Learning from International Leaders in Green Roof Policy

Section TWO

This section highlights municipalities that are leaders in implementing green roof policy. This section is based on the case studies in *Resource Manual on Green Roof Infrastructure for Municipal Policy Makers* by the Canada Mortgage and Housing Corporation[2]. Later, in Section 5, this paper will examine the applicability of the different strategies to Toronto.

Portland, Oregon

Motivation for Green Roof Action

In Portland, motivation for developing green roofs is concern about water pollution from combined sewer overflow (CSO), particularly in light of major pollution of the Willamette River.

Green Roof Policy in Portland

Portland promotes green roof development through a number of policies, but requires green roofs only on public buildings. The following summarizes Portland's efforts:

- All new City-owned buildings are required to be built with a green roof that covers at least 70% of the roof. The remaining roof area must be covered with Energy Star rated roofing material. When practical, all roof replacements must also include a green roof. The City has internal green building consultants to assist City buildings in meeting green building policy objectives. Most public green roof projects have been financed by stormwater fees (see below).
- The City Zoning Code offers developers floor area bonuses when they implement stipulated options, like a green roof. The bigger the proportion of green roof coverage, the larger the bonus offered. The owner must sign an agreement ensuring proper roof maintenance (although proper long-term maintenance continues to be a concern).
- Portland levies a stormwater management charge for commercial, industrial, and institutional ratepayers that is based on the amount of impervious area on site ($6.45

Ecotrust's John Vollum Natural Capital Centre
Photo courtesy of Linda S. Velazquez

[2] Canada Mortgage and Housing Corporation (Sandra Marshall – Policy and Research Division). To be published winter 2005-6

Hamilton Building in Portland
Source: Green Roofs for Healthy Cities
www.greenroofs.org

USD per 1000 square feet of hard surface per month). There is an initiative under consideration to reduce charges by 35% for owners who install green roofs with coverage of at least 70%. Residences are charged for stormwater management at a flat rate.

- In the Central City District, developments must comply with architectural design guidelines, and are subject to a general design review process prior to approval. A green roof in a design is considered an asset and will assist the proposal in being approved.
- Portland provides education and outreach on green roof development, by providing technical assistance to building owners and guided tours of green roofs. It also monitors green roofs.
- Portland has funded green roof demonstration exhibits and test sites.
- Green roofs are formally recognized as a Best Management Practice in the City's stormwater manual.
- A citizens' group called "Ecoroofs Everywhere" promotes green roof development for lower income areas. It creates affordable demonstration projects, secures grants for small-scale developments, and negotiates lower prices with vendors.

Effectiveness of efforts so far

Portland is considered one of the North American leaders in green roofs. There are approximately 2 acres of green roofs in Portland, with about another 2 acres committed to be built. The City of Portland has promoted green roofs so effectively that the private sector and some private citizens are starting to build or install them on their own initiative. However, green roofs have not yet taken off in the industrial sector.

Chicago, Illinois

Of all the cities highlighted here, Chicago's climate is most similar to Toronto's, with similar average summer and winter temperatures and average rainfall. However, Toronto usually receives more snowfall in the winter.

Motivation for Green Roofs Action

In Chicago, motivation for developing green roofs is concern about the urban heat island (UHI) effect, air quality and its effects on public health, and aesthetics. The Mayor has been a strong advocate of green roof development.

Green Roof Policy in Chicago

Chicago has a variety of policies and programs that encourage green roof development. Specifically:

- The 2001 Regulation called the Energy Conservation Code requires that all new and retrofit roofs should meet minimum standards for solar reflection (0.25 reflectance). Chicago's Bureau of the Environment deemed that green roofs are an acceptable way to lower roof reflectivity, mitigate UHI and improve air quality.
- A "Building Green/Green Roof" policy applies to construction projects that receive public assistance or certain projects that are subject to review by the Department of Planning and Development. Through this policy, the City of Chicago grants a density bonus option to developers whose buildings have a minimum vegetative coverage on the roof of 50% or 2000 sq. feet (whichever is greater), usually in the form of a green roof.
- Chicago has various City-sponsored green roofs, including demonstration sites, test plots, and others. The City has partnered with green roof providers to build and compare test plots that use different kinds of plants and material. It has issued a report on some of its findings.

Schwab Rehabilitation Hospital, Supported by Chicago's Urban Heat Island Reduction Initiative.
American Hydrotech Inc.
www.greenroofs.org

Millenium Park, Chicago
A.W. Terry Green Design Associates
www.greenroofs.org

- Chicago has engaged the Chicago Urban Land Institute, a non-profit organization of real estate professionals, in seminars and surveys. This helped to determine which kinds of incentives would encourage green roof development.
- Chicago offers a stormwater retention credit for green roofs, but does not levy a stormwater impact fee.
- The City has a website that supports green roof installation, and provides information and technical assistance.
- In 2005, Chicago is offering a limited number of $5,000 grants for building small-scale residential or commercial green roofs.
- There is currently no requirement for green roofs in the private sector.

