2.3%	2,024	4.3%	281,700	1.4%	139.2
Triplex	346	0.8%	1,038	2.2%	93,000	0.5%	89.6
4-Plex	195	0.4%	780	1.7%	76,100	0.4%	97.5
5-Plex	56	0.1%	280	0.6%	21,800	0.1%	77.7
6-Plex	99	0.2%	594	1.3%	70,600	0.4%	118.9
7+ Unit Apartments	246	0.6%	5,811	12.4%	702,500	3.5%	120.9
Condominium	1,829	4.1%	1,829	3.9%	134,800	0.7%	73.7
Townhouse	330	0.7%	330	0.7%	45,200	0.2%	137.1
Mobile Home Park	4	0.0%	218	0.5%	64,700	0.3%	296.8
Residential Subtotal	38,203	86.2%	46,990	100.0%	11,617,800	57.9%	247.2
Industrial/Comm/Institutional	3,051	6.9%	n/a		8,460,000	n/a	
Miscellaneous/Mixed Use	519	1.2%			incl. above		
Non-Residential Subtotal	3,570	8.1%			8,460,000	42.1%	
Undeveloped Subtotal	2,523	5.7%			0	0.0%	
Total	44,296	100.0%			20,077,800	100.0%	



Updated Tax Levy Values & Impervious Area Estimates

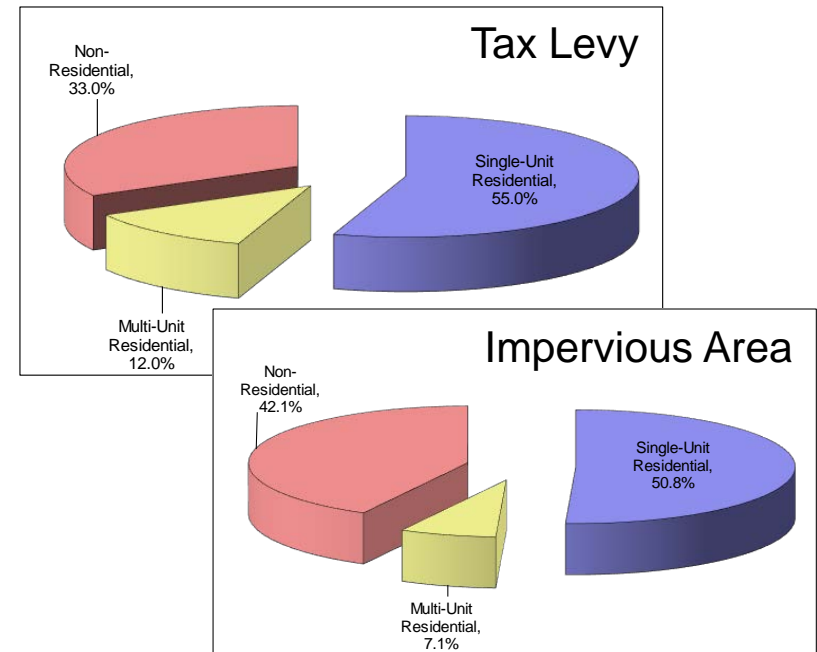
SAC #2 (based on high-level MPAC groupings) ❌



Revenue Distribution (SAC #2)

Property Type	Tax Levy Contribution	Impervious Area	Difference
Single-Unit Residential	62.7%	51.0%	-11.7%
Multi-Unit Residential	7.7%	7.2%	-0.5%
Non-Residential	29.6%	41.8%	12.2%
	100.0%	100.0%	0.0%

Updated Values (based on records for all properties) ✅

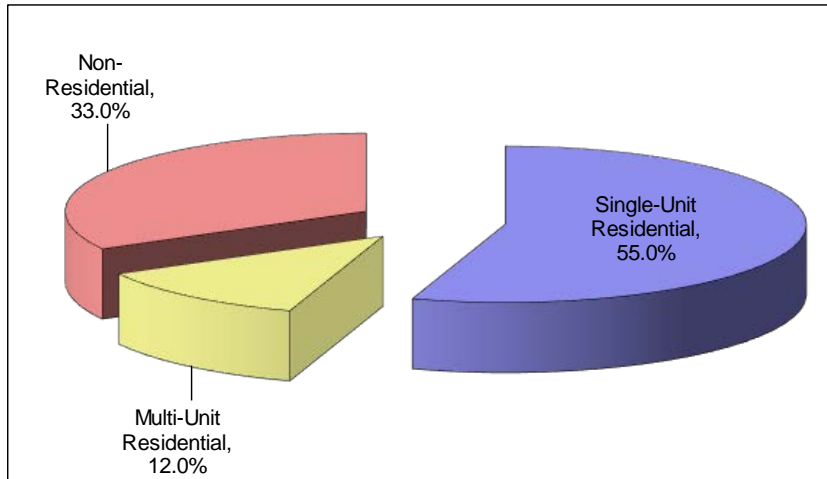


Revenue Distribution (Updated)

Property Type	Tax Levy Contribution	Impervious Area	Difference
Single-Unit Residential	55.0%	50.8%	-4.2%
Multi-Unit Residential	12.0%	7.1%	-4.9%
Non-Residential	33.0%	42.1%	9.1%
	100.0%	100.0%	0.0%

Updated Findings (summary): Source of Funding (taxes) vs. Source of Stormwater

Tax Revenue Distribution

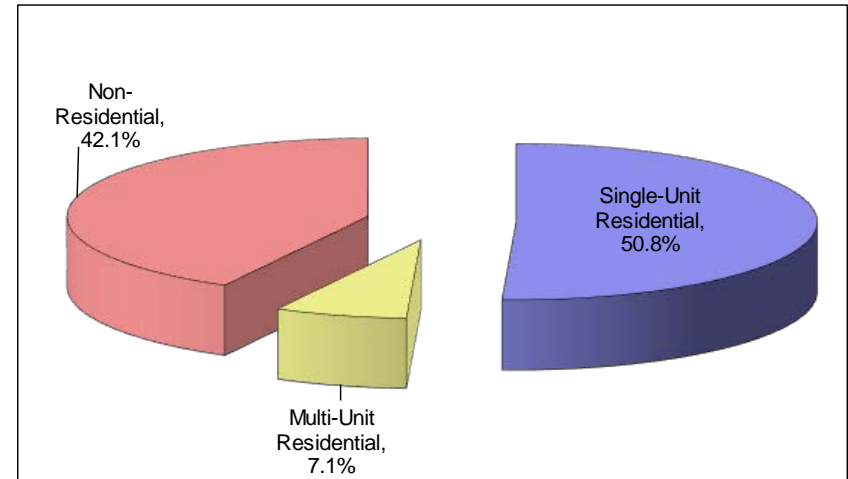


Residential = 67% of Revenue

Non-Residential = 33% of Revenue

VS

Impervious Area Distribution

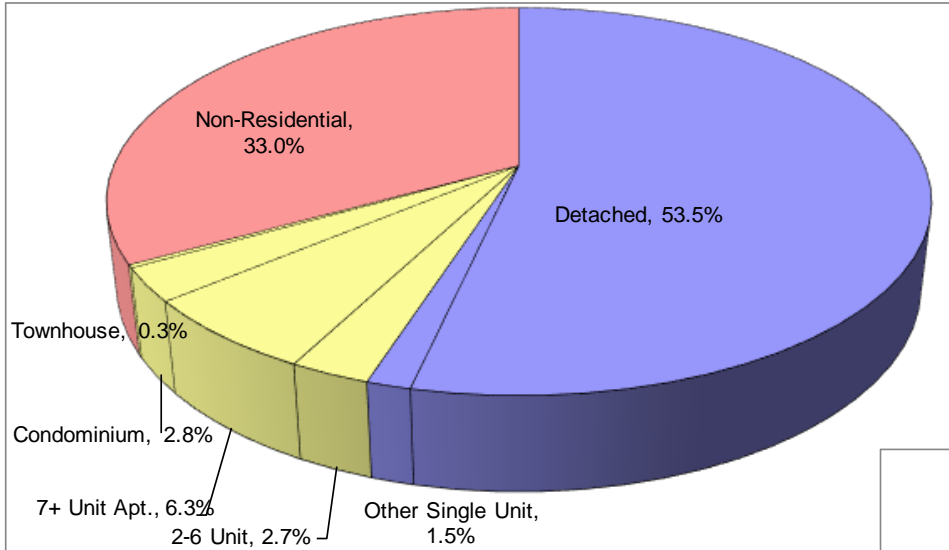


Residential = 58% of Impervious Area

Non-Residential = 42% of Impervious Area



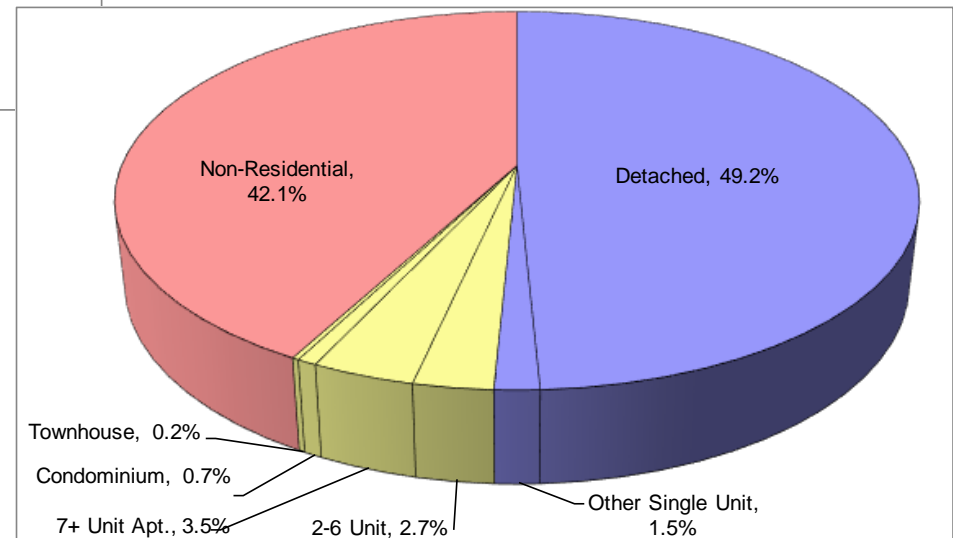
Updated Findings (detailed): Source of Funding (taxes) vs. Source of Stormwater



Tax Levy

Revenue Distribution (updated)

Category	Tax Levy Contribution	Impervious Area	Difference
Detached	53.5%	49.2%	-4.3%
Other Single Unit	1.5%	1.5%	0.1%
2-6 Unit	2.7%	2.7%	0.0%
7+ Unit Apt.	6.3%	3.5%	-2.8%
Condominium	2.8%	0.7%	-2.1%
Townhouse	0.3%	0.2%	0.0%
Non-Residential	33.0%	42.1%	9.1%
Total	100.0%	100.0%	0.0%

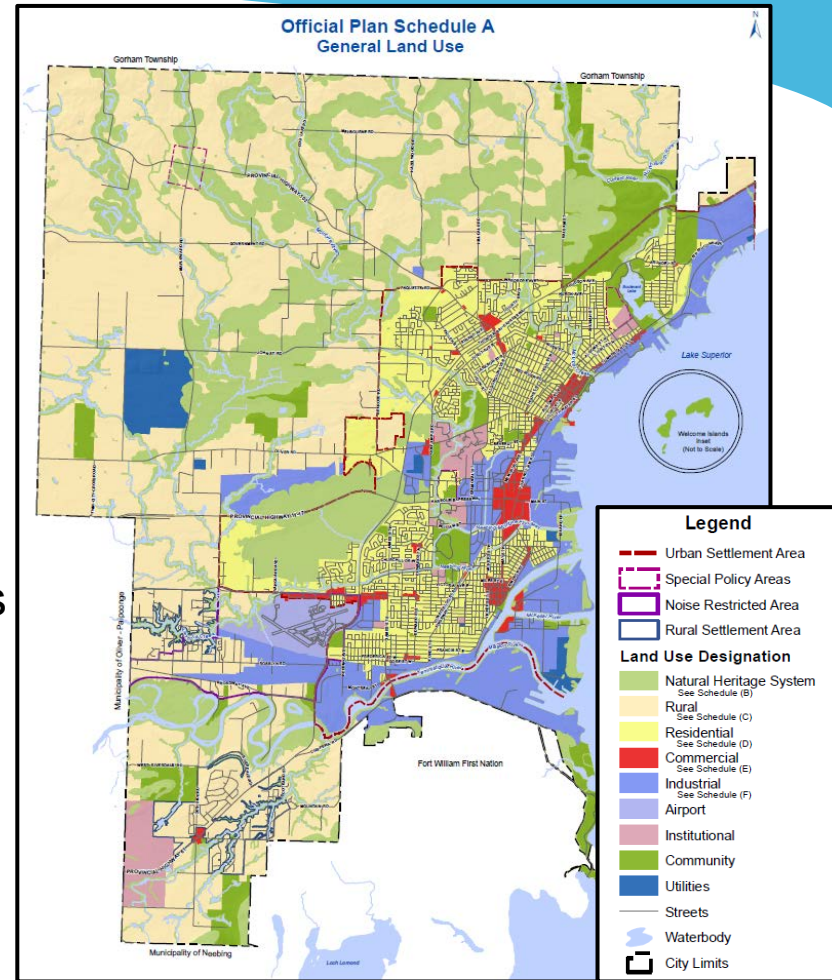


Impervious Area

Urban vs. Rural Properties

- There are many perspectives on how to categorize settlement / development...
 - Planners: zoning designation
 - Engineers: infrastructure connections
 - Property owners: connections to amenities or services received
 - Taxing authorities: building type, land use, or services provided

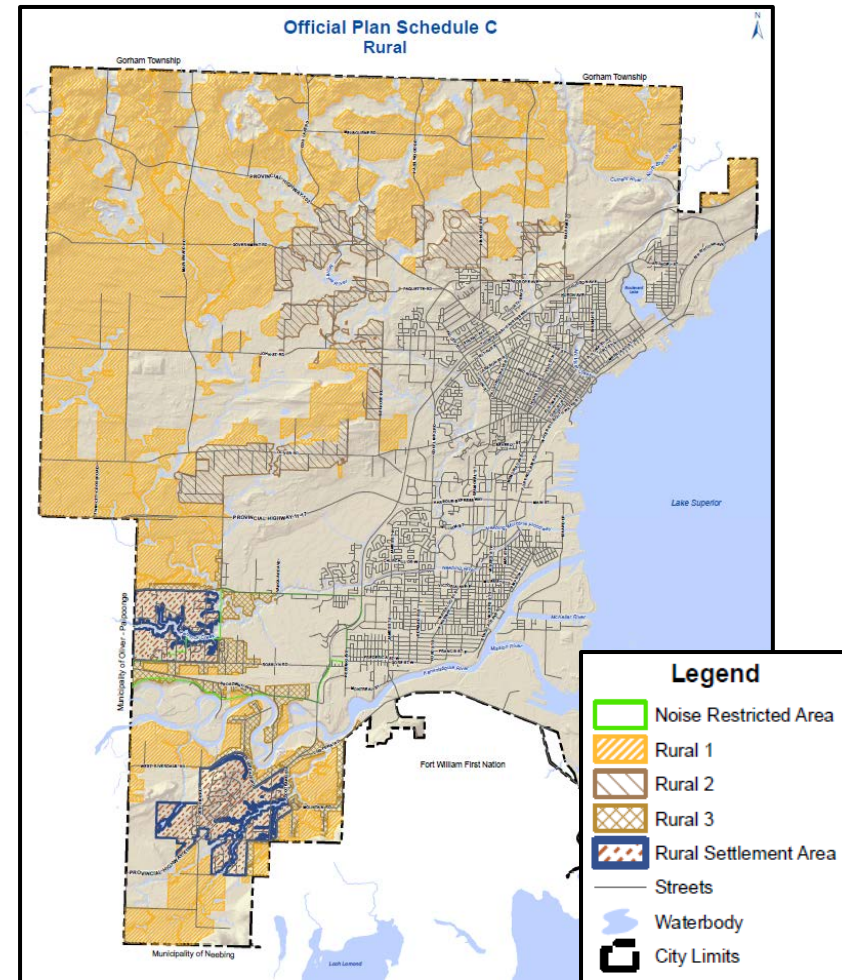
Official Plan Zoning	Municipal Tax Service Areas
Urban Settlement Areas	Urban
Rural Settlement Areas	Rural
Rural 1,2,3	Rural



		Category	Water Distribution	Sewage Collection	Drainage & Stormwater Mgmt.
Stormwater Funding	Urban	Urban	municipal service	municipal service	storm sewers & roadside drainage
		Suburban	municipal service	private septic	storm sewers
	Rural	Suburban	municipal service	private septic	roadside drainage
		Rural	private well	private septic	roadside drainage

Urban vs. Rural (Taxation)

- Urban Service Area levies
 - General Municipal
 - Education
 - Garbage Collection
 - Street Lighting
 - Sewage & Drainage
 - Public Transportation
- Rural Service Area levies
 - General Municipal
 - Education
 - Garbage Collection



Stormwater Program Costs by Service Area

– Current service level
(current budget year, tax funded):

- Urban: \$2.58M
- Rural: \$0.57M
- TOTAL: \$3.15M

– Interim service level
(current budget year, all sources):

- Urban: \$5.34M
- Rural: \$0.57M
- TOTAL: \$5.91M

– Required service level:

- Urban: \$11.25M
- Rural: \$ 0.87M
- TOTAL: \$12.12M

Stormwater Management Program Item	Current Funding Source	FY2018 Budget			
		Urban		Rural	
Operations & Maintenance					
Street Cleaning	Tax	\$305,000	100%	\$0	0%
Drainage & Flood Control	Tax	\$352,000	51%	\$334,000	49%
Catchbasins	Sewer Rate	\$443,000	100%	\$0	0%
Pump Stations	Sewer Rate	\$36,000	100%	\$0	0%
Storm Sewers	Sewer Rate	\$361,000	100%	\$0	0%
Subtotal		\$1,497,000	82%	\$334,000	18%
Capital Improvements					
Storm Sewer Separation	Sewer Rate + Grant	\$0	100%	\$0	0%
Stormwater Mgmt. Projects	Tax + Grant	\$2,915,000	98%	\$65,000	2%
Bridges & Culverts	Tax	\$25,000	100%	\$75,000	0%
Subtotal		\$2,940,000	97%	\$140,000	3%
Other					
Lakehead Region CA Levy	Tax	\$900,000	90%	\$100,000	10%
Subtotal		\$900,000	90%	\$100,000	10%
TOTAL		\$5,337,000	92%	\$574,000	8%

In summary:

- FY2018 - \$2.22M spent using General Tax Levy
- FY2018 - \$0.57M spent in “rural” areas **or 26%**

New Funding Option: Revised Stormwater Levy

- Property tax funding with separate Urban/Rural levies
 - Update (and rename) urban service area Sewage & Drainage levy
 - Add new rural service area Stormwater Management levy

Urban Service Area levies	Rural Service Area levies
– General Municipal	– General Municipal
– Education	– Education
– Garbage Collection	– Garbage Collection
– Street Lighting	– Stormwater Management
– Sewage & Drainage → Stormwater Management	
– Public Transportation	

- Thunder Bay properties by taxing status and by service area (currently):

Taxing Status	Parcels
Taxable	42,379
Tax-Exempt	1,917
Total	44,296

Service Area	Parcels	2017 CVA	2017 Tax
Urban	38,539	8,884,401,208	158,173,254
Rural	5,757	1,693,774,277	24,323,145
Total	44,296	10,578,175,485	182,496,399

13% of Tax Revenue from "Rural"

Program Cost

- Issue #1: How much money is needed?
- New Service level scenarios:
 - Current = \$3.15M (tax-funded portion of FY2018)
 - Interim = \$5.91M (all sources of FY2018 budget)
 - Partially Funded = \$9.2M (acceptable LOS – topped up with grants, as available)
 - Fully Funded = \$12.12M (identified in 2016 SMP)
- Annual Cost = Base Program + Administration
 - Tax options = \$0 (no additional Admin. costs)
 - Rate options = Admin. costs will vary



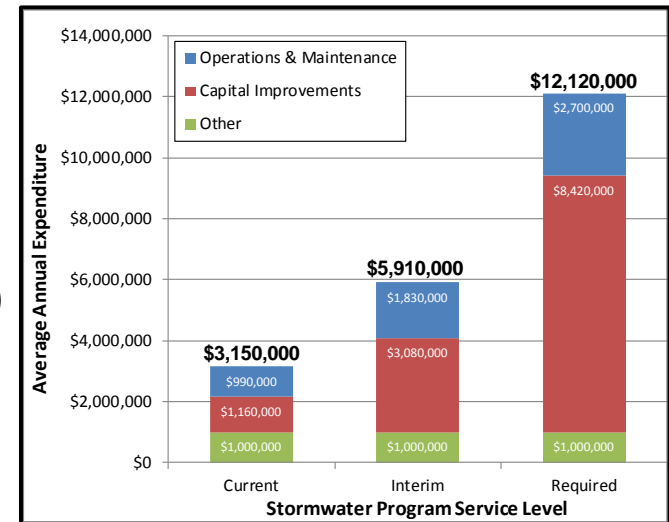
$$\text{Charge} = \frac{\text{"cost of program" (NUMERATOR)}}{\text{"customer allocation" (DENOMINATOR)}}$$

Service Level Scenarios

Current (status quo)

Interim (short-term)

Required (long-term)



Rate Administration Costs (% of Total Revenue)			
Option	Current	Interim	Required
ERU	\$180,000 5.7%	\$220,000 3.7%	\$250,000 2.1%
SFU	\$220,000 7.0%	\$260,000 4.4%	\$310,000 2.6%
Tiered SFU	\$240,000 7.6%	\$290,000 4.9%	\$340,000 2.8%



Total Program Costs (Base Monthly Charges)			
Option	Current	Interim	Required
ERU	\$3,330,000 \$4.00	\$6,130,000 \$7.30	\$12,370,000 \$14.70
SFU	\$3,370,000 \$4.90	\$6,170,000 \$9.00	\$12,430,000 \$18.10
Tiered SFU	\$3,390,000 \$4.90	\$6,200,000 \$9.00	\$12,460,000 \$18.10

Program Funding

- Issue #2: How to distribute the costs?
- Taxation
 - Changes to property tax funding
- Development Charges (for new and infill/re-development)
 - Implement DC funding program per bylaw
 - Council has been reluctant to do this in the past
- User fee
 - Adopt new stormwater user-fee bylaw
 - Implement user-fee funding program

$$Charge = \frac{\text{“cost of program” (NUMERATOR)}}{\text{“customer allocation” (DENOMINATOR)}}$$

Funding Options
Taxation
Development Charges
User Fee

Options Presented at SAC #2
1: Property Tax (current Sewage & Drainage tax levy)
2: Equivalent Residential Unit (ERU) User Fee
3: Single Family Unit (SFU) User Fee
4: Tiered Single Family Unit (Tiered SFU) User Fee

New Options
5: Property Tax (with urban/rural Sewage & Drainage levies)
6: User Fee (with urban/rural base charges)



THUNDER BAY
STORMWATER FINANCING STUDY

Discussion Pause

Tax Funding Option – Comparison Based on Statistics

Tax-Funded Program Expenditures	2017 Stormwater Management Program			Future Stormwater Management Program (Service Levels)						
				Current	Interim			Required		
Program Cost	\$4,360,000 (incl. PPCP)			\$3,150,000	\$5,910,000			\$12,120,000		
Municipal Tax Levy Allocation	1.73%			1.73%	3.24%			6.64%		
Representative Property	Taxation	Other	Total	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Single Unit Residential										
Detached (small tier, 10-percentile)	\$28	\$15	\$43	\$28	\$52	\$24	87%	\$106	\$79	284%
Detached (medium tier, 25-percentile)	\$36	\$15	\$51	\$36	\$67	\$31	87%	\$137	\$101	284%
Detached (medium tier, 50-percentile)	\$49	\$15	\$64	\$49	\$92	\$43	87%	\$188	\$139	284%
Detached (medium tier, average)	\$52	\$15	\$67	\$52	\$98	\$46	87%	\$201	\$149	284%
Detached (medium tier, 75-percentile)	\$62	\$15	\$77	\$62	\$117	\$55	87%	\$240	\$177	284%
Detached (large tier, 90-percentile)	\$85	\$15	\$100	\$85	\$158	\$74	87%	\$325	\$240	284%
Semi-Detached (average)	\$31	\$15	\$46	\$31	\$59	\$27	87%	\$120	\$89	284%
Other (average)	\$9	\$15	\$24	\$9	\$17	\$8	87%	\$34	\$25	284%
Multi-Unit Residential										
Duplex (average)	\$47	\$15	\$62	\$47	\$87	\$41	87%	\$179	\$132	284%
Triplex (average)	\$41	\$23	\$64	\$41	\$78	\$36	87%	\$159	\$118	284%
4-Plex (average)	\$60	\$30	\$90	\$60	\$112	\$52	87%	\$229	\$169	284%
5-Plex (average)	\$54	\$38	\$92	\$54	\$101	\$47	87%	\$207	\$153	284%
6-Plex (average)	\$86	\$45	\$131	\$86	\$160	\$75	87%	\$329	\$243	284%
7+ Unit Apartments (average)	\$924	\$177	\$1,101	\$924	\$1,731	\$807	87%	\$3,547	\$2,623	284%
Condominium (average)	\$48	\$15	\$63	\$48	\$90	\$42	87%	\$185	\$137	284%
Townhouse (average)	\$25	\$15	\$40	\$25	\$46	\$21	87%	\$94	\$70	284%
Non-Residential										
Non-Residential (average)	\$303	\$300	\$603	\$303	\$568	\$265	87%	\$1,164	\$861	284%
Undeveloped (average)	\$5	\$300	\$305	\$5	\$10	\$5	87%	\$20	\$15	284%
Tax/ Fee Exempt (average)	\$1	\$0	\$1	\$1	\$1	\$0	87%	\$2	\$2	284%

Other = Estimated sewer rate surcharge for Pollution Prevention Control Plan (PPCP) stormwater projects (not transferable to future funding options).

Tax Funding Option – Comparison of Actual Properties

Tax-Funded Program Expenditures	2017 Stormwater Management Program			Future Stormwater Management Program (Service Levels)						
	Current	Interim		Required						
Program Cost	\$4,360,000 (incl. PPCP)			\$3,150,000	\$5,910,000			\$12,120,000		
Municipal Tax Levy Allocation	1.73%			1.73%	3.24%			6.64%		
Representative Property	Taxation	Other	Total	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Example Non-Residential Properties										
Shopping centre (Fort William Road)	\$52,708	\$1,327	\$54,035	\$52,708	\$98,714	\$46,005	87%	\$202,302	\$149,594	284%
Shopping centre (River Street)	\$4,426	\$490	\$4,916	\$4,426	\$8,289	\$3,863	87%	\$16,988	\$12,562	284%
Retail complex 1 (Memorial Avenue)	\$2,797	\$63	\$2,859	\$2,797	\$5,237	\$2,441	87%	\$10,734	\$7,937	284%
Retirement home (Arundel Street)	\$2,956	\$398	\$3,354	\$2,956	\$5,537	\$2,580	87%	\$11,347	\$8,391	284%
Retail complex 2 (Memorial Avenue)	\$2,391	\$299	\$2,690	\$2,391	\$4,477	\$2,087	87%	\$9,175	\$6,785	284%
Restaurant (Highway 61)	\$225	\$0	\$225	\$225	\$422	\$197	87%	\$865	\$639	284%
Retail (Memorial Avenue)	\$942	\$40	\$982	\$942	\$1,765	\$823	87%	\$3,617	\$2,675	284%
Athletic club (Egan Street)	\$159	\$132	\$292	\$159	\$299	\$139	87%	\$612	\$452	284%
Medical office (Barton Street)	\$550	\$75	\$625	\$550	\$1,029	\$480	87%	\$2,109	\$1,560	284%
Commercial (Arthur Street)	\$885	\$60	\$945	\$885	\$1,658	\$773	87%	\$3,397	\$2,512	284%
Law office (Alloy Drive)	\$709	\$137	\$846	\$709	\$1,328	\$619	87%	\$2,721	\$2,012	284%
Commercial (Cumberland Street)	\$556	\$75	\$631	\$556	\$1,041	\$485	87%	\$2,134	\$1,578	284%
Retail (Cumberland Street)	\$155	\$31	\$185	\$155	\$290	\$135	87%	\$594	\$439	284%
Medical office (Archibald Street)	\$74	\$16	\$90	\$74	\$139	\$65	87%	\$286	\$211	284%
Dentistry office (Edward Street)	\$61	\$32	\$92	\$61	\$114	\$53	87%	\$234	\$173	284%
Industrial (waterfront)	\$892	\$107	\$999	\$892	\$1,670	\$778	87%	\$3,423	\$2,531	284%
Warehouse (Lithium Drive)	\$2,154	\$91	\$2,245	\$2,154	\$4,034	\$1,880	87%	\$8,266	\$6,113	284%
Warehouse (Rosslyn Road)	\$612	\$0	\$612	\$612	\$1,146	\$534	87%	\$2,349	\$1,737	284%
Industrial (Bare Point Road)	\$224	\$0	\$224	\$224	\$419	\$195	87%	\$859	\$635	284%
Industrial mall (Gorham Street)	\$179	\$39	\$218	\$179	\$335	\$156	87%	\$687	\$508	284%
College (Nakina Drive)	\$1,333	\$2,153	\$3,486	\$1,333	\$2,497	\$1,164	87%	\$5,118	\$3,785	284%
Non-profit office (Amelia Street)	\$66	\$12	\$78	\$66	\$124	\$58	87%	\$255	\$188	284%
Non-profit office (Algoma Street)	\$104	\$13	\$117	\$104	\$195	\$91	87%	\$399	\$295	284%
Place of worship (Sprague Street)	\$1	\$34	\$36	\$1	\$3	\$1	87%	\$6	\$4	284%
Public school (High Street)	\$11	\$245	\$255	\$11	\$20	\$9	87%	\$40	\$30	284%
Public school (Sherbrooke Street)	\$4	\$99	\$103	\$4	\$8	\$4	87%	\$16	\$12	284%

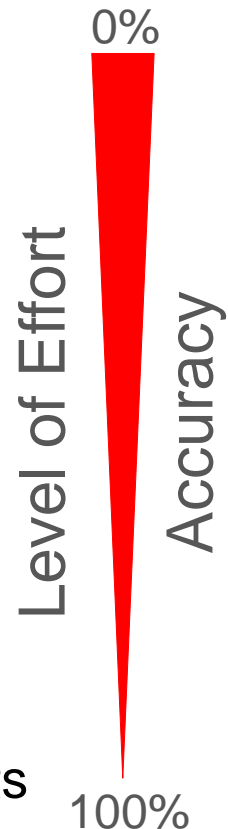
Common Stormwater Rate Methodologies

– Flat Rate

- Flat fee
- Tiered based on zoning

– Variable Rate

- Varies by lot size, development intensity, etc.
- Equivalent Residential Unit (ERU) 2-ERU
- Single Family Unit (SFU) 3-SFU
- Tiered Single Family Unit (Tiered SFU) 4-TSFU
- Tiered based on service level, geography, etc.
- Individual fee for all properties based on annual measurements



Stormwater Rate Calculation

– ERU = Equivalent Residential Unit

$$\text{Charge} = \frac{\$ \text{Expense}}{\text{Billing Units}} = \$ / \text{Month} / \text{Unit}$$
$$\text{Billing Units (ERU)} = \text{Dwelling Unit Count} + \frac{\text{Non-Residential Impervious Area}}{\text{m}^2 / \text{ERU}}$$

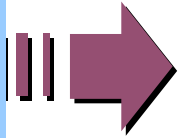
Equivalent Residential Unit (ERU)

- Single Family
- Multi-Family
- Condominiums
- Townhouses



= Base Rate (1 billing unit per residential dwelling unit)

- Governmental
- Commercial
- Institutional
- Industrial

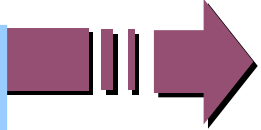


$$\frac{\text{Parcel Impervious Area}}{\text{ERU Base Area}^*} = \text{No. of Billing Units}$$

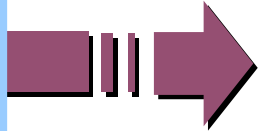
*Typical size range in Canada = 160-240 m² (1,700-2,600 ft²)

Single Family Unit (SFU)

- Single Family
- Multi-Family
- Condominiums
- Townhouses

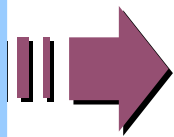


= Base Rate (1 billing unit per single-family detached home)



= Fractional billing units per residential dwelling unit

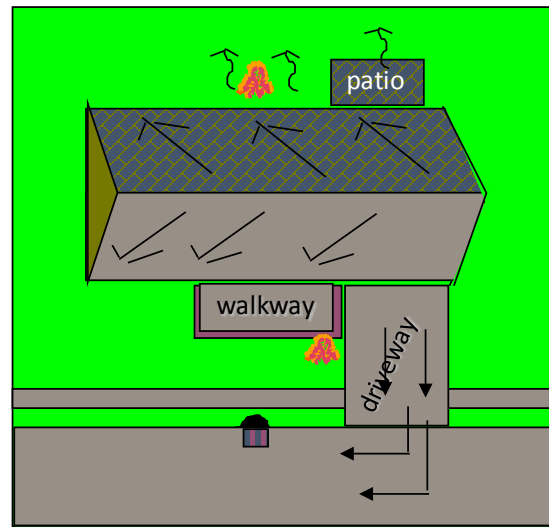
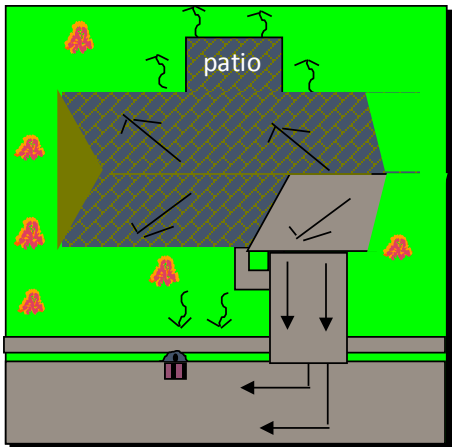
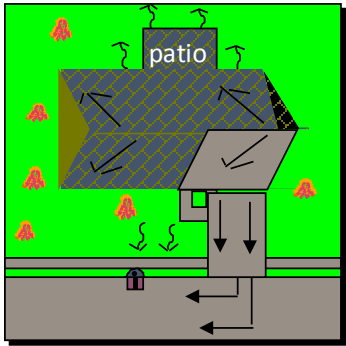
- Governmental
- Commercial
- Institutional
- Industrial



$$\frac{\text{Parcel Impervious Area}}{\text{SFU Base Area}^*} = \text{No. of Billing Units}$$

*Typical size range in Canada = 230-300 m² (2,500-3,200 ft²)

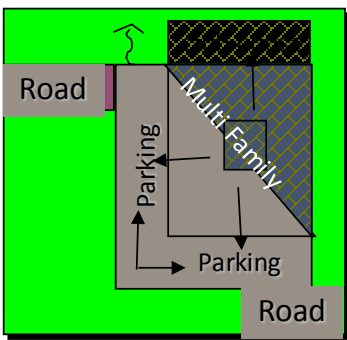
Tiered Single-Family Units



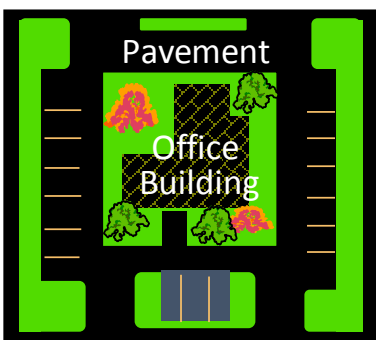
Small single-family detached
161 m² = 0.5 SFU
Lowest 10% (0-161 m²)

Medium single-family detached
303 m² = 1.0 SFU
Middle 80% (162-468 m²)

Large single-family detached
469 m² = 1.5 SFU
Highest 10% (>469 m²)



Multi-Family
1 Dwelling Unit =
0.2 - 1.0 SFU



Number of Billing Units = $\frac{\text{Non-Residential impervious area}}{\text{SFU base area}}$



Stormwater User Fee Credit Program

- Provides financial incentives by offering a reduction to the base charge for landowners who implement measures, practices, or activities on their properties
- Stormwater runoff quantity/pollutant reductions discharged into the City's stormwater system, watercourses, or waterbodies may qualify for a credit
- Credits can be cumulative for flood/erosion protection, water quality treatment, and other environmental enhancements or non-structural best practices
- Very popular with Ontario municipalities that have undertaken funding studies



Stormwater User Fee Credit Program (continued)

- Often require certification that eligible facilities have been properly designed, installed, operated, and maintained
- Property owner may be required to allow access for City staff to conduct inspections to confirm credit eligibility
- Credit programs can help to change the actions and behaviors of developers, property and business owners
- Benefits all around...
 - Reduces stormwater charge to landowner
 - Reduces runoff and pollutant loading to the municipal system and downstream watercourses/bodies
 - Creates mechanism for private property facility inspections

Example Base Charge Calculation (ERU, Interim Service)

– Credit scenarios:

- No Credits
- Full Credits: All fee-eligible properties receive maximum 50% credit
- Typical Credits: Representative of mature credit programs

Credit Scenario:	No Credits	Full Credits	Typical
Residential Properties			
Maximum Individual Credit	0%	50%	25%
Credit Uptake	0%	100%	35%
Non-Residential Properties			
Maximum Individual Credit	0%	50%	50%
Credit Uptake	0%	100%	15%
All Properties			
Total Credit Amount	\$0 0.0%	\$3,065,000 50.0%	\$504,000 8.2%
Total Unrecognized Revenue (incl. uncollected)	\$123,000 2.0%	\$3,188,000 52.0%	\$627,000 10.2%
Collection Rate	98.0%	48.0%	89.8%
Base Charge (\$/ERU/mo)	\$6.70	\$13.70	\$7.30

ERU User Fee Option – Comparison Based on Statistics

Billing Units (ERU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program							
				Current	Interim				Required		
				Program Cost	\$6,130,000				\$12,370,000		
				Base Rate (\$/ERU/mo)	\$7.30				\$14.70		
Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%				
Single Unit Residential											
1.0	1.0	160.5	Detached (small tier, 10-percentile)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	302.5	Detached (medium tier, average)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	468.5	Detached (large tier, 90-percentile)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	172.0	Semi-Detached (average)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	296.8	Other (average)	\$48	\$88	\$40	83%	\$176	\$128	268%	
Multi-Unit Residential											
2.0	2.0	278.4	Duplex (average)	\$96	\$175	\$79	83%	\$353	\$257	268%	
3.0	3.0	268.8	Triplex (average)	\$144	\$263	\$119	83%	\$529	\$385	268%	
4.0	4.0	390.0	4-Plex (average)	\$192	\$350	\$158	83%	\$706	\$514	268%	
5.0	5.0	388.5	5-Plex (average)	\$240	\$438	\$198	83%	\$882	\$642	268%	
6.0	6.0	713.4	6-Plex (average)	\$288	\$526	\$238	83%	\$1,058	\$770	268%	
23.6	23.6	2,855.9	7+ Unit Apartments (average)	\$1,133	\$2,067	\$935	83%	\$4,163	\$3,030	268%	
1.0	1.0	73.7	Condominium (average)	\$48	\$88	\$40	83%	\$176	\$128	268%	
1.0	1.0	137.1	Townhouse (average)	\$48	\$88	\$40	83%	\$176	\$128	268%	
Non-Residential											
10.3	n/a	2,532.9	Non-Residential (average)	\$494	\$902	\$408	83%	\$1,817	\$1,323	268%	
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!	
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!	

ERU User Fee Option – Comparison of Actual Properties

Billing Units (ERU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program								
				Current	Interim			Required				
			Program Cost			\$3,330,000	\$6,130,000			\$12,370,000		
			Base Rate (\$/ERU/mo)			\$4.00	\$7.30			\$14.70		
Representative Property			Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			

Example Non-Residential Properties

457.2	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,946	\$40,051	\$18,105	83%	\$80,650	\$58,704	268%
89.6	n/a	22,142.9	Shopping centre (River Street)	\$4,301	\$7,849	\$3,548	83%	\$15,805	\$11,505	268%
87.5	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,200	\$7,665	\$3,465	83%	\$15,435	\$11,235	268%
45.5	n/a	11,240.1	Retirement home (Arundel Street)	\$2,184	\$3,986	\$1,802	83%	\$8,026	\$5,842	268%
34.4	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,651	\$3,013	\$1,362	83%	\$6,068	\$4,417	268%
24.8	n/a	6,132.1	Restaurant (Highway 61)	\$1,190	\$2,172	\$982	83%	\$4,375	\$3,184	268%
20.6	n/a	5,087.9	Retail (Memorial Avenue)	\$989	\$1,805	\$816	83%	\$3,634	\$2,645	268%
13.7	n/a	3,374.9	Athletic club (Egan Street)	\$658	\$1,200	\$543	83%	\$2,417	\$1,759	268%
12.7	n/a	3,137.1	Medical office (Barton Street)	\$610	\$1,113	\$503	83%	\$2,240	\$1,631	268%
12.4	n/a	3,050.8	Commercial (Arthur Street)	\$595	\$1,086	\$491	83%	\$2,187	\$1,592	268%
11.3	n/a	2,779.4	Law office (Alloy Drive)	\$542	\$990	\$447	83%	\$1,993	\$1,451	268%
11.1	n/a	2,749.8	Commercial (Cumberland Street)	\$533	\$972	\$440	83%	\$1,958	\$1,425	268%
9.0	n/a	2,233.8	Retail (Cumberland Street)	\$432	\$788	\$356	83%	\$1,588	\$1,156	268%
3.4	n/a	842.5	Medical office (Archibald Street)	\$163	\$298	\$135	83%	\$600	\$437	268%
1.2	n/a	285.8	Dentistry office (Edward Street)	\$58	\$105	\$48	83%	\$212	\$154	268%
254.1	n/a	62,756.1	Industrial (waterfront)	\$12,197	\$22,259	\$10,062	83%	\$44,823	\$32,626	268%
119.7	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,746	\$10,486	\$4,740	83%	\$21,115	\$15,369	268%
41.3	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,982	\$3,618	\$1,635	83%	\$7,285	\$5,303	268%
25.3	n/a	6,238.3	Industrial (Bare Point Road)	\$1,214	\$2,216	\$1,002	83%	\$4,463	\$3,249	268%
10.6	n/a	2,612.0	Industrial mall (Gorham Street)	\$509	\$929	\$420	83%	\$1,870	\$1,361	268%
588.1	n/a	145,271.6	College (Nakina Drive)	\$28,229	\$51,518	\$23,289	83%	\$103,741	\$75,512	268%
6.2	n/a	1,535.4	Non-profit office (Amelia Street)	\$298	\$543	\$246	83%	\$1,094	\$796	268%
5.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$254	\$464	\$210	83%	\$935	\$681	268%
8.3	n/a	2,058.6	Place of worship (Sprague Street)	\$398	\$727	\$329	83%	\$1,464	\$1,066	268%
61.3	n/a	15,129.0	Public school (High Street)	\$2,942	\$5,370	\$2,427	83%	\$10,813	\$7,871	268%
30.9	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,483	\$2,707	\$1,224	83%	\$5,451	\$3,968	268%

SFU User Fee Option – Comparison Based on Statistics

Billing Units (SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program							
				Current	Interim				Required		
				Program Cost	\$6,170,000				\$12,430,000		
				Base Rate (\$/SFU/mo)	\$9.00				\$18.10		
			Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%	
Single Unit Residential											
1.0	1.0	160.5	Detached (small tier, 10-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%	
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%	
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%	
1.0	1.0	302.5	Detached (medium tier, average)	\$59	\$108	\$49	84%	\$217	\$158	269%	
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%	
1.0	1.0	468.5	Detached (large tier, 90-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%	
0.6	1.0	172.0	Semi-Detached (average)	\$35	\$65	\$30	84%	\$130	\$95	269%	
1.0	1.0	296.8	Other (average)	\$59	\$108	\$49	84%	\$217	\$158	269%	
Multi-Unit Residential											
1.0	2.0	278.4	Duplex (average)	\$59	\$108	\$49	84%	\$217	\$158	269%	
0.9	3.0	268.8	Triplex (average)	\$53	\$97	\$44	84%	\$195	\$143	269%	
1.2	4.0	390.0	4-Plex (average)	\$71	\$130	\$59	84%	\$261	\$190	269%	
1.5	5.0	388.5	5-Plex (average)	\$88	\$162	\$74	84%	\$326	\$238	269%	
2.4	6.0	713.4	6-Plex (average)	\$141	\$259	\$118	84%	\$521	\$380	269%	
9.4	23.6	2,855.9	7+ Unit Apartments (average)	\$553	\$1,015	\$462	84%	\$2,042	\$1,489	269%	
0.2	1.0	73.7	Condominium (average)	\$12	\$22	\$10	84%	\$43	\$32	269%	
0.5	1.0	137.1	Townhouse (average)	\$29	\$54	\$25	84%	\$109	\$79	269%	
Non-Residential											
8.4	n/a	2,532.9	Non-Residential (average)	\$494	\$907	\$413	84%	\$1,824	\$1,331	269%	
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!	
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!	

