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City of Prince George

Integrated Stormwater Management Plan

Technical Working Paper # 4 – Financing Options

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Date: July, 2021

Project #: 60628231

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AECOM: 2015-04-13

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Executive Summary

AECOM has been contracted by the City of Prince George to develop an Integrated Stormwater Management Plan (ISMP) so the City can fully understand and work towards sustainable service delivery of stormwater management. One of the major tasks of this assignment was to review the previously proposed stormwater utility funding model and provide recommendations for the best options for sustainable funding. A summary of this review and recommendations for sustainable stormwater funding is provided in this Technical Working Paper (TWP#4). More specifically this TWP describes the City's current stormwater funding model and needs; the previous stormwater financing work completed by the City; additional work or changes that have occurred since the previous stormwater funding study; municipal stormwater funding options available to the City; a comparison of stormwater financing models used by other, similar, municipalities in B.C. and across Canada; and conclusions and recommendations for next steps.

City's Current Stormwater Funding Model
The City currently funds its stormwater program through property taxes (general levy), debt, reserves and grant funding when available. Two of the City's dedicated tax levies, Road Rehabilitation and General Infrastructure Reinvestment Fund (GIRF), may help fund stormwater capital projects but neither levy is dedicated to stormwater projects.

Since the City does not have a dedicated stormwater funding source, preventative maintenance and capital improvement projects are often delayed until infrastructure fails, typically during storm events. Letting infrastructure run to failure can be an acceptable strategy for some low-risk assets but for most assets it can cause physical, environmental, and reputational damage, and typically leads to costly repairs. Having the funds to implement a predictive and preventative maintenance program allows for a more cost-effective approach to repairs and can also help extend the life cycle of the City's assets, reducing their overall life-cycle costs.

City's Stormwater Funding Needs
Over the last 5 years (2016-2020) the City has spent, on average, $4.4 million per year on stormwater management, which included the replacement of deteriorated assets at the end of their service life, maintenance activities such as inspecting culverts and providing new infrastructure to service development when it was not 100% funded through Development Cost Charges (DCC's). In 2021, the City has budgeted to spend $5.6 million on stormwater management. As part of this assignment, we developed a high-level estimate of what the City should be spending annually to achieve sustainable service delivery of stormwater management. We have estimated the City should be spending approximately $9.1 million annually to maintain, renew and upgrade its stormwater system. This is equivalent to approximately $9 per metre of system which is slightly less than the median of current expenditures amongst Canadian municipalities involved in the National Water and Wastewater Benchmarking Initiative.

Previous Stormwater Funding Study
In 2013, AECOM completed a study for a stormwater utility for the City of Prince George, which included public consultation. AECOM, with City staff support, completed a stormwater rate analysis and completed extensive public consultation. Public feedback was mixed, depending on the amount of knowledge they had about the City's stormwater system and funding needs. Most residents thought that the existing stormwater management program was sufficient and had no knowledge of additional stormwater funding needs.

In November 2013, City staff proposed a stormwater rate (based on a tiered Single-Family Unit (SFU) model with an option for credits for non-residential properties) to the Finance and Audit Committee and recommended draft bylaw approval. The proposed bylaw was not approved by the Committee and the Committee decided not to pursue a stormwater utility further.

A future attempt to implement a stormwater rate may be more successful if Council and the public were better informed of stormwater funding needs. Recent problems such as the Winnipeg Street storm sewer failure and resulting sinkhole may help in this regard.

Stormwater Funding Options

As part of this study stormwater funding options were reviewed that would allow the City to increase the stormwater funding level from current levels. Common municipal funding models that could be used to finance the City's entire stormwater program (i.e. capital and operating) include: General Tax Levy (property taxes), Dedicated Stormwater Tax Levy (if it was applied to capital and operating), Stormwater Rate/User Fee, and Water/Wastewater Rate Surcharge. These funding models would be complimented by other funding sources such as development charges and grants from senior levels of government.

Conclusions & Recommendations

From the previous stormwater funding work and more recent public consultation work for general municipal budgeting, it appears that historically stormwater management has not been the most pressing issue for residents of of Prince George. This may make it difficult for the City to engage residents about the need for a new stormwater funding model and will also make it difficult for stormwater managers to obtain sufficient funding from the general and existing dedicated tax levies when Council is being pressed by residents for other infrastructure such as recreational facilities and better sidewalks.

However, due to the on-going lack of stormwater funding and the associated risks (e.g. collapsing culverts), it is recommended that the City pursue additional stormwater funding. In order to be successful, it is recommended that the City do the following:

- Explore simpler stormwater funding models than the tiered SFU model proposed in 2013, to reflect the desires of residents and City Finance staff; and
- Educate staff, public officials and the public on the need for improved stormwater management. Use real examples such as the recent collapsed culverts to demonstrate the need for increased stormwater funding. Use financial information (e.g. the cost of emergency repairs vs planned maintenance) to demonstrate the financial benefits of maintaining the system in a planned rather than a reactive manner.

Given current challenges with reduced municipal revenues due to COVID-19 and competing priorities for funding from the General Tax Levy, City staff may want to consider a phased approach to stormwater funding. In the short-term, City staff may want to pursue additional stormwater funding through existing mechanisms (i.e. GIRF). If City staff are successful in consistently achieving sustainable stormwater funding levels through the general tax levy and the GIRF, then the City could continue funding stormwater through these mechanisms. However, if the City cannot achieve long-term sustainable stormwater funding levels through the general tax levy and the GIRF, then we recommend that the City consider the following two funding models:

- A dedicated stormwater tax levy (example: Delta); and
- An Equivalent Residential Unit (ERU) based variable stormwater rate (example: Guelph) which is similar to but simpler than the previously proposed tiered SFU model proposed in 2013.

If the City chooses to gradually increase stormwater funding to sustainable levels, then we recommend they use a risk-based approach to identify the highest priority needs. The risk analysis completed as part of TWP #2 and the project prioritization framework completed as part of TWP #1, will help in this regard. In general, the following key elements are important for developing a cost-effective stormwater program:

- Strong bylaws that prevent contamination of the stormwater system, ensures that polluters pay for any required clean-up, and ensures that developers pay their fair share for new infrastructure;
- Strong Design Guidelines to ensure that new infrastructure is effective and has an acceptable life-cycle cost; and
- A strong maintenance program that allows the City to prevent costly infrastructure failures, extend the life of its assets and prioritize infrastructure spending.

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1. Introduction

AECOM has been contracted by the City of Prince George to develop an Integrated Stormwater Management Plan (ISMP) so that the City can fully understand and work towards sustainable service delivery of stormwater management. One of the major tasks of this assignment is to review the previously proposed stormwater utility funding model and provide recommendations for the best options for sustainable funding. A summary of this review and recommendations for sustainable stormwater funding is provided in this Technical Working Paper (TWP#4). More specifically this Technical Working Paper #4 describes:

- The City's current stormwater funding model;
- The previous stormwater financing work completed by the City;
- Additional work or changes that have occurred since the previous stormwater funding study;
- Municipal stormwater funding options available to the City;
- A comparison of stormwater financing models used by other, similar, municipalities in B.C. and across Canada; and
- Conclusions and recommendations for next steps.

1.1 Prince George Current Stormwater Funding Model

The City currently funds its stormwater program, both operating and capital, primarily through property taxes (tax levy), which are based on assessed property value. In addition to the general tax levy, the City has several dedicated tax levies. Two of the levies, the Road Rehabilitation and General Infrastructure Reinvestment Fund (GIRF), may help fund capital projects that are related to stormwater management but neither levy is dedicated to stormwater projects. Stormwater capital projects may also be partially funded through other sources such as development cost charges (when related to new development), gaming revenue/reserves and grants (when available). The City does have a storm drainage reserve fund for funding capital projects related to stormwater; however, this fund has very little balance and no ongoing source of funds.

The main challenge with the City's stormwater funding model is that preventative maintenance and improvement projects are often delayed until infrastructure fails, often during storm events. Letting infrastructure run to failure can be a good strategy for low-risk assets but for other assets it can cause physical, environmental and reputational damage and typically leads to costly repairs. Having the funds to implement a predictive and preventative maintenance program allows for a more cost-effective approach to repairs and can also help extend the life cycle of the City's assets, reducing their overall life-cycle costs.

1.2 Prince George Current Stormwater Funding

Over the last 5 years (2016-2020) the City has spent, on average, $4.4M per year on its stormwater system. This year (2021) the City has budgeted to spend $5.6M on its stormwater system. The breakdown of stormwater spending or budget from 2016 to 2021 is shown in Table 1 where stormwater spending is broken into the following four categories:

- Renewal - replacement or significant rehabilitation of existing infrastructure (i.e. at the end of its service life).
- Upgrades – making improvements to the existing system, such as through the addition of water quality treatment (e.g. ponds).
- New (not DCC funded) – new infrastructure that typically expands the system to service new areas. The amounts shown in Table 1 exclude contributions from development cost charges (DCC), so that it only includes contributions from the City.
- O&M – operations and maintenance activities such as storm sewer cleaning.

Table 1: City of Prince George Stormwater Funding 2016-2021

	Actual					Budget	Average
	2016	2017	2018	2019	2020	2021	
Renewal	$1,425,683	$3,087,343	$2,514,895	$1,079,798	$505,307	$1,940,596	$1,758,937
Upgrades	$0	$66,441	$1,719,250	$167	$0	$0	$297,643
New – not DCC funded	$1,208,170	$21,402	$1,739,037	$586,157	$42,405	$1,900,000	$916,195
O&M	$1,178,461	$1,734,648	$1,664,428	$1,701,389	$1,934,164	$1,791,669	$1,667,460
Total	**$3,812,314**	**$4,909,834**	**$7,637,610**	**$3,367,512**	**$2,481,876**	**$5,632,265**	**$4,640,235**

The City primarily funds its stormwater program from property taxes. More specifically, the City funds its stormwater program through the following mechanisms:

- Approximately $1.3M is directly allocated annually to stormwater operating from the General Levy (i.e. property taxes);
- Debt servicing (Note: repayment of debt also uses property taxes); and
- Reserves (Note: some reserves are still funded by property taxes, e.g. the General Infrastructure Reinvestment Fund).

