

Update on Green Roof Strategy

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To:	Executive Committee
From:	Chief Planner and Executive Director, City Planning Division
Wards:	All Wards
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SUMMARY

This report provides a summary of the progress of the initiatives to encourage green roofs as recommended by Council in February 2006 including: a pilot incentive program; installation of green roofs on City/ABC buildings; use of the development approval process to encourage green roofs; and promotion and awareness.

A pilot incentive program was initiated in 2006 and to date has resulted in the construction of 16 green roofs. The City and its ABC's have installed 3 green roofs, with 9 more proposed for construction commencing in 2008/2009, and a further 10 under consideration. Through the development approval process, 14 green roofs were approved in 2007. A green roofs webpage has been established on City's website and 60 city staff from different Divisions have attended a specialized training course. In 2007 the City of Toronto's Green Roof Strategy was awarded the Federation of Canadian Municipalities FCM CH2Hill Sustainable Community Award. Approximately 40 green roofs have been constructed and/or planned since the Green Roof Strategy was approved.

When Council approved the green roofs strategy, it recommended that green roofs be installed on city-owned facilities and those of the City's ABC's "where feasible and practical" to address the fact that the approved budgets for proposed facilities may not be able to accommodate the additional costs associated with green roofs. However, the term 'where feasible' may now be deleted since proposed new facilities contemplating a green roof can account for any additional costs at the time of budget approval. The term "where practical" should remain as there could be situations in both new construction and roof replacement where structural or other technical concerns would preclude the construction of a green roof. For clarification, the term should read 'where technically practical', so that it is not confused with monetary feasibility. It should be noted that

green roofs are complementary to, and not in conflict with rooftop renewable energy systems.

RECOMMENDATIONS

The City Planning Division recommends that:

1. Council amend its policy respecting the installation of green roofs on City and ABC owned facilities by deleting the term 'where feasible' so that the policy now reads:
 - a) where technically practical, green roofs with a coverage of at least 50% of the building footprint be constructed on all new city-owned buildings, including Agencies, Boards and Commissions; and
 - b) where technically practical, green roofs be installed on existing City-owned buildings, including Agencies, Boards and Commissions, when roofs are due to be replaced.

Financial Impact

This recommendation will have **no** financial impact beyond what has already been approved in this year's budget.

DECISION HISTORY

On February 1, 2006, Toronto City Council approved a set of recommendations to encourage green roofs. This set of recommendations effectively comprises Toronto's green roof strategy. (See clauses 28 and 28(a) on the agenda of the January 23, 2006 Policy & Finance Committee <http://www.toronto.ca/legdocs/2006/agendas/pof.htm> and clause 20 of the January 31-February 2 City Council Decision Document at <http://www.toronto.ca/legdocs/2006/agendas/council/cc060131/cofa.pdf>).

On July 16, 17, 18 and 19, 2007 City Council adopted a number of recommendations in support of the Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action, including developing a strategy for funding green roofs.

<http://www.toronto.ca/legdocs/mmis/2007/cc/decisions/2007-07-16-cc11-dd.pdf>

ISSUE BACKGROUND

Toronto's green roof strategy was developed after a study, commissioned by the City and undertaken by a team from Ryerson University, indicated that widespread implementation of green roofs in Toronto would provide significant economic benefits to the City, particularly in the areas of stormwater management and reducing the urban heat island and associated energy use for cooling. The results of this study prompted the City to hold two stakeholder workshops to help to define criteria for green roofs, and identify barriers and solutions to green roof implementation. Thereafter, the City produced a

discussion paper, *Making Green Roofs Happen*, which proposed options for implementing green roofs. This paper was based on the results from the study and the stakeholder workshops, along with information about the strategies of other municipalities that are leaders in green roof policy. The results of the discussion paper were presented to a Special Meeting of the Roundtable on the Environment on November 23, 2005. Members of the Roundtable provided some additional suggestions on implementation, which were forwarded to the Policy and Finance Committee. These suggestions further informed the final set of recommendations approved by Council on February 1, 2006.

One of the recommendations of the green roof strategy stated that “the Chief Planner and Executive Director, City Planning, monitor progress of all initiatives and ... that an annual report be presented to the Roundtable on the Environment, and all interested parties be invited to attend and provide their comments through submissions and deputations”.

The initiatives in this strategy fall into four main categories:

- A pilot incentive program
- Installation of green roofs on City/ABC buildings
- Use of the development approval process to encourage green roofs
- Publicity and education.