Effectiveness of efforts so far

As of June 2004, Chicago had more than 80 green roofs over municipal and private buildings in various stages of installation. The total area of these roofs is over 1 million square feet.

Basel-City, Switzerland

Motivation for Green Roofs Action

In Basel, motivation for developing green roofs is an interest in energy savings, and promoting protection of biodiversity.

Green Roof Policy in Basel

Basel has promoted green roof development through a number of policies. Specifically:

- In the mid-1990's, after a public poll found general support for an electricity tax to promote energy saving measures, and after consultation with stakeholders, Basel invested 1 million SFr. ($670,000 CAD) from electricity fees into a two-year incentive program, providing a subsidy of 20 SFr./m^2 of green roof. Another program like this is planned for 2005/06.

- Since 2002, building regulations stipulate that all new and renovated flat roofs must be greened to provide valuable habitat (primarily for invertebrates), using specified materials.
- Basel provided a grant for research on the biodiversity protection benefits of green roofs. The results of this study shaped the design specifications for green roofs in Basel.
- Basel promoted the program by holding a contest for the best looking green roof.

Effectiveness of efforts so far

In 1996/7, there were 135 applicants for the green roof subsidy, and 85,000m^2 of roofscape were greened, resulting in 4 GW/year of energy savings. As a result of the regulations for new and renovated flat roofs, 15% of flat roofs in Basel have been greened. Basel is now exploring ways of enforcing proper green roof quality.

Basel's incentive program concentrated efforts into a two year period, thereby raising the profile of green roofs in the City. The incentive program was well-received, media interest was high, and Basel received nationwide prominence as a result.

Basel's green roof regulations did not meet with any significant resistance, because all stakeholders were involved in the process of from the beginning, and because of the success of the incentive program.

Munster, Germany

Motivation for Green Roofs Action

In Munster, motivation for developing green roofs is primarily concern about storm water management, and also interest in increasing green space.

Green Roof Policy in Munster

At present, Munster has promoted green roof development through a couple of policies/programs:

- Munster charges a stormwater fee, according to the amount of stormwater that runs off a property and into the sewer system (i.e. if there is no runoff, there is no fee). The fee is reduced by 80% or more when a green roof is installed. To implement this program,

the Public Works department sends property owners a bill stating the amount of pervious and impervious surface area on the property, with the corresponding stormwater fee. The fees are used for maintenance of the sewer system.

- Munster has also had an evolving incentive program for a variety of environmental measures that can include green roofs. Subsidies were provided for green roof development, but this program ended in 2002, due to financial constraints.

Effectiveness of efforts so far

Munster's incentive program was effective, resulting in a total of approximately 12,000m^2 of green roof coverage by the end of the program.

The stormwater fee has also been very successful, and it has been accepted well by the community, however specific information about additional green roof development resulting from the fee is not yet available. This program does have a considerable administrative component, as pervious and impervious areas for each property must be determined, verified, and in the case of adjustment, reassessed. Costs for administration can be offset by the fee.

Stuttgart Daimler Chrysler Mercedes Benz Factory
Photo courtesy of Linda S. Velazquez
www.greenroofs.com

Stuttgart, Germany

Motivation for Green Roofs Action

In Stuttgart, motivation for developing green roofs is primarily concern about air quality, since the city is situated in a basin-like valley where pollution tends to settle. Urban growth that has removed vegetation from surrounding slopes has exacerbated the problem. There is also interest in mitigating urban heat island effect.

Green Roof Policy in Stuttgart

Stuttgart promotes green roof development in three ways:

- Stuttgart is greening the roofs of its public buildings. It has an annual budgetary allocation for green roof development, and most green roofs are installed when the roof is due to be replaced.

- Stuttgart has provided a financial incentive for green roofs since 1986. The program has the equivalent of $81,000 CAD available each year, and pays for 50% of costs, or a maximum of the equivalent of $28 CAD/$m^2$ of roof. The City provides a free consultation, and a comprehensive brochure to property owners explaining how to install green roofs.
- Stuttgart has regulation requiring all flat and slightly sloped roofs (up to 12 degrees) of new development to be extensively greened to certain standards. Trade-offs or compromises with developers are common in the roof greening process.

Effectiveness of efforts so far

All three approaches have been successful. 105,000m^2 of public roofscape have been greened, and 55,000m^2 of roofscape have been greened through the incentive program. No data is available on the amount of roofscape greened through regulation.