Currently the average home in Prince George contributes approximately $100 annually towards stormwater management through property taxes.

1.3 Prince George Stormwater Funding Needs

From Table 1, we can see that the City has spent an average of $4.4M ($4.6M if you include the budgeted amount for 2021) annually on stormwater for asset renewal, system upgrades, new infrastructure and O&M. As part of this assignment, we wanted to estimate what the City should be spending annually to achieve sustainable service delivery of stormwater management.

More description about our estimate of the City's stormwater funding needs in the areas of renewal, upgrades, new infrastructure, planning studies & policy work, and O&M are provided in the five sections below.

Renewal

Using the City's asset management tools PowerpPlan/BUILDER, the City has estimated average annual renewal (AAR) needs for its storm sewer system (e.g. sewers, culverts, and pumping stations) of $4,300,000. This is the amount that has been included in the City's Infrastructure Report Cards within the 2021-2025 Financial Plan. The renewal costs assume a like-for-like replacement of existing infrastructure. If infrastructure needs to be larger due to climate change projections, then the costs will increase accordingly. The renewal needs show average annual needs and have not been prioritized based on risk.

The City must also consider the renewal/rehabilitation of its stormwater ponds. The City currently owns 26 ponds, 20 of which are wet ponds that will require significant sediment removal every 10-30 years. We have developed a high-level estimate that each wet detention pond will be cleaned at a cost of $100,000 every 20 years. This results in an annual pond cleaning cost of $100,000 which has been added to the AAR estimate of $4.3M to determine total stormwater renewal needs. Once the City completes more sediment surveys of its existing ponds and removes sediment from these ponds, it will be able to provide a better estimate of its annual pond sediment removal needs.

Upgrades

Upgrades include projects where improvement are made to the existing system (i.e. adding water quality treatment with the addition of a detention pond) rather than simply replacing existing infrastructure (which is considered "renewal") or upsizing the system to service new development (typically funded by new development).

The City's six watershed drainage plans (WDPs) have recommended over 250 action items, some of which are considered "upgrades". A cost estimate for 167 of these 250 action items was provided. The remaining action items were deemed to have only internal costs (i.e. for staffing) or a cost estimate was simply not provided. Since the WDPs have been developed, some of the recommended action items have been completed and a few new action items have been identified. Completed action items and new action items were eliminated and added to the list respectively. As pipe (sewer or culvert) renewal needs are included within the stormwater AAR needs from PowerPlan, any WDP pipe renewal projects were assumed to be already accounted for. The only exception is if a culvert needs to be replaced with an open span bridge as this level of upgrade would not have been considered within the AAR needs from PowerPlan.

The remaining "upgrade" action items from the WDPs have a total estimated cost of $31M, when corrected for inflation (see inflation rates provided in TWP#1) and climate change (simply added 15% if the WDP didn't consider climate change). The breakdown of projects by priority where 9 is the highest priority and 1 is the lowest priority is outlined in the following table.

Table 2: City of Prince George Stormwater Upgrade Projects by Priority Level

Priority	Estimated Cost	Cumulative Estimated Cost
9	$1,000,000	$1,000,000
8	$0	$1,000,000
7	$65,000	$1,065,000
6	$3,714,000	$4,779,000
5	$6,189,000	$10,969,000
4	$11,684,000	$22,653,000
3	$2,618,000	$25,271,000
2	$5,437,000	$30,708,000
1	$0	$30,708,000

To determine a sustainable funding level, we have taken the cost of completing the higher priority upgrade projects (i.e. priority level 5-9) over a ten (10) year time span. This represents a total cost of $11 M or $1M per year.

Watershed Drainage Plans (WDP) have not been completed for the whole City, so the estimate for upgrades may increase as additional Watershed Drainage Plans are completed. In addition, some of the WDPs did not provide cost estimates for all recommended projects so the cost of completing all recommended upgrades will likely increase.

New (not DCC Funded)
The "New-not DCC funded" needs estimate is zero as it is assumed development will pay for all development related costs. However, Development Cost Charges (DCC's) may not cover all development related infrastructure upgrades so the cost here may be higher than zero.

Studies and Policy Work
The City needs to periodically develop, review and revise bylaws, policies, Design Guidelines and planning studies for stormwater management. We have included the following within our high-level estimate of the main stormwater related studies that the City should be completing:

- The City completes a new Watershed Drainage Plan or reviews one of its previous Watershed Drainage Plans every 2 years (at a cost of $250k per plan). The City has developed 6 drainage plans for different watersheds thus far which covers most of the developed areas within the City boundaries. This level of frequency would result in a watershed being looked at once every 15 years.
- The City should review this ISMP (at an estimated cost of $200k) and its Design Guidelines (at an estimated cost of $50k) every 10 years.
- The City spends $10k per year in the tracking and monitoring of this ISMP and the resulting action items.

The resulting total cost of studies is $185k per year. The City may need to spend additional money in the development and revision of stormwater related bylaws.

Operating (Maintenance)

We have estimated that it would cost $3.5M annually for the City to complete a full stormwater O&M program. This stormwater O&M cost estimate includes activities such as;

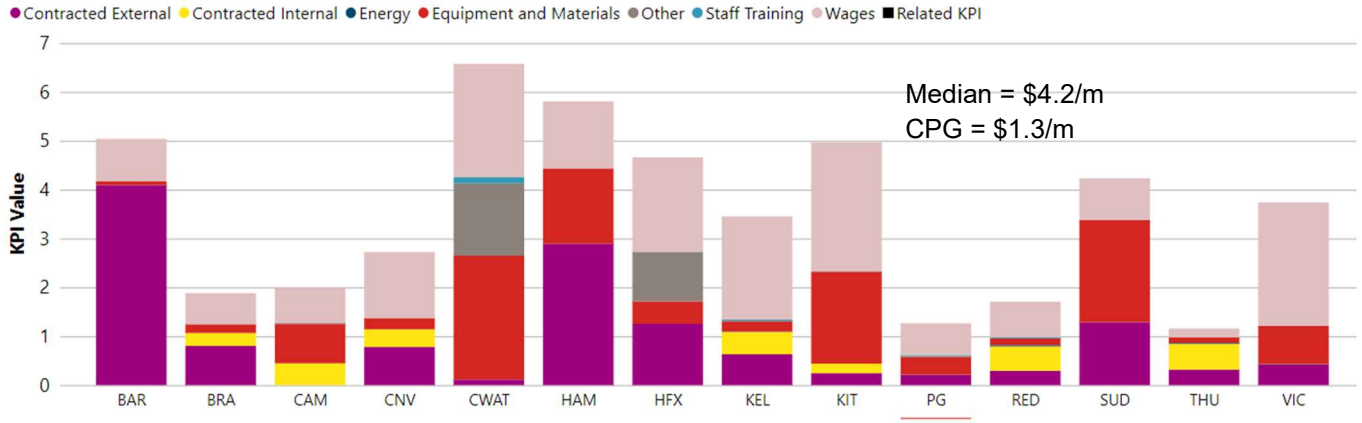
- cleaning catch basin sumps annually,
- inspecting the storm sewer system with CCTV every 20 years,
- maintaining the ditch network on a 20-year cycle,
- inspecting the City's 919 culverts annually (outside visual inspection only for notable blockages/erosion),
- cleaning the culverts every 10 years,
- inspecting each pond annually (with basic maintenance such as trash pick-up and vegetation control),
- continuing with the current pump station maintenance program, and
- some stormwater monitoring and periodic repairs of stormwater infrastructure.

The proposed O&M program does not include street sweeping, leaf pick-up, street flushing, sidewalk cleaning, pond sediment removal, screen/inlet maintenance, or infiltration facility maintenance. The City has budgeted $1.2 M for its street sweeping program (summer sweeping and winter sand pick-up). If the City wanted to include this activity within its future stormwater funding model, then it would need to add $1.2 M to its stormwater budget.

Currently the City spends $1.7M annually, on average, towards the maintenance of its stormwater system. This is equivalent to approximately $1.3-1.5 per metre of system (depending on the length of assumed sewer and ditch used). The median O&M cost amongst Canadian municipalities that participate in the National Water and Wastewater Benchmarking Initiative (NWWBI) is $4.2 per metre of system. If the City of Prince George spent $4.2 per metre of system on O&M then that would equate to a total O&M budget of $4.7M annually. Coincidently this is equivalent to our $3.5 M cost estimate plus $1.2 M for street sweeping.

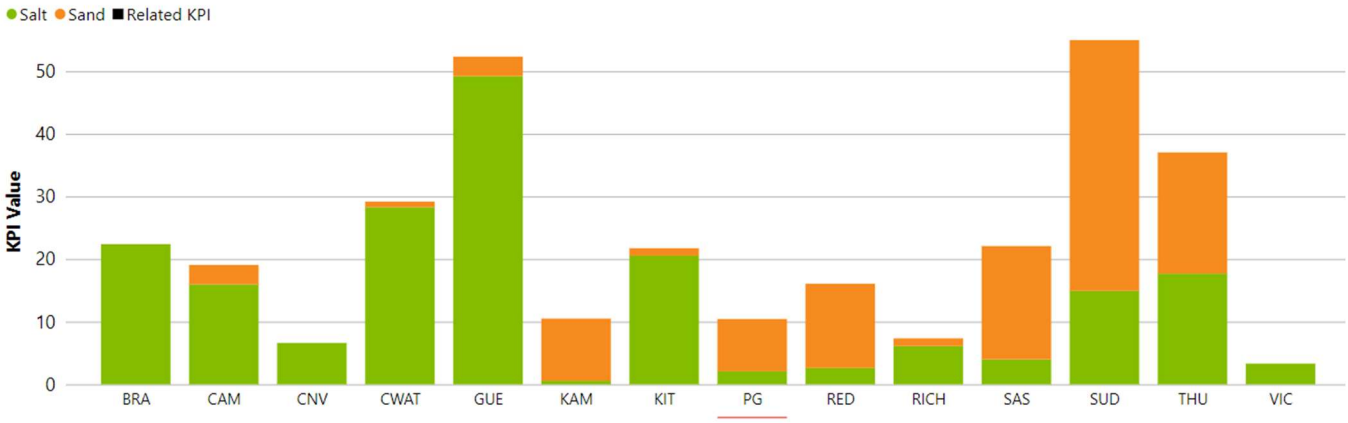
The figure below shows the O&M costs per metre of system for the municipalities participating in the NWWBI, including the City of Prince George (labeled as PG).

