



STORMWATER CREDIT PROGRAM REVIEW
PHASE 2
Final Report
City of Mississauga

2021-010
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**storm
water
charge**



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Executive Summary

A stormwater credit program is a way to promote and commit to maintaining stormwater practices while offering a user fee reduction to those properties that implement onsite controls. In January 2016, the City of Mississauga (the 'City') launched the Stormwater Charge which included a Stormwater Credit program. This credit was made available to institutional, commercial, industrial, and multi-residential (≥ 2 dwelling units) developments but not to single-unit residential dwellings. The stormwater credit, up to a maximum of 50%, is applied to the stormwater charge and reflected on the respective bill.

As the City's Stormwater Charge has been in effect for five years, a review of the current program is being conducted to assess improvements and required updates. In 2019, Resilient Consulting Corporation (Resilient), in partnership with Computational Hydraulics International (CHI), was retained by the City to complete a thorough review of their existing Stormwater Credit Program and considerations for pursuing incentives for residents, and recommended enhancements and improvements to the non-residential credit program. These recommendations were summarized in the 2020 Phase 1 Study (as described in **Section 2**), which is used as the basis for this report, known as the Phase 2 Study.

Overall, the main objective of the Phase 2 Study is to align the credit program with the City's current priorities while providing increased flexibility to the program to help achieve these goals. To update the current credit program, a variety of recommendations from the Phase 1 Study were evaluated in depth to solicit stakeholder feedback as well as to identify impacts to existing credit holders. These recommendations include:

- 1) Formalize the practice of allowing communal facilities to share credits.
- 2) Align credit criteria with development criteria through defining variable credit criteria for Peak Flow Reduction by geography and applying sliding scale criteria. Note that these were separate recommendations from the Phase 1 Study that have been assessed concurrently.
- 3) Change the maximum credit amounts in any credit category supported through further financial analysis.
- 4) Expand the list of eligible practices or measures to achieve credits and rename the "Pollution Prevention" credit category to "Operations and Activities" to increase credit opportunities.

Formalize Credit Sharing Process

While allowed for under the City's current credit program, a more formalized credit sharing process has been developed for inclusion in the City's Credit Application Guidance Manual, as discussed in **Section 5**. Based on the feedback received and internal discussions with City staff, the recommended process for sharing stormwater charge credits is described as follows:

- 1) Applicants enter into an agreement that identifies all signatory parties, their respective roles and responsibilities with respect to the communal stormwater facility, and their respective credit allocation (expressed as a percentage of the City-approved credit award for the shared facility).
- 2) Application is submitted to the City for approval.
- 3) City staff review the credit application and decide on the appropriate maximum credit to be awarded for the communal stormwater facility. A preliminary recommendation is to establish the maximum credit for the communal facility by treating the contributing area as a single parcel with a single charge/credit.
- 4) City staff distribute the credit to the applicable stormwater charge accounts based on details provided by the applicant.

The recommended application form checklist for shared credits is provided in **Appendix C**.

It is noted that in order to qualify for shared credits, all parties must meet the eligibility requirements for stormwater credits to be identified in the City's Credit Application Guidance Manual. In addition, all parties must have a stormwater charge account in good standing and not be in contravention of the City's sewer use bylaw.

Alignment of Credit Criteria with Development Criteria

As discussed in **Section 6**, alignment of credit criteria with development criteria for Peak Flow Reduction has been examined, including the inclusion/adjustment of sliding scale criteria.

Quantity Control

Alignment of the peak flow reduction credit to the existing development criteria requires special consideration as the quantity control requirements through development differ across all watersheds. Quantity control requirements in watersheds across Mississauga range from 100-year post-development flows controlled to 2-year pre-development levels, to no quantity controls required.

To align the peak flow reduction development and credit criteria, the updated program will issue full peak flow reduction credits for properties that apply and adhere to the applicable development criteria for the watershed specific to the site. In watersheds that do not require quantity control, peak flow reduction credit would be "not available" as the program is not set-up to provide credit for "over-controlling". Therefore, peak flow reduction credit will not be available to credit applicants in the following watersheds, based on current development criteria:

- Credit River
- Cumberland Creek
- Etobicoke Creek – lower and main branch
- Fletchers Creek
- Moore Creek

While peak flow reduction is not a concern for sites within these watersheds, other aspects of stormwater management remain important. To recognize sites with stormwater management measures for quality control and runoff volume reduction within these watersheds and throughout the City, the maximum credits in these other categories will be increased to provide opportunity for sites to achieve a maximum 50% credit without available credits in the peak flow reduction category.

Quality Control

In recognition of sites that may have stormwater quality controls that do not meet the "Enhanced" level of protection as defined by the Ontario Ministry of the Environment, Conservation and Parks (MECP) guidelines, it is recommended that a sliding scale of treatment levels be implemented. The current sliding scale for the percentage of impervious area treated would be maintained, while the sliding scale for treatment levels would be added based on:

- "Enhanced"/80% total suspended solids (TSS) removal would be eligible to achieve the full credit for this category;
- "Normal"/70% TSS removal eligible to achieve 75% credit; and,
- "Basic"/60% TSS removal eligible to achieve 50% credit.

In addition, through development quality control is currently deemed not required for properties that ultimately drain to a Municipal water treatment facility. The City recognizes the additional benefits of on-site treatment in these situations and will grant water quality credit to those that provide adequate on-site treatment regardless of the presence of a downstream facility.

Runoff Volume Reduction

The City's current development criteria requires all runoff from the first 5 mm of precipitation to be retained on site. The current maximum runoff volume reduction credit of 15% for 15mm is much more difficult to achieve during site development and would require additional stormwater management measures.

It is recommended to better align the credit runoff volume reduction criterion with the City's current priorities to incentivize runoff volume reduction. Maintaining the current sliding scale approach, the awarded credit is recommended to be doubled under these aligned conditions. In other words, a credit of 2%/mm is recommended resulting in a 10% credit to those that retain the minimum 5 mm as per the development criteria. To promote additional on-site retention, the credit is capped at 30% to allow for up to 15 mm of retention, similar to the current credit program.

Maximum Total Credit and/or Credit Category Percent Analysis

As discussed in **Section 7**, it is recommended that the maximum available credit at 50% remains unchanged with this update, but the available maximum credit in some categories adjusted to align with the City's current stormwater management objectives and goals. The purpose of increasing the maximum credit available per category is to increase applicant flexibility which may result in an increase in program uptake.

The available credit for peak flow reduction has been maintained at 40% (within watersheds with quantity control requirements). Proposed maximum credits for runoff volume reduction and water quality control categories have been increased to 30%.

To further increase flexibility for credit applicants and align credit criteria with City stormwater objectives, it is recommended to rename the Pollution Prevention category to "Operations and Activities" along with an increase in the maximum available credit to 20%.

Overall, the proposed alignment of peak flow reduction credit criteria to development criteria has some impacts to existing credit holders in some watersheds, however it is anticipated that many existing credit holders will benefit from the changes to the maximum credits available in each category and the expansion of eligible practices. In addition, alignment of the credit criteria with development criteria is considered good practice and increasing efficiency for both the City and credit applicants/holders.

Identify & Expand Eligible Practices

As discussed in **Section 8**, it was recommended in the Phase 1 Study to accept new eligible practices and to rename the "Pollution Prevention" credit category to "Operations and Activities" to increase credit opportunities and provide further flexibility for credit applicants.

Expansion of Potential Acceptable Technologies

Based on discussions with the City's review staff, and current industry practices, it is recommended that in conjunction with the stormwater charge credit program update, the City's Credit Application Guidance Manual should be revised to include the practices listed in **Section 8.1** as eligible for use towards credits for peak flow reduction, runoff volume reduction and water quality control, when supported by a stormwater management report sealed by a Professional Engineer. It is suggested that the list should not be intended to be all-inclusive and should remain non-descriptive as facilities not listed can be approved if proven adequate and supported by a Professional Engineer, demonstrating success of the practices to typical development criteria standards.

Operations and Activities Category

Several key recommendations for the Operations and Activities category have been developed:

- **Change in Category Name.** It is recommended to change the name of this credit category from “Pollution Prevention” to “Operations and Activities”. The name change is recommended to decouple the credit category from the City’s Storm Sewer Use By-Law and to allow for greater flexibility to grant credits for other actions that may also align with the intent of the City’s stormwater charge and credit programs.
- **Removal of Engineer Sign-off.** As it is recommended to broaden activities beyond pollution prevention planning and reduce barriers a Professional Engineer sign-off is proposed to no longer be required for this category. As discussed below, the list of eligible practices under this category typically do not require engineering analysis to support implementation, and therefore should not require sign-off from a Professional Engineer.
- **Increase Maximum Credit in Category and Allow a “Menu” Approach.** This category is recommended to have an increased maximum credit available which can be fully achieved by implementing multiple operations or activities listed within Section 8.2.3 as acceptable practices, instead of listing set requirements to achieve the maximum credit. This is known as the “menu” approach giving the applicants the flexibility to pick and chose which practices work best with their site conditions, land use and operations. The varying stormwater benefits to the City are recognized by awarding credits from 5% to 20%, depending on the level of benefit.

Stakeholder Engagement

As discussed in **Section 4**, a survey of stormwater charge account holders with approved credits (credit holders) was published and was available between April 26, 2021 and July 7, 2021. Eleven (11) responses were received with eight responses from property owners/managers, and three from consultants representing the credit holders. No respondents were very dissatisfied or very satisfied with the City’s existing credit program, with all respondents being somewhat dissatisfied (3 of 11), neither satisfied or dissatisfied (3 of 11) or somewhat satisfied (5 of 11). Respondents indicated that they were interested in:

- Greater flexibility to receive maximum total credit or maximum in a credit category (8 of 11);
- Align credits with development criteria (7 of 11); and,
- Expand eligible practices (5 of 11).

The findings of the survey indicate that the credit program is generally satisfactory, and the recommendations of the Phase 1 Study generally align with requests from credit holders.

In addition to the survey, two (2) digital meetings were hosted by the consulting team and the City to engage with various stakeholders affected by the proposed changes. The first meeting was conducted on June 30, 2021 to present the preliminary recommendations developed from the Phase 1 Study and solicit opinions on the proposed changes. The opinions of the stakeholders were documented and considered while refining the details of the recommendations. The refined recommendations were presented in a second meeting, hosted on September 15, 2021, where general agreement with the changes was received.

Further engagement with the local conservation authorities (TRCA and CVC) was conducted to solicit input on the proposed credit sharing process and checklist. A digital meeting was hosted with the local conservation authorities on May 18, 2021, to solicit input on the process and to ensure their initiatives aligned with the recommendation to formalize the credit sharing process. Their input was considered while refining the checklist and process. The checklist was circulated to both the TRCA and CVC in August with comments and recommendations received by the end of August.

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1 Introduction

The City's stormwater user fee, known as the Stormwater Charge, began in January 2016 and includes a Credit Program that reduces the fee for property owners that have installed, operate, and maintain eligible facilities or practices on their property. Credits are available to industrial, commercial, institutional, and multi-residential property owners but do not apply to low-density residential properties with a single dwelling unit. In Mississauga, the land area is approximately comprised of 80% non-residential and multi-residential properties and 20% residential properties.

As the City's Stormwater Charge has been in effect for five years, a review of the current program is being conducted to assess improvements and required updates. Resilient Consulting Corporation (Resilient), in partnership with Computational Hydraulics International (CHI), was retained by the City to complete a thorough review of their existing Stormwater Credit Program and considerations for pursuing a residential program, and recommended enhancements and improvements to the non-residential credit program. These recommendations were summarized in the Phase 1 Study (as described in **Section 2**), which is used as the basis for this report, known as the Phase 2 Study.

The Phase 2 Study was undertaken to build-on the findings from the previous report, assess impacts of the recommended changes, and provide an overall recommendation on any changes to the Stormwater Credit Program. A series of meetings were held with City staff, local conservation authorities, and various stakeholders between April 2021 and September 2021 to present study findings and refine the credit program adjustments that are described in this report.

Overall, the main objective of these updates is to align the credit program to the City's current priorities while providing increased flexibility to the program to help achieve its stormwater management goals. These shifted priorities include greater emphasis on water quality treatment and runoff volume retention to align with the City's development criteria. As a result, it is understood that an increase in uptake to the credit program may occur, but that improved stormwater management City-wide will be experienced.

2 Phase 1 Study

As the City's Stormwater Charge program was nearing its fifth year since implementation, a detailed review of the existing programs and policies was conducted to identify recommendations for potential improvements to the non-residential and multi-residential credit program and a renewed assessment of existing residential incentive programs. The project team was retained by the City in December 2019 to complete this Study. As part of the review, fourteen (14) municipalities and agencies across North America with established stormwater credit programs were selected as benchmark programs and contacted for an interview. The purpose of these interviews was to discuss the details of their existing program and to capture the successes and challenges experienced. The benchmarking feedback was separated into non-residential/multi-residential and residential credit programs to inform potential recommendations for each program.

Website materials from each benchmark community were reviewed and summarized in a standard table for comparison. A set of 29 questions regarding both residential and non-residential credit programs was developed as part of this study and sent to all benchmark municipalities and agencies. Follow-up phone interviews were conducted with managers or staff that work within the stormwater credit program with the purpose of soliciting opinions and lessons learned from their stormwater charge and credit programs.

From the benchmarking exercise, twelve (12) preliminary options were outlined for the City to consider enhancing their current credit program. These options were reviewed with the City and

prioritized based on options that align best with the City's stormwater objectives, which are feasible and can be implemented reasonably. The Phase 1 Study recommendations were received by City Council in November 2020 and the final report finalized in December 2020. The findings and further recommendations from this Study are described in the following section.

2.1 Phase 1 Study Findings

From the list of preliminary options for modifying and improving the current credit program for the City's consideration, it was recommended that:

- Simplified credits based on presumptive criteria should not be added.
- The existing credit program should not be increased in complexity.
- Stormwater grants and credit trading / offsetting should not be implemented.
- The City's maximum credit of 50% is appropriate as 9 of the 14 benchmark programs have a maximum credit set between 45-55%.

Of the options for consideration presented in the Phase 1 report, the following are those that were recommended as they would better align the program with the City's objectives and could be reasonably implemented:

- 1) *Formalize the process of allowing communal facilities to share credits:* Refine the existing program to allow for multiple property owners to claim credits for communal facilities that serve multiple adjacent properties. Credit amounts can be established based on contributing impervious area. This approach will increase customer flexibility and possibly encourage uptake but will require an update to the City's stormwater credit related policies.
- 2) *Define variable credit criteria for Peak Flow Reduction by geography:* To align with the existing stormwater development criteria for the watersheds throughout the City, it is recommended that the maximum credit available to each property be dependent on the applicable watershed. This will allow the City to encourage onsite stormwater management (SWM) where it will have the most impact and discourages the practice of receiving additional credit for "over-controlling" in areas where limited benefits are expected. This recommendation would best be coordinated with the City's current development standards to decrease administrative complexity and review time.
- 3) *Apply sliding scale criteria:* To provide flexibility to applicants in existing developed areas, a sliding scale is recommended for consideration. Different credit requirements would apply in the same watershed, depending on whether the facility is part of a new development or a retrofit on an already developed property. This encourages the uptake by property owners who are discouraged from applying for credit due to the prohibitively high cost of installing retrofit facilities that meet the current criteria. This option would make credits available to those who are not required to achieve the City's standards for new development.
- 4) *Change maximum credit in any category:* While the overall maximum credit of 50% compares well with the benchmark communities, an assessment could be conducted to determine the optimal maximum credits in each credit category. This provides flexibility to the City by allowing the credit to be maximized in the most influential category to achieve the City's stormwater management objectives and provide flexibility to applicants. This option can work in conjunction with credits assigned by geography.
- 5) *Accept new practices as eligible:* It is recommended to expand the list of eligible practices and to rename the "Pollution Prevention" credit category to "Operations and Activities" to increase credit opportunities. This approach will increase customer flexibility and possibly encourage uptake.

3 Scope of Phase 2 Study

The Phase 2 consulting assignment expands on the initial Stormwater Credit Program review (Phase 1 Study, fall 2020), completed by Resilient on behalf of the City. The objective of this assignment is to build on recommendations in the 2020 review, including:

- Undertaking a survey of existing credit holders (**Section 4**);
- Developing recommendations for formalizing the credit sharing application process (**Section 5**);
- Assessing the impact of aligning credit criteria with development criteria (**Section 6**);
- Assessing the maximum credits available in each credit category, including facilitating City staff meetings and summarizing the results of sensitivity/rate impact analysis to be completed by City Finance staff (**Section 7**);
- Identify and expand the list of practices considered as eligible for the credit (**Section 8**);
- Lead a series of public/stakeholder meetings to propose enhancements to the credit program (**Section 9**);
- Conclusions of consultation, analysis and recommendations (**Section 10**); and
- Next steps for implementation (**section 11**).

4 Existing Credit Holder Survey

An online survey was created to solicit feedback on the current credit program/application process and potential improvements to consider. The survey was circulated to various stakeholders including local conservation authorities, consultants, and previous and current credit holders as their experiences and opinions would be most informative. The survey was divided into five categories, and only provides multiple choice questions to ensure the survey was quick and easy to complete to maximize the number of responses. Refer to **Table 1** below for a list of the survey questions.

Table 1: Credit Holder Survey Questions

General	What type of applicant are you?
	How familiar are you with the credit program?
Application Process	Rate the application process.
	Which portion of the process could be improved?
Credit Renewal	Did you renew your credit in 2020/2021?
	If yes, rate the renewal process.
	If yes, what was your biggest challenge to satisfy the renewal?
	If no, what are your reasons for not renewing your credit?
Operations and Maintenance (O&M)	Rate your experience with satisfying your O&M Plan.
	Are you aware of the Credit Update Process to notify the City of changes to your O&M Plan?
Potential Improvements	Overall, how satisfied are you with the City's existing credit program?
	If the program eligibility could be improved, which of the following would you be interested in?

The survey was released to almost 30 previous and existing credit holders and stakeholders and was open for over 2 months starting on April 26, 2021 and closed on July 7, 2021. The survey was extended by 1 week from the intended closing date to allow stakeholders additional time to provide feedback after the first stakeholder meeting, held on June 30, 2021. Overall, 11 survey responses were received, and the findings are summarized below with the entire survey results provided in **Appendix A**.

4.1 Survey Findings

Of the 11 responses, 8 were from property owners/managers, and 3 were from consultants. 55 percent of the respondents stated that they are very familiar with the existing credit program, with the remaining responses ranging from moderately familiar to a single person not at all familiar with the program. The following general trends were observed:

- Only 2 of 11 respondents were either very dissatisfied or somewhat dissatisfied with the application process;
- 7 of 11 respondents suggested that the required documentation could be improved;
- 10 of 11 respondents renewed their credit in 2020/2021, with only 1 respondent somewhat dissatisfied with the renewal process;
- No respondents were very dissatisfied or very satisfied with the City's existing credit program, with all respondents being somewhat dissatisfied (3 of 11), neither satisfied or dissatisfied (3 of 11) or somewhat satisfied (5 of 11);
- When asked if program eligibility could be improved, respondents would be interested in:
 - Greater flexibility to receive maximum total credit or maximum in a credit category (8 of 11);
 - Align credits with development criteria (7 of 11); and,
 - Expand eligible practices (5 of 11).