SFU User Fee Option – Comparison of Actual Properties

Billing Units (SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program								
				Current	Interim			Required				
			Program Cost			\$3,370,000	\$6,170,000			\$12,430,000		
			Base Rate (\$/SFU/mo)			\$4.90	\$9.00			\$18.10		
Representative Property			Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			

Example Non-Residential Properties

372.7	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,915	\$40,252	\$18,337	84%	\$80,950	\$59,036	269%
73.1	n/a	22,142.9	Shopping centre (River Street)	\$4,298	\$7,895	\$3,597	84%	\$15,877	\$11,579	269%
71.3	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,192	\$7,700	\$3,508	84%	\$15,486	\$11,294	269%
37.1	n/a	11,240.1	Retirement home (Arundel Street)	\$2,181	\$4,007	\$1,825	84%	\$8,058	\$5,877	269%
28.0	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,646	\$3,024	\$1,378	84%	\$6,082	\$4,435	269%
20.2	n/a	6,132.1	Restaurant (Highway 61)	\$1,188	\$2,182	\$994	84%	\$4,387	\$3,200	269%
16.8	n/a	5,087.9	Retail (Memorial Avenue)	\$988	\$1,814	\$827	84%	\$3,649	\$2,661	269%
11.1	n/a	3,374.9	Athletic club (Egan Street)	\$653	\$1,199	\$546	84%	\$2,411	\$1,758	269%
10.4	n/a	3,137.1	Medical office (Barton Street)	\$612	\$1,123	\$512	84%	\$2,259	\$1,647	269%
10.1	n/a	3,050.8	Commercial (Arthur Street)	\$594	\$1,091	\$497	84%	\$2,194	\$1,600	269%
9.2	n/a	2,779.4	Law office (Alloy Drive)	\$541	\$994	\$453	84%	\$1,998	\$1,457	269%
9.1	n/a	2,749.8	Commercial (Cumberland Street)	\$535	\$983	\$448	84%	\$1,977	\$1,441	269%
7.4	n/a	2,233.8	Retail (Cumberland Street)	\$435	\$799	\$364	84%	\$1,607	\$1,172	269%
2.8	n/a	842.5	Medical office (Archibald Street)	\$165	\$302	\$138	84%	\$608	\$444	269%
0.9	n/a	285.8	Dentistry office (Edward Street)	\$53	\$97	\$44	84%	\$195	\$143	269%
207.1	n/a	62,756.1	Industrial (waterfront)	\$12,177	\$22,367	\$10,189	84%	\$44,982	\$32,805	269%
97.5	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,733	\$10,530	\$4,797	84%	\$21,177	\$15,444	269%
33.7	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,982	\$3,640	\$1,658	84%	\$7,320	\$5,338	269%
20.6	n/a	6,238.3	Industrial (Bare Point Road)	\$1,211	\$2,225	\$1,014	84%	\$4,474	\$3,263	269%
8.6	n/a	2,612.0	Industrial mall (Gorham Street)	\$506	\$929	\$423	84%	\$1,868	\$1,362	269%
479.4	n/a	145,271.6	College (Nakina Drive)	\$28,189	\$51,775	\$23,586	84%	\$104,126	\$75,937	269%
5.1	n/a	1,535.4	Non-profit office (Amelia Street)	\$300	\$551	\$251	84%	\$1,108	\$808	269%
4.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$253	\$464	\$212	84%	\$934	\$681	269%
6.8	n/a	2,058.6	Place of worship (Sprague Street)	\$400	\$734	\$335	84%	\$1,477	\$1,077	269%
49.9	n/a	15,129.0	Public school (High Street)	\$2,934	\$5,389	\$2,455	84%	\$10,838	\$7,904	269%
25.2	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,482	\$2,722	\$1,240	84%	\$5,473	\$3,992	269%



Tiered SFU Option – Comparison Based on Statistics

Billing Units (Tiered SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program						
				Current	Interim			Required		
				Program Cost	\$6,200,000			\$12,460,000		
				Base Rate (\$/SFU/mo)	\$9.00			\$18.10		
Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%			
Single Unit Residential										
0.5	1.0	160.5	Detached (small tier, 10-percentile)	\$29	\$54	\$25	84%	\$109	\$79	269%
1.0	1.0	302.5	Detached (medium tier, 25-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%
1.0	1.0	302.5	Detached (medium tier, 50-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%
1.0	1.0	302.5	Detached (medium tier, average)	\$59	\$108	\$49	84%	\$217	\$158	269%
1.0	1.0	302.5	Detached (medium tier, 75-percentile)	\$59	\$108	\$49	84%	\$217	\$158	269%
1.5	1.0	468.5	Detached (large tier, 90-percentile)	\$88	\$162	\$74	84%	\$326	\$238	269%
0.6	1.0	172.0	Semi-Detached (average)	\$35	\$65	\$30	84%	\$130	\$95	269%
1.0	1.0	296.8	Other (average)	\$59	\$108	\$49	84%	\$217	\$158	269%
Multi-Unit Residential										
1.0	2.0	278.4	Duplex (average)	\$59	\$108	\$49	84%	\$217	\$158	269%
0.9	3.0	268.8	Triplex (average)	\$53	\$97	\$44	84%	\$195	\$143	269%
1.2	4.0	390.0	4-Plex (average)	\$71	\$130	\$59	84%	\$261	\$190	269%
1.5	5.0	388.5	5-Plex (average)	\$88	\$162	\$74	84%	\$326	\$238	269%
2.4	6.0	713.4	6-Plex (average)	\$141	\$259	\$118	84%	\$521	\$380	269%
9.4	23.6	2,855.9	7+ Unit Apartments (average)	\$553	\$1,015	\$462	84%	\$2,042	\$1,489	269%
0.2	1.0	73.7	Condominium (average)	\$12	\$22	\$10	84%	\$43	\$32	269%
0.5	1.0	137.1	Townhouse (average)	\$29	\$54	\$25	84%	\$109	\$79	269%
Non-Residential										
8.4	n/a	2,532.9	Non-Residential (average)	\$494	\$907	\$413	84%	\$1,824	\$1,331	269%
0.0	n/a	0.0	Undeveloped (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!
0.0	n/a	0.0	Fee Exempt (average)	\$0	\$0	\$0	#DIV/0!	\$0	\$0	#DIV/0!

Tiered SFU Option – Comparison of Actual Properties

Billing Units (Tiered SFU)	Number of Dwelling Units per Property	Estimated Impervious Area (m ²) per Property	Stormwater Program Item	Future Stormwater Management Program							
				Current	Interim			Required			
			Program Cost	\$3,390,000	\$6,200,000			\$12,460,000			
			Base Rate (\$/SFU/mo)	\$4.90	\$9.00			\$18.10			
			Representative Property	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%	
Example Non-Residential Properties											
372.7	n/a	112,923.7	Shopping centre (Fort William Road)	\$21,915	\$40,252	\$18,337	84%	\$80,950	\$59,036	269%	
73.1	n/a	22,142.9	Shopping centre (River Street)	\$4,298	\$7,895	\$3,597	84%	\$15,877	\$11,579	269%	
71.3	n/a	21,618.2	Retail complex 1 (Memorial Avenue)	\$4,192	\$7,700	\$3,508	84%	\$15,486	\$11,294	269%	
37.1	n/a	11,240.1	Retirement home (Arundel Street)	\$2,181	\$4,007	\$1,825	84%	\$8,058	\$5,877	269%	
28.0	n/a	8,489.2	Retail complex 2 (Memorial Avenue)	\$1,646	\$3,024	\$1,378	84%	\$6,082	\$4,435	269%	
20.2	n/a	6,132.1	Restaurant (Highway 61)	\$1,188	\$2,182	\$994	84%	\$4,387	\$3,200	269%	
16.8	n/a	5,087.9	Retail (Memorial Avenue)	\$988	\$1,814	\$827	84%	\$3,649	\$2,661	269%	
11.1	n/a	3,374.9	Athletic club (Egan Street)	\$653	\$1,199	\$546	84%	\$2,411	\$1,758	269%	
10.4	n/a	3,137.1	Medical office (Barton Street)	\$612	\$1,123	\$512	84%	\$2,259	\$1,647	269%	
10.1	n/a	3,050.8	Commercial (Arthur Street)	\$594	\$1,091	\$497	84%	\$2,194	\$1,600	269%	
9.2	n/a	2,779.4	Law office (Alloy Drive)	\$541	\$994	\$453	84%	\$1,998	\$1,457	269%	
9.1	n/a	2,749.8	Commercial (Cumberland Street)	\$535	\$983	\$448	84%	\$1,977	\$1,441	269%	
7.4	n/a	2,233.8	Retail (Cumberland Street)	\$435	\$799	\$364	84%	\$1,607	\$1,172	269%	
2.8	n/a	842.5	Medical office (Archibald Street)	\$165	\$302	\$138	84%	\$608	\$444	269%	
0.9	n/a	285.8	Dentistry office (Edward Street)	\$53	\$97	\$44	84%	\$195	\$143	269%	
207.1	n/a	62,756.1	Industrial (waterfront)	\$12,177	\$22,367	\$10,189	84%	\$44,982	\$32,805	269%	
97.5	n/a	29,554.9	Warehouse (Lithium Drive)	\$5,733	\$10,530	\$4,797	84%	\$21,177	\$15,444	269%	
33.7	n/a	10,205.5	Warehouse (Rosslyn Road)	\$1,982	\$3,640	\$1,658	84%	\$7,320	\$5,338	269%	
20.6	n/a	6,238.3	Industrial (Bare Point Road)	\$1,211	\$2,225	\$1,014	84%	\$4,474	\$3,263	269%	
8.6	n/a	2,612.0	Industrial mall (Gorham Street)	\$506	\$929	\$423	84%	\$1,868	\$1,362	269%	
479.4	n/a	145,271.6	College (Nakina Drive)	\$28,189	\$51,775	\$23,586	84%	\$104,126	\$75,937	269%	
5.1	n/a	1,535.4	Non-profit office (Amelia Street)	\$300	\$551	\$251	84%	\$1,108	\$808	269%	
4.3	n/a	1,317.1	Non-profit office (Algoma Street)	\$253	\$464	\$212	84%	\$934	\$681	269%	
6.8	n/a	2,058.6	Place of worship (Sprague Street)	\$400	\$734	\$335	84%	\$1,477	\$1,077	269%	
49.9	n/a	15,129.0	Public school (High Street)	\$2,934	\$5,389	\$2,455	84%	\$10,838	\$7,904	269%	
25.2	n/a	7,630.2	Public school (Sherbrooke Street)	\$1,482	\$2,722	\$1,240	84%	\$5,473	\$3,992	269%	

Urban/Rural Levy Option – Comparison Based on Statistics

Tax-Funded Program Expenditures	2017 Stormwater Management Program			Future Stormwater Management Program (Service Levels)						
				Current	Interim			Required		
Program Cost	\$4,360,000 (incl. PPCP)			\$3,150,000	\$5,910,000			\$12,120,000		
Tax Levy Allocation	1.73%			0.03097%	0.06411%			0.13507%		
Representative Property	Taxation	Other	Total	Charge	Charge	Δ _{Current}	%	Charge	Δ _{Current}	%
Single Unit Residential										
Detached (small tier, 10-percentile)	\$28	\$15	\$43	\$33	\$68	\$35	107%	\$144	\$111	336%
Detached (medium tier, 25-percentile)	\$36	\$15	\$51	\$42	\$88	\$45	107%	\$185	\$143	336%
Detached (medium tier, 50-percentile)	\$49	\$15	\$64	\$58	\$121	\$62	107%	\$254	\$196	336%
Detached (medium tier, average)	\$52	\$15	\$67	\$62	\$129	\$67	107%	\$272	\$209	336%
Detached (medium tier, 75-percentile)	\$62	\$15	\$77	\$74	\$154	\$80	107%	\$324	\$250	336%
Detached (large tier, 90-percentile)	\$85	\$15	\$100	\$101	\$208	\$108	107%	\$439	\$338	336%
Semi-Detached (average)	\$31	\$15	\$46	\$37	\$77	\$40	107%	\$163	\$125	336%
Other (average)	\$9	\$15	\$24	\$15	\$32	\$17	107%	\$68	\$52	336%
Multi-Unit Residential										
Duplex (average)	\$47	\$15	\$62	\$55	\$115	\$59	107%	\$241	\$186	336%
Triplex (average)	\$41	\$23	\$64	\$49	\$102	\$53	107%	\$215	\$166	336%
4-Plex (average)	\$60	\$30	\$90	\$72	\$149	\$77	107%	\$314	\$242	336%
5-Plex (average)	\$54	\$38	\$92	\$64	\$132	\$68	107%	\$278	\$214	336%
6-Plex (average)	\$86	\$45	\$131	\$102	\$211	\$109	107%	\$444	\$342	336%
7+ Unit Apartments (average)	\$924	\$177	\$1,101	\$460	\$953	\$492	107%	\$2,007	\$1,547	336%
Condominium (average)	\$48	\$15	\$63	\$57	\$119	\$61	107%	\$250	\$193	336%
Townhouse (average)	\$25	\$15	\$40	\$29	\$60	\$31	107%	\$127	\$98	336%
Non-Residential										
Non-Residential (average)	\$303	\$300	\$603	\$247	\$512	\$265	107%	\$1,079	\$831	336%
Undeveloped (average)	\$5	\$300	\$305	\$16	\$32	\$17	107%	\$68	\$53	336%
Tax/ Fee Exempt (average)	\$1	\$0	\$1	\$2	\$5	\$3	107%	\$11	\$8	336%

Example – Single-Family Detached Home

Example: Detached home (with average assessed value = \$201,250)

Lot Size: 810 m² (with average impervious area = 303 m²)

Infrastructure Service Area: Urban

Number of Dwelling Units: 1

Number of ERU, SFU and Tiered SFU Billing Units: 1.0




Annual Base Charges (Average Detached Home)			
Option	Current	Interim	Required
1-Tax	\$52.40	\$98.14	\$201.13
2-ERU	\$48.00	\$87.60	\$176.40
3-SFU	\$58.80	\$108.00	\$217.20
4-TSFU	\$58.80	\$108.00	\$217.20
5-Levies	\$62.34	\$129.02	\$271.82

Annual Charges (Interim Service Level, Urban Service Area)

- 1-Tax: \$201,250 at 1.505% tax rate × 3.24% municipal tax levy = \$98/yr
- 2-ERU: 1.0 ERUs × \$7.30/ERU × months = \$88/yr
- 3-SFU: 1.0 SFUs × \$9.00/SFU × months = \$108/yr
- 4-TSFU: 1.0 Tiered SFUs × \$9.00/SFU × months = \$108/yr
- 5-Levies: \$201,250 × 0.0641% urban SWM levy = \$129/yr

Average Residential Rate Categories Tax Option – Interim Service Level

Single-Family
Detached
Tax rate = 1.505%




\$98/year

Semi-Detached
Tax rate = 1.505%



\$59/year

Duplex
Tax rate = 1.505%




\$44/year/unit

3-, 4-, and 5-Plex
Tax rate = 1.505%




\$26/year/unit

6-Plex
Tax rate = 1.505%




\$27/year/unit

7+ Unit Apartments
Tax rate = 3.745%




\$73/year/unit

Condominium
Tax rate = 1.505%



\$90/year/unit

Townhouse
Tax rate = 1.505%




\$46/year/unit

Average Residential Rate Categories


ERU Option – Interim Service Level

Single-Family
Detached
ERU factor = 1.0




\$88/year

Semi-Detached
ERU factor = 1.0



\$88/year

Duplex
ERU factor = 1.0/unit



\$88/year/unit

3-, 4-, and 5-Plex
ERU factor = 1.0/unit



\$88/year/unit

6-Plex
ERU factor = 1.0/unit



\$88/year/unit

7+ Unit Apartments
ERU factor = 1.0/unit




\$88/year/unit

Condominium
ERU factor = 1.0/unit



\$88/year/unit

Townhouse
ERU factor = 1.0/unit




\$88/year/unit

Average Residential Rate Categories

SFU Option – Interim Service Level

Single-Family
Detached
SFU factor = 1.0




\$108/year

Semi-Detached
SFU factor = 0.6



\$65/year

Duplex
SFU factor = 0.5/unit



\$54/year/unit

3-, 4-, and 5-Plex
SFU factor = 0.3/unit



\$32/year/unit

6-Plex
SFU factor = 0.4/unit




\$43/year/unit

7+ Unit Apartments
SFU factor = 0.4/unit




\$43/year/unit

Condominium
SFU factor = 0.2/unit



\$22/year/unit

Townhouse
SFU factor = 0.5/unit



\$54/year/unit

Average Residential Rate Categories

Tiered SFU Option – Interim Service Level

Single-Family Detached (Small)
SFU factor = 0.5

Single-Family Detached (Medium)
SFU factor = 1.0

Single-Family Detached (Large)
SFU factor = 1.5

Semi-Detached
SFU factor = 0.6

Duplex
SFU factor = 0.5/unit



\$54/year

\$108/year

\$162/year

\$65/year

\$54/year/unit

3-, 4-, and 5-Plex
SFU factor = 0.3/unit

6-Plex
SFU factor = 0.4/unit

7+ Unit Apartments
SFU factor = 0.4/unit

Condominium
SFU factor = 0.2/unit

Townhouse
SFU factor = 0.5/unit



\$32/year/unit

\$43/year/unit


\$43/year/unit

\$22/year/unit

\$54/year/unit

Average Residential Rate Categories Tax Option – Interim Service Level

Single-Family
Detached
Urban levy = 0.06411%




\$129/year

Semi-Detached
Urban levy = 0.06411%



\$77/year

Duplex
Urban levy = 0.06411%




\$57/year/unit

3-, 4-, and 5-Plex
Urban levy = 0.06411%



\$34/year/unit

6-Plex
Urban levy = 0.06411%




\$35/year/unit

7+ Unit Apartments
Urban levy = 0.06411%




\$40/year/unit

Condominium
Urban levy = 0.06411%



\$119/year/unit

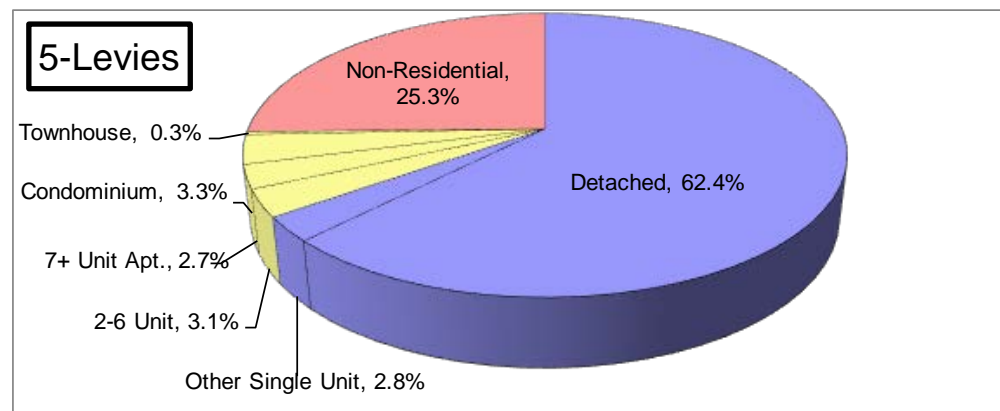
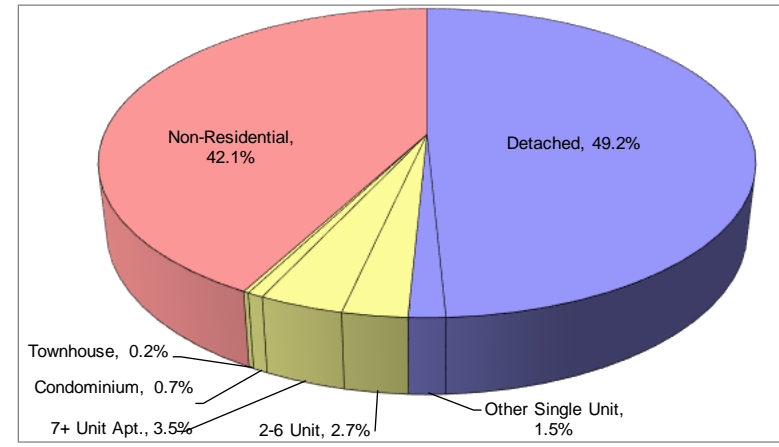
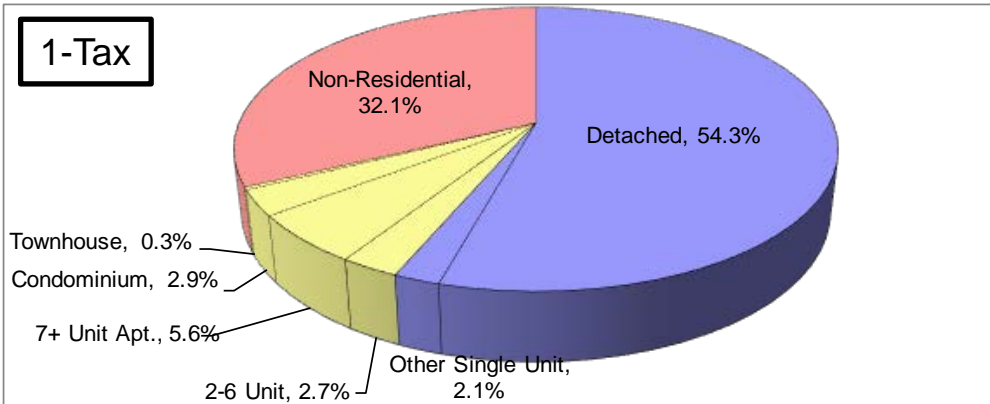
Townhouse
Urban levy = 0.06411%



\$60/year/unit

Revenue Distributions (Interim Service Level)

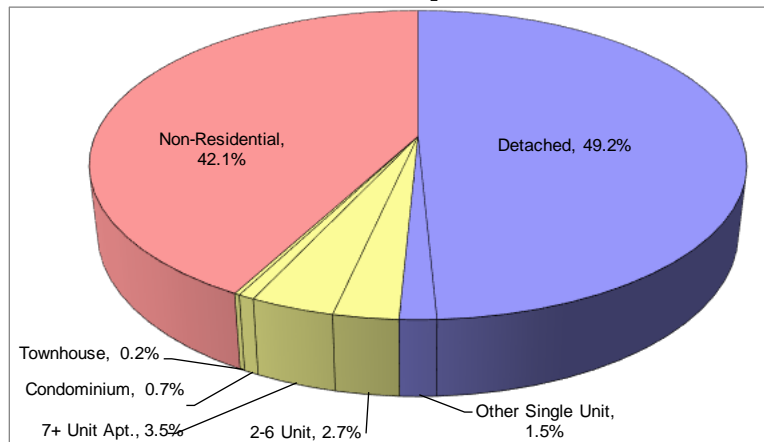
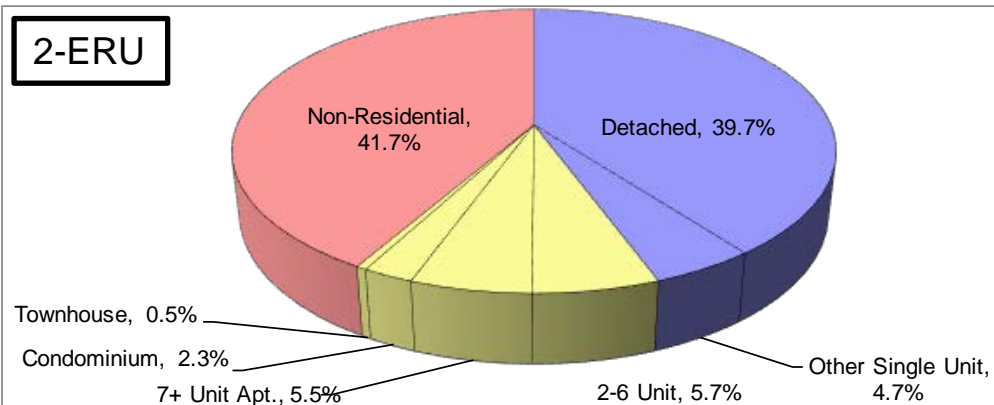
Estimated Impervious Area



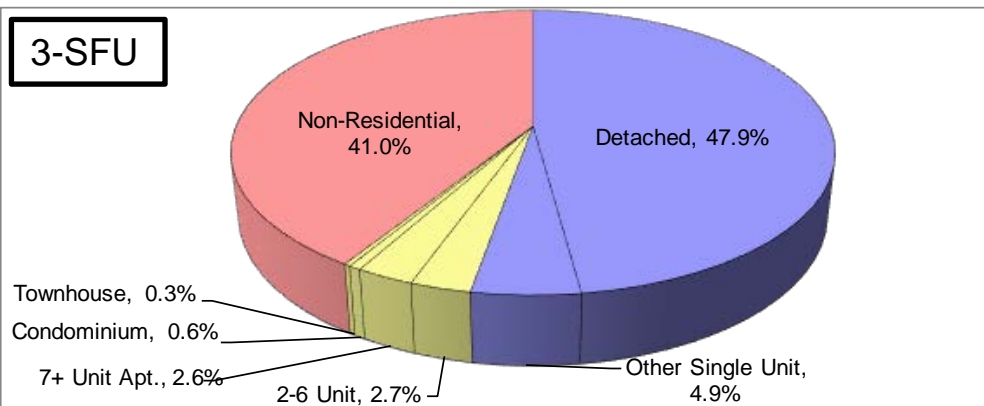
Revenue Distributions (Interim Service Level)

Estimated Impervious Area

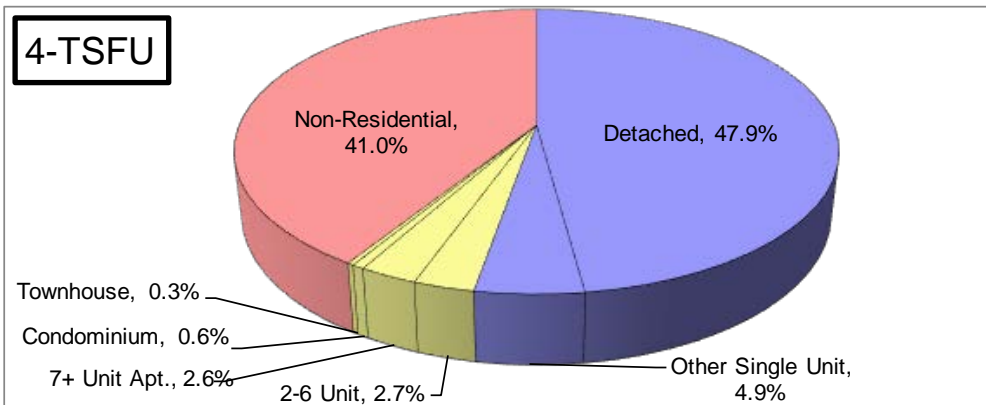
2-ERU



3-SFU



4-TSFU



Discussion



Discussion / Draft Evaluation Criteria

1. City-Wide Applicability
2. Meets Entire Revenue Needs
3. Fair & Equitable Allocation
4. Dedicated & Long-Term Funding Source
5. Effort to Administrate
6. Public Accountability
7. Environmental Benefits
8. Social Benefits

How would the Advisory Committee like to see and weight these (i.e. matrix table?)

Any other criteria?

Next Steps

- Continue to communicate via the City website www.thunderbay.ca/stormwaterplan
- Upcoming Meetings
 - Stakeholder Meetings (Universities / Colleges / First Nations / Major Employers, etc.)
 - Public Information Centre No. 2 (tentative Feb. 12, 2019)
- Present project findings and preliminary staff recommendations to the *NEW* Council in early 2019.

Questions?



Appendix E

**Stormwater Advisory Committee
Meeting #3B**



Minutes of Meeting #3B

Date of Meeting: December 10, 2018
Start Time: 12:00 p.m.
Location: Victoriaville Civic Centre

1. Overview

On Monday, December 10th, from 12:00 p.m. to 2:00 p.m., the City of Thunder Bay, with support from AECOM, hosted an additional meeting of the Stormwater Advisory Committee (SAC) for the Stormwater Financing Study. The purpose of the SAC is to provide organizations representing a broad range of interests with the opportunity to learn about and provide input into the study. At the SAC Meeting No. 3, held on Monday November 19, members agreed to continue with the evaluation matrix discussion, to assist SAC members in evaluating the various funding options.

Six (6) members were present, along with one (1) City staff and three (3) AECOM consultant team members.

The format of the meeting included reading the description of each suggested evaluation criteria, followed by a discussion specific to each criterion and going through the evaluation matrix. The minutes below outline the questions, comments and feedback received during the SAC meeting.

2. Attending

Organization	Name
Resident	Valerie Cameron
Zanette Realty	Robert Zanette
Lakehead Region Conservation Authority	Gail Willis
Red Sky Métis Independent Nation	Kayla Searle
Eco Superior	Will Vander Ploeg
Eco Superior	Ellen Mortfield
City of Thunder Bay	Aaron Ward
AECOM	Mike Gregory
AECOM	Pippy Warburton
AECOM	Kathryn Ross

3. Introduction

Aaron Ward (City of Thunder Bay) opened the meeting and invited all attendees to introduce themselves and the organization that they represented. Pippy Warburton (AECOM), Mike Gregory (AECOM) and Kathryn Ross (AECOM) joined the meeting by telephone. Aaron Ward (City of Thunder Bay) provided an update since the SAC #3 meeting, which included one-on-one local stakeholder meetings with Confederation College, Lakehead District School Board, Lakehead University and St. Joseph's Care Group. These stakeholder meetings introduced the Stormwater Financing Study – what it is, why it's being done, what the City is looking to accomplish, and a high level overview of potential impacts to each stakeholder. All of the organizations are tax-exempt organizations, although the meetings weren't intended to be set-up with only tax-exempt organizations. Aaron Ward (City of Thunder Bay) noted that the meetings went well and the reactions were as expected, namely about organizations being on fixed incomes and having to cut budgets in some areas to pay for this additional new cost. It was suggested that each organization reach out to counterparts in Southern Ontario who have gone through similar studies.



Correspondence, including Questions and Answers, between Valerie Cameron and Aaron Ward (City of Thunder Bay) was reviewed with the group, which included discussions on the breakdown of contributions from urban vs. rural properties, including a review of an “actual” residential property, and discussion on tax exempt properties, including a high-level review of the background supporting legislation.

4. Q&A

Throughout the meeting, questions were addressed and comments received. Key discussion items during the meeting are summarized below. Questions are noted with a “Q”, answers with “A”, comments with a “C” and responses with an “R”. Aaron Ward (City of Thunder Bay) provided answers and responses, unless otherwise noted. Questions and comments specific to the Evaluation Criteria are included in [Section 5 below](#).

Q1: How will sewage and drainage be funded? How will those dollars be allocated to stormwater?

A1: To clarify, currently, stormwater funding comes from three internal sources: the general municipal tax levy (applies to both urban & rural properties), the sewage & drainage tax levy (applies only to urban properties), and the sewer rate charge (applies only to urban properties).

Prior to amalgamation, there was no sewer rate charge or sewage & drainage levy (i.e., the sewage treatment plant was funded with general taxes). The levy was created to fund both sanitary sewage & drainage works, but that is no longer an accurate name since the sewage treatment plant and sanitary collection systems are not funded through a user fee (the “sewer rate charge” on your water bill). The sewer rate charge is meant to cover the costs of the sanitary sewer collection and treatment systems.

Currently, 10% of the sewer rate charge is used to fund both stormwater capital projects (only the Pollution Prevention Control Plan (PPCP) works, which is separating stormwater from sanitary sewers – this was approximately 5.9% of the 10% in 2018), and storm sewer operations & maintenance services in urban areas (this was approximately 4.1% of the 10% in 2018).

It was noted that the PPCP works are expected to be completed within 5-years, therefore, it is anticipated these operation and maintenance costs (the 4.1% or



approximately \$840,000 in 2018) will be moved to the tax levy as stormwater will no longer be associated with sanitary sewage.

Q2: If we assume Lakehead University and Confederation College combined have 10,000 students, and they pay \$75 per student in taxes, is that a \$750,000 being paid to the City of Thunder Bay?

A2: In general, yes.

Q3: So school boards also pay \$75 per student?

A3: Yes, those rates haven't changed in 30 years. The school boards are funded by the Province and the college doesn't control their tuition rate, but universities do control their tuition rate, so it adds a level of complexity to the issue when it comes to educational organizations.

Q4: Do you take a percentage of what they're already paying and dedicate it to stormwater?

A4: Yes, the payments are made in lieu of taxes (PIL) and are used generally the same as taxes, however, the actual PIL contributions to stormwater revenue are actually quite small (approximately \$125,000 per year). We don't control the amount of \$75 per student paid to the City, that is set by the Province. If we went with a stormwater user fee, the portion of PIL contributed to stormwater would have to be considered in the stormwater charge so these properties are not "paying twice".

Q5: Do churches pay anything other than water / sanitary rates?

A5: There are few rural churches that would contribute \$0 to stormwater, but I don't think these are big contributors to the stormwater system – that's why after SAC #2 meeting we had a good understanding of tax exempt situations. However, for urban churches, yes, they would only pay the water / sanitary rate as revenue to the City.

C1: Does it matter what kind of organization it is (i.e., religious or not)? Paying a stormwater fee seems the right thing to do.

C2: If it's a new property owner's responsibility, everyone should make an equal contribution and it needs to be fair.

R1 / R2: It's a tricky situation for a feasibility study. We've gone far down the path towards implementation, but do we want to make a decision now for just that church? A lot of charitable / not-for-profit organizations are also considered to be tax exempt, but would not automatically be exempt from a user fee.



Q6: It may come down to beliefs and morals, but fair is fair. What are other municipalities doing with these ‘sensitive’ organizations?

A6: Mike Gregory (AECOM) noted that City of Kitchener and City of Mississauga are two municipalities that come to mind. The Canada Revenue Agency will recognize charitable organizations and places of worship. The City of Kitchener and the City of Mississauga have agreed to pay (subsidize) stormwater user fee bills on behalf of charitable organizations and places of worship. These cities cover the costs with tax money. In Kitchener specifically, there was a large presence at council meetings on behalf of charitable organizations and places of worship requesting for council to consider a subsidy.

C3: Administration [for this subsidy] would also be an added cost.

C4: I don’t see a lot of people in Thunder Bay agreeing with the subsidy situation in City of Kitchener and City of Mississauga. Places of worship are sometimes very large buildings. This becomes a social and political pressure for Council to make these decisions.

C5: If we look at what’s happened in France, any time there is another tax, everyone is going to sing and dance to the same tune. We can’t keep taxing the same people and not taxing others. There are a lot of these organizations that I call ‘special interest’ – whether it’s charity, children’s aid, etc.

R5: A lot of the impervious areas in the city are tax exempt. These are the plus and minuses that people have to consider. It’s trick for this study. As SAC members, you’re all more informed than we could get the general public to be. There is a lot of acceptance, but we can’t talk about each property one-by-one. One suggestion I came up with is asking AECOM (consultants) to set-up an online calculator so that people can see what they are paying today.

C6: The general public will need more visuals to better understand the study.

Q7: Did you talk about tax exempt scenarios to stakeholders that were invited for the one-on-one meetings?

A7: We did reach out to some of the major employers like Bombardier, but they didn’t return our request for meetings or to be part of the Advisory Committee. Others responded saying thank-you but they weren’t interested until we get further down the road in the study. We invited around 45 people / groups to the Advisory Committee, including interest groups, general citizens, Indigenous communities, property manager groups, and others. We did not invite charitable organizations.



C8: When it's time to introduce this information to the public and to council, it will be important to keep it simple. It's very complicated right now. We'll need plain language and clear visual presentation. We might even need to go a step back and start by explaining storm drains.

C9: It will be especially hard to sell to rural groups. Talking about flooding and culverts will be important for the rural audience.

5. Evaluation Matrix

As a continuation from SAC #3A meeting, an updated draft evaluation matrix spreadsheet and evaluation criteria guideline document was presented a second time to allow for continued discussion about the matrix and go into more detail for each criteria. Aaron Ward (City of Thunder Bay) read a description for each of the eight (8) criteria, followed by a discussion and questions and answers.

To identify the preferred weighting of each criterion, the group voted and assigned a number of one (1) to five (5) (with five (5) being the most important), and then weighted each criterion a second time against each option in terms of whether the option meets the criteria (3), somewhat meets the criteria (2) or doesn't really meet the criteria (1). The results are shown in the table below (see attached for completed excel version, a "blank" excel version, and the evaluation criteria guideline document).



**THUNDER BAY
STORMWATER FINANCING STUDY**

Stormwater Advisory Committee

EVALUATION Meets Criteria = 3 Somewhat Meets Criteria = 2 Doesn't Really Meet Criteria = 1							
Criteria	Weight (1 to 5, 1 being non important, 5 being very important)	Option 1 Property Tax (current Sewage & Drainage tax levy)	Option 2 Equivalent Residential Unit (ERU) User Fee	Option 3 Single Family Unit (SFU) User Fee	Option 4 Tiered Single Family Unit (Tiered SFU) User Fee	Option 5 Property Tax (with urban/rural Sewage & Drainage levies)	Option 6 User Fee (with urban/rural base charges)
1. City-Wide Applicability							
Funding option is applicable City-wide.	5	1	3	3	3	2	3
Funding option captures both urban and rural properties.							
Funding option captures tax exempt properties.							
2. Meets Entire Revenue Needs							
Funding option covers all of the City's capital improvement projects, operations and maintenance activities, engineering/ support and administration of the program. Funding option covers all of the City's capital improvement projects, operations and maintenance activities, engineering/ support and administration of the program.	4	1	2	2	2	1	2
3. Fair & Equitable Allocation							
Funding option charges individuals in proportion to their stormwater use.	5	1	2	2.5	3	1	3
4. Dedicated & Long-Term Funding Source							
Funding option is dedicated solely to the City's stormwater program.	5	1	2	2	2	1	2
Funding option is stable, planned for and managed over multiple years.							
5. Effort / Cost to Administrate							
Funding option requires no additional administration costs.	3	3	1	1	1	3	1
6. Accountability to Public							
Funding option is regularly monitored for costs incurred and income earned.	4	1	3	3	3	1	3
Funding option is regularly reported to the public							
Information option the funding source is easily accessible and understandable to the public.							
7. Environmental Benefits							
Funding option offers incentives for environmental stewardship initiatives.	3	1	2	2	2	1	2
8. Social Benefits							
Funding option can accommodate low-income residents.	4	2	1	1	2	2	2
Funding option does not take away funding for other City services.							
EVALUATION		43	68	70.5	77	48	77

1. City-Wide Applicability

This category indicates the geographical extent over which a funding option can be applied. SAC Members agreed to weigh this category with a five (5) as very important.

Mike Gregory (AECOM) clarified that for this criterion, impervious areas are treated the same regardless of where it is located for Options 2 (two), 3 (three), and 4 (four). Option 6 (six) has a different charge, because it's discharging into a system that has a different level of service, particularly for rural charges. Option 1 (one) would maintain the current tax structure, and Option 5 (five) would see all three current funding sources replaced with one stormwater tax.

One comment about City-Wide Applicability was that if you live in a rural area, but you spend your days in the city, you are contributing to the need for stormwater services. Aaron Ward (City of Thunder Bay) replied to the comment adding that some feel that if you are bringing your kids to hockey games or to the mall, the mall pays taxes and part of those taxes is an incentive to get you there, however, this view may not be shared by all.

2. Meeting Entire Revenue Needs

This category indicates whether or not the funding method satisfies the revenue requirements of the City's stormwater program. SAC Members noted and agreed to weigh this category with a four (4).

3. Fair & Equitable Allocation

This category indicates whether or not the funding method charges the property owner according to individual contribution to the stormwater program expenditures. SAC Members agreed to weigh this category with a five (5). The members agreed that they would like to be able to give half points.

Mike Gregory (AECOM) noted that social and political considerations are not on the list of considerations. However, tax exempt lobbyists have said that it is not just about the ability to pay, but about the province offloading social services onto tax exempt organizations such as places of worship and charitable organizations. Fair and equitable can have different definitions depending on the person and viewpoint.

4. Dedicated Long-Term Funding Source

This category identifies those options where funds are dedicated solely to stormwater program expenditures and in a sustainable, long-term manner. SAC Members agreed to weigh this category with a five (5).



During the discussion about this category, Aaron Ward (City of Thunder Bay) mentioned that water and sanitary rates are mandated provincially, and there is no current legislation specific to stormwater rates. Mike Gregory (AECOM) noted that City of Kitchener is in its ninth year of collecting stormwater user fees, and council has only requested a reduction in the stormwater budget by ten percent once. There were no other reductions.

5. Effort to Administrate

This category identifies the relative effort and resources for City staff to administer and manage the funding option. SAC Members agreed to weigh this category with a three (3).

Aaron Ward (City of Thunder Bay) reminded SAC members that funding options one (1) through five (5) already have administrative systems in place and require no additional staffing. The more complex the option becomes, there will be more administrative costs like administering rebate programs.

6. Public Accountability

This category helps to define the relative scale to which stormwater program expenditures and revenue are monitored and communicated to the public. SAC Members agreed to weigh this category with a four (4).

Members commented that this is a very important category because people want to know where their money is going. It was noted that currently water bills aren't very clear, and also that Option 6 will need high accountability, particularly for rural properties.

7. Environmental Benefits

This category identifies the relative scale of environmental benefits provided by the funding option. SAC Members agreed to weigh this category with a three (3).

The discussion related to this category focused on extreme weather events and how the more people do now, the better off Thunder Bay will be in the future. One member asked where the bigger impact was, on the homeowner or city infrastructure side? Another member responded with the city stormwater infrastructure being a bigger issue, and overall environmental impact will come from the City of Thunder Bay being better prepared for weather events. Aaron Ward (City of Thunder Bay) mentioned that for large companies, they can have a larger impact, but for them it's about dollars and cents and a return on investment. One member asked about the uptake of rebate programs. Mike Gregory (AECOM) responded by mentioning that it depends on how uptake is defined. It's assumed that eight (8) percent of stormwater user fee collected

will be given back to a rebate/ credit program. The uptake rate could be lower than expected in the estimates.

8. Social Benefits

This category identifies the relative scale of social benefits provided by the funding option. SAC Members agreed to weigh this category with a four (4).

Aaron Ward (City of Thunder Bay) clarified that this category is about having more financial flexibility for people with different social needs. Originally, the environmental category was given a weight of four (4), but after discussing the difference between the environmental category and the social category, the group decided to weigh Social Benefits as a four (4) – higher than environmental. A member commented that if the environmental category is more about uptake, then it should be lower than social, because if you're from a lower income bracket you might not be able to go and get a rebate.

At the end of the discussion, one member asked how this information will be shared with the public. Aaron Ward (City of Thunder Bay) said that once the feasibility plan and recommendation is fully developed, then a discussion will take place about sharing with the public. For now, the study will be high level until there's a recommended option.

There was also discussion about a possible 9th criterion around "Social / Political Implications", but it was generally agreed that this was beyond the scope of the Advisory Committee.

6. Meeting Adjournment

Before the meeting was adjourned, next steps were discussed. The project team is expecting a recommendation in February, followed by going back to the public and consulting on the recommendation. From that consultation and recommendation, council will be consulted. A final report will then be written and will include high level details about how implementation will work.

No further comments or questions were raised. The meeting was adjourned at 2:00 p.m.

Thunder Bay Stormwater Funding Options

Suggested Evaluation Criteria Guideline

This document is meant to guide your evaluation of the various funding options using the companion evaluation matrix spreadsheet. It is the intent of the project team to receive feedback from Stormwater Advisory Committee members, ideally expressing funding option preferences that best reflect your personal opinion or the interests of the organization that you are representing. A description of each criterion is given followed by the key points to consider when identifying desirable options, including a summary statement on topics that have been presented and discussed in previous meetings.

1. City-Wide Applicability

This category indicates the geographical extent over which a funding option can be applied.

Considerations:

- Can the revenue collected be used to support services throughout the City?
- Is revenue collected from all contributing properties?
- Does it account for differences in services received in various locations?

A desirable funding option should apply City-wide, whereas an undesirable funding option would be restricted to certain locations or properties within the City. In previous meetings, the project team noted that taxes and user fees can collect and spend revenue throughout the City. It was also noted that tax-exempt properties do not contribute to tax funds (with the exception of certain institutions that pay “in-lieu” fees, representing approximately 4% of the total tax fund in 2017), and that user fees can collect funds from properties regardless of tax-exempt status. It was further learned that there are geographic differences with stormwater servicing and infrastructure, as distinguished by rural/urban boundaries. With the current tax-funding system (Option 1), rural properties only contribute stormwater funds through the “general” municipal tax levy, whereas additional funds are collected from urban properties through the Sewage & Drainage tax levy as well as the sewer rate charge on the water bill. Options 2-4 represent user fees with a base charge that does not distinguish between rural/urban properties. The remaining options are intended to charge separate stormwater tax levies (Option 5) or user fee base charges (Option 6) depending on rural/urban stormwater services received.

2. Meets Entire Revenue Needs

This category indicates whether or not the funding method satisfies the revenue requirements of the City’s stormwater program.

Considerations:

- Does it provide sufficient funds for all of the City’s critical stormwater management needs?

A desirable funding option would fully fund the City’s priority capital improvement projects, operations and maintenance activities, engineering/support functions, and overall administration of the program. An undesirable funding option would only partially fund the program. It was learned that increased/reduced tax-funding for stormwater is dependent on Council priorities, as annual operating budgets for all City services are subject to Council approval. It is possible to fund all the City’s stormwater program needs with both taxes and user fees, if Council chooses to do so.

3. Fair & Equitable Allocation:

This category indicates whether or not the funding method charges the property owner more in-line with individual contribution to the stormwater program expenditures.

Considerations:

- Does it assign charges to individual properties in closer proportion to the demand placed on the City's stormwater management system?

A desirable funding option would allocate costs in a systematic and consistent manner that represents the relative contribution of stormwater runoff and pollutant loading. An undesirable funding option would allocate costs in a manner that does not reflect individual contributions. The differences between tax and user fees in allocating individual property charges was discussed in previous meetings. The basis for tax-based funding is the assessed property value, with the underlying principle of "ability to pay". The basis for user fees is intended to allocate charges more in-line with actual stormwater runoff contribution (as indicated by the individual impervious area footprint), regardless of assessed value or tax-exempt status. The user fee options presented represent a range of property classifications with varying degrees of equitability (i.e. Option 2 charges all residential properties the same rate per dwelling unit, whereas high/low density residential properties are distinguished in Options 3 and 4, and multiple categories are distinguished for single-family detached homes in Option 4).

4. Dedicated & Long-Term Funding Source:

This category identifies those options where funds are dedicated solely to stormwater program expenditures and in a sustainable, long-term manner.