Figure 1: 2019 Stormwater O&M Costs per metre of Sewer and Ditch- NWWBI



The City has noted that the current lack of stormwater funding has impacted their ability to complete maintenance activities such as catch basin sump cleaning. In 2020 the City cleaned only 11% of its catch basin sumps. As can be seen in the following figure from the NWWBI, sediment management is important for northern communities such as Prince George, where the climate requires significant amounts of sand to be applied to the roadways in the winter.

Figure 2: 2019 Tonnes of Sand and Salt Applied per km of Roadway- NWWBI



In TWP#2 we addressed condition assessment needs for the City's stormwater system. We estimated that it costs significantly less to inspect and proactively repair the City's storm sewer system rather than to allow the system to "run to failure" and to respond (i.e. emergency repairs), only as needed.

Total

When the cost estimates for the five different sections are totalled, we have estimated the City should be spending approximately $9.1M annually for the sustainable service delivery of stormwater management. A breakdown of the estimate is shown in Table 3 below.

Table 3: Annual Stormwater Funding Needs

Stormwater Expenditure Type	Annual Funding Needs	Supporting Information
Renewal	$4,400,000	AAR from Power Plan/BUILDER + pond sediment removal
Upgrades	$1,000,000	Highest priority WDP upgrade projects over 10 years
New – not DCC funded	$0	Assume development pays for dev't related works
Planning Studies	$185,000	New/revised WDP every 2nd year, updated Design Guidelines/ISMP every 10 years & annual ISMP Roadmap tracking/review
O&M	$3,468,000	Based on estimated sustainable O&M program for CPG. Does not include street sweeping.
Total	**$9,053,000**	

The full future stormwater funding needs may be greater than $9.1M per year, as future studies are completed and sewers are inspected, but the City could apply a risk-based approach to determine high priority short-term funding needs (i.e. 2022 -2026).

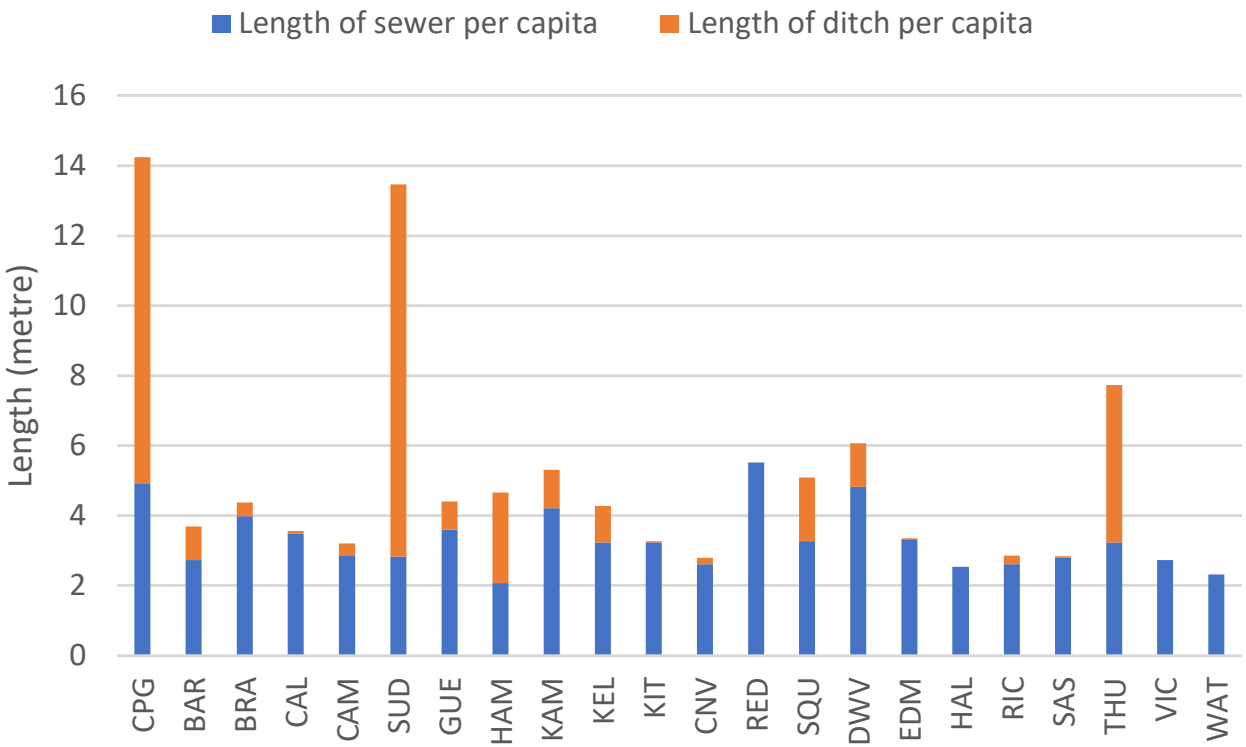
If the City were to spend $9.1M per year on stormwater, and it was to be funded entirely through the tax levy (general and dedicated levies) then the average homeowner would contribute $183 per year towards stormwater management. In order to increase stormwater funding from the $3.4M budget in 2019 to the long-term sustainable amount of $9.1M the City would need to increase the overall tax rate by 5% (assuming that other budgets for services funded from the general tax levy stayed the same).

If the City chooses to gradually increase stormwater funding to sustainable levels, then we recommend they use a risk-based approach to identify the highest priority needs. The risk analysis completed as part of TWP #2 and the project prioritization framework completed as part of TWP #1, will help in this regard. In general, the following key elements are important for developing a cost-effective stormwater program:

- Strong bylaws that prevent contamination of the stormwater system, ensures that polluters pay for any required clean-up, and ensures that developers pay their fair share for new infrastructure;
- Strong Design Guidelines to ensure that new infrastructure is effective and has an acceptable life-cycle cost; and
- A strong maintenance program that allows the City to prevent costly infrastructure failures, extend the life of its assets and prioritize infrastructure spending.

The City of Prince George has an extensive stormwater system due to the spread-out nature of development combined with a relatively low population. The following graph shows the length of system (sewer and ditch) per capita for various municipalities across Canada that participate in the NWWBI. The City of Prince George is denoted as “CPG” and has the highest length of stormwater system per resident of all the Canadian municipalities included. This poses a challenge for funding infrastructure as the City of Prince George has “fewer taxpayers” per unit of infrastructure to financially support the maintenance and renewal of the infrastructure.

Figure 3: Length of Stormwater System (m) per Capita- NWWBI



2. Previous Work

2.1 Previous Prince George Stormwater Utility Study

In 2013, AECOM completed a study for a stormwater utility for the City of Prince George, which included public consultation. Initially the study looked at including snow removal as well as stormwater management within one "stormwater utility", but part way through the study, the snow removal activities were removed from the stormwater utility study.

A rough timeline of the work involved in the 2013 stormwater utility study is presented below.

- *December 2012*: Council approved the creation of a stormwater utility using a tiered single-family unit rate structure (i.e. tiered SFU).
- *Spring/summer 2013*: AECOM completes a rate analysis for a stormwater utility.
- *September 9, 2013*: Proposed stormwater fees were presented to the Finance and Audit Committee and a method for calculation of the different rate categories. Average fees from the following variable rate structures were presented: Equivalent Residential Unit (ERU), Single Family Unit (SFU), and Tiered SFU.
- *October 2013*: Information regarding stormwater runoff, the City's infrastructure funding challenges and the need to consider a user fee-based stormwater utility was uploaded to the City's website.
- *October 7, 2013*: A stormwater utility project update was made to the Finance and Audit Committee. It provided the Finance and Audit Committee with the Stakeholder and Public Consultation Plan as the next step in establishing a Stormwater Utility for the City of Prince George.
- *October/November 2013*: Conducted two stakeholder meetings (School District #57 and Chamber of Commerce), media briefing, two public open houses, an online survey (received 545 surveys and 26 telephone calls), and notified owners of large properties and organizations currently receiving permissive tax exemptions, regarding the proposed stormwater utility, rates, and the methods for calculating different rate categories. See Table 4 for more information.
- *October 30, 2013*: Different funding alternatives were reviewed in light of feedback received during the public consultation. The following funding models were reviewed: SFU (no tiers), ERU, blended SFU/assessed value, and 100% assessed value. Ultimately, it was decided to continue with the tiered SFU model but to simplify it by combining some of the multiple family categories (i.e. from seven to three).
- *November 2013*: Stormwater utility implementation analysis, including bylaw and IT considerations.
- *November 18, 2013*: Presented stormwater utility public consultation results and proposed rate structure to the Finance and Audit Committee and recommended draft bylaw approval. Staff proposed a tiered SFU model with an option for credits for non-residential properties. The proposed bylaw was not approved by the Committee and the Committee decided not to pursue a stormwater utility further.

The intent of the proposed stormwater utility was to remove the existing funding for stormwater infrastructure from the general tax levy and to collect revenues for sustainable funding through a stormwater and drainage utility. The proposed stormwater and drainage utility would have collected approximating $4M per year.