5 Credit Sharing Process

The typical credit application is for individual property owners to claim stormwater credits for facilities that capture and treat runoff from their property. However, there may be cases where a stormwater facility could receive runoff from multiple properties where property owners would be willing to share the cost of construction and/or operations and maintenance between contributing properties in exchange for shared stormwater credits. While the City allows for credit sharing, specific policies and procedures have not been formalized.

A recommendation from the Phase 1 study was to formalize the process that would allow communal stormwater facilities to share credits among contributing property owners. Under this process, multiple property owners could apply to claim fractional credits if their property discharges to a communal facility.

5.1 Policy and Procedure Considerations

Based on feedback received from interested stakeholders, the City's motivation for formalizing this option is primarily to provide more flexibility and opportunities that may encourage uptake among property owners in a retrofit scenario rather than a development application. The benefits to property owners may include the potential to improve the payback period for stormwater facility investments since construction and maintenance costs as well as stormwater credits can be distributed among multiple parties.

The City's role is in developing an appropriate process for administering a credit sharing application through formal policies and procedures. The allocation of shared credits would likely be based on contributing impervious area or some other cost-share formula acceptable to the contributing property owners.

Since credit sharing is considered a private initiative, the City would not be responsible for advising applicants on credit allocation, be a party to any multi-party agreement nor mediate or arbitrate should a disagreement among property owners regarding credit allocation or other issues occur (e.g. failure to meet conditions of credit renewal). To address this concern, a written multi-party agreement would need to be in place as a condition of credit sharing application approval. This agreement would specifically identify the credit allocation for the various contributing property owners and their respective roles and responsibilities. Another concern is identifying the responsible party in a shared credit application. As a result, the agreement should specifically appoint an individual/entity who is responsible for the shared credit application, operations and maintenance requirements and any other administrative details associated with multiple billing accounts that receive a credit share on behalf of the other contributing property owners.

5.2 Engagement with CVC, TRCA and City

The project team met with staff from Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority (TRCA). Preliminary ideas for the credit sharing process were presented and feedback received from the conservation authorities at a meeting held on May 18, 2021. Meeting minutes are provided in **Appendix B**.

It was noted during the meeting that, apart from an industrial site in the Southdown district, the attendees had not been aware of interest from other property owners concerning shared credits. Through the Credit Survey, there was some interest in potential credit sharing. The conservation authorities recommended the City launching an educational campaign to present changes to the current credit program, including details of the credit sharing process. It was suggested that examples of different credit sharing scenarios could be provided in the City's guidance documents to assist applicants. Another suggestion was that the responsible party or "host" of a communal facility receive a higher maximum credit than contributing properties; it was felt that this could further increase uptake.

On August 9, 2021, additional feedback was solicited from the local conservation authorities on the proposed credit sharing process through circulation of the updated application form checklist. Both the CVC and TRCA provided comments by August 30, 2021, for the City's consideration. Overall, the feedback from the conservation authorities is positive and in general agreement with the credit sharing process. Feedback and comments are provided in **Appendix B**.

Internal meetings were also held with City staff from various departments on June 11 and June 22, 2021 to discuss the proposed credit sharing process as well as a preliminary credit sharing application form checklist. A consensus opinion was reached on the guiding principles and general approach for the credit sharing process. The project team further refined this into the recommendation described below.

5.3 Recommended Credit Sharing Application Process

Based on the stakeholder feedback received and internal discussions with City staff, the recommended process for sharing stormwater charge credits is described as follows.

1. Applicants enter into an agreement that identifies all signatory parties, their respective roles and responsibilities with respect to the communal stormwater facility (a responsible party is

- required to be identified), and their respective credit allocation (expressed as a percentage of the City-approved credit award for the shared facility).
2. Application is submitted to the City for approval.
 3. City staff review the credit application and decide on the appropriate maximum credit to be awarded for the communal stormwater facility. A preliminary recommendation is to establish the maximum credit for the communal facility by treating the contributing area as if it was a single parcel with a single charge/credit. Refer to **Figure 1** in **Appendix C** for an example drainage area plan showing runoff from two property owners to one communal, private stormwater management pond.
 4. City staff distribute the credit to the applicable stormwater charge accounts based on details and multi-party agreement provided by the applicant.

The recommended application checklist for shared credits is provided in **Appendix C**. To qualify for shared credits, all parties must meet the eligibility requirements for stormwater credits as identified in the City's Credit Application Guidance Manual. In addition, all parties must have a stormwater charge account in good standing and not be in contravention of the City's Storm Sewer Use Bylaw.

The application identifies a single responsible party, and the submission must include the multi-party agreement as well as the operation and maintenance plan for the communal facility.

Renewal applications for shared credits would require that signatory parties to the agreement collectively certify that:

- Agreement is still valid;
- Facilities have been adequately inspected on an ongoing basis;
- Facilities are functioning as designed; and,
- Regular maintenance and corrective activities have been completed according to their approved operation and maintenance plan.

Updated applications for shared credits would be required for a *Material Change*, as defined in Stormwater Fees and Charges By-law 0295-2020, made to any property that could affect the distribution or validity of approved credits.

Additional guidance may be available from the local conservation authorities and the following websites may provide supporting information useful to prospective credit sharing applicants:

- Sustainable Technologies Evaluation Program (STEP) at <https://sustainabletechnologies.ca/>
- Partner in Project Green at <https://partnersinprojectgreen.com/>

6 Aligning Credit Criteria with Development Criteria

As discussed in **Section 2.1**, the Phase 1 study made two recommendations to better align the credit categories with the City's development criteria:

- Define variable credit criteria for Peak Flow Reduction by geography: To align with the existing stormwater criteria for the watersheds throughout the City, it is recommended that the maximum credit available to each property be dependent on the applicable watershed. This will allow the City to encourage onsite SWM where it will have the most impact and discourages the practice of achieving additional credit for "over-controlling" in areas where limited benefits are expected. This recommendation would best be coordinated with the City's current development standards, otherwise it might require significant changes, increase administrative complexity and review time.
- Apply sliding scale criteria: To provide flexibility to applicants in existing developed areas, a sliding scale is recommended for consideration. Different credit requirements would apply in

the same watershed, depending on whether the facility is part of a new development or a retrofit on an already developed property. This encourages potential uptake by property owners who are discouraged from applying for credit due to the prohibitively high cost of installing retrofit facilities that meet current development criteria. This option would make credits available to those who are not required to achieve the City's current development standards.

As both of these recommendations could affect how applicants could achieve maximum credits in each category, they are somewhat linked and will be discussed and analyzed together. To complete the analysis of these recommendations, the following steps were completed:

- Review and summarize existing development criteria;
- Review a sample of current credits by watershed;
- Compile aligned credits by category, allowing for sliding scale criteria; and,
- Assess the potential impact of aligned credits.

6.1 Summary of Development Criteria versus Credit Criteria

Quantity (Peak Flow Reduction) Control

As previously mentioned, City's current practice is to assign quantity control criteria for development on a watershed or sub-watershed specific basis. Quantity control requirements are determined with the input of Conservation Authorities and typically involve the completion of various watershed/sub-watershed studies to determine control levels. Quantity control requirements range from no control required, to 100-year post-development controlled to 2-year pre-development levels or specified release rates. The City's stormwater quantity control requirements for development are provided in **Appendix D**.

Credits for quantity control (i.e. Peak Flow Reduction) are currently applied on a sliding scale basis. To achieve a maximum credit of 40% for quantity control, the applicant must demonstrate that the peak flow from the site during the 100-year return period event under post-development conditions is reduced to the peak flow from the site during the same event under pre-development conditions. If the target is not fully met, the fraction of the target met is multiplied by 40% to determine the credit amount awarded for peak flow reduction.

Quality Control

The quality control requirement for development within the City is to achieve "Enhanced" level of protection as refined by MECP guidelines by removing 80% of total suspended solids (TSS) on an annual basis from runoff generated by the site. This is consistent with the credit criterion for quality control. The percentage allocated for the quality control credit is based on the percentage of the impervious area that is directed to an approved on-site quality control BMP that provides "Enhanced" treatment. This provides a sliding scale with regards to the percentage of the site being treated.

However, in regard to the level of treatment, quality control is not applied on a sliding scale basis. Currently, if a credit application does not achieve "Enhanced" level of protection, it is not eligible for a quality control credit. Some sites within the City may provide quality control to a lower treatment standard (with a lower annual TSS removal percentage), and currently these sites would not be eligible for any credits under the quality control criterion.

Further, the current development criteria for quality control is optional where the development site ultimately drains to a City facility designed for "Enhanced" level of protection. Although it is not required, the City recognizes the benefits associated with on-site quality control prior to discharging

to the City-owned facility. Therefore, ICI properties providing upstream, on-site quality treatment will be eligible for the water quality credit.

Runoff Volume Reduction

The City's current development criteria requires that the runoff from the first 5 mm of precipitation be retained on site. The current credit criterion for runoff volume reduction is based on the capture of the first 15 mm of rainfall. A site which fully retains the first 15 mm of rainfall would achieve a maximum credit of 15%. A sliding scale credit is currently applied using 1% per mm of retention achieved. As an example, a site which retains the first 3 mm of rainfall would achieve a 3% credit, and a site which retains the first 7 mm would achieve a 7% credit.

Based on the current development and credit criteria, new development sites should achieve 5% credit based on meeting development criteria.

6.2 Credit Review Summary

To gain an understanding of current credit allocation by watershed, and assess potential changes, a detailed review of 61 active credit applications and supporting engineering reports across 17 of the City's watersheds was completed. The applications were selected by the City to cover various credit types and subwatersheds and represent approximately one third of the current total applications. Although 61 applications were reviewed in detail, a master excel sheet of all the active credits in the City was provided to aid in developing trends city-wide.

Through the detailed review, the Consultant Team analyzed and documented several key parameters including:

- Site area, impervious area, and runoff coefficient;
- Pre-development peak flows (100-year and 2-year);
- Post-development uncontrolled peak flows (100-year and 2-year);
- Post-development controlled peak flows (100-year and 2-year);
- Level of quality control treatment;
- Amount of volume reduction;
- Total site stormwater charge; and,
- Total site stormwater credit.

To assess the impacts of aligning the peak flow reduction credit criteria to the development criteria, the 2-year pre-development site flow was recorded for watersheds with a 2-year level of control. The 2-year flow was typically not provided in the credit application, as current requirements are only for the 100-year, and therefore the rational method was used to establish the updated target release rate. The City's Intensity-Duration-Frequency (IDF) parameters, minimum time of concentration (15 mins), site area, and runoff coefficient of 0.25 were applied.

The level of quality control was also recorded in the analysis, since a sliding scale approach is being considered to allow credit for facilities achieving Normal (70% TSS) and Basic (60% TSS) level quality control. During this review, it was noted that very few sites are claiming quality control credit and that the majority of reviewed sites drain to a City-owned treatment facility and therefore do not have on site water quality controls eligible for a water quality credit as such controls were not required through development. A summary of the City's treatment facilities was provided with the level of quality control outlined, although not confirmed during this review.

The impervious area of each site was recorded to calculate the estimated stormwater charge based on the City's current billing unit. The City's online tool for estimating the stormwater charge was used to confirm each applicant's estimated charge. The total credit issued under the existing program and

proposed aligned program were calculated to assess the impacts to the available credit for all reviewed applications. The purpose of this comparison is to identify the existing credit accounts that will experience a change in available credit as a result of the aligned criteria. The potential financial implications of this change are further explored in the **Section 6.4**.

6.3 Potential Aligned Criteria

Quantity (Peak Flow) Control

Aligning the peak flow reduction credit to the existing development criteria requires special consideration as the quantity control requirements differ across all watersheds. To fully align the criteria, the maximum available credit for peak flow reduction may be granted to non- and multi-residential properties that fully satisfy the quantity control requirements for their specific watershed, as outlined in the development standards.

As previously noted, the existing quantity control development criteria range from 100-year post-development flows controlled to 2-year pre-development levels, to no quantity controls required. As a result, in watersheds that do not require quantity control, a peak flow reduction credit would be “not available” given that “over-controlling” would not provide meaningful benefits to the watershed or the City overall. Therefore, it is proposed that peak flow reduction credit will not be available to credit applicants in the following watersheds, based on current development criteria:

- Credit River
- Cumberland Creek
- Etobicoke Creek – lower and main branch
- Fletchers Creek
- Moore Creek

While peak flow reduction is not required for sites within these watersheds, other aspects of stormwater management remain important throughout the entire City. In keeping with the City's other initiatives, the maximum available credit for water quality control and volume retention are recommended to significantly increase. As these types of controls are required per development criteria, the maximum 50% credit should be easily attainable for any future developments.

Various watersheds require control to the pre-development 2-year levels or unit flow rates which result in more stringent controls than the current 100-year post to 100-year pre requirements of the credit program.

While it is recognized that some existing peak flow credits will be impacted through the alignment of the credit and development criteria (see **Section 6.4**), those that satisfy multiple credit categories may receive or be eligible for an increased credit due to the recommended maximum credit by category revisions discussed in **Section 7**. Overall, the proposed changes better align with the City's current objectives and recognizes the benefits of a more holistic stormwater management approach that includes peak flow reduction, water quality treatment, volume reduction and other operations and maintenance practices.

Quality Control

As outlined in the development standards, those properties that currently drain to a Municipal water treatment facility are not required to implement on-site water quality treatment. The City recognizes the benefits associated with a treatment train approach by implementing on-site water quality treatment. Therefore, the City will assign water quality credits to those properties that provide on-site quality treatment regardless of the presence of a downstream treatment facility.

In recognition of sites that may have stormwater quality controls that do not meet the “Enhanced” level of protection as defined by MECP’s guidelines, it is recommended that a sliding scale for treatment levels be implemented. It is noted that water quality treatment below 60% TSS removal, or “Basic” level treatment, will remain ineligible for water quality credit. The current sliding scale for the percentage of impervious area treated would be maintained, the sliding scale for treatment levels would be added based on:

- “Enhanced”/80% total suspended solids (TSS) removal would be eligible to achieve the full credit for this category;
- “Normal”/70% TSS removal eligible to achieve 75% credit; and,
- “Basic”/60% TSS removal eligible to achieve 50% credit.

Examples of applying the recommended sliding scale for quality control are provided in **Table 2** below. Note that the maximum quality control credit has been proposed to be increased to 30% as further discussed in **Section 7**.

Table 2: Example Water Quality Sliding Scale Calculations

Example Site	Proposed Maximum Quality Control Credit	% of Site Impervious Area Treated	Treatment Level	Calculation Quality Control Credit
1	30%	100%	Enhanced	$30\% \times 100\% \times 100\% = 30\%$
2	30%	70%	Enhanced	$30\% \times 70\% \times 100\% = 21\%$
3	30%	100%	Basic	$30\% \times 100\% \times 50\% = 15\%$
4	30%	60%	Normal	$30\% \times 60\% \times 75\% = 13.5\%$

Runoff Volume Reduction

As discussed in **Section 6.1**, the City’s current development criteria is for all runoff from the first 5 mm of precipitation to be retained on site. This requirement has become relatively standard industry practice for developments across the Greater Toronto Area and may be met through a number of low impact development practices. The current maximum runoff volume reduction credit is 15% and is obtained by retaining the first 15 mm of precipitation. This is considered much more difficult to achieve by the development industry and would typically require additional stormwater management measures.

To refine these criteria while providing incentives to property owners who may wish to retain additional runoff on site, it is recommended to increase the maximum credit available for this category as discussed in **Section 7**. The existing sliding scale approach will be maintained, but credit will be doubled per millimeter retained. In other words, the existing 1%/mm retained will be increased to 2%/mm under these aligned conditions. Sites which meet the current development criteria of retention of the first 5 mm of precipitation would receive a 10% credit. Sites that provide runoff volume reduction in excess of development requirements would have increased maximum credits up of to 30% for retaining the first 15 mm of precipitation.

6.4 Potential Impact of Alignment of Credit Criteria to Development Criteria

As noted above, the alignment of credit criteria to development criteria could have impacts to existing and new applicants interested in applying for future stormwater charge credits. It is recommended, in recognition of the investment that credit applicants have made in applying for the credit, any existing credits will maintain their current credit amount until their next renewal. Should the applicant

wish to renew the credit, the updated criteria will then apply which may affect the total credit amount. For applicants who wish to update their credit amount prior to renewal (i.e. they are eligible to receive a higher credit under the updated program), they may submit a Credit Update Application to the City.

Based on the recommended alignments to the development criteria as discussed in **Section 6.3**, applicants will see potential increases in available credits related to runoff volume reduction and quality controls. However, the changes to the peak flow reduction criterion may result in reduction of available credits to some current credit holders. To assess this potential impact, the recommended changes were tested against the credit applications reviewed as discussed in **Section 6.2**.

A representative sample of 61 credit applications were reviewed and the following general trends were observed:

- 23 sites do not experience any impact to their existing credit amount.
- 1 site experienced additional credit for peak flow reduction
- 31 sites (approximately 51%) experience a reduced credit or are no longer eligible for peak flow reduction credits.
 - 11 sites were no longer eligible to receive peak flow reduction credits.
 - Peak flow reduction credits for 20 sites were reduced under the new criteria.
- Of the 20 sites with reduced credits for peak flow reduction, there were increases in credits for water quality and runoff volume reduction for 1 site. It is noted that only 1 site currently claims an additional credit beyond the peak flow reduction category.
- Those that currently receive the maximum credit of 50% maintains full credit under the new criteria. This was experienced for 1 site within the scope.
- 7 sites experience an increase to their existing credit amounts under the new criteria. All of these sites either implement just water quality treatment, or a combination of multiple credits.
- The largest decrease in credit are located in watersheds that are no longer eligible to receive peak flow reduction credits.
- Generally, most credits impacted relate to peak flow reduction as the overwhelming majority of applicants apply for this category and very few apply for water quality or runoff volume reduction.

While the proposed alignment of peak flow reduction credit criteria to development criteria could have potential negative impacts to existing credit holders in some watersheds, it is anticipated that many existing credit holders and future credit applicants will benefit from the changes to the maximum credits available in each category (**Section 7**) and the expansion of eligible practices (**Section 8**), ultimately minimizing the amount of credit lost or even increase available credits for some sites. In addition, alignment of the credit criteria with development criteria is considered good practice and process efficiency for both the City and credit applicants. Instead of preparing separate peak flow reduction calculations for credit applications, applicants with new developments will now be able to submit the stormwater management reports prepared for their developments in support of their credit applications, and City reviewers will not require significant review time.

7 Maximum Total Credit and/or Maximum Credits by Category

The Phase 1 Study found that the overall maximum credit of 50% compares well with benchmark communities throughout North America, but recommended that an assessment be completed to determine the optimal maximum credits in each credit category. As a result, the consulting team assessed the impacts through a detailed review of applications in terms of overall credit percentages and impacts to current credit amounts. This detailed credit impact assessment is included in

Appendix E for reference. Refer to **Table 3** below for a summary of the credits available under the existing Stormwater Credit Program.