Considerations:

- Are funds dedicated solely to the City's stormwater program?
- Are funds sustainable, stable, and able to support the program over multiple years?

A desirable funding option would be fully dedicated to the needs of the stormwater program, and able to endure highly variable cost fluctuations over a long-term timeframe. An undesirable funding option would authorize a fixed funding envelope for a single budget year. It is possible to dedicate stormwater funds with both taxes and user fees, if Council chooses to do so, but generally this is done on an annual basis (and note that both tax and utility rates must be approved by Council). The urban Sewage & Drainage levy has been dedicated to stormwater for several decades. There is an annual competition for general tax funds to support other community services and it has proven difficult to sustain the stormwater program when there are higher Council priorities. User fees are operated as an enterprise fund, whereby the money collected must be distributed back into the program that it supports.

5. Effort to Administrate:

This category identifies the relative effort and resources for City staff to administer and manage the funding option.

Considerations:

- Does it require additional administration costs?

A desirable funding option would not require additional administrative costs (i.e., above the current funding system). An undesirable funding option would result in high, ongoing administrative costs. The tax-based options have a clear advantage as there would be minimal incremental administration costs on an ongoing basis (Option 5 would require some initial effort to change the urban tax levy and implement a new rural tax levy, but would not require on-going increased costs). The project team has made a deliberate effort to be conservative (i.e., use higher than typical values) in their estimate of the incremental administration costs required for the user fee options, including one-time "start-up" costs and ongoing annual administrative costs. As explained in the previous meeting, using high rate administration costs has led to diminished revenue distribution impacts than would otherwise be expected when comparing user fees to taxes.

6. Public Accountability:

This category helps to define the relative scale to which stormwater program expenditures and revenue are monitored and communicated to the public.

Considerations:

- Is it regularly monitored for costs incurred and revenue collected?
- Are financial records regularly summarized and reported to the public?
- Is information easily accessible and understandable by the public?

A desirable funding option would continually monitor its financial position (including expenditures by cost center and revenue collected/credits given by customer category), and it would also report these at a high level of detail and in a transparent and easily accessible manner. An undesirable funding option would only report the minimum required financial data (e.g., a budget summary table in the appendix of a report to Council). Financial information for both taxes and our user fees is widely available in the public realm. Tracking and identifying tax-based stormwater related costs across multiple cost centers and from a variety of sources has been challenging during this project. With user fees, the money in an enterprise fund must be segregated, accounted, and reported separately from the monetary contributions of other funding sources (i.e., it is part of the required reporting process).

7. Environmental Benefits:

This category identifies the relative scale of environmental benefits provided by the funding option.

Considerations:

- Does it offer incentives that encourage environmental stewardship or support other “green” initiatives?

A good funding option would offer financial incentives to those property owners who reduce their stormwater runoff and pollutant loads on-site, or otherwise promote good housekeeping practices or environmental stewardship initiatives. An undesirable funding option would not motivate property owners to reduce the amount of stormwater that they discharge into the City’s stormwater management system. With tax-based funding, there is generally no significant on-going financial incentive for property owners to reduce stormwater runoff and pollutant discharge. In Thunder Bay, the City currently offers one-time subsidies, but these are strictly volunteer based and often do not result in on-going financial savings to the property owner. It is common in Ontario for stormwater user fees to include a credit program, which is a strong motivator to encourage on-site stormwater management practices. This has the added benefit of allowing the municipality to ensure privately-owned stormwater facilities have been properly designed, constructed, and maintained.

8. Social Benefits:

This category identifies the relative scale of social benefits provided by the funding option.

Considerations:

- Does it accommodate economically disadvantaged citizens?
- Does it diminish funding resources for other essential City services?

In a general context, socially beneficial options would inspire citizens and business owners to act in the best interests of society to protect against risks to public health, safety, and welfare or otherwise have a positive influence on the quality of life (e.g., developing a reputation as good societal stewards, improving community pride, or engaging people in awareness/outreach of social causes). One opinion of a funding option that provides high social benefit is a mechanism that minimizes the use of tax funds for stormwater services (e.g., moving it off

the tax base onto a user fee), thereby leaving more available tax funds to support health/safety, law enforcement, or other public service needs. Another benefit to society would be a funding option that would charge less to smaller properties which may correlate to smaller incomes. In Thunder Bay, the City currently offers tax/water bill assistance programs. For more information visit:

<https://www.thunderbay.ca/en/city-hall/resources/Documents/TaxandWaterCreditProgramsforLow-IncomeSeniorsandLow-IncomePersonswithDisabilities.pdf> and <https://www.thunderbay.ca/en/city-services/discounts-and-rebates.aspx>

With user fees, the Tiered Single-Family Unit option (Option 5) assigns a lower base charge to the smaller sized properties, which may correlate to lower incomes.

Appendix F

Public Information Centre #1

Thunder Bay Stormwater Financing Study – Public Information Centre #1 Feedback Summary

This concise Summary Report has been prepared to provide a snapshot of the feedback captured at Public Information Centre #1 held on Tuesday, January 23, 2018 and through the corresponding online comment form.

Introduction

As part of its commitment to environmental stewardship and community sustainability, the City of Thunder Bay has developed a Stormwater Management Plan, which will guide the City’s stormwater management actions for the next 20-years. One of the goals highlighted in the plan is to identify alternative ways to provide a dedicated, consistent, and fair funding system for the current and future needs of the stormwater management system. This Study will help achieve the goals of the Stormwater Management Plan.

A Public Information Centre (PIC) took place on Tuesday, Jan. 23, at the Italian Cultural Centre and gave residents an opportunity to learn about the study and funding options under consideration and give their feedback. For those who were unable to attend, the informational materials and comment form were posted on the project website following the PIC.

Highlights of Participant Feedback

Sign-in sheets recorded 56 participants attending the in-person meetings. Comment forms were distributed at the in-person meeting and were available online. The Project Team received 108 comment forms online, and 23 comment forms in-person. The information below provides a summary of comments and concerns raised by residents of Thunder Bay about the Stormwater Financing Study.

Question 1. A

Question	Total responses	Common themes of text responses
Based on what you have heard today, what do you believe is the most important stormwater management issue(s) facing Thunder Bay now?	90	<ul style="list-style-type: none"> • Many have concerns over replacing aging infrastructure • Majority of respondents worry of the cost of stormwater management and/or more/increased taxes • Many question equality in a user-fee (location within Thunder Bay, i.e. low lying properties should pay more) • Many are concerned with current potential environmental issues (flooding, contamination, pollution, amount of existing impervious surfaces)

Question 1. B

Question	Total responses	Common themes of text responses
Based on what you have heard today, what do you believe is the most important stormwater management issue(s) facing Thunder Bay in the future?	87	<ul style="list-style-type: none"> • Majority of respondents worry of the cost of stormwater management and/or more/increased taxes • Future environmental concerns (climate change, flooding, contamination, pollution) • Some respondents show interest in building sustainable infrastructure and better maintenance • Concerns over future urban planning (i.e. some suggest building more permeable surfaces vs. parking lots)

Thunder Bay Stormwater Financing Study – Public Information Centre #1 Feedback Summary

Question: 2. (A-G)

Question	Neutral (% of respondents)	Agree (% of respondents)	Disagree (% of respondents)
A. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).	27 (20%)	60 (46%)	42 (32%)
B. This Stormwater Financing Study recommendations must be publicly supported.	25 (19%)	71 (55%)	33 (25%)
C. Stormwater funding should be stable, sustainable, and dedicated to addressing stormwater needs.	26 (20%)	73 (57%)	28 (22%)
D. Costs and benefits must be equitably distributed across the community (i.e. everyone pays their fair share).	17 (13%)	59 (45%)	53 (41%)
E. Costs and benefits must be equally distributed across the community (i.e. everyone contributes the same)	21 (16%)	25 (19%)	79 (61%)
F. The City must maintain appropriate reserve funding levels for unforeseen events.	31 (24%)	80 (62%)	18 (13%)
G. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.	35 (27%)	69 (53%)	24 (18%)

Question 3.

Question	Yes (% of respondents)	No (% of respondents)	Common themes of text responses
Do you feel the City is currently spending enough on stormwater to meet your expectations? Please explain.	74 (58%)	52 (41%)	<ul style="list-style-type: none"> Majority of respondents feel they already pay enough in taxes Many suggest that the City is too reactive and not proactive If more money is to be spent, it should include assets like more roads/bridges Some respondents suggest reallocating funds from other departments to cover stormwater management Many respondents answered they are uncertain

Question 4.

Question	Yes (% of respondents)	No (% of respondents)	Common themes of text responses
If you answered “No” to the question above, would you be willing to pay more to meet these needs/expectations?	28 (33%)	55 (66%)	<ul style="list-style-type: none"> Majority of respondents feel they already pay enough in taxes Some respondents would like to see more specific information about where money is required before new taxes are implemented Many feel current property taxes should cover

Thunder Bay Stormwater Financing Study – Public Information Centre #1 Feedback Summary

			stormwater management
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Question 5.

Question	Based on the value of a property (% of respondents)	Based on the amount of stormwater that runs off of the property into the public system (% of respondents)	Shared equally by property type (everyone pays the same) (% of respondents)	Other (% of respondents)	Other: Common themes of text responses
If a new funding mechanism is recommended, how should stormwater management costs be allocated? (Please check your top choice)	11 (9%)	43 (35%)	20 (16%)	48 (39%)	<ul style="list-style-type: none"> Majority of respondents feel they already pay enough in taxes Many feel stormwater management charges should be based on square footage of homes Many feel that those who live in flood prone areas should pay more or those without sewers should be exempt Many suggest reallocating funds from other departments to cover stormwater management Some respondents feel a combination of options should be explored

Question 6.

Question	Yes (% of respondents)	No (% of respondents)	If no, what would change your mind? Common themes of text responses
Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.	92 (71%)	37 (28%)	<ul style="list-style-type: none"> Many respondents say they've already taken steps on their property (existing grading, permeable driveways, rain gardens and rain barrels) Many respondents do not want to pay for the changes to their property Multiple responses suggest that if incentives are provided they would make changes

Thunder Bay Stormwater Financing Study – Public Information Centre #1 Feedback Summary

Question 7.

Question	Total responses	Common themes of text responses
Do you have additional ideas, questions or concerns that you would like to leave with the study team?	74	<ul style="list-style-type: none"> Majority of respondents feel they already pay enough in taxes Many suggest finding funds from other reserves vs. implementing new taxes Some suggest finding other means to manage stormwater (i.e. creating large rain gardens, larger sewer pipes, building up instead of out) More public education about the importance of stormwater management Better incentives for those who are environmentally conscious Some support a new stormwater management fee if it is reasonable/fair to all

Presentation Question and Answers

During PIC 1 the Project Team delivered a presentation at 5:00p.m and 7:00p.m., below is a summary of the questions and answers captured during the presentations.

Question/ Answer #	Question	Answer
1	Resident lives outside City Limits and indicated he does not pay for stormwater. Will there be a distinction between urban and rural properties?	AW: Yes, this is being considered. Some urban areas receive different services than rural areas. Very brief discussion of mill rates.
2	Comment about the Environmental Commissioner of Ontario and impermeable surfaces. His property is large and based on acreage. When considering impermeable surfaces, will land size be factored in?	AW: Yes, will consider how urban, rural and vacant land is impacted.
3	Resident commented that presentation is “presuming” we want to pay more. She considered stormwater a necessity vs. a luxury (commented on a contribution to the Art Gallery of \$5M). Discussed that she wasn’t clear on the funding gap in the slide that compared tax funding options of \$4M vs. \$9M vs. \$13	MG: Explained the slide - \$4M tax replaced with a user fee; 2018 spend of \$9M vs. requirement of \$13M is a \$4M gap. AW: When storm is funded through tax a process is followed and Council decides how best to spend the funds; it is not a solely dedicated source to stormwater and can vary year to year.
4	Is there a regulation that mandates Stormwater Management? Commented that the old system of combining stormwater and wastewater as the only problem that the City is facing (in terms of stormwater).	AW: Discussion of PPCP and the separation of the combined storm and sanitary sewers. For new development, there is a regulation from the MOE that regulates, drainage requirements, etc. However, for existing properties there is no current regulation. Noted that the City is seeing issues by not seeing stormwater management (other than the combined sewers) PW: Noted that other problems (other than combined sewers). \$540M of existing assets that need to be funded and currently there is not enough funding. Acknowledged PPCP is a priority. Also, the SWMP was already approved in 2016 (which identifies the stormwater projects).
5	For the 1-20 year forecast has inflation been factored in? Could we be paying more in the future?	AW: The 2016 SWMP was adjusted to 2018 dollars and the 20 year average was based on today’s

Thunder Bay Stormwater Financing Study – Public Information Centre #1 Feedback Summary

		dollars. Yes, could be paying more through inflation or other projects that are identified during that time frame.
6	Clarification of \$4M vs. \$9M slide. Would mill rates increase? Can other sources be leveraged?	MG: Indicated that if \$4M and other funding sources (\$3.1M and \$1.9M) was all moved to taxes, rate would need to increase 2.76% (above proposed 2018 tax rate increase). Encouraged him to submit suggestion.
7	Will this Utility Fee be a recommendation and will it be a “slam dunk”?	MG: No, a range of options are being reviewed.
8	Why is the City spending \$250K on AECOM for these studies?	MG: AECOM was selected through an RFP/Tender process. AW: City was directed to looking into Stormwater as this type of study hasn’t yet been done. The City also doesn’t have the resources for this type of study.
9	How will large properties be charged? Will they get less of a fee because the proportion of the lot covered by impervious services is less? Commented that in a downtown area in a row house, these residents will get “hammered” with a fee because the impervious area is a larger portion of the lot.	AW: Commented that other Municipalities that have implemented a fee have used a tiered system for urban and rural areas (ex. Mississauga uses 5 levels/tiers). Based on actual impervious area not the property size.
10	Comment on Development Charges. Some development is in wetland areas. Then the City has to address storm water issues. Why aren’t they paying their fair share?	AW: Wetlands, conservation authority evaluation; there are more “protected” wetlands and water sheds. There are steps in place for wetland protection. Clarified that the City is currently not collecting Development Charges and this study can look into “what if” they were collected. MG: Agreed. Developers should be fiscally responsible for their development
11	Describe “impervious”.	AW: Surfaces that don’t allow water to flow through them. There are some options now that include asphalt that is porous.
12	Comment on rainfall and how much residents contribute to run off. Asked if he keeps track of how much rainfall on his property can he argue his bill (if the charge doesn’t reflect actual rainfall)?	AW: If stormwater is a fee based option, it’s not the rain that happens that day it is the weather overall. Can’t “meter” rain on each property.
13	CTB allowed people to build on land/nature’s natural rain garden (ex. he commented that Northwood should not have been built on). Now the City is expecting people to pick up the tab.	AW: Now there are other Government Regulations that restrict new building
14	Hard Surface – doesn’t recognize large roof vs. small roof doesn’t mean that it contributes to storm water on public lands. Commented that there is no correlation because it drains into the ground. Commented that there are alternative ways of doing things from the past.	AW: Commented on direct discharger
15	How to account for green roofs, etc. and mitigating flow rates (ex. rain barrel). How to track mature trees and if somebody cut one down. There is a significant cost to manage a credit program. How many FTE will be required to run the program?	MG The more you contain water, you are eligible for a discount, rebate as part of a credit/discount program. Will get examples of managing the credit program. AW: City will look at “admin” costs (existing taxes vs. new program vs. credit program) etc.



www.thunderbay.ca

City of Thunder Bay
Infrastructure & Operations Department
PUBLIC SERVICE ANNOUNCEMENT

DIVISION	Engineering & Operations	MEDIA	All
CONTACT	Aaron Ward	RELEASE DATE	As soon as possible
TELEPHONE	625-2444		
INSTRUCTIONS	Please run as often as possible until Friday, Feb. 9		

-NOTICE-

City Survey Seeks Residents' Thoughts on Stormwater Management Financing

In 2016, City Council adopted the Stormwater Management Plan, outlining stormwater management goals and objectives for the next 20 years. Now, a Stormwater Financing Study is underway to investigate a sustainable and fair funding source to support the City's current stormwater program and the implementation of the Stormwater Management Plan.

Visit www.thunderbay.ca/stormwaterplan to learn more about the study and answer the online survey. The survey will be available until Friday, February 9.

For more information, contact: Aaron Ward – Project Engineer at 625-2444



Thunder Bay Stormwater Financing Study

Public Information Centre #1 - Comment Form

Tuesday, January 23, 2018
Italian Cultural Centre,
123 Algoma Street North

We want to hear from you! Please fill out and submit the following comment form no later than Monday, February 5, 2018.

Please submit by:

- Dropping off your completed form in the comment box at the sign-in table
- Emailing your completed form to: pippy.warburton@aecom.com or award@thunderbay.ca
- Mailing your completed form to:

Aaron Ward
Engineering & Operations Department
111 Syndicate Ave. S., 2nd Floor
P.O. Box 800
Thunder Bay, ON P7C 5K4

1. Based on what you have heard today, what do you believe is the most important stormwater management issue(s) facing Thunder Bay:

a. Now?

b. In the future?

2. What is your opinion of the following statements: (circle either Agree, Neutral or Disagree)

- a. Stormwater management should be a priority for the City (i.e. when considering all City responsibilities).

Agree **Neutral** **Disagree**

- b. This Stormwater Financing Study recommendations must be publicly supported.

Agree **Neutral** **Disagree**



THUNDER BAY STORMWATER FINANCING STUDY

- c. Stormwater funding should be stable, sustainable, and dedicated to addressing stormwater needs.

Agree **Neutral** **Disagree**

- d. Costs and benefits must be **equitably** distributed across the community (i.e. everyone pays their fair share).

Agree **Neutral** **Disagree**

- e. Costs and benefits must be **equally** distributed across the community (i.e. everyone contributes the same).

Agree **Neutral** **Disagree**

- f. The City must maintain appropriate reserve funding levels for unforeseen events.

Agree **Neutral** **Disagree**

- g. Policies for credits, incentives, adjustments and appeals are important for any stormwater funding system.

Agree **Neutral** **Disagree**

3. Do you feel the City is currently spending enough on stormwater to meet your expectations?

Yes **No** Please explain:

4. If you answered "No" above, would you be willing to pay more to meet these needs/ expectations?

Yes **No** Please explain:



THUNDER BAY STORMWATER FINANCING STUDY

5. If a new funding mechanism is recommended, how should stormwater management costs be allocated? (Please check your top choice)

- Based on the value of a property
- Based on the amount of stormwater that runs off of the property into the public system
- Shared equally by property type (everyone pays the same)
- Other (anything that was not presented today):

6. Would you be willing to take steps on your own property to reduce the impacts of heavy rainfall events? Some examples might be disconnecting your downspouts, creating a rain garden, or using permeable pavers.

Yes No If no, what would change your mind?

7. Do you have additional ideas, questions or concerns that you would like to leave with the study team?

Thank you!

We appreciate the time you have taken today. We value your input to this study and encourage you to stay connected:

- Please visit the project website at www.thunderbay.ca/stormwaterplan
- Join our mailing list – leave us your email address so we can keep you up-to-date as the project progresses
- Contact the Project Manager with any additional comments or questions at any time:

Pippy Warburton, P. Eng.
 AECOM
 519-650-8629
pippy.warburton@aecom.com

Aaron Ward, P.Eng., Project Manager
 City of Thunder Bay
 807-625-2444
award@thunderbay.ca

*Please remember to drop off your completed comment form before you leave or send it to us by email before February 5, 2018



Welcome

Thunder Bay Stormwater Financing Study Public Information Centre #1

Presentations at 5p.m. and 7p.m.

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

Why are we here?

The City of Thunder Bay is conducting a study to review and recommend a sustainable and fair funding source to support the City's current stormwater management program and help achieve the future goals of the Stormwater Management Plan.



Stormwater

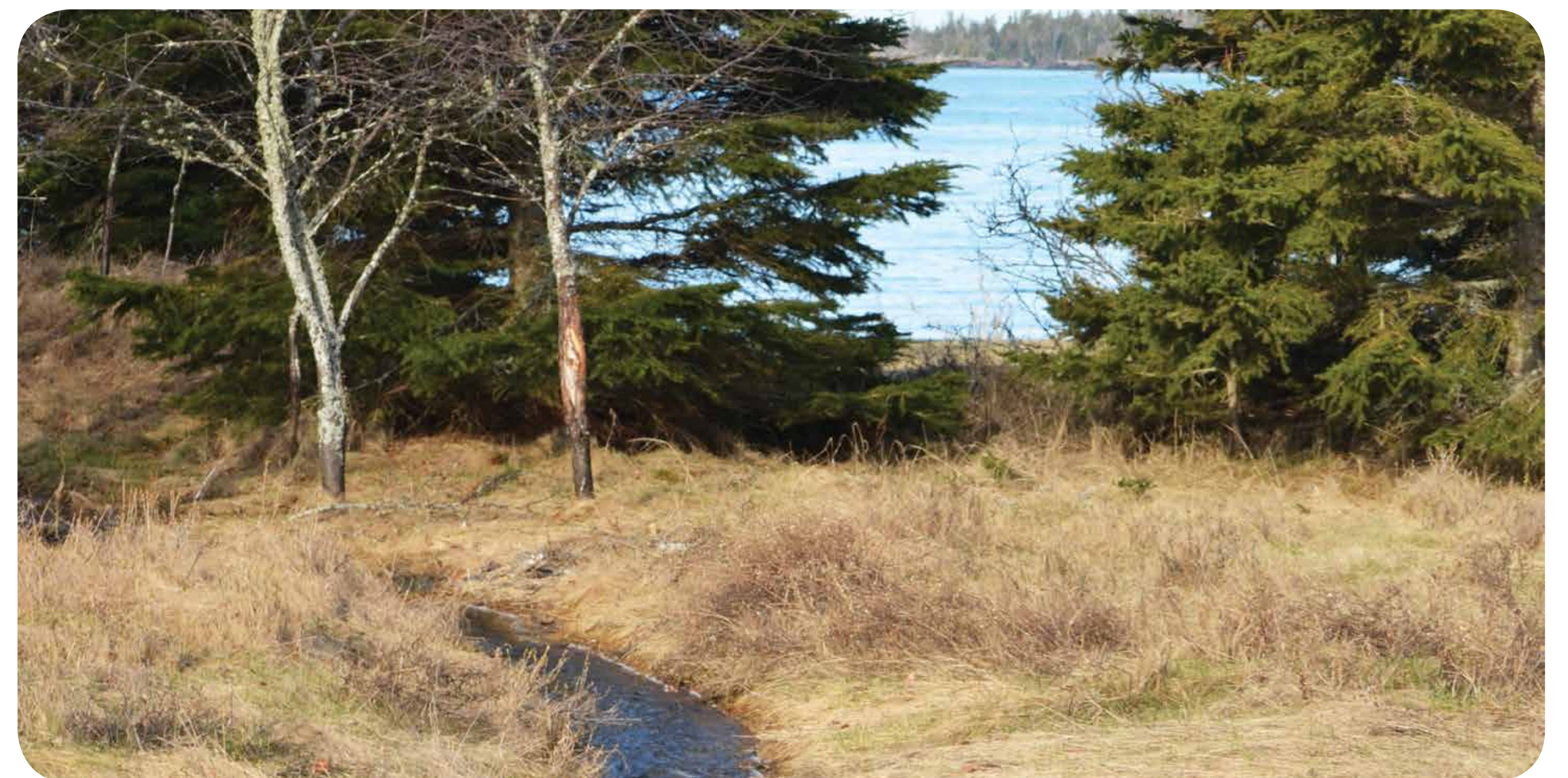
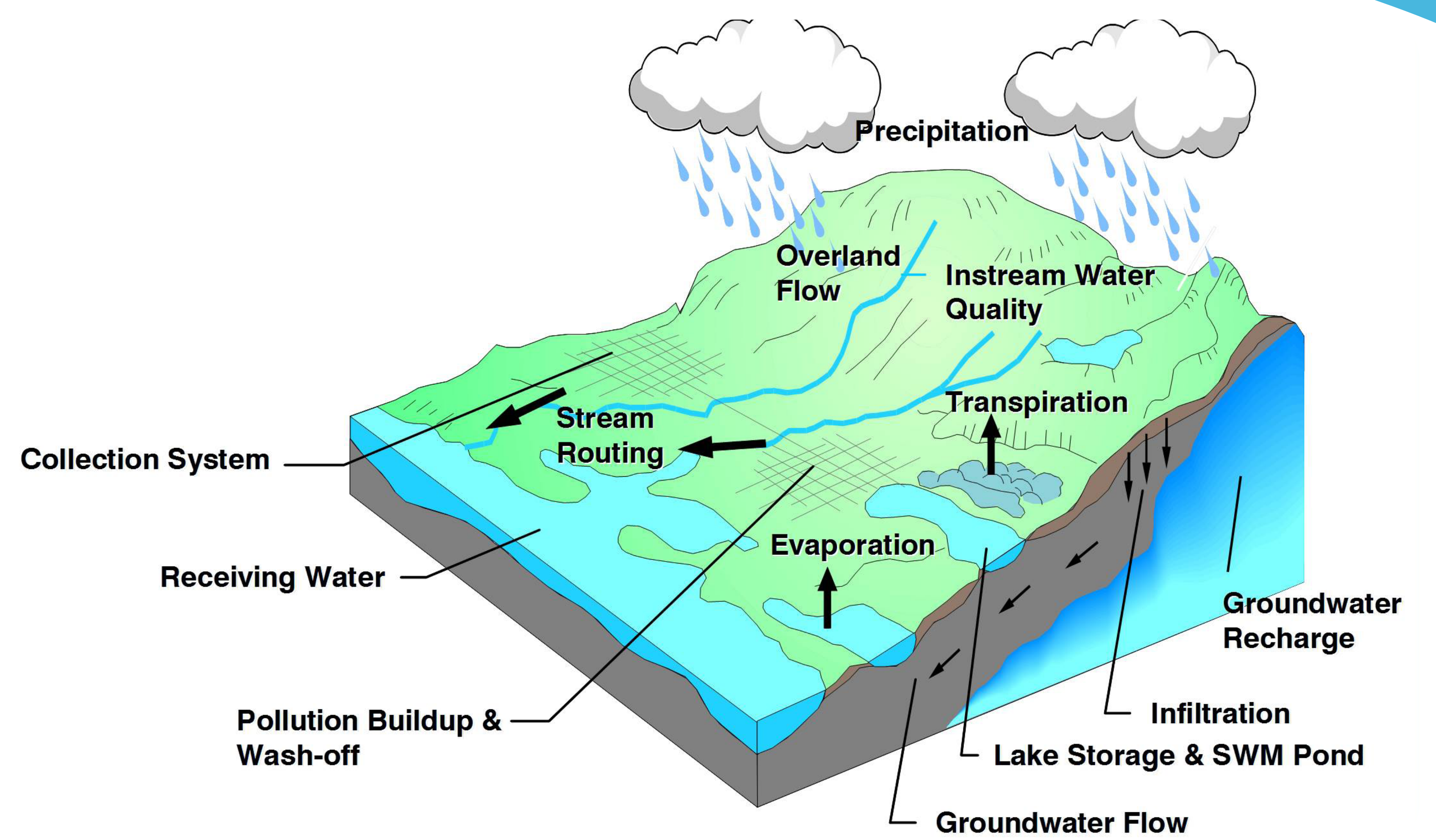
Nature continuously recycles our water supply through the hydrologic cycle: evaporation, condensation, precipitation, infiltration, groundwater recharge and runoff.

Stormwater comes from the rain and melted snow that flows over land and into storm drains or streams, rivers and lakes.

Stormwater in Nature: The natural landscape soaks up stormwater like a sponge, nourishing plants and slowly replenishing streams, lakes, wetlands, and aquifers.

Stormwater in Built Landscapes: Impervious surfaces such as pavement and roofs prevent precipitation from naturally soaking into the ground. Instead the water runs quickly into storm drains, sewer systems, and drainage ditches, and then to our lakes and rivers.

Impervious areas create more runoff, transport it more quickly, and accumulate more pollutants than natural areas.



Increased stormwater runoff can affect:

Water Quality

Increased stormwater runoff carries a greater volume of pollutants to our rivers and lakes which contributes to closed beaches and habitat degradation, including fish habitat.



Flooding

Excessive stormwater runoff can lead to costly flooding of sidewalks, streets, properties and buildings.



Erosion

Increased stormwater runoff can accelerate streambank erosion and road washouts, and impact wildlife and fish habitat.



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 the passage of water within the drainage system and may result in flooding.





Stormwater Management in Thunder Bay

The City's stormwater management systems protect the health and safety of the public and the environment by managing the quality and quantity of stormwater reaching our lakes and rivers.

Management of stormwater in Thunder Bay consists of:



Typical stormwater management challenges facing municipalities can include:

- **Urbanization:** Growth and development alters the amount of runoff and pollution
- **Aging infrastructure:** Pipes, culverts, facilities, and outfalls have limited life expectancy
- **Changing design standards:** Systems designed to old standards may be inadequate compared to current and future regulatory requirements
- **Insufficient long-term planning and funding:** Appropriate resources, facilities, and improvement projects must be proactively planned and funded to address needs and problems
- **Limited maintenance:** Facilities must be actively operated, watercourses maintained, and streets, ditches, catchbasins, culverts and outfalls inspected and maintained
- **Climate change:** Facilities must respond to increasing rainfall events that are becoming more intense and frequent, and seasonal changes such as rainfall in the winter

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



Stormwater Management Plan

As part of its commitment to environmental stewardship and community sustainability, the City of Thunder Bay has developed a **Stormwater Management Plan**. This plan, adopted by Council in 2016, will guide the City's stormwater management actions for the next 20-years, based on the following goals:



ECOSYSTEM HEALTH: The ecological integrity of the City's surface water, groundwater and natural resources provide their original level of function and value



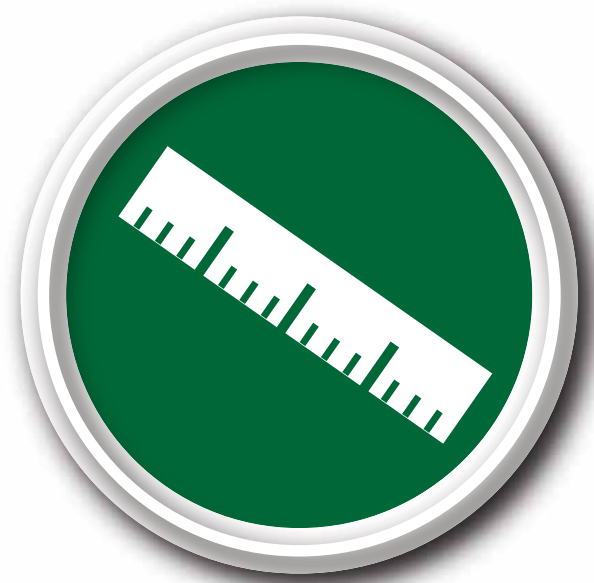
WATERSHED QUALITY: The streams, rivers, lakes and wetlands in the Lakehead Watershed meet their Beneficial Uses ("fishable and swimmable")



WATER QUANTITY: The City's stormwater system effectively manages the quantity and delivery of runoff in a manner that protects the environment, infrastructure, and the health and safety of residents



OPERATIONS and MAINTENANCE: The City of Thunder Bay's stormwater systems are properly maintained, managed and operated



MONITORING and DATA ASSESSMENT: There is a wealth of surface water and groundwater quality and quantity data in the Lakehead Watershed to assess the health of resources, evaluate trends, and track improvements related to implementation of the Stormwater Management Plan



REGULATION and ENFORCEMENT: Engineering and Design Standards and By-Laws are in place and enforced to effectively manage the impact of new development and re-development activities in the City of Thunder Bay



EDUCATION and OUTREACH: The City of Thunder Bay's residents, businesses, and institutions have a good understanding of stormwater management and are committed stewards of the Lakehead Watershed's resources



FUNDING and ORGANIZATION: The City of Thunder Bay has the resources and capacity needed to adequately implement an effective Integrated Stormwater Management Program



CLIMATE CHANGE: The City of Thunder Bay has evaluated the potential impacts related to climate change, built resiliency into its stormwater management system and incorporated adaptation strategies that will translate into long-term cost savings to the City and its inhabitants



Thunder Bay's Stormwater Management Plan

The City's Stormwater Management Plan outlines a recommended path towards sustainable stormwater management in Thunder Bay that can be funded through a refined financing strategy. Implementation will prepare the City's infrastructure for the growing challenges of climate change and will need to adapt to lessons learned through evaluating progress over the next 20 years.

The City funds the stormwater system primarily through property taxes, but also through the sewer surcharge rate. For the tax portion, homeowners and landowners across Thunder Bay contribute to the stormwater system based on assessed property value and some properties are exempt from these taxes.

Stormwater Management Funding Required Over the Next 20 Years (per capita)		
	Year 1	20-yr Avg.
Annual Stormwater Funding Required	\$7,095,000*	\$11,161,950
Per Capita (108,000) population	\$65.7	\$103.4

*Includes funding from all sources



Green Infrastructure at the Bare Point WTP



Stormwater Management Assets

The City's stormwater management system contains valuable infrastructure assets that include:



Storm sewers



Catchbasins



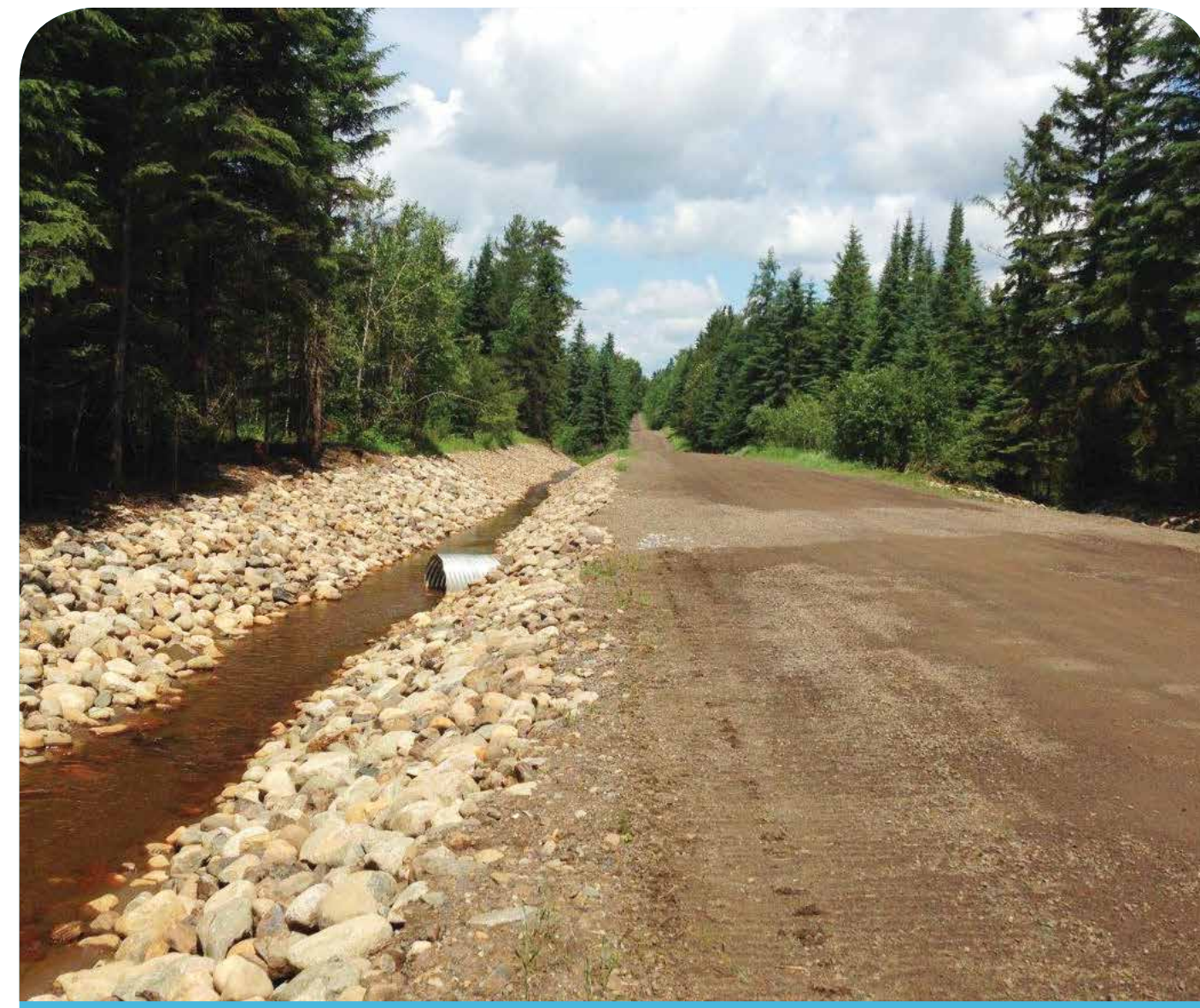
Inlets and outlets



Oil-grit separators



Bridges



Ditches and Culverts



Watercourse



Stormwater treatment facilities, including Green Infrastructure

Storm Sewer Network Assets

An inventory of the City's stormwater assets was undertaken, identifying an overall replacement value total of approximately \$508 million, not including the value of ditches, watercourses, and ponds. This is equivalent to nearly \$11,000 per household.

Thunder Bay's Stormwater Management Infrastructure Quantity and Value		
Assets Type	Quantity	Replacement Value (as of 2018)
Storm Sewers ¹	330 km, 11,000 catch basins, 4,200 manholes, 380 outfalls	\$321,940,000
Pumping Stations ¹	4	\$7,020,000
Bridges ¹	57	\$179,150,000
Culverts (>3m span) ¹	16	\$15,960,000
Dams ¹	2	\$15,390,000
The information below is not currently included in the Asset Management Plan (AMP), but was identified in the Stormwater Management Plan to be included in future AMP's. Quantities and values below are preliminary in nature.		
Culverts (>3m span)	389	??
Ditches	486 km	??
Treatment Facilities	45	\$3,600,000
Watercourses	74 km	??
Total Replacement Value \$543,060,000		

As the infrastructure ages, a regular renewal/ replacement plan for the infrastructure will be required.



Thunder Bay's Stormwater Funding and Expenditures

Current Funding Sources

- 1 Property Taxes:** The contribution each property owner makes to the stormwater program is based on assessed property value, and some properties are exempt from these taxes.
- 2 Sewer Surcharge Rate:** Approximately 10% of funds collected from wastewater revenue are directed to stormwater operating and capital programs.
- 3 Federal / Provincial Contributions:** Grants are available through various government programs to help communities implement capital and operational programs. Grants such as the Gas Tax Fund, Ontario Community Infrastructure Fund, the Clean Water and Wastewater Fund, and others are used to supplement the stormwater program.
- 4 Other Grant and Funding Programs:** There are a number of other organizations and foundations that provide grants for habitat restoration, green initiatives, and public education and outreach, which continue to be accessed. Examples include RBC Blue Water Community Action Grants, CN EcoConnexions, and the Great Lakes and St. Lawrence Cities Initiatives.

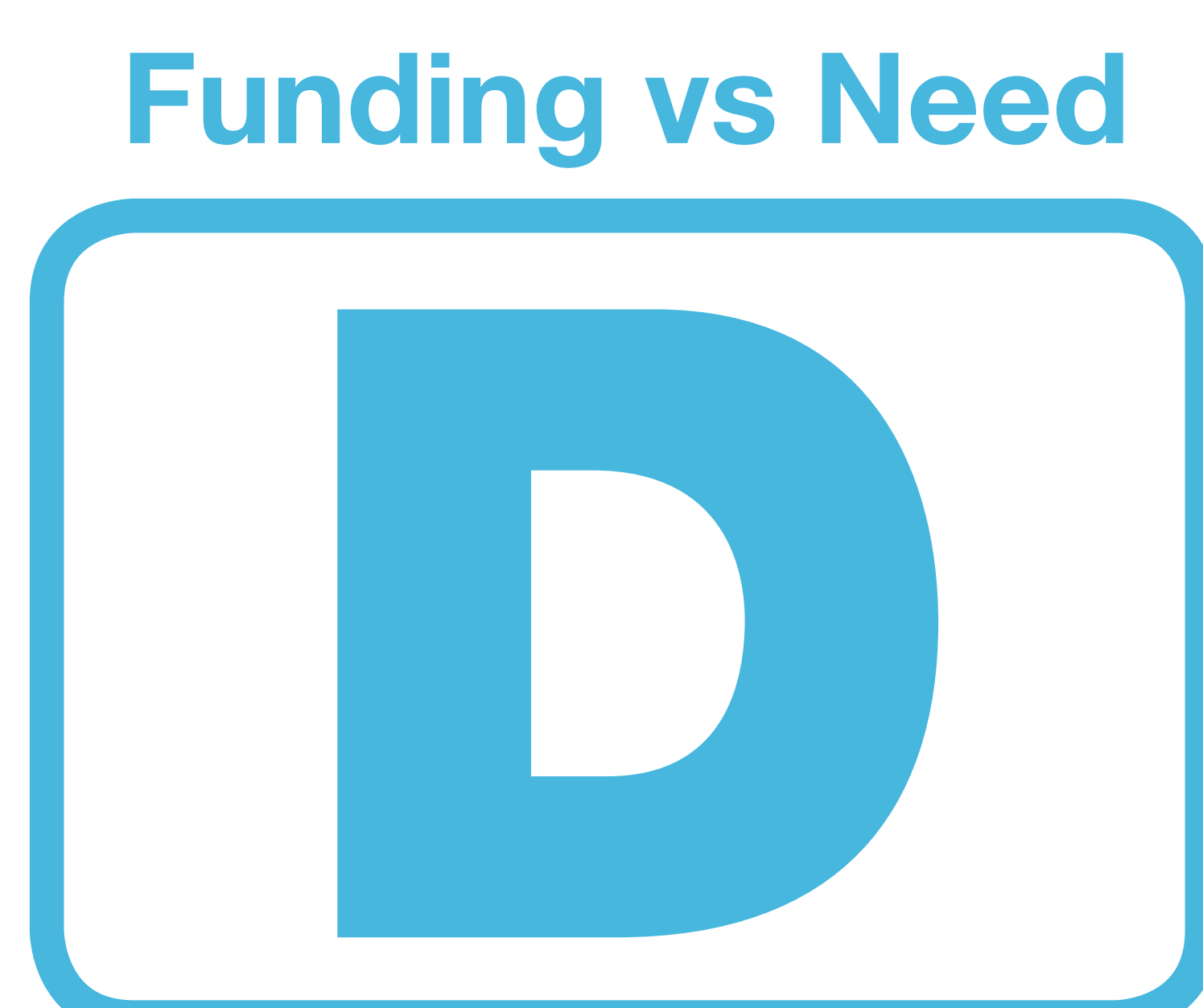
Current Expenditures

According to Thunder Bay's 2016 Asset Management Plan:

Average spending
from 2011-2015 =
\$2.9 million annually

Capital funding required to repair/
replace existing infrastructure =
\$6.2 million annually

This equates to a \$3.3 million annual funding gap and grade of D.



This does not include the construction of new infrastructure and treatment facilities.



Thunder Bay's Stormwater Financing Study Overview

To complete the Stormwater Financing Study, we will:

- 1** Determine the appropriate and affordable level of service for future stormwater management program projects and activities
- 2** Identify and evaluate stormwater funding options and alternatives
- 3** Actively solicit feedback from a Stormwater Advisory Committee as well as residents and business owners (a second Public Information Centre is planned later in 2018)
- 4** Recommend a preferred option and determine the impacts compared to the current tax-based funding approach
- 5** Present project findings and study recommendations to Council in late 2018





Alternative Funding Options Under Consideration

The City of Thunder Bay is investigating several options to provide funding for its stormwater management program. These options may include:

- Status Quo
- Increased property tax rates
- Modifications to the current Sewage & Drainage property tax levy
- A new Stormwater Management property tax levy
- Modifications to the current Development Charges program (partial program funding for new development and infill/re-development only)
- A new Development Impact Fee program (partial program funding for new development and infill/re-development only)
- A new Stormwater Management User Fee program

A user fee where users are charged based on how much stormwater they contribute to the stormwater management system - similar to a water and wastewater rate - could be applied in the following ways:

- A simple **flat fee** charged to all properties equally, or
- A **variable charge** based on the amount of impervious area on each property (i.e. the amount of runoff created by each property).

The following evaluation criteria will be used to identify a preferred funding option:



Applicability of funding method citywide



Eligibility to support capital improvement projects, operations & maintenance activities



Eligibility to offset costs for engineering, support, and overall administration of the stormwater program



Fair and equitable charges to the property owners



Long-term funding source dedicated solely to stormwater program expenditures



Level of effort to administrate and staffing/resource requirements



Environmental benefits including opportunities for rebates and incentives to reduce stormwater and pollutant loads



Thank you for Attending!

We appreciate the time you have taken today. We value your input to this study and encourage you to stay connected:

- Please visit the **project website** at www.thunderbay.ca/stormwaterplan
- Complete the **online survey** available through the project website
- Join our **mailing list** – leave us your email address so we can keep you up-to-date as the project progresses
- Contact the Project Manager with any **additional comments or questions** at any time:

Pippy Warburton, P. Eng.

AECOM

519-650-8629

pippy.warburton@aecom.com

Aaron Ward, P.Eng., Project Manager

City of Thunder Bay

807-625-2444

award@thunderbay.ca

*Please remember to drop off your completed comment form in before you leave or send it to us by email before February 5, 2018



Notice of Public Information Centre #1

Stormwater comes from the rain and melted snow that flows over land. In our city, most stormwater runs off hard surfaces like roofs and driveways, carrying pollution into waterways, and potentially causing flooding along the way.

Managing stormwater protects the health and safety of our community. The City consistently invests in stormwater management – including our catch basins, sewers, and other infrastructure. However, our infrastructure is aging and will need to be renewed on a regular basis to avoid costly repairs in the future. In 2016, Council adopted the Stormwater Management Plan (the SWM Plan), outlining stormwater management goals and objectives for the next 20 years.

