City of Grand Rapids Post-Construction Stormwater Volume Credit Trading Program Design Summary

Prepared for the City of Grand Rapids Environmental Services Department

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Over the past two years, Stormwater Currency has worked with staff from the City of Grand Rapids Environmental Services Department (ESD) to conduct extensive outreach and analyses related to the feasibility and design of a post-construction stormwater volume credit (SVC) trading program. Based on this work, this document outlines Stormwater Currency's proposed framework for the SVC trading program and identifies next steps for program implementation. In addition to this document, which is intended to briefly describe key program components, Stormwater Currency has provided ESD with a more detailed report that provides additional information on the analyses and rationale behind our proposed framework and recommendations.

Program Overview

Within the City of Grand Rapids, an SVC trading program provides an offsite compliance option for developers and property owners who will be subject to post construction stormwater management requirements under the City's renewed Municipal Separate Storm Sewer System (MS4) permit. It is anticipated that the renewed permit will include channel protection standards that require new development and redevelopment sites to retain the post-development increase in stormwater runoff volume from all storms, up to and including the 2-year, 24-hour rainfall event. In addition, new development and redevelopment sites will be required to treat the volume of runoff generated from 1-inch of rainfall over the project site to specified water quality standards. New development and redevelopment sites that add 1,000 square feet of impervious area or more will be subject to these requirements.

SVC trading allows property owners or developers subject to stormwater management requirements to meet some portion of their requirements by purchasing stormwater volume credits (SVCs) from other property owners or developers who voluntarily implement green stormwater infrastructure (GSI) Best Management Practices (BMPs). These "credit-generators" may include third parties or property owners who voluntarily implement GSI retrofit projects or developers and property owners subject to post construction stormwater management requirements who retain stormwater runoff from more impervious area than required by regulation.

The new channel protection requirements serve as the driver for the program because they are retention-based and must be met through GSI practices, if possible. However, developers and property owners who purchase SVCs to meet channel protection requirements will also get some credit towards the volume of runoff they are required to manage for water quality, as well as for the City's flood control requirements.

Program Benefits

Post-construction stormwater trading provides flexibility for property owners and developers who will be subject to post-construction stormwater management requirements adopted as part of the City's new MS4 permit and stormwater ordinance. These new requirements apply to new development and redevelopment sites that add 1,000 sq. ft. of impervious area or more relative to pre-development conditions. Property owners and developers will buy credits from an offsite provider when it is cheaper or easier than managing all stormwater onsite. In some cases, buying credits can allow property owners or developers to take advantage of additional buildable area onsite, including rooftop or underground area. In other cases, onsite controls may not be feasible or may be very expensive. Purchasing credits can

provide a less expensive option for meeting stormwater management obligations compared to paying an in lieu fee to the City (as defined below).

In addition to benefits for developers, a trading program can result in greater overall water quality/stormwater control benefits compared to standards that require developers to manage stormwater on-site. For example, allowing some portion of retention to be met offsite can result in a greater number of smaller GI installations which, in comparison to a smaller number of larger stormwater management practices, capture more stormwater annually and help distribute the environmental, social, and human health co-benefits of GI throughout a city or watershed (Dougherty et al. 2016). Municipalities can also design programs in a way that encourages or incentivizes credit generation in areas where it will result in the greatest overall benefit, rather than simply gaining additional stormwater control where new development and redevelopment happens to be occurring.

Alternative Compliance Options

COMPLIANCE OBLIGATIONS. Developers and property owners subject to the City of Grand Rapids Land Use Development Services (LUDS) requirements must demonstrate intended compliance prior to receiving a building permit from the City. Compliance can be demonstrated through an approved onsite stormwater management plan, a contract with a certified credit supplier, through payment of an in lieu fee to the City, or through a combination of these options.

SVC PURCHASE OPTION. If opting to participate in the SVC trading program, developers or property owners must purchase enough SVCs to meet the portion of their stormwater management requirements that are not met onsite, into perpetuity or until the development site is redeveloped. Stormwater requirements reflect those in place at the time the development was permitted by the City. The SVCs purchased by the Qualified Buyer must be certified by the City prior to the developer receiving a LUDS permit.[1]

By purchasing credits, the buyer shifts the responsibility for compliance with stormwater management requirements to the seller. Qualified Sellers are obligated to maintain Qualified BMPs at the credit site for each certification and recertification period for which they have received and sold credits, or for the duration of the contract between the buyer and seller, whichever is longer.