Table 3: Summary of Existing Credit Program

Credit Category	Description / Basis for Fee Reduction	Maximum Credit
Peak Flow Reduction	Percent reduction of the 100-year post development flow to pre-development conditions of the site.	40%
Runoff Volume Reduction	Percent capture of first 15 mm of rainfall during a single rainfall event.	15%
Water Quality Treatment	Percent of site (hard surface) receiving water quality treatment consistent with Provincial criteria for enhanced treatment.	10%
Pollution Prevention	Develop and implement a pollution prevention plan.	5%
Maximum Non-Residential Credit Available (Capped)		50%

7.1 Maximum Total Credit

At this time, it is recommended to maintain the maximum 50% total credit with the following rationale:

- From the benchmarking assessment in the Phase 1 Study, an overall maximum credit of 50% is considered reasonable as this was the median of all reviewed communities.
- Based on our review of existing credit applications as discussed in **Section 6.2**, only one application requested and was awarded the full 50% credit.
- The overall objective of these program changes is to provide appropriate credits to sites whose stormwater management measures reduce the load on the City's stormwater system. The recommended adjustments are intended to increase efficiency and flexibility of the credit program, making it easier to utilize. The focus is not simply increasing credit for existing holders and future applicants.
- Funding from the stormwater charge is used to support the City's stormwater system. The potential revenue impacts associated with increases to the maximum credit would need to be understood as they are offset by an increase to the charge rate.
- It is worth noting that one of the founding principles of the Stormwater Charge is to have a fair 'user fee' whereby the greatest stormwater generators (i.e. Non-Residential lands) are charged accordingly. The amount of credits given reduces total Stormwater Revenue and as such must be balanced with the impact or additional burden passed onto other users (i.e. Residential properties) from corresponding rate increases.

It is therefore not recommended to change the maximum credit amount. However, consistent with the recommendations of the Phase 1 Study, it is recommended to examine the maximum credit available in each credit category as this will increase flexibility to credit applicants and better align the credit program with the City's overall stormwater management goals.

7.2 Maximum Credits by Category

As discussed in **Section 6.4**, changes to the credit program are recommended to better align credit criteria with development criteria and to be in better alignment with the City's general objectives for stormwater management. In conjunction with these changes, the maximum credits in each category

are being evaluated. This evaluation is intended to propose additional flexibility to maximize credits in categories.

The advantages include:

- Credit allocations can be adjusted to better reflect the City's stormwater management objectives, particularly when coupled with the geographically varied peak flow reduction credit criteria as discussed in **Section 6**.
- By increasing the maximum credits available in each category, there is increased flexibility for applicants, which may allow applicants to obtain higher credits while helping support the City's stormwater management goals.

Impact considerations include:

- Staff time to establish and implement the process.
- Concerns from existing credit holders and impact to their credit amount.
- Data management system and online application portal to be updated.

7.3 Alignment of Maximum Credit in Categories with City Stormwater Management Priorities

The current Stormwater Credit Program places an emphasis on peak flow reduction (quantity control), followed by runoff volume reduction, water quality control, and lastly pollution prevention. Over time, the City's stormwater management objectives have evolved to place greater emphasis on volume reduction and water quality control, which aligns with the City's on-going Stormwater Master Plan. The City is therefore seeking to align the available credit in these categories to promote uptake of runoff volume reduction and water quality treatment with a goal of reducing runoff and improving the condition of stormwater draining into its system, watercourses and Lake Ontario. Although there is a shift to promote runoff volume reduction and water quality treatment through the City, peak flow reduction (as determined to be required by watershed planning) is still very important and is proposed to remain eligible for the 40% credit where required by development criteria.

Further, the credit application review (as summarized in **Section 6.2**) demonstrated that there are no active credits for Pollution Prevention. This review highlighted the lack of interest and uptake of the pollution prevention credit which is likely a result of the application requirements and low available credit. Per the credit application guidance manual, a maximum 5% credit is available to those who submit an approved pollution prevention plan for handling, replacement or reduced use of harmful materials used or created on the subject property. The requirements of the pollution prevention plan are outlined in Schedule 'A' of the City's Storm Sewer Use By-law 0259-2005 and include dye-testing to ensure the system is in good condition and often necessitates sign-off from a professional engineer. A pollution prevention plan meeting the requirements of the by-law is onerous, and potential credits low

Although the requirements of the pollution prevention plan protect water quality by preventing spills and contamination, it does not satisfy the development criteria or credit criteria requirements for water quality. Therefore, it is recommended to broaden the existing Pollution Prevention category to recognize the stormwater benefits that other non-structural measures provide. These measures better align with the City's overall stormwater objectives and will have an improved benefit to the City's overall stormwater system. The proposed category changes are discussed in **Section 8.2**.

7.4 Proposed Maximum Credits by Category

The purpose of increasing the maximum credit available in three categories is to increase applicant flexibility which may encourage greater uptake and supports the City's stormwater objectives. The

available credit for peak flow reduction has been maintained at 40% (within watersheds with quantity control development requirements). This is particularly important for watersheds that do not require peak flow reduction per the City's site development standards and are therefore ineligible to receive the peak flow reduction credit. Water quality and runoff volume reduction are requirements for development and can achieve the full maximum credit of 50% if implemented to the requirements of the credit program.

To further increase flexibility for credit applicants, it is recommended to rename the Pollution Prevention category to "Operations and Activities" along with an increase in the maximum available credit to 20%. Based on the qualitative stormwater benefit potential associated with this category it is recommended that the available credit be increased; however, the credit is capped at a maximum of 20% as practices covered in this category are not considered as "engineered" and may not be fully relied upon to meet the City's stormwater management objectives. The intent of changes to this category is to recognize the resulting benefits (environmental, enforcement, etc.) with implementing "soft" practices such as education programs and other non-structural measures. These changes aid in maximizing the credit for property owners that seek to retrofit their site with practices to improve stormwater management. The revised category is further discussed in **Section 8.2**.

As discussed in **Section 7.1**, the maximum available credit at 50% remains unchanged with this update but increases to the allowable maximum credit under three categories is being proposed to reflect the City's current stormwater management priorities. To date, there has only been one application that has achieved the 50% maximum credit. However, with the adjusted maximum credits in each category and alignment with the development criteria, it is anticipated that the City will receive more applications that would meet the maximum credit of 50%. At a minimum, the average credit claimed should be expected to increase. Refer to **Table 4** below for a summary of the updated maximum credits available in each category.

Table 4: Summary of Updated Credit Maximums per Category

Credit Category	Current Maximum Credit	Updated Maximum Credit (Watershed without Peak Flow Reduction Criteria)	Updated Maximum Credit (Watershed with Peak Flow Reduction Criteria)
Peak Flow Reduction	40%	N/A	40%
Runoff Volume Reduction	15%	30%	30%
Water Quality Treatment	10%	30%	30%
Operations and Activities	5%	20%	20%
Maximum Non-Residential Credit Available (Capped)	50%	50%	50%

7.5 Overall Financial Impact to the City

The City of Mississauga conducted a detailed financial review and sensitivity analysis to identify and forecast potential impacts to stormwater revenue from implementing the proposed recommendations to the credit program. The review was conducted from the perspective of an existing credit holder as well as new applicants to the credit program. This analysis was out of scope for the consultant

assignment and further information and discussion can be found in the City's Corporate Report taken to General Committee on October 20, 2021.

8 Identify & Expand Eligible Practices

The Phase 1 Study recommended that the Stormwater Credit Program consider accepting new eligible practices and to rename the "Pollution Prevention" credit category to "Operations and Activities" to increase credit opportunities and provide further flexibility for credit applicants.

This task included consulting with the City's Development Application Review staff regarding practices currently being designed on development sites and with the City's Environmental Engineering staff regarding potential changes to the Pollution Prevention plan credit. Key points from discussions with these staff are summarized in the following sections, and meeting minutes provided in **Appendix B**.

8.1 Expansion of Potential Eligible Technologies

The current Stormwater Charge Credit Application Guidance Manual (2015) lists numerous practices that are considered as eligible technologies for meeting the stormwater credit requirements for peak flow reduction, runoff volume reduction or quality control. The field of stormwater management is constantly evolving, and therefore it was recommended in the Phase 1 Study to revisit the list of eligible practices that can be used to obtain credits. This approach is intended to increase flexibility to receive credit, foster innovation and potentially encourage uptake of new stormwater management/LID technologies.

A meeting with the City staff responsible for stormwater management review was held on May 14, 2021, to conduct an open discussion regarding the current list of eligible facilities and the potential expansion of this list to cover measures not currently listed in the City's Credit Application Guidance Manual. The current list of eligible facilities in the City's Guidance Manual includes the following:

- Infiltration galleries;
- Permeable pavement;
- Rainwater cisterns;
- Enhance vegetated swales;
- Constructed wetlands;
- Stormwater ponds;
- Rain gardens / bio-retention systems; and,
- Oil-grit separators.

During this discussion, the development reviewers indicated that a variety of stormwater management practices are currently being proposed in development applications. When reviewing development applications, the City's general approach is that all facilities/technologies may be acceptable provided that they are supported by engineering opinion and the practice or measure can be successfully demonstrated to satisfy current development criteria and standards.

Typical practices include rooftop controls which has been noted to be transitioning to other various forms including green roofs, rooftop ponding, and blue roofs. Although the Ministry of Transportation (MTO) does not recognize rooftop controls, the City and local conservation authorities do recognize these practices and are typically approved by the City. Other topics discussed include:

- Water Quality Credit – currently, the City's water quality control credit is only issued for those properties achieving enhanced level control but nothing below that (i.e. normal or basic level). In locations across the City, some properties ultimately drain to a municipal facility providing quality control but in addition may have various levels of on-site treatment (none, basic,

normal, enhanced) that contribute to better overall water quality. Therefore, a sliding scale approach for water quality credit could be considered for basic level control (60% TSS removal), and normal level control (70% TSS removal).

- Permeable Pavers – Currently, the City only recognizes water quality and runoff volume reduction using permeable pavement products that provide sufficient storage volume through the development process. However, the current credit program allows peak flow reduction credit for these same facilities which should be reconciled with the updated credit program.
- Inlet Control Devices (ICD) – the City considers ICD's such as CB inserts, orifice plates, and vortex controls temporary as these measures can be more easily modified or removed. To satisfy quantity control criteria, the City has approved vortex controls / plates where more permanent measures could not satisfy the site development requirements due to small site sizes or other site constraints. Therefore, these measures could be eligible for peak flow and water quality credits (as applicable) if demonstrated through the engineering design review
- Downspout Disconnection – the City will not consider downspout disconnection as a stormwater management control or eligible for stormwater credit as this is already a development requirement of the City and promoted by the Region of Peel, under a separate initiative.
- Amended Topsoil Depth –The City is not currently approving amended topsoil depth as a volume reduction control or for credit.
- Tree Canopy – the City does not currently recognize tree plantings as eligible for credit which was a common theme amongst the benchmark communities. Credits for tree plantings over a specified trunk diameter or canopy footprint on private property could be explored as a non-structural measure.

Based on discussions with the City's review staff, and current industry practices, it is recommended that in conjunction with the stormwater charge credit program update, the City's Credit Application Guidance Manual be revised to consider the follow practices as eligible for use towards credits for peak flow reduction, runoff volume reduction and water quality control, when supported by a stormwater management report sealed by a Professional Engineer:

- Planters
- Exfiltration systems
- Rainwater harvesting systems
- Ditching
- Green roofs for runoff volume reduction
- Inlet/outlet control devices for peak flow reduction
- CB inserts or other in-sewer devices for quality control
- Baffle systems

It is recommended that the list be updated to broaden the eligible facilities as noted above, but that the list should not be intended to be all-inclusive and should remain non-descriptive as facilities not listed can be approved if proven adequate and supported by an approved stormwater management report sealed by a Professional Engineer, demonstrating that the practices satisfy development criteria and standards.

8.2 Operations and Activities Category

The current Pollution Prevention credit is historically not applied for likely due to the stringent requirements and low available maximum credit. Through the benchmarking exercise in the Phase 1 Study, it was noted that many of the benchmarked programs had an "Operations and Activities" category to issue credits for non-structural measures such as educational programs, risk and salt

management plans, and/or strategic initiatives such as planting. Generally, this category contained presumptive performance practices that did not require sign-off from an engineer, making the credits easier to claim but resulting in lower available credit relative to other criteria such as peak flow reduction, runoff volume reduction and water quality control.

It is recommended to rename the “Pollution Prevention” category to “Operations and Activities” and to allow for broadening of eligible practices to ultimately increase flexibility to claim this credit, as discussed in the subsequent sections.

8.2.1 Summary of Current Pollution Prevention Category

At this time, the available credit is linked to the completion of a pollution prevention plan, which is defined by the City’s Storm Sewer Use By-law 0259-2005, Schedule ‘A’. In summary, applicants are required to submit a detailed pollution prevention plan, often completed by a professional engineer, outlining the existing infrastructure and pathways via dye-testing or television inspection, identification of all materials and potential pollution opportunities, and evaluation of pollution prevention options and remediation actions. A pollution prevention plan may be required by the City as part of a property demonstrating to be in compliance with the City’s By-law.

A maximum stormwater credit of 5% is currently available if an approved pollution prevention plan, containing all components outlined in Schedule ‘A’, is submitted. Percentage allocation for this credit is based on approval of the pollution prevention plan and achievement of distinct milestones. For example, a company could implement the required training programs for handling and storing of materials but could only be 60% complete at the time of the credit application. Therefore, partial credit in the amount of 3% can be issued until training of all employees has been completed, at which time a Credit Update Application can be submitted. Refer to **Table 5** below for a summary of the existing percent allocation for this category.

Table 5: Pollution Prevention Credit Allocation Summary

Credit Percentage	Level Achieved
1%	Implemented 20% of Pollution Prevention Plan
2%	Implemented 40% of Pollution Prevention Plan
3%	Implemented 60% of Pollution Prevention Plan
4%	Implemented 80% of Pollution Prevention Plan
5%	Implemented 100% of Pollution Prevention Plan

During the existing credit application review, it was noted that no pollution prevention credits are currently active in the City. Although the project team only thoroughly reviewed approximately one third of the applications, an overview of all current applications was provided by the City and referenced to conclude that there are not any active pollution prevention credits. It is believed that the stringent requirements for the pollution prevention plan, particularly activities such as dye-testing, and low available credit is the likely cause of low uptake in this credit category.

8.2.2 Considerations for Potential Improvements to Category

While pollution prevention plans, as defined under the Storm Sewer Use By-law 0259-2005, are a useful tool for by-law enforcement the City also recognizes the benefits associated with implementing general good practices related to stormwater and pollution prevention, such as litter clean-up and better waste management, salt management, and other non-structural practices. These practices

can have a positive impact on City's stormwater system and the general health of receiving water bodies and should therefore be encouraged through the credit program.

To further understand the interface between pollution prevention planning and the City's stormwater credit charge program, a meeting with the City's Environmental Coordinator, Storm Sewers was conducted on May 28, 2021, to discuss their experience with pollution prevention in the field. This staff position enforces Storm Sewer Use By-law 0259-2005 to regulate the quality of the stormwater entering the municipal storm sewer network, with a focus on liquid pollutants. Site investigations are a large portion of this position, inspecting various properties and following up on complaints to ensure compliance with City regulations. Staff efforts to trace spills and follow-up on storm sewer use infractions can be quite onerous and time intensive.

During this meeting it was discussed that a lack of education on stormwater and pollution control was evident during the coordinator's site investigation. Although an education program is a soft benefit, there could be a large impact given the volume of incidences that may have been prevented by educating property owners and tenants. Previously, the City's Stormwater Education and Outreach program was used to primarily inform Residential property owners of the newly coming stormwater charge through in-person events. More recently the program has since shifted to focus on engaging the ICI sector in addition to residents through digital engagement. It is considered that there is significant value in various forms of education programs for the ICI sector which could be encouraged through the stormwater credit program.

It was also discussed that large industrial companies are known to implement their own type of pollution prevention plan which meets their corporate requirements for risk management. The implementation of these plans may be highly beneficial in terms of meeting the City's stormwater management objectives, but because the developed plans may not meet the City's specific requirements under the by-law, the plans may not be currently eligible for credits.

8.2.3 Potential Recommended Operations and Activities Category

Several key recommendations for the Pollution Prevention category have been developed.

Change in Category Name

It is recommended to change the name of this credit category from "Pollution Prevention" to *Operations and Activities*. The name change is recommended to decouple the credit category solely from the City's Storm Sewer Use By-Law and to allow for greater flexibility to grant credits for other actions that may better align with the intent of the City's stormwater charge and credit programs such as improving water quality.

Engineer Sign-off

As part of the City's Storm Sewer Use By-Law, a Professional Engineer is often required to sign-off on a pollution prevention plan and this requirement is further reinforced with a report certified by an Engineer to apply for credit. As it is intended to allow for flexibility in pollution prevention planning eligible for the stormwater credit program a Professional Engineer sign-off is proposed, in most instances, to be no longer a requirement for this and other initiatives in the proposed Operations and Activities category. As discussed below, the list of potential eligible practices under this category typically do not require engineering analysis to support implementation, and therefore should not require sign-off from a Professional Engineer.

Increase Maximum Credit in Category and Allow a "Menu" Approach

As per **Section 7.4** above, the renamed Operations and Activities category is recommended to have an increased maximum credit available. A maximum credit of 20% has been proposed for this category, which can be fully achieved by implementing and maintaining multiple operations or activities listed below instead of listing set requirements to achieve the maximum credit. This is known as the "menu" approach giving the applicants the flexibility to pick and chose which practices work best with their site conditions, land use and operations.

The City recognizes the varying level of benefit to the City for the options within this category, and the resulting benefit to stormwater management. Therefore, each proposed activity has been listed in the table below from lowest to greatest benefit and has credits assigned accordingly. Activities with less direct stormwater benefit to the City may include items such as plantings, strategic landscaping, and litter clean-up and could be eligible for a maximum credit of 5% each. Medium level benefits may include development of on-going education programs, spill control and risk management plans and therefore the maximum credit for these activities could be increased to 10%. Lastly, activities with the greatest benefit, such as the development and implementation of a salt management plan, paved area sweeping programs, or a pollution prevention plan could be eligible for a 10%-20% credit each, up to a maximum of 20%. Refer to **Table 6** below for a list of the potential eligible activities in this category.