A **Stormwater Financing Study** is underway to investigate a sustainable and fair funding source to support the City's current stormwater program and the implementation of the SWM Plan.

We Want to Hear from You

Join us at a Public Information Centre to learn about the study and funding options under consideration.

Tuesday, January 23, 2018

Italian Cultural Centre,
123 Algoma Street North,
Thunder Bay

Drop in between 4 pm and 8 pm.
Presentations at 5 pm and 7 pm.

Bus Routes: 3M Memorial,
11 John,
13 John-Jumbo

Stay Informed

Public input is essential to the success of the Stormwater Financing Study. Please visit the Study website at thunderbay.ca/stormwaterplan for study updates, and to submit your ideas and feedback. A survey will be posted shortly to share your preferences for stormwater financing.

Comments / Ideas / Questions?

Please contact us at:

Pippy Warburton, P. Eng.

AECOM
519-650-8629
pippy.warburton@aecom.com

Aaron Ward, P. Eng.

City of Thunder Bay
807-625-2444
award@thunderbay.ca

**Presentations at
5pm and 7pm**

City of Thunder Bay Stormwater Financing Study



Public Information Centre
Meeting No. 1
January 23, 2018

Project Manager: Aaron Ward, P.Eng.

Consultant Team: Pippy Warburton, P.Eng., Mike Gregory, P.Eng.



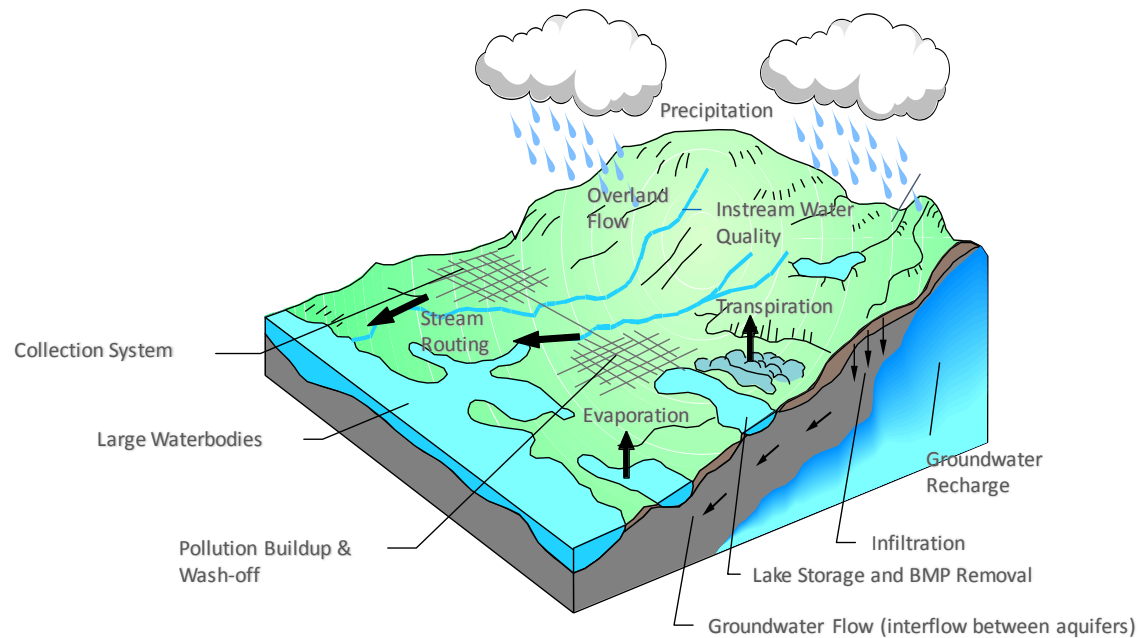
Meeting Purpose and Objectives

- Reintroduce stormwater management: what it is and why it is important
- Revisit the 2016 Stormwater Management Plan, the storm sewer network grade assigned in the 2016 Asset Management Plan, and the City's long-term stormwater management goals
- Introduce the financing study: why it is needed and what is involved
- Provide information about Thunder Bay's current stormwater management program and funding sources
- Identify future needs and potential alternative funding sources
- Describe next steps in the study process
- Seek feedback on stormwater management financing issues and concerns



What is Stormwater Management?

- Capture/collection, storage/treatment and conveyance of water in response to rainfall and snowmelt
- Legislative requirements have evolved significantly from traditional “drainage”
 - Hazard protection
 - Quality treatment
 - Volume reduction
 - Watershed health





2016 Stormwater Management Plan

- Developed as part of the City’s commitment to environmental stewardship and community sustainability
- Adopted by Council in 2016, this plan will guide the City’s stormwater management actions for the next 20 years, based on the following goals:

- ECOSYSTEM HEALTH
- WATERSHED QUALITY
- WATER QUANTITY
- OPERATIONS and MAINTENANCE
- MONITORING and DATA ASSESSMENT

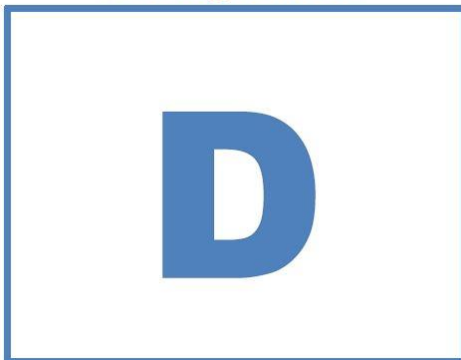
- REGULATION and ENFORCEMENT
- EDUCATION and OUTREACH
- FUNDING and ORGANIZATION
- CLIMATE CHANGE

Report Card

- From the 2016 Asset Management Plan...
 - Average spending from 2011-2015 was \$2.9 million annually
 - Capital funding should amount to \$6.2 million annually

This equates to a **\$3.3 million annual funding gap and grade of D.**

Funding vs Need



Note: this does not include all current stormwater assets, such as ditches, culverts, and treatment facilities, nor does it include the construction of new infrastructure and treatment facilities



Stormwater Management Asset Inventory

– What are Thunder Bay’s stormwater assets?



Storm sewers



Catchbasins



Inlets and outlets



Oil-grit separators



Bridges



Ditches and Culverts



Watercourse

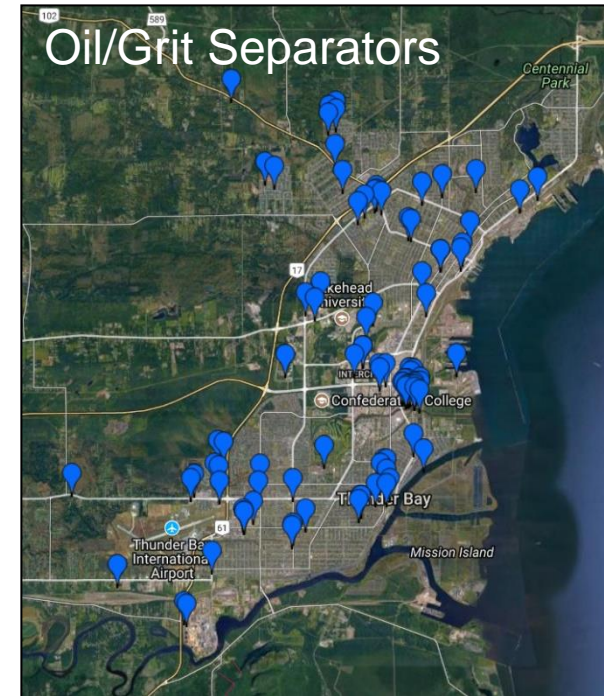
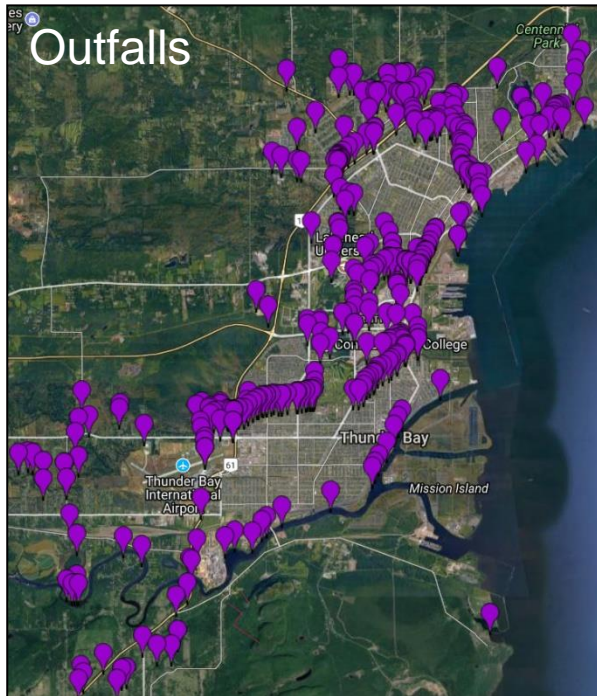


Stormwater treatment facilities, including Green Infrastructure



Stormwater Management in Thunder Bay

- Currently, stormwater from 95% of the City (does not include private facilities) is discharged directly into the environment without any water quality treatment





Stormwater Management Asset Value

- How much are the City’s stormwater assets worth?
- The overall replacement value exceeds **\$540M dollars**. This is equivalent to over \$11,000 per household.

Asset Type	Quantity	Replacement Value (2018)
Storm Sewers ¹	330 km of pipes; 11,000 catch basins; 4,200 manholes; 380 outfalls	\$321,940,000
Pumping Stations ¹		\$7,020,000
Bridges ¹	57	\$179,150,000
Culverts (>3m span) ¹	16	\$15,960,000
Dams ¹	2	\$15,390,000
<i>The information below is not currently included in the Asset Management Plan (AMP), but was identified in the 2016 Stormwater Management Plan to be included in future AMP's. Quantities and values below are preliminary in nature.</i>		
Culverts (<3m span)	389	??
Ditches	486 km	??
Treatment Facilities	45	\$3,600,000
Watercourses	±70 km	??

Total Replacement Value >\$540,000,000

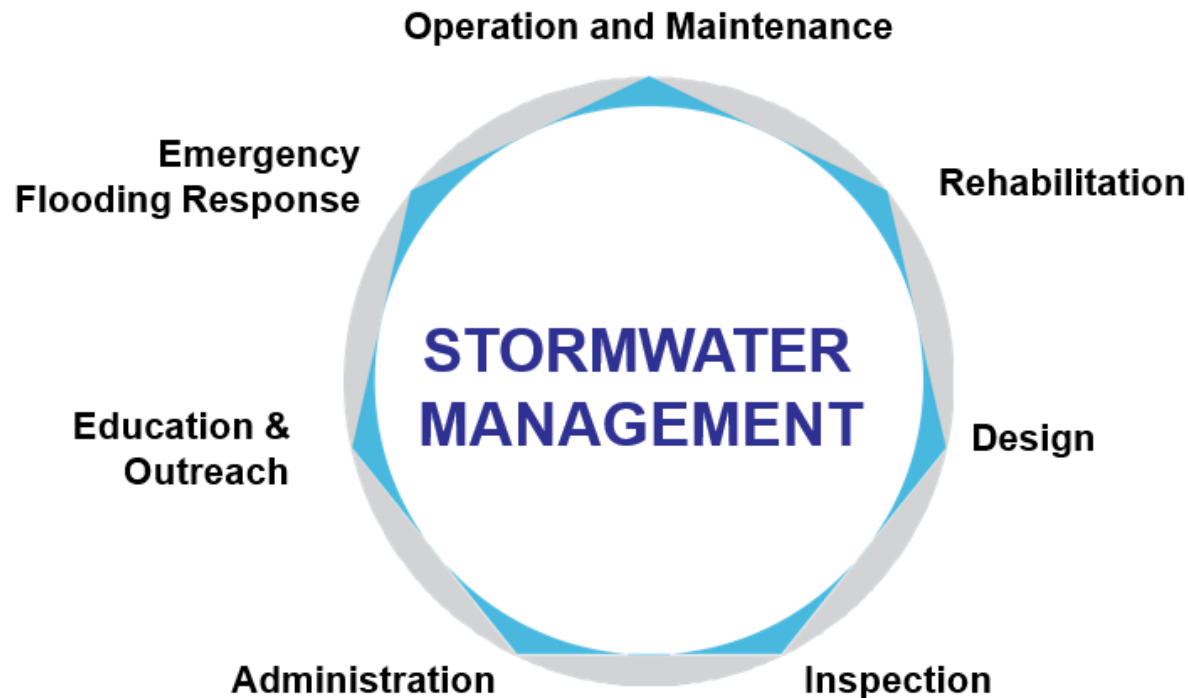
Notes

1. 2016 Thunder Bay Asset Management Plan (AMP).



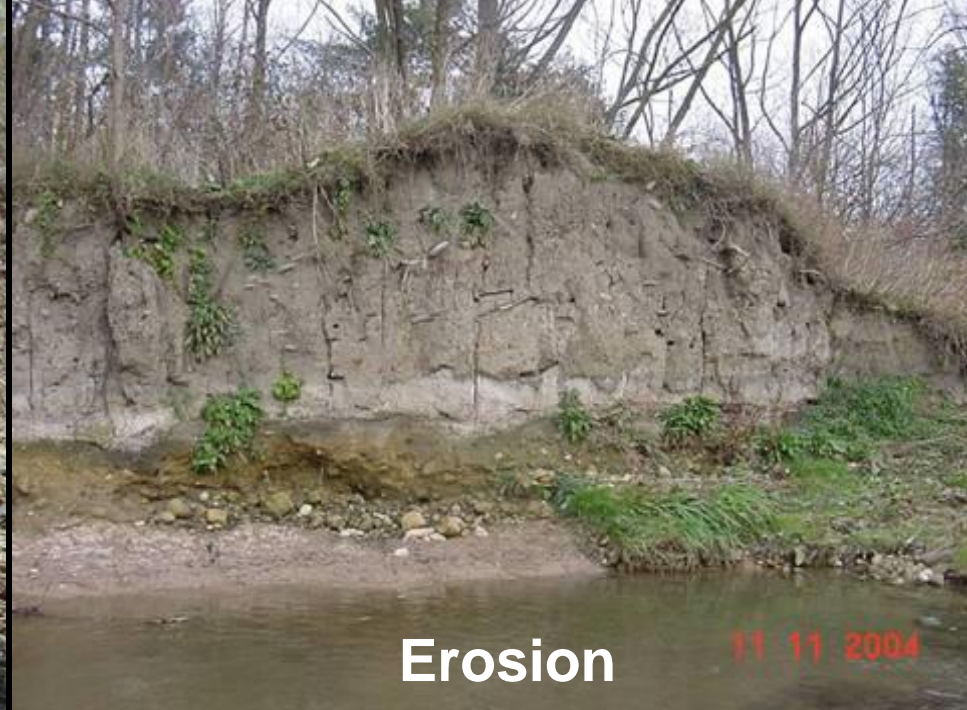
What is Thunder Bay Currently Doing?

- The City is responsible for protecting public health & safety as well as the environment by managing the quality and quantity of stormwater reaching our lakes and rivers





Debris



Erosion

11 11 2004



Water Quality

5/6/1999 1:57pm



Flooding



Local Flooding and Erosion

May 28, 2012



Image from: tbnewswatch.com



Image from: news.national.post





Kam River Streambank Erosion
(Victor Street)



McIntyre River (Central Avenue)



Capital Projects



Operations and Maintenance



Operations and Maintenance



Repair



Debris Removal



Ditch Cleaning



River Dredging



Floodway Dredging

Education and Outreach





Stormwater Financing Study Overview

1. Determine the appropriate and affordable level of service for future stormwater program projects and activities
2. Identify and evaluate funding options and alternatives
3. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
4. Recommend a preferred option and determine the impacts compared to current funding sources
5. Present project findings and study recommendations to Council later this year



Study Highlights

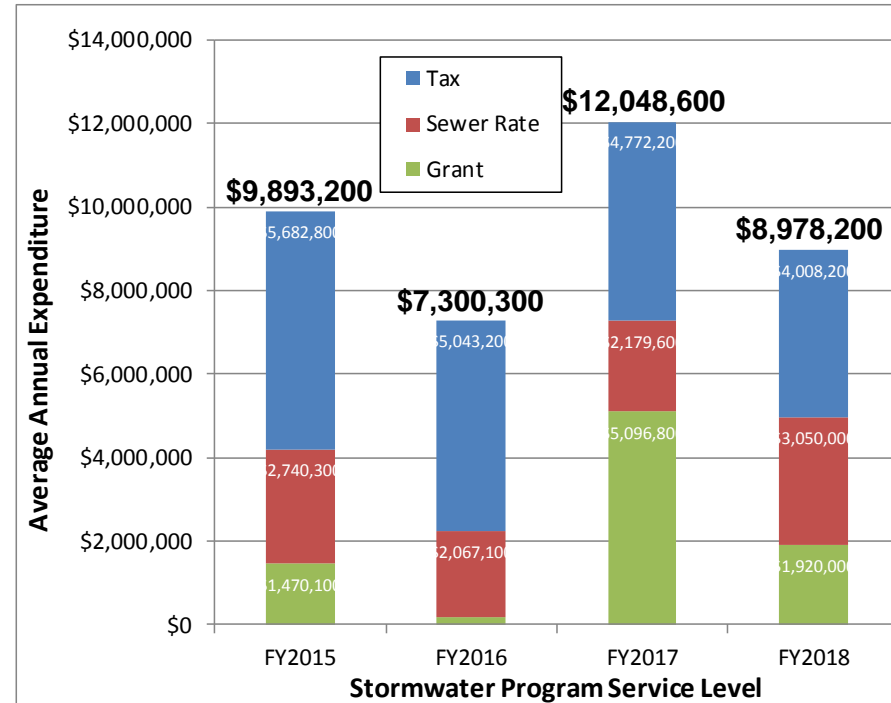
- Range of funding options to be investigated
 - Do nothing (no change to current funding sources)
 - Changes to property tax funding
 - Changes to development charges (for new development)
 - New user-fee funded program
- Led by City Internal Steering Committee
- Advised by Stormwater Advisory Committee as well as the general public and interested stakeholders
- Direction from (and decisions will be made by) City Council



Current Stormwater Program Expenditures

– Annual stormwater program costs (FY2018 budget): \$9.0M

- Tax funded portion: \$4.0M
- Rate funded portion: \$3.1M
- Grant funded portion: \$1.9M



Stormwater Management Program Item	Current Funding Source	Annual Expenditure	
		Tax Funded	All Sources
Operations & Maintenance			
Street Cleaning	Tax	\$762,300	\$762,300
Drainage & Flood Control	Tax	\$685,900	\$685,900
Catchbasins	Sewer Rate	\$0	\$443,300
Pump Stations	Sewer Rate	\$0	\$36,100
Storm Sewers	Sewer Rate	\$0	\$360,600
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,448,200	\$2,288,200
Capital Improvements			
Storm Sewer Separation	Sewer Rate + Grant	\$0	\$2,210,000
Stormwater Mgmt. Projects	Tax + Grant	\$1,060,000	\$2,980,000
Culvert Replacement	Tax	\$100,000	\$100,000
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,160,000	\$5,290,000
Other			
Lakehead Region CA Levy	Tax	\$1,400,000	\$1,400,000
Indirect Overhead	Tax	??	??
Subtotal		\$1,400,000	\$1,400,000
TOTAL		\$4,008,200	\$8,978,200



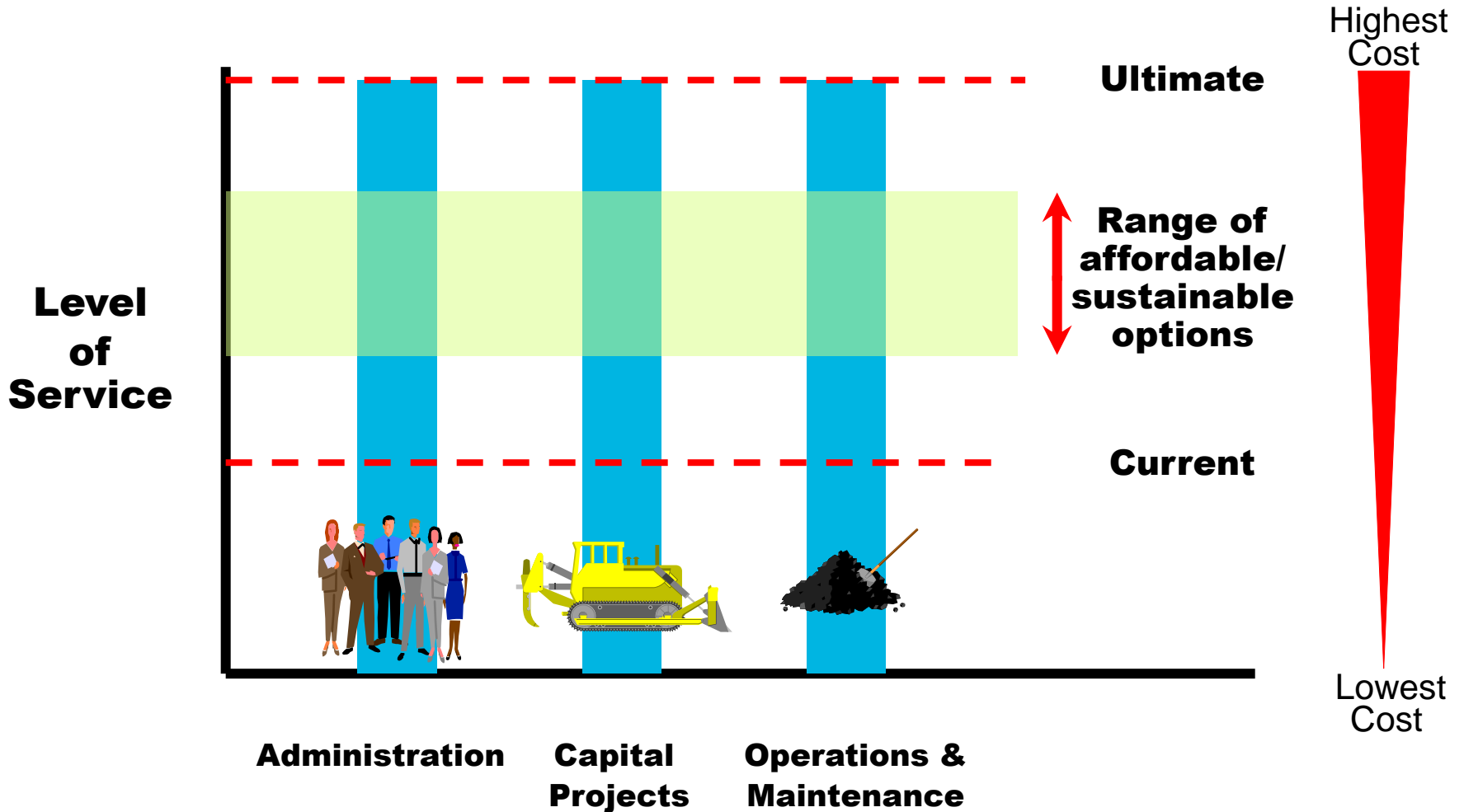
Future Program Requirements

- The 2016 Stormwater Management Plan outlines a recommended path towards sustainable stormwater management in Thunder Bay while addressing future program pressures and challenges
- Currently unfunded operational needs
- Increased capital program needs in response to climate change, greater focus on watershed health, etc.

Stormwater Management Program Item	Annual Expenditure	
	Year 1	Year 1-20
Operations & Maintenance	\$2,608,000	\$3,698,950
Capital Improvements	\$4,487,000	\$7,463,000
TOTAL (\$2016)	\$7,095,000	\$11,161,950
TOTAL (\$2018)	\$7,380,000	\$11,610,000
Other (LRCA Levy)	\$1,400,000	\$1,400,000
TOTAL	\$8,780,000	\$13,010,000

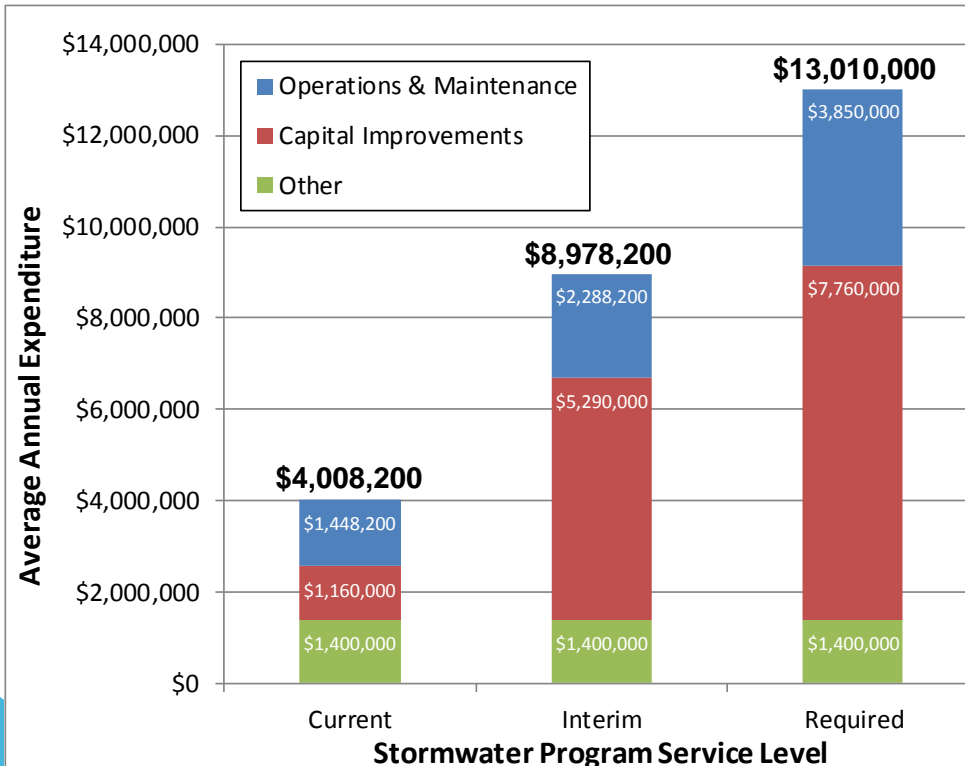


Level of Service Decisions Affect Program Affordability



Service Level Scenarios

- Current: Tax-funded portion from proposed FY2018 budget
- Interim: Total amount (all sources) from FY2018 budget
- Required: Identified in the 2016 SMP (in \$2018)



Stormwater Service Level (annual cost)	2016 Census - City of Thunder Bay		
	Land Area (ha)	Population	Households
	per hectare	per capita	per house
Current: \$4,008,200	32,836	107,909	47,182
Interim: \$8,978,200	\$273	\$83	\$190
Required: \$13,010,000	\$396	\$121	\$276



Consultant Team Experience

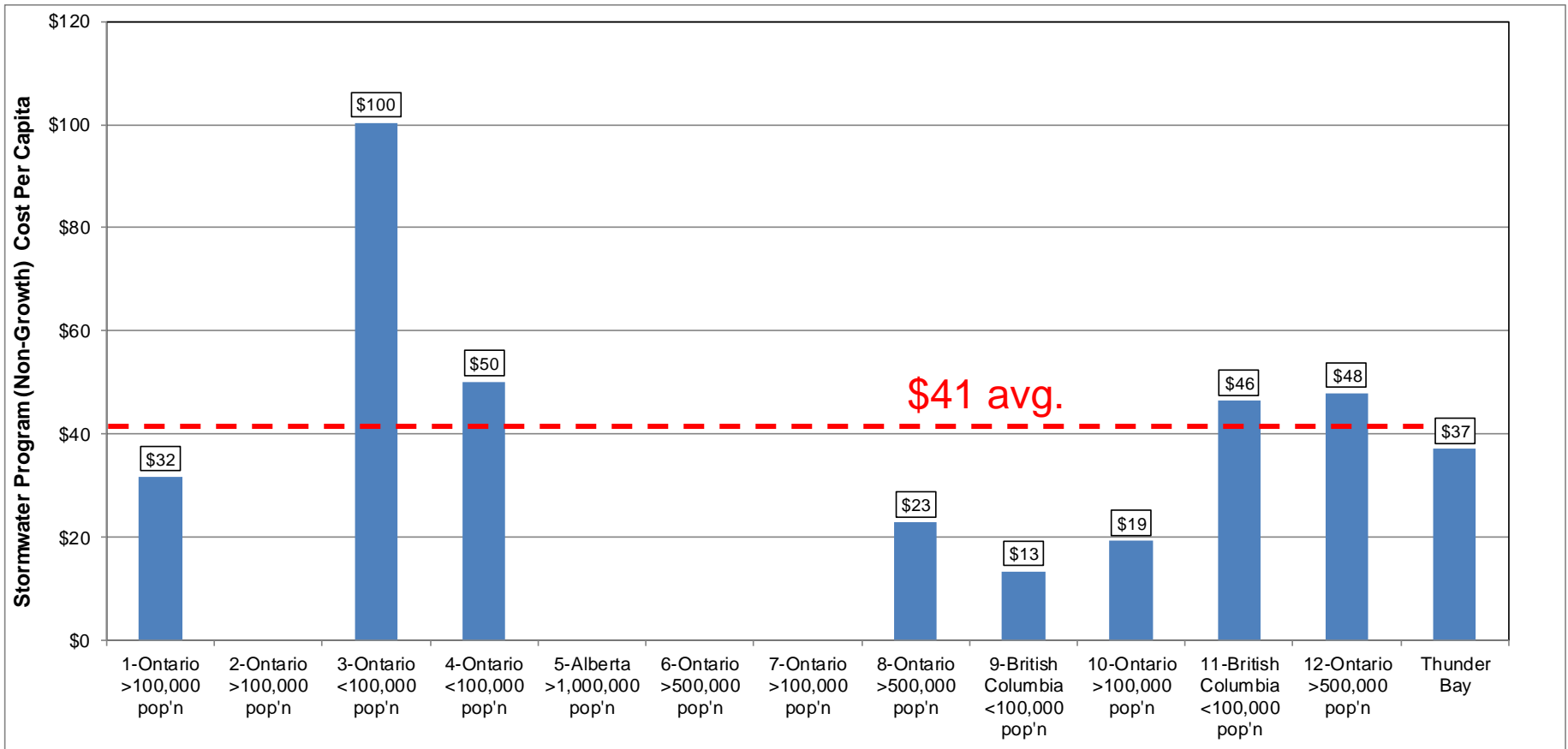
– Stormwater financing studies in Canada, 2005-present

Municipality / Agency	Year Completed	Study Type	Advisory Committee	Credits Explored
Stratford, ON	2007	Feasibility study	Yes	Somewhat
Calgary, AB	2008	Feasibility study	No	No
Credit Valley Conservation, ON	2008	Concept study	n/a	n/a
Kitchener & Waterloo, ON	2009	Feasibility study	Yes	Yes
Hamilton, ON	2010	Feasibility study	No	Somewhat
Kitchener, ON	2010	Implementation	No	Yes
Mississauga, ON	2013	Feasibility study	Yes	Yes
Markham, ON	2014	Feasibility study	No	Somewhat
Mississauga, ON	2014	Implementation	Yes	Yes
Prince George, BC	2014	Feasibility study	No	No
Markham, ON	2015	Implementation	No	Somewhat
Vernon, BC	2015	Feasibility study	No	No
Guelph, ON	2016	Feasibility study	Yes	Yes
Ottawa, ON	2016	Feasibility study	No	No
Guelph, ON	2018	Implementation	Yes	Yes
Thunder Bay, ON	in progress	Feasibility study	Yes	???
Sault Ste. Marie, ON	in progress	Feasibility study	Yes	???



How Does Thunder Bay Compare?

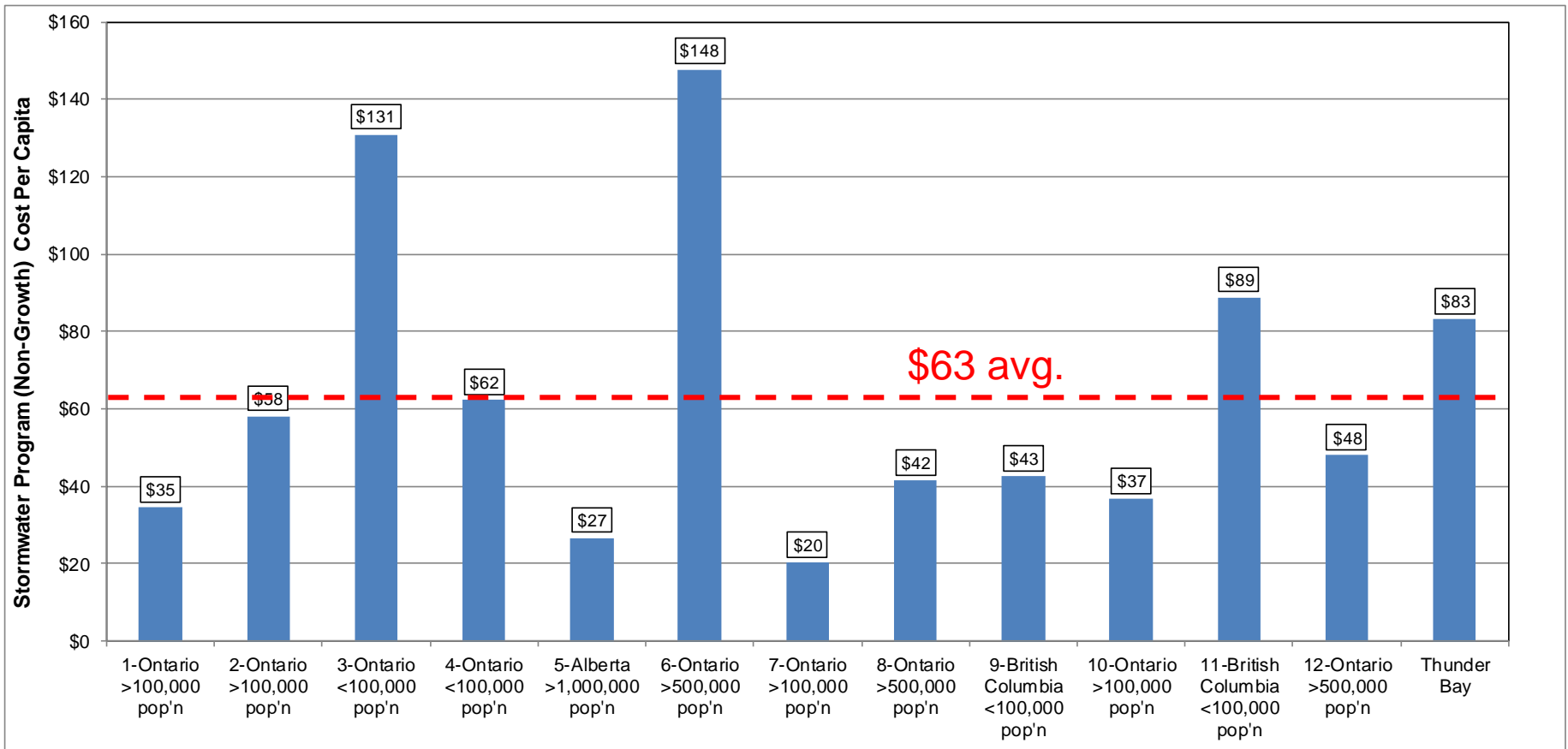
– Current Service Level (tax-funded portion only)





How Does Thunder Bay Compare?

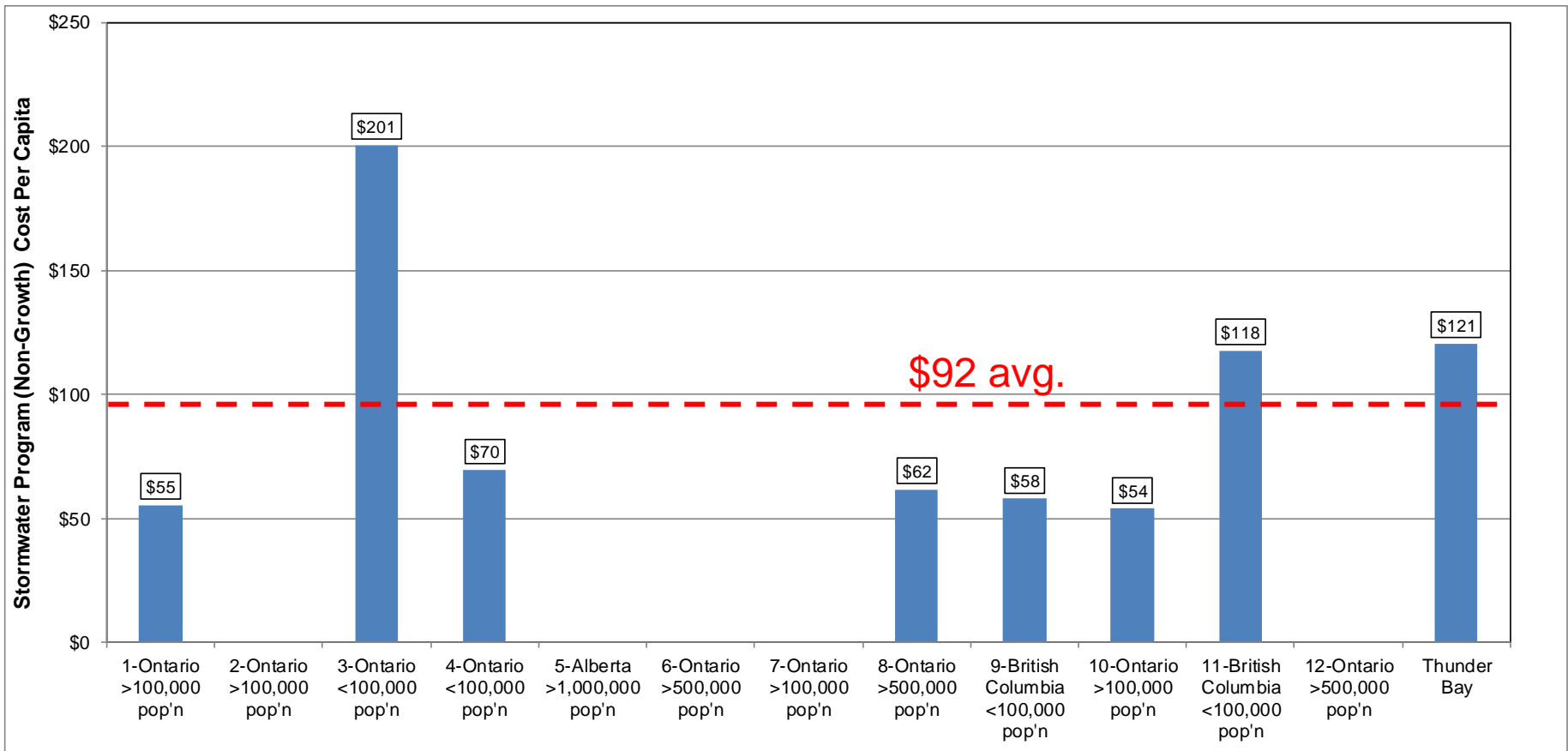
– Interim Service Level (entire program, all funding sources)





How Does Thunder Bay Compare?

– Required Service Level (future stormwater program needs)





Funding Options

- Taxes: mandatory levies that are not related to any specific benefit or government service (i.e., general services for the public good)
- Fees/Rates: payments made to offset the cost of a specific service and payable by those people who benefit from the service (i.e., a “rational nexus” must be demonstrated)
- Other means: e.g., public-private partnerships, long-term debt-financing strategies, federal or provincial economic stimulus grants for infrastructure investment
- Or any combination of the above



Stormwater Financing Options in North America

- Property Tax
- Development Charges
- Sewer Rate
- Federal/Provincial Grants
- Stormwater User Fee



Property Tax

- Local property taxes are the most significant revenue source to support municipal stormwater programs in Canada
- Determined based on the property value assessment times the applicable tax rate
- Many municipalities have caps that limit tax payments for selected property types
- Tax-exempt properties include gov't buildings, schools, hospitals, churches, and other charitable organizations



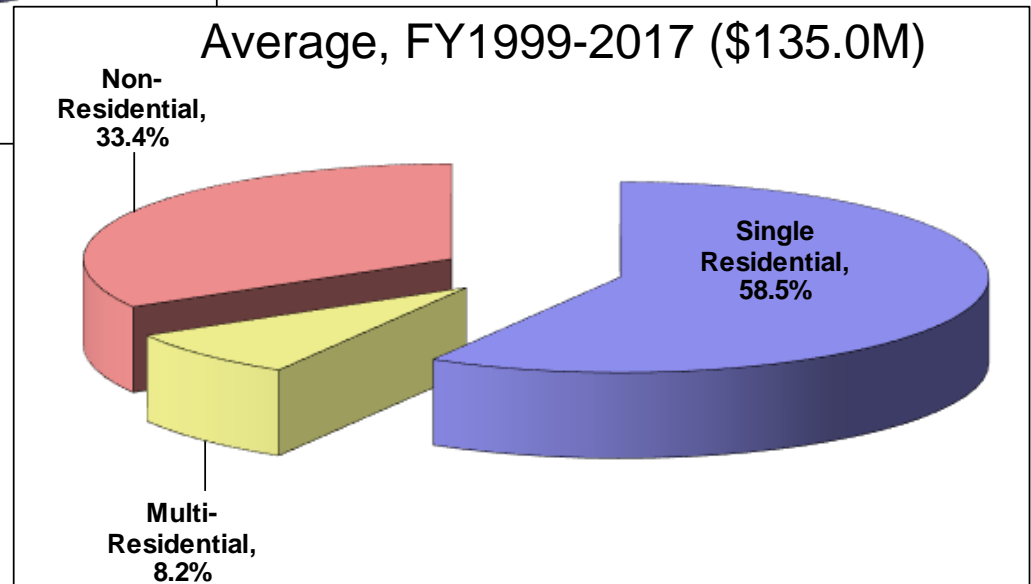
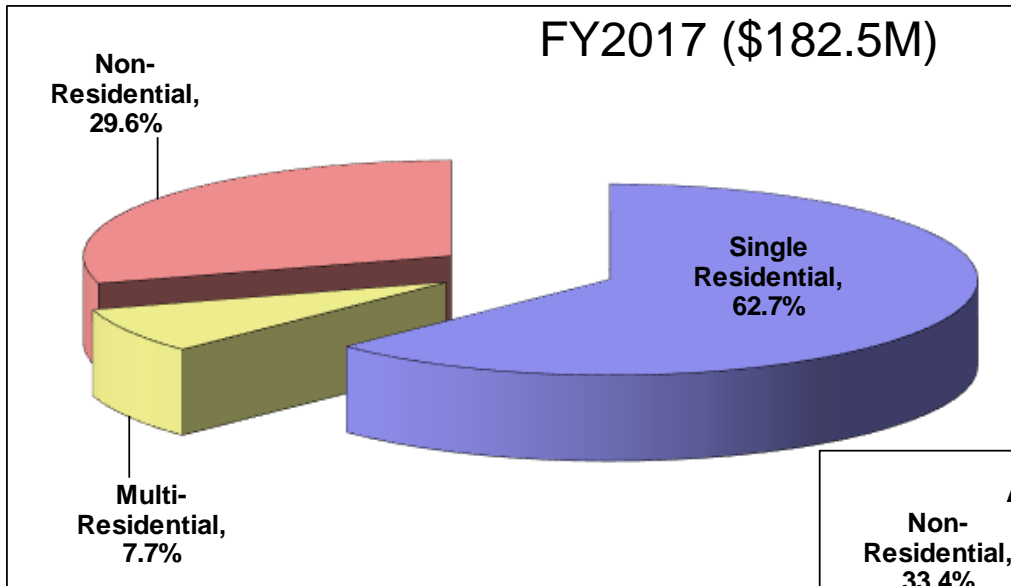
Tax Funding Options

- Dedicate more tax funds towards stormwater; or
- Raise taxes to meet additional stormwater needs

2017 Tax Revenue \$182,496,000	Stormwater Program Service Level		
	Current	Interim	Required
Program Cost	\$4,008,200	\$8,978,200	\$13,010,000
Tax Levy Allocation	2.20%	4.92%	7.13%
Tax Increase Required	0.00%	2.76%	5.00%



Tax Levy Distribution





Property Tax Funding

	Pros	Cons
Tax-Based Funding	<ul style="list-style-type: none">• Already accepted as the primary existing source of revenue for municipalities• Can be used to fund all stormwater management program activities• The billing system is already established	<ul style="list-style-type: none">• Property taxes are based on a property's assessed value, not runoff contribution, so the fairness and equity of this revenue source is low• Not a dedicated* or stable funding source• Annual competition for general tax funds to support other community services• No incentive to adopt source controls to reduce runoff• Tax-exempt properties don't contribute to stormwater program

**Note: A dedicated tax levy for specific stormwater services could be adopted*



Development Charges

- Ontario Development Charges (DC) Act of 1997 authorizes municipalities to pass by-laws to recover costs incurred related to new and re-development projects
- Only used to fund eligible growth-related capital costs, and only for the services for which they were collected
- Often based on the number of residential dwelling units or the building floor area for non-residential developments
- City has enacted a DC by-law, but it has not been implemented yet



Development/Growth Related Funding

	Pros	Cons
Dev't Related Funding	<ul style="list-style-type: none">• Accepted by development community• Based on contributing area, more equitable than property value	<ul style="list-style-type: none">• Limited by developable land within municipality (i.e., not applicable throughout municipality)• Directly dependent on growth and growth rates (i.e., if growth rate declines, so does the revenue collected)• Development charges are generally limited to the capital costs associated with the development



Stormwater User Fee

- Progression of public utilities once funded from general tax support and then shifted to enterprise fund
 - Water – Volume used
 - Wastewater – Volume generated
 - Solid Waste – Quantity generated
 - Stormwater – Runoff contribution
- Variable rate with charge based on total impervious area (hard surfaces):
 - Rooftops
 - Driveways
 - Parking areas
 - Patios
 - Sidewalks



Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
- Flat fee: equal charge to all utility customers (Calgary)
- Tiered flat fee: charges by customer type (London, Aurora, Richmond Hill)
- Variable rate: property owners based on measured impervious area (Kitchener, Mississauga, and Guelph)

Municipality	Fee Type (as of 2016)	Start
Nova Scotia		
Halifax	Variable Rate	2013
Ontario		
London	Tiered Flat Fee	1996
Aurora	Tiered Flat Fee	1998
St. Thomas	Tiered Flat Fee	2000
Kitchener	Variable Rate	2011
Waterloo	Variable Rate	2011
Richmond Hill	Tiered Flat Fee	2013
Markham	Tiered Flat Fee	2015
Mississauga	Variable Rate	2016
Saskatchewan		
Regina	Tiered Flat Fee	2001
Saskatoon	Variable Rate	2012
Alberta		
Calgary	Flat Fee	1994
Edmonton	Variable Rate	2003
St. Albert	Tiered Flat Fee	2003
Strathcona County	Flat Fee	2007
British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016



Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none">• Dedicated and stable funding source for all stormwater activities (i.e., sustainable)• Fair and equitable fee based on runoff contribution (assessed to all private and publicly-owned properties in the same manner)• With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge• Mechanism to ensure privately owned stormwater facilities are maintained	<ul style="list-style-type: none">• Additional implementation costs (rate study, database management, billing and customer service*)• Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>



Next Steps

- Collect input on the key questions and factor all ideas into the evaluation of the different funding options
- Continue parcel analysis (impervious area measurements)
- Continue to communicate via the City website www.thunderbay.ca/stormwaterplan
- Online survey will be available in February



Next Steps (continued)

- Upcoming Meetings (dates to be determined)
 - Stormwater Advisory Committee Meeting 2 and 3 (No. 1 today)
 - Public Information Centre No. 2 (meeting No. 1 tonight)
 - Additional as required
- Present project findings and study recommendations to Council in the Fall

Questions?