IN LIEU FEE. As an alternative to the SVC trading program, the City has established an in lieu fee as an alternative compliance option for meeting stormwater standards. The in lieu fee payment includes a one-time upfront payment to cover capital cost installation, and an ongoing annual maintenance fee ($/cu. ft.) which can be paid either all up-front, annually or according to a schedule set by the City.

The in lieu fee serves as the ceiling price for the credit market because it is typically much more expensive for a municipality to implement GI on public property than it is for private property owners to install stormwater management BMPs on their properties. Thus, the public agency would have to charge a higher price (in the form of an in lieu fee) than a private credit-generator selling credits on the market.

Stormwater Currency has estimated the in lieu fee using the methodology described in the accompanying report (see Appendix 1 in that document). The City should follow this methodology in setting an initial

[1] We suggest that ESD consider altering this schedule to allow developers to purchase, and obtain off-site compliance through credits that will be certified before the development is complete.

price for the in lieu fee and in making regular adjustments to this price. Annual or bi-annual adjustments would keep the price consistent with current levels of costs that the City would incur.

MINIMUM ON-SITE REQUIREMENTS AND CREDIT RATIOS: Pursuant to the City's proposed MS4 permit, developers facing infeasibility constraints must try to retain the increase in stormwater runoff volume associated with a 0.4-inch rain event. If this can be done onsite, then the developer can purchase additional retention capacity, either by paying the in lieu fee or by purchasing SVCs, to meet their remaining compliance obligations. As with in lieu fee payments, however, SVCs must be purchased at a 1.5:1 ratio, meaning for every cu. ft. of retention required, developers must purchase 1.5 times that amount in the form of SVCs (or in lieu fee retention capacity). If it is infeasible for the developer to retain any stormwater onsite through GSI practices, he/she may purchase credits to meet their full compliance obligation. In this event, however, SVC's must be purchased at a 2:1 ratio.

Key Program Considerations

This section highlights the key components of the program, including key definitions and descriptions of program parameters.

POST-CONSTRUCTION STORMWATER CREDIT TRADING UNIT: One SVC represents one-unit volume of Qualified BMP (see below) retention capacity per year. The City's stormwater manual guides site developers through the calculations required to determine water quality, channel protection, and flood protection control volumes in terms of cubic feet. To enable consistency with local practice, we suggest that credits be created, traded and consumed in "cubic feet." In other words, one credit shall be worth one cubic foot of BMP retention capacity. An SVC generating project can supply SVCs up to the total approved design capacity.

QUALIFIED SVC PURCHASERS: Any property owner or developer who is subject to post-construction stormwater management requirements and who cannot feasibly implement GSI-based stormwater BMPs onsite is a Qualified Buyer of credits. The City's proposed stormwater ordinance, intended to effectuate the updated MS4 permit states that infeasibility will be based on multiple criteria and not solely on the difficulty or cost of implementing BMPs on site. The ordinance lists several conditions under which the option to move off site may become available, including:

- Limited size of the lot outside of the building footprint to create the necessary infiltration capacity even with amended soils.
- Soil instability as documented by a thorough geotechnical analysis.
- A site use that is inconsistent with capture and reuse of stormwater.
- Too much shade or other physical conditions that preclude adequate use of plants.
- The potential water quality impacts associated with the original project site compared to the benefits realized at the offsite location.

A second set of infeasibility criteria are also listed in the City's draft stormwater manual (2017). We recommend that the City consider adding criteria from the following list, in order to include other common factors that might lead to site infeasibility for infiltration:

- Poorly draining soils <0.24 inches per hour; typically, hydrologic soil groups C or D)
- Bedrock
- High groundwater, or the potential of mounded groundwater to impair other uses

- Stormwater hot spots (includes Part 201 and Part 213 sites, and areas of soil or groundwater contamination)

The criteria for determining infeasibility are more fully discussed in the accompanying Report at pages 6-7. ESD will determine on a case by case basis whether infiltration on-site is infeasible according to the above criteria and will need to further define methods for determining whether a particular criterion applies to a particular site.