The funding model proposed to the Finance and Audit Committee was a tiered SFU rate. The proposed rate structure had three rates for small, medium and large single-family detached homes, three rates for multi-family residential types, and one rate for all non-residential and mixed property types (e.g. mixed commercial/residential). The residential charges were based on typical impervious areas determined through statistical sampling. The non-residential rates would be determined for each property based on actual impervious area measurements. Although

Council had approved the creation of a tiered rate structure in December 2012, the Finance and Audit Committee did not approve the implementation of the proposed tiered rate structure in November 2013. Details of the proposed rate structure and associated charges by parcel type are shown in the following table.

Table 4: Proposed Rate Structure to the Finance and Audit Committee (November 2013)

Parcel Type	Prop Annual Charge SW Charge
Single Family – Small (<125m^2)	$58.21 per lot
Single Family – Medium(123<226m^2)	$83.16 per lot
Single Family – Large (>226m^2)	$116.42 per lot
Multi-Family – Duplex/Townhouse	$49.90 per unit
Multi-Family – Triplex/Quadplex	$33.26 per unit
Multi-Family – 4+ Units/Condo	$24.95 per unit
Non-Residential Mixed-Use	$26.57 per 100m^2 impervious area

2.1.1 Public Consultation

AECOM with sub-consultant Radloff developed and implemented a Stormwater Utility Consultation Plan as part of the 2013 study. Education and outreach focused on describing the stormwater management services currently provided by the City. Emphasis was placed on the economic, environmental and social benefits of these services and the cost to provide them. This was complemented by the following key messages to clarify the purpose behind the proposed stormwater utility:

- Why is Stormwater Management Important?
- Asset Management and the Need for Long-Term, Adequate Funding
- Fairness and Equity
- Greater Transparency and Accountability

The key audiences and stakeholders identified are outlined below.

External Customers

- All property owners in the City
- Landowners who receive a permissive property tax exemption
- Large property owners (either owner of large parcels and/or many small parcels)

Internal Customers

- City Council and Council Committees (e.g. Standing Committee – Finance & Audit)
- City Staff (e.g. Operations, Customer Service, Finance, Asset Management and IT Services)

Specific education and outreach techniques that were used included:

- Traditional media advertisements (Meeting announcements and Your City Matters)
- Fact sheets and meeting handouts
- Briefing notes for internal customers
- Media briefing
- Information repositories (Library and City Hall)
- Comprehensive web-site updates for storm water information
- Public meetings
- Facilitated meetings with key audiences and stakeholders
- Surveys
- Feedback received through customer service centre and webpage

- Internal information meetings

The table below outlines the contacts made during the stormwater utility consultation process in October and November 2013.

Table 5: Contacts Made During the Stormwater Utility Public Consultation Process

Dates	Organization	# of Participants
Oct 17	Media Briefing	3
Oct 17	Public Meeting #1	18
Oct 17	Public Meeting #2	10
Oct 18-Nov 15	Survey – on-line and in person	545
Oct 29	School District #57, Administration	3
Nov 7	Chamber of Commerce, Advocacy Committee	8
Oct 18-Nov 15	Contacted large property owners	50
Oct 18-Nov 15	Contacted non-profit org and places of worship	64
Oct 18-Nov 15	Individual inquiries and feedback (phone and email)	26

At the open houses, the project team heard that residents preferred a simple funding model for the following reasons:

- Determining how much run-off each property contributes is more difficult than just measuring impervious area as some impervious area (i.e. roofs) may drain to landscaped areas;
- The perceived level of service that each resident receives varies widely (ditches, curb and gutter, infrastructure work in their area etc.) and according to residents does not appear to relate to the amount of impervious area on their property;
- One of the largest areas of imperviousness are the roadways, which is considered a common good and should be paid for by everyone, regardless of the amount of impervious area on their property.

The input received by Prince George residents from all the consultation methods can be summarised as follows:

- The majority of respondents indicated that stormwater infrastructure, flooding & landslide protection, and protecting the water quality in streams, creeks, rivers and ponds is important to them.
- The majority of respondents felt that existing storm water infrastructure was being managed adequately or very well, but concerns were expressed regarding ponding and pollution in certain areas of the City, or as a result of new development activity.
- Many respondents did not believe that their property had any impact on the stormwater infrastructure in the City but felt that any increase to fees or taxes should result in a corresponding improvement to service levels to address existing problem areas and replace aging infrastructure.
- A majority of survey respondents do not wish to see any increases in taxes or fees for stormwater infrastructure. Many responses demonstrated a general concern over the City's current expenditure of tax dollars and were sceptical that the creation of a stormwater utility fee would result in a corresponding reduction to their current tax burden.
- A majority of survey respondents preferred the existing system of stormwater funding (i.e. through taxation). By contrast, most Public Meeting attendees saw merits with a new funding system based on impervious area, however considerable debate and difference of opinion was evident over the implementation of the rate structure for different types of properties.
- If the stormwater utility was created, the majority of respondents supported a credit or refund system for property owners that implemented measures to reduce the volume or improve the quality of drainage leaving their site, provided it was simple to administer. The majority of attendees to the public meetings thought credits should be available to industrial, commercial, and institutional properties,

while indicating that the administration of a credit system for residential properties would be problematic.
- Responses were divided on whether or not agencies who currently receive a permissive tax exemption should pay fewer annual fees should the storm water utility be created.

Throughout the stormwater funding study, the strongest proponents for a new stormwater funding model based on a variable stormwater rate were Utilities and Environmental staff who saw and understood the negative implications of the on-going lack of stormwater funding (e.g. deteriorating infrastructure, environmental degradation etc.). Utilities and Environmental staff valued a stormwater rate that was based on fairness, transparency, financial and environmental sustainability, and hence pursued the Tiered SFU stormwater funding model. This funding model closely resembled a user pay fee (i.e. property owners pay based on the impact they have on the public stormwater system), with "reasonable" set-up and on-going administration costs, that would provide for sustainable funding and encourage environmentally sustainable forms of development.

Other City departments, such as IT, were receptive to and cooperative in reviewing the impact of employing a new stormwater funding model (i.e. modified billing systems). There was mixed support for a variable stormwater rate at the senior management level. Although there was some support within Council for the tiered SFU funding model, there was also a strong desire to heed residents' concerns.

The public consultation process revealed a range of opinions. Those residents and stakeholders who attended meetings developed a better understanding of stormwater management and supported the City in addressing funding needs. Interestingly, however, the majority of residents who provided feedback seemed to favour simplicity over equity when developing a stormwater funding model.

2.2 Additional Public Consultation Work

Since the 2013 Stormwater Utility Study the City has not completed further public consultation specific to stormwater funding. However, the City does continue to engage residents and seek feedback on a variety of municipal issues through face to face workshops and online communications.

The City began conducting face to face and online community events as part of their "Talktober" initiative. These events, that occur in October of each year, invite residents to give feedback on budget priorities. The City also uses "CITIZEN BUDGET by Ethelo", which is an interactive online budget simulator where residents can select their preferences for budget allocations across various City services. They can then use their own residential assessment value to get an idea of how much they pay for the various municipal services.

In 2016 the City conducted Talktober events in five communities across Prince George where they could rate their priorities for capital investment across ten City services. The results in order of priority are:

1. Parks and trails
2. Sports and recreational facilities
3. Culture and community events
4. Roadway and lighting
5. Sidewalks/pedestrian services
6. Bicycle routes
7. Public bus services
8. Water and sewer
9. Stormwater management
10. Government services facilities

The results are shown in the following figure.

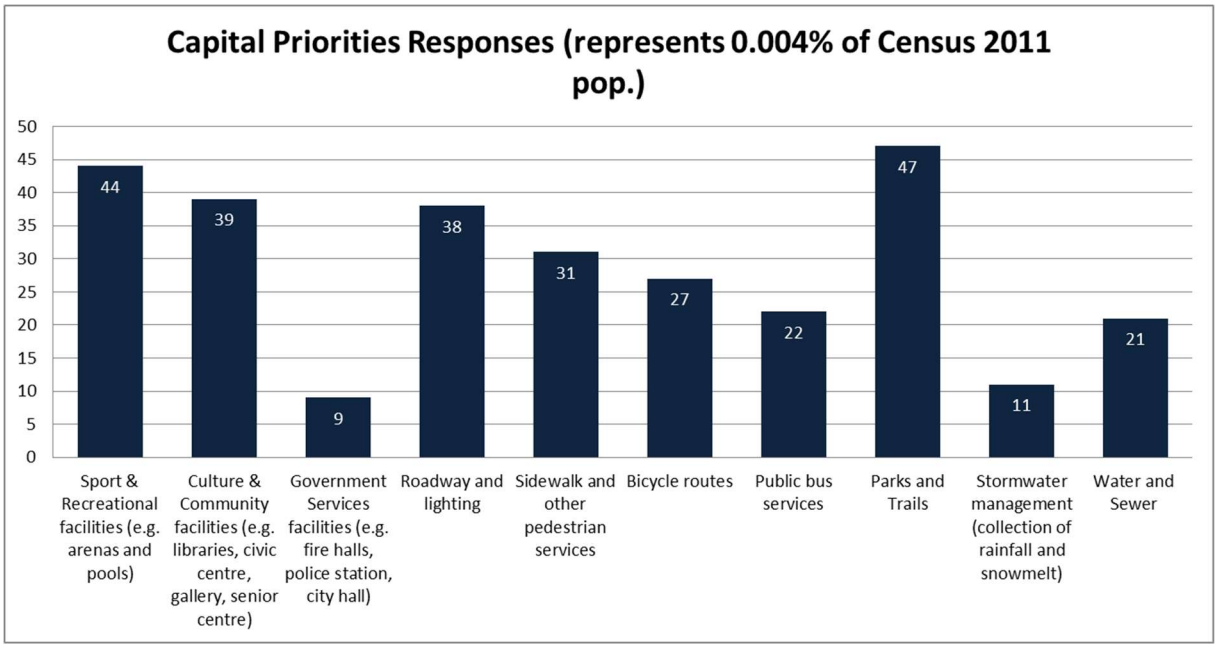


Figure 4: Resident Capital Priority Responses at 2016 Talktober Community Events

Not surprisingly, the services provided by assets that residents can see ranked highest. Whereas services provided by assets that residents do not directly see or experience (e.g. underground pipes, inside firehalls and police stations etc.) ranked lowest. This does not necessarily reflect residents' values as most residents would choose clean drinking water over a new waterslide, but it does reflect where residents think future spending should occur based on their knowledge of existing services and assets. Most residents do not know the condition of the City's underground pipes and since clean water comes out when they turn on the tap, they did not prioritize capital spending on water and sewer. However, they do know the condition of the City's main roads and the condition of the local recreational facilities and therefore prioritized capital spending in these areas. Therefore, the fact that citizens did not prioritise capital spending in the area of stormwater management, probably indicates that they are not aware of many of the issues related to a lack of historical funding for stormwater (e.g. collapsed culverts).