THUNDER BAY STORMWATER MANAGEMENT FINANCING STUDY – PUBLIC INFORMATION CENTRE
Tuesday, Jan. 23, Italian Cultural Centre



The City of Thunder Bay strives to keep its citizens informed and up-to-date. We send messages by email, electronic newsletter, and social media about your community. If you would like to receive electronic messages from us about the *Thunder Bay Stormwater Management Financing Study*, please indicate your consent for us to do so by providing the following information:

SIGN-IN SHEET (PLEASE PRINT)

FULL NAME	EMAIL ADDRESS*	PHONE NUMBER*	AFFILIATION (ie: Resident, Name of Business or Organization)

* The personal information on this form collected for the purposes of receiving electronic communications about the **Thunder Bay Stormwater Management Financing Study**. The City of Thunder Bay takes the collection of your personal information very seriously, and will not sell, rent, or otherwise give your information to a third party, except if required to do so in law. If you receive electronic messages from the City of Thunder Bay, and you no longer wish to receive them, you can unsubscribe at any time by emailing us, or by visiting the City of Thunder Bay's website at thunderbay.ca.



THUNDER BAY STORMWATER FINANCING STUDY

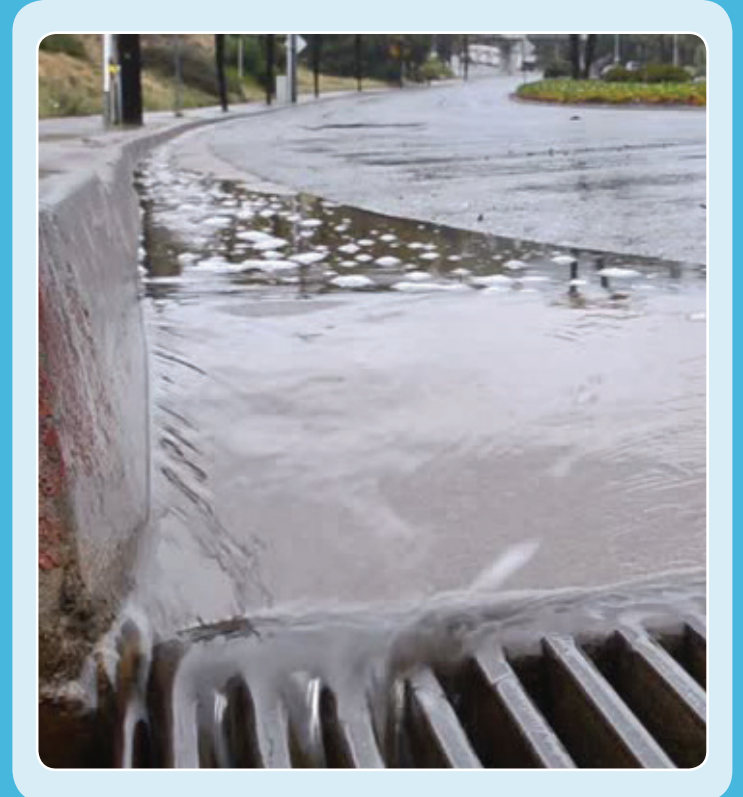
THUNDER BAY STORMWATER FINANCING STUDY PUBLIC INFORMATION CENTRE

JOIN US!

A Stormwater Financing Study is underway to investigate a sustainable and fair funding source to support the City's current stormwater program. Drop by a Public Information Centre to learn more about the future of financing Thunder Bay's stormwater management program.

Tuesday, January 23, 2018
Italian Cultural Centre,
123 Algoma Street North,
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Drop in between 4 pm and 8 pm.
Presentations at 5 pm and 7 pm.
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11 John,
13 John-Jumbo



STAY INFORMED!

Please visit the Study website at thunderbay.ca/stormwaterplan for study updates, and to submit your ideas and feedback.

COMMENTS / IDEAS / QUESTIONS? PLEASE CONTACT US AT:

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WHAT IS STORMWATER?

Stormwater comes from the rain and melted snow that flows over land. In our city, most stormwater runs off hard surfaces like roofs and driveways, carrying pollution into waterways, and potentially causing flooding along the way. Managing stormwater protects the health and safety of our community!

Appendix G

Communication Tracking Table

Thunder Bay Stormwater Financing Study Feedback Summary Table

Feedback Summary Table

PUBLIC			
Comment	Date	Source	Response
<p>After reading the stormwater management plan on the city website, I would like to say that it is not very well thought out. Some questions arise –</p> <ol style="list-style-type: none"> 1. What has the city done in the past? 2. What have other cities done -- and what is the measurement of the Impact? <p>To arbitrarily increase the tax levy on the home and business owner is NOT a solution due to</p> <ul style="list-style-type: none"> • difficulty in measuring effect (this was not explained in the review) • how to ascribe the current effect of the property to the individual owner. <p>The home and business owners are already taxed to the limit. Other solutions should be explored, and this should not even be an option.</p>	1-22-18	Email	<p>Thank you for your questions and comments.</p> <p>We are in the early stages of this Financing Study and no recommendations have been brought forward yet.</p> <p>If you are available, I'd like to invite you to our Public Information Session tomorrow night (Tuesday) from 4pm to 8pm (with presentations at 5pm and 7pm) where the goals and intent of this study will be discussed. I believe this will help to answer your questions as the presentation does include what the City has been doing in the past and what other municipalities across Ontario and Canada have been doing. There is also an opportunity to ask questions of the City and its project team afterwards.</p> <p>If you are not available to attend, a copy of the presentation will be posted on our website afterwards – www.thunderbay.ca/stormwaterplan - and you can contact me afterwards, and throughout this study, if you have any questions.</p> <p>I'd also like to note that this study does not have any impact on the budget currently under review by Council.</p>

Thunder Bay Stormwater Financing Study Feedback Summary Table

PUBLIC			
Comment	Date	Source	Response
<p>Unable to attend today's open house regarding Stormwater management. My main concern with the management of storm water is the development of Parkdale subdivision which as you should know is quickly eating up the Williams Bog which is nature's stormwater sponge and a supposedly protected wetland. Every year more of this natural stormwater protection has been allowed to be developed with sidewalks and streets and driveways replacing the natural water retention capacity of the bog. I believe Thunder Bay Field Naturalist have been expressing concern about this for several years to no avail because in Thunder Bay the developers make the decisions and we the taxpayers pick up the tab for bad planning decisions. Having people put in rainwater gardens is a lovely little idea but does not address the weak decision making that is quickly taking up our protection from future catastrophic events inevitable with climate change. We have seen some of the problems in Northwood from building in boggy areas yet continue down the same path. City staff and councilors need to get serious about taking control of environment instead of allowing planning decisions to be made by developers which evidently, they are. And please don't give the pat answer that they are now putting in a fire access road which is now necessary for public safety however the culverts required for this road will increase the drainage from the bog. Time to become true planners for the benefit of everyone in the city instead of developing cute little programs to avoid facing the big issues facing our environment and our city's lack of proper planning and standing up to requests for unnecessary development.</p>	01-23-18	Email	<p>Thanks for reaching out to us with your concerns.</p> <p>Regarding the Parkdale Subdivision and the William's Bog, in 2013, the Lakehead Region Conservation Authority (LRCA) and the City required that a series of studies be completed around this very issue. The conclusion of these studies helped to define the current boundary of the Williams Bog, a Provincially Significant Wetland, based on ground and field measurements at that time. The studies also concluded that the Parkdale Subdivision, including the lands that have not been developed yet (the future stages), are located outside of the Wetland Boundary.</p> <p>The studies were also required to look at the undeveloped portions of the Parkdale Subdivision and what impacts they may have, if any, on the Wetland, as we also want to ensure that the Wetland is protected and continues to provide its many benefits to the City. The studies again concluded that the further development of the Parkdale Subdivision would not impact the function of the Wetland (mainly because the subdivision is downstream of the Wetland).</p> <p>On the topic of wetlands, the LRCA and the City do understand the importance of wetlands and the many benefits they provide, particularly around water retention and protection from potentially worse flooding. The LRCA has recently completed wetland studies within the McVicar Creek watershed (2015) and the McIntyre River watershed (2017). The conclusion of these studies has resulted in identifying over 500ha of wetlands in the McVicar Creek watershed, and over 700ha of wetlands in the McIntyre River watershed, that are now regulated by the Province and protected from development and alterations.</p>

Thunder Bay Stormwater Financing Study Feedback Summary Table

		<p>This is further supported and compounded by the City’s Draft 2018 Official Plan which also provides additional protections for wetlands, both Provincially Significant Wetlands and those wetlands that have not been “evaluated” yet. The City’s Draft Official Plan is available online currently at: http://www.thunderbay.ca/City_Government/Departments/Development_Emergency_Services/Planning_Division/Official_Plan.htm</p> <p>I have also provided a link to a map that shows the proposed Environmental Protection areas in the Draft Official Plan at: http://www.thunderbay.ca/Assets/City+Government/Departments/Dept+-+Dev+Services/docs/Official+Plan+Map+B+-+Environmental+Protection.pdf</p> <p>In addition, the LRCA and the City are hoping to complete additional wetland studies, like the McVicar Creek and McIntyre River studies, in the coming years to further provide protections of our wetland resources.</p> <p>Finally, with respect to the Stormwater Financing Study that is underway and was discussed at the open house on last week, our project website has been updated with the presentation materials from last week. They also provide additional information on the options this study is considering, and additional background material. Please visit www.thunderbay.ca/stormwaterplan.</p> <p>If you have any other questions or would like to discuss anything further on this Financing Study or the Stormwater Plan, please contact either myself or Pippy Warburton (pippy.warburton@aecom.com).</p>
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Thunder Bay Stormwater Financing Study Feedback Summary Table

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Comment	Date	Source	Response
<p>Thank you for the Stormwater Management Fee presentation last evening. I include an attachment with some questions and some information.</p> <p><i>(Attachment Contents)</i></p> <p><small>Urban Service Area By-laws were established when the City was first amalgamated as a fairness measure so that citizens who did not receive the benefit of certain services (transit, street lighting, sewage and drainage and garbage collection) did not pay for them.</small></p> <p>From chart A below you will note how everyone pays into the general levy. However you only pay for an urban service if you receive it.</p> <p>At present most rural residents do not contribute to the “Storm Sewer” levy and it would be unfair to impose a “storm water management fee” to pay for infrastructure they cannot access.</p> <p>Maybe Aaron or Kerri Marshall can explain how the urban tax levy was only \$229,991 when the net from taxpayers excluding EIRP was \$630,800 in the 2017 for storm sewers?</p> <p>Can someone please tell me where the other revenue of \$4,031,300 came from for 2017?</p> <p>Finally I include the urban tax levy for storm sewers for 2014-15-16-17, note the decrease.</p> <p>If a storm water management fee is implemented, based on impermeable surfaces, it should factor in the square footage of impermeable surface to total square footage of the property.</p>	<p>01-24-18 03-01-18</p>	<p>Email</p>	<p>Thanks for following-up, and I apologize in the delay in providing you with a response. Part of the delay is that I don’t quite have a full answer to your questions, but I am still looking into it, specifically to why the Sewage & Drainage Levy in 2017 was \$229,991 when the net from taxpayers was \$630,800.</p> <p>I have a meeting coming up soon with other staff (Finance, Revenue, etc.) where I am looking deeper into how the Sewage & Drainage Levy system currently works, so I can better understand this, as well as other components of this Levy system.</p> <p>The other question you asked is where the other revenue of \$4,031,300 came from in 2017. The ultimately came from the Clean Water and Wastewater Fund program, a joint Federal / Provincial program. However, at the time of the budget, while we were planning on this funding program, we did not know if we would be successful in our funding application, so it was placed under “Other Revenue” as a place-holder.</p> <p>Lastly, I appreciate and note your comment and suggestion regarding if a utility fee is recommended and implemented, it should factor in the overall size of the property to the area of impervious area, i.e. our rural and sub-urban areas. We have heard this from other residents as well and are factoring it into our options under consideration.</p>

Thunder Bay Stormwater Financing Study Feedback Summary Table

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Comment	Date	Source	Response
<p>Thank you for the response for the federal/prov. funding for the CWWF.</p> <p>If I may, I suggest following the implementation of the 2018 tax policy and it may answer "why the Sewage & Drainage Levy in 2017 was \$229,991 when the net from taxpayers was \$630,800 ". It will be interesting to see if the Capital out of revenue (\$575,000) and EIRP (\$485,000) in the capital budget for stormwater management for 2018 will only be billed to the taxpayers with that Urban Service (storm sewers) as it should be!</p> <p>As the 2018 tax policy is out, can you tell me why the allocated cost for 'sewage and drainage' went to \$ 942,940 from \$229,990 in 2017, when the capital budget for storm sewers shows \$575,000 from capital out of revenue and \$485,000 from the EIRP?</p> <p>My apologies! Actually the allocated cost for 'sewage and drainage' of \$ 942,940 in the 2018 tax policy makes sense ,when the capital budget for storm sewers shows \$575,000 from capital out of revenue and \$485,000 from the EIRP.</p> <p>It was the allocated cost for 'sewage and drainage' of \$229,991 in the 2017 tax policy that caused me concern when the capital budget for storm sewers showed \$630,800 from capital out of revenue and \$1,255,000 from the EIRP ? How did the allocated cost get reduced to \$229,991 for 'sewage and drainage' in 2017?</p>	<p>03-01-18 05-25-18 06-12-18</p>	<p>Email</p>	<p>Regarding the 2017 "Storm Sewer" capital budget figures (the \$630,800 capital out of revenue & \$1,255,000 from EIRP), and the actual 2017 "sewage and drainage" tax levy of \$229,991, I have reviewed the information from Finance about this difference.</p> <p>In general, there will always be a difference between the storm sewer capital figure and the sewage and drainage tax levy, the main reason being that one is a budget figure vs. the other being actual.</p> <p>However, in this particular year, there was a larger difference between the two for the following reasons:</p> <ul style="list-style-type: none"> • The trunk ditching rural wards and Highgate Road ditching improvements were not included in the sewage and drainage levy as these works were considered to be completed outside the sewage and drainage levy boundary (i.e. a rural drainage improvement vs. an urban drainage improvement) and did not involve any storm sewer works. These 2 items were charged to the general tax levy. • In the previous year, one of the larger storm sewer projects was ultimately financed under debenture (debt financing), and not directly from that years sewage and drainage levy. This resulted in carry-forward funds from the previous year's sewage and drainage levy to off-set the levy required in 2017. <p>Hopefully that helps to answer your question.</p>

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Comment	Date	Source	Response
Is the rural and Highgate ditching costs in 2017 eligible for CWWF funding?	06-12-18	Email	Yes, the CWWF funding was used towards the Highgate Road project, but not the trunk ditching, however, federal gas tax funds were contributed to the trunk ditching item.
<p>This is opening Pandora’s box. All I see for 2017 is Highgate Ditching Improvements with a budget of \$175,000. The net from tax excluding the EIRP amount which was debentured would be \$630,800. Now if I understand, you are telling me it was Federal Gas Tax money which paid for it. Should not the net from tax excluding the debentured EIRP been lower than \$630,800 if it was Federal Gas Tax money that paid for the ditching?</p> <p>Would it be fair to say that it appears that most of the CWWFs went for projects in the urban service areas and nothing for the rural areas?</p>	06-13-18	Email	<p>I have attached an excerpt from the 2017 Capital Improvement Summary (found online at http://www.thunderbay.ca/City_Government/Finance_and_Budgets/City_Budget/2017_Capital_Improvements.htm), which summarizes the method of financing for the various projects related to stormwater management.</p> <p>This table shows the 2017 projects that made up the \$5,967,000 budget, and its various funding sources. For the trunk ditching rural wards (\$130,000), \$37,900 was used from Federal Gas Tax towards this item.</p> <p>Regarding the other CWWF projects, I am not directly involved in the other capital projects so can’t answer your question. I do note that from the excerpt attached, \$131,200 from CWWF went towards the Highgate ditching project, which is within the rural area of the City.</p> <p><i>(Attachment: 2017 Capital Program Details – Storm Sewers.pdf)</i></p>
<p>From the summary, it was nice to see that the some of the costs for Highgate rural ditching were offset by the CWWF and not all of it going in urban storm sewers.</p> <p>Thank you for the 2017 Capital Improvement Summary.</p> <p>The commingling of funds makes it difficult to follow.</p>	06-19-18		

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<p>I went back to the 2015 Capital Improvement Summary and noted that storm sewers were debentured as they were in 2016but there was no carry forward to 2016 even though it was to come from the EIRP....interesting.</p> <p>I asked the budget chair to provide a chart like the one I include as an attachment so those of us who do not have urban services can see that we do not pay for them. It would be nice to see in the budget which items in storm water are part of the general levy and which are urban service items.</p> <p><i>(Image below attached with email)</i></p> <table border="1"> <caption>2017 Urban Service Area Budget</caption> <thead> <tr> <th rowspan="2"></th> <th colspan="4">Urban Service Levy</th> <th rowspan="2">Total Urban Service Levy</th> <th rowspan="2">General Levy</th> <th rowspan="2">2017 Budget</th> </tr> <tr> <th>Storm</th> <th>Street</th> <th>Lighting</th> <th>Transit</th> </tr> </thead> <tbody> <tr> <td>Financial Statement Balance Dec 31, 2016</td> <td>230,474</td> <td>(1,181,949)</td> <td>130,591</td> <td>577,051</td> <td>(243,793)</td> <td>-</td> <td></td> </tr> <tr> <td>Revenues:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Supplementary Tax Revenue</td> <td>(25,900)</td> <td>(11,177)</td> <td>(26,944)</td> <td>(82,677)</td> <td>(146,798)</td> <td>(1,151,796)</td> <td>(1,800,000)</td> </tr> <tr> <td>Expenditures:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Taxes Written Off</td> <td>87,755</td> <td>13,655</td> <td>100,525</td> <td>258,111</td> <td>460,045</td> <td>3,378,155</td> <td>4,035,860</td> </tr> <tr> <td>Net Operating Expenditures</td> <td>3,967,009</td> <td>-</td> <td>2,895,516</td> <td>10,805,741</td> <td>16,812,257</td> <td>141,804,343</td> <td>156,019,490</td> </tr> <tr> <td>Capital From Revenue</td> <td>-</td> <td>118,700</td> <td>712,000</td> <td>270,700</td> <td>1,101,400</td> <td>3,908,136</td> <td>6,905,500</td> </tr> <tr> <td>EIRP</td> <td>-</td> <td>1,136,200</td> <td>-</td> <td>-</td> <td>1,136,200</td> <td>7,304,400</td> <td>8,440,600</td> </tr> <tr> <td>Debt</td> <td>-</td> <td>154,562</td> <td>970,304</td> <td>-</td> <td>1,124,866</td> <td>(6,759,535)</td> <td>7,384,400</td> </tr> <tr> <td>Total 2017 Expenditures</td> <td>4,054,755</td> <td>1,423,116</td> <td>4,022,745</td> <td>10,534,552</td> <td>20,035,167</td> <td>145,251,533</td> <td>185,286,700</td> </tr> <tr> <td>2017 Tax Levy</td> <td>4,259,123</td> <td>229,991</td> <td>4,124,394</td> <td>11,029,975</td> <td>19,643,482</td> <td>164,943,618</td> <td>181,910,700</td> </tr> </tbody> </table> <p><small>* Northwood Storm Sewer - Edward/Churchill was originally to be financed using Capital from Revenue (\$1,225,500) but was debentured resulting in a carryforward of the 2016 overlevy at Dec 2016.</small></p>		Urban Service Levy				Total Urban Service Levy	General Levy	2017 Budget	Storm	Street	Lighting	Transit	Financial Statement Balance Dec 31, 2016	230,474	(1,181,949)	130,591	577,051	(243,793)	-		Revenues:								Supplementary Tax Revenue	(25,900)	(11,177)	(26,944)	(82,677)	(146,798)	(1,151,796)	(1,800,000)	Expenditures:								Taxes Written Off	87,755	13,655	100,525	258,111	460,045	3,378,155	4,035,860	Net Operating Expenditures	3,967,009	-	2,895,516	10,805,741	16,812,257	141,804,343	156,019,490	Capital From Revenue	-	118,700	712,000	270,700	1,101,400	3,908,136	6,905,500	EIRP	-	1,136,200	-	-	1,136,200	7,304,400	8,440,600	Debt	-	154,562	970,304	-	1,124,866	(6,759,535)	7,384,400	Total 2017 Expenditures	4,054,755	1,423,116	4,022,745	10,534,552	20,035,167	145,251,533	185,286,700	2017 Tax Levy	4,259,123	229,991	4,124,394	11,029,975	19,643,482	164,943,618	181,910,700					
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<p>Why can't you use the New Build Canada Fund? I believe it qualifies for funding under the disaster mitigation category. They were pretty adamant about using this for the Event Centre yet nothing on this?</p>	01-24-18	Email	<p>Thank you for this question / suggestion. This is something that we will look into further, as well as leveraging other Federal and Provincial funding as much as possible.</p> <p>I believe the New Building Canada Fund, in general, is linked to projects that promote economic growth and job creation, that being said, there is also a component that notes it is linked to a clean environment and stronger communities. We will look into this further, including if other municipalities have been able to leverage this program towards stormwater projects.</p>																																																																																																						

Thunder Bay Stormwater Financing Study Feedback Summary Table

PUBLIC			
Comment	Date	Source	Response
			<p>I'd also like to note that our project website has been updated today with the presentation materials from our consultations the past few days, which also provides additional information on the options this study is considering, and additional background material. Please visit www.thunderbay.ca/stormwaterplan .</p> <p>If you have any other questions or would like to discuss anything further, please contact either myself or Aaron Ward at the City (award@thunderbay.ca).</p>
<p>I was curious if administration had proposed any other funding ideas other than taxes for the stormwater plan? Anyone can come up with the idea of using taxes. If admin is really qualified then they should offer at least some creative ideas on how to fund this in addition to a new tax. I'm sick of seeing my taxes skyrocket, and demand more insight, thought and effort from the well paid mangers that work for our city. Secondly, are any city engineers doing any "engineering" on this or is it all being outsourced? If that's the case, please explain why we have engineers on staff? Thank you for your time.</p>	01-24-18	Email	<p>Yes, we are reviewing several funding options in this Financing Study to implement the Stormwater Plan. We are currently considering:</p> <ul style="list-style-type: none"> i. Status Quo – paying for stormwater as we are currently, including leveraging Federal and Provincial Funding as much as possible. ii. Increases or changes to property taxes. iii. Modifications to the current Sewage & Drainage property tax levy – this is currently a separate line item on tax bills for those who are within the “urban” area of the City. iv. Implementing and / or modifying the existing Development Charge by-law where new development contributes additional fees to the City. v. A new Development Impact Fee program – a variation on Development Charges. vi. A new Stormwater User Fee / Utility – this would be similar to a water / wastewater (sewage) utility bill where people currently pay for how much water they consume and how much sewage they generate. <ul style="list-style-type: none"> a. There are several variations / sub-options to a stormwater fee, but essentially, any fees

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Comment	Date	Source	Response
			<p>generated would be linked to how much hard surface areas properties have. For example, a commercial parking lot should contribute more in fees to stormwater than a residential or rural property that has much less hard surface area.</p> <p>b. A User Fee / Utility also allows one to offer incentive or rebate programs where one could reduce their bill by reducing how much hard surface area and/or stormwater they are contributing to the City's system. For example for residential properties, by installing a rain barrel or a rain garden, your fee could be reduced.</p> <p>i. Any combination of the above, or any other ideas that are presented to us.</p> <p>Regarding this project, while the Engineering Division (myself) is the lead and point of contact on this project, it does involve members from many other groups of the City including Revenue, Finance, Planning, Environment, etc. as this Financing Study is much more than an engineering study.</p> <p>I'd also like to note that our project website has been updated today with the presentation materials from our consultations the past few days, which also provides additional information on the options this study is considering, and additional background material. Please visit www.thunderbay.ca/stormwaterplan.</p> <p>If you have any other questions or would like to discuss anything further on this Financing Study or the Stormwater Plan, please contact either myself or Pippy Warburton</p>

Thunder Bay Stormwater Financing Study Feedback Summary Table

PUBLIC			
Comment	Date	Source	Response
			pippy.warburton@aecom.com .
I am against the idea of rural paying more as they didn't get the same level of service.	01-25-18	Telephone	The City of Thunder Bay explained the options that the study was considering and why. The caller was on board with the intent of the study.
I'm following up on your memo to city councillors re: above. It begs some questions. Will there be another public information centre/meeting held to explain the findings to date? Will there be a final report from AECOM? The contract cost was \$250,000. Was all of that money spent?	06-04-19	Email	<p>Regarding the Financing Study and its final report, yes, there will be a final report from AECOM summarizing all of the work and conclusions of the study. The final report is still being drafted and reviewed, so it is not available yet. We also have not spent all of the funds within the contract.</p> <p>As we have concluded that we will not be currently changing how we are financing stormwater works in the City, no, we will not be having another public information centre. There were two main reasons for this:</p> <p>Since we are not currently recommending any changes, we did not feel it necessary to have another public information centre. This will result in savings on our contract with AECOM, and additional savings to the City, as preparing and hosting the PIC is quite costly.</p> <p>With the new Asset Management Legislation, the City will be required to develop levels of service and financing strategies for all of our infrastructure, including stormwater, all within the next few years.</p> <p>Essentially, the process we've been following in this stormwater financing study will have to be done for all of</p>

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Comment	Date	Source	Response
			<p>our infrastructure, including broad and thorough community consultation, public information centres, etc. The work we have done as part of this study, including the lessons learned, will all be used towards, and as part of, this broader study.</p> <p>Given that we are now legislated to complete this other level of service and financing strategy, we also did not want to make any changes in how we are financing stormwater today that may be short-lived and possibly changed in a few years.</p> <p>On a very positive note, you may have also heard that the City was successful in a large, multi-year funding application for stormwater capital works. Amongst other funds, we will also receive 40% funding towards \$13 million in new stormwater works over the next 9-years to help address our storm sewers, flooding, and other related works. This funding will help to bridge the gap in the interim as the other financing strategy (which includes stormwater) must be completed well before this additional funding expires.</p>
<p>I've been reading the province's new Municipal Asset Management Regulation (O Reg. 588/17) It says nothing about financing other than through taxes. Now I'm interested in this subject. Could you send me anything you have that discusses the implementation of this regulation and the possibility of alternate financing strategies that involve other mechanisms than current property taxes or water rates or sewer surcharges?</p> <p>You had said: Given that we are now legislated to complete this</p>	06-06-19	Email	<p>In terms of formal City documentation, I have attached Corporate Report R16/2019, and its appendices. There are other Corporate Reports referenced in this document as well, but this is the most recent City document that I am aware of.</p> <p>The Regulation itself does not provide guidance on specific funding methods that can, or cannot, be used. Rather, each Municipality must, amongst everything else in the Regulation, develop financial strategies, identify annual funding projected to be available, and provide an explanation of the options examined to maximize funding.</p>

Thunder Bay Stormwater Financing Study Feedback Summary Table

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other level of service and financing strategy, we also did not want to make any changes in how we are financing stormwater today that may be short-lived and possibly changed in a few years.			The funding sources and options to be considered are up to each Municipality, whether it be through property taxes, special services levies, user fees, 3rd party funds (i.e. federal / provincial grants), etc.

OTHER STAKEHOLDERS			
Comment	Date	Source	Response
I was wondering if the study report is available to the public (I could not locate on the website) or if it could be shared.	07-07-18	Email	<p>This study is still in progress, but the final report will be made public eventually.</p> <p>The most recent PIC material can be found here:</p> <p>https://www.thunderbay.ca/en/city-hall/storm-water-management-plan.aspx (then click "Stormwater Financing Study")</p> <p>I've cc'd the City project manager (Aaron) on this email if you have any other questions please let us know.</p>

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OTHER STAKEHOLDERS			
Comment	Date	Source	Response
<p>RSMIN’s Chief and Council has reviewed the funding options that were presented during the last Stormwater Advisory Board Meeting and they have some questions. Having the answers to these questions will help RSMIN decide which funding option they feel best suits the City of Thunder Bay. I have attached a letter that outlines the questions and I look forward to hearing back from you.</p> <p><i>(Attachment)</i></p> <p>RE: City of Thunder Bay Stormwater Financing Study, Stormwater Advisory Committee Meeting No. 2</p> <p>Good Afternoon Aaron,</p> <p>Following a review of the presentation provided in the City of Thunder Bay’s second Stormwater Advisory Committee Meeting, Red Sky Métis Independent Nation has some concerns about the proposed Stormwater Financing Options. The primary concern relates to how the proposed options do not include buildings that are zoned for both residential and commercial uses. These buildings are quite common in Thunder Bay and there should be a clear and equitable plan put in place for how these types of buildings will be charged, not matter what fee structure is recommended to the Thunder Bay Council.</p> <p>After reviewing the three “Flat Rate” user fee options presented, RSMIN believes that the Single Family Unit model is the most reasonable option for the City of Thunder Bay. However, this model poses the same concern as the others since there is a cost to administering a user fee. While a “Flat Rate” would be</p>	08-08-18	Email	I confirm receipt of your questions and we will review.

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OTHER STAKEHOLDERS			
Comment	Date	Source	Response
<p>cheaper to administer than a “Variable Rate” it will still come with a large cost that is likely to increase over time. This concern has lead RSMIN to have the following questions: Will a plan be put in place to deal with increases in the cost of administration? Will this new user fee be included on existing water bills or sent out separately?</p> <p>Red Sky Métis Independent Nation looks forward to hear back from you on this topic.</p>			

Appendix H

Webpage and Social Media Content



Website Landing Page

<https://www.thunderbay.ca/en/city-hall/storm-water-management-plan.aspx>

The screenshot shows the website's landing page for the Storm Water Management Plan. The header includes the City of Thunder Bay logo and navigation links for City Services, Recreation, Business, and City Hall. A search bar and utility links (A-Z Directory, Accessibility, Connect, Maps, Translate) are also present. The main content area features a large image of a lake at sunset with the title "Storm Water Management Plan" and a breadcrumb trail: Home / City Hall / Reports, Studies, Policies and Plans / Storm Water Management Plan. Below the title, there is a brief introduction and a list of related documents. On the right, a sidebar lists various reports, studies, and policies.

To help achieve a sustainable environment, the City of Thunder Bay has developed a Stormwater Management Plan.

The plan focuses on the stormwater system, and how changes in the environment, land use, and climate affect it. The plan will spread over 20 years. It will look for opportunities to assess and improve current infrastructure.

- Stormwater 101
- Stormwater financing study
- Stormwater financing options
- Stormwater Management Plan
- Community involvement

Reports, Studies, Policies and Plans

- Accessibility Plan
- Active Transportation Plan
- Age Friendly Plan
- Asset Management Plan
- Boulevard Lake Dam
- City Policies and Procedures Database
- Corporate Energy Management Plan

Thunder Bay Stormwater Financing Study

What is stormwater?

Stormwater is surface water that comes from rain and melted snow that flows over land and into storm drains or streams, rivers and lakes.

Nature continuously recycles the water supply through the hydrologic cycle: evaporation, condensation, precipitation, infiltration, groundwater recharge and runoff.



THUNDER BAY STORMWATER FINANCING STUDY

In natural landscapes, stormwater is soaked up like a sponge, which then nourishes plants and slowly replenishes streams, lakes, wetlands, and aquifers.

In more urban areas, impervious, or hard, surfaces such as asphalt, concrete, and rooftops, prevent stormwater from naturally soaking into the ground. Instead, the water runs quickly into storm drains and sewer systems, and then to our lakes and rivers.

These hard surface areas create more stormwater runoff, which carries more pollutants, such as oil, grit, and garbage into our lakes and rivers.

What is the purpose of this study?

As part of its commitment to environmental stewardship and community sustainability, the City of Thunder Bay has developed a **Stormwater Management Plan**, which will guide the City's stormwater management actions for the next 20-years.

One of the goals highlighted in the plan is to identify alternative ways to provide a dedicated, consistent, and fair funding system for the current and future needs of the stormwater management system. This Study will help achieve the goals of the Stormwater Management Plan.

To help achieve a sustainable environment, the City of Thunder Bay has developed a Stormwater Management Plan.

The plan focuses on the stormwater system, and how changes in the environment, land use, and climate affect it. The plan will spread over 20 years. It will look for opportunities to assess and improve current infrastructure.

Stormwater 101

What is stormwater

Rain and melted snow flow over land into storm drains, streams, rivers, and lakes.

In natural landscapes, stormwater is soaked up like a sponge, which then nourishes plants and slowly replenishes streams, lakes, wetlands, and aquifers.

In more urban areas, impervious, or hard, surfaces such as asphalt, concrete, and rooftops, prevent stormwater from naturally soaking into the ground. Instead, the water runs quickly into storm drains and sewer systems, and then to our lakes and rivers.

These hard surface areas create more stormwater runoff, which carries more pollutants, such as oil, grit, and garbage into our lakes and rivers.

Why is stormwater an issue

Stormwater that does not soak into the ground flows into rivers, ponds and lakes. The runoff can contain chemicals, sediment, and trash.

It is important to monitor stormwater runoff. First, to track how much and how often which can result in flooding. Second, to track the amount of contaminants the water carries.



THUNDER BAY STORMWATER FINANCING STUDY

The plan will help lower the danger of runoff, protect our roads and structures, while a fully function storm sewer system.

Stormwater financing study

A public information forum was held to give residents an opportunity to learn about the study and funding options under consideration and give their feedback.

- Stormwater Financing Study Public Information Centre **Poster** for the Jan. 23, 2018 Public Information Session
- Thunder Bay Stormwater Management Financing Study **Storyboards** from the Jan. 23, 2018 Public Information Session
- Thunder Bay Stormwater Management Financing Study **Presentation** the Jan. 23, 2018 Public Information Session
- Thunder Bay Stormwater Management Financing Study to City Council

AECOM

AECOM is a firm that connects knowledge and experience across a global network of experts to help their clients solve complex challenges. AECOM offers premier professional and technical services to help plan, design, build, finance, and operate infrastructure assets for public and private sector clients.

Contact AECOM

Pippy Warburton, P.Eng.

AECOM

519-650-8629

pippy.warburton@aecom.com

Stormwater financing options

There are several options to provide funding for a stormwater management program. These options include:

- Status quo
- Increased property tax rates
- Changes to the current Sewage & Drainage property tax levy
- A new stormwater management property tax levy
- Changes to the current Development Charges program (partial program funding for new development and infill/re-development only)
- A new Development Impact Fee program (partial program funding for new development and infill/redevelopment only)
- A new Stormwater Management User Fee program

One option the City is exploring that is becoming more common in Ontario, and throughout North America, is financing stormwater management through a user fee. A



THUNDER BAY STORMWATER FINANCING STUDY

stormwater user fee, also referred to as a utility, would charge homeowners and landowners based on the amount of stormwater their property contributes.

Stormwater Management Plan

The stormwater management plan will span over 20-years. It will protect the quality and health of water resources in Thunder Bay.

The guidance of **Emmons & Olivier Resources, INC.**, as well as input from community groups and residents helped create the plan.

The City of Thunder Bay strategic plan (2011-2014) supported the development of the plan.

Thunder Bay City Council approved the Stormwater Management Plan in principle on June 13, 2016.

- Stormwater Mgmt. Plan - **Vol I: The Plan**
- Stormwater Management Plan - **Vol. II: Appendices**
- Stormwater Management Plan - Vol. III: Watershed Maps - *Available at the Victoriaville Civic Centre, 111 Syndicate Ave South*
- Stormwater Management **Presentation to City Council**

Community Involvement

Good planning and better decisions involves input from many perspectives, including the residents of our community. We encourage residents to help shape the plans for stormwater management financing which will help meet the needs of the current and future stormwater demand.

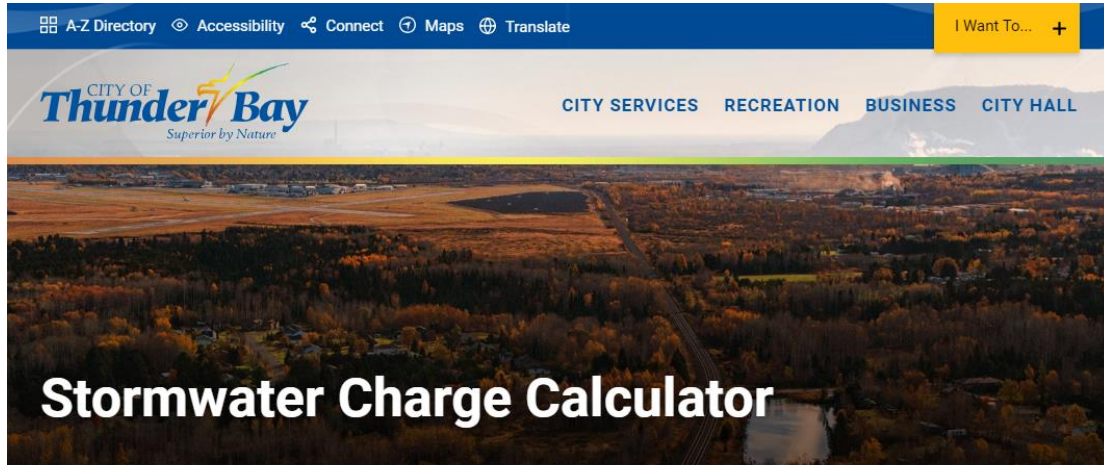
What homeowners can you do right now

- Plant a **rain garden**
- Install a rain barrel or two
- Dispose of hazardous waste at the City's Household Hazardous Waste Depot-link to internal site
- Do not wash automotive fluids into the storm sewer
- Pick up after your pets
- Clean up litter
- Avoid the use of chemical fertilizers



Online Stormwater Charge Calculator

<https://forms.thunderbay.ca/INOP/Stormwater-Charge-Calculator>



Step 1: Have your 2018 Final tax bill and your four (4) water bills from 2018 on-hand.

Step 2: Are you urban or rural? * [?](#)

Rural Urban

Step 3: Enter your General Municipal Tax Levy * [?](#)

Step 4: Enter your Sewage & Drainage Tax Levy * [?](#)

Step 5: Enter your four Sewer Rate Charges* from your quarterly water bills

*In 2018, 4.1% of this fee was directed to stormwater related works in the City.

<p>Enter your Quarter 1 Sewer Rate Charge *</p> <p>?</p> <input type="text" value="9,999.99"/>	<p>Enter your Quarter 2 Sewer Rate Charge *</p> <p>?</p> <input type="text" value="9,999.99"/>	<p>Enter your Quarter 3 Sewer Rate Charge *</p> <p>?</p> <input type="text" value="9,999.99"/>	<p>Enter your Quarter 4 Sewer Rate Charge *</p> <p>?</p> <input type="text" value="9,999.99"/>
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Step 6: Hit Calculate

Any collection of personal information is made under the authority of the Municipal Act, 2001. Personal information is collected in compliance with the Municipal Freedom of Information and Protection of Privacy Act.

Calculate



THUNDER BAY
STORMWATER FINANCING STUDY

Social Media Content

January 19, 2018
Facebook Post



City of Thunder Bay - Municipal
Government, Ontario, Canada

Like Page

January 19, 2018 · 🌐

In 2016, City Council adopted the Stormwater Management Plan, outlining stormwater management goals and objectives for the next 20 years. A Stormwater Financing Study is underway to investigate a sustainable and fair funding source to support the City's current stormwater program and the implementation of the Stormwater Management Plan. Join us on Tuesday, Jan. 23, at the Italian Cultural Centre, 123 Algoma Street North. Residents can drop-in between 4 - 8 pm, and presentations will take place at 5 pm and 7 pm. For more information, visit: www.thunderbay.ca/stormwaterplan

THUNDER BAY
STORMWATER FINANCING STUDY
Public Information Centre

Tuesday, January 23
Italian Cultural Centre,
Drop-in between 4 - 8 pm
Presentations at 5 pm and 7 pm

CITY OF
Thunder Bay AECOM
Superior by Nature

41

23 Comments 29 Shares

Like

Comment

Share



THUNDER BAY STORMWATER FINANCING STUDY

January 22, 2018
Facebook Post



City of Thunder Bay - Municipal
Government, Ontario, Canada

Like Page

January 22, 2018

The City of Thunder Bay is seeking public input on its Stormwater Financing Study.

Read more: <http://bit.ly/2G2oQJL>

THUNDER BAY
STORMWATER FINANCING STUDY

**THUNDER BAY STORMWATER FINANCING STUDY
PUBLIC INFORMATION CENTRE**

JOIN US!
A Stormwater Financing Study is underway to investigate a sustainable and fair funding source to support the City's current stormwater program. Drop by a Public Information Centre to learn more about the future of financing Thunder Bay's stormwater management program.

Tuesday, January 23, 2018
Italian Cultural Centre,
123 Algoma Street North,
Thunder Bay

Drop in between 4 pm and 8 pm.
Presentations at 5 pm and 7 pm.
Bus Routes: 3M Memorial,
11 John,
13 John-Jumbo

STAY INFORMED!
Please visit the Study website at thunderbay.ca/stormwaterplan for study updates, and to submit your ideas and feedback.

**COMMENTS / IDEAS / QUESTIONS?
PLEASE CONTACT US AT:**

Pippy Warburton, P. Eng.
AECOM
519-850-8629
pippy.warburton@aecom.com

Aaron Ward, P. Eng.
City of Thunder Bay
807-825-2444
award@thunderbay.ca

WHAT IS STORMWATER?
Stormwater comes from the rain and melted snow that flows over land. In our city, most stormwater runs off hard surfaces like roofs and driveways, carrying pollution into waterways, and potentially causing flooding along the way. Managing stormwater protects the health and safety of our community!

Thunder Bay AECOM

2

1 Comment 1 Share



THUNDER BAY STORMWATER FINANCING STUDY

January 23, 2018
Facebook Post



City of Thunder Bay - Municipal
Government, Ontario, Canada

January 23, 2018 · 🌐

👍 Like Page ...

The City is hosting the Stormwater Management Financing Study Public Information Centre tonight until 8 pm at the Italian Cultural Centre. A presentation took place at 5 pm and the second presentation will take place at 7 pm. Residents are encouraged to attend. For more information, visit: www.thunderbay.ca/stormwaterplan



👍 Like

💬 Comment

➦ Share



THUNDER BAY STORMWATER FINANCING STUDY

January 30, 2018
Facebook Post



City of Thunder Bay - Municipal Government, Ontario, Canada

January 30, 2018 · 🌐

👍 Like Page ⋮

In 2016, City Council adopted the Stormwater Management Plan, outlining stormwater management goals and objectives for the next 20 years. Now, a Stormwater Financing Study is underway to investigate a sustainable and fair funding source to support the City's current stormwater program and the implementation of the Stormwater Management Plan.

Visit www.thunderbay.ca/stormwaterplan to learn more about the study and answer the online survey. The survey will be available until Friday, Feb 9.



👍 😄 😊 11

12 Comments 7 Shares

👍 Like

💬 Comment

↪ Share

Appendix I

One-on-one Stakeholder Presentations

City of Thunder Bay Stormwater Financing Study



Confederation College
Stakeholder Meeting
Tuesday, November 20, 2018

Project Manager: Aaron Ward, P.Eng.
Consultant Team: Pippy Warburton P.Eng. and
Mike Gregory, P.Eng.



Meeting Purpose and Objectives

- Introduce the Stormwater Financing Study
 - What is it and why it is needed?
- Discuss stormwater management in Thunder Bay
- Outline community engagement efforts
- Host an open discussion
- Identify next steps



Stormwater Financing Study – What & Why?

What is it?

- How the City currently pays for stormwater, where the funds comes from, and is it fair?
- What is fairest way to generate increased, sustainable funds for stormwater, while balancing what the community can afford and the ease of implementing changes.
- Recommended plan with steps for implementation for preferred strategy.