QUALIFIED SVC SELLERS: Credits can be generated and sold by:

1) Property owners who are not subject to post construction stormwater management requirements and who voluntarily implement Qualified BMPs (as defined below) as GSI retrofit projects on their property
2) Third-parties who work with property owners not subject to post construction stormwater management requirements to implement Qualified BMPs
3) Developers or property owners who are subject to stormwater management requirements and who build Qualified BMPs that retain stormwater from more impervious area than required by regulation on a particular property.

QUALIFIED SVC-GENERATING BMPs: SVCs are generated by GSI-based BMPs that meet the design, hydraulic, and hydrologic requirements outlined in the City's Stormwater Manual. Currently, the City's Stormwater Manual includes a list of eligible GSI practices for meeting channel protection requirements onsite. Prior to program implementation, the City will develop further guidance for Qualified BMPs and associated design, construction, and maintenance specifications.

Qualified BMPs must be built to retain at least the amount of rainfall associated with a 1-inch storm from the hydrologically connected area, and no more than the amount of rainfall associated with the 2-year, 24 hour storm (approximately 2.54-inches).

Qualified BMPs built by property owners or third parties who are not subject to regulation must be designed with a capacity to retain at least 250 cubic feet of runoff from the hydrologically connected area. This volume was chosen to ease the administrative cost and burden on ESD staff charged with inspecting and certifying credit generating BMPs. It is also a feasible amount of retention that could be provided by a small property retrofit.

There is no minimum volume requirement for Qualified BMPs built by developers or property owners at development sites subject to post-construction stormwater management requirements who retain runoff from more impervious area than required by regulation.

SVC APPLICATION AND CERTIFICATION: Property owners, developers, and/or third parties interested in becoming Qualified Sellers must submit an application to the City for each proposed stormwater management BMPs or set of BMPs. The application process will require concept-level designs. Specific application requirements will be developed by the City prior to program implementation.

Once completed, the City will evaluate stormwater management BMPs and issue associated SVCs, based on design retention capacity of the BMP. Qualified BMPs will be certified for three-years at time (the Certification Cycle), beginning with the date upon which the Qualified BMPs are fully implemented. SVCs must be certified prior to sale to a Qualified Buyer.

After each Certification Cycle, so long as the Qualified BMPs remain in place and functional at the SVC supply site, a seller may apply for recertification of SVCs. Prior to program implementation, the City will develop an inspection program to certify and recertify credits and validate continued performance of Qualified BMPs. This program is anticipated to be closely based on the inspection process that the City would apply to on-site green infrastructure BMPs at new and redevelopment projects.

CREDIT PRICE. Prices for SVCs will be calculated by the seller and should be based on the cost of capital installation (including design and construction), maintenance, and expected return on investment. Credits are priced on a $/volume unit (i.e., $/cu. ft.) basis. The City should anticipate tracking SVC transactions and making price information publicly available. Transparency about pricing will effectively prevent price gouging by SVC sellers.

CREDIT PURCHASE AND PAYMENT STRUCTURE: Potential payment structures include annual payments on a $/volume/year basis (such as occurs in the Washington D.C. Stormwater Credit Retention Trading Program), one-time upfront payments for credits (including cost of maintenance over the duration of the purchase), or one-time upfront payment for capital costs and continued payments for maintenance over time (either to the credit-generator or to a third party). If the City opts for a one-time payment model, it would need to create a parallel transaction structure to ensure that SVC transactions are accompanied by a strong maintenance agreement, potentially tied to the deed of the property. A parallel approach to the in lieu fee will also be required.