2.3 Prince George Policy/Regulatory/Strategy Analysis

The Official Community Plan Bylaw No. 8383,2011, approved by Council in April 2012, states under Policy 31.2.14 that the City should review its Storm Sewer Bylaw and consider a stormwater utility to fund the ongoing operating and maintenance of its storm water network. This led to the 2013 Stormwater Utility Study. The Storm Sewer Bylaw No. 2656 (1974) and the Comprehensive Fees and Charges Bylaw No. 7557 (2004) would need to be updated to implement a stormwater utility.

Achieving sustainable funding for the City's stormwater management program was identified as a priority under the Environmental Leadership and Climate Action myPG pillar. It assists with three of Council's focus areas:

- Incorporate adaptation to climate change in relevant operations;
- Prioritize infrastructure re-investment and renewal to ensure the delivery of critical recreation emergency, transportation, and utility services; and
- Maintain fiscal sustainability, balance service levels with the affordability of the City's services, facilities, and operations.

2.4 Recent Events and Changes

Since the City completed its Stormwater Utility Study in 2013, some changes and events have occurred that could impact decisions around future funding of the City's stormwater program. Recent events and changes include:

- New City Councillors, who have different priorities and may or may not champion the implementation of a stormwater rate;
- Recent large culvert collapses which required borrowing to fund the repairs (e.g. Winnipeg St. sinkhole shown in Figure 4);
- New and updated municipal policies and strategies in the areas of climate change adaptation and asset management;
- Increasing Provincial and Federal requirements and enforcement with respect to water and sustainability, particularly regarding McMillan Creek and salmon populations. Changes in Provincial and Federal statutes include the Water Sustainability Act that was brought into force in 2016 and periodic amendments to the Fisheries Act and Species at Risk Act;
- Increased inventory of detention ponds, which increases pond maintenance costs, particularly for sediment removal;
- Impact of beavers on natural stormwater assets; and
- Impact of COVID-19 on City revenues (e.g. from City facility closures).

Figure 5: Winnipeg St. Sinkhole (2018) - $1.7M

3. Financing Options

3.1 Overview of Funding Mechanisms

To support current and future stormwater management (SWM) needs, there are four general types of funding for the major components of municipal SWM programs in North America, including:

- Taxes, which are mandatory levies authorized through legislation, collected by a public body, and not related to any specific benefit or government service (i.e., these are for general services to support the public good)
- Special levies that have specific designations and limitations for usage
- Fees and special charges, which are payments made to offset the cost of a specific service and payable by those people who benefit from the service (includes stormwater rates)
- Other means such as public-private partnerships, federal or provincial economic stimulus grants for infrastructure investment, debentures, and long-term debt-financing strategies

Property taxes are the primary source of funding for SWM programs in the City of Prince George and across Canada, although stormwater rates are becoming increasingly used. Details of the most common SWM funding mechanisms are presented below.

1. Property Tax - general tax fund and dedicated levy
2. Stormwater Rate – flat rate
3. Stormwater Rate – variable rate based on land use and/or property size
4. Stormwater Rate – variable rate based on actual or estimated impervious area
5. Water/Wastewater Rate
6. Development Related Charges and Fees
7. Grants

Development related charges and grants can provide important funding to specific projects but will not be able to fund an entire stormwater program (e.g. operations and maintenance, on-going renewal etc.). They are typically used to complement other stormwater funding models. Therefore, we will explore stormwater funding models numbered 1 to 5 above for the City of Prince George, understanding that any funding model would be supplemented by development cost charges and grants, where applicable.

3.2 Property Tax

3.2.1 General Tax Fund

Local property taxes are the most significant revenue source to support municipal SWM programs in Prince George and other municipalities in Canada such as the Cities of Red Deer, Kelowna, Kamloops and Greater Sudbury. Revenue derived from the municipality's portion of property tax goes into a general fund which covers the operating and capital expenditures of most municipal services. Property tax is determined based on the property value assessment multiplied by the applicable tax rate which depends on the classification of the property.

Property tax rates are established on an annual basis by Canadian municipalities to meet their projected funding needs and in consideration of the total current value assessment of all taxable properties within their jurisdiction.

Tax-exempt properties generally do not contribute tax funds to the municipality's SWM program. Tax-exempt properties include governmental parcels (e.g., municipal, regional, provincial, and federal buildings) as well as

institutional parcels (e.g., schools, hospitals, and churches) and other charitable organizations that are registered with the Canada Revenue Agency.

Some municipalities charge a core service fee or tax-like payment to tax-exempt properties. For example, the federal government administers the Payments in Lieu of Taxes (PILT) program which distributes funds on behalf of eligible tax-exempt institutions to property taxing authorities to compensate for valuable services such as SWM, police protection, fire protection, and roads.

3.2.2 Dedicated Tax Levy

A dedicated levy can be administered specifically to raise revenue for stormwater services, such that a fixed property tax rate is applied and itemized on the property owner's annual tax bill. A by-law would be required to dedicate these funds specifically to SWM. The Cities of Delta and Langley are examples where a dedicated tax levy is dedicated specifically to stormwater. The City of Thunder Bay has a sewage & drainage special area levy that funds a portion of Thunder Bay's SWM program.

The City of Prince George currently administers many dedicated tax levies, some for third parties (e.g. schools, hospital, and Regional District), and some for municipal services (e.g. snow control, road rehabilitation and the General Infrastructure Reinvestment Fund).

Although, some of the funding from the City's current dedicated tax levies for snow control, road rehabilitation and the General Infrastructure Reinvestment Fund (GIRF) may get used for stormwater related activities (e.g. ditching or replacing culverts and sewers), none of the funds are dedicated specifically to stormwater management. The existing GIRF can only be applied to capital reinvestment projects and cannot fund new capital or operating. As the City is familiar with the use of dedicated tax levies it may like to consider the use of a dedicated tax levy for stormwater management.

The presence and naming of a dedicated tax levy for SWM can be important for raising public awareness and obtaining buy-in. As many residents are not familiar with what stormwater management is and how it benefits them, some municipalities have used other words that resonate more with its citizens and their priorities. For instance, the Cities of Delta, Pitt Meadows, West Vancouver, Surrey and Abbotsford uses the word "Drainage" for naming its tax levy as opposed to the Township of Langley, City of Victoria and City of Markham who elected to use the word "Stormwater" The City of North Vancouver combines the two terms and has a "Storm Drainage Levy". The City of Chilliwack has two separate levies; one for drainage and one for dyking. The City of Richmond has a Drainage and Dyking Utility which includes a "flood protection rate". The City of Barrie is working on the implementation of a new fee for its "Stormwater Climate Action Fund".

3.2.3 Advantages and Disadvantages

Funding a municipal SWM program through property taxes offers several advantages, including:

- Property-tax based revenues are already accepted as the primary existing source of revenue for Prince George
- Can be used to fund all SWM program activities
- The billing system already exists and is well established

Funding a municipal SWM program through property taxes presents several disadvantages, including:

- Inequitable: Property taxes are based on a property's assessed value, which does not typically correlate with its runoff contribution, so the fairness and equity of this revenue source is low
- Inequitable: Tax-exempt properties, even those that are major producers of stormwater runoff, contribute very little (i.e., through payments in lieu of taxes) or nothing to support the SWM program
- Unpredictable: Except in the case of a dedicated stormwater tax levy, funding is not dedicated to stormwater and can be diverted to other municipal services

- Unsustainable: There is no incentive for property owners to reduce stormwater runoff and pollutant discharge which could potentially reduce City costs in the operation and renewal of the stormwater system
- Unsustainable and Unpopular: Council and residents are sensitive to tax increases and the ability to increase funding is constrained. As outlined in Section 1.3, the City would need to increase taxes by at least 4.7% to fully fund the City's stormwater program such that it is both financially and environmentally sustainable.

3.3 Stormwater Rate

A stormwater rate is a financing mechanism that allocates costs to individual properties based upon a "user pay" formula, in a similar fashion as a water/wastewater rate. This is known as a stormwater utility in the U.S.

The principal advantage associated with a stormwater rate (except for the flat fee option) is that all parcels can be assessed a user fee that reflects their relative stormwater contribution to the municipal SWM system, including tax-exempt properties (e.g., places of worship, provincial and federal agencies, and other tax-exempt buildings and entities). For example, each tax-exempt parcel could be charged a stormwater user fee that is proportional to the stormwater runoff from the property. This method is similar to the manner in which other public utilities charge tax-exempt property based on usage (e.g., water and sewer utility fees).

Applying a user pay approach to water is fairly simple, it is based on the amount of water one consumes, which is commonly measured continually through a meter. Applying a user pay approach to stormwater is slightly more challenging because you cannot continually measure the amount and quality of stormwater runoff from a property. However, you can approximate the amount of stormwater runoff, to varying degrees of accuracy, as discussed below.

It is important to note that there is a large range of stormwater rates across Canadian municipalities. Some of them are very simple and are not proportional to the amount of stormwater runoff from a property (i.e. flat fee option), some of them are fairly simple and are loosely related to the amount of stormwater runoff from a property (i.e. variable rate based on land use and/or property size), whereas others are based on actual or estimated imperviousness and are therefore more proportional to the amount stormwater runoff from a property (i.e. variable rate based on impervious area). In other words, some stormwater rates closely resemble a "user-pay" approach, whereas other stormwater rates do not really apply "user-pay" principles. Stormwater rates that apply a "user-pay" approach (i.e. impervious based rate) are considered more equitable but some municipalities prefer a simpler approach (i.e. flat fee option).

