Sustainable Technologies
EVALUATION PROGRAM

Addressing the Stormwater Management Crisis in Urban Ontario:

Aggregated Private-Public Land Green Infrastructure Retrofits

Current Problem with Urban Stormwater Management: Stormwater Runoff

Ontario and its municipalities incur a significant financial cost as a result of stormwater runoff. Cities and towns are faced with the challenge of managing and treating stormwater, while contending with increased flooding, rapid urban growth, climate change and aging, limited or no stormwater infrastructure. In fact, 65 – 70% of the GTA was built before current stormwater management or flood control standards. The extreme cost of retrofitting stormwater infrastructure within public lands (road right of ways) makes it untenable for most municipalities. This leaves municipalities, the Province and its residents at greater risk to flooding and water quality impairments. A new approach is needed.

A Made in Ontario Innovative Solution to Stormwater Management

With funding support from the Federation of Canadian Municipalities (FCM), Credit Valley Conservation (CVC) is testing the engineering, financial and regulatory feasibility of implementing at source, low impact development (LID) stormwater infrastructure on private lands using property aggregation and a communal design, build and maintenance approach, based on the Drainage Act process. This innovative project is being piloted in southwest Mississauga and includes 13 industrial-commercial properties and numerous small businesses working together with local government and the CVC. Through collaboration, economies of scale and cost sharing can occur to achieve reduced flood risk and improve stormwater managment.

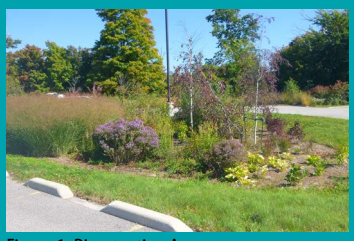

Figure 1: Bioretention Area

Figure 2: Permeable Pavers

Figure 3: Infiltration Chamber and Stormwater Re-use

Figure 4: Rainwater Harvesting

Further project details are included below:

1. *LID Stormwater Infrastructure:* Innovative LID solutions complement existing stormwater infrastructure, extend its useful life, decrease flood risk and build community resilience to climate change. They also provide numerous other co-benefits such as carbon sequestration, reduced urban heat island effect and potable water use offset opportunities. See figures 1 to 4 for some examples of LID solutions.

2. *Using Private Property to Improve Urban Stormwater Management:* Constructing drainage works for stormwater management on private property is cheaper than doing so within the public road right of way. The City of Philadelphia found that an acre of private impervious land could be retrofitted 67% cheaper than the cost of retrofitting stormwater infrastructure within the public road right of way[1]. By working on private property, 85% of the land in a municipality becomes available to manage stormwater where it lands, avoiding costly downstream impacts and stormwater infrastructure upgrades.

3. *Overcoming Barriers to Implementation*

   a) Economies of Scale and Cost Sharing: A key barrier preventing wide-scale implementation of LID on private property is the high cost. Even where storm water credits exist, the payback period is poor. If landowners and local government collaborate by taking an aggregated approach (see Figure 5 above), economies of scale will emerge and cost sharing of planning, design, construction and maintenance can happen.

   b) Maintaining Stormwater Infrastructure on Private Property: Historically, municipalities have been reluctant to rely on infrastructure on private property because there are no guarantees that they would be inspected and maintained or be able to access the property. The Drainage Act provides a made in Ontario process for the design, construction and maintenance of communal stormwater works and ensures property access and operations can be facilitated.

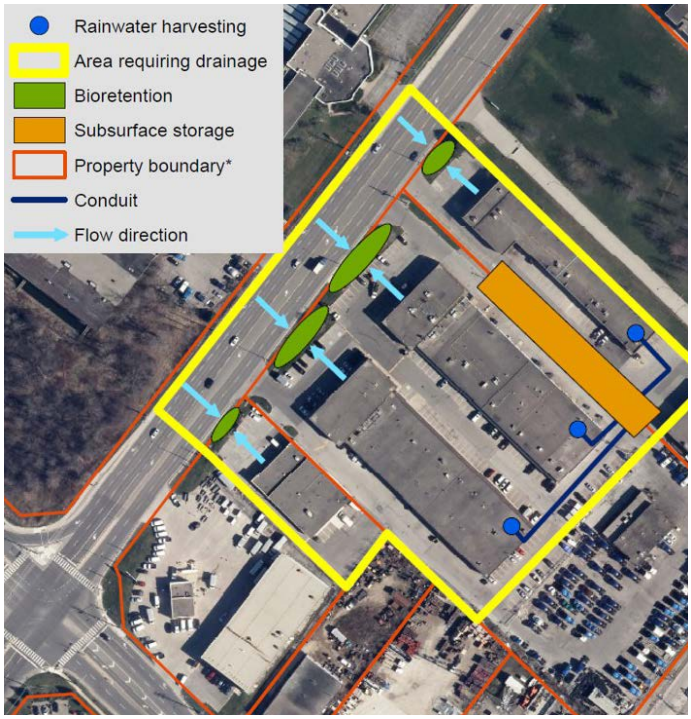

Figure 5: Aggregated Property Stormwater Solution

REFERENCES

[1] *Valderrama, A., P. Davis (2015). Wanted: Green Acres, How Philadelphia's Greened Acre Retrofit Program is catalyzing low-cost green infrastructure retrofits on private property. NRDC Issue brief January 2015, ib:14-12-B*

For more information please see the following resources:

Paper: **The Drainage Act as a Tool to Facilitate the Aggregation and Wide-scale Implementation of GI LID on Private Property**

Paper: **Economic Instruments to Facilitate Stormwater Management on Private Property**

Website: **sustainabletechnologies.ca**

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If you are interested in getting involved through any of our engagement opportunities, please contact us at:

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The water component of STEP is a collaborative of:

Credit Valley Conservation
inspired by nature

Lake Simcoe Region conservation authority

Toronto and Region Conservation Authority