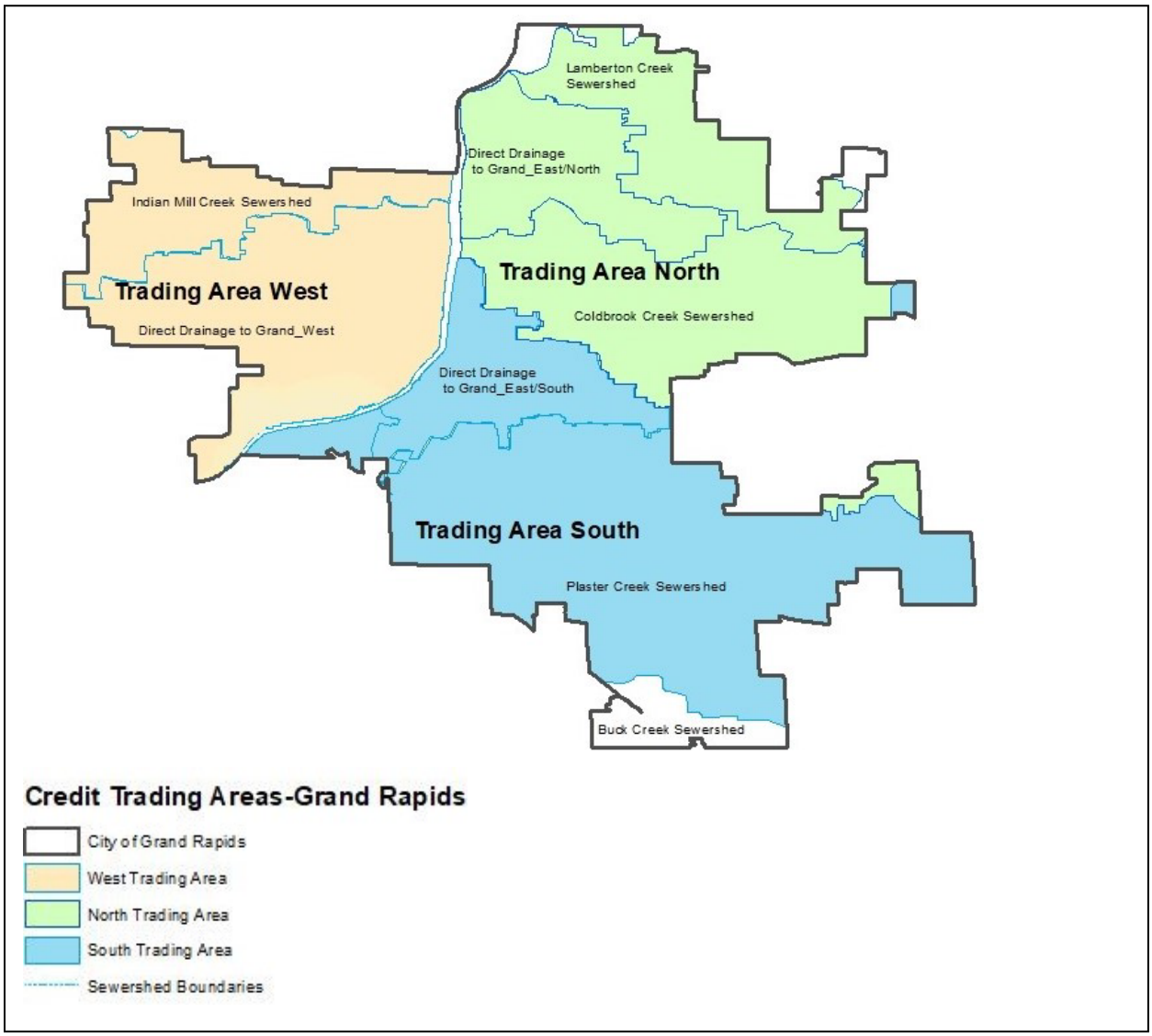
We recommend using the "one time capital, plus on-going maintenance" payment model. This model will most likely provide both the certainty and flexibility needed for credit purchasers and sellers. For capital costs, the seller will enter into a 'one time' transaction with the buyer to provide SVCs for an agreed upon period of years to match the expected useful life of the BMP to be installed, with a minimum of 20 years. At the end of the SVC purchase term, the agreement could either be extended with the needed reinvestment to assure another minimum 20-year useful life of the BMP, or the SVC purchaser would be obligated to find a new provider of SVCs. The tracking system developed by the City will alert ESD staff.