Table 6: Summary of Potential Operations and Activities Credits

Proposed Activity	Potential Description of Requirements	Proposed Maximum Credit
Turf Conversion	Full credit awarded to those that convert existing turf coverage to native plantings for a minimum area of 100 m ² .	5%
Litter Cleanup or Waste Management	Submit litter clean-up program sign-up, total number of hours, date stamped photos, and weight of litter collected and disposed of. Maximum credit issued for 5 hours of litter cleanup for 5-person crew.	5%
Education Program	Submit a detailed education program for employees on pollution prevention, spill response, and/or stormwater management. Proof of complete education program required for full credit.	5 - 10%
Spill Control or Pollution Prevention Lite Plan	Full credit awarded to those who submit and implement a spill control plan aligning with the City's sewer use by-law.	10%
Risk Management Plan	Submit a detailed risk management plan identifying flood risk areas and a flood management/response plan.	10%
Urban Nutrient Management Plan	Submit an Urban Nutrient Management (UNM) Plan that outlines how Nitrogen, Phosphorus and Potassium are managed on an annual basis to protect water quality. Credit assigned based on reduction of major plant nutrients.	10%
Salt Management Plan	Property Owner to submit a salt management plan and use a "Smart About Salt" certified contractor to maintain the site.	10 - 15%

Proposed Activity	Potential Description of Requirements	Proposed Maximum Credit
Paved Area Sweeping	Submit a detailed paved area sweeping plan that defines the areas, sweeper, frequency, and disposal method. Proof of completion required at renewal in the form of invoices, certificates etc.	10 - 15%
Pollution Prevention Plan	Submit a detailed pollution prevention plan satisfying the requirements of Schedule "A" in By-Law 0259-2005.	20%
Maximum Operations and Activities Criteria		20%

It is noted that the above potential items and associated credit guidance and requirements should be refined as part of the implementation phase of the credit program. It is also recommended that the City reach out to industrial companies which have already prepared spill control, salt management or other similar plans to understand typical plan contents to better align the City's credit criteria to those typically used by industry. Ultimately, changes to the category will require update of the City's Credit Application Guidance Manual, including checklists which will outline what is required for each of the operations and activities eligible for credits.

9 Public/stakeholder meetings

A large portion of this Study was to engage with various stakeholders to gather their opinions on and their experiences with the existing credit program and solicit input on the recommended changes. Engagement with the following stakeholders occurred in various formats:

- Mississauga Board of Trade (MBOT)
- Existing credit holders and applicants
- Local conservation authorities (TRCA and CVC)
- City Facility Credit Holders

Information gathered during these discussions was used to inform the recommended program updates that were finalized and presented to the stakeholders in two separate meetings.

9.1 Meeting #1

Stakeholder meeting #1 was held in an online format on June 30, 2021. The meeting was attended by twenty (20) stakeholders from various organizations. The City and Consulting team provided a presentation to the stakeholders followed by a question-and-answer session. In addition, stakeholders were given two weeks to review the presentation and provide formal comments. The attendee list, presentation content and summary of questions and answers are provided in **Appendix B**.

9.2 Meeting #2

Stakeholder meeting #2 was held in an online format on September 15, 2021. The meeting was attended by eleven (11) stakeholders from various organizations. The City and Consulting team provided a presentation to the stakeholders on the updates since the last meeting followed by a question-and-answer session. In addition, after the meeting stakeholders were provided with the presentation and asked to provide formal comments. The attendee list, presentation content and summary of the questions and answers are provided in **Appendix B**.

9.3 Supplemental Meetings

On September 24, 2021, additional engagement was conducted with the Environment, Sustainability & Infrastructure Committee of MBOT. This meeting was held in an online format and was attended by members of the MBOT Committee. City staff presented the recommended changes to the existing credit program to solicit input and opinions from the committee.

9.4 Summary of Feedback

Based on all the engagement, below is a list of consistent points of feedback received from stakeholders:

- Stakeholders would like to see an increased maximum credit above the current 50% cap.
- Removing the peak flow reduction credit for certain watersheds impacts existing credit holders.
- Removal of the P.Eng. requirement will improve ease and flexibility to the applicant.
- Overall agreeance that the increased credit available in each category is desired.

10 Conclusions and Recommendations

Building on the recommendations of the Phase 1 Study (as described in **Section 2**) the Phase 2 Study has been undertaken to expand the findings from the previous report, assess impacts of the recommended changes, and provide an overall recommendation to update the Stormwater Credit Program. Specifically, the Phase 2 Study has provided further assessment and recommendations related to the following:

- 1) Formalize the practice of allowing communal facilities to share credits.
- 2) Align credit criteria with development criteria through defining variable Peak Flow Reduction credit criteria by geography and applying sliding scale criteria. Note that these were separate recommendations from the Phase 1 Study that have been assessed concurrently.
- 3) Change maximum credit in any category and undertake further financial analysis.
- 4) Expand the list of practices as considered as eligible for peak flow reduction, runoff volume reduction and water quality control and rename the "Pollution Prevention" credit category to "Operations and Activities" to increase credit opportunities.

While allowed for under the City's current credit program, a more formalized credit sharing process has been developed for inclusion in the City's Guidance Manual. Based on the feedback received and internal discussions with City staff, a checklist has been created to aid property owners in the application of a shared credit. This checklist outlines the requirements of the application, including signatures of all involved parties, their respective roles and responsibilities, and the break-down of the assigned credit. Upon review and approval, the City will assign the requested credit to each party involved but will not act as a mediator to the agreement. This process is intended to streamline the application for shared credits, while promoting shared facilities amongst multiple property owners.

The recommendations to each category of the existing credit program are summarized in **Table 7** below.

Table 7: Summary of Recommendations

Category	Recommended Changes	Updated Maximum Credit (%)
Peak Flow Reduction	<ul style="list-style-type: none"> Peak Flow criteria is recommended to be aligned with current development criteria requirements (i.e. varying quantity control requirements based on watershed) Maximum credit for this category is available to non-residential sites that fully satisfy quantity control requirements for their watershed as specified by development standards 	40%
Water Quality Treatment	<ul style="list-style-type: none"> Water Quality criteria is recommended to be aligned with current development criteria and allow for a sliding scale approach to grant credits for enhanced, normal, and basic quality control Maximum credit available to those that provide enhanced water quality treatment on-site, regardless of downstream municipal treatment facilities 	30%
Runoff Volume Retention	<ul style="list-style-type: none"> Volume retention criteria is recommended to be adjusted to increase credit and incentivize retention up to 15 mm. Maximum credit for volume retention available to those that fully retain 15 mm on-site. A 2%/mm retained is applied to this category. 	30%
Operations and Activities	<ul style="list-style-type: none"> The Pollution Prevention category is recommended to be re-named to Operations and Activities to allow for inclusion of additional practices with varying benefit to the City. 	20%
Maximum Credit Available		50%

Below is a list of some potential eligible activities that have been recommended for inclusion in the Operations and Activities Category, which will be confirmed and refined through the implementation phase of the enhanced Credit Program:

- Turf Conversion, Litter Clean-up
- Spill Control Plan, Risk Management Plan
- Urban Nutrient Management Plan, Salt Management Plan, Paved Area Sweeping Plan
- Educational Programs to promote stormwater management
- Pollution Prevention Plan per By-Law 0259-2005

Overall, the recommended changes to the current credit program are intended to align with the City's current objectives and goals for stormwater management across the City. These changes are noted to potentially increase uptake of the credit program, for new developments already subject to the development criteria and those looking to retrofit properties or initiate new practices that support stormwater management.

11 Next Steps

It is anticipated that City staff and the consultant team will present this report to Council/Committee for consideration and approval to move forward with implementing the recommended updates to the stormwater charge credit program. If approved, implementing the enhanced Credit Program will involve various steps and may include:

- Undertake research to determine the nature of spill control plans, salt management plans, paved area sweeping programs, etc. to align the requirements of the operations and activities category with typical industry practices;
- Define the requirements to apply and maintain credit for newly eligible initiatives in the Operations and Activities category;
- Establish and implement any changes required to existing credit business rules, administration systems and billing practices;
- Update the Stormwater Fees and Charges By-law 0295-2020, Stormwater Credit Program Corporate Policy, City's Stormwater Charge Credit Application Guidance Manual, City website and other materials with the credit sharing process, revised maximum credits per category, aligned and sliding scale credit criteria including example calculations; and,
- Undertake an outreach program to educate credit holders, property owners/managers and consultants on the updated credit program.

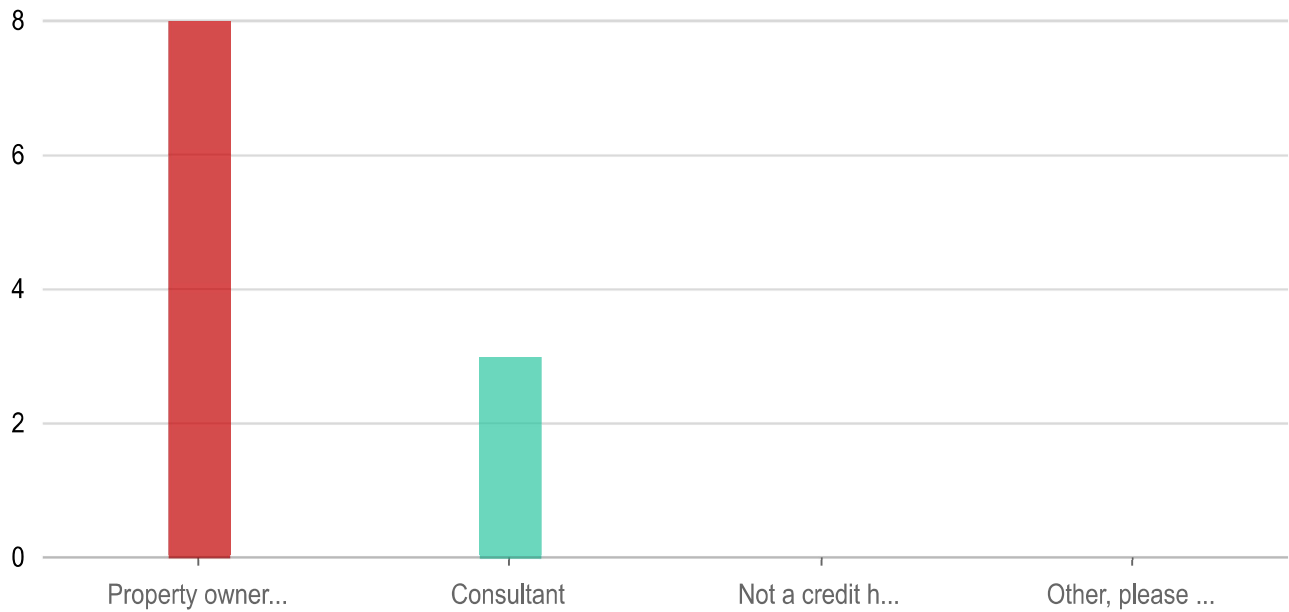
APPENDIX A

Survey Results

City of Mississauga Stormwater Credit Program

General

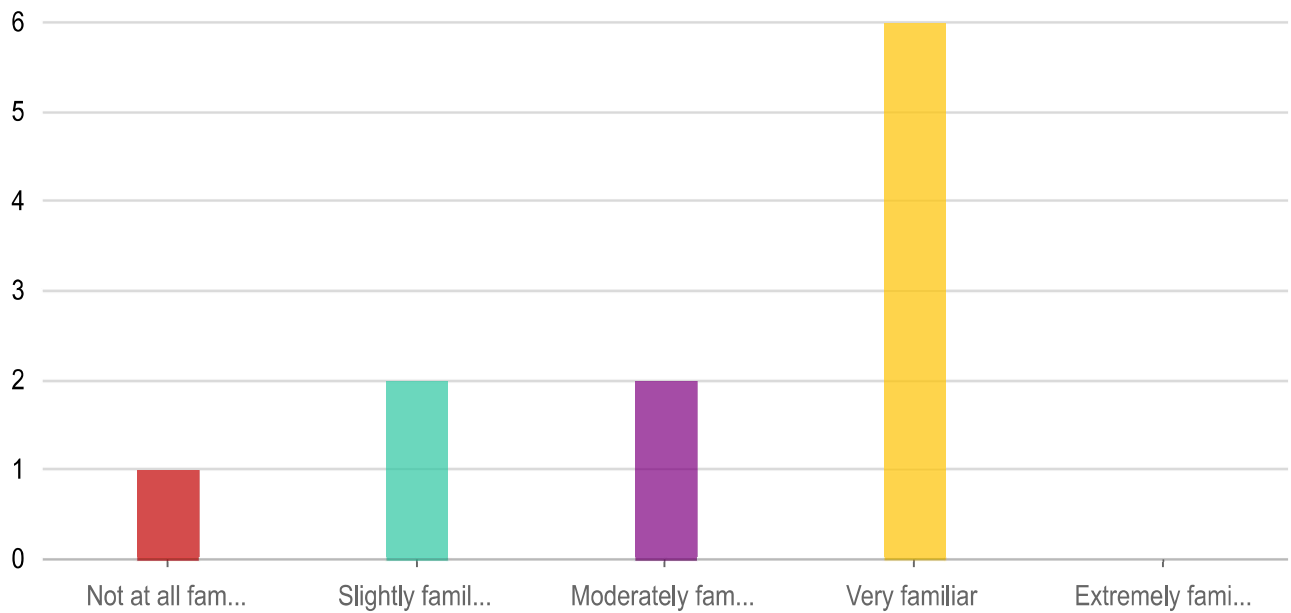
○ Which type of applicant are you? *



Answers	Count	Percentage
Property owner/manager	8	72.73%
Consultant	3	27.27%
Not a credit holder	0	0%
Other, please indicate:	0	0%

Answered: 11 Skipped: 0

○ How familiar are you with the credit program? *

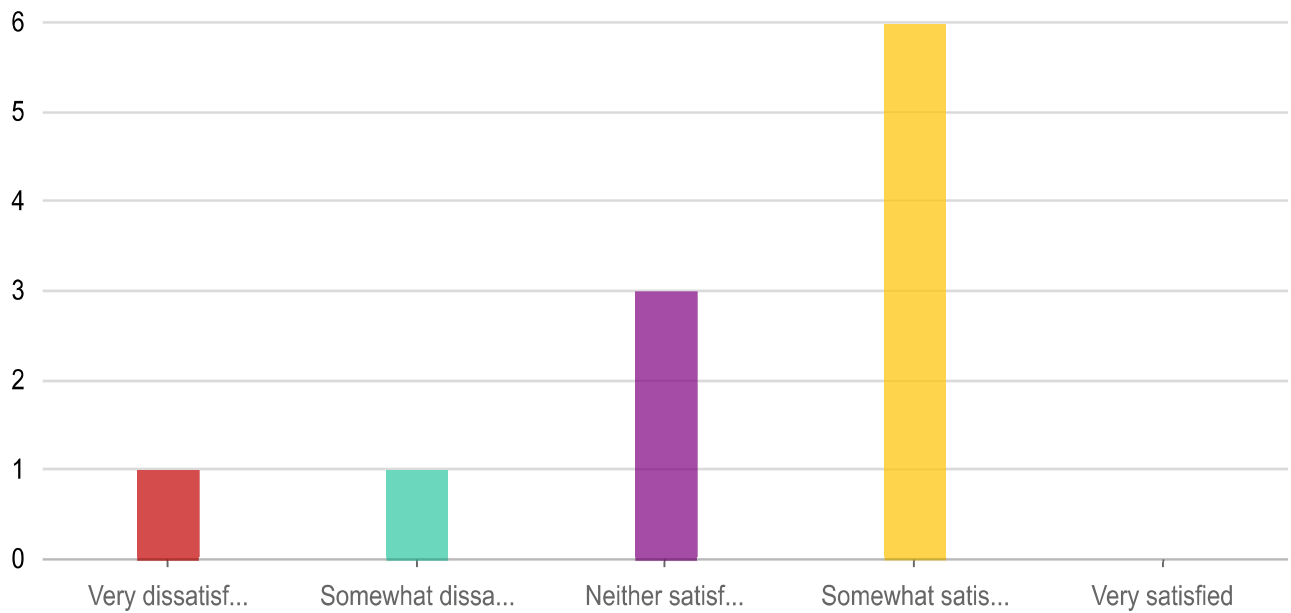


Answers	Count	Percentage
Not at all familiar	1	9.09%
Slightly familiar	2	18.18%
Moderately familiar	2	18.18%
Very familiar	6	54.55%
Extremely familiar	0	0%

Answered: 11 Skipped: 0

Application Process

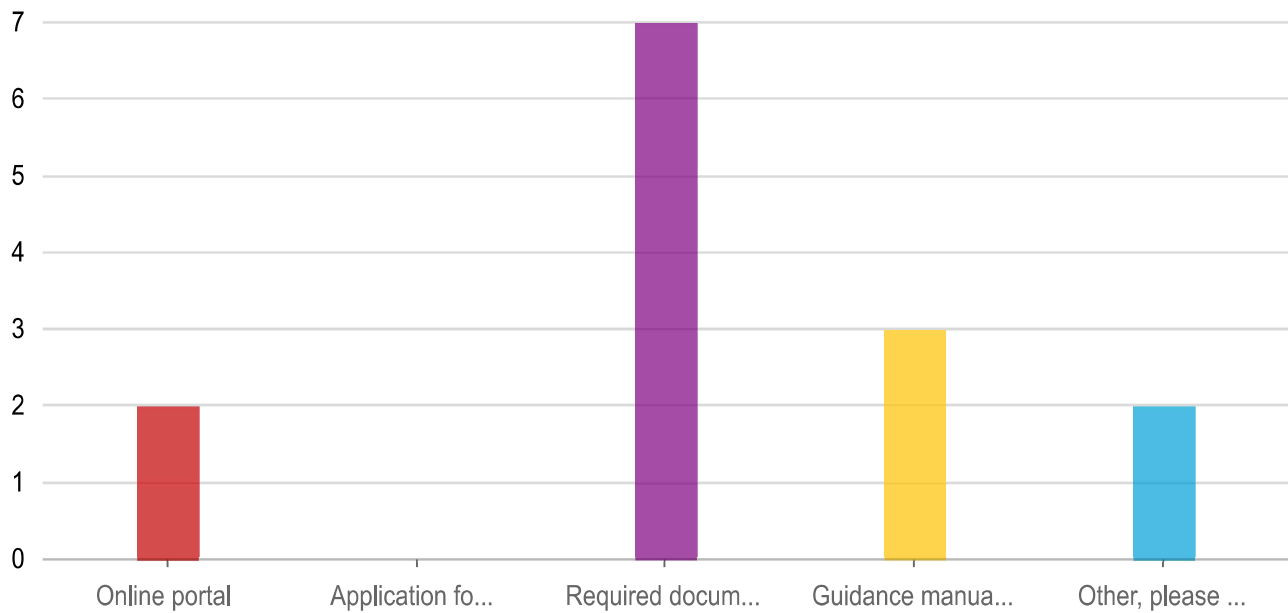
○ Rate the application process. *



Answers	Count	Percentage
Very dissatisfied	1	9.09%
Somewhat dissatisfied	1	9.09%
Neither satisfied nor dissatisfied	3	27.27%
Somewhat satisfied	6	54.55%
Very satisfied	0	0%

