MUNICIPAL PROFILE:
POPULATION: ~183,314
LOCATION: A city in the Regional Municipality of Halton at the northwestern end of Lake Ontario. Along with Milton to the north, Burlington forms the west end of the Greater Toronto Area
SIZE: 185.66 km²
TOTAL PRIVATE DWELLINGS: 72,535
GREAT LAKES WATERSHED: Lake Ontario

BACKGROUND
In recent years, the City of Burlington has experienced multiple extreme weather events and has been impacted significantly by urban flooding. In both 2013 and 2014, the City was hit by torrential rainfall that resulted in severe flooding and damage to private property and public infrastructure. It was reported that the 2014 flooding damaged up to 10% of the City’s houses.

These instances, although catastrophic, spurred on multiple climate change adaptation projects across the City. The City has since undertaken a variety of community adaptation efforts such as ICLEI’s Train the Trainer project (supported by the MOECC under the Canada-Ontario Agreement Respecting the Great Lakes). Participation in this project allowed the City to identify key vulnerabilities and risks facing the broader community. Building on this knowledge and growing partnerships with community members, the City has now embarked on more localized adaptation efforts such as the rain garden introduced as part of the Collaborative Implementation Group project.

PROJECT DESCRIPTION
The City of Burlington chose to construct a rain garden on public school grounds. The purpose of the rain garden was twofold: to serve as a solution to existing drainage problems on the school’s property, and to serve as a hands-on educational tool for teachers and students. The rain garden would be installed by the City’s hired contractors but maintained by students as part of an environmental education program delivered to Grade 5 and 6 students. Students would pass the maintenance of the garden on to the incoming Grade 5-6 students each year, providing long-term maintenance and an environmental education component for the students.

Bruce T. Lindley Public School was selected for the pilot project, as it had experienced problems with drainage in the past. One area of the school’s soccer field had been found to hold standing water and mud, causing health and safety risks to children, hygiene issues, loss of access to the property, and complaints from staff. The school also has an active outdoor environmental education program which is well-suited to the goal of the rain garden as both a practical and educational addition to the property.

OBJECTIVES
The objectives of the project were threefold:
• Improve the drainage conditions at a local school by constructing a raingarden on school property;
• Educate and engage students/staff about sustainability, climate change and adaptation measures; and
• Involve students/staff in construction and maintenance of garden as part of on-going outdoor education curriculum.
PROJECT PLANNING
Planning for the project was initiated in Spring of 2017. Once the school was selected, the project team at the City of Burlington met with the school board to present the project and conceptual design. Authorization for construction would be obtained by presenting concept drawings to the school board for approval.

To do this, the City contacted a rain garden designer. AVESI landscaping services were selected for the project due to their focus on low impact development (LID) projects. Michael Albanese of AVESI has a wide range of experience in LIDs and stormwater management, with years of relevant adaptation experience in areas such as home flood protection and the RAIN home visit program.

While drawings were under way, communication with the public school and school board were ongoing. The official proposal, drawings, and a quote for the rain garden were presented to the school board in late Spring of 2017. Due to summer breaks, approval of the drawing and the finalized legal agreement between the City and the school became delayed until Fall. As such, the construction of the rain garden was postponed to Spring of 2018. In the meantime, the City worked to develop the educational component of the project to have it ready for the start of the Fall 2018 school year.

Green Venture, a Hamilton-based non-profit focused on environmental education and stormwater management was contacted and retained to provide the educational component of the project. Green Venture would provide a 2-hour presentation to students, including a hands-on model of a rain garden and stormwater walk around the neighbourhood. Green Venture staff would educate students about the natural water cycle and demonstrate how stormwater is managed in Burlington.

Additional components of the educational program would include providing curriculum-based follow up material and activities for the maintenance and care of their rain garden after construction. Maintenance of the rain garden will likely include the following:

- Regular watering until vegetation is established;
- Periodic weeding as needed;
- Cutting back on perennial plant material in spring;
- Hardwood mulch may be needed every 2 - 3 years to keep the absorption levels in the ideal range.