In addition, credit purchases should provide sufficient sustained revenue to assure the long-term maintenance of the SVC generating green infrastructure to match the term of the SVC purchase agreement. In each SVC transaction, the developers in need of credits would enter into an agreement with the credit generator under which they pay an appropriate amount each year to cover maintenance costs (the developer could also pay for multiple years of maintenance at one time, depending on the buyer-seller agreement, for say either 5 or 10 years). The certification of SVC purchase provided to the City would also include a copy of the maintenance payment agreement between the developer and SVC provider(s).

TRADING AREA GEOGRAPHY: The City has established three trading areas within which trades can occur. The trading areas were designed to protect against adverse water quality impacts in accordance with the City's MS4 permit. Broadly speaking, the trading areas were created from the sewersheds currently recognized by ESD. Three sewersheds - Lamberton Creek, Coldbrook Creek and northern portion of the Direct Discharge to Grand River East, have been consolidated to form the Northern Trading Area. Direct Discharge to Grand River West and Indian Mill Creek sewersheds have been combined to create the West Trading Area. The South Trading Area is made up of the Plaster Creek sewershed and the southern portion of the Direct to Grand River East sewershed. See map in Figure 1**.** SVC exchanges must occur between

projects located within the same trading area. Initial analysis indicates that trading conditions are unlikely to occur with any frequency in the Buck Creek sewershed, however, any SVC purchases by projects in that area should be sourced from credit suppliers within the same sewershed as well. This would prevent any stormwater impacts from being improperly displaced to neighboring municipalities.

FIGURE 1: Trading Areas and component sewersheds



The City should track the distribution of projects that create SVCs and of projects that purchase them to ensure that the program does not inadvertently create adverse environmental or infrastructure impacts. If such impacts become likely, the City may consider taking steps to guide SVC development and transactions to favor development of retention in optimal locations within each trading area.

PURCHASE GUARANTEE PROGRAM: Stormwater Currency strongly recommends that the City assess the viability and financial details for creating a credit price floor by establishing a purchase guarantee program. With such program, the City would offer to be a buyer of last resort for SVCs providers who are otherwise unable to find a buyer. This approach would require that the City provide funding to purchase

unsold credits at a price that is lower than the expected market rate in order to incentivize and provide assurance to potential credit-generators.

FURTHER INCENTIVES. The City may, at any time, create rules or programs that incentivize sellers or disincentivize buyers in priority areas, address equity concerns, or offer incentives to create Qualified BMPs. This may include working with third-parties and/or potential project aggregators to generate interest in participating in the market, and/or providing financial incentives to credit generators. It may also be necessary for the City to develop programs or incentives that help to ensure an adequate supply of credits over time.

SVC RECORDING AND TRACKING: The City will need to track each credit with a unique identification code (format to be determined), which shall include a marker for the parcel and date on which the credits are certified. Once purchased or expired, credits cannot be re-sold. Prior to program implementation, the City shall establish a credit recording and tracking database.

SVC EXCHANGE: Prior to program implementation, the City will establish a web-based market platform where the seller can advertise credits for sale (price and volume) and through which a buyer may contact a seller for additional information or to enter into a purchase contract. We also suggest that the City allow parties interested in generating credits to advertise on the exchange platform. The market platform will be tied to the SVC recording and tracking database.

GRANDFATHERING. Stormwater Currency recommends that the City consider making an initial supply of credits available to the market by selling credits from municipal projects built in recent years. In particular, the projects that ESD and other departments have installed since 2015 which are not intended to meet any current regulatory requirements are eligible for inclusion in this initial SVC bank. The price for SVCs generated by City projects should be set at market rate (or estimated market rate). At the outset of the market, these projects will essentially serve as the supply that the City can use to meet demand created by developers who opt to pay the in lieu fee. Once the SVCs from these projects are sold, the City shall establish the in lieu fee using the methodology outlined in the accompanying report. The City can use the revenues from the SVCs it sells for market administration purposes (potentially including a purchase guarantee program).

