



Municipalities are increasingly turning to horticulture for green infrastructure solutions, such as the new absorbent landscape in Beamsville, Ont.
Photo: Jason Henry, Vineland

Store water, steward trees, save money

Town of Lincoln's innovative approach to municipal stormwater management

A combination of community engagement and a willingness to take a chance on an innovative approach has led to a creative and environmentally friendly stormwater management solution in one Ontario municipality. It not only reduces stormwater flows, but also saves money and increases the chance that trees planted onsite will grow and thrive.

Thanks to a partnership with a local horticultural innovation centre, the new absorbent landscape at Ashby Drive Park, a two-and-a-half-acre area of parkland in Beamsville, Ont., has become a real success story for other municipalities to emulate.

"This was an existing park with a lot of open space that could still be developed. Before the pandemic, we conducted an exercise in community engagement to understand what local residents wanted to see in the space," explained Shannon McKay, director of community services with the Town of Lincoln. "Three quarters of the park was open green space and we heard from residents that they wanted more trees, shade, and additional amenities."

According to McKay, cash-in-lieu of parkland from a developer gave the town funding to consider its options. The consultation was part of ongoing efforts by the municipality to upgrade their parks to be more inclusive with a community focus while offering more amenities to residents. The Ashby Drive Park enhancement project included:

- resurfacing and upgrading the existing basketball court,
- installing shade sail seating areas and fitness equipment
- expanding the play area,
- converting to a rubber play surface, and
- adding a "learn to ride" bicycle playground complete with bicycle repair station.

However, how to best approach stormwater management while considering all the enhancements to the park was a challenge for the town. It had to develop a plan for handling stormwater, particularly following heavy precipitation events, where large amounts of water fall quickly in a short amount of time. As well, the water needed to be captured

and stored for later use during dry periods. The park's enhancements included additional impervious surfaces in its bicycle playground and asphalt pathways that also had to be considered as part of the water management plan.

A discussion about low-impact development with research scientists at the nearby Vineland Research and Innovation Centre, where the Town of Lincoln is a founding member of the Greening the Landscape Research Consortium, brought forward an alternative solution. This was to create an absorbent landscape that would not only fit the vision for the park, but could also serve as a living demonstration site of science and research in action.

According to McKay, the original recommendation was to proceed with a traditional stormwater management



Lilian Schaer (lilian@agrifoodprojects.ca) is an award-winning freelance journalist, corporate writer, and communications professional.



MUNICIPAL WORLD JOURNAL

NORTH AMERICA'S DIGEST ON ASSESSMENT & TAXATION



**Covering news, views, and
commentary in the rapidly evolving
field of municipal property
assessment and taxation!**

*To subscribe, contact us at
1-888-368-6125, ext. 212
or visit
municipaltaxation.com*

PUBLISHED IN CANADA BY

**MUNICIPAL
WORLD**

municipalworld.com

Conventional stormwater management often treats precipitation as a waste product. But combining soil restoration research with stormwater management has provided a unique opportunity to irrigate vegetation ...

system where precipitation is captured and sent to a centralized stormwater pond located next to the park. This option did not fit the town's vision of what the park should be.

"With the guidance and support of the team at Vineland, we pursued the absorbent landscape project," McKay said. "It was a fantastic collaboration that let us avoid the traditional stormwater management processes and do something pretty unique and innovative."

Soil Restoration Key to Green Infrastructure

According to Rhoda deJonge, director of plant responses and the environment at Vineland, municipalities are increasingly turning to horticulture for green infrastructure solutions to some of their biggest problems, such as using large greenspaces to capture and use stormwater instead of letting it run off downstream. Often, working with the function of natural processes improves the efficiency of a site and can result in cost savings.

"Over the past decade, our research team has focused on soil restoration to improve soil quality before planting," said deJonge. "Once the soil is restored, our main limiting factor for successful vegetation growth is water."

According to deJonge, conventional stormwater management often treats precipitation as a waste product. But combining soil restoration research with stormwater management has provided a unique opportunity to irrigate vegetation, while capturing, storing, and providing water for extended periods of time.

"During the urbanization process, we strip and stockpile topsoil for extended periods of time," said Jason Henry, laboratory supervisor and senior research technician at Vineland. "During this process, we degrade and ultimately kill the topsoil, but stockpile topsoil has the potential to be restored and reused."