The fee for a stormwater rate is typically applied on a monthly or occasionally annual basis. The revenue generated through a stormwater rate can be used for any SWM program related costs.

The basic calculation for a stormwater rate is simply the municipal SWM program expense divided by the number of billing units within the municipality. How one allocates the number of billing units to each property depends on the type of stormwater rate selected (e.g. allocate billing units based on land use, property size or impervious area). The following types of stormwater rates (and hence billing unit methods) have been used throughout North America and are listed in increasing order of equity.

1. Flat Fee
2. Variable Rate Based on Land use and/or Property Size
3. Variable Rate Based on Impervious Area
    a. Equivalent Residential Unit (ERU)
    b. Single Family Unit (SFU)
    c. Tiered SFU
    d. SFU with geographical consideration

e. Impervious area measured for every property

These types of rates listed above are described further in the following sub-sections.

3.3.1 Flat Fee

In a flat fee funding model, the charge does not vary according to usage of the property (e.g., a charge of $5 per month per water meter account). *Example: City of Calgary.*

3.3.2 Variable Rate – based on land use/property size

Industrial, commercial and institutional properties tend to have greater impacts on a municipal stormwater system for two reasons:

- They generally have more impervious area resulting in higher peak flows and volumes of stormwater run-off; and
- They generally include uses (such as surface parking) that create run-off with poor water quality.

Larger properties also tend to have greater impacts on a municipal stormwater system for two reasons:

- They generally require a greater length of network (e.g. fronting storm sewer or ditch to service the property); and
- They generally have more impervious area than smaller properties of similar land use.

Therefore, some municipalities, such as the cities of Edmonton, Vaughan, London and Newmarket have decided that land use and/or property size is an appropriate approximation of a property's impact on the stormwater system and should form the basis to determine a stormwater fee for each property.

Three examples of a variable stormwater rate based on land use and property size that we have seen in North America are:

1. **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). *Example: City of London.* The *City of Vaughan* has additional tiers that also consider property size and type of development ($51 for low-density residential, $33 for medium density residential, $46 for non-residential properties less than an acre, $1,187 for non-residential properties 1-10 acres etc.).
2. **Runoff Coefficient**: the charge varies by property size and an assumed stormwater runoff potential by property type. An example of this approach is the *Town of Newmarket* where they charge $0.017 per m^2 for natural areas, $0.082 per m^2 for residential/institutional properties and $0.163 per m^2 for commercial, industrial and mixed-use buildings.
3. **Intensity of Development Factor**: similar to 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 underlying zoning category). *Example: City of Edmonton*

3.3.3 Variable Rate – based on imperviousness

A variable rate based on impervious area accounts for the contribution of stormwater runoff from each property to the local drainage system (e.g., ditches, sewers, and channels) and water quality control facilities. The area of impervious ground cover (e.g., rooftops, driveways, and parking lots) is typically used as the basis for the stormwater rate because impervious area is a common indicator of stormwater flow and pollution discharge potential.

Figure 6 illustrates the impervious area for a non-residential property, highlighting the building footprint in the left panel and the driveway and parking areas in the right panel. The sum total of these areas within the lot boundary represents the total impervious area for this property.

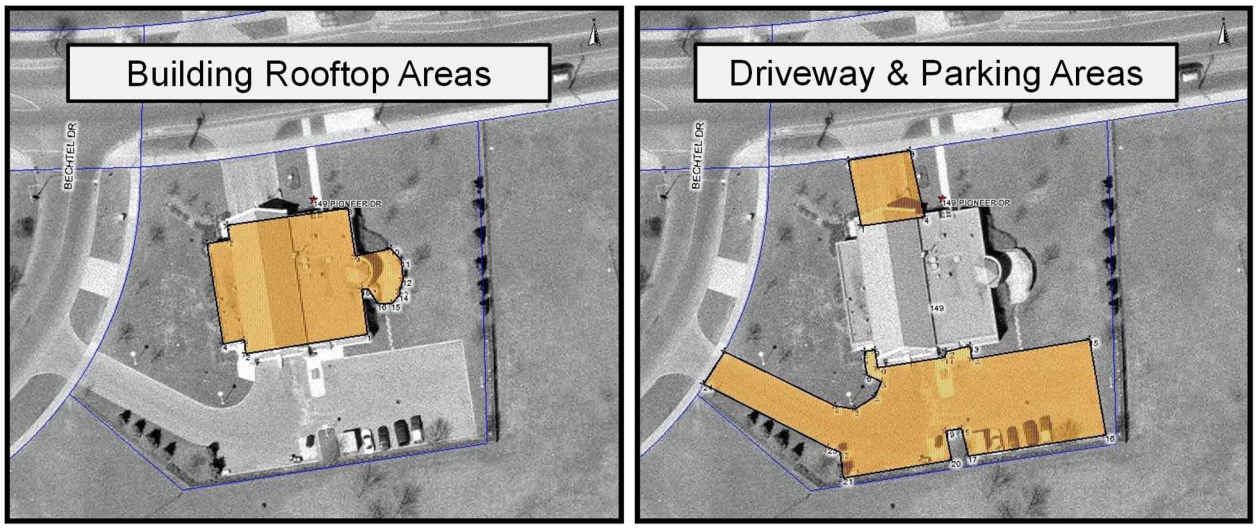


Figure 6: Example of Impervious Areas

Canadian cities with variable stormwater rates based on impervious area include Kitchener, Waterloo, Saskatoon, Mississauga, Guelph and Victoria. A stormwater rate based on impervious area offers a more equitable funding mechanism than other funding sources, because fees assessed to each parcel of land are based on runoff contribution to the municipal SWM system rather than property value or size.

There will be certain properties that will have characteristics that do not fit the exact model that states: “increased imperviousness correlates to increased runoff”. Examples include developments that disconnect their impervious areas from the storm sewer/drainage system (e.g., by discharging onto pervious surface areas or into porous media). Likewise, developments that incorporate source controls or private SWM facilities prior to discharge to the municipal collection system should be charged less than developments that do not adopt best management practices. These two examples could be addressed through an effective credit policy that acknowledges and reduces the fees for properties that manage their stormwater run-off on-site.

The use of impervious area as the basis for setting a stormwater rate is supported by standard manuals of practice. These manuals confirm the use of impervious area as a technically sound, fair and equitable basis for allocating SWM program costs, and include:

- Water Environment Federation. User-Fee-Funded Stormwater Utilities. This manual was prepared by the Water Environment Federation’s Task Force on User-Fee-Funded Stormwater Utilities and summarizes stormwater rate implementations throughout the U.S.
- Florida Stormwater Association (2003). Establishing a Stormwater Utility in Florida - 2003 Edition. This manual was developed from the state with the largest number of stormwater rate implementations in the U.S.
- American Public Works Association – Financing Stormwater Utilities 2nd Edition – 2020. This publication defines stormwater utilities, and their potential for revenue generation.

A stormwater rate based on measured impervious area is a relatively new concept in Canada, but has been successfully implemented throughout the U.S. There are well over 1,500 stormwater user fees across the U.S. and over 700 of these are based on measured impervious area.

The average impervious area per dwelling unit (in square meters) for residential land use categories is typically designated as the base unit for the user fee structure. The base unit represents the stormwater discharge potential

of the average residential dwelling and its associated lot. For example, if a commercial parcel has four times the impervious area of the average residential dwelling, then the commercial parcel would be billed four times the monthly flat fee for residential dwelling units.

There are many ways to develop a stormwater rate based on impervious area. Outlined below are five methods that are listed in increasing order of accuracy, complexity and equity,

1. **Equivalent Residential Unit (ERU)**: a statistical sampling of measured impervious area for all types of residential dwelling units is performed to determine the average ERU size (i.e., square meters of impervious area for average residential dwelling). The average ERU size then becomes the base billing unit. Each residential property (regardless of density) is assigned one stormwater billing unit. The charge for non-residential properties is determined by dividing the measured impervious area by the average ERU size. *Example: City of Guelph.*
2. **Single Family Unit (SFU)**: a statistical sampling of measured impervious area for single-family detached homes is performed to determine the average SFU size (i.e., square meters of impervious area for the average single-family detached home). The average SFU size becomes the base billing unit with one stormwater billing unit assigned to each single-family detached home. Fractional billing units are assigned to other residential property types based on statistical sampling of their measured impervious area. Multi-family residential properties such as apartments, condominiums, and townhouses have a smaller footprint than single-family detached homes and would therefore be charged less than single-family detached homes. The charge for non-residential properties is determined by dividing the measured impervious area by the average SFU size.
3. **Tiered Residential Rate** (e.g. Tiered SFU): the Tiered SFU billing unit method extends the SFU method by accounting for the variability in impervious area among residential properties by assigning three tiers to single-family detached homes (e.g., Small, Medium and Large). *Example: Cities of Kitchener, Mississauga and Waterloo.*
4. **Level-of-Service/Geography Base**: the ERU and SFU billing unit methods can be extended to include separate rate structure calculations that vary by the level of service provided within distinct geographical boundaries (e.g., a higher rate in urban areas that receive more frequent O&M activities and have facilities that provide a higher level of flood protection than in rural areas).
5. **Impervious Area Measurement** (Complete Coverage): the most accurate of all billing unit methods is to measure the impervious area of all properties within a given jurisdiction. *Closest example is the City of Victoria which uses building footprint for residential and measured imperviousness for ICI.*

As noted above, the methods listed are in increasing order of accuracy with respect to allocating charges among property types based on relative contribution of stormwater runoff and pollutant loading. However, with increasing accuracy the cost to administer and manage the stormwater rate also increases.