This report is being presented to the Executive Committee as it affects a number of City divisions, and its agencies, boards and commissions.

COMMENTS

The City’s 2005 *Report on the Environmental Benefits and Costs of Green Roof Technology for the City of Toronto* noted that there are many benefits to green roofs from both the public and private perspective. An individual building can benefit from reduced energy for cooling, increased sound insulation, increased longevity of the roof membrane and, potential for food production. From the public perspective, green roofs can also help manage stormwater by capturing rainfall, reduce the heat island effect by vegetating surfaces that would otherwise absorb and re-radiate heat, improve air quality with vegetation that filters air, generates oxygen and absorbs carbon dioxide and enhance bio-diversity by providing refuge for birds and insects. Green roofs also add aesthetic value, providing visible green space from surrounding buildings. This does come at a cost. The study noted that an initial cost premium of \$75 to \$90 per square metre over a conventional roof can be expected.

The private benefits and costs to the building owner were explored in a study by the Toronto and Region Conservation Authority’s Sustainable Technologies Evaluation Program. *An Economic Analysis of Green Roofs: Evaluating the costs and savings to building owners in Toronto and surrounding regions* calculated the life cycle costs and savings associated with building and owning a green roof in the Greater Toronto Area for

six alternative scenarios. The different scenarios illustrated the cost impact associated with changes in assumptions. Given the high costs associated with green roof construction and maintenance, and the limited savings experienced by the owner of the roof, one of the key recommendations of this study was that:

“A direct financial incentive of \$4 - \$7 per square foot is needed in order to decrease capital costs enough to make green roofs an attractive option, and thus spur market growth.”

The study further stated that:

“Offering an incentive of more than \$8/sqft could potentially stunt market growth, as it may lead suppliers to keep costs high rather than striving to develop solutions that reduce solutions that reduce prices charged to potential clients.”

Green Roof Pilot Incentive Program

A key outcome of the Council’s green roof implementation strategy was that a Green Roof Incentive Pilot Program be created to encourage the installation of green roofs by the private sector. The program, funded by Toronto Water, was initiated in 2006 and offered a financial incentive of \$10 a square metre. The 2006 program was very successful and awarded grants to 16 applicants, resulting in the construction of 3,000 square metres of green roofs. The incentive program is available to the private sector and to the City’s ABC’s.

The 2007 incentive program provided an incentive of \$50 a square metre, with an upset limit of \$10,000 for residential projects and \$100,000 for institutional/commercial projects. The results of the 2007 pilot program will be reported to the April 2008 meeting of the Planning and Growth Management Committee.

Installation of green roofs on City/ABC buildings

Since Council approved the Green Roof strategy, green roofs have been constructed on:

- York Civic Centre, 2700 Eglinton Ave, (204 sqm)
- Gladstone Library, 1101 Bloor St, (176 sqm)
- Toronto Botanical Gardens, 777 Lawrence Ave., (223 sqm)

Green roofs have been incorporated into the budget of the following City/ABC’s proposed facilities which are expected to commence construction in 2008/2009:

- new addition on Social Services Building at 1631 Queen St, (15.65 sqm)
- the new Personnel Building at the Dufferin Transfer Station (300 sqm)
- Horgan Water Filtration Plant
- the podium at Nathan Phillips Square, (4,000 sqm)
- TTC Victoria Park Station (3310 sqm)

- Toronto Zoo, 2 replacement roofs (196 sqm and 144 sqm)
- Don Valley Brickworks (288 sqm)
- TEDCO's Corus entertainment building, south of Queen's Quay, east of Jarvis
- West Annex of the Direct Energy Centre, Exhibition Place (2000 sqm)

Green roofs are also being considered for the following new City and ABC proposed projects, where feasible and technically practical:

- Edithvale Community Centre, Westminster-Branson
- Parkway Community Centre
- York Community Centre
- Warden-Sheppard Community Centre
- Regent Park Pool
- Kitchen Garden in High Park
- Amalgamated Water Laboratory, 30 Dee Avenue
- Anaerobic Digestion Facilities, Disco Rd. and Dufferin Transfer Station
- Solid waste re-use centres
- Union Station

In addition, the Facilities and Real Estate Division is now planning for green roofs as part of its budget submissions. A consultant was hired to examine the roofs of buildings owned and/or managed by Facilities and Real Estate that are due for replacement in the next five years to determine which could structurally accommodate a green roof or a 'cool' roof. Out of 14 roofs, it was determined that 3 could accommodate a green roof, and the remainder could accommodate a cool roof.