Working with the town and a landscape contractor, the research team tested the topsoil layer before removing and stockpiling it during the construction process of the park enhancement projects. Before reapplying the topsoil after construction was completed, they mixed in locally sourced compost and broke up the compacted subsoil left by the heavy construction equipment. Turf was then installed to finalize the new absorbent landscape soil. Other planting activities have not happened yet, but Vineland's tree selector tool is available to help municipalities like Town of Lincoln select the most appropriate species for a specific site.

It is expected that by storing more water onsite, this increased moisture – along with soil that is not pressed and compacted – will lead to additional benefits related to improved tree survivorship and growth on the site.

"The trees planted here, with ample space to grow their roots and better water access than a typical park tree, will have a real chance at growing into the behemoths of the future," deJonge said, adding that a tree that grows and thrives is also cost-saving



A community engagement exercise revealed local residents wanted to see more trees, shade, and additional amenities come from the Town of Lincoln's Ashby Drive Park enhancement project. *Photo: Town of Lincoln*

to the municipality. "The green infrastructure will improve with time and there is a lot more learning from this project to come. While we can't use all the water, we can use most of it, and so far, the amended soil is already taking in about 96 per cent of the precipitation that hits this section of the park. Once the soil matures and trees start growing as well, we'll see this number continue to increase."

Vineland's urban greening research is proving that it's tough to judge the health of soils without proper analysis. Often, a quick look at soil nutrients will not illustrate how well a soil can function and whether it can grow the trees or turf needed for urban landscapes.

The team's soils laboratory looks at numerous key parameters that determine whether a soil is healthy or not and provides clear advice and recommendations to municipalities on how to start the path to "fix" their soils. Soils can act like a sponge as they mature, keeping water from running off overland and into local creeks, where it has the potential to contaminate the water or harm wildlife. It will also ensure whatever plantings are implemented have the best chance at survival.

Benefits of Absorbent Landscape Projects

According to McKay, the absorbent landscape project ended up being a more cost-effective solution for the municipality than the traditional stormwater

management approach given their available budget. And the benefits are expected to continue long-term, in the form of better turf establishment and tree health. Also, it means not having to maintain a stormwater pond, which can come with a hefty price tag.

The town has further developed story boards for the park so residents can learn about the science and research happening in the landscape.

"This has been a great demonstration of the town's commitment to green infrastructure and low impact development," McKay said. "We have tremendous support from our mayor and council and that allows us, as staff, to take a risk on a project like this in order to learn and do something innovative and good for the environment."

The concept is easily transferrable to other municipalities as well. The Vineland team suggests the following three key learnings from the project:

- Start an absorbent landscape project with a clear plan and specifications so contractors are very clear on what they are bidding on and are responsible for.
- Plan for healthy urban soils just as you would for other aspects of green infrastructure, like urban forest canopy. Healthy urban soil will save costs in the long run by reducing stormwater treatment pressures, improving urban tree survivorship, and even storing carbon.
- Reuse of water takes time. Absorbent landscapes bring together engineering and horticulture, and as the soil's

sponge function continues to grow, it will make the municipality less and less reliant on grey infrastructure.

"We can see this absorptive soil technology in many other landscape settings too, especially in areas where tree survivorship has typically been a challenge and the topsoil is required to be reused," Henry says, adding that the process could also help Ontario municipalities meet the new Regulation 406/19 that requires reusing stockpiled soils on site for beneficial uses.

"No one should be afraid to ask questions about something like this. The Town of Lincoln is a wonderful, forward-thinking municipality who was able to make this happen without a top-tier budget," said DeJonge. "There are things municipalities of all sizes can do."

The Town of Lincoln is also working on a case study project as part of Vineland's Greening the Landscape Research Consortium to better understand the role healthy soils can play in how well trees and turf survive and thrive in urban parks.

The consortium was launched two years ago to bring together the urban tree value chain, from municipalities and developers to nurseries and contractors, to identify key municipal challenges and develop research projects to find answers municipalities will be able to implement. Five projects are part of the first wave of case studies currently underway at the Vineland campus in the Niagara Region. **MW**