

Toronto, Canada

Green Roof Bylaw: institutional coordination to enable the greening of the city from above

Toronto is the first North American city to mandate the construction of green roofs on new developments. As part of the City's Climate Change Action Plan, aimed at reducing greenhouse gas emissions by 80% by 2050, implementation of the bylaw is characterized by institutional NEXUS coordination and cross-sectoral benefits.

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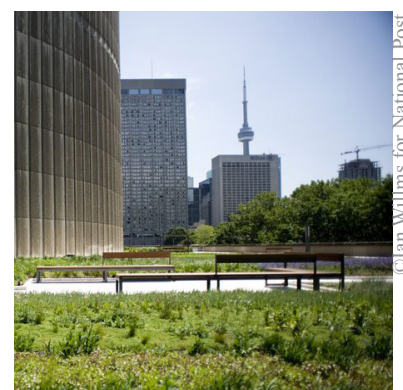
The project in brief

The Green Roof Bylaw, adopted by the Toronto City Council in May 2009 and implemented since February 2010, requires green roofs on new commercial, institutional and residential developments with a minimum gross floor area of 2000m². The green roof coverage requirement ranges from 20-60% of available roof space, depending on the size of the building. As of April 2012, the bylaw also has also applied to industrial buildings with customized requirements.

In 2011, one and a half years after the Bylaw's implementation Toronto had benefited from 113,300m² of new green space, a 12,300m³ reduction in stormwater runoff, 1.5 million kWh savings for building owners and the creation of 125 new jobs. Additional metropolitan benefits from green space cultivation include the preservation of biodiversity in the urban environment, improved water and air quality, and reductions in the urban heat island effect.

What makes it "Urban NEXUS"?

The Green Roof Bylaw is supported by a variety of legislation, programs and incentives arising out of an institutional NEXUS, which enhances green roof technology and design and user behavior. The City's programs such as the City's Eco-Roof grant program, the Toronto Green Standard, and the City's Better Building Partnerships program, help provide financial incentives, performance measures and resources to support the design and construction of new energy and stormwater efficient buildings. Whereas standards and guidelines such as the Green Roof Construction Standard, overseen by the Toronto Building Department, ensure minimum standards of stormwater retention and energy saving capacity for all new buildings. Whereas the Toronto and Region Conservation Authority's Guidelines for Biodiverse Green Roofs, help to customize appropriate types of green roof vegetation to increase biodiversity and water management in the region. Bolstered by its Urban NEXUS of institutions, jurisdictions and design, Toronto has consistently hosted the largest increase in green roof coverage in Canada.



Date	2010-ongoing
NEXUS Sectors	Biodiversity-Air-Water-Green Buildings
NEXUS Innovations	Law + Policy; Institutions, Design and Technology
Scale	City-wide (2,615,000 inhabitants)
Budget	n/a

Urban NEXUS Definition

The Urban NEXUS is an approach to the design of sustainable urban development solutions. The approach guides stakeholders to identify and pursue possible synergies between sectors, jurisdictions, and technical domains, so as to increase institutional performance, optimize resource management, and service quality.

It counters traditional sectoral thinking, trade-offs, and divided responsibilities that often result in poorly coordinated investments, increased costs, and underutilized infrastructures and facilities. The ultimate goal of the Urban NEXUS approach is to accelerate access to services, and to increase service quality and the quality of life within our planetary boundaries.

ICLEI / GIZ 2014

Further Reading

Toronto Green Roof Bylaw official website: <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=83520621f3161410VgnVCM10000071d60f89RCRD&vgnextchannel=3a7a036318061410VgnVCM10000071d60f89RCRD> (20 Aug 2014)

Ontario Green Policy Hub: City of Toronto Green Roof Bylaw: <http://ogph.ca/94/Toronto> (20 Aug 2014)

Mitrovic, S., 2010, Action Plan for Sustainable City of Toronto: Case Study for Green Roofs. Presented at 46th ISOCARP Congress 2010, Nairobi: http://www.isocarp.net/data/case_studies/1825.pdf (20 Aug 2014)

GIZ and ICLEI, 2014, Operationalizing the Urban NEXUS: towards resource efficient and integrated cities and metropolitan regions, GIZ Study: www.iclei.org/urbanexus

Scope for improvement

The Bylaw specifies the preference for mixed vegetation over monoculture. By expanding the Bylaw to promoting urban agriculture on green roofs, further benefits are gained such as improved food security and reduced transportation costs of food supply. Also, financial incentives in the form of subsidies or grants by Toronto Water and Toronto Hydro, institutions which benefit from green roofs, could help redistribute the gains and mitigate the additional expenses of constructing green roofs, which builders currently pass on to users, resulting in the critique that green roofs are not cost-effective.

Replication

All municipalities in Ontario have the same legislative authority as Toronto to require sustainable performance methods such as those found in the Toronto Green Standard. It is thus possible for municipalities across Ontario to adopt the same process followed by Toronto, to increase green roof coverage.

Keeping the local context in mind, any municipal council can adopt incentives and legislation to promote green roof cover, especially in cities suffering from issues of air pollution or food scarcity.

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On behalf of:



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