

**A**s an older, highly urbanized municipality, a significant portion of the natural landscape of the City of Toronto has been replaced by hard, non-permeable surfaces. These conditions give rise to increased pollution levels and energy demands as the surfaces absorb solar energy and reradiate it as heat and do not allow the absorption of rainwater. This has other implications for Toronto residents, including beach closures, smog events, and illness and even deaths directly attributable to air pollution.

Municipalities can mitigate some of these effects by promoting 'green' alternatives, such as green roofs, in building design and construction, as many European cities have done. Green Roofs are a very visible, tangible tool that provide, in one package, a number of environmental and social benefits. These benefits include collecting stormwater that would otherwise go into the sewer system, saving energy, reducing the urban heat island effect, and adding more green space to a built-out environment. While green roofs are starting to be implemented in North America, including a few green roofs that have been constructed in Toronto on a volunteer basis, they do not exist in the numbers required to make a significant positive environmental impact.

There has been an interest in encouraging green roofs in Toronto for some time. This started at the community level with a partnership between the City, the National Research Council (NRC), and Green Roofs for Healthy Cities to build 2 demonstration sites on city buildings – the podium of Toronto City Hall and the gymnasium roof of the Eastview Community centre. With the help of NRC, the storm water runoff from the roofs was also monitored.

The City then furthered its commitment to support green roofs in the recommendations of the Environmental Plan, calling for a strategy to encourage green roofs and rooftop gardens and through the policies of the new Official Plan that support the “development of innovative green spaces such as green roofs, and designs that will reduce the urban heat island effect.”

The next step was to investigate ways in which the city could encourage implementation of green roofs, but to do so, the City needed to understand the

## INTRODUCTION



Toronto City Hall's Green Roof Demonstration Project  
Source: Green Roofs for Healthy Cities  
[www.greenroofs.org](http://www.greenroofs.org)



### 3.4 THE NATURAL ENVIRONMENT

#### Policies

15. Innovative energy producing options, green industry and green building designs and construction practices will be supported and encouraged through:

[...]

f) the development of innovative green spaces such as green roofs, and designs that will reduce the urban heat island effect.



environmental benefits of green roofs given our local environment and climate. The City initiated a study, entitled *The Environmental Benefits and Costs of Green Roof Technology*, to understand the measurable benefits of green roofs to the City's environment, and to quantify the potential monetary savings to the City. The City undertook the Study with a grant from the Federation of Canadian Municipalities Green Municipal Funds, and in partnership with Earth and Environmental Technologies (formally CRESTech), which is one of five Ontario Centres for Excellence, a program made possible by the Ontario Ministry of Economic Development and Trade.

The results of this study, along with this report, are now being submitted to the City's Roundtable on the Environment, which was created to advise the Mayor and City Council on current and emerging environmental sustainability issues affecting the City. The Roundtable's recommendations will be submitted to City Council through the Policy and Finance Committee.

This report has five sections. Section 1 is a summary of the results of the study, *The Environmental Benefits and Costs of Green Roof Technology*. Section 2 describes the policies of those municipalities that are international leaders in green roof development, thereby setting out some of the options that may be available to Toronto. Section 3 presents the findings of two City stakeholder workshops that were held to receive input on a City definition of green roofs, the barriers to green roof development in Toronto, and solutions to overcome those barriers. Section 4 uses the input received from the workshops to present a recommended definition of green roofs and criteria for green roof development, to support a City policy. Finally, Section 5 lists and discusses the options suggested by workshop participants, and strategies used by the municipal leaders in green roof policy, as they may apply to Toronto. This discussion produces a set of recommendations about the strategies the City should employ to encourage green roofs in Toronto.