



MISSISSAUGA

Central Parkway low impact development (LID) project

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Source: City of Mississauga

THE SCIENCE

The design and construction decisions behind Canada's aging public infrastructure were based on climate trends that have now changed. In the past, the lack of government mandate to integrate climate resilience into infrastructure planning might have been attributed to insufficient climate science data; however, this is changing as asset management is becoming more of a necessity. Today, climate change has placed more strain on aging water, wastewater, and stormwater infrastructure in Ontario, resulting in extreme flooding. The City of Mississauga, located in the Golden Horseshoe region, is investing in low impact development (LID) projects to upgrade their stormwater infrastructure – actions consistent with their Climate Change Action Plan (CCAP). The Central Parkway LID road retrofit is a successful example of this. The City, in partnership with DeepRoot, TD Friends of the Environment Foundation, and Credit Valley Conservation (CVC), installed a bioretention system within the existing road median.

At the project site, Central Parkway had a paved concrete median, which would discharge stormwater flow directly into the storm sewer system. Through the modification of existing catch basins, runoff from the road is now directed to a bioretention system that incorporates Silva Cell technology for water quality and quantity treatment. The trees, shrubs, and bioretention soil within the system filter out nutrients and pollutants (e.g., total suspended solids, phosphorus, and nitrogen) as the water moves through the soil profile beneath the median surface. The vegetation and biomedial also retain and infiltrate some stormwater into the surrounding soil, thereby reducing the amount of stormwater entering municipal storm sewers within the Cooksville Creek Watershed and reducing peak flow levels in nearby catchment areas.

THE TRIGGER

The City of Mississauga's Stormwater Program is focused on improving existing municipal stormwater infrastructure and enhancing stormwater management wherever effective and feasible. The Stormwater Assets and Programming Department is primarily funded through Stormwater Charge revenue. Stormwater projects, among others, support and are in alignment with the City's CCAP as they build resiliency with green infrastructure and provide opportunities for better asset management – both identified actions in the CCAP. It was against this backdrop that a City Council resolution was passed in 2014, which paved the way for LIDs to be integrated with other projects in the City, such as the road rehabilitation program. The City also received a grant from TD Green Streets for implementing green infrastructure at Central Parkway.

THE APPROACH

LIDs have been formalized as a viable option to support the City's stormwater management goals. Every year, the City reviews city-wide infrastructure projects for opportunities to integrate LID features. In undertaking LID projects, internal and external stakeholders are taken into consideration so that there is coordination with



Figure 16: City of Mississauga low-impact development feature located on First Street. The LID is composed of both bioswales and permeable pavements. (Source: City of Mississauga)

planned construction projects.

The Central Parkway LID was retrofitted into existing infrastructure, which required the City to be creative and flexible with design, techniques, and solutions, and to think beyond traditional engineering design. A partnership was formed with CVC, which provided design and construction assistance and conducted performance monitoring and maintenance inspections.

Other project partners and stakeholders included municipal decision-makers, provincial and federal environmental agencies, engineering and planning professionals, academia, and watershed advocate groups. City staff managing the project collected input from other departments to include Parks & Forestry (in the initial stages of the design process), to receive recommendations on types of vegetation and soil most suitable for the median, and the Works Operations Department for facility maintenance over its lifecycle.

THE OUTCOME

The Central Parkway LID project has resulted in substantial water quality and quantity benefits. For instance, there was a 98% reduction in total suspended solids and a 94% reduction in total phosphorous in the treated stormwater from 2015 to

2017. Of the 115 monitored events, 31 produced outflow that resulted in a 95% total volume reduction of stormwater entering the municipal storm sewer system. The average peak flow reduction for all events was 97%. This project demonstrates how innovation can play a key role in driving climate resilience of infrastructure. The Silva Cell system had been specifically used for stormwater treatment for the first time in Mississauga. Additional benefits include encouraging tree growth and aesthetic design.

These results have been showcased through presentations, events, and site tours, helping educate numerous stakeholders on the benefits of LIDs. The great successes have led stormwater staff to continue to seek implementation of LIDs in other projects. The City's partnership with CVC continues through monitoring LID performance to demonstrate the benefits to sub-watersheds within their jurisdiction.

Their partnership with CVC will persist to ensure the well-being of watersheds within their jurisdiction.

A WORD FROM MISSISSAUGA

Implementing LIDs requires various City departments and stakeholders to be on the same page. To ensure everyone has the same goal and a good understanding of the LIDs, Zain Zia, Storm Drainage Coordinator at the City of Mississauga, emphasized the importance of engaging colleagues in the planning stage. This initial conversation helps ensure all stakeholders are satisfied with what is being built, how it will function, and how it will be maintained. Scott Perry, Manager of the Stormwater Assets and Programming team at the City, stressed the need for champions who support these types of facilities. LID projects are integrated into the streetscape, requiring a collaborative approach with multiple stakeholders involved. As Mr. Perry remarked, "We need people to bring up creative solutions incorporated with a holistic approach. Without these champions, especially on the stormwater side, it would be a challenge."

Mr. Perry also stressed the importance of the City's Stormwater Assets and Programming Department in spearheading LID projects. He said, "Asset management is about who owns what and who's responsible to maintain it. In the stormwater group, we're taking ownership of these assets, we're maintaining them, we're paying for it, and we're integrating it with the rest of our colleagues and partners in the right-of-way and we're lucky to have a stormwater charge to support it."