Council also recommended that support for initiatives encouraging green roofs also include, and is not meant to replace, encouragement and support for the use of alternative energy or environmental measures that achieve similar or better results. Green roofs are complementary to, but not in conflict with rooftop renewable energy systems as the recommendation is for 50% of the building footprint to be green roof, not the entire roof.

“Where feasible and practical”

When Council approved the green roofs strategy, it recommended that green roofs be installed on city-owned facilities and those of the City's ABC's “where feasible and practical” for new construction and roof replacements. The term “where feasible and practical” was included for two reasons. The term ‘where feasible’ addressed the fact that the capital budget plans for new city-owned facilities, approved prior to adoption of the green roof strategy, did not account for any additional costs associated with green roofs.

The term ‘where practical’ was intended to address structural and technical issues that may preclude the construction of a green roof. The term ‘where feasible’ should now be deleted on a go forward basis since proposed new facilities contemplating a green roof will account for the cost during the budget process. The term “where practical” should be retained as there would be situations in both new construction and roof replacement

where structural or technical issues preclude a green roof. For clarification, the term should read 'where technically practical', so that it is not confused with monetary feasibility.

Use of Development Review process to encourage green roofs

When Council approved the green roofs strategy, it also directed that green roofs be achieved by the Chief Planner through approval of zoning by-law amendments and site plan control applications. In 2007, 14 green roofs were approved through the planning process (an additional 3 proposed green roofs will be confirmed at the site plan stage). These included 4 green roofs on commercial buildings, 8 on mixed-use residential/commercial buildings, 2 on condominiums, 1 live/work, 1 seniors complex and 1 school.

Promotion and Awareness

The Green Roofs Strategy approved by Council identified a number of initiatives to promote green roofs in the city, including the establishment of a green roof web page, technical workshops and staff training.

The City launched its green roof website (www.toronto.ca/greenroofs) October 31, 2005. It contains information about green roofs, the City's incentive program, cost benefit study and links to other relevant web sites, and contact information for further questions (sustainablecity@toronto.ca). Since its launch, the site has received 35,085 visits, and generated 360 e-mail enquiries and calls from around the world.

The City has held 2 in-depth 'Green Roof 101' training sessions for a cross section of approximately city staff (including staff from Toronto Building, Facilities and Real Estate, Toronto Water, Technical Services and City Planning). The training session provided information on green roof benefits and their design and construction. The City also hosted a green roof information session for Toronto's school boards.

City staff also responded to many requests for presentations on its Green Roofs Strategy and have spoken at conferences in Montreal and Boston as well as numerous local seminars and workshops and at universities and colleges. Presentations have also been given to municipal staff and Councillors in Mississauga, Vaughan and Markham, as well as Ministry of Municipal Affairs and Housing staff.

In 2007, in recognition of its exemplary efforts in developing and promoting the Green Roofs Strategy, the City of Toronto was awarded the **Federation of Canadian Municipalities FCM CH2Hill Sustainable Community Award**. This award recognizes leadership in sustainable community development and gives national recognition to projects that demonstrate environmental excellence and innovation in service delivery.

Since the Green Roof Strategy was approved 40 green roofs have been constructed and/or planned in the City.

Further Initiatives on Green Roof Implementation

Section 108 of The City of Toronto Act provides Council with the authority to pass a bylaw requiring and governing the construction of green roofs, as an "exception" to the Building Code Act, 1992. The Act also provides an opportunity for the City of Toronto to implement the goal of mandatory green roof standards as outlined in the Toronto Clean Air and Climate Change Action Plan.

In June, 2007 the Chief Building Official and Executive Director reported to the Planning and Growth Management Committee with a technical report, providing a framework for a City of Toronto construction standard. That report also identifies how potential green roof standards will support the City's green roof policy objectives and performance criteria.

Section 108 of the Act also provides Toronto with a clear regulatory tool to implement Toronto's green roof strategy by permitting a city by-law to require green roofs. Further analysis is required in this area to determine where the use of this power would be best used.

The June, 2007 report recommended a public consultation solicit input on when and where green roofs should be required. Due to cost containment in 2007, this work was delayed. Based on the outcome of the consultation and peer review of the proposed standard, the Chief Building Official and Chief Planner will report back to Planning and Growth Management Committee this Spring with recommendations for a Toronto Green Roof By-law for Council's consideration.

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SIGNATURE

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