Answered: 11 Skipped: 0

○ Which portion of the process could be improved? *



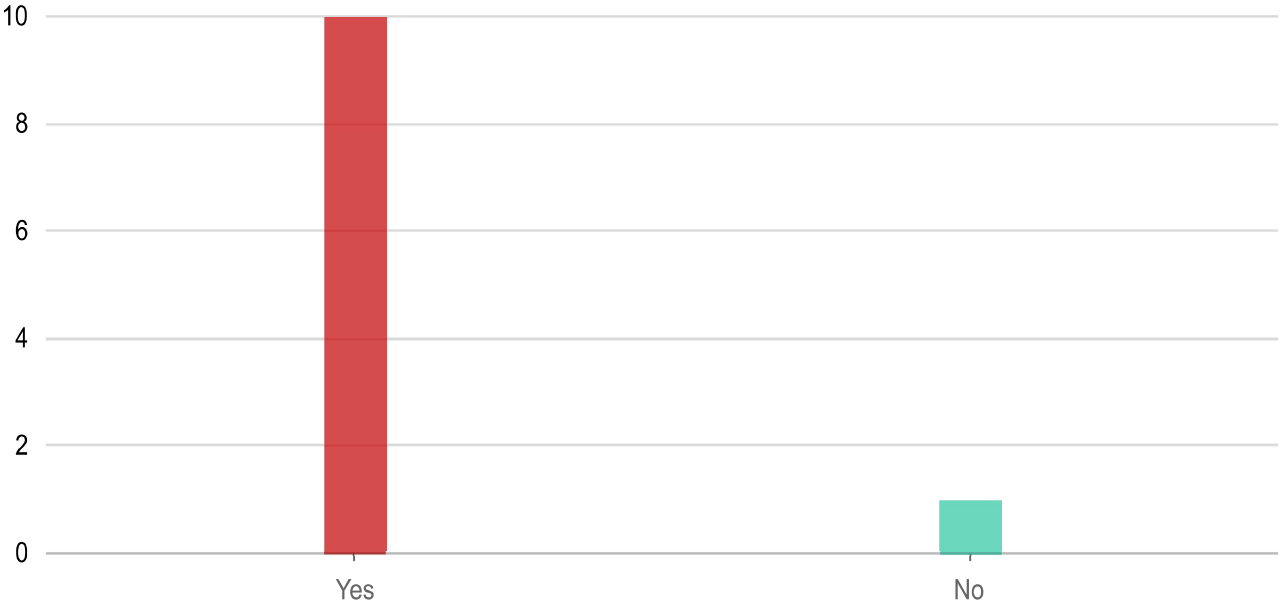
Answers	Count	Percentage
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Online portal	2	18.18%
Application form	0	0%
Required documentation/certification	7	63.64%
Guidance manual	3	27.27%
Other, please indicate:	2	18.18%

Answered: 11 Skipped: 0

Credit Renewal

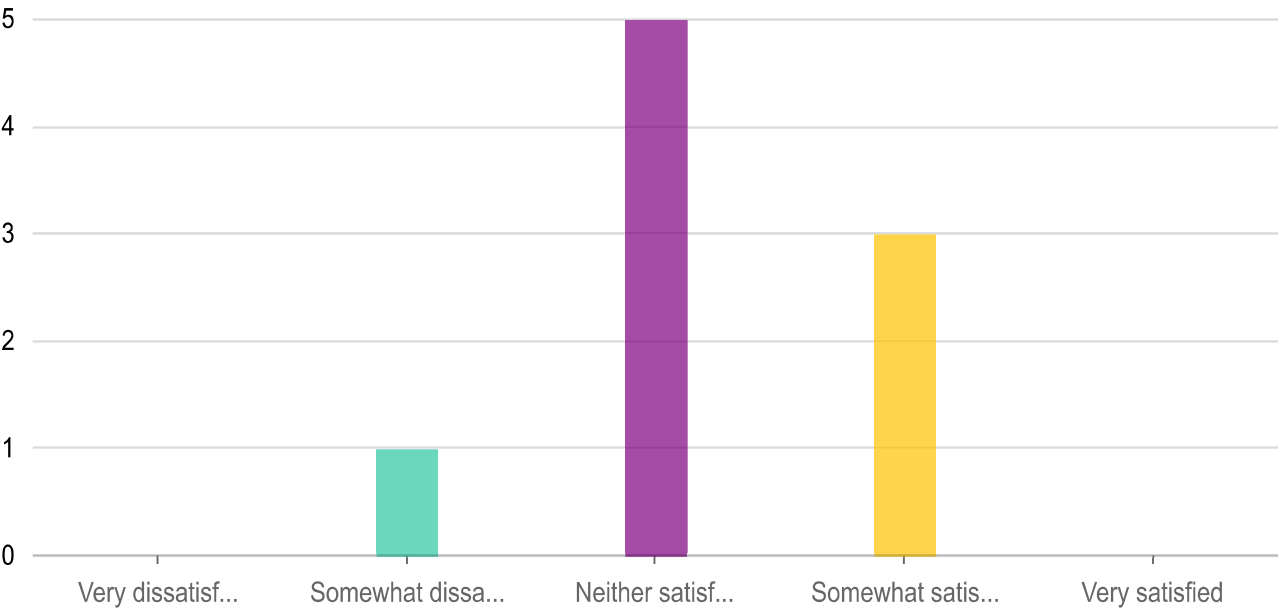
○ Did you renew your credit in 2020/2021? *



Answers	Count	Percentage
Yes	10	90.91%
No	1	9.09%

Answered: 11 Skipped: 0

☐ If yes, rate the renewal process.

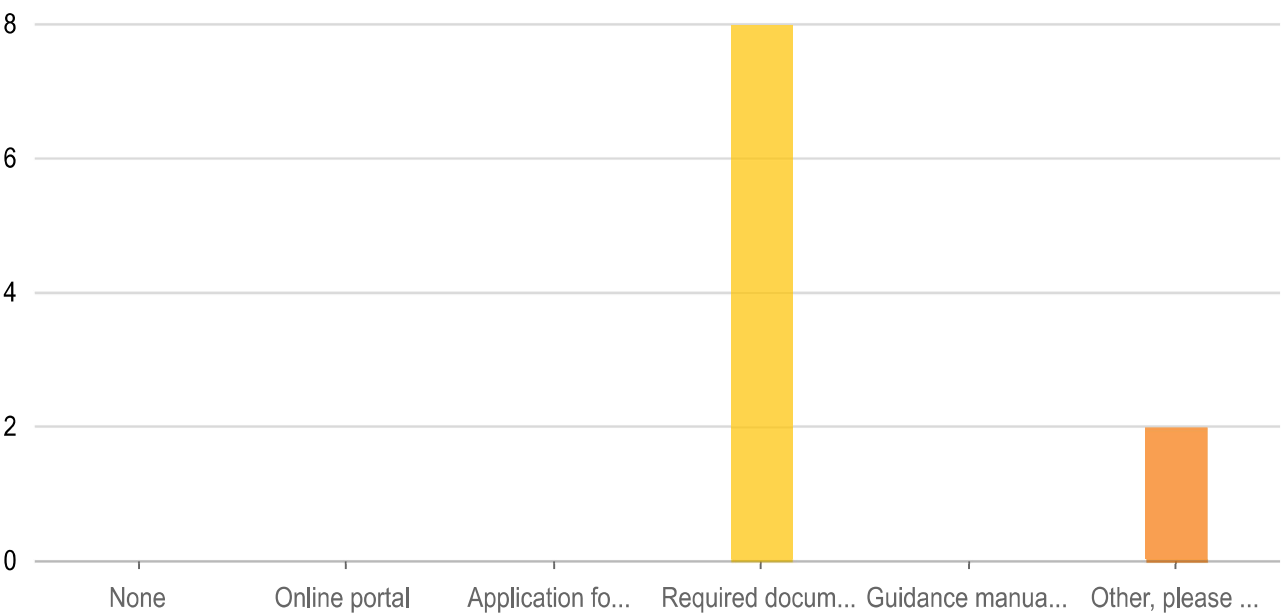


Answers	Count	Percentage
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Very dissatisfied	0	0%
Somewhat dissatisfied	1	9.09%
Neither satisfied nor dissatisfied	5	45.45%
Somewhat satisfied	3	27.27%
Very satisfied	0	0%

Answered: 9 Skipped: 2

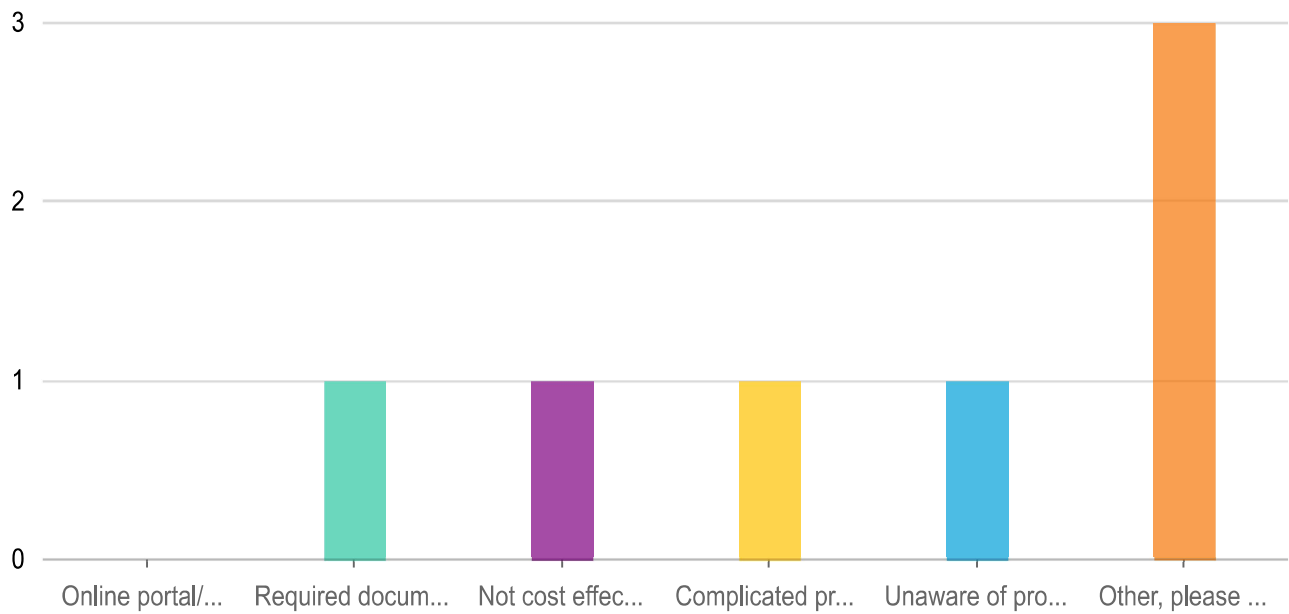
○ If yes, what was your biggest challenge to satisfy the renewal?



Answers	Count	Percentage
None	0	0%
Online portal	0	0%
Application form	0	0%
Required documentation/certification	8	72.73%
Guidance manual	0	0%
Other, please indicate:	2	18.18%

Answered: 10 Skipped: 1

○ If no, what are the reasons for not renewing your credit?

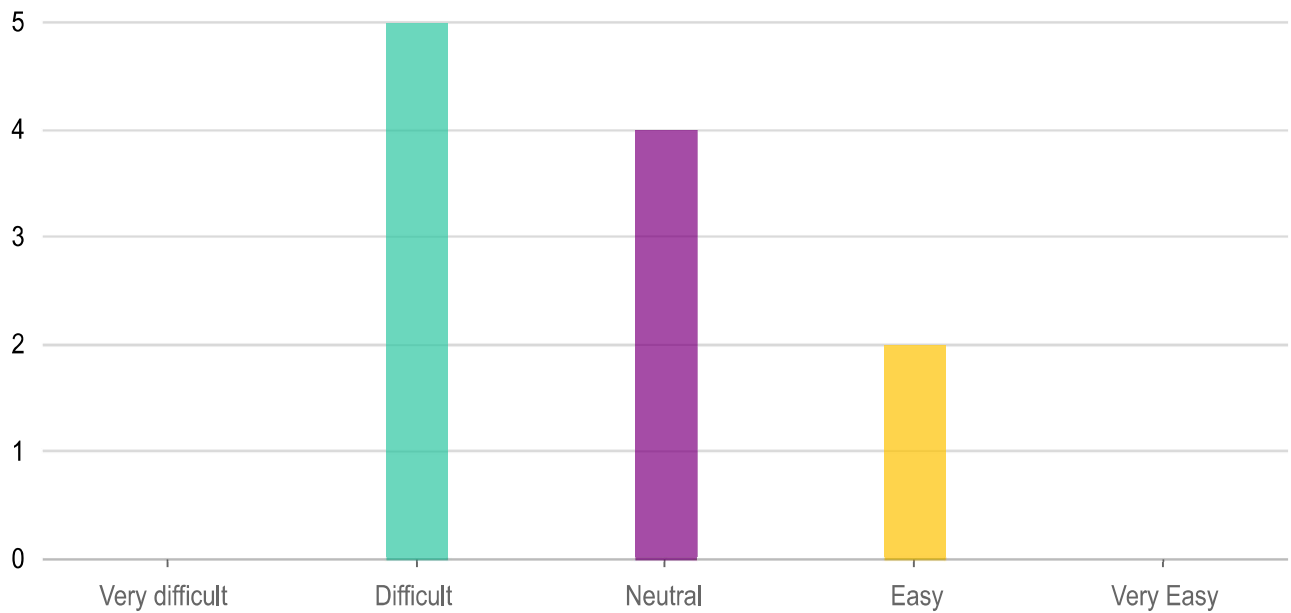


Answers	Count	Percentage
Online portal/forms	0	0%
Required documentation/certification	1	9.09%
Not cost effective	1	9.09%
Complicated process	1	9.09%
Unaware of process	1	9.09%
Other, please indicate:	3	27.27%

Answered: 3 Skipped: 8

Operation & Maintenance (O&M)

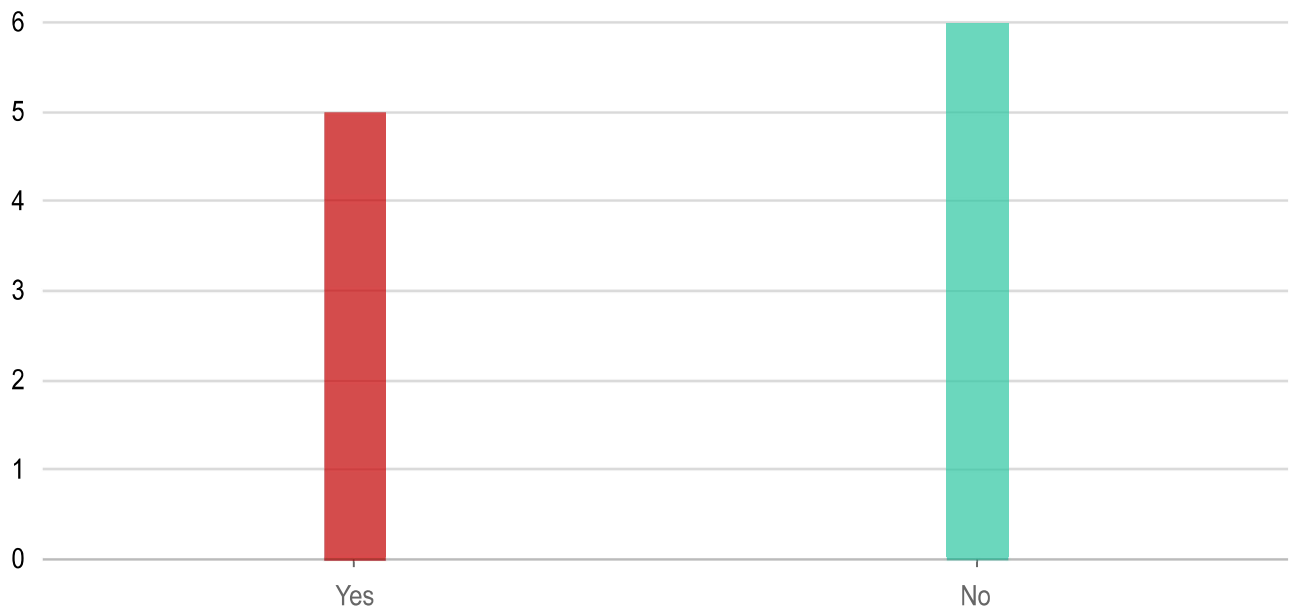
○ Rate your experience with satisfying your O&M plan. *



Answers	Count	Percentage
Very difficult	0	0%
Difficult	5	45.45%
Neutral	4	36.36%
Easy	2	18.18%
Very Easy	0	0%

Answered: 11 Skipped: 0

○ Are you aware of the Credit Update Process to notify the City of changes to your O&M plan? *

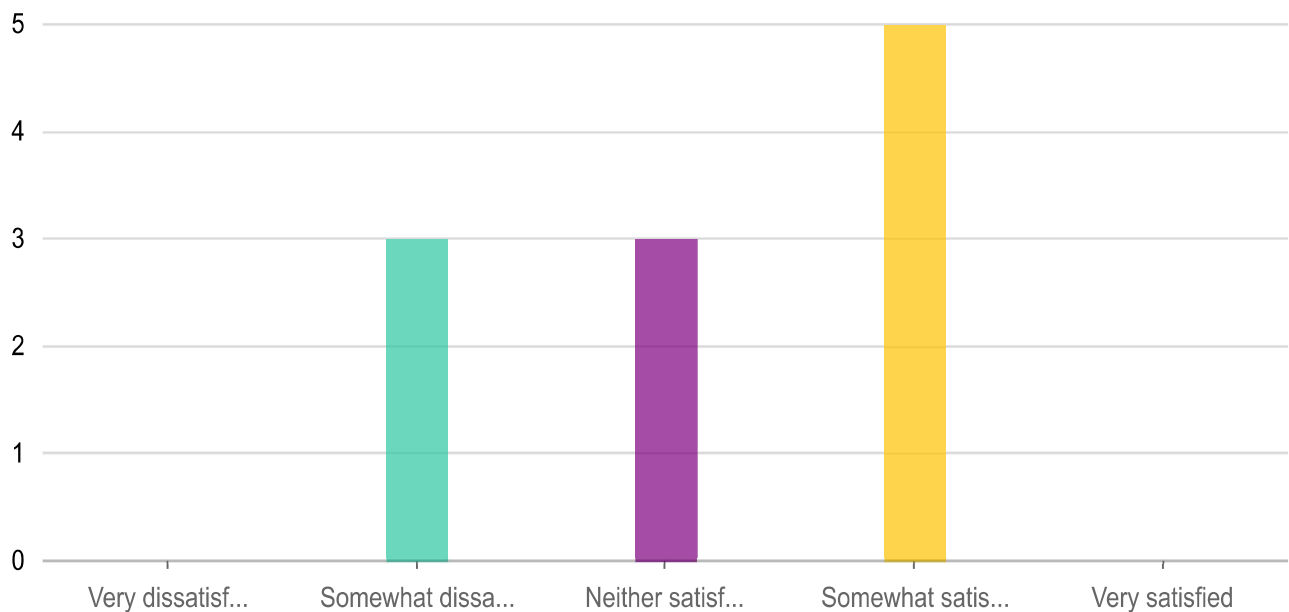


Answers	Count	Percentage
Yes	5	45.45%
No	6	54.55%

Answered: 11 Skipped: 0

Potential Improvements

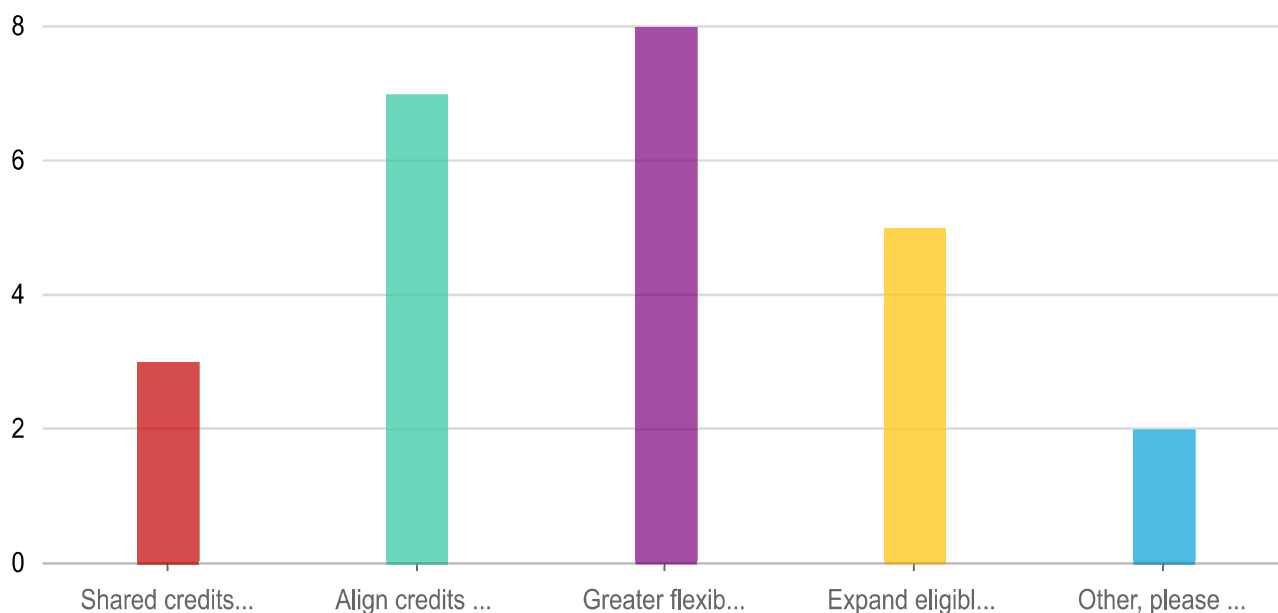
Overall, how satisfied are you with the City's existing credit program? *