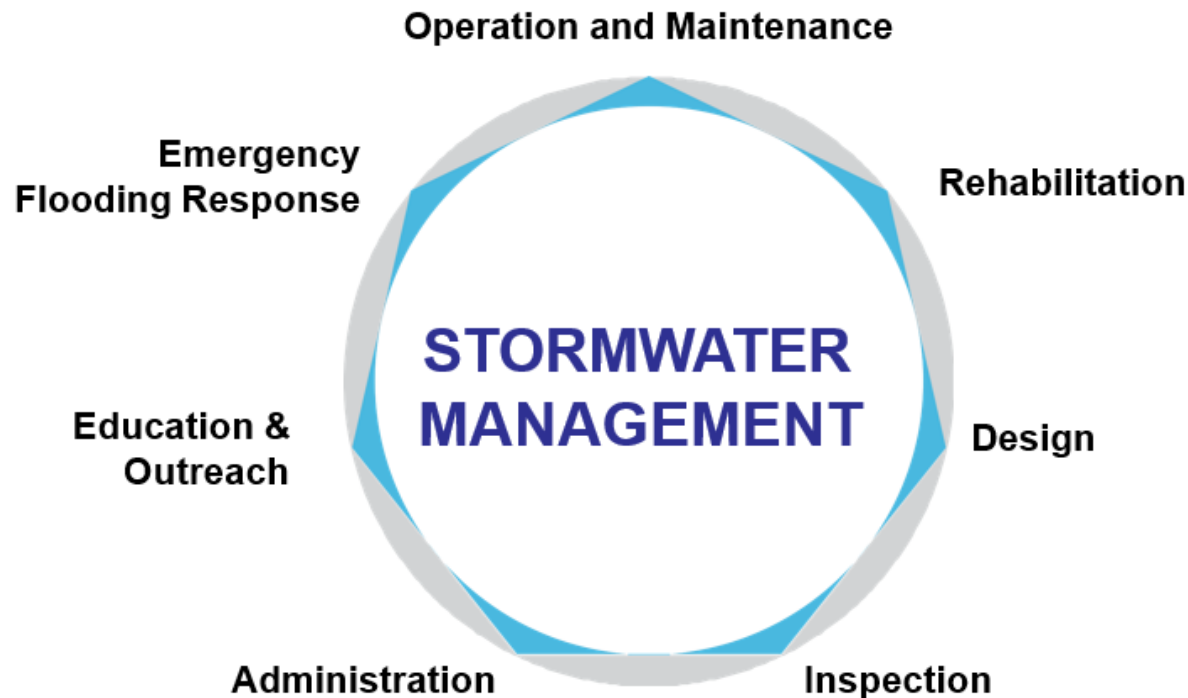
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- 2016 Stormwater Management Plan
- 2016 Asset Management Plan



Stormwater Management in Thunder Bay

- The City is responsible for protecting public health & safety as well as the environment by managing the quality and quantity of stormwater reaching our lakes and rivers.



2016 Stormwater Management Plan

– Adopted by Council in 2016, this plan will guide the City’s stormwater management actions for the next 20 years, based on the following goals:



ECOSYSTEM HEALTH



WATERSHED QUALITY



WATER QUANTITY



OPERATIONS and MAINTENANCE



MONITORING and DATA ASSESSMENT



REGULATION and ENFORCEMENT



EDUCATION and OUTREACH



FUNDING and ORGANIZATION



CLIMATE CHANGE

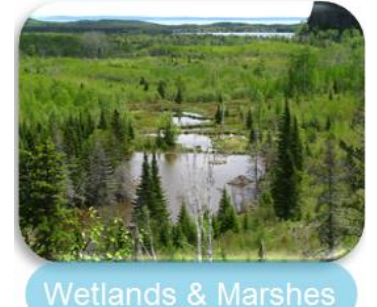
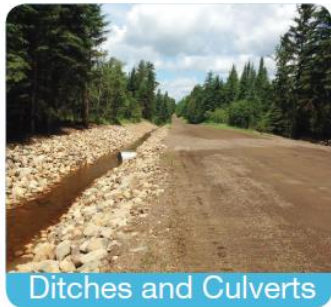


Plan Components	Year 1 (2015 \$)	Year 20 Average Spending (2018 \$)
Studies and Inventories		
Feasibility Studies	\$ -	\$ 240,000
Natural Resources Inventories	\$ -	\$ 90,000
Stormwater Infrastructure Inventories & Data Collection	\$ -	\$ 40,000
Modeling Efforts	\$ -	\$ 30,000
Sub-Total	\$ -	\$ 400,000
Capital Projects		
Sub-Total	\$ 4,048,000	\$ 8,020,000
Operations and Programs		
Administration	\$ -	
Monitoring Program	\$ 113,000	\$ 130,000
Inspection & Maintenance Program	\$ 1,698,000	\$ 2,230,000
Regulations & Enforcement	\$ 53,000	\$ 100,000
Public Education, Outreach, and Rebate Programs	\$ 160,000	\$ 260,000
Sub-Total	\$ 2,024,000	\$ 2,720,000
Lakehead Region Conservation Authority Levy		
Sub-Total	\$ 1,000,000	\$ 1,000,000
TOTAL	\$ 7,072,000	\$ 12,140,000



Stormwater Management Infrastructure

– What is the City's Stormwater Infrastructure?



330km of sewers, 4,200 manholes, 11,000 catch basins, 486km ditches, 45 treatment facilities, 4 pumping stations

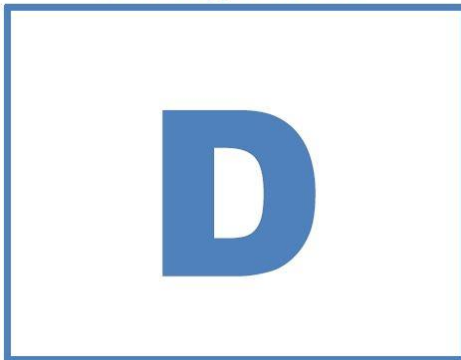
Report Card

- The City’s ability to effectively and adequately perform its duties are limited by available consistent funding.
- Average spending from 2011-2015 was \$2.9 million annually
- Capital funding should amount to \$6.2 million annually



This equates to a **\$3.3 million annual funding gap and grade of D**

Funding vs Need



Note: this does not include all current stormwater assets, such as ditches, culverts, and treatment facilities, nor does it include the construction of new infrastructure and treatment facilities



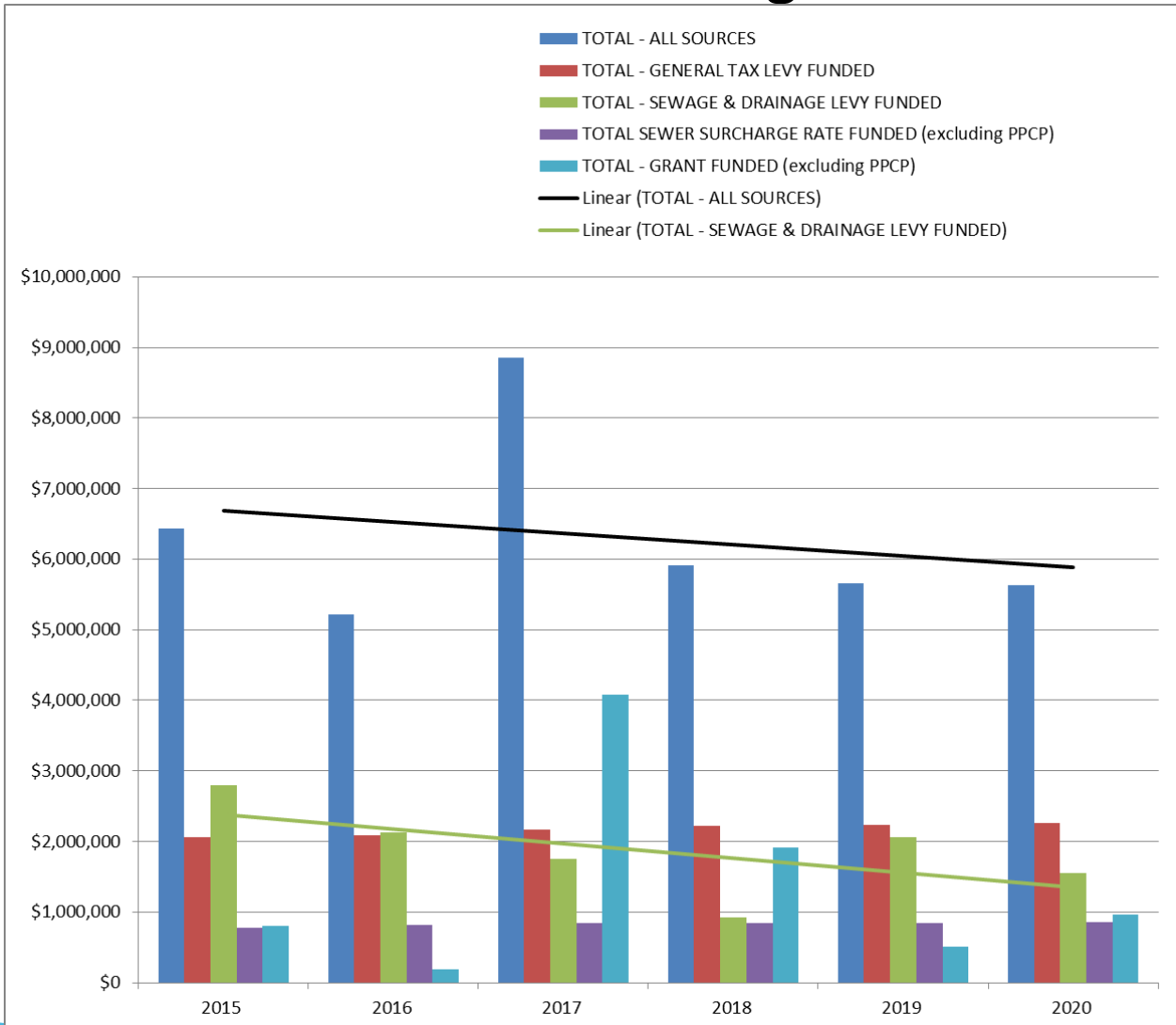
Stormwater Management Asset Value

- How much are the City's stormwater assets worth?
- The overall replacement value exceeds **\$540M dollars**. This is equivalent to over \$11,000 per household.
- As infrastructure ages and could lead to failures, a regular renewal/ replacement plan for the infrastructure will be required.

This is why the City is conducting a Stormwater Financing Study – to review and recommend a sustainable and fair funding source to support stormwater initiatives and future goals.



Current Stormwater Funding



- 2015 - \$6.43M
- 2016 - \$5.22M
- 2017 - \$8.85M
- 2018 - \$5.91M
- 2019 - \$5.66M*
- 2020 - \$5.63M*

* *Current forecasted budget*



Stormwater Financing Study Overview

1. Evaluate current expenditures & funding sources
2. Determine the appropriate and affordable level of service for future stormwater program projects and activities
3. Identify and evaluate funding options and alternatives
4. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
5. Recommend a preferred option and determine the impacts compared to current funding sources
6. Present project findings and study recommendations to Council in early 2019.

On-Going Community Engagement

- Public Information Centre #1 was on Tuesday, January 23, 2018
 - 56 participants; 131 comment forms: 108 online and 23 in-person
- Councillor Ward Meetings
 - Attended 5 Neighbourhood Ward meetings after first PIC; approximately 90 people in attendance
- Stormwater Advisory Committee Meetings (x3)
- Stakeholder Engagement – One-on-One Meetings
- Public Information Centre #2 – planned for February 2019



Study Highlights

- Range of funding options being investigated
 - Do nothing (no change to current funding sources)
 - Changes to property tax funding
 - Changes to development charges (for new development)
 - New user-fee funded program
- Led by City Internal Steering Committee
- Advised by Stormwater Advisory Committee as well as the general public and interested stakeholders
- Direction from (and decisions will be made by) City Council



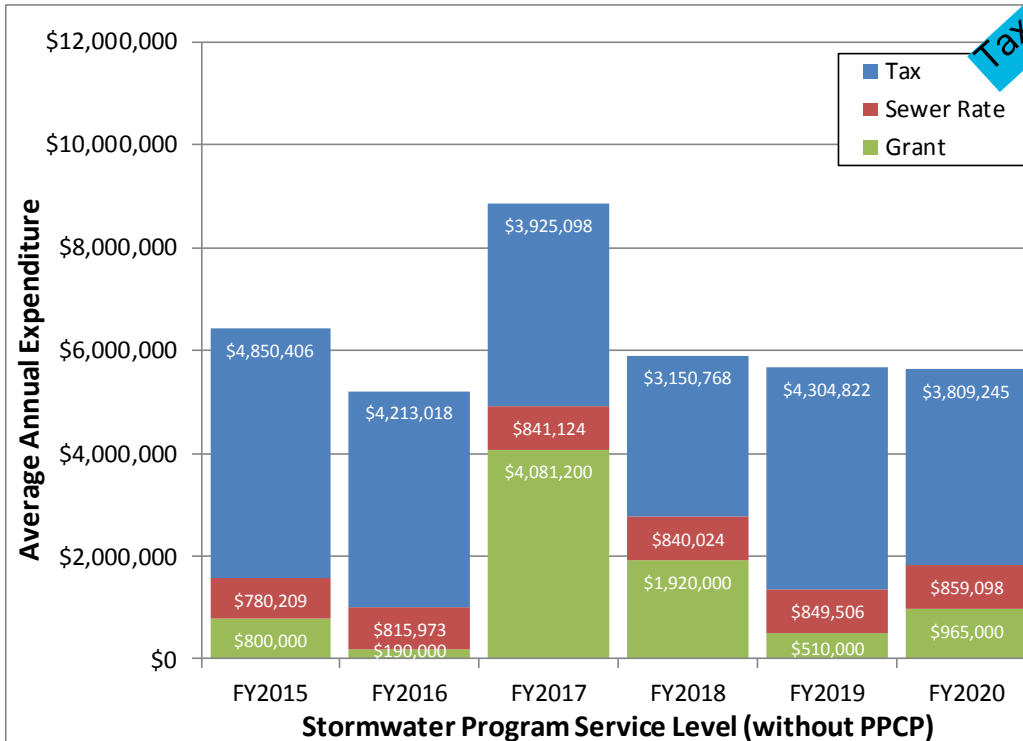
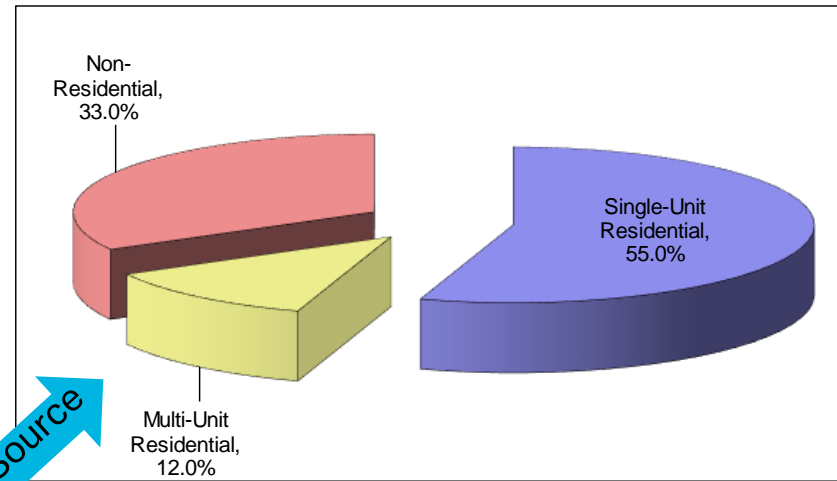
Funding Options

- Taxes: mandatory levies that are not related to any specific benefit or government service (i.e., general services for the public good)
- Fees/Rates: payments made to offset the cost of a specific service and payable by those people who benefit from the service (i.e., a “rational nexus” must be demonstrated)
- Other means: e.g., public-private partnerships, long-term debt-financing strategies, federal or provincial economic stimulus grants for infrastructure investment
- Or any combination of the above



Current Funding Sources

- 3 current funding sources – taxes, sewer rate, grants – but majority is from taxes.



Your organization currently contributes through taxes (payment-in-lieu-of-taxes, or PILT), and sewer rates.

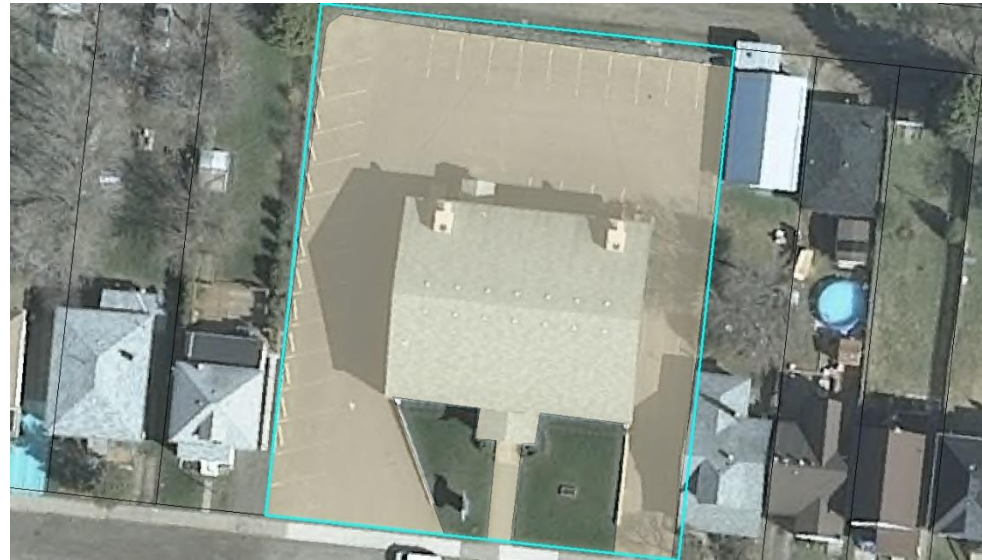


Source of Stormwater

- In general, stormwater generated from impervious (hard surfaces) – roads, roofs, parking lots, etc.
- An indicator of how much stormwater a property generates can be linked to how much impervious area they have.



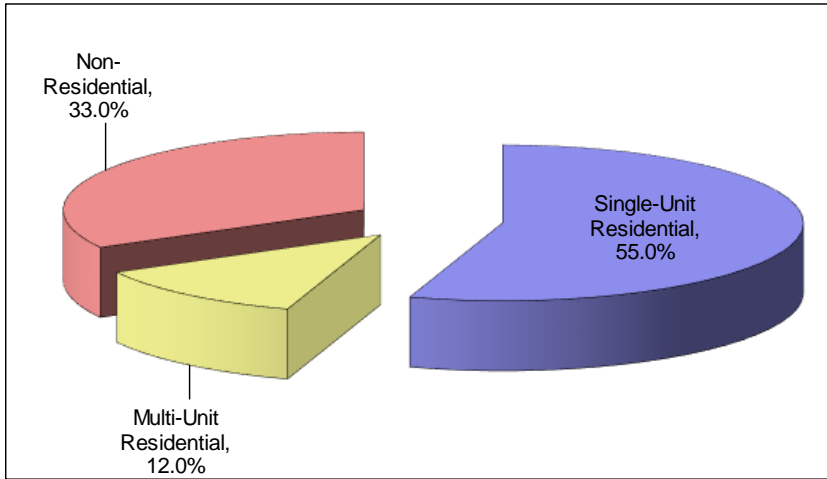
Sample single-family residential property



Sample non-residential property

Findings: Source of Funding (taxes) vs. Source of Stormwater

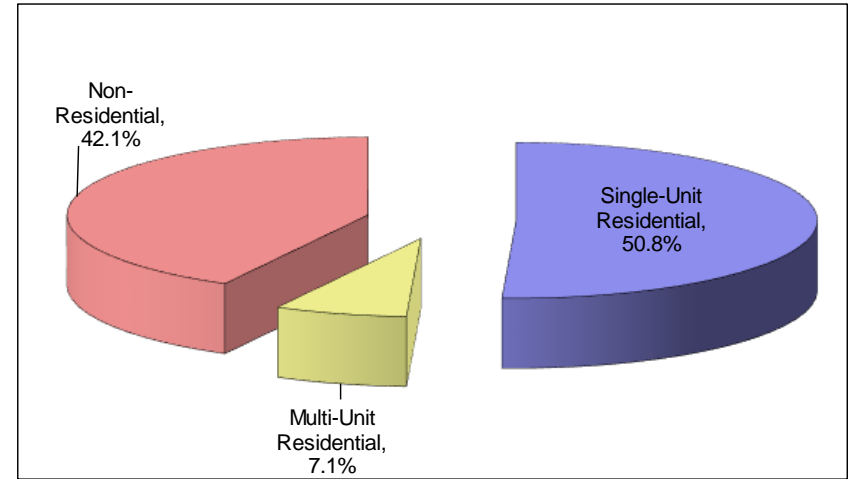
Tax Revenue Distribution



Residential = 67% of Revenue

Non-Residential = 33% of Revenue

Impervious Area Distribution

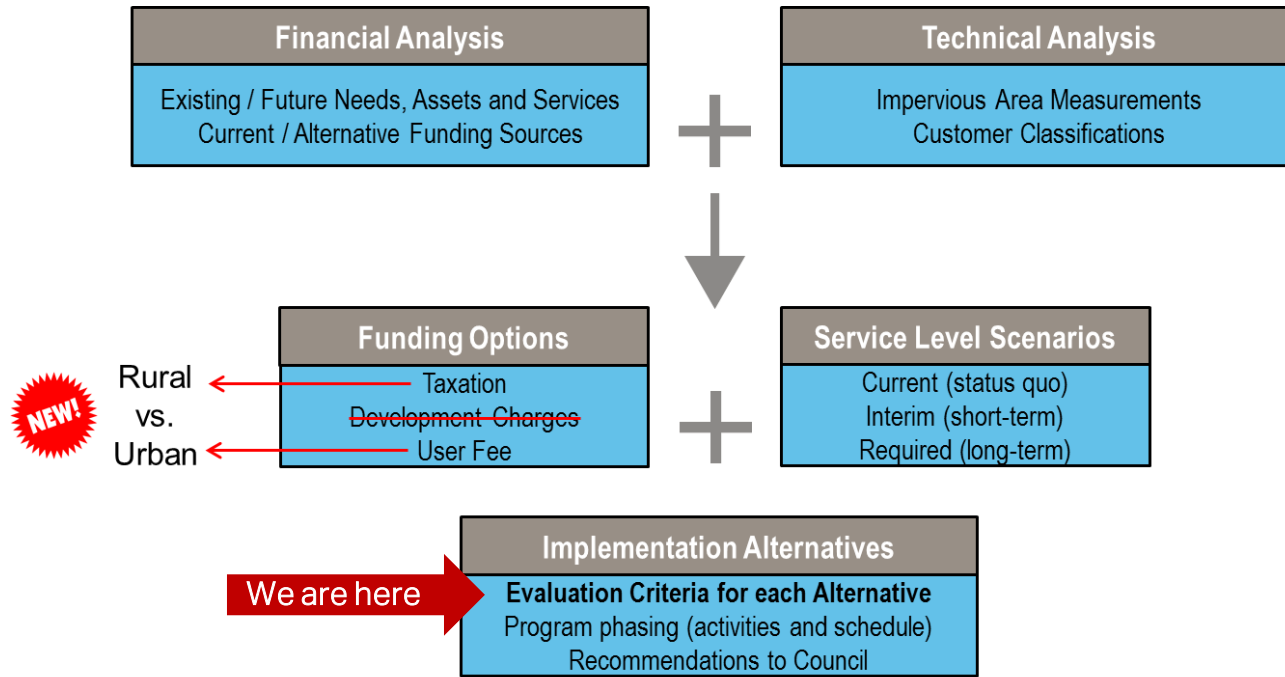


Residential = 58% of Impervious Area

Non-Residential = 42% of Impervious Area

VS

Current Stage



Evaluation Criteria for Alternatives

1. City-Wide Applicability
2. Meets Entire Revenue Needs
3. Fair & Equitable Allocation
4. Dedicated & Long-Term Funding Source
5. Effort to Administrate
6. Public Accountability
7. Environmental Benefits
8. Social Benefits

Discussion



Open Discussion

- Questions & discussion about the above?
- What could this mean for your organization?
- What are the pros and cons for the various funding types for your organization?
- How would you like to stay informed?



Next Steps

- Continue to communicate via the City website
<https://www.thunderbay.ca/en/city-hall/storm-water-management-plan.aspx>
- Upcoming Meetings
 - Public Information Centre No. 2 (February 2019)
 - Additional Stakeholder Meetings
- Present project findings and preliminary staff recommendations to the *NEW* Council in 2019.

Questions?





Property Tax Funding

	Pros	Cons
Tax-Based Funding	<ul style="list-style-type: none">• Already accepted as the primary existing source of revenue for municipalities• Can be used to fund all stormwater management program activities• The billing system is already established	<ul style="list-style-type: none">• Property taxes are based on a property's assessed value, not runoff contribution, so the fairness and equity of this revenue source is low• Not a dedicated* or stable funding source• Annual competition for general tax funds to support other community services• No incentive to adopt source controls to reduce runoff• Tax-exempt properties don't contribute to stormwater program

**Note: A dedicated tax levy for specific stormwater services could be adopted*



Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none">• Dedicated and stable funding source for all stormwater activities (i.e., sustainable)• Fair and equitable fee based on indicator of runoff contribution (assessed to all private and publicly-owned properties in the same manner)• With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge• Mechanism to ensure privately owned stormwater facilities are maintained	<ul style="list-style-type: none">• Additional implementation costs (rate study, database management, billing and customer service*)• Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>

Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
- Flat fee: equal charge to all utility customers (Calgary)
- Tiered flat fee: charges by customer type (London, Aurora, Richmond Hill)
- Variable rate: property owners based on measured impervious area (Kitchener, Mississauga, and Guelph)

Municipality	Fee Type (as of 2016)	Start
Nova Scotia		
Halifax	Variable Rate	2013
Ontario		
London	Tiered Flat Fee	1996
Aurora	Tiered Flat Fee	1998
St. Thomas	Tiered Flat Fee	2000
Kitchener	Variable Rate	2011
Waterloo	Variable Rate	2011
Richmond Hill	Tiered Flat Fee	2013
Markham	Tiered Flat Fee	2015
Mississauga	Variable Rate	2016
Saskatchewan		
Regina	Tiered Flat Fee	2001
Saskatoon	Variable Rate	2012
Alberta		
Calgary	Flat Fee	1994
Edmonton	Variable Rate	2003
St. Albert	Tiered Flat Fee	2003
Strathcona County	Flat Fee	2007
British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016

City of Thunder Bay Stormwater Financing Study



Lakehead District
School Board
Stakeholder Meeting
Monday, November 19, 2018

Project Manager: Aaron Ward, P.Eng.
Consultant Team: Pippy Warburton P.Eng. and
Mike Gregory, P.Eng.



Meeting Purpose and Objectives

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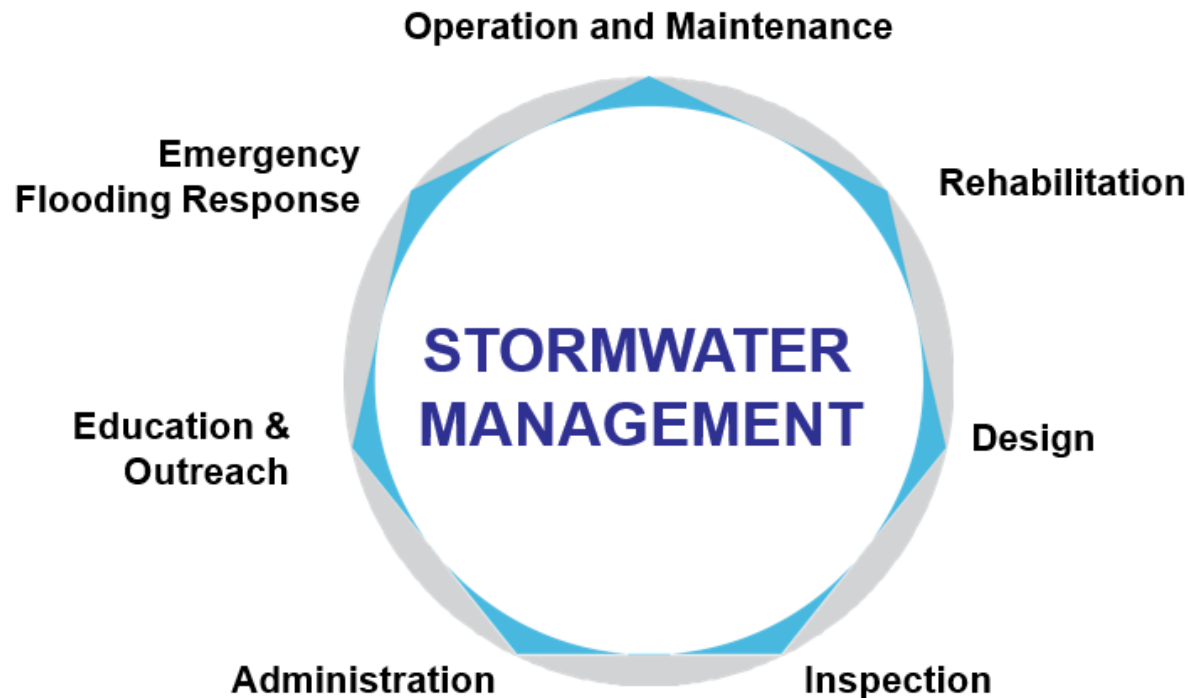
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WATERSHED QUALITY



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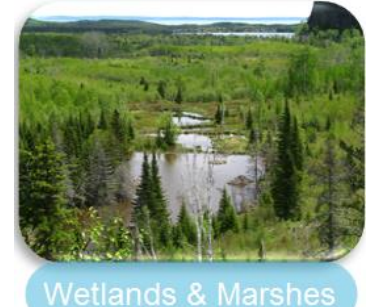
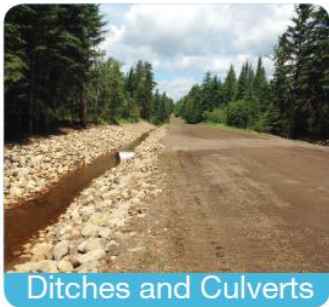


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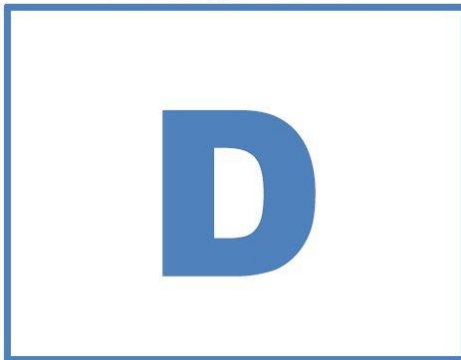
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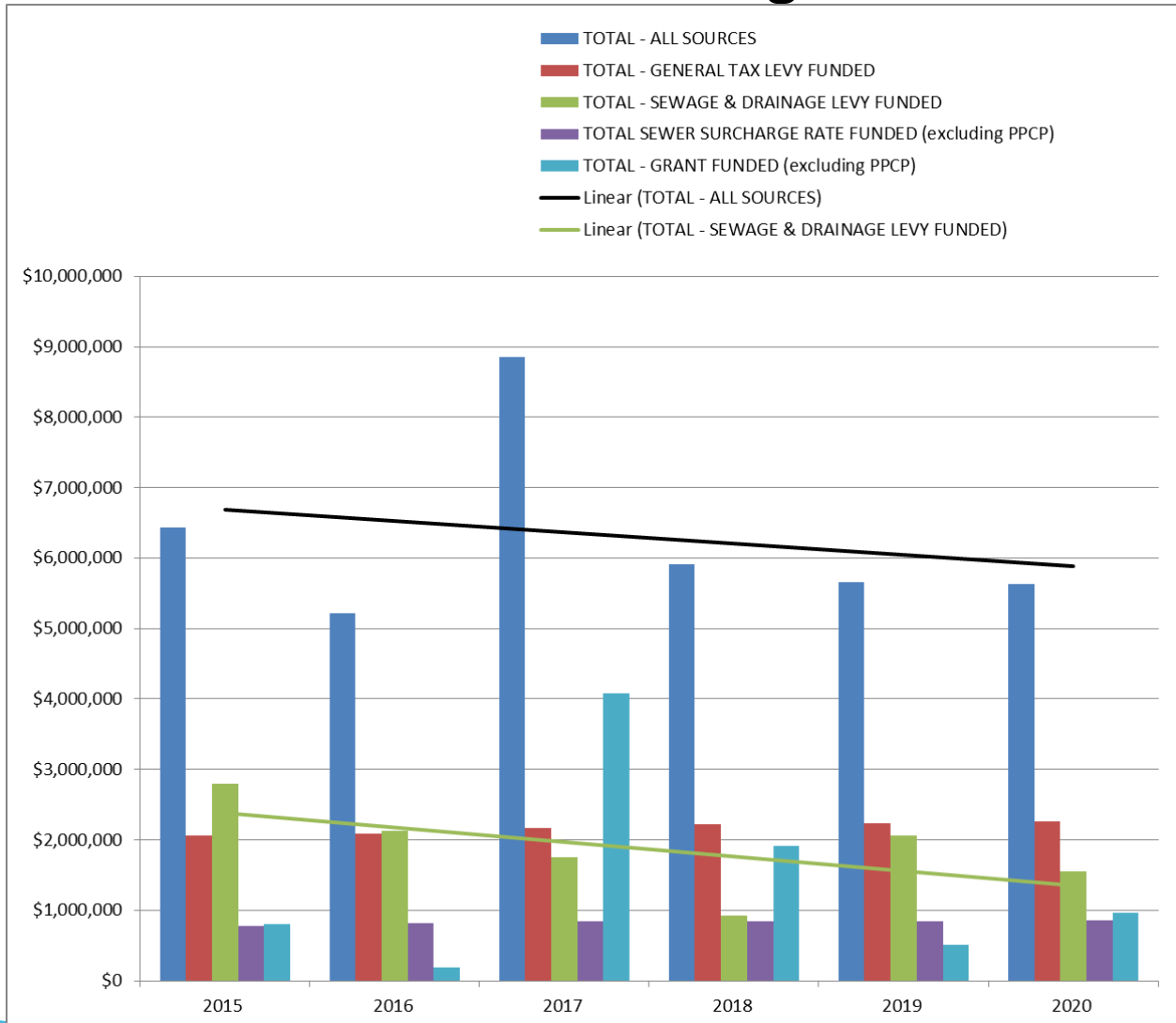
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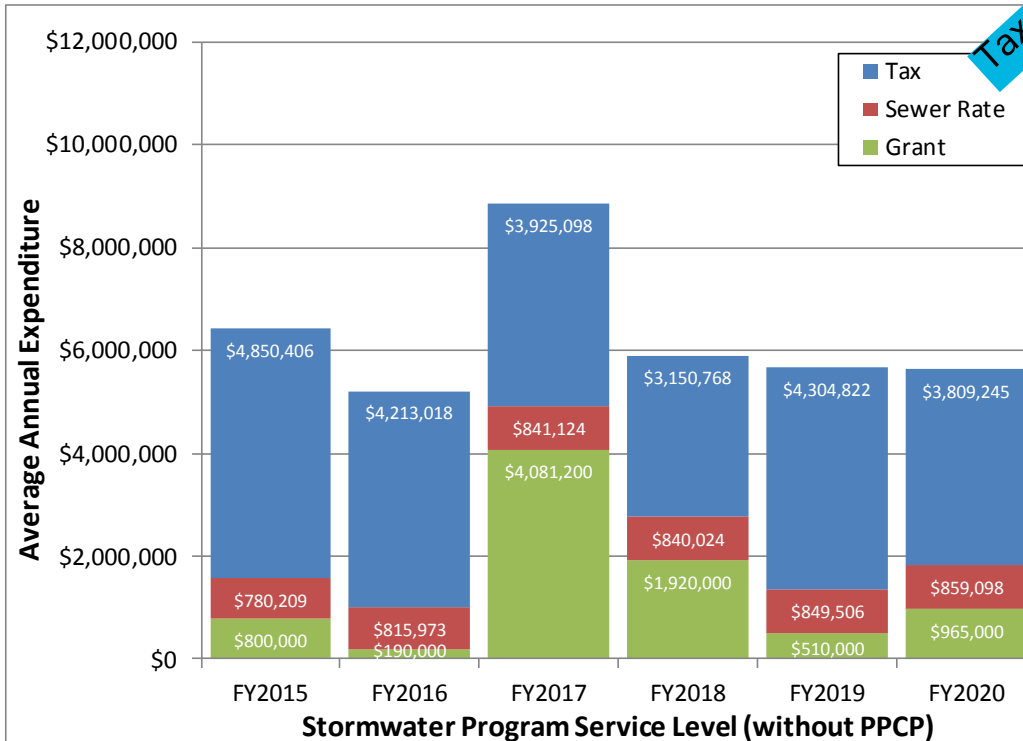
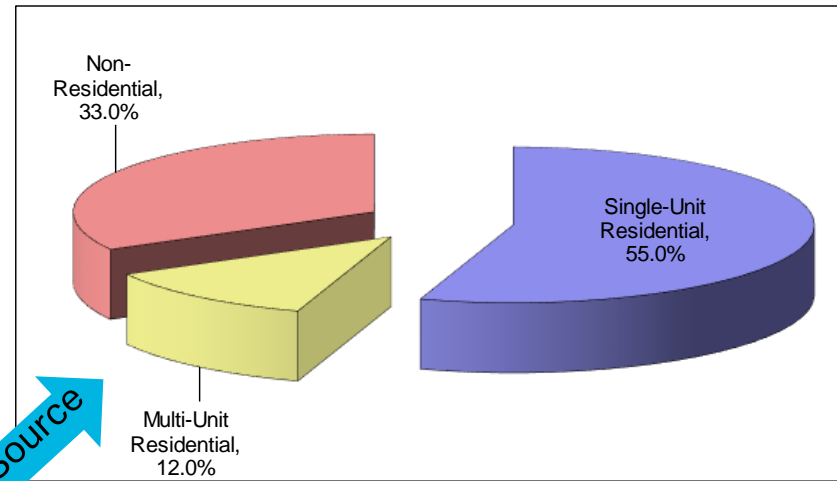
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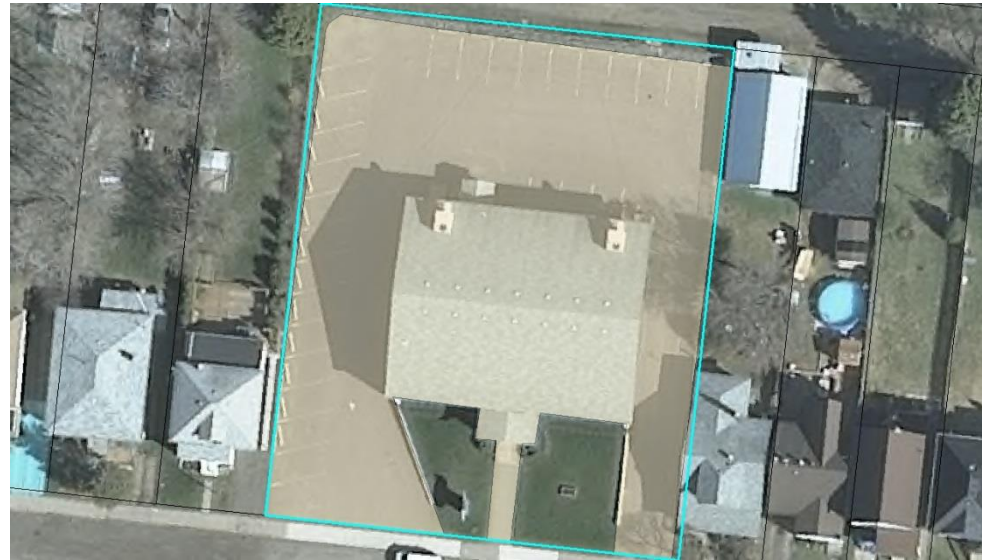


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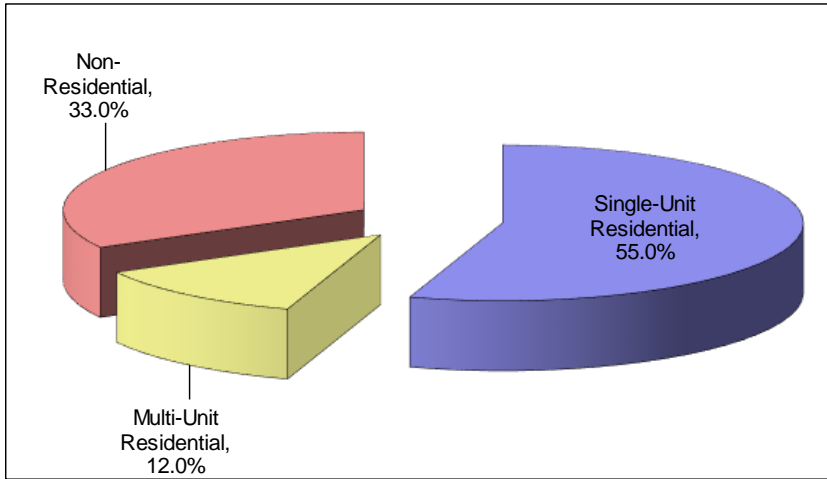
Sample single-family residential property



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Findings: Source of Funding (taxes) vs. Source of Stormwater

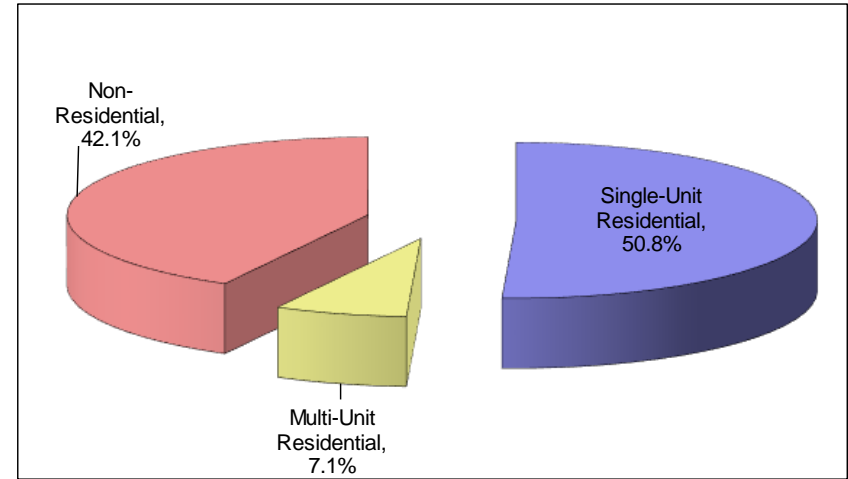
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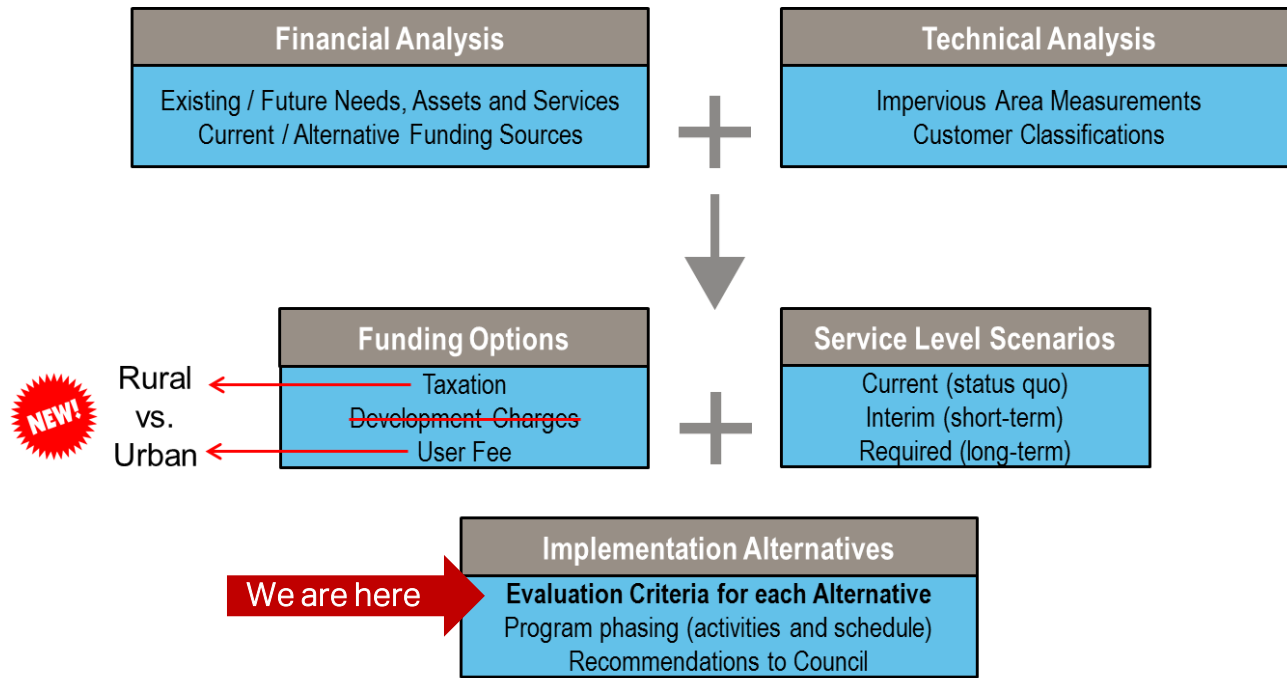


Residential = 58% of Impervious Area

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Current Stage



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Questions?





Property Tax Funding

	Pros	Cons
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**Note: A dedicated tax levy for specific stormwater services could be adopted*



Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none">• Dedicated and stable funding source for all stormwater activities (i.e., sustainable)• Fair and equitable fee based on indicator of runoff contribution (assessed to all private and publicly-owned properties in the same manner)• With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge• Mechanism to ensure privately owned stormwater facilities are maintained	<ul style="list-style-type: none">• Additional implementation costs (rate study, database management, billing and customer service*)• Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>

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City of Thunder Bay Stormwater Financing Study



Lakehead University
Stakeholder Meeting
Tuesday, November 20, 2018

Project Manager: Aaron Ward, P.Eng.
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Meeting Purpose and Objectives

- Introduce the Stormwater Financing Study
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What is it?

