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Water Stewardship

Low impact solutions in Toronto

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Through a case study with Calstone Inc., **Eric Meliton** and **Alyssa Cerbu** of Partners in Project Green demonstrate how businesses can become leaders in water stewardship by implementing lot-level stormwater management solutions to create a growing portfolio of projects across Ontario's greater Toronto area.

Building a network of water stewardship initiatives

The Greater Toronto Area in Ontario, Canada spans more than 7,000 square kilometers. It is home to more than six million people and has more than 200,000 businesses and nine watersheds. This area faces many of the same stormwater challenges as other urban centers around the world: population growth, urbanization, aging infrastructure, and an increased risk of flooding, to name a few. For instance, the ramifications of an over-burdened, outdated stormwater management system were felt in New York City during Hurricane Sandy in 2012. The hurricane severely damaged infrastructure in nine US states and was deemed the second costliest hurricane in US history with over US\$70 billion in damages.

In the past, to tackle these challenges, cities like Toronto have tried implementing large stormwater retrofit projects, which are burdened with high capital costs and logistical concerns. To confront the growing concerns of flood management, climate change resiliency, and increased financial and operational risks, urban areas must explore different methods of managing stormwater.

One method Ontario's Conservation Authorities are exploring in urban areas is promoting small-scale, site-level stormwater management, such as low impact development (LID) technologies.

Founded in 1946, Ontario's 36 Conservation Authorities help ensure the restoration, conservation, and responsible management of natural habitat, land, and water. After the destruction and deaths related to Hurricane Hazel in 1954, authorities in the Toronto area merged to create a single overseeing body that was given legal authority to purchase lands for conservation. Now known as the Toronto and Region Conservation Authority (TRCA), it is the largest land owner in Toronto and oversees the management of nine watersheds and the preservation of 12 conservation areas.

As a leader in stormwater management and urban flood prevention, TRCA has looked to lot-level stormwater management to reduce the burden on municipal infrastructure and decrease local, onsite flooding risks. One key strategy TRCA is using to actually implement these lot-level stormwater management techniques is to focus on property owners with large amounts of impervious surfaces. By retrofitting their property, large property owners – many of which are businesses – can significantly benefit local watersheds. In partnership with the Toronto Pearson International Airport – a major North American global hub and the largest airport in Canada – TRCA created the Partners in Project Green program, which is designed to work with businesses to tackle their key sustainability challenges.

Dedication to sustainability

Created in 2008, Partners in Project Green is focused on transforming the 14,000-hectare industrial area around the airport, an area that accommodates more than 12,500 businesses with 350,000 employees. The goal is to convert this area, called the Pearson Eco-Business Zone, into a competitive, high-performance, and sustainability-friendly business climate. In this zone, Partners in Project Green is facilitating the proliferation of public- and private-sector partnerships and operates in four key performance areas: waste management, energy performance, employee engagement, and water stewardship. Partners in Project Green provides programming and events to organizations to foster peer-to-peer learning and collaborative opportunities that engage employees to reduce waste sent to landfills, carbon emissions, and water footprints.

Partners in Project Green's ultimate goal is the replication and proliferation of lot-level LID stormwater management projects. By encouraging the adoption of stormwater

Milestones for Calstone Inc. collective stormwater infrastructure project

Date	Milestone
May 2014	On-site assessment
May 2014	Site selection
September 2014	Funding allocation
October 2014	Long-term conceptual architectural plan
October 2014	Procurement
October 2014	Site preparation
November 2014	Construction commencement
November 2014	Construction completion
May 2015	Planting
June 2015	On-site monitoring commencement

WHEN USING A COLLABORATIVE FUNDING MODEL BY COMBINING INCENTIVES AND ENACTING A DEDICATED VENDOR NETWORK, IT BECOMES EASIER TO MAXIMIZE THE POTENTIAL OF A SUSTAINABILITY PROJECT.

management projects across Toronto and the Pearson Eco-Business Zone, the group can showcase how private property owners can help manage stormwater risks and reduce burdens on aging municipal stormwater systems. Together with initiatives involving water assessments and audits as well as process and wastewater improvements,

Partners in Project Green aims to showcase stewardship successes to grow the number of projects within and across watersheds.