Very dissatisfied	0	0%
Somewhat dissatisfied	3	27.27%
Neither satisfied nor dissatisfied	3	27.27%
Somewhat satisfied	5	45.45%
Very satisfied	0	0%

Answered: 11 Skipped: 0

○ If the program eligibility could be improved, which of the following would you be interested in? *



Answers	Count	Percentage
Shared credits between adjacent owners	3	27.27%
Align credits with development criteria	7	63.64%
Greater flexibility to receive maximum total credit or maximum in a credit category	8	72.73%
Expand eligible practices	5	45.45%
Other, please indicate:	2	18.18%

Answered: 11 Skipped: 0

APPENDIX B

Meeting Materials and Minutes



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Stormwater Credit Program Review Meeting Date and Time: April 19, 2021 1:00pm
Project Number: 2021-010 Meeting Location: Webex Conference Call
Meeting Purpose: Project Kickoff Meeting
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Elizabeth Dollimore (ED), City of Mississauga
Ghazwan Yousif (GY), City of Mississauga
Muneef Ahmad (MA), City of Mississauga
Nathan McFadden (NM), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting

Meeting Minutes

Item No.:	Item:	Action:
1	<u>Opening remarks, team introductions, project overview</u> <ul style="list-style-type: none">• Mark introduced the consulting team, including Mike who is on vacation• New team members: Cindy Truong EIT working with Scott, Nathan McFadden – reviewer• Background information – this is the second phase of the project.• Overview of schedule – a total of seven tasks, with submission target in the fall of 2021• City performance agreement is driving the tight schedule	
2	<u>Project Management, Scheduling, Regular Meetings and Invoicing Procedures</u> <ul style="list-style-type: none">• Scott is the PM/technical lead – Cindy to be cc'd on everything.• Invoicing procedures the same as phase 1 - Mark to send Scott a draft of item breakdowns, Scott reviews/approves, Mark sends off lump sum amount to accounts payable.• Regular meetings – bi-weekly informal 15-30 min check in meetings.• Pre-schedule recurring meetings (Mondays @ 11:00am)• Becky to send meeting invites starting on May 3rd. Microsoft teams is acceptable.• Resilient to make Gantt Chart to establish preliminary stakeholder meeting dates. Circulate Gantt chart to the City this week.• Meeting with all stakeholders to be high-level to inform team but not to illicit opinions. Introductory meeting to start and will go from there.• Have individual meetings with each stakeholder as required. Potentially re-collect all stakeholders for final meeting.• Time considerations/scheduling to be considered for stakeholder meetings.	Resilient Resilient

3	<p><u>Work Plan overview, data request (applications)</u> The various tasks of the assignment were reviewed, with highlights noted below.</p> <p><i>Task 1 - Survey</i></p> <ul style="list-style-type: none"> • City to handle issuing and collecting information from the surveys. <p><i>Task 2 – Credit Sharing Application Process</i></p> <ul style="list-style-type: none"> • Application process formalization. Resilient to produce flow charts, tables etc. outlining the requirements of the process. <p><i>Task 3 – Align Credit Criteria with Development Criteria</i></p> <ul style="list-style-type: none"> • Aligning credits and categories – review 66 applications across 18-subwatersheds, review criteria, analyze to switch criteria to a subwatershed basis. • City has prepared/collected: list of credits in each identified watersheds, SWM reports for applications. City to provide master table for this phase. • Resilient to set up SharePoint link for City to upload information to. • City to select which applications to be reviewed. Scott to review and determine how 66 applications was decided upon. • Findings of reports are confirmed – Resilient does not need to confirm calculations or values. (ie. post to pre: 100-year post to 100-year pre, or 100-year post to 2-year pre). • Resilient to complete 2/3 of the application reviews, and CHI to complete 1/3 of application reviews. <p><i>Task 4 – Maximum Total Credit and/or Credit Category Percent Analysis</i></p> <ul style="list-style-type: none"> • Review of overall maximum credit, and maximum credit in each category. • MBOT will want to see impacts associated with increased overall maximum credit. • Resilient reporting to discuss maximum credit more qualitatively. • Previous benchmarking analysis determined that 50% was consistent with other similar programs. • Need to demonstrate that we are open to increasing maximum credit available. • Providing a higher maximum credit to non-res users would shift burden onto the residential users. <p><i>Task 5 – Identify & Expand Eligible Practices</i></p> <ul style="list-style-type: none"> • Review of other SWM practices in the industry – look at applicability to be used in the credit program. • Discuss with Environmental Engineering on changes to pollution prevention plan. • Imshun Je’s group will be the key people for the pollution prevention. <p><i>Task 6 and 7 are meetings and reporting as per the proposal.</i></p>	<p>City</p> <p>Resilient</p>
4	<p><u>Credit Sharing Application Process</u></p> <ul style="list-style-type: none"> • Muneef, Liz, Nathan, Ghazwan joined meeting for review purposes. • Credit sharing isn’t excluded from the existing program, but there is no formal process for credit sharing. • CVC – Southdown project may be the first project for credit sharing. • Written multi-party agreement – who reviews? Concerns with this falling on the technical reviewer who is not trained to review. 	

	<ul style="list-style-type: none"> • City legal department to look at multi-party agreement? Are we looking for a legal agreement? • On private property, City has the right to inspect and could ultimately enforce through the ability to revoke if City finds evidence that the party is not maintaining the facility. • Concerns with Drainage Act & CVC – the City's help is to review and assign credits but responsibility does not extend further. City is not the proponent of the work, and will not have maintenance obligations or responsibilities. City's responsibilities are limited to administration of the credit and would not be involved in dispute resolution, undertaking maintenance, etc. • City does not want to be involved in the agreement. Agreement to be made between property owners themselves. • Maintenance of the facility – who maintains the facility? Agreements between property owners is a private issue – not the City's responsibility to mediate. • Property owner change – a new multi-party agreement would be required if one owner changes. • City legal department should be consulted to determine disclaimers and requirements for multi-party agreement. • Mark suggests to not even review the agreement. Checklist of agreement and acknowledgement that the City is not responsible. • Does the City split the credit (each party would receive the credit through their billing) or does the "agent" of the agreement divvy up the credit (agent would receive the credit by billing and then distribute cash). • How do you divide up the credit? By performance (contributions)? By imperviousness? It may be better to simply let the owners/parties to the agreement decide. • Shared exemption? Exemptions are for properties draining directly to the Lake. Not to a property draining to the Lake. • MB suggested that it may be preferable to simply have the Owners confirm that they have an agreement in place which covers the City's requirements, but not have the City actually review/enforce the agreement. The City's concerns are that the SWM measures are being operated and maintained properly in exchange for the credit. 	
5	<u>Existing Survey Review and Discussion</u> <ul style="list-style-type: none"> • City to provide updated survey for our review. Resilient to provide comments on updated survey, if required. • City could consider incentives to perform survey to encourage a strong outcome. 	City
6	<u>Summary of Action Items, Upcoming meetings/deliverables</u> <ul style="list-style-type: none"> • Resilient to provide Gantt Chart for project and meetings • Resilient to circulate ShareLink • Bi-weekly Meeting invite starting May 3 • List of potential issues to be brainstormed with the stakeholders 	Resilient Resilient Resilient Resilient



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: May 7, 2021 10:00am
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Task 4 Meeting #1 – Finance/Environmental
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Patti Laurie (PL), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI

Meeting Minutes

Item No.:	Item:	Action Item:
1	<u>Opening Remarks, Team Introductions</u> <ul style="list-style-type: none">• PL is the Financial Analyst who assists the City with the stormwater charge• Mark introduced the consultant team• Scott introduced the City's team looking at the credit review program	
2	<u>Project Background Information</u> <ul style="list-style-type: none">• The Consultant team is assisting the City with the next phase of the stormwater credit program, building on the previous Phase 1 report. One of the recommendations from the Phase 1 Study was to evaluate potential changes to the max. credit/category amount.• During Phase 1 of the credit review, the team heard that the credit was not sufficient to increase uptake. An increase in the maximum credit was an "ask" from Mississauga Board of Trade (MBOT).• This increase in available credit is anticipated to increase uptake as the ROI for landowners would be improved.• Background/Overview on current credit program – started in 2016, only available for non-residential/multi-residential developments, four categories with various maximum credit allocation with an overall max. 50% credit available.• The Phase 1 Benchmark evaluation was performed for 23 municipalities and public utility districts across North America	

	<p>that have existing credit programs for non-residential and residential developments.</p> <ul style="list-style-type: none"> • A few benchmark communities in America can assign up to 100% credit but are legislated and have combined sewers. • Phase 1 Report recommended 5 potential enhancements to the current program, one of which is changing the maximum credit available or in any category to better align with the City's objectives. 	
3	<p><u>Open Discussion on Maximum Credit/Category Credit</u></p> <ul style="list-style-type: none"> • Preliminary review of the available applications indicate that the maximum credit is rarely fully claimed. • Typically, we see a maximum requested credit of 40% for the peak flow reduction as quantity control is usually required for site plan approval. • The 40% credit applications are typically on large industrial/warehouse developments where installing roof controls are normal practice. • Is the amount of available credit in each category unfair for developers/developments in watersheds where quantity control is not as stringent? (ie. aligning credit criteria with watershed criteria). • Current program is a performance based and therefore applications only need to demonstrate satisfactory performance to get the credit. • Available credit in each category should align with the City's overall objective for the charge. When the charge first setup, flooding had recently occurred and there was an emphasis on peak flow/quantity control. However it stormwater objectives are broadening to volume reduction and water quality control. • Very few credit applications are for quality control due to the low available credit. • Project team would like to explore increasing maximum water quality credit. • Is there an opportunity to offer additional credit for those who claim in 2 or more categories? Yes, this aligns with the City's objectives and would increase uptake. • Allowing credit for catch basin quality controls could drastically increase quality control credit uptake due to ease of installation and O&M. • Only 11 current applications claim quality control credit. • City's objective is to ensure private landowners maintain existing stormwater infrastructure that aligns with the City's objections. 	

4	<u>Revenue Impacts Discussion</u> <ul style="list-style-type: none"> • There have not been credit applications requesting the maximum 50%, so why should an increase in the maximum be entertained? • Changing the maximum credit in each category will likely result in an increased uptake and may in time result in applications requesting up to the 50% maximum. • There may be benefits to increasing water quality credit category to 40% and assess revenue impacts. • In some locations, property runoff drains to an existing treatment facility. While overall water quality is provided either by the facility or by the on site controls, the City would still realize benefits through on site controls through reduced loading to the municipal facility. • Revenue is not anticipated to be affected largely by these changes, but the analysis will still be completed to confirm. • Increases to all categories to be explored. 	<p>CHI/City</p> <p>CHI/City</p>
5	<u>Summary of action items, upcoming meetings/deliverables</u> <ul style="list-style-type: none"> • Work on other tasks to inform the numbers for financial assessment. • Project team to continue reviewing existing applications to further support credit changes in each category. • City to explore increasing water quality credit from 10% to 20%, 30% and 40%. 	<p>Resilient/CHI City</p>



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: May 14, 2021 1:00pm
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Task 5 Meeting #1 – Identify/Expand Eligible Practices
Attendees: Scott Perry (SP), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Elizabeth Dollimore (ED), City of Mississauga
Ghazwan Yousif (GY), City of Mississauga
Nathan McFadden (NM), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI
Regrets: Shaunna Xiao Zhang (SZ), City of Mississauga
Muneef Ahmad (MA), City of Mississauga

Meeting Minutes

Item No.:	Item:	Action Item:
1	<u>Opening Remarks</u> <ul style="list-style-type: none">Purpose of this meeting is discuss expanding the list of eligible technologies/practices in the Stormwater Credit Guidelines.	
2	<u>Purpose of Expanding Eligible Practices</u> <ul style="list-style-type: none">The City's existing credit program is for non-residential properties and for multi-residential developments with more than 2 dwellings.The current credit program includes 4 categories: Peak Flow Reduction, Water Quality Treatment, Runoff Volume Reduction, and Pollution Prevention.The credit amount in each category varies with a total maximum credit of 50% available to the customers.Phase 1 of this study included benchmarking 14 municipalities/agencies with established credit programs.Many credit programs have been simplified to assign credit based on the percent of impervious area captured/treated.Many benchmark communities had an "Operations and Activities" category which included items such as educational programs, risk management plans, strategic planting, salt management programs etc.	

	<ul style="list-style-type: none"> • As identified in the Phase 1 Study, it is recommended broaden the list of eligible practices and to change the name of the Pollution Prevention category to "Operations and Activities". • The purpose of this change is to increase the credit flexibility for the customer and ultimately increase uptake. • The list of current approved techniques/technologies is in the Stormwater Credit Guidelines. • Additional structural measures to consider: street planters, Etobicoke exfiltration systems, parking lot and roof storage, inlet/outlet control devices, roadside ditching etc. • Smaller credits should be available for Operations and Activities category which may include inlet/outlet controls as these items are not expected to provide similar performance as traditional measures. 	
3	<p style="text-align: center;"><u>Open Discussion on Eligible Practices</u></p> <p><i>Structural Measures</i></p> <ul style="list-style-type: none"> • City is seeing a lot of development application SWM reports with Green roofs – discussion required on how we will issue credits for this. • Any technology/practice proposed by an engineer can be considered for approval for a development application provided sufficient justification and demonstrated success. • CVC are encouraging Blue Roof's, but the City has not seen these proposed yet. • MTO does not recognize rooftop quantity controls, but the City does accept rooftop control. • CB Shields – can be approvable from both a development application and credit application perspective provided favorable numbers are demonstrated in the SWM report. • CB Shields can be argued as temporary since they are so easily removed. Similar discussion related to orifice tubes vs. plates. • Inlet control devices on CB intakes (Vortex) – City has seen a few for development applications with stringent targets and small drainage areas. • The City is open to any technologies/practices as long as the consultant can demonstrate positive results. • Current list of credit practices is not as descriptive and only outlines common eligible practices. • The list is recommended to remain non-descriptive, or be removed all together, as the City will make the final call on approvability (site specifics). • Credit program guidelines are to follow similar trend to the development application guidelines which does not outlined how to get approval. • One previously proposed technique that was not approved was amended soil/additional topsoil depth to increase water 	

	<p>retention. This was not approved by the City as landscaping can change, compaction etc.</p> <ul style="list-style-type: none"> • Permeable pavers – does not get quantity control benefits in the development application process but can get water balance and quality control if sufficient volume provided. • Discussion required on how credits for permeable pavers would be given (credit for peak flow, volume reduction, and quality?). • OGS Sizing has been refined over the years. How does the City handle old OGS units that are not sized to current enhanced level protection since old PSD is used in sizing? • City does not specify PSD for OGS sizing. Development criteria has not been updated to include ETV requirements. Therefore, any OGS system which can demonstrate proper sizing as per MECP guidelines is credited for enhanced protection. • Quality control is not a sliding scale, so no credit is assigned for those that do not demonstrate 80% TSS removal with sizing report. <p><i>Non-Structural Measures</i></p> <ul style="list-style-type: none"> • Education programs - the City is open to including this provided there is a way to ensure it is completed. Applicants to submit brochures, advertising, invite City staff etc. • "Pollution Prevention" category to be renamed to "Operations and Activities" to include additional measures such as plantings, education programs, spill control plan, sweeping, climate resiliency, sustainability. • Consider increasing credit available in this category up to 10% – to incentivize this category. • Multiple credits can be provided within this category with varying credit amounts as some tasks are harder/easier than others, and some have much larger impacts to the City's infrastructure. • Tree Plantings – City is open to this, but wants to examine benchmarks. Tree plantings in benchmark communities assign a set credit amount per tree planted on private property of a certain diameter. • Trees are best considered as non-structural measures as SWM design cannot account for tree canopy as it is too dynamic. • Assigning credits for downspout disconnection will not be considered further. This is already a requirement of the City in certain situations. Industrial properties do not disconnect downspouts as runoff is directed to tank. 	
4	<p><u>Summary of action items, upcoming meetings/deliverables</u></p> <ul style="list-style-type: none"> • Team progress meeting scheduled for Monday, May 17, 2021 • First meeting with the CA's scheduled for Tuesday, May 18, 2021 • Next meeting agenda to be circulated 	Resilient



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: May 18, 2021 1:00pm
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Task 2 Meeting #1 – Formalize Credit Sharing
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI
Phil James (PJ), CVC
Victoria Kramkowski (VK), TRCA
Tim VanSeters (TV), TRCA
Dan Hipple (DH), TRCA
Rehana Rajabali (RR), TRCA
Regrets: Kyle Vander Linden (KL), CVC

Meeting Minutes

Item No.:	Item:	Action:
1	<p><u>Opening Remarks, Team Introductions</u></p> <ul style="list-style-type: none">As part of the review of the Stormwater Charge, a review of the credit program is being undertaken.Team introductions conducted - CVC, TRCA, City, Consultant team.The purpose of this meeting is to discuss and solicit suggestions on a formalized credit sharing process. Currently looking for input from the TRCA and CVC.We anticipate a total of two meetings with the TRCA and CVC to discuss this subject.Project team will take input from today's meeting and prepare a draft framework for the credit sharing process which will be reviewed by the City.Future meeting with TRCA and CVC will be to discuss the draft framework for the credit sharing process.	Resilient/CHI
2	<p><u>Purpose of Credit Sharing Process, and Background Information</u></p> <ul style="list-style-type: none">Phase 1 Report finalized Dec 2020 – one of the recommendations is to formalize the practice of allowing communal facilities to share credits between multiple properties.	