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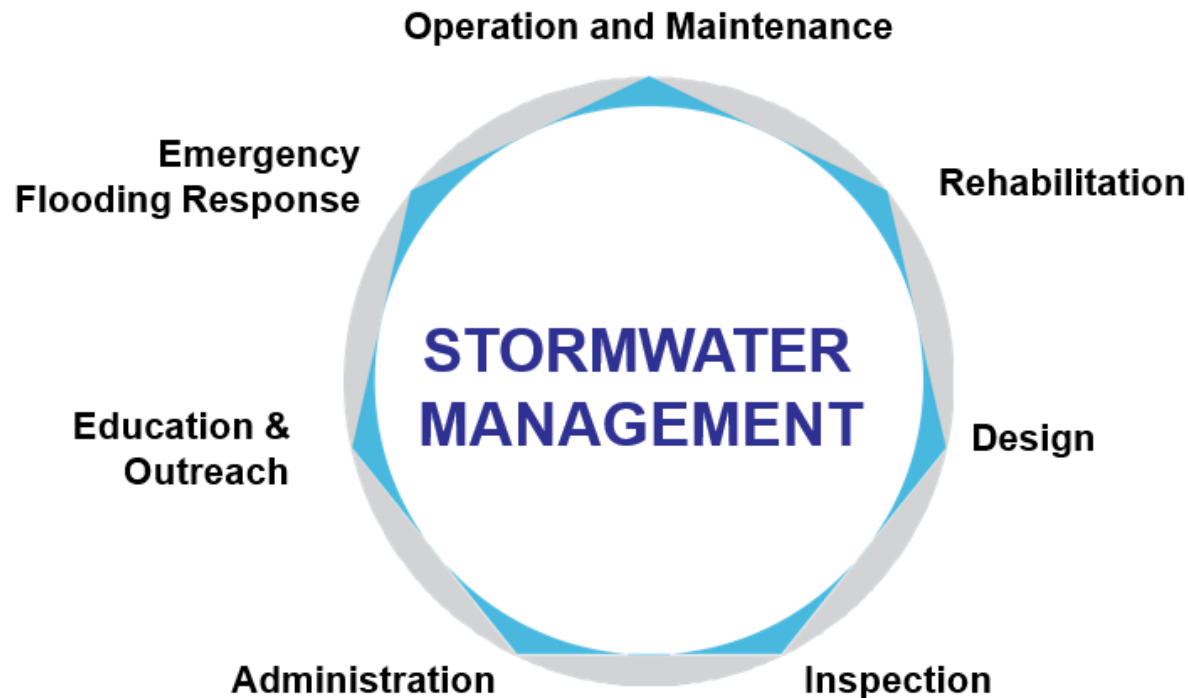
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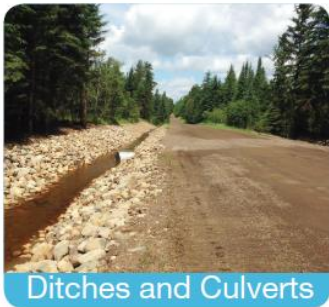
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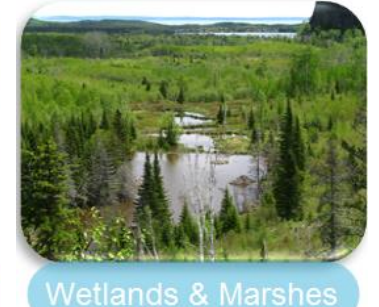
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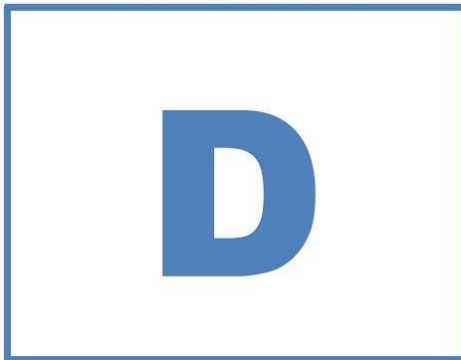
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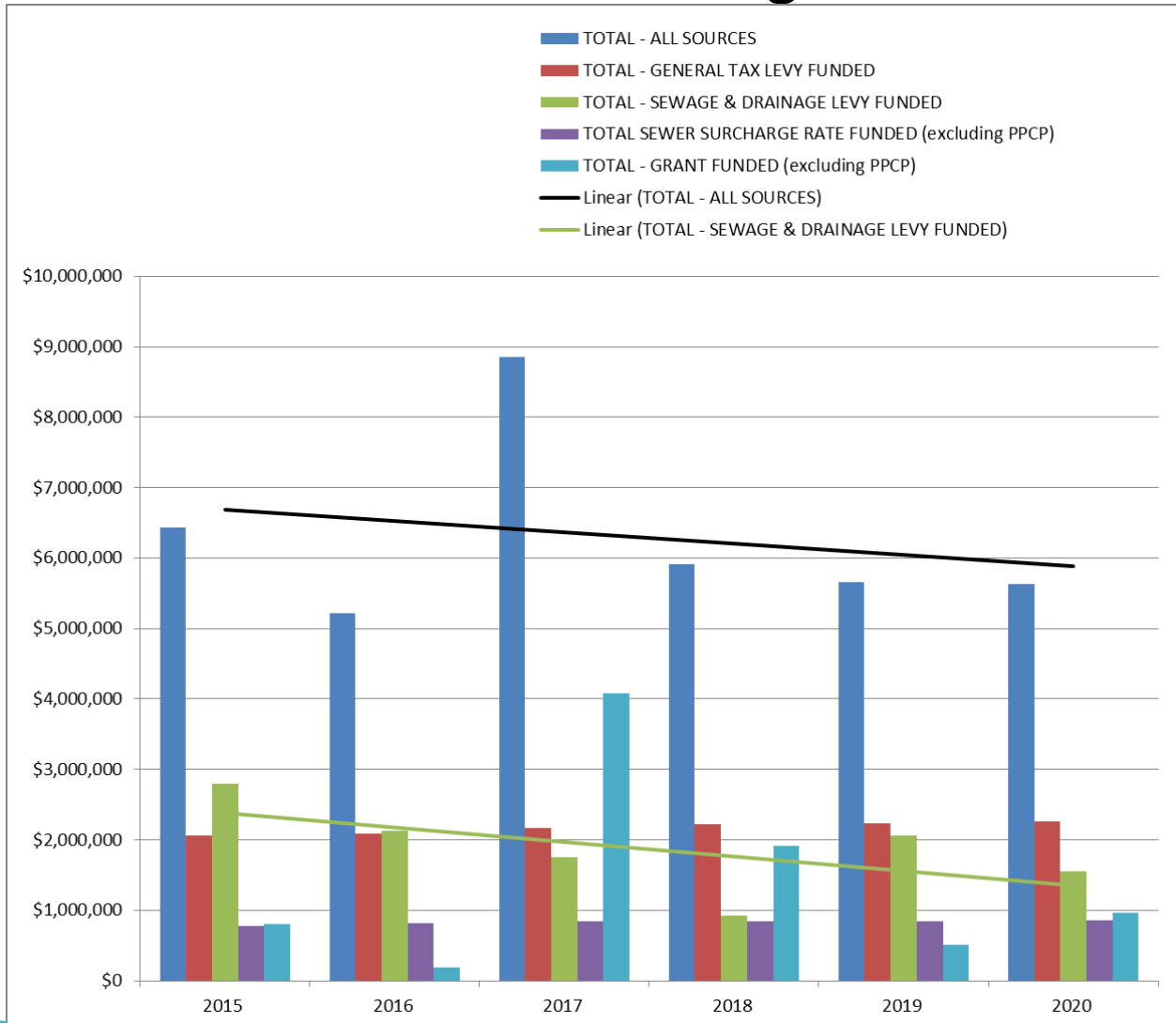
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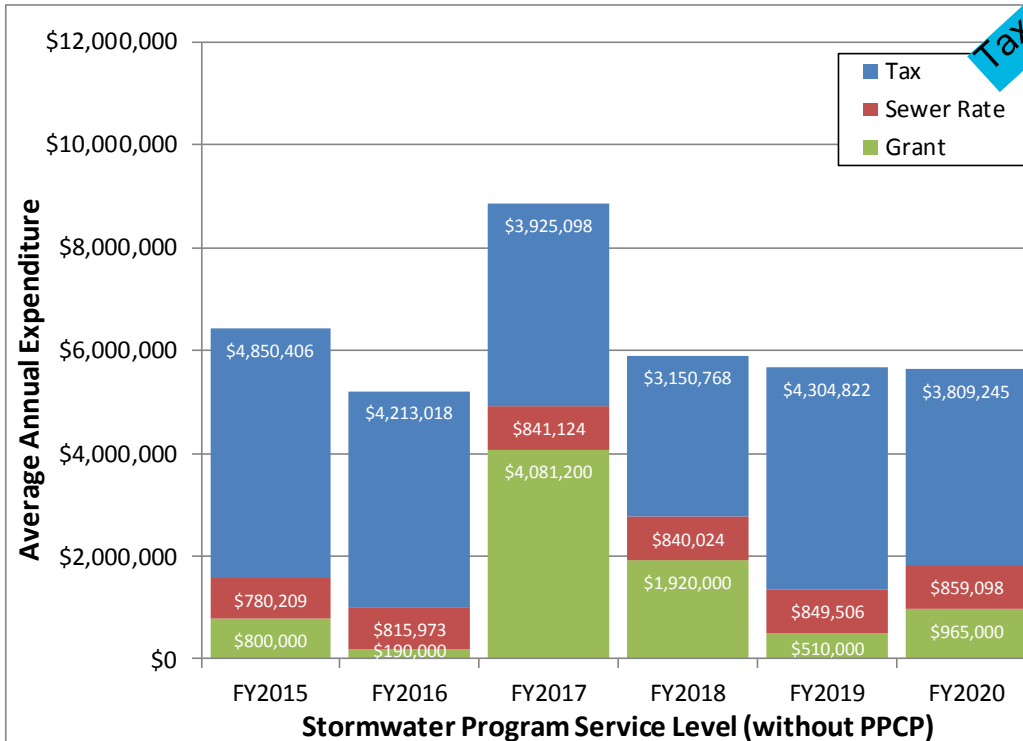
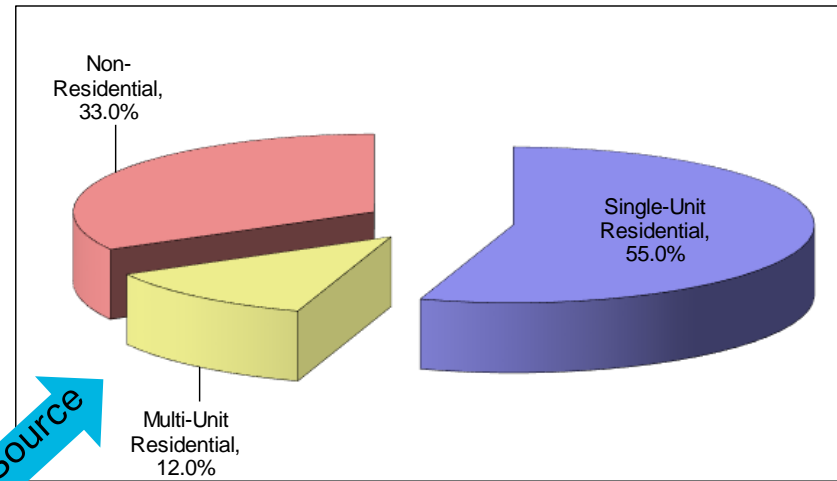
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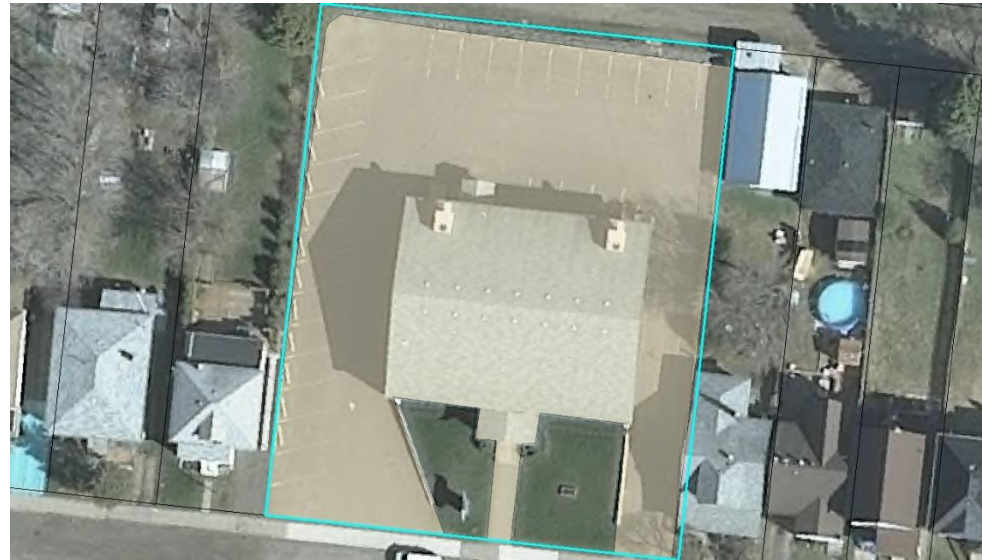


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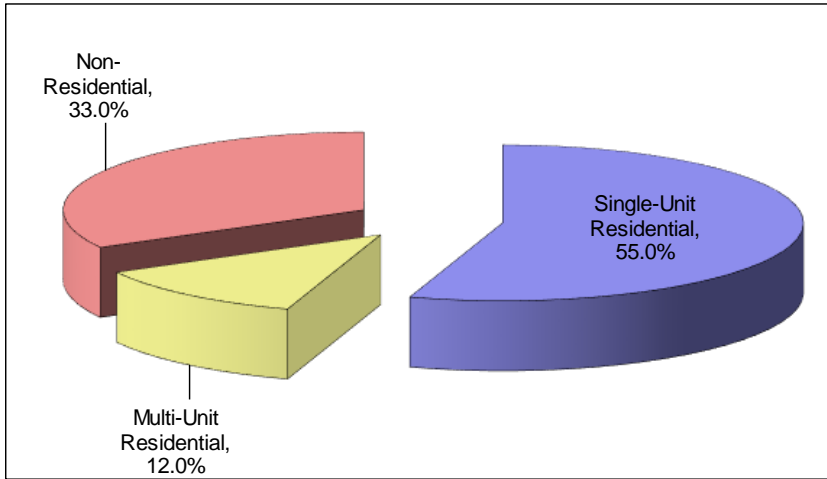
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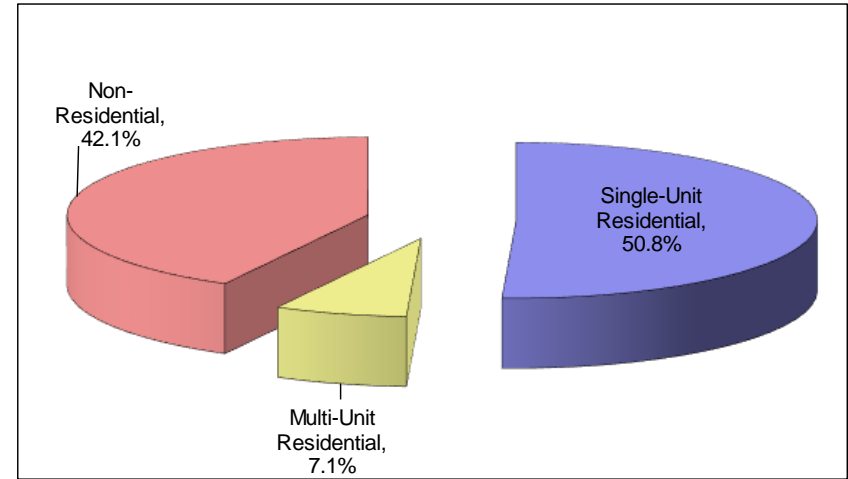
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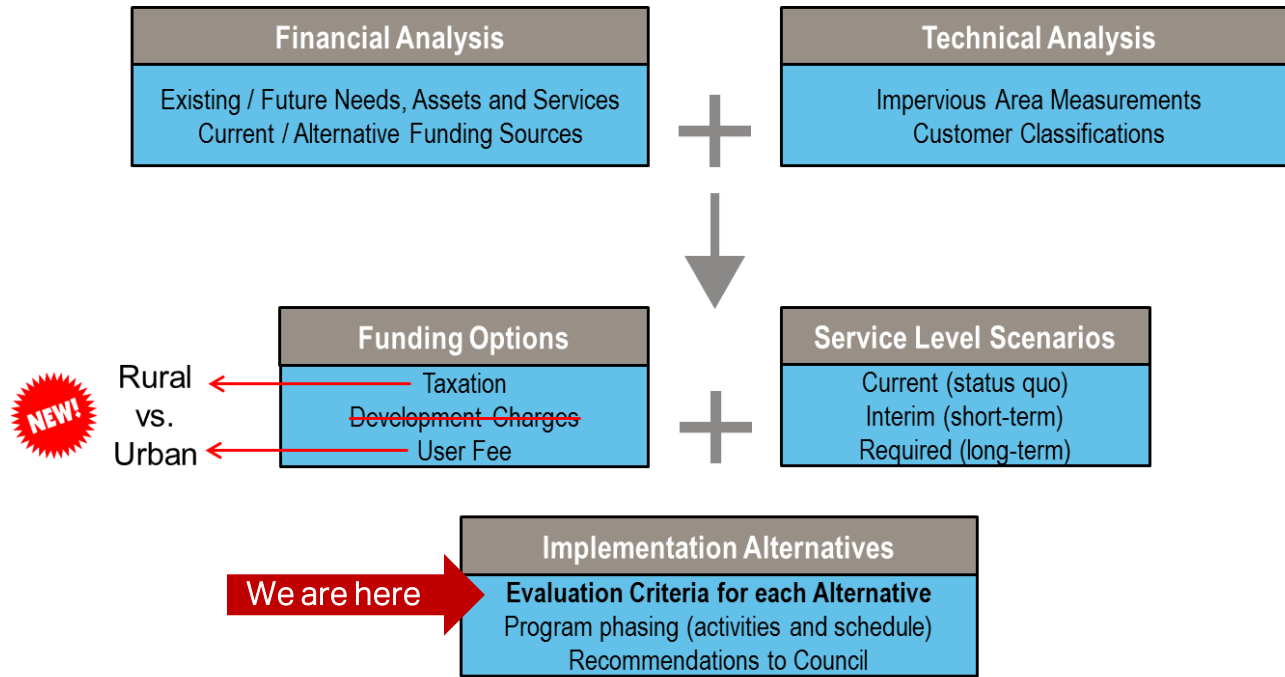


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City of Thunder Bay Stormwater Financing Study



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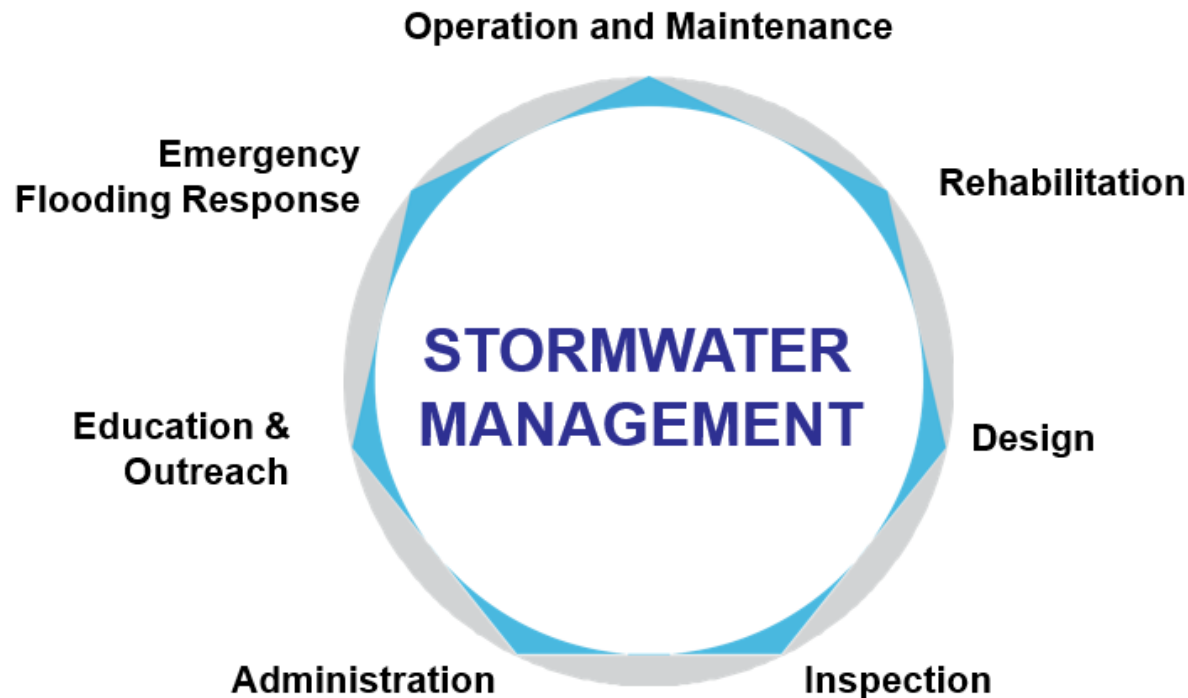
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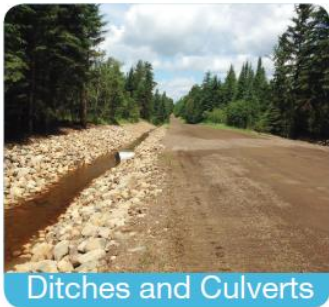
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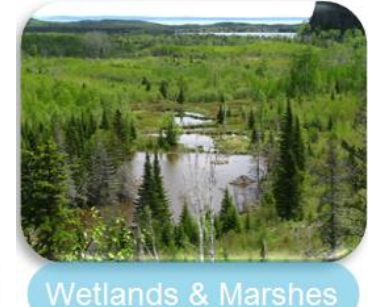
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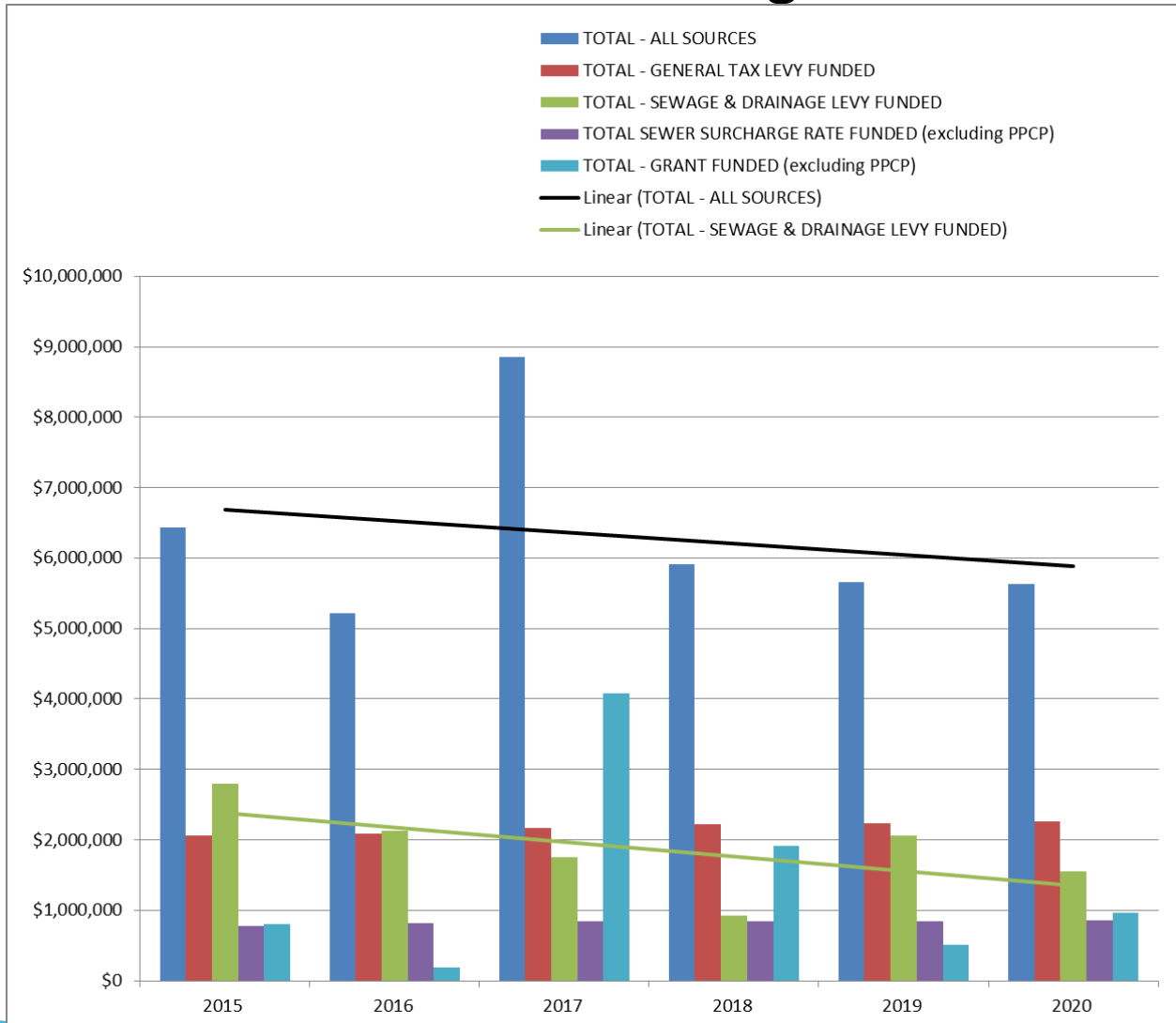
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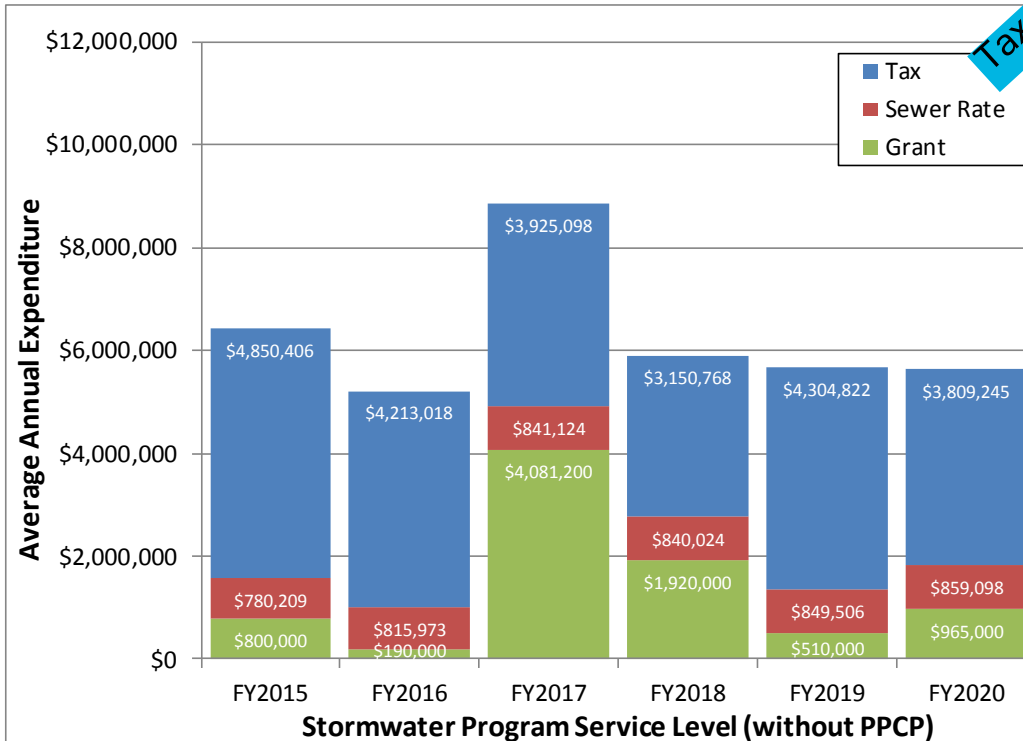
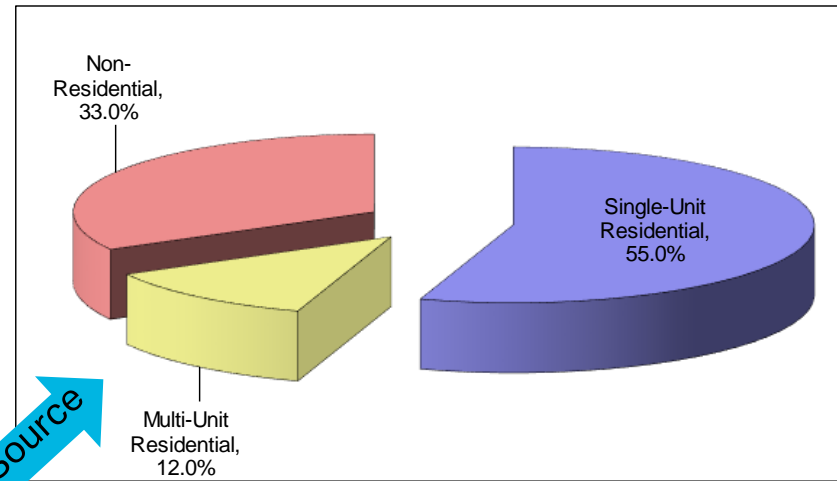
Funding Options

- Taxes: mandatory levies that are not related to any specific benefit or government service (i.e., general services for the public good)
- Fees/Rates: payments made to offset the cost of a specific service and payable by those people who benefit from the service (i.e., a “rational nexus” must be demonstrated)
- Other means: e.g., public-private partnerships, long-term debt-financing strategies, federal or provincial economic stimulus grants for infrastructure investment
- Or any combination of the above



Current Funding Sources

- 3 current funding sources – taxes, sewer rate, grants – but majority is from taxes.



Your organization currently contributes through taxes (payment-in-lieu-of-taxes, or PILT), and sewer rates.

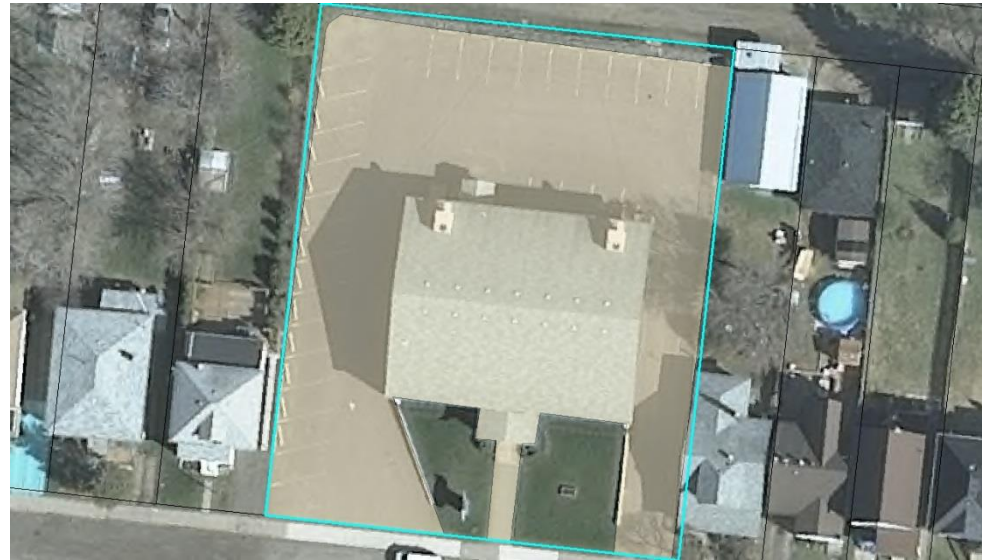


Source of Stormwater

- In general, stormwater generated from impervious (hard surfaces) – roads, roofs, parking lots, etc.
- An indicator of how much stormwater a property generates can be linked to how much impervious area they have.



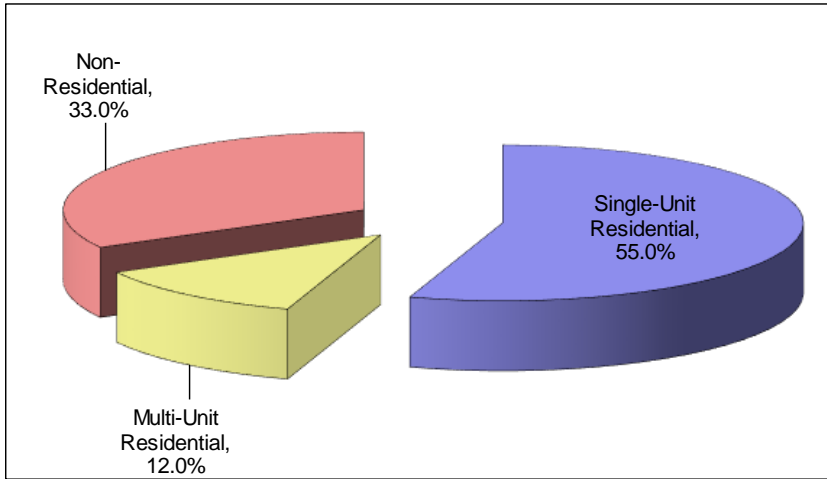
Sample single-family residential property



Sample non-residential property

Findings: Source of Funding (taxes) vs. Source of Stormwater

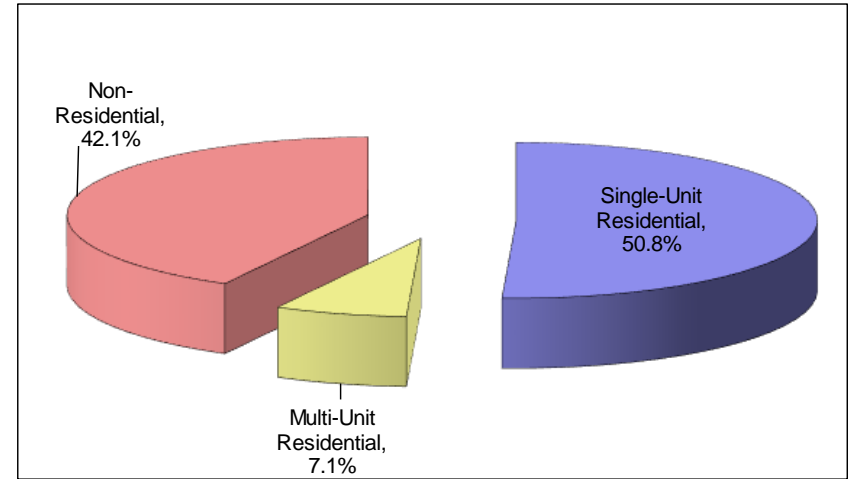
Tax Revenue Distribution



Residential = 67% of Revenue

Non-Residential = 33% of Revenue

Impervious Area Distribution

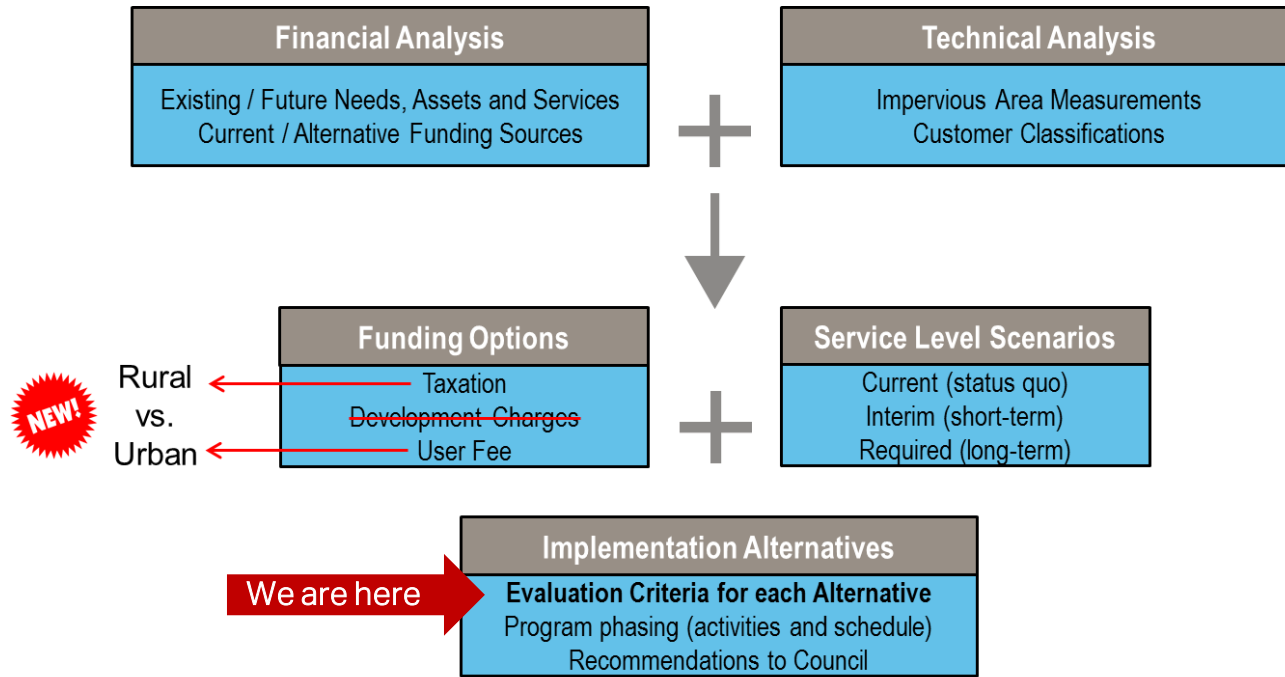


Residential = 58% of Impervious Area

Non-Residential = 42% of Impervious Area

VS

Current Stage



Evaluation Criteria for Alternatives

1. City-Wide Applicability
2. Meets Entire Revenue Needs
3. Fair & Equitable Allocation
4. Dedicated & Long-Term Funding Source
5. Effort to Administrate
6. Public Accountability
7. Environmental Benefits
8. Social Benefits

Discussion



Open Discussion

- Questions & discussion about the above?
- What could this mean for your organization?
- What are the pros and cons for the various funding types for your organization?
- How would you like to stay informed?



Next Steps

- Continue to communicate via the City website
<https://www.thunderbay.ca/en/city-hall/storm-water-management-plan.aspx>
- Upcoming Meetings
 - Public Information Centre No. 2 (February 2019)
 - Additional Stakeholder Meetings
- Present project findings and preliminary staff recommendations to the *NEW* Council in 2019.

Questions?





Property Tax Funding

	Pros	Cons
Tax-Based Funding	<ul style="list-style-type: none">• Already accepted as the primary existing source of revenue for municipalities• Can be used to fund all stormwater management program activities• The billing system is already established	<ul style="list-style-type: none">• Property taxes are based on a property's assessed value, not runoff contribution, so the fairness and equity of this revenue source is low• Not a dedicated* or stable funding source• Annual competition for general tax funds to support other community services• No incentive to adopt source controls to reduce runoff• Tax-exempt properties don't contribute to stormwater program

**Note: A dedicated tax levy for specific stormwater services could be adopted*



Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none">• Dedicated and stable funding source for all stormwater activities (i.e., sustainable)• Fair and equitable fee based on indicator of runoff contribution (assessed to all private and publicly-owned properties in the same manner)• With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge• Mechanism to ensure privately owned stormwater facilities are maintained	<ul style="list-style-type: none">• Additional implementation costs (rate study, database management, billing and customer service*)• Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>

Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
- Flat fee: equal charge to all utility customers (Calgary)
- Tiered flat fee: charges by customer type (London, Aurora, Richmond Hill)
- Variable rate: property owners based on measured impervious area (Kitchener, Mississauga, and Guelph)

Municipality	Fee Type (as of 2016)	Start
Nova Scotia		
Halifax	Variable Rate	2013
Ontario		
London	Tiered Flat Fee	1996
Aurora	Tiered Flat Fee	1998
St. Thomas	Tiered Flat Fee	2000
Kitchener	Variable Rate	2011
Waterloo	Variable Rate	2011
Richmond Hill	Tiered Flat Fee	2013
Markham	Tiered Flat Fee	2015
Mississauga	Variable Rate	2016
Saskatchewan		
Regina	Tiered Flat Fee	2001
Saskatoon	Variable Rate	2012
Alberta		
Calgary	Flat Fee	1994
Edmonton	Variable Rate	2003
St. Albert	Tiered Flat Fee	2003
Strathcona County	Flat Fee	2007
British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016

City of Thunder Bay Stormwater Financing Study



Thunder Bay Catholic District School Board Stakeholder Meeting

Project Manager: Aaron Ward, P.Eng.
Consultant Team: Pippy Warburton P.Eng. and
Mike Gregory, P.Eng.



Meeting Purpose and Objectives

- Introduce the Stormwater Financing Study
 - What is it and why it is needed?
- Discuss stormwater management in Thunder Bay
- Outline community engagement efforts
- Host an open discussion
- Identify next steps



Stormwater Financing Study – What & Why?

What is it?

- How the City currently pays for stormwater, where the funds comes from, and is it fair?
- What is fairest way to generate increased, sustainable funds for stormwater, while balancing what the community can afford and the ease of implementing changes.
- Recommended plan with steps for implementation for preferred strategy.

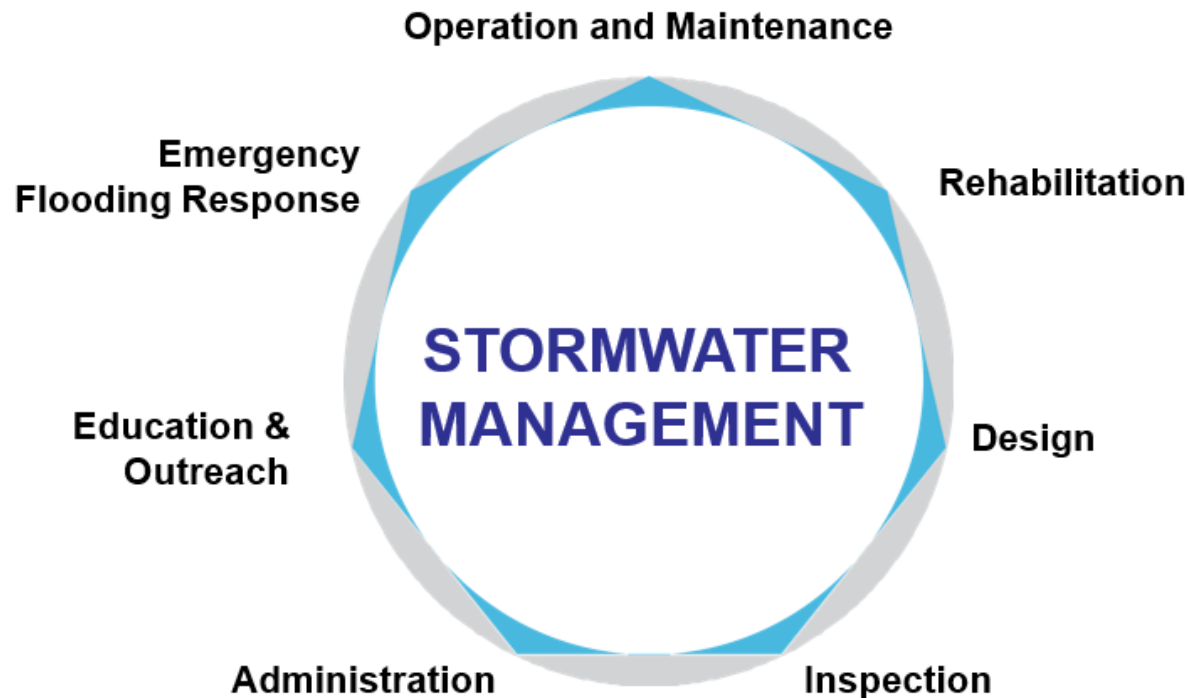
Why are we doing this study?

- 2016 Stormwater Management Plan
- 2016 Asset Management Plan



Stormwater Management in Thunder Bay

- The City is responsible for protecting public health & safety as well as the environment by managing the quality and quantity of stormwater reaching our lakes and rivers.



2016 Stormwater Management Plan

– Adopted by Council in 2016, this plan will guide the City’s stormwater management actions for the next 20 years, based on the following goals:



ECOSYSTEM HEALTH



WATERSHED QUALITY



WATER QUANTITY



OPERATIONS and MAINTENANCE



MONITORING and DATA ASSESSMENT



REGULATION and ENFORCEMENT



EDUCATION and OUTREACH



FUNDING and ORGANIZATION



CLIMATE CHANGE

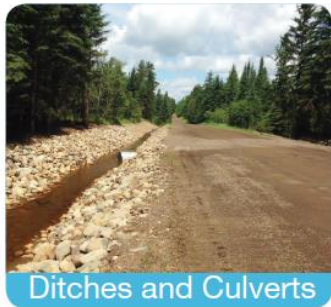


Plan Components	Year 1 (2015 \$)	Year 20 Average Spending (2018 \$)
Studies and Inventories		
Feasibility Studies	\$ -	\$ 240,000
Natural Resources Inventories	\$ -	\$ 90,000
Stormwater Infrastructure Inventories & Data Collection	\$ -	\$ 40,000
Modeling Efforts	\$ -	\$ 30,000
Sub-Total	\$ -	\$ 400,000
Capital Projects		
Sub-Total	\$ 4,048,000	\$ 8,020,000
Operations and Programs		
Administration	\$ -	
Monitoring Program	\$ 113,000	\$ 130,000
Inspection & Maintenance Program	\$ 1,698,000	\$ 2,230,000
Regulations & Enforcement	\$ 53,000	\$ 100,000
Public Education, Outreach, and Rebate Programs	\$ 160,000	\$ 260,000
Sub-Total	\$ 2,024,000	\$ 2,720,000
Lakehead Region Conservation Authority Levy		
Sub-Total	\$ 1,000,000	\$ 1,000,000
TOTAL	\$ 7,072,000	\$ 12,140,000



Stormwater Management Infrastructure

– What is the City’s Stormwater Infrastructure?