3.3.4 Advantages and Disadvantages

Funding a municipal SWM program through a stormwater rate offers several advantages, including:

- Dedicated funding source
- Fair and equitable fee that is based on runoff contribution rather than property value (this will vary based on the type of stormwater rate selected)
- Costs for municipal SWM services are distributed to all privately and publicly owned developed properties within the municipality (i.e. includes tax exempt properties)
- With a credit program, provides an incentive for property owners to reduce stormwater runoff and pollutant discharge
- A stable funding source for all SWM program activities to allow for long-range planning, large-scale capital improvements, and leverage for debentures
- A mechanism to ensure privately owned SWM infrastructure is properly maintained
- Can take a variety of forms to tailor to a municipality's desire for simplicity or accuracy

Funding a municipal SWM program through a stormwater rate also presents several disadvantages, including:

- Additional implementation costs (e.g., rate study, database management, billing and customer service). These costs would depend on the type of rate structure selected.
- Required to update the system as properties redevelop
- A portion of the public will express disapproval of a new fee

Implementation costs for database management are typically less for municipalities like Prince George that have high-quality, established Geographic Information Systems (GIS) and an existing in-house utility billing system. Further, public reception can be improved through a structured public consultation program.

We are aware of 20 to 30 municipalities across Canada that have either implemented or are in the process of implementing a stormwater rate (e.g. user fee) and Table 7 includes details for many of these.

3.4 Water Rate Surcharge

Some Canadian municipalities fund all or a portion of their wastewater programs through a rate surcharge added on the water or wastewater utility bill. However, some municipalities also fund all or portion of their stormwater programs through a rate surcharge added on the water/wastewater utility bill. For example, the City of Thunder Bay funds a portion of their stormwater program through the use of the wastewater rate.

3.4.1 Advantages and Disadvantages

Funding a municipal SWM program through a water/wastewater rate offers several advantages, including:

- Dedicated funding source
- Costs for municipal SWM services are distributed to all privately and publicly owned developed properties with water service within the municipality (i.e. includes tax exempt properties)
- A stable funding source for all SWM program activities to allow for long-range planning, large-scale capital improvements, and leverage for debentures
- Existing billing system
- Existing and accepted form of funding

Funding a municipal SWM program through a water/wastewater rate also presents several disadvantages, including:

- Tracking revenue transfers from water/wastewater to stormwater can be complicated
- Lack of fairness and equity in allocating stormwater costs based on water consumption
- Might be legally challenged as it bears little relation to the amount of stormwater runoff generated from a property
- Since the charge is based on water metering, there may be properties that do not contribute to municipal servicing costs (e.g., un-serviced areas with private wells or properties without water meters such as parking lots).

3.5 Comparison of Funding Options

The main funding options explored in this memo were evaluated. Table 6 compares the various stormwater funding options with respect to several criteria, including:

- **City-Wide Applicability**: This category indicates whether or not the funding method can be used throughout the municipality's jurisdiction.
- **Meets Entire Revenue Needs**: Identifies the eligibility for funds to be used to support capital improvement projects, operations and maintenance activities, engineering, support, and overall administration of the SWM program.
- **Equitable**: This category indicates whether or not the funding method charges the property according to their loading on the SWM system.
- **Dedicated Funding Source**: Identifies those funding methods that are sustainable and dedicated solely to SWM program expenditures.
- **Effort to Set-up**: This category identifies the relative effort to set-up the funding option (i.e., options with low set-up effort are considered to be advantageous). Note that we are only addressing set-up costs since all the options presented below could be set up with the proper procedures to minimize on-going maintenance costs as new properties develop and rates change. The only exception would be if the City chose to implement a credit program that had significant uptake.
- **Public Accountability**: This category identifies how well the amount that is charged to each property can be justified to a property owner or the general public.
- **Environmental Benefits**: This category identifies the relative scale of environmental benefits provided by the option (i.e., options with high environmental benefit are considered to be advantageous and generally include those options that provide incentives to reduce stormwater and pollutant loads using source control measures).
- **Social Benefits:** This category identifies the extent to which each funding option can positively impact social behaviour (e.g. encourage property owners to reduce their impact on the environment or stormwater system).

Table 6: Comparison of Stormwater Funding Options

Funding Method	City Wide Applic-ablity	Meets All Revenue Needs	Equitable	Dedicated Funding Source	Effort to Set-up	Public Account-ability	Environ-mental Benefits	Social Benefits
General Tax Fund (Property Tax)	Yes	Rarely	Low	No	Low	Low	Low	Low
Dedicated Tax Levy	Yes	Possibly	Low	Yes	Low	Medium	Low	Medium
Development Charges	No	No	Medium	Yes	Medium	Medium	Low	Medium
Water Rate Surcharge	Partly	Rarely	Low	Partly	Low	Medium	Medium	Medium
Stormwater Rate - flat fee	Yes	Yes	Low	Yes	Medium	Medium	Medium	Low
Stormwater Rate - variable based on land use and/or property size	Yes	Yes	Medium	Yes	Medium	Medium	Medium	Medium
Stormwater Rate based on imperviousness - ERU	Yes	Yes	High	Yes	Medium	High	High	High
Stormwater Rate based on imperviousness - tiered SFU	Yes	Yes	Higher	Yes	High	High	High	High

An ideal funding source should have the following characteristics:

- Consistent with provincial and federal legislation
- Applicable for use on a City-wide basis and across all land use types
- Provides a sustainable, stable and dedicated funding source to support SWM program needs
- Revenue meets the requirements for the City's desired level of service provided
- Costs and benefits are equitably distributed across the community
- Appropriate reserve funding levels are maintained
- Sound policies are in place for credits, adjustments and appeals, and rate study recommendations are publicly supported
- Reasonable implementation costs (e.g., billing systems and administration)

The following table outlines a number of Canadian municipalities that have implemented a dedicated tax levy or a stormwater rate and describes the type of funding model that they have implemented.

Table 7: Summary of Stormwater Rates, Fees and Levies in Canada

Municipality	Rate Type	Details	Annual Rate for Typical Single Family Residential
Ontario			
City of London	Tiered Flat Fee	Storm Drainage Charge - Land area 0.4 hectares or less $16.71/month - Residential land area 0.4 hectares or less without a stormdrain within 90m $12.56/month - Land area above 0.4 hectares $139.10/ hectare/month	$200.52
City of Guelph	ERU	The City's stormwater service fee is based on an Equivalent Residential Unit (ERU) of 188 m2. Residential fee of $6.40/month is applied to every residential unit..	$76.80
City of Waterloo	Tiered SFU	13 rate tiers based on typical impervious coefficients . Residential broken into large = $18.61/month; medium = $12.75/month; and small = $8.50/month	$153.00
City of Hamilton	Sewer / SW Flat Fee	Fixed daily charges are applied for all properties based on meter size. Wasteweter/stormwater combined rate is $0.39/day.	$131.40* *combined with WW
City of Kitchener	Tiered SFU	Residential single detached small = $9.26/month; Residential single detached medium = $15.46/month; Residential single detached large = $20.32/month	$185.52
City of Mississauga	Tiered SFU	Residential Stormwater Charge is calculated based on the residential property size and charged based on 5 tiers (ranges from $54.10 to $183.94 per year).	$108.20
Town of Newmarket	Runoff Coefficient	Stormwater Charge = property size x rate. Low runoff group (natural areas, vacant properties, golf courses etc.): $0.016698 per m² Medium runoff level group (residential and institutional properties): $0.081633 per m² High runoff level group (commercial, industrial and mixed-use buildings): $0.163325 per m²	$73.80
City of Vaughan	Tiered Flat Fee	Stormwater Charge is based on property type: Residential (low density): $51.25; Residential (medium density): $33.28; Residential (high density): $201.35; Non-res (small): $45.96; Non-res (medium)$1,187.54; Non-res (large) $18,137.30; Non-res (large, rural) $10,680.83; Agricultural/vacant $640.04	$51.25
City of Ottawa	Tiered Flat Fee	Stormwater rates are based on estimated hard surface area. Following discounts apply: Townhouse/apartment receive a 50% discount; Urban non-connected properties receive a 30% discount; Rural non-connected properties receive a 50% discount.	$140.65
City of Markham	Flat Fee/ Property Tax	Annual fee of $47.00 per residential property and/or $26.00 per $100,000 of Current Value Assessment (CVA) for non-residential properties.	$47.00
City of St. Thomas	Tiered Flat Fee	Storm Drainage Rate, Res'l $10.11/mo, Comm'l/Inst'l $10.11/mo or $139.35/ha/mo if land area >1800m^2.	$121.32
Town of Richmond Hill	Tiered Flat Fee	The annual rate is $73.95 for residential, and $214.83 for Industrial, Commercial, and Multy-Unit and Condominium properties	$73.95
Saskatchewan			
City of Regina	Water Use Surcharge	Daily charges are applied for all properties based on size. $0.57/day for up to 1000m²	$208.05
City of Saskatoon	ERU	The 2020 rate for one ERU is $79.80 ($6.65 monthly). The temporary Flood Protection Program (FPP) levy of $27.00 ($2.25 monthly) is charged for each water meter .	$106.80
Alberta			
City of Calgary	Flat Fee	Storm Drainage Service Charge, $15.63/mo to fund capital improvement projects. Currently investigating a move towards a variable rate charge.	$187.56
City of Edmonton	Tiered Flat Fee	The charges are calculated as follows: A (property size) x I(development intensity) x R (runoff coefficient) x Rate = Land Drainage Utility Charge.	$167.36
St. Albert	Tiered Flat Fee	Storm Sewer Utility, monthly billing, Res'l $16.11/mo, Res'l (stacked/ condo) $11.08; Non-Res'l $43.09	$193.32
British Columbia			
Township of Langley	Parcel tax	Universal User Rate based on property tax for Stormwater.	$54.03
City of Surrey	Flat Fee	Distinguishes lowland from upland service areas, used for dyke measures. Rates determined by property class (Res/Recreational, Farm, Non-Res.	$227.00
City of Pitt Meadows	Tiered flat fee	Includes a utility charge based on assessed value of the property (drainage assessment) and a flat rate for residential properties or a charge per area for rural and commercial properties.	$98.31
District of West Vancouver	Drainage Levy	Drainage levy (flat fee) that depends on the type of property (single family residential, multi-family, or commercial).	$496.68
City of Richmond	Land Drainage Fee and Tax Levy	Annual Residential Drainage and Dyke System Fee = $171.72 (Flood Protection System Fees), Storm Drainage Residential Tax Rate = $0.03448	$207.03
City of Delta	Drainage Levy	Delta does not have a stormwater fee specifically, but there is a levy included in the taxes. In 2018, Drainage Levy is $0.1220/ $1000 taxable property value.	$67.10
City of Victoria	Stormwater User Fees	Rate based on impervious area, street type, land use and # of parking spaces.	$187.20
City of Chilliwack	Dedicated Tax Levy	Drainage Residential $0.15461/$1000 of Assessed Taxable Value	$61.84
City of Port Moody	Dedicated Tax Levy	Storm Drainage Residential $0.0745/$1000 of Assessed Taxable Value	$76.70
City of North Vancouver	Dedicated Tax Levy	Drainage levy is billed as part of the annual tax notice. Storm drainage tax rate: $0.05966 /$1000 taxable property value	$32.81
City of Abbotsford	Dedicated Tax Levy	Urban storm drainage levied on gross land. $0.14808 for >$5,000 improvements, $0.06581 for <$5,000 improvements, * $1000 assessed value. Assume average assessed value is $429,000	$63.53
City of Penticton	Tiered Flat Fee	Rate being phased in over 7 years. Categories include SFD, MF apart < 4 units, MF apart > 4 units, Condo, Farm/rec/nonprofit/supportive housing, Business/Industry < $300k CVA, Business/Industry 300k-800k CVA, Business/Industry >$800k CVA.	26.70 (but will increase significantly until 2025)

