



CASE STUDY

City of Brampton
 Water Stewardship



465 m²
 combined swale
 area

1,563 m³
 stormwater treated in
 an average year

3,094 m²
 drainage area
 captured by swales



Improved Treatment of Stormwater Runoff

“The City of Brampton has been able to take a standard road-reconstruction project, and incorporate specially designed filter swales to improve stormwater treatment and help transform local public space. This is a great success story.”

Michael Hoy, Senior Environmental Policy Planner, City of Brampton

Background

City of Brampton’s Filter Swales – part of County Court Sustainable Neighbourhood Retrofit Action Plan (SNAP)

The County Court neighbourhood is the focus of a Sustainable Neighbourhood Retrofit Action Plan (SNAP), a collaborative initiative led by the City of Brampton and the Toronto and Region Conservation Authority (TRCA), which promotes widespread adoption of sustainable technologies, practices and lifestyles in the community.

In addition to green renovations of local homes, the SNAP Action Plan recommends public-realm renewal projects that focus on the aging stormwater infrastructure and community park to promote an increased sense of community and sustainable design, including boulevard filter swales and improved urban forest cover.



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“The swales feature salt-tolerant flowers, herbs and grasses as well as shredded mulch cover, thereby creating an attractive, landscaped feature that also treats runoff.”



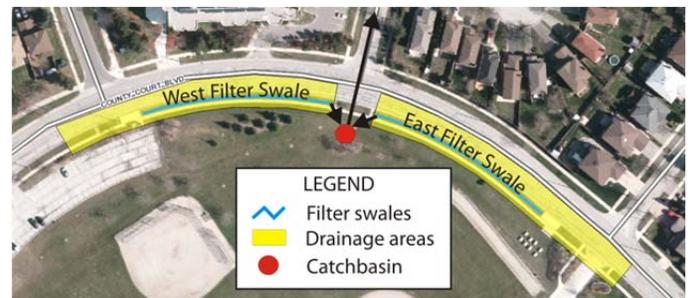
The Problem

Since stormwater infrastructure servicing this 1980's-era community no longer meets current standards, an objective of the plan was to retrofit Low Impact Development best management practices throughout the community to improve treatment and avoid the cost of rebuilding the existing detention pond.

County Court Boulevard Filter Swale Project

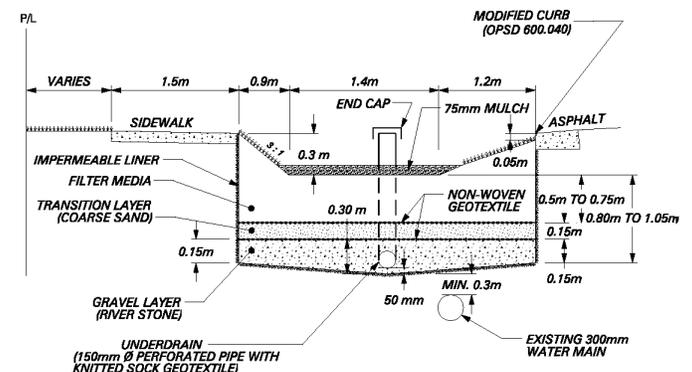
To align with this neighbourhood plan, in July of 2014, the City of Brampton constructed two bioretention swales featuring impermeable liners (also referred to as filter swales or dry swales) within the road right-of-way of County Court Boulevard, a medium traffic collector road that services residential, institutional and parkland areas in the neighbourhood. The City took advantage of an opportunity presented by an upcoming road reconstruction project on County Court Boulevard to plan; design and construct filter swales into the reconstructed road right-of-way. Impermeable liners were included in the design to protect a watermain located directly below the footprint of the swales.

The two filter swales, West and East, are 3 metres in width and 70 and 85 metres in length, respectively and receive drainage from a combined area of 3,094 square metres which includes 238 metres of road.



Above: Aerial photo of filter swale locations and drainage areas

Road runoff enters the swales through curb cuts where it is then filtered through a 0.75 to 0.9 metre deep filter media bed. Under-drains collect the filtered runoff and convey it to the storm sewer system via a nearby catchbasin in County Court Park. The swales feature salt-tolerant flowers, herbs and grasses as well as shredded mulch cover, thereby creating an attractive, landscaped feature that also treats runoff.



Above: Design drawing showing filter swale cross-section

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Lessons Learned

A valuable lesson was learned about the design of retrofit projects during construction. The design called for vertical walled excavations along the existing concrete curb which, upon completion, destabilized the gravel base of the curb and necessitated replacement of the entire curb rather than just sections at the swale inlets. To avoid this in future retrofit projects, swale excavations should be offset at least 0.5 metres from the curb face and the excavation should be sloped rather than vertical.