	<ul style="list-style-type: none"> • The existing program already allows for this but the policies and procedures to share credits have yet to be developed. • Purpose: to increase uptake, make it easier for applicants. • A formalized process allows for multiple property owners to claim a portion of the credit for a communal facility. • Benefits to the City: more flexibility to align development behavior to focus on opportunities that are most effective. Reduction in loading on City system. • Benefits to the Applicant: improved payback period. • Benefits to the Environment: improvements to the downstream receiving waters (water quantity, quality, erosion). <p><i>Program Considerations</i></p> <ul style="list-style-type: none"> • Cost allocation between landowners could be based on impervious area or another acceptable cost-sharing formula. This would be fully determined by the landowners not the City. • Multi-party agreement must identify credit allocation and specific roles/responsibilities of each property owner. • The City will not be part of the agreement, or act as an arbiter or mediator. • Renewal would require confirmation that agreement is still valid, inspection, maintenance has been completed, confirmation facilities are operating as designed. 	
3	<p style="text-align: center;"><u>Open Discussion on Credit Sharing Process</u></p> <ul style="list-style-type: none"> • TRCA – after the agreement is established, does the City issue credits to each property owner based on the agreement, or issue to one person who divides up the credit. • Current charge is done on a parcel basis, and therefore credit would be issued to each property owner on their bill. • In situations where there is one property owner and multiple tenants, the property owner would be responsible for dividing up the credit to the tenants. • City prefers to have a primary contact to coordinate inspections who would be responsible for notifying others. This would be noted in the agreement. • TRCA – has there been interest from property owners, developers, MBOT for a shared facilities / credit? What's the public opinion/interest in shared credits? • Not much interest, apart from the Southdown area. • TRCA – will there be an educational campaign to present the new program to property owners? • Yes, an educational program will be rolled out to outline the changes to the current credit program. This will explain all changes to the program, not just the credit sharing process. • CVC – Is it up to the professional engineer to outline interested parties and demonstrate how the City credit would be divided? 	

	<ul style="list-style-type: none"> • Would be the responsibility of the engineer or lead proponent to outline credit allocation, would not be the responsibility of the City. City needs sign-off from all involved parties on the agreement. • TRCA – would shared credits be based on contributing impervious area? Installation costs and maintenance costs could play a factor in credit allocation and therefore it is up to the property owners to decide credit split. • TRCA - Would the same methodology be applied for shared credit applications as a single credit application? • Yes, current process will be maintained as much as possible to avoid having two separate processes. • Examples of different credit sharing scenarios could be provided in the City's guidance documents to help owners develop framework. • TRCA – will this be on title? What happens with a new property owner, or someone in the agreement wants out? • This process does not propose to include any of it on title. All parties must be in agreement or no credit is assigned through credit sharing process. • As part of the credit program, any title or property owner changes must be disclosed to the City and new owners must reapply. Process already in place to keep track of property owner changes. • TRCA – suggest incentivizing the host of the communal facility (ie. Increasing credit available). • Similarly, lower maximum credit available to contributing properties. • TRCA – Property owner Agreement is a barrier. Will be difficult to organize maintenance costs, installation costs etc. • City/project team to explore increasing/decreasing credits for host and contributing property owners. • Could the City provide a "who is my neighbour" tool to outline to contributors to a storm sewer? • Confidential information concerns. Best to leave it to the consultants to request drainage area plans to avoid releasing confidential information. • TRCA – what is the City's overall vision of the review of this program? • Ultimately the City is trying to make it more flexible to make it easier to apply for and receive credits when justified, make the process more all-inclusive etc. • Categories are to remain the same, but percentages and details of each category are being reviewed. Overall the framework of the existing credit program is being maintained with enhancements within each category. 	Resilient/CHI
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	<ul style="list-style-type: none"> • TRCA – considerations for public/private partnership? Facility installed on public property but paid for by private property owners. Would the City allow for this sharing in a flood susceptible area? • City to review charge principles to confirm if they can consider partnership. It may not be required to specify these details at this time, and treat it as a case by case basis. • Southdown project includes communal facilities which were aligned with the Drainage Act. • TRCA – Not include credit sharing requirements on title could be problematic. • It is up to the engineer/proponent to justify credit amounts and allocate credit sharing. An agreement is required for all involved parties. Shared credit to be cancelled if all parties are not in agreement. • Next meeting is to present and discuss proposed draft framework for the shared credit process. • CVC to review information related to the Southdown and Drainage Act and provide any helpful input to the project team. • Framework to be worded to outline minimum requirements (ie. Agreement, engineering report, credit allocation etc.) and approve on a case-by-case basis. City may not feel comfortable that O&M would be performed if agreement outlines one private landowner. • Need strong language to protect the City against landowner / agreement disputes. • Outline that shared process is available to already eligible ICI properties. 	<p>City</p> <p>CVC</p>
4	<p><u>Summary of action items, upcoming meetings/deliverables</u></p> <ul style="list-style-type: none"> • Minutes to be circulated to all attendees. Edits and suggestions welcomed. • Preliminary framework to be provided one week in advance of the next meeting. • Next meeting invite to be circulated by City. 	<p>Resilient</p> <p>Resilient City</p>



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: May 28, 2021 10:00am
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Task 5 Meeting #2 – Identify/Expand Eligible Practices
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Cindy Truong (CT), City of Mississauga
Trevor Swift (SW), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI
Regrets: Lincoln Kan (LK), City of Mississauga
Imshun Je (IJ), City of Mississauga

Meeting Minutes

Item No.:	Item:	Action:
1	<u>Opening Remarks, Introductions</u> <ul style="list-style-type: none">Trevor Swift (TS) introduced himself – the Environmental Storm Sewer Coordinator responsible for the quality of storm water entering the storm system.In TS experience, a lack of knowledge and understanding of stormwater and impacts of contamination is a leading cause of incidents against the sewer use by-law.Consultant team introductions.	
2	<u>Background Information, Purpose of Expanding Eligible Practices</u> <ul style="list-style-type: none">Phase 1 of Study recommended adding new practices to the list of eligible facilities.Phase 1 made the suggestion to change the name of the credit category to "Operations and Activities (O&A)".Why make these changes – increase credit opportunities, customer flexibility, encourage uptake.Current maximum Pollution Prevention (PP) credit is 5%. Sliding scale approach based on percent of plan implemented.Phase 1 of the study included benchmarking other credit programs to assess potential operations/activities credits.O&A category can include structural and non-structural measures.Non-structural measures classified as low, medium, high efforts.	

	<ul style="list-style-type: none"> ▪ Low effort Activities – native tree plantings, turf conversion, litter cleanup etc. ▪ Medium: Plans to achieve a defined goal – Risk management, climate adaptation, education program. ▪ High: Programs to implement defined plans and activities – pollution prevention, salt management program. <ul style="list-style-type: none"> • Other recommendation from Phase 1 study: Waive the requirement for certification by a P.Eng. • Credits should be aligned to incentivize those following the sewer-use by-law or at a minimum, revoke credits for those not following sewer use by-law. 	
3	<p style="text-align: center;"><u>Pollution Prevention</u></p> <ul style="list-style-type: none"> • Greening Corporate Grounds (GCG) is still a corporate partner and is keen to help on the credits, particularly PP category. • Essentially no one has claimed PP credit in the City (maybe one or two active credits). • From the landowner perspective, the ROI on PP does not make financial sense, limiting uptake. • Education Program would be very helpful to Pollution Prevention. Through experience, businesses/residents are oblivious to impacts to the environment (ie. Grease trap over CB's). • There is a high staff effort to deal with incidents. Reviewing plans and credits would be less staff time than tracing spills and pollutions. • TS Recommends a P2 Lite plan which simplifies the requirements into a checklist for property inspections. • Solid waste/litter is less of a concern from TS perspective. Enforcement issues come from chemical waste, filling/emptied, movement of containers etc. • Storm sewer covers in loading docks would provide benefits. • Management of Salt use is not in the by-law and is not a focus for TS at this time. • New PP category to be organized to have a "menu" of options to pick and chose options on how to get maximum credit. • From TS' perspective, the most beneficial category would be a spill/release prevention plan. • By-law applies to SWM ponds but TS does not deal with ponds. • Pollutant concerns for ponds is solid waste. Large concern over sediment loading to the systems. (is. Sweeping etc.). • Cost to empty ponds is large, but practices to prevent sediment issues are much cheaper (sweeping, litter clean-up etc.) • Paved area sweeping, spills control plans is more of a direct benefit to City and should be incentivized. 	

	<ul style="list-style-type: none"> • Education is a soft benefit however there is a large amount of incidents is related to lack of education so there could be a large impact. • Feel good things tend to have higher uptake (ie. Litter clean-up). • Credit assigned would be based on the level of effort (ie. Easy effort gets less credit, more effort gets higher credit). • Concern over people taking the easy credit and leaving pollution prevention credit as this is typically requires more effort. • Currently, validation comes from the sign-off from the engineer. How can we validate credit for this category if the P.Eng. sign off requirement is removed? • Checklist to be created to outline the requirements of the City to get the credit. A follow-up checklist can be created for site-inspections outlining the requirements of the by-law. • Checklist can be reviewed by the owner themselves, then the follow-up on the checklist would be completed by the City. City staff effort would be minimal on the follow-up (30mins). • Education for potential 5% credit. To be worthwhile this would need to be distributed to all employees, information of impacts of spills etc. Sliding scale approach in that partial credits are available for completion of components of the education program. • At renewal stage, documentation must be provided to demonstrate measures were completed. Credit gets revoked if documentation is not provided. • P.Eng. requirement on pollution prevention is outlined in the By-law, and therefore the By-law requirements and credit should be unlinked. • Large companies have their own policies for pollution prevention and are generally not the offenders. Small-medium enterprises (SME) are main offenders with pollution/spill concerns. • Large companies are still not applying for PP credit. Perhaps their PP does not fully satisfy the City's requirements, or not aware of available credit. • GCG could reach out to Honey Well to see requirements of internal PP requirements to align with credit requirements. • Multi-unit locations – owner is responsible for initiating the compliance in tenants are not complying. Orders are issued to both the business and property owner. • Limited space to specify distance grease bins from storm sewers. • There will be a checklist to outline what is acceptable to receive the credit. • Staff time includes review of applications, checklist, and 5-year renewal application (logs to validate credit). Random selection of sites for audits. 	
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	<ul style="list-style-type: none"> • Automatic credit cancellation if a violation in the sewer use by-law is noted. Depending on level of incident, a warning can be issued before revoking the credit. 	
4	<p><u>Summary of action items, upcoming meetings/deliverables</u></p> <ul style="list-style-type: none"> • Next Step – project team can proceed with the text of this task. • End of June – presentation of recommendations to City and stakeholders. • Progress meeting on Monday, May 31 to discuss upcoming larger stakeholder meetings. 	Resilient/CHI



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: June 11, 2021 1:00pm
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Task 2 Meeting #2 – Formalize Credit Sharing Application
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Elizabeth Dollimore (ED), City of Mississauga
Ghazwan Yousif (GY), City of Mississauga
Mark Basingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI
Regrets: Muneef Ahmad (MA), City of Mississauga

Meeting Minutes

Item No.:	Item:	Action Item:
1	<p><u>Opening Remarks</u></p> <ul style="list-style-type: none">Continuing to develop an understanding and process for the shared credit process.Next week – CVC meeting regarding Southdown experience.Follow-up meetings with the conservation authorities not scheduled yet.Intent today is to look at what we have done so far and discuss how we want to augment that and then shared with CVC/TRCA.	
2	<p><u>Review of Credit Sharing Process</u></p> <ul style="list-style-type: none">City's objective for this shared credit process is to provide a formalized way to share credits but will not be promoting communal facilities.Therefore, a process or checklist is to be prepared to know how to handle the application for when these communal facilities occur.TRCA/CVC Meeting – need to bring closure to not giving credits for facilities on City ROW. Shared credits on private properties will be implemented first to gauge uptake/success. Offering shared credits for facilities on City property can be added in the future.	

	<ul style="list-style-type: none"> • Review of preliminary checklist – document is an appendix to the guidance documentation for the stormwater credit program. • Outlines that if you are considering a shared credit, this is the material that is required. • This occurs when multiple property owners contribute to one communal facility when the City is not maintaining the facility. • Tenants' situation is not applicable for communal – property owner is responsible for the charge and therefore ultimately property owner is responsible for requesting credit. • Landowner vs property owner language. Cannot use account holder because that is already used for water and sanitary accounts. • Only the one situation is applicable for shared credit – no tenant situation. • The purpose of the checklist is that the City reviewer can review this checklist to make sure everything is provided. But will not review the details of the credit allotment. Will assign credit based on the Property Owner Agreement. • A separate technical review will remain to confirm SWM calcs and total credit assigned for the facility, following the same procedure for regular credit applications. • Prerequisite – Add "All parties are in good standing with the City" as a prerequisite. • GCG – wanted to make it aware and use other resources for education. What if they cancel the program? • GCG program is limited in the Credit Valley Conservation jurisdiction. No GCG in TRCA watershed. • GCG – remove as it is too restrictive. • Roles and responsibilities – who is going to operate and maintain the facility, who manages the controls. • City requires a single point of contact in the property owner agreement. • Requirement for the agreement was discussed. The City will not confirm that the agreement is valid, but wants to know that the agreement is in place. • Change language from "sealed" to "signed and sealed by a Professional Engineer". • Do we want to list requirements of the renewal on this form? Renewal will be the same as the regular process. • Checklist to include requirement of maintenance records? This is for the initial application – maintenance records needed for renewal. • Maintenance records required as part of the regular renewal process. • Naming convention – need to update to be consistent. Since Property Owner is in the by-law, checklist should be updated to 	
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	<p>use property owner instead of involved parties, multi-party, landowner etc.</p> <ul style="list-style-type: none"> • Credit allotment – calculation is complicated and would be based on the amount of impervious area. • Application would require the total credit claimed and the credit breakdown per property owner. • Example to be prepared for the next meeting (Wednesday, June 16th after the CVC meeting). • Examples to be included in the manual. • Does the City want to explore preparing a property owner agreement template? Likely not – would want to get legal involved and involves the City in the agreement. The situation will be different every time that a template would not be beneficial. 	CHI
3	<p><u>Summary of action items, upcoming meetings/deliverables</u></p> <ul style="list-style-type: none"> • CVC meeting next week. • Report is underway. • Lots of response for the meeting at the end of the month. • Progress meeting on Monday to be cancelled. • Presentation for the meeting – send to the City on June 24th. 	Resilient Resilient/CHI

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: June 22, 2021 9:00am
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Review of Credit Sharing Examples / Credit Alignment
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI

Meeting Minutes

Item No.:	Item:	Action Item:
1	<p><u>Review of Credit Sharing Calculation Example</u></p> <ul style="list-style-type: none"> • Average Credit is about \$4,440/year. • Average of impervious area of properties claiming credit is 4 ha. • Average credit amount is 26.7%. • Therefore, the example is done for a 4 ha site. <p><u>General Example: one property, one credit assigned.</u></p> <ul style="list-style-type: none"> • Pre-development conditions is 25% impervious (300 L/s), and post-development is 85% impervious (1,481 L/s). • Storage tank for post-development conditions to control 100-yearstorm event. Example assumes 80% controlled, to 537 L/s. Therefore, credit claimed in 32%, or \$4,492. <p><u>Credit Sharing Example: two properties, one credit applicant</u></p> <ul style="list-style-type: none"> • Assumes property have same contributing impervious area. • Credit is split 50/50 between properties. <p><u>Credit Sharing Example: multi-party applicants</u></p> <ul style="list-style-type: none"> • Charge and credit divided up by percentage of impervious area. • However, applicants can split up the credit however they want. • Develop credit example with varying impervious areas. <p><u>General Comments</u></p> <ul style="list-style-type: none"> • The general approach/guiding principle is to communal credits is to look at all contributing properties as a whole to develop maximum credit available. It is up to the landowners to distribute credit to each party. • City decides the maximum credit per facility. Property-owner agreement to outline credit allotment. • What about when a property owner has other features that are not part of the communal facility? (for example, one property owner has permeable pavement separate from a communal infiltration facility). • Up to the property owner to decide if its worth it to go in on the communal facility and how on-site controls are factored into the allocations of credits. 	CHI

	<ul style="list-style-type: none"> • Communal facility applications to disclose any existing credit applications on the involved properties. • City only reviews the allocation but only to make sure that it does not surpass the total available credit. • What if one contributing property owner does not want to be part of the shared credit but their drainage is treated by the communal facility? Do all parties need to be involved to assign a communal credit? Can the larger group claim that outstanding credit? Yes, provided that the facility is not located or partially located on the non-participating property as maintenance/access is required by the participating landowners. • CHI to share the credit example slides. 	CHI
2	<p><u>Aligning Credit Criteria to Development Criteria</u></p> <ul style="list-style-type: none"> • Example demonstrates maximum credit for peak flow is aligned with the most restrictive criteria: (ie. 100yr post to 2yr pre = 40%, 10yr to 2yr = 30%, 100yr post to 100yr pre = 20%.) • City prefers assigning full credit if you satisfy the development criteria applicable on a watershed basin. • Watersheds that with no quantity control requirements get 0% peak flow credit. However, to encourage other SWM controls (quality, retention, good operations, and activities), the maximum credit in other categories could be increased, while maintaining the maximum 50% cap. • What if development criteria changes? New criteria is only applied to new credit applications. Existing applications will maintain credit amount until renewal. • What if updated criteria gives them more credit and they want it now instead of waiting to renewal? They can submit a credit update application to get the updated credit before renewal. • Maximum credit available in peak flow reduction, water quality, and retention to remain at 40%. • Other maximum credits (operation and activities, water quality) to be increased in line with evolving City objectives for SWM. • Although the maximum credit in each category is raised, the maximum credit available remains 50%. • Increasing maximum credit in other categories ensures fairness across watersheds as criteria varies. • 80% TSS removal, and 5 mm retention is required as part of the development criteria and therefore properties that cannot claim peak flow reduction credit can easily achieve the maximum credit available by satisfying the other development criteria. • More discussion required over the updated volume retention criteria. Currently, no one claims the full 15% as 15mm retention is not required by the development criteria. Recommended to maintain a sliding scale approach which incentivizes retention above the 5mm minimum up to a maximum of 15mm. 	
3	<p><u>Summary of action items, upcoming meetings/deliverables</u></p> <ul style="list-style-type: none"> • Slide deck for Stakeholder meeting to be circulated to the City on Thursday. 	



Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: June 30, 2021 10:00am
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Stakeholder Meeting #1
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Cindy Truong (CT), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Rebecca Turbitt (RT), Resilient Consulting
Mike Gregory (MG), CHI
Linda Drisdelle, Pinchin
Pegah Meghrazi, Burnside
Brad Butt, MBOT
Jennifer Scherer, Burnside
Shawn Henwood, Burnside
Phil James, CVC
Khaled Abu-Eseifan, City of Mississauga
Melanie Kennedy, Golder
Rosanna DiLabio, Pinchin
Victoria Kramkowski, TRCA
Dan Hipple, TRCA
Cosimo Stalteric, Orlando Corp
Frank Caldarola, Oxford Properties
Rosanne Mateff, Loblaw's
Garvin Alleyne, Nissan Canada
Raman Panaser, unknown
Lorrie Frankland, Loblaw's
Linda Sketchley, Bentall Greenoak
Ajay Dullabh, Bentall Greenoak
L Howieson, Imax

Meeting Minutes

Item No.:	Item:	Action Item:
1	<u>Discussion / Question & Answers</u> <ul style="list-style-type: none">• Refer to presentation slide deck	
2	<u>Discussion / Question & Answers</u> <ul style="list-style-type: none">• Brad Butt – Explain rational why 50% is the maximum credit available? Other municipalities have up to 100%.<ul style="list-style-type: none">▪ MB – Benchmarking exercise found that a maximum 50% credit was the median. The average was slightly higher as a result of the outlying communities that have 95-100% available credit. The higher credits are available in municipalities that have a consent decree or order present, typically in locations with combined sewers.	

	<ul style="list-style-type: none">▪ MB – Based on our review of existing credit applications in the City, very few applicants achieve the full 50% credit. Therefore, we think it is better to improve flexibility and category maximums to increase the average of credits claimed.▪ MG – During the benchmarking exercise, it was noted that the applicants who receive the available 100% are less than 5%, ie. not very common. Low uptake concerns are still present in these agencies/municipalities.• Linda Drisdelle – Further to BB question above, not every property owner has the knowledge to do their own calculations and requires consulting assistance. The payback on the credit is not enough to justify hiring consultants.<ul style="list-style-type: none">▪ MB – City is looking to increase flexibility and make the credit program more straight forward for applicants. As an example, Pollution Prevention Plans used to require P.Eng seal which is being considered to be removed.• Rosanna DiLabio – can you please send out the survey link with the presentation?<ul style="list-style-type: none">▪ Yes, both the presentation and survey link will be circulated.	City
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Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3

Project Name: Mississauga Stormwater Credit Program Review
Meeting Date and Time: September 15, 2021 10:00am
Project Number: 2021-010
Meeting Location: WebEx
Meeting Purpose: Stakeholder Meeting #2
Attendees: Scott Perry (SP), City of Mississauga
Shaunna Xiao Zhang (SZ), City of Mississauga
Lincoln Kan (LK), City of Mississauga
Mark Bassingthwaite (MB), Resilient Consulting
Mike Gregory (MG), CHI
Pegah Meghrazi, Burnside
Brad Butt, MBOT
Jennifer Scherer, Burnside
Khaled Abu-Eseifan, City of Mississauga
Victoria Kramkowski, TRCA
Dan Hipple, TRCA
Cosimo Stalteric, Orlando Corp
Rosanne Mateff, Loblaw's
Garvin Alleyne, Nissan Canada
Ajay Dullabh, Bentall Greenoak
Kyle Vander Linden, CVC

Meeting Minutes

Item No.:	Item:	Action Item:
1	<u>Discussion / Question & Answers</u> <ul style="list-style-type: none">Refer to presentation slide deck	
2	<u>Discussion / Question & Answers</u> <ul style="list-style-type: none">Kyle Vander Linden – Confirming requirements for P.Eng. sign-off<ul style="list-style-type: none">MB – P.Eng. sign off would still be required for peak flow reduction, water quality, volume reduction credit applications. The former Pollution Prevention Plan category is being re-named to Operations and Activities. Some of the potential credits in this category may not require P.Eng. sign off, but some will require P.Eng. sign off.Cosimo Stalteric – Confirming the impact of removal of peak flow reduction credits for watersheds with no quantity control requirements. Suggested that this may not be a fair approach if owners have invested in stormwater controls and this may have implications to site drainage practices.<ul style="list-style-type: none">MB – preliminary analysis indicates that 10 current credit applications may be affected. Increased maximum credits in other categories may assist with making up the creditSP – City will discuss with Cosimo offline, provide a map of watershed	City

	<ul style="list-style-type: none">• Brad Butt – Please explain further why peak flow reduction is not necessary for some sites.<ul style="list-style-type: none">▪ All – For some sub-watersheds within the City, development criteria do not require peak flow reduction. Development criteria are formulated with input from Conservation Authorities and are based on watershed modelling/flood mapping. In some cases, peak flows at certain locations occur when large peaks come from the upper parts of the watershed. It is therefore not required to control peak flows in lower parts. In some cases, delay of flow in the lower portion of the watershed could add to flow when the peaks arrive from upstream.• Cosimo Stalteric – In the case of a credit update, would this simply update the credit amount for the remaining term, or would this qualify for a new 5 year term?<ul style="list-style-type: none">▪ SP – has not been determined yet. This would be considered further in the implementation phase, with a goal of reducing wasted application and review time/effort.	City
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APPENDIX C

Credit Sharing Application and Checklist

Application for Multi-Property Shared Stormwater Credit

Purpose:

Typically, stormwater credits are applied to a single property that has stormwater management controls prior to discharge of stormwater off-site. A Multi-Property Shared Stormwater Credit may be applied for when multiple property owners discharge stormwater to communal stormwater management facilities owned by an entity other than the City of Mississauga.

Resources:

Please refer to the Mississauga Credit Application Guidance Manual for additional details on the available credit amounts and approved best management practices and technologies eligible for credit: <http://www7.mississauga.ca/Departments/Marketing/stormwater/stormwater-charge/img/stormwater-credits-manual-0.1.pdf>

Please refer to the examples provided in the manual for the required credit allotment information (*future*).

Application Screening:

Please confirm the following items are submitted with your shared stormwater credit application by checking the box to the left. It is noted that all components of the Property Owner Agreement are required for approval of a shared credit. If all parties have not signed the agreement, no credits will be issued.

Please be advised that the following information does not represent an exhaustive list of the credit requirements, but rather is intended to provide guidance to those applying for shared credit for an eligible communal facility. Specific details related to the site plan and stormwater management design will be reviewed and commented on by City staff.

Prerequisites

<input type="checkbox"/>	Eligible as Non-Residential / Multi-Residential Property
<input type="checkbox"/>	All property owners are in good standing with the City

Property Owner Agreement (mandatory)

<input type="checkbox"/>	Agreement signed by all property owners
<input type="checkbox"/>	Parcel ID number for each involved property (from charge estimator tool)
<input type="checkbox"/>	Addresses for all involved properties
<input type="checkbox"/>	Roles and responsibilities of all property owners
<input type="checkbox"/>	Single point of contact for City regarding application, inspection, O&M and renewal
<input type="checkbox"/>	Credit allotment (percentage by property owner)
<input type="checkbox"/>	Contact information for each property owner

Enclosures (mandatory)

<input type="checkbox"/>	Site plan(s) signed and sealed by Professional Engineer
<input type="checkbox"/>	Drainage report signed and sealed by Professional Engineer
<input type="checkbox"/>	Summary of proposed credits claimed
<input type="checkbox"/>	Operation and maintenance manual

SECOND STREET

BUILDING

PARKING

SWM
FACILITY

BUILDING

PARKING

MAIN STREET

LEGEND



FLOW DIRECTION



PROPERTY LINE

ROAD



BUILDING



EXAMPLE DRAINAGE AREA PLAN
MISSISSAUGA CREDIT ANALYSIS

DATE: AUGUST 2021

PROJECT No.: 2021-010

SCALE: NTS

FIGURE No.: 1

APPENDIX D

Stormwater Quality Control Requirements by Watershed

TABLE 2.01.03.03a: STORMWATER QUANTITY CONTROL REQUIREMENTS

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Applewood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Avonhead Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Birchwood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Carolyn Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Master Drainage Study (Winter Associates, 1987)
Cawthra Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Drainage diversion to Cooksville Creek and a very small area draining to creek.
Chappell Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Clearview Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Cooksville Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Revised development standards via Mississauga Staff report to City Council
Credit River - Norval to Port Credit (CVC)	No control required	Subwatershed Study in progress (partially complete)
Cumberland Creek (CVC)	No control required	-
Etobicoke Creek - Main Branch & Lower Etobicoke (TRCA)	No control required in the City of Mississauga	Hydrologic Model: VISUAL OTTHYMO-Return period peak flows based on the AES - 12 hour design storm Hydrology Study:Etobicoke Creek Hydrology Update (MMM Group, 2013)

TABLE 2.01.03.03b: STORMWATER QUANTITY CONTROL REQUIREMENTS

Note 1: In all cases, the storm sewer capacity constraints may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Etobicoke Creek - West Branch (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO-Return period peak flows based on the AES - 12 hour design storm Hydrology Study:Etobicoke Creek Hydrology Update (MMM Group, 2013)
Fletcher's Creek (CVC)	No control required in the City of Mississauga	Fletchers Creek Subwatershed Study Report (Paragon Engineering Limited, 1996) Subwatershed Management Strategy and Implementation Plan (AMEC Earth & Environmental, 2012)
Joshua Creek (CH)	100 Year Post to 2 Year Pre-development Control	Commentary from Conservation Halton in lieu of 1992 Watershed Plan
Kenollie Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Lakeside Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Levi Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) & Regional Storm	Hydrologic Model: GAWSER Model-Return period peak flows based on 24 hour SCS Type II distribution Gateway West Subwatershed Study (Gartner Lee Limited & Cosburn Patterson Mather, 1999) Gateway West Subwatershed Study Update by Kidd Consulting (Update in Progress)
Little Etobicoke Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO-Return period peak flows based on the AES - 12 hour design storm Hydrology Study:Etobicoke Creek Hydrology Update (MMM Group, 2013)
Lornewood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-

TABLE 2.01.03.03c: STORMWATER QUANTITY CONTROL REQUIREMENTS

Note 1: In all cases, the storm sewer capacity constraints may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Loyalist Creek (CVC)	East of Winston Churchill Blvd - Provide post to pre control for only 10 year design storm	Loyalist Creek Watershed Study (CBCL Limited, 1980)
	West of Winston Churchill Blvd - Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Erin Mills West Loyalist Creek Drainage Report (Proctor & Redfern Group, 1985)
Mary Fix Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Mimico Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Hydrologic Model: VISUAL OTTHYMO-Return period peak flows based on the AES - 12 hour design storm Hydrology Study:Mimico Hydrology Update (Marshall Macklin Monaghan, 2009)
Moore Creek (CVC)	No control required	-
Mullet Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) & Regional storm	Hydrologic Model: GAWSER Model-Return period peak flows based on 24 hour SCS Type II distribution
	Consider storm sewer constraints outlined in Streetsville Area Drainage Study (Dillon, 1994)	Gateway West Subwatershed Study (Gartner Lee Limited & Cosburn Patterson Mather, 1999)
		Gateway West Subwatershed Study Update by Kidd Consulting (Update in Progress)
Sawmill Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Hydrologic Model: GAWSER Model-Return period peak flows based on 24 hour SCS Type II distribution Sawmill Creek Subwatershed Study (Proctor & Redfern Limited, 1993)
Serson Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Large number of buildings (> 150) in the regulated flood plain

TABLE 2.01.03.03d: STORMWATER QUANTITY CONTROL REQUIREMENTS

Note 1: In all cases, the storm sewer capacity constraints may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Sheridan Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Sixteen Mile Creek (CH)	East of Ninth Line, north of CN Rail (North 16 District) – Flows draining to a North 16 District stormwater quality/erosion control facility (Ponds Q1 & Q2) are to be controlled on-site to 75 l/s/ha for the 5-year storm event	North 16 District Scoped Subwatershed Study and Ninth Line District Floodplain Mapping (Philips, 2004); recommended Scenario 2B (Recommendation (v) on page 50)
	East of Ninth Line, north of CN Rail (North 16 District north-west quadrant) – Flows draining to Ponds Q3a & Q3b are required to provide storage for 25mm and 2-year storms at 300m ³ /imp.ha and 380m ³ /imp.ha, respectively, as well as release rates of 1.5L/s/imp.ha for the 25mm storm and 5L/s/imp.ha for the 2-year storm	Master Servicing Study for the Mississauga Fire and Emergency Services Training Centre (Sernas, 2008) Detailed Design – Sanitary, Water & Storm Services, Mississauga Fire and Emergency Services Training Centre (Sernas, 2009); recommendations in Section 4.2 (page 13)
	East of Ninth Line between CN Rail and Britannia (Lisgar and surrounding area) - Provide post to pre flow control for all storms (i.e. 2,5,10,25,50 & 100 year) and volume control to pre-development conditions. No connections to FDC permitted.	-
	East of Ninth Line, south of Britannia Road (Churchill Meadows) - No connections to FDC permitted. No controls otherwise	Stormwater Management Design Report – Churchill Meadows Stormwater Management Facilities – Sixteen Mile Creek Watershed (RAND Engineering, 1997)
	West of Ninth Line - <u>to be established</u> through Ninth Line Lands-East Branch Subwatershed Study (ongoing)	-
Spring Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO-Return period peak flows based on the AES - 12 hour design storm Hydrology Study:Etobicoke Creek Hydrology Update (MMM Group, 2013)
Stavebank Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Tecumseh Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Turtle Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Wolfedale Creek (CVC)	10-year post to 2-year pre	-

APPENDIX E

Financial Assessment

Example Analysis of Recommended Maximum Credits in each Category

The consulting team has undertaken preliminary analysis to better understand the credit impacts to example applications, with three scenarios reviewed below:

- 1) Property located in a watershed that requires the same peak flow control as the current credit program (100-year post to 100-year pre);
- 2) Property located in a watershed that does not require quantity control, resulting no available peak flow credit; and,
- 3) Property located in a watershed that requires more stringent quantity control (i.e. 2-year pre, unit flow rates etc.).

Scenario 1 – Site in Watershed with No Change to Peak Flow Criteria

This example is located in the Mimico Creek watershed where quantity control criteria require 100-year post-development flows to be controlled to the 100-year pre-development levels (aka. post to pre). The site includes peak flow reduction and water quality control credits, but no volume reduction or pollution prevention. Refer to **Table 1** below for an example calculation.

Table 1: Impact Assessment: Scenario 1

Program	Peak Flow Reduction (%)	Water Quality (%)	Volume Reduction (%)	Pollution Prevention (%)	Stormwater Charge (\$)	Total Credit ¹ (%)	Total Credit (\$)
Existing	40%	10%	0%	0%	2,068.57	50%	1,034.29
Updated	40%	30%	0%	0%		50%	1,034.29
Net Change						0%	0.00

1 – Maximum total credit is 50%

For this site, as the maximum total credit remains at 50%, the alignment of the credit criteria to the development criteria results in the same credit amount for watersheds that require 100-year post to 100-year pre control. This is applicable in six (6) of the City's watersheds: Carolyn Creek, Levi Creek, Loyalist Creek, Mimico Creek, Mullet Creek, and Sawmill Creek. Based on the 61 applications reviewed, all twenty-four (24) of the active credit accounts in these watersheds will remain unaffected.

Scenario 2 – Site in Watershed with no Quantity Control Required

This scenario is located in the Fletcher's Creek watershed where quantity control is not required as per the City's development standards. As a result, a peak flow reduction credit is not available. This affects a total of five (5) watersheds in the City: Credit River, Cumberland Creek, Main and Lower Etobicoke Creek, Fletcher's Creek and Moore Creek. See **Table 2** below for an example calculation of this scenario. This assumed site currently achieves a partial peak flow reduction credit, and water quality credit.

Table 2: Impact Assessment: Scenario 2

Program	Peak Flow Reduction (%)	Water Quality (%)	Volume Reduction (%)	Pollution Prevention (%)	Stormwater Charge (\$)	Total Credit ¹ (%)	Total Credit (\$)
Existing	31.7%	10%	0%	0%	29,488.21	41.7%	12,296.58
Updated	0%	30%	0%	0%		30%	8,846.46
Net Change						-11.7%	-3,450.12

1 – Maximum total credit is 50%

As demonstrated above, the total credit amount is reduced by 12% under the aligned criteria as the applicant can no longer claim credit for their peak flow controls. Although the peak flow reduction credit is not available, the maximum credit for water quality is assigned as the site provides enhanced level treatment. Based on the 61 applications reviewed as part of this assignment, a total of eleven (11) applications will experience a decrease in their current peak flow reduction credit.

Scenario 3 – Site in Watershed with 2-year (pre) Quantity Control required

This example is located in the Cooksville Creek watershed that requires control of the 100-year post-development flows to the 2-year pre-development levels. In this scenario, existing credit holders have claimed a peak flow reduction credit for controlling to the 100-year pre-development flow or less, and will experience a lower total credit in this category as the existing controls are not sufficient to reduce flows to the 2-year levels (refer to Scenario 3A in **Table 3**).

Table 3: Impact Assessment: Scenario 3A

Program	Peak Flow Reduction (%)	Water Quality (%)	Volume Reduction (%)	Pollution Prevention (%)	Stormwater Charge (\$)	Total Credit ¹ (%)	Total Credit (\$)
Existing	40.0%	0%	0%	0%	101,693.91	40.0%	40,677.56
Updated	33.2%	0%	0%	0%		33.2%	33,756.03
Net Change						-6.8%	-6,921.53

1 – Maximum total credit is 50%

Alternatively, applications that currently claim multi-credits may be eligible for an increased total credit after the proposed changes to the credit program. This is applicable to twenty-two (22) watersheds that require control to the 2-year level, unit flow rates, or a specified release rate from the watershed study. This specific example does not provide full control to the 100-year pre-development levels under current conditions, as is common amongst the reviewed application. Refer to Error! Not a valid bookmark self-reference. below for an example that does provide full control to the 100-year pre-development levels.

Table 4: Impact Assessment: Scenario 3B

Program	Peak Flow Reduction (%)	Water Quality (%)	Volume Reduction (%)	Pollution Prevention (%)	Stormwater Charge (\$)	Total Credit ¹ (%)	Total Credit (\$)
Existing	14.4%	10%	0%	0%	11,096.61	24.4%	2,707.57
Updated	11.8%	30%	0%	0%		41.8%	4,638.38
Net Change						+17.4%	+1,930.81

1 – Maximum total credit is 50%

The above scenarios demonstrate results that may encourage applications to implement practices across multiple categories to maximize their available credit. This aligns with the City's current objectives of recognizing the benefits of not only peak flow reduction but a greater acknowledgement of water quality control and runoff volume reduction.

As demonstrated in the above tables, the total credit amount may be slightly reduced under these aligned conditions as the applicant currently does not provide full control to the 2-year pre-development levels. Based on the 61 applications reviewed, a total of twenty-one (21) active credits will be reduced, with four (4) applications experiencing an increase to the awarded credit as they currently claim more than one credit (i.e. not just peak flow reduction).

Overall, approximately 51% of the reviewed applications experience a reduction to their current credit amount under the aligned criteria. Although this reduction will be experienced, it is noted that only three (3) applications have the volume runoff reduction credit claimed and two (2) of which do not experience a reduction to the overall credit. None of the reviewed applications have the pollution prevention credit claimed. Those affected by the aligned criteria can easily claim additional credit under the new Operations and Activities category by developing and implementing a variety of plans to be determined, such as salt management, paved area sweeping, or spill prevention plans. The City recognizes the benefits associated with these plans and therefore an increased credit of 20% is proposed for this category.