Knowing that the City is interested in a simple but sustainable stormwater funding solution, we will look at the following three options and how specific Canadian municipalities have implemented them in more detail:

- Dedicated Tax Levy
- Variable Stormwater Rate - Tiered Flat Fee
- Variable Stormwater Rate - ERU

3.6 Municipal Example – Dedicated Tax Levy

There are many examples of dedicated tax levies including the City of Prince George's GIRF, the Township of Langley's Stormwater Levy and the City of Delta's Drainage Levy. All of these levies were instated through a by-law and are charged through the City's property tax bill.

The greatest challenge with dedicated tax levies is that they are part of "property taxes" they receive public and political scrutiny if increases are proposed. Therefore, the amount of stormwater revenues tends to be limited when it is generated through property taxes or a dedicated tax levy (e.g. $50-$75 for an average single-family home). Whereas stormwater revenues tend to be greater (e.g. $100-$150 for an average single-family home) when the main revenue source is a stormwater rate. In 2019, the average singe family home in Prince George contributed approximately $62 to SWM. If the City were to fund its stormwater program at sustainable levels this would need to increase to $165 per household, which equates to a total tax increase of 3-5%.

3.7 Municipal Example – Tiered Flat Fee

Both the City of Vaughan and City of Penticton have implemented a stormwater rate that resembles a tiered flat fee. Their funding models are described in further detail below.

3.7.1 City of Vaughan

The City of Vaughan recently developed a stormwater rate that can be summarised in the following table. The charges shown are annual charges.

Table 8: City of Vaughan Annual Stormwater Charges

Property Type	Criteria	2020 Charge
Residential (low density)		$51.25
Residential (medium density)		$33.28
Residential (high density)		$201.35
Agricultural/vacant		$640.04
Non-residential (small)	< 1 acre	$45.96
Non-residential (medium)	1-10 acre	$1,187.54
Non-residential (large,rural)	10 acre	$10,680.83
Non-residential (large)	10 acre	$18,137.30

As can be seen in the table, the rates are based on:

- property type (residential by density, agricultural/vacant, non-residential urban, non-residential rural); and
- property size (by tiers) for non-residential properties, as well.

3.7.2 City of Penticton

The City of Penticton's stormwater rate can be summarised in the following table. As can be seen in the table, the rates are based on:

- Whether the property is directly connected to the municipal stormwater system;
- Property type (single family, multi-family apartments < 4 units, multi-family apartments > 4units, multi-family - strata, farm/recreational/non-profit, industrial/commercial); and
- Assessed value.

Table 9: Penticton Stormwater Fee Schedule

Property Type	2019-connected	2019 – no connection
SFD, farm, rec, non-profit	$26.70	$20.50
MF < 4 units	$42.80	$32.90
MF > 4 units, strata	$14.30/unit	$11.00/unit
Business/industry < $300k CVA	$54.10	$41.60
Business/industry $300k - $800k CVA	$81.20	$62.40
Business/industry > $800k CVA	$121.80	$93.70

3.8 Municipal Example – Variable Rate (ERU)

The City of Guelph has recently implemented a variable stormwater rate based on the Equivalent Residential Unit (ERU) funding model. Under the ERU funding model, all residential properties (from single family to condo) pay the same amount. Non-residential properties pay based on the amount of impervious surface on their properties. Non-residential properties can apply for a credit for up to 50% off their stormwater rate for peak flow reduction, runoff volume reduction, water quality treatment, education and pollution prevention.

4. Conclusions and Recommendations

4.1 Prince George Considerations and Recommended Funding Models

From the previous stormwater funding work and more recent public consultation work for general municipal budgeting, it appears that stormwater management is not the most pressing issue for residents of the City of Prince George. This will make it difficult for the City to engage residents about the need for a new stormwater funding model and will also make it difficult for stormwater managers to obtain sufficient funding from the general and existing dedicated tax levies when Council is being pressed by residents for other infrastructure such as recreational facilities and better sidewalks.

Due to the on-going lack of stormwater funding and the associated risks (e.g. collapsing culverts), it is recommended that the City pursue additional stormwater funding. In order to be successful, it is recommended that the City do the following:

- Explore simpler stormwater funding models than the tiered SFU model proposed in 2013, to reflect the desires of residents and City Finance staff; and
- Educate senior management, Council and the public on the need for improved stormwater management. Use real examples such as the recent collapsed culverts to demonstrate the need for increased stormwater funding. Also use financial information (e.g. the cost of emergency repairs vs planned maintenance) to demonstrate the financial benefits of maintaining the system in a planned rather than a reactive manner, and to demonstrate that the City of Prince George spends significantly less than other comparable municipalities on stormwater management..

Given current challenges with reduced municipal revenues due to COVID-19 and competing priorities for funding from the General Tax Levy City staff may want to consider a phased approach to stormwater funding. In the short-term, City staff may want to pursue additional stormwater funding through existing mechanisms (i.e. GIRF). If City staff are successful in achieving sustainable stormwater funding levels through the general tax levy and the GIRF, then the City could continue funding stormwater through these mechanisms. However, if the City cannot achieve long-term sustainable stormwater funding levels through the general tax levy and the GIRF, then we recommend that the City consider the following two funding models:

- A dedicated stormwater tax levy (example: Delta)
- An ERU based variable stormwater rate (example: Guelph)

The advantages and disadvantages for the two funding models listed above are outlined in the following table.

If the City chooses to gradually increase stormwater funding to sustainable levels, then we recommend they use a risk-based approach to identify the highest priority needs. The risk analysis completed as part of TWP #2 and the project prioritization framework completed as part of TWP #1, will help in this regard. In general, the following key elements are important for developing a cost-effective stormwater program:

- Strong bylaws that prevent contamination of the stormwater system, ensures that polluters pay for any required clean-up, and ensures that developers pay their fair share for new infrastructure;
- Strong Design Guidelines to ensure that new infrastructure is effective and has an acceptable life-cycle cost; and
- A strong maintenance program that allows the City to prevent costly infrastructure failures, extend the life of its assets and prioritize infrastructure spending.

Table 10: Advantages and Disadvantages of Two Funding Models for Prince George

	Advantages	Disadvantages
Dedicated Tax Levy	• simple • could likely be administered by existing staff on an on-going basis • can fund all existing and future activities within the City's stormwater program • use existing billing system • dedicated stormwater funding source	• inequitable: no correlation with a property's impact on the stormwater system • associated with the general tax levy, so will be subject to tax sensitive scrutiny • a credit system cannot be applied to properties that install on-site stormwater measures • tax exempt properties will not contribute
ERU Variable Rate	• relatively simple • could likely be administered by existing staff on an on-going basis • can fund all existing and future activities within the City's stormwater program • outside the general tax levy, so will not burden City revenues from property tax • a credit system can be applied to properties that install on-site stormwater measures • all properties (including tax exempt properties) will contribute • sustainable and dedicated stormwater funding source • equitable: the fee is proportional to the amount of stormwater runoff generated on-site • will encourage non-residential properties to reduce the imperviousness of their properties	• will require some effort to set-up, particularly with respect to the billing of properties that do not currently receive a utility bill (e.g. well and septic system) and the impervious area measurement of non-residential properties

With either of the two funding models, the City of Prince George may need to address rural versus urban properties since it is often perceived that rural areas receive a lower level of service with respect to stormwater management even though it is often not the case.

4.2 Public Education

In the previous stormwater financing work in 2012-2013 it was found that:

- Residents generally disapproved of any new fees or raising taxes;
- Residents were generally satisfied with the City's stormwater system and did not see a need to increase expenditures; and
- Residents/property owners who attended information sessions (e.g. open houses) were more amenable to a stormwater rate, albeit a simple model.

More recently, the City's public education work, including Talktobers show that stormwater management is not a high priority for City residents. At the same time, City staff are reporting the historical lack of funding for stormwater management and how that has begun to result in failing infrastructure and high repair costs. It appears that the public is unaware of the historical lack of stormwater funding and the risk that poses. Therefore, before residents accept a new stormwater funding model or increased stormwater funding, they must understand:

- The risks that low stormwater funding poses with real, short term examples that will directly impact residents; and
- The real benefits that residents will experience in the short term with increased funding.

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