In November 2014, simulated storm event tests were completed to verify that each swale is functioning as intended and examine runoff reduction performance during a medium-sized rain event (i.e. approx.. 12 mm, 40 minute rain storm). Results show that East and West Swales retained 32% and 10% of the water, respectively. This suggests that substantial runoff volume reduction benefits can be provided by swales designed with impermeable liners.

Given the swales were part of a planned road reconstruction project, City of Brampton staff was able to access funding through the existing capital

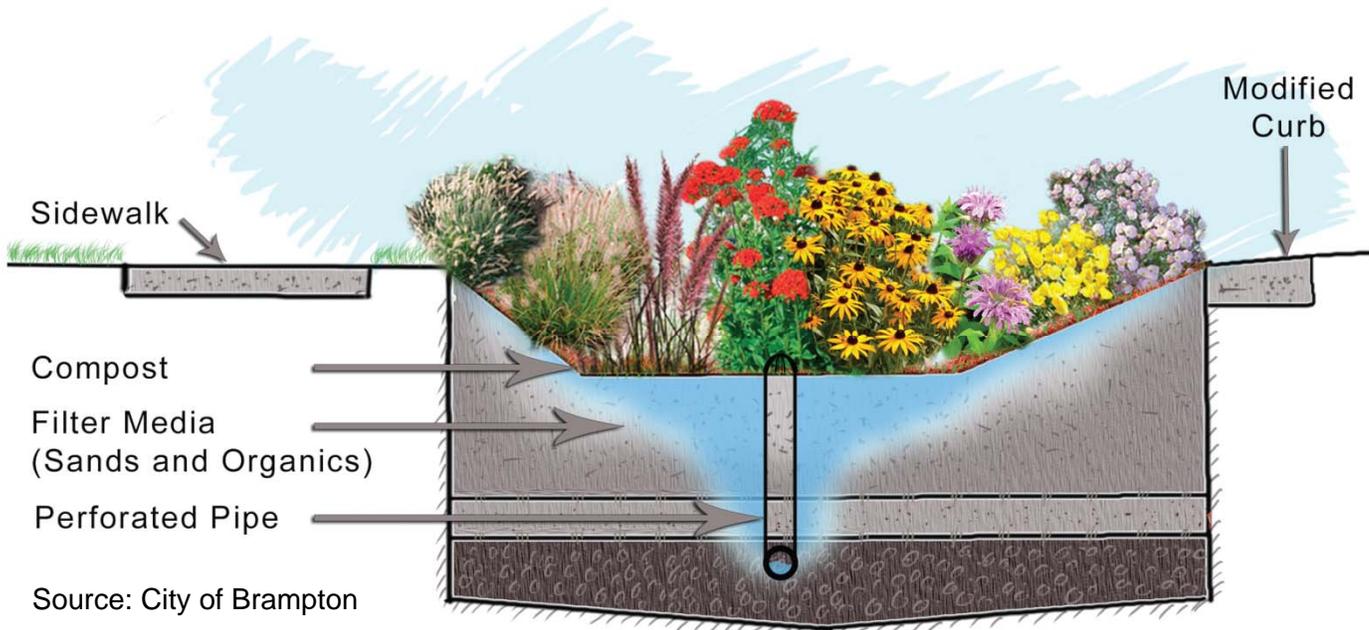
budget. TD Green Streets / Tree Canada provided funding for planting, and TRCA Sustainable Technologies Evaluation Program (STEP) staff will conduct a two year monitoring program with funding from Ontario Ministry of Environment and Climate Change Showcasing Water Innovation Program, Toronto and Region Remedial Action Plan, Partners in Project Green and the City of Brampton.

Next Steps

The performance of the swales will be monitored continually for two years beginning in spring 2015 for their ability to: reduce runoff volume for a wide range of storm event sizes; reduce concentrations and loads of typical stormwater pollutants; and affect the temperature of treated water. How winter operation affects the swales treatment performance and maintenance needs will also be examined. The understanding gained from this work about the treatment and cost effectiveness of lined bioretention swales will help inform decisions regarding whether or not to include such retrofits as part of routine road reconstruction projects, which will be beneficial to all municipalities in Ontario.

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Artist Illustration – may not be accurate. Rendering is to depict the filter swale design and plant choices only.

For More Information:

About the Sustainable Technologies Evaluation Program (STEP) - www.sustainabletechnologies.ca

About the Sustainable Neighbourhood Action Plan (SNAP) - www.sustainableneighbourhoods.ca

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This project has received funding support from the Government of Ontario. Such support does not indicate endorsement by the Government of Ontario of the contents of this material