One example is a project implemented successfully at Calstone Inc., a medium-sized steel furniture manufacturer located in east Toronto. Calstone undertook several green initiatives that have allowed the company to capitalize on business opportunities with organizations wanting to partner with green suppliers. Through its initiatives, Calstone has become a recognized leader in Toronto and gained a reputation for its corporate sustainability. In 2014, Calstone leveraged previous green initiatives to win an award valued at \$5,000 for installing a rain barrel at its site. The company then contacted Partners in Project Green to assist with the project.

Collective stormwater management

After visiting the Calstone site in the fall of 2014, Partners in Project Green realized that, with senior-level buy-in from Calstone President and Chief Executive Officer Jim Ecclestone, the site would be ideal for showcasing unique stormwater management technologies available to businesses for retrofitting their property. As a result, Partners in Project Green pooled available stormwater capital infrastructure funds, available in-kind support, and a grant from the Ontario Ministry of the Environment and Climate Change to increase the value of the project. When using a collaborative funding model by combining incentives and enacting a dedicated vendor network, it becomes easier to maximize the potential of a sustainable project. The Calstone project was transformed from a simple rainwater harvesting tank to include retention and infiltration features by expanding funding from \$5,000 to more than \$125,000.

As part of its stewardship initiative, Calstone previously disconnected one of six downspouts to use the water for flushing toilets and cooling spot-welding equipment. In collaboration with Partners in Project Green, new initiatives focused on disconnecting the remaining five downspouts to capture 100 percent of the rainwater from Calstone's 3,900-square-meter roof. Harvested rainwater is used for onsite irrigation and beautification of Calstone's employee green space. Additionally, infiltration of stormwater benefits the local watershed of Highland Creek – one of TRCA's nine watersheds – and reduces the strain on municipal storm sewer infrastructure.

The first phase of the project involved the installation of a 9,300-liter rainwater harvesting tank and a 780-square-meter infiltration and retention system, which includes two retention ponds, one infiltration pond, and one infiltration trench. During a rain event, water will flow from the roof downspouts into the rainwater harvesting tank or the infiltration trench. When the tank overflows, that water will move into the three interconnected ponds. One of the ponds remains a permanent onsite water feature while the other two provide temporary water infiltration and retention capabilities. Employees can enjoy the space by using a walkway made from recycled materials that leads to an infiltration trench at the other end of the facility.



The interconnected stormwater detention and infiltration ponds on Calstone's property. The pond closest to the parking lot acts as spillover from Calstone's rainwater harvesting tank as well as a permanent, attractive water feature. Image by Partners in Project Green

In the spring of 2015, the official planting of native, drought-resistant plants commenced and marked the start of monitoring and testing of these stormwater infiltration and treatment systems. The system will be evaluated for two years, and the insights gained from Calstone's installation will help to assess the effectiveness and cost feasibility of these LID systems. This information will be used to inform and encourage the uptake of future private-sector property retrofits.

According to estimates, phase one of the project can capture, infiltrate, and divert approximately 1.9 million liters of water annually. Not only is Calstone helping to restore the water cycle and water quality within the priority watershed of Highland Creek, but it also is showcasing its dedication to corporate water stewardship to neighbours within the local watershed, Ontario, and beyond.

Replication in the Greater Toronto Area and abroad

Calstone is playing its part in resolving the stormwater issues facing many urban areas – from degraded watersheds, to flooding, to aging infrastructure – placing the organization at the forefront of corporate water stewardship. Calstone's project shows that taking a collaborative approach to LID installation can lead to a timelier, value-added project resulting in a greater positive impact and a more effective stormwater management system. However, it takes more than just one leader in a watershed to address key environmental concerns.

Calstone's leadership in water stewardship is the first step in growing a portfolio of projects across the Greater Toronto Area. Partners in Project Green hopes to replicate this type

of project across the Pearson Eco-Business Zone and the Toronto area at-large to create a network of stormwater infrastructure projects that produce an even greater positive effect. This will improve local resiliency during storm events and ensure continued improvements to the health of rivers and streams.

Combined with its other programming focused on process and wastewater efficiencies for businesses, Partners in Project Green recognizes the value of driving collaborative, business-led efforts to tackle important water issues on a local scale. Building a robust network of successful water stewardship projects is a valuable tool for promoting positive stewardship activities. This type of model can be replicated within and across watersheds, nationally, and internationally.

With the increasing water-related threats facing urban areas, it becomes pertinent for businesses to start making waves in onsite stormwater management.

Authors' Note

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