330km of sewers, 4,200 manholes, 11,000 catch basins, 486km ditches, 45 treatment facilities, 4 pumping stations

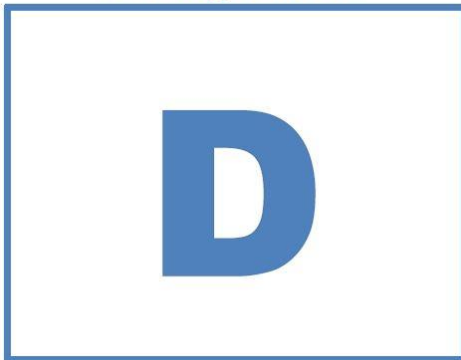
Report Card

- The City’s ability to effectively and adequately perform its duties are limited by available consistent funding.
- Average spending from 2011-2015 was \$2.9 million annually
- Capital funding should amount to \$6.2 million annually



This equates to a **\$3.3 million annual funding gap and grade of D**

Funding vs Need



Note: this does not include all current stormwater assets, such as ditches, culverts, and treatment facilities, nor does it include the construction of new infrastructure and treatment facilities



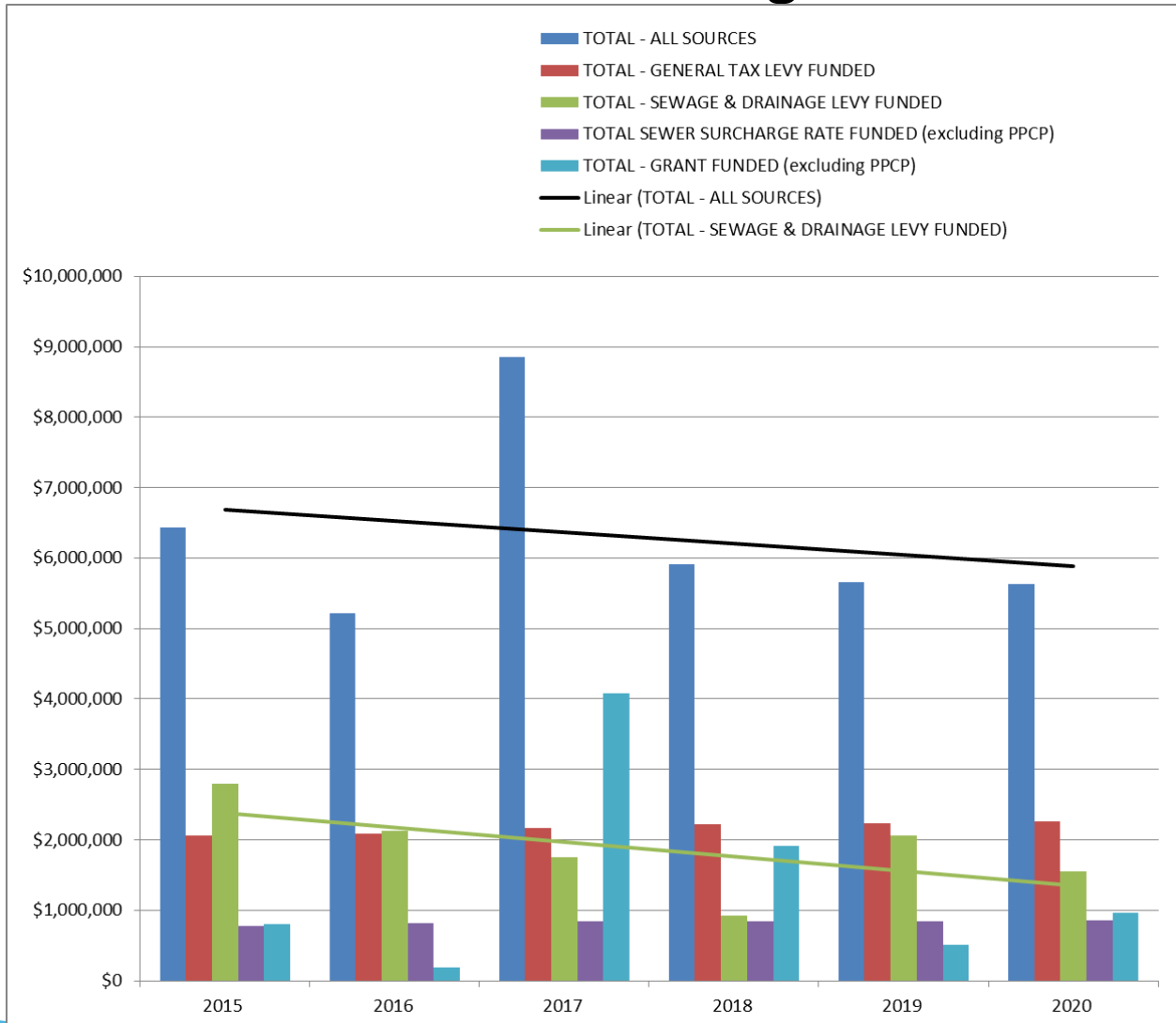
Stormwater Management Asset Value

- How much are the City's stormwater assets worth?
- The overall replacement value exceeds **\$540M dollars**. This is equivalent to over \$11,000 per household.
- As infrastructure ages and could lead to failures, a regular renewal/ replacement plan for the infrastructure will be required.

This is why the City is conducting a Stormwater Financing Study – to review and recommend a sustainable and fair funding source to support stormwater initiatives and future goals.



Current Stormwater Funding



- 2015 - \$6.43M
- 2016 - \$5.22M
- 2017 - \$8.85M
- 2018 - \$5.91M
- 2019 - \$5.66M*
- 2020 - \$5.63M*

* *Current forecasted budget*



Stormwater Financing Study Overview

1. Evaluate current expenditures & funding sources
2. Determine the appropriate and affordable level of service for future stormwater program projects and activities
3. Identify and evaluate funding options and alternatives
4. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
5. Recommend a preferred option and determine the impacts compared to current funding sources
6. Present project findings and study recommendations to Council in early 2019.

On-Going Community Engagement

- Public Information Centre #1 was on Tuesday, January 23, 2018
 - 56 participants; 131 comment forms: 108 online and 23 in-person
- Councillor Ward Meetings
 - Attended 5 Neighbourhood Ward meetings after first PIC; approximately 90 people in attendance
- Stormwater Advisory Committee Meetings (x3)
- Stakeholder Engagement – One-on-One Meetings
- Public Information Centre #2 – planned for February 2019



Study Highlights

- Range of funding options being investigated
 - Do nothing (no change to current funding sources)
 - Changes to property tax funding
 - Changes to development charges (for new development)
 - New user-fee funded program
- Led by City Internal Steering Committee
- Advised by Stormwater Advisory Committee as well as the general public and interested stakeholders
- Direction from (and decisions will be made by) City Council



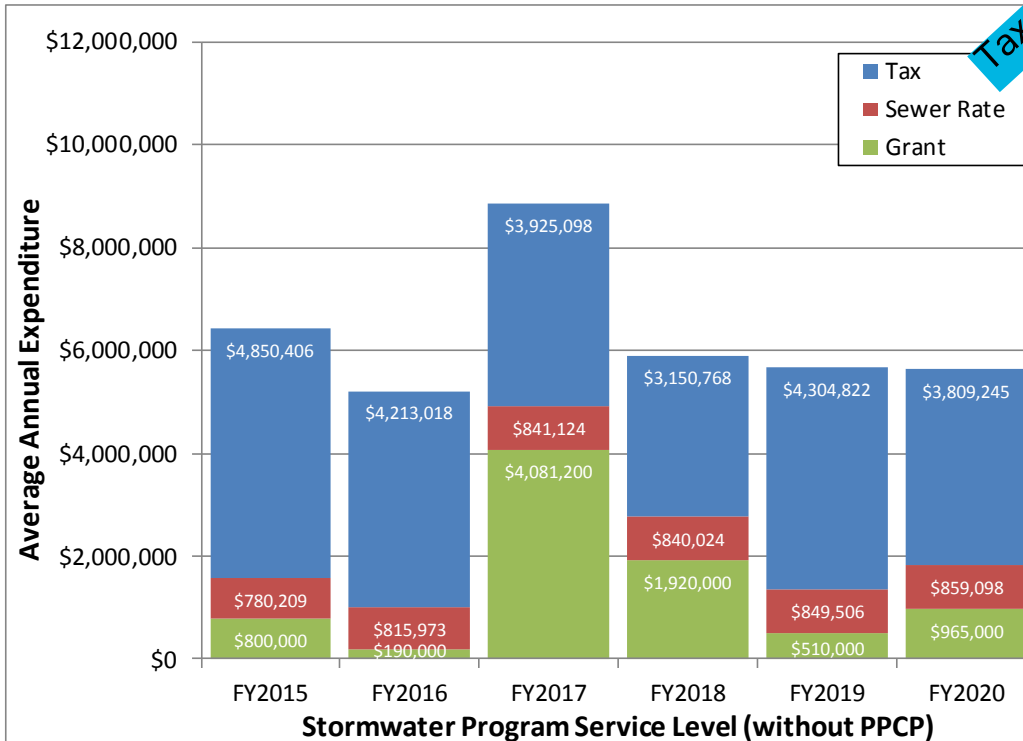
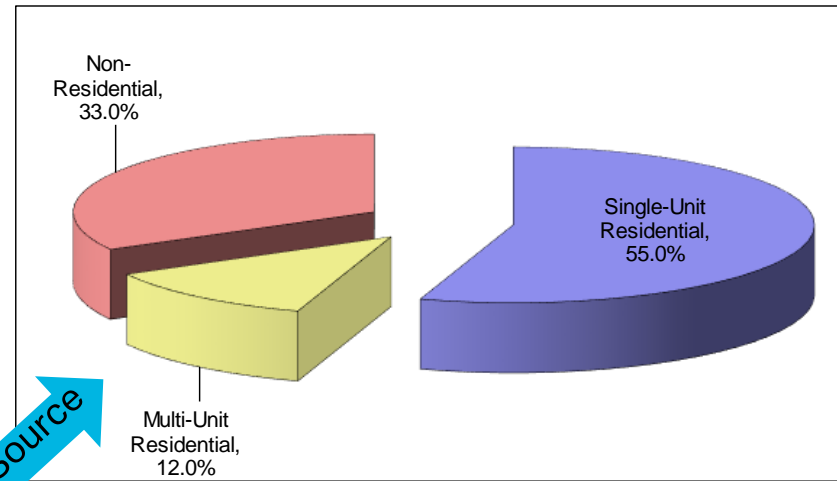
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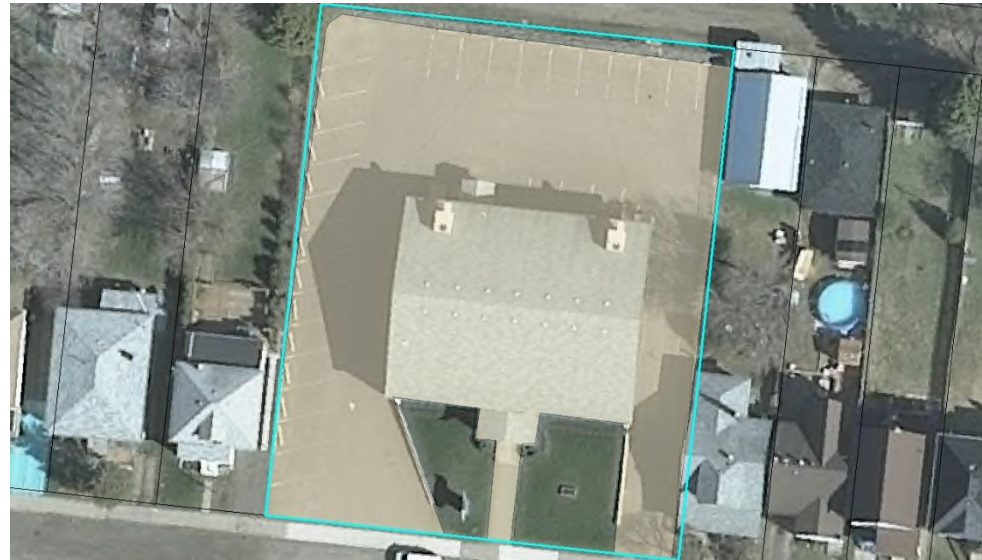


Source of Stormwater

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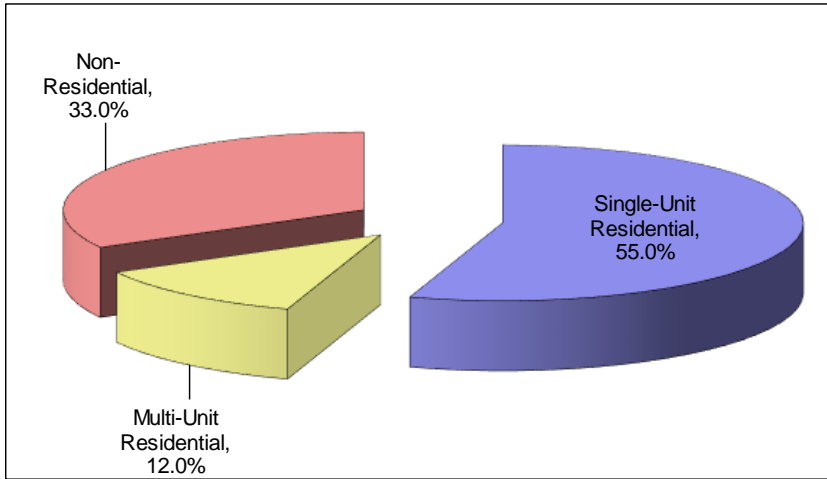
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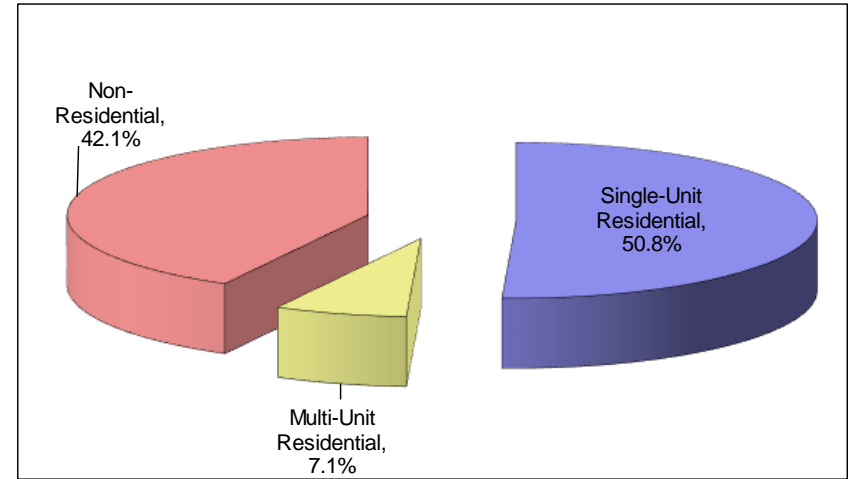
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Residential = 67% of Revenue

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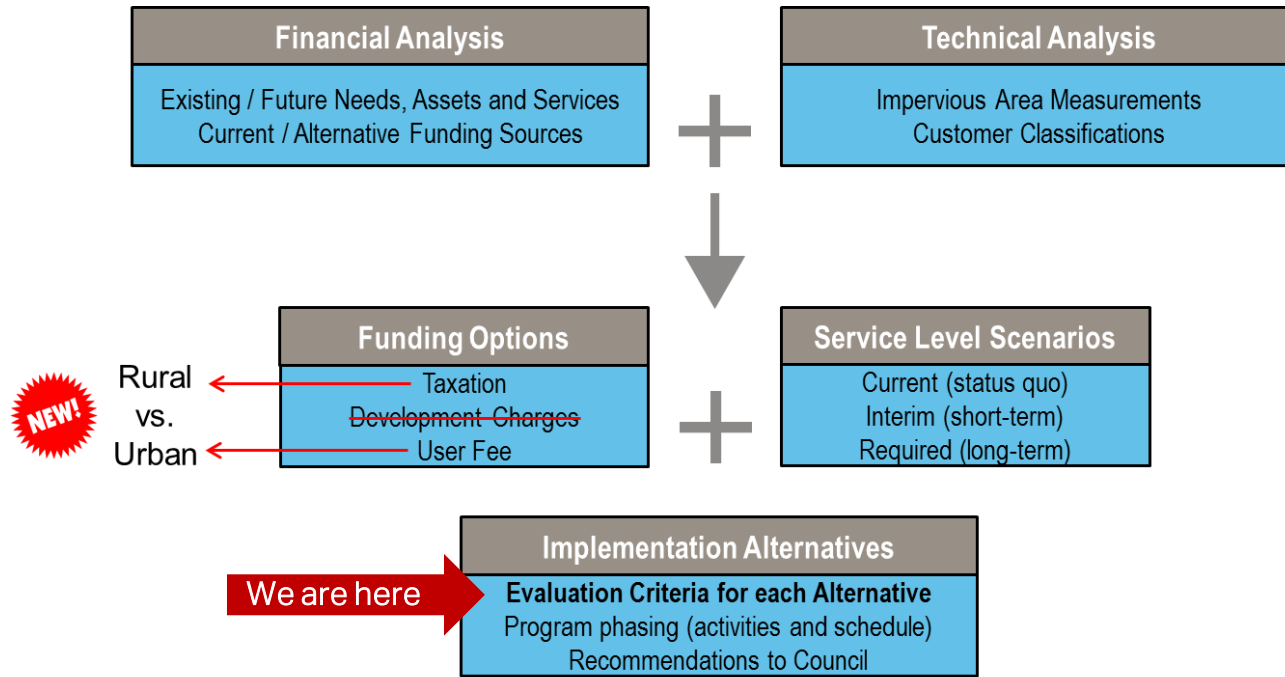


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VS

Current Stage



Evaluation Criteria for Alternatives

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Open Discussion

- Questions & discussion about the above?
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Next Steps

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Questions?





Property Tax Funding

	Pros	Cons
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**Note: A dedicated tax levy for specific stormwater services could be adopted*



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Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
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British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016

Appendix J

Ward Meeting Presentation

City of Thunder Bay Stormwater Financing Study



Ward Meeting Presentation
February 2018

Project Manager (City): Aaron Ward, P. Eng.

Consultant Team (AECOM):

Pippy Warburton, P. Eng., Mike Gregory, P. Eng.

Stormwater Financing Study – What & Why?

What is it?

- How the City currently pays for stormwater, where the funds comes from, and is it fair?
- What is fairest way to generate increased, sustainable funds for stormwater, while balancing what the community can afford and the ease of implementing changes.
- Recommended plan with steps for implementation for preferred strategy.

Why are we doing this study?

- 2016 Stormwater Management Plan
- 2016 Asset Management Plan

2016 Stormwater Management Plan

– Adopted by Council in 2016, this plan will guide the City’s stormwater management actions for the next 20 years, based on the following goals:



ECOSYSTEM HEALTH



WATERSHED QUALITY



WATER QUANTITY



OPERATIONS and MAINTENANCE



MONITORING and DATA ASSESSMENT



REGULATION and ENFORCEMENT



EDUCATION and OUTREACH



FUNDING and ORGANIZATION



CLIMATE CHANGE



Plan Components	Year 1	Year 20 Average Spending
Studies and Inventories		
Feasibility Studies	\$ -	\$ 227,400
Natural Resources Inventories	\$ 46,000	\$ 129,600
Stormwater Infrastructure Inventories & Data Collection	\$ -	\$ 30,600
Modeling Efforts	\$ 100,000	\$ 123,000
Sub-Total	\$ 146,000	\$ 510,600
Capital Projects		
Sub-Total	\$ 4,341,000	\$ 8,022,800
Operations and Programs		
Administration	\$ -	<i>To be determined</i>
Monitoring Program	\$ 113,000	\$ 119,450
Inspection & Maintenance Program	\$ 2,261,000	\$ 2,707,800
Regulations & Enforcement	\$ 53,000	\$ 88,200
Public Education, Outreach, and Rebate Programs	\$ 181,000	\$ 266,600
Sub-Total	\$ 2,608,000	\$ 3,182,050
Lakehead Region Conservation Authority Levy		
Sub-Total	\$ 1,400,000	\$ 1,400,000
TOTAL	\$ 8,495,000	\$ 13,115,450



Stormwater Management Asset Inventory

– What are Thunder Bay’s stormwater assets?



Storm sewers



Catchbasins



Inlets and outlets



Oil-grit separators



Bridges



Ditches and Culverts



Watercourse



Stormwater treatment facilities, including Green Infrastructure

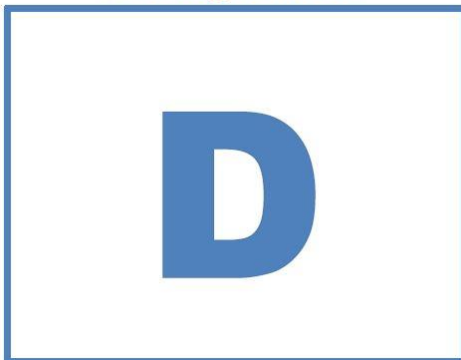
330km of sewers, 4,200 manholes, 11,000 catch basins, 486km ditches, 45 treatment facilities, 4 pumping station

Report Card

- From the 2016 Asset Management Plan...
 - Average spending from 2011-2015 was \$2.9 million annually
 - Capital funding should amount to \$6.2 million annually

This equates to a **\$3.3 million annual funding gap and grade of D.**

Funding vs Need



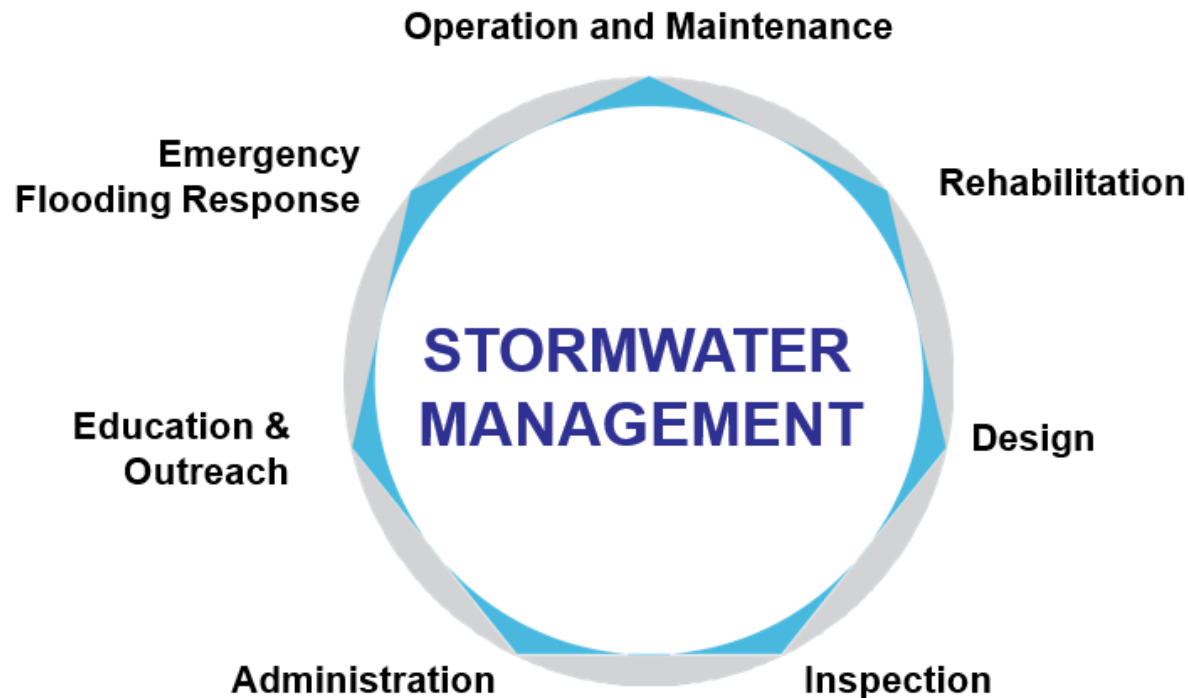
Note: Does not include:

- all current assets, such as ditches, culverts, and treatment facilities
- the construction of new, or larger, infrastructure and treatment facilities



What is Thunder Bay Currently Doing?

- The City is responsible for protecting public health & safety as well as the environment by managing the quality and quantity of stormwater reaching our lakes and rivers



Capital Projects



Operations and Maintenance



Repair



Street Sweeping



*Ditch
Cleaning*



Catch Basin Cleaning



Floodway Dredging

Residential Drainage Rebate Program

Protect your house from flooding!



Drainage Measure Rebate

Sump Pump	50% of the invoiced cost up to a maximum of \$1,250.00 including labour, materials, permit and taxes
Backflow Prevention Valve	50% of the invoiced cost up to a maximum of \$1,750.00 including labour, materials, permit and taxes
Disconnect Weeping Tile	100% up to a maximum of \$500.00 including labour, materials, permit and taxes

Drainage Rebate Program

The City of Thunder Bay is offering financial assistance for homeowners to take flood prevention measures including sump pumps, backflow prevention valves and weeping tile disconnections. The rebate program continues to be available to property owners who wish to protect their homes from future extreme weather events.

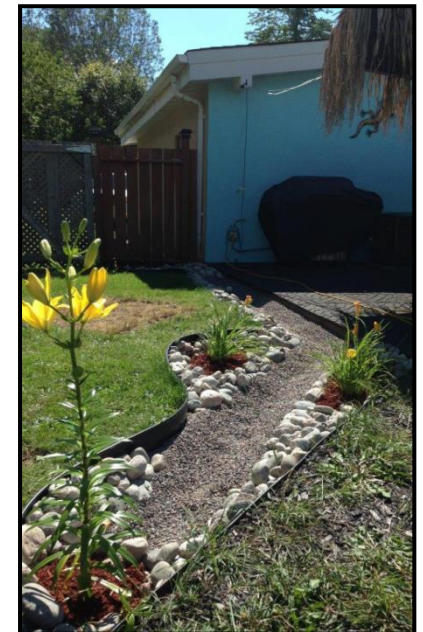
Assistance & Rebate Programs



Understanding and Improving Your Residential Drainage



- Residential Drainage Program
- Rain Garden Rebate
- Rain Barrel Rebate
- Residential Drainage Guide





Stormwater Financing Study Overview

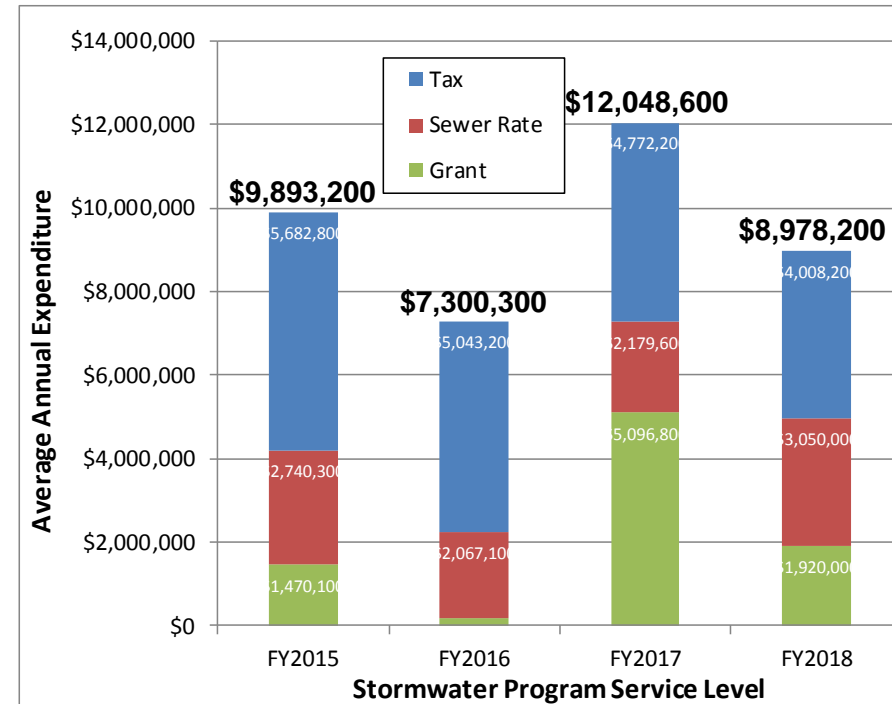
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4. Solicit feedback from a Stormwater Advisory Committee as well as residents and business owners
5. Recommend a preferred option and determine the impacts / differences compared to current funding sources
6. Present project findings and study recommendations to Council later this year

Current Stormwater Program Expenditures

– Annual stormwater program costs (FY2018 budget): **\$9.0M**

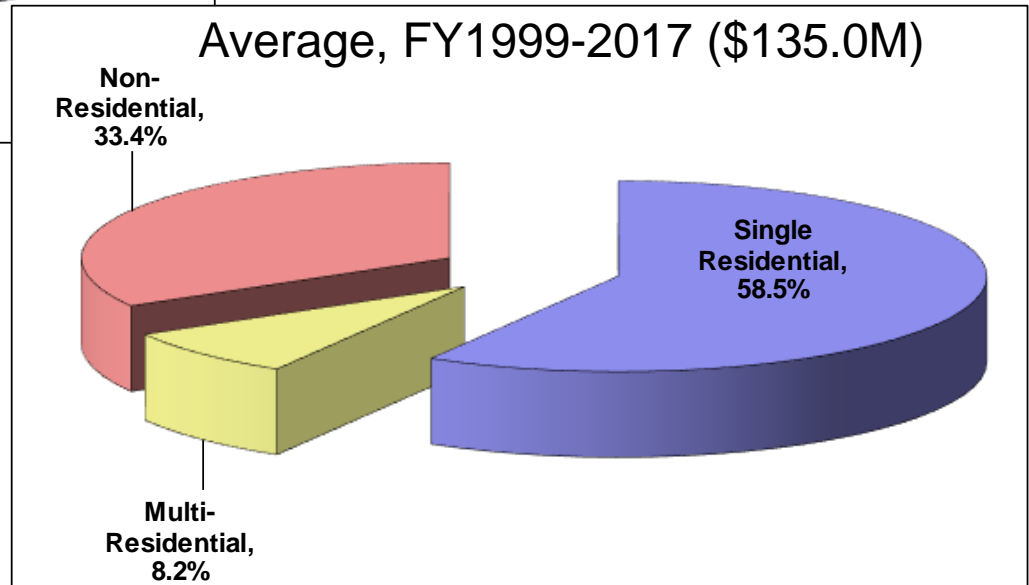
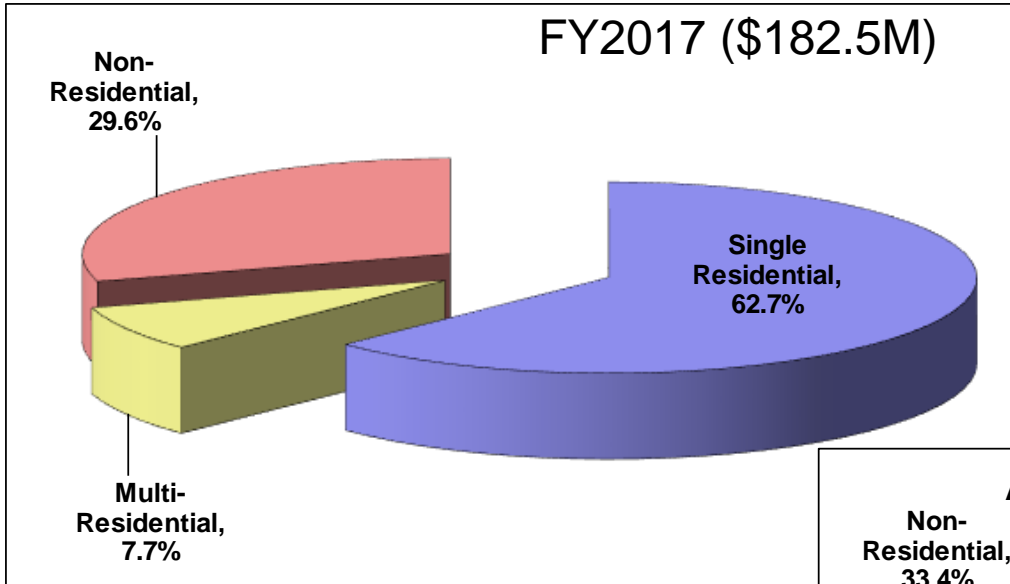
- Tax funded portion: \$4.0M
- Rate funded portion: \$3.1M
- Grant funded portion: \$1.9M

Stormwater Management Program Item	Current Funding Source	Annual Expenditure	
		Tax Funded	All Sources
Operations & Maintenance			
Street Cleaning	Tax	\$762,300	\$762,300
Drainage & Flood Control	Tax	\$685,900	\$685,900
Catchbasins	Sewer Rate	\$0	\$443,300
Pump Stations	Sewer Rate	\$0	\$36,100
Storm Sewers	Sewer Rate	\$0	\$360,600
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,448,200	\$2,288,200
Capital Improvements			
Storm Sewer Separation	Sewer Rate + Grant	\$0	\$2,210,000
Stormwater Mgmt. Projects	Tax + Grant	\$1,060,000	\$2,980,000
Culvert Replacement	Tax	\$100,000	\$100,000
2016 SMP (20-year average)	n/a	n/a	n/a
Subtotal		\$1,160,000	\$5,290,000
Other			
Lakehead Region CA Levy	Tax	\$1,400,000	\$1,400,000
Indirect Overhead	Tax	??	??
Subtotal		\$1,400,000	\$1,400,000
TOTAL		\$4,008,200	\$8,978,200





Tax Levy Distribution





Property Tax Funding

	Pros	Cons
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**Note: A dedicated tax levy for specific stormwater services could be adopted*



Development Charges

- Ontario Development Charges (DC) Act of 1997 authorizes municipalities to pass by-laws to recover costs incurred related to new and re-development projects
- Only used to fund eligible growth-related capital costs, and only for the services for which they were collected
- Often based on the number of residential dwelling units or the building floor area for non-residential developments
- City has enacted a DC by-law, but it has not been implemented yet



Stormwater User Fee (Utility)

- Progression of public utilities once funded from general tax support and then shifted to enterprise fund
 - Water – Volume used
 - Wastewater – Volume generated
 - Solid Waste – Quantity generated
 - Stormwater – Runoff contribution
- Variable rate with charge based on total impervious area (hard surfaces):
 - Rooftops
 - Driveways
 - Parking areas
 - Patios
 - Sidewalks



Stormwater User Fee (continued)

- Typical range in Ontario is \$4-15 per month for average homeowner
- Wide variety in service levels and portion of program that is rate financed
- Flat fee: equal charge to all utility customers (Calgary)
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Halifax	Variable Rate	2013
Ontario		
London	Tiered Flat Fee	1996
Aurora	Tiered Flat Fee	1998
St. Thomas	Tiered Flat Fee	2000
Kitchener	Variable Rate	2011
Waterloo	Variable Rate	2011
Richmond Hill	Tiered Flat Fee	2013
Markham	Tiered Flat Fee	2015
Mississauga	Variable Rate	2016
Saskatchewan		
Regina	Tiered Flat Fee	2001
Saskatoon	Variable Rate	2012
Alberta		
Calgary	Flat Fee	1994
Edmonton	Variable Rate	2003
St. Albert	Tiered Flat Fee	2003
Strathcona County	Flat Fee	2007
British Columbia		
Pitt Meadows	Tiered Flat Fee	2009
Richmond	Tiered Flat Fee	n/a
West Vancouver	Tiered Flat Fee	n/a
Surrey	Tiered Flat Fee/ Parcel Tax	n/a
White Rock	Tiered Flat Fee/ Parcel Tax	n/a
Langley Township	Parcel Tax	n/a
Victoria	Variable Rate	2016

Stormwater User Fee Funding

	Pros	Cons
User-Fee Funding (e.g., Stormwater Rate based on impervious area)	<ul style="list-style-type: none"> • Dedicated and stable funding source for all stormwater activities (i.e., sustainable) • Fair and equitable fee based on indicator of runoff contribution (assessed to all private and publicly-owned properties in the same manner) • With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge • Mechanism to ensure privately owned stormwater facilities are maintained 	<ul style="list-style-type: none"> • Additional implementation costs (rate study, database management, billing and customer service*) • Possibility that a new fee may not be well received by the public <p>*Note: Potential to administer stormwater rate through other existing billing systems (e.g., hydro, water/ sewer, etc.).</p>



Evaluation Criteria for Preferred Option



Applicability of funding method citywide



Eligibility to support capital improvement projects, operations & maintenance activities



Eligibility to offset costs for engineering, support, and overall administration of the stormwater program



Fair and equitable charges to the property owners



Long-term funding source dedicated solely to stormwater program expenditures



Level of effort to administrate and staffing/resource requirements



Environmental benefits including opportunities for rebates and incentives to reduce stormwater and pollutant loads

Next Steps

- Collect input on the key questions and factor all ideas into the evaluation of the different funding options
- Continue parcel analysis (impervious area measurements)
- Continue to communicate via the City website www.thunderbay.ca/stormwaterplan
- Upcoming Meetings (dates to be determined)
 - Stormwater Advisory Committee Meeting 2 and 3
 - Public Information Centre No. 2
 - Ward Meetings
 - Council Presentation(s)
 - Additional as required

Questions?



Appendix K

Memo to Council

Memorandum

TO: Mayor and Members of Council

FROM: Aaron Ward, Project Engineer – Infrastructure & Operations

DATE: May 21, 2019

SUBJECT: Stormwater Financing Study

This memorandum is to update Council on the Stormwater Financing Study that commenced in the fall of 2017.

Background

In June 2016, Council approved in principle the Stormwater Management Plan for Sustainable Surface Water Management (the “Stormwater Plan”), and directed Administration to report back on a financing strategy to support the successful implementation of the Stormwater Plan.

In the fall of 2017, the City retained the services of AECOM to assist and complete a Stormwater Financing Study (the “Financing Study”), including reviewing how the City currently collects revenue for stormwater, what are other options to collect revenue for stormwater, what are sustainable stormwater service and funding levels, and to develop steps for implementing the preferred strategy.

A presentation to Council was held on January 22, 2018, and a Public Information Centre was held on January 23, 2018 to introduce the Financing Study.

Administrative Update

Based on the Financing Study findings to date, the City’s current expenditures on stormwater management (\$5.63M in 2019), and due to changes in asset management legislation, no changes are recommended at this time in stormwater financing.

Throughout the Financing Study, the project team received feedback from a number of forums, including the Public Information Centre, online and in-person surveys, from attending Ward meetings, meeting directly with major employers, and through a Stormwater Advisory Committee, which was made up of members of the public, business sector, and other agencies.

The Financing Study recommends that a stormwater user fee, or utility, be considered in the future once investment in stormwater increases to a level to make it cost effective. A stormwater user fee is becoming much more common throughout Ontario and Canada, and there are many benefits to a user fee, such as incentive and rebate programs for private properties which help encourage responsible stormwater management behaviours. However, a user fee is not recommended to be created at this time

as there is not a business case to implement it due to the high initial (one-time) costs and the increased on-going costs to administer the user fee. Further assessment on the impacts to currently tax-exempt properties, and properties that may be exempt from a user fee, is also required.

On January 1, 2018 Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure (the “Regulation”) came into effect under the Infrastructure for Jobs and Prosperity Act, 2017. This Regulation requires municipalities to identify all infrastructure assets, and to develop levels of service and a ten-year financing strategy for the long-term sustainability of all assets by July 1, 2024. This will consider the City’s ability to afford proposed levels of service and will include a detailed and thorough community consultation plan to seek input on the overall asset management program, including stormwater assets.

With the timeframes and scope of this Regulation, moving ahead with implementing changes to stormwater financing in isolation is not recommended given that these changes may be short-term and may not align with the future holistic plan that includes all infrastructure assets.

All of the information gathered in the Financing Study will inform the stormwater financing strategy to meet the Regulation and will also aid in the assessment, and development of financing strategies for other components of the City’s infrastructure.

In the interim, the City will continue to pursue additional funding for stormwater capital infrastructure to reduce the infrastructure gap – capital expenditures were identified as the largest portion of the infrastructure gap in both the Stormwater Plan and Financing Study. A current example is City’s application for the Community Flood Mitigation Project under the Disaster Mitigation and Adaptation Fund, which, if successful, will provide up to 40% funding towards \$13 million (gross) total in new stormwater capital expenditures for the next 9-years (up to the 2027 – 2028 fiscal year).

Yours Truly,



Aaron Ward, P. Eng.
Project Engineer
Infrastructure & Operations Department

AW
Encl.

Attachment 1 – Report R16/2019 – Strategic Asset Management Policy

cc: John S. Hannam – City Clerk
Norm Gale – City Manager
Kerri Marshall – General Manager – Infrastructure & Operations
Kayla Dixon – Director – Engineering & Operations
Mark Smith – General Manager – Developer & Emergency Services

DEPARTMENT/ DIVISION	Infrastructure & Operations	REPORT NO.	R 16/2019
DATE PREPARED	16/01/2019	FILE NO.	
MEETING DATE	04/02/2019 (mm/dd/yyyy)		
SUBJECT	Strategic Asset Management Policy		

RECOMMENDATION

With respect to Report No. R16/2019 (Infrastructure and Operations), we recommend that the Strategic Asset Management Policy as appended to this Report be adopted;

AND THAT any necessary By-laws be presented to City Council for ratification.

LINK TO STRATEGIC PLAN

This report directly supports Goal #18 under the Governance pillar of the Corporate Strategic Plan: “Sustainable through enhanced infrastructure renewal.” The City of Thunder Bay aims to better direct infrastructure investments in a way that is socially, environmentally and economically sustainable in the long-term.

This report also supports Strategic Action 8.1 under the Environment pillar: “Plan for climate resilient infrastructure and services”.

EXECUTIVE SUMMARY

The purpose of this report is to seek approval of the new Strategy Asset Management Policy in compliance with Ontario Regulation 588/17. This Policy will provide leadership in and commitment to the development and implementation of the City’s asset management program. It is intended to guide the consistent use of asset management across the organization, to facilitate logical and evidence-based decision-making for the management of municipal infrastructure assets and to support the delivery of sustainable services now and in the future. This policy demonstrates an organization-wide commitment to the good stewardship of municipal infrastructure assets, and to improved accountability and transparency to the community through the adoption of best practices in asset management.

DISCUSSION

On January 1, 2018 Ontario Regulation 588/17 Asset Management Planning For Municipal Infrastructure came into effect under the Infrastructure for Jobs and Prosperity Act, 2015. The first requirement under this new regulation is to develop a Strategic Asset Management Policy by July 1, 2019. Grant funding was secured through the Federation of Canadian Municipalities (FCM) Climate and Asset Management Network to take the first steps in the multi-year process of developing an asset management program to meet the regulation.

The draft policy has been developed in collaboration with municipalities across Canada. Thunder Bay is one of 19 municipalities participating in the FCM Climate and Asset Management Network with a goal to manage the City's assets more efficiently and sustainably. Policy development has been a key focus of this network and is one of the key deliverables under our funding agreement with FCM. Further, an internal working group was created to help further guide the development of the proposed Strategic Asset Management Policy for Thunder Bay. Representatives from across the Corporation with lead roles in asset management guided this work.

The proposed Strategic Asset Management Policy communicates the City's commitment to developing and implementing a corporate wide asset management program in compliance with Ontario Regulation 588/17. The development and approval of this policy is the first step to achieve compliance. Following the adoption of this policy, work will continue to be carried out in three phases as identified below:

- Phase I would address core infrastructure assets (roads, bridges, water, wastewater and storm management systems) and require completion by July 1, 2021.
- Phase II would expand on Phase I by including all infrastructure assets by July 1, 2023.
- Phase III would require refinement of all asset data, levels of service and the development of a ten year financing strategy for the long term sustainability of the Plan by July 1, 2024. This will consider the City's ability to afford proposed levels of service.

Community consultation is important in the development of the program. A detailed consultation approach will be developed upon approval of this policy to help engage the community in this process, to inform levels of service, and in the development of the overall asset management program.

The approval of this policy is an important step towards aligning and integrating the City's strategic mission, vision and goals with its asset management program, and ensuring that critical municipal infrastructure assets and vital services are maintained and provided to the community in a consistent, reliable and sustainable manner.

LINK TO EARTHCARE SUSTAINABILITY PLAN

This report supports Goal #4 of the Climate Adaptation Strategy to “consider climate change impacts in the design, construction and maintenance of physical infrastructure while considering affordability and co-benefits”.

FINANCIAL IMPLICATION

There are no direct financial implications associated with this Report. However, there may be financial implications that arise from the implementation of the Asset Management Program. There is also a risk that if the policy is not approved by February 2019, we may not be eligible to claim FCM funding for the project.

CONCLUSION

It is concluded that City Council should approve and adopt the appended Strategic Asset Management Policy.

BACKGROUND

Corporate Report R180/2017 (Corporate Services & Long Term Care – Financial Services) outlined the proposed requirements for municipalities through Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure under The Infrastructure for Jobs and Prosperity Act, 2015.

On November 6, 2017 Council passed a resolution with Report R 139/2017 (Infrastructure & Operations) to approve the receipt and expenditure of funding through the FCM through Phase I of the Climate and Asset Management Network.

On June 5, 2017 Council passed a resolution recommending that the City of Thunder Bay participate in FCM’s Climate and Asset Management Network to develop an asset management policy, strategy and governance framework to align with the City’s Climate Adaptation Strategy and other social, economic and environmental sustainability goals.

Version 3 of the City’s Asset Management Plan was published in January 2017 with Report 3/2017 (Corporate Services & Long Term Care – Financial Services) and included all asset categories.

REFERENCE MATERIAL ATTACHED:

Attachment A – Draft Strategic Asset Management Policy

Attachment B – Ontario Regulation 588/17, Asset Management Planning For Municipal Infrastructure

Attachment C – Section 3: Infrastructure Planning Principles from the Infrastructure for Jobs and Prosperity Act, 2015.

PREPARED BY: AMY COOMES, SUSTAINABILITY COORDINATOR

THIS REPORT SIGNED AND VERIFIED BY: (NAME OF GENERAL MANAGER) Kerri Marshall, General Manager – Infrastructure & Operations	DATE: January 28, 2019
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