While the educational program was designed for students in Grades 5 and 6, it was also arranged that teachers and students would visit the junior classes and transfer knowledge about the rain garden project in their own words. This way, the rain garden project extends through to younger children as well.

Construction of the rain garden is set to be tendered and completed in Spring 2018, in conjunction with the
delivery of the classroom educational component from Green Venture. Students will have the opportunity to observe the installation of the rain garden while learning about storm water in their community.

Communication about the project including presentations and social media marketing have been planned in an effort to inspire widespread uptake of the project at other schools and in other districts across the City of Burlington.

FUNDING
Funding for the project was supported by the $7,000 grant from the MOECC for participating in the Collaborative Implementation Group project. These funds were matched by cash or in-kind contributions on behalf of the City. The costs associated with rain garden design and construction (including labour, materials, and plantings), as well as fees for Green Venture’s educational services, were covered under the combined contributions.

PARTNERSHIPS
The foundational partner for the project was Bruce T. Lindley Public School and the Halton District School Board. Support from the environmental coordinator at the school was particularly valuable in securing support for the initiative and advancing the educational component of the project.

The second key partner in the project was AVESI, the Landscape Architect that specialized in low impact development (LID) installations. AVESI was able to provide drawings for approval from the schoolboard and state-of-the-art LID insights to ensure a sustainable rain garden for the school grounds.

Green Venture was another key partner for the project. Although their work will only begin after the rain garden is built, the non-profit was instrumental in aligning the rain garden project with the students’ Grade 5 and 6 curricula. Green Venture attending on-site meetings with school staff who would be assisting with the school education component.

CHALLENGES
The installation of the rain garden was delayed approximately 8-9 months from its projected construction dates. Construction was originally planned for September/October 2017 but had to be postponed until Spring 2018 because the garden design and legal agreements had not been authorized by the school board before the summer break. The June-September summer break for students, teachers, and board members caused unforeseen delays, where the conceptual design was not approved until the Fall.

POSITIVE OUTCOMES
Once the project is complete, it will provide several benefits to Bruce T. Lindley Public School and the surrounding community. Key outcomes of this project are listed below:

- Creation of a template legal agreement that can now be implemented at other schools/school boards with relative ease;
- Improving the drainage issue on the soccer field, leading to a better experience for students and staff;
- Educating students about climate change, stormwater management, and garden/landscape maintenance;
- Saving costs on maintenance through integration into school curriculum.

MEASURING OUTCOMES
At this stage of the project, indicators to measure the effectiveness of the rain garden and education program have not yet been developed. Process-based indicators include the completion of the rain garden construction and integration of the educational component into Grade 5 and 6 curriculum. Moving forward, success of the rain garden could be measured by reduction of standing water on the soccer field, improvement in students knowledge of stormwater management practices, and uptake of the project by other schools or facilities.

LOOKING AHEAD
The detailed design is set to be finalized in early winter 2018. The construction of the project will be tendered in Spring 2018 and installation will be simultaneously coordinated with the classroom education component delivered by Green Venture. After completion, the project will be featured on City of Burlington media challenges and the Take Action Burlington website.
Acknowledgements
This project was made possible by the Ontario Ministry of Environment and Climate Change, under the Canada-Ontario (COA) Respecting the Great Lakes.

The Great Lakes Adaptation Project Collaborative Implementation Groups

The Collaborative Implementation Groups (CIG) project targeted 12 municipalities throughout the Great Lakes watershed to identify and implement an adaptation initiative in their community over the period of one year (January 2017 – December 2017). The CIGs came together at various stages to share experiences, challenges, and opportunities on such items as measuring progress through indicators, project financing, budgeting, scheduling, evaluation, monitoring, and reporting. Ultimately, the CIGs were an opportunity to bring together practitioners struggling with implementation challenges to create a peer support network that brings these individuals together (both online and in person) to collectively work through the implementation of an identified action and share the resulting experiences.

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