NON-PERFORMANCE: The City will use the Stormwater Retention Credit Maintenance Agreement as a means of ensuring that credit-generating GI is continuously maintained. This Agreement, which mirrors that required of developers who install GI on-site, provides a mechanism for granting City a maintenance easement and damages for non-compliance with maintenance obligations. In the event of non-performance by the seller, credits purchased by a buyer remain valid for the buyer. Settlement of damages is entirely between the City and the non-compliant SVC seller.

The City shall also develop a mechanism for assessing and ensuring compliance with stormwater regulations by developers who pursue off-site compliance through SVC purchases. The enforcement authority used by the City to ensure the functionality of on-site stormwater BMPs may be sufficient to ensure that off-site retention is maintained over the lifetime of a real estate development, however, the City may need to consider supplemental enforcement authority, perhaps including property liens or deed restrictions for non-compliant properties.

Next Steps for Implementation

The new MS4 permit is expected to require that the City implement a functioning credit trading program within twelve months of the permit's effective date. The following list briefly describes the major tasks that ESD can anticipate undertaking during that time.

Program Launch and Administration

Establish process for credit certification/recertification: This is the process by which SVC providers gain ESD's approval to market their credits. Approval will be conditioned upon ESD's review of the retention capacity of the credit generating project. A key question to resolve is timing of certification (upon completion of project or at an interim stage) and whether an interim approval is sufficient to allow the SVC provider to provisionally market the credits.

Establish process for infeasibility determination: A clear process for making this determination is necessary in order to guide real estate developers in making the choice to purchase SVCs. A key question to resolve is whether the developer can make the determination without review and approval by ESD or other City staff.

Clarifying infeasibility criteria and other modifications to stormwater manual: the current draft of the City's Stormwater Manual contains some inconsistent and potentially incorrect information. For example, Figure 3: Flowchart outlining conditions for offsite compliance (in the Manual) indicates that offsite compliance is only available when favorable infiltration rates are unavailable on-site. Poor infiltration is but one of the allowable infeasibility criteria otherwise specified in the Manual and draft MS4 permit.

Credit tracking database and website: Developing this database and launching its online version is a fundamental step to ensure a successful credit program. This database needs to contain information about:

- available SVCs, their location, provider contact, and associated maintenance plan;
- real estate developers who have purchased SVCs, their associated SVC providers, duration of credit purchase, and maintenance plan;
- potential SVC providers: landowners who would be willing to 'host' green infrastructure to generate SVCs or landscape/stormwater professionals able to provide green infrastructure design/build services.

Determination of in lieu fee: Using the methodology provided in Appendix 1 of the accompanying report, ESD should identify the initial in lieu fee cost and the schedule by which it will regularly update the fee. This price should be incorporated into outreach to the real estate developer community.

Developing and publishing overall trading program procedures: The Department should compile, or have compiled, a document outlining the processes ESD will follow to administer the program and its application to both real estate developers and SVC providers. This document should be intended for both internal ESD/City staff and public participants in the SVC market.

The launch of a stormwater credit trading program will need the approval and support from the City of Grand Rapids. City departments will need to coordinate with ESD to address updating codes and

ordinances, and/or development guidelines to coincide with new stormwater requirements and ensure ease of access to the market.

Developing Support and Participation

Outreach to real estate developer community: Education and engagement of the local real estate developers is critically important. ESD should undertake this effort with partners from the community. In advance of doing so, the Department should develop relevant presentation and outreach materials, clear procedures for developers to follow, and initial information about estimated SVC and in lieu fee costs.

Outreach to affordable housing developers: Affordable housing developers, like the broader real estate sector, can be both providers and consumers of SVCs. Given their particular needs and restrictions, the Department should consider tailored outreach to this community.

Outreach to institutional landowners, community organizations and other potential credit generators: Building adequate supplies of SVCs will likely require some degree of engagement of landowners and green infrastructure specialists who are capable of installing significant amounts of green infrastructure. ESD and local partners should plan continuing efforts to reach this community.

Coordination with Planning and Development, Economic Development, Parks and other City departments: ESD and its partners should ensure that the credit trading program is introduced to and coordinated with all City departments involved in funding/financing, planning, review and approval of real estate projects, affordable housing projects, and economic development initiatives.

Collaboration on Workforce Development: Collaborate with Lower Grand River Organization of Watersheds (LGROW) and Grand Valley Community College (GVCC) to ensure an equitable workforce certified to implement and maintain GSI projects throughout the city. The workforce can provide some assurance to buyers of SVCs that the projects will be maintained by certified professionals and therefore continue to meet regulatory requirements.

Creating and Assuring Adequate Supply

Green infrastructure design and program manuals for potential credit generators: SVC generators may benefit from simplified descriptions of the City's standards for green infrastructure as well as a guide to participating in the SVC market.

Creation of transaction support resources, including sample SVC sales contract and template for credit pricing: Template contracts, maintenance agreements, and pricing calculators will ease the creation of SVCs and overall participation in the market.

Application materials for prospective SVC sellers: Simplified application forms should be created to ease entry both into the market for potential SVC providers as well as review by City staff.

Issuing SVCs for banked ESD, Parks, and Vital Streets projects and setting price for these SVCs: Initial supply of SVCs is likely to come from publicly funded projects completed since 2015. While a registry of these projects and their associated retention volumes exists, ESD needs to issue SVCs for these volumes and enter them into the registry of SVCs available for purchase. The Department should also set a price for these SVCs that will be competitive with newly created SVCs and not underprice new projects.

Issuing SVCs for previously constructed private GSI projects: Private projects that were implemented since 2015, with an approved stormwater permit, and meets the new stormwater requirements can apply for SVC's; sellers should be guided in setting a price based on current construction cost of implementing the project to be competitive with new SVC's.

Issuing SVCs for voluntary green infrastructure projects: SVC's can be generated by installing GI that is not required to meet stormwater or water quality requirements. These projects include (re) development projects that treat more stormwater beyond the required volume, or retrofits on properties with no other construction ongoing. Property owners can implement GI practices from developed areas to generate retention credits. Site that chose to implement GI that do not trigger stormwater requirements, GI practice must meet a minimum threshold to generate credits. In Grand Rapids GI projects that treat runoff volume produced by connected impervious areas for the 2-year 24-hour storm or channel protection standard.

Potential for project aggregation: the credit trading program provides an opportunity for projects to be spread across multiple properties, reducing the cost for each property owner while increasing the benefits to the watershed. As with any other SVCs, SVC's generated from these projects can be banked and sold at a future date.

Incentives for developers to treat runoff beyond requirements: The City can develop incentives to increase participation in the market and ensure a future supply of credits, particularly in areas where insufficient credits currently exist. Incentives can be provided at minimal cost in the form of resources and guidance or opportunities for coordinated financing and public-private partnerships could be explored.

"Purchase guarantee" program: incentive program that assures buyers SVCs will be sold, the City could offer to purchase unsold retention credits at a lower price to create a degree of certainty in the market as a buyer of last resort.

Other Considerations: As the City becomes increasingly aware of ensuring that benefits are dispersed equitably across the city, stormwater credit trading has the ability to distribute GI investments across neighborhoods. Implementing GI in historically underserved communities could potentially provide greater community benefits than GI implemented in established high-development areas. However, the trading program may also spur undesirable gentrification and displacement of long-term, economically underprivileged residents. ESD should coordinate with other City departments and community organizations to anticipate these impacts and respond with a package of measures to ameliorate these impacts.

Conclusion

This guide and the accompanying manual serve to assist ESD with the implementation of a stormwater credit trading option for Grand Rapids. To create a viable market and ensure a successful market in the future, aside from recommendations listed above, the acceptance by the development community is critical. The support of local leaders and community stakeholders are vital for advancing the market into a functioning mechanism for delivering privately funded GI projects and effectively decreasing the volume of stormwater runoff throughout the watershed. The City's willingness to undertake a stormwater credit trading program will position them as regional leaders in sustainable stormwater

management, the willingness to take a risk on innovative solutions to protecting the environment and community members could potentially lead to increased economic investment in the region. We look forward to assisting ESD in executing this program to achieve their stormwater reduction goals through a new market-based approach.

References

Dougherty, S., R. Hammer, and A. Valderrama. 2016. How to: Stormwater Credit Trading Programs. NRDC Issue Brief 16-01-A. New York: NRDC.