



2009 | Buildings

City of Toronto

Ontario

Population: 2,503,281



Toronto Green Standard and the Better Buildings Partnership – New Construction Program (BBP–NC)

Summary

The City of Toronto used the Toronto Green Standard (TGS) and the Better Buildings Partnership – New Construction program (BBP–NC) as a two-pronged approach to encourage sustainable building design and address several of the city's environmental challenges. The TGS includes both mandatory and optional performance measures for sustainable building and landscape development. BBP–NC complements the TGS by providing incentives for energy-efficient building design. Together the programs encourage new developments in the city to exceed the energy efficiency standards of the Model National Energy Code for Buildings (MNECB) by at least 25 per cent, reducing operating costs, greenhouse gas (GHG) emissions and infrastructure demands. Toronto condominiums constructed under the BBP–NC program have achieved 45 per cent greater efficiency than the levels outlined in the MNECB, while office buildings have achieved up to 63 per cent greater efficiency. The return on investment for buildings that meet TGS specifications is 20 to 30 per cent. The combined implementation of the TGS and BBP–NC is expected to save the city approximately \$1.2 billion in infrastructure expansion and health care costs over the next 25 years.

Background

The City of Toronto's population is projected to rise to three million by 2031, intensifying the many existing environmental pressures caused by rapid urbanization, and increasing the stress on water and energy infrastructure. The city's electricity transmission facilities already reach capacity under peak summer demands. Stormwater runoff often exceeds sewer capacity and can lead to lower water quality. These concerns, along with other issues such as poor air quality and high ambient urban temperatures, led to the development of the Toronto Green Standard.

The TGS is a "made in Toronto" solution to environmental concerns. It is based on a bioregional approach to green development where a region is defined by natural, ecological boundaries rather than traditional jurisdictional boundaries. The TGS recognizes the uniqueness of the Great Lakes ecosystem of which Toronto is a part. For example, because the city is located on a migratory bird pathway, the TGS contains performance measures for bird-friendly development.

Toronto's high-rise, multi-residential sector has seen a sustained construction boom over the past several years, generating substantial uptake of the Better Buildings Partnership – New Construction program.

Toronto City Council adopted the Climate Change, Clean Air and Sustainable Energy Action Plan in 2007. The plan sets incremental GHG reduction targets over the short and long term. Since buildings account for an estimated 63 per cent of Toronto's total GHG emissions, increasing the sustainability of new and existing structures will be an important step in meeting these targets. The city's commitment to improving air quality and reducing emissions has sharpened the focus on tools such as the TGS and BBP–NC.

Project Development

The City of Toronto designed and implemented the Better Buildings Partnership – New Construction program in 2004. More than 220 participants contributed to the design of the program through workshops and collaborative meetings. The development of BBP–NC was a coordinated effort across several municipal divisions with expertise in finance, procurement, legal issues, facilities and real estate. The development team consulted extensively with federal government departments, the Ontario ministries of energy, environment, and municipal affairs and housing, and a broad array of community groups, environmental organizations and NGOs.

The city began developing the Toronto Green Development Standard, the precursor to the Toronto Green Standard, in 2005 with a review of the green development requirements of more than 100 cities. To facilitate internal collaboration on the project, the city formed a green development working group made up of staff from all relevant municipal divisions. The group developed the Toronto Green Development Standard performance measures. The city also consulted with external partners through a survey of developers, a workshop event and extensive interviews with individual developers.

In developing the TGS, the city did a cost–benefit study in partnership with Ontario Centres of Excellence (OCE), which provided funding and defined study parameters. A Steering Committee made up of developers and sustainable building experts guided the study. The study results were instrumental in revising and finalizing the TGS, which was approved by Toronto City Council in December 2008.

Project Implementation

The Toronto Green Development Standard was adopted by city council in July 2006. The standard was mandatory for new municipally owned facilities and voluntary for private sector developments. From its inception, it was intended as a living document, to be updated every two years to take emerging technologies into account. The city has monitored the implementation of the standard since January 2007, using checklists and tracking progress against performance indicators in a project database.

In July 2007, Toronto City Council adopted the Climate Change, Clean Air and Sustainable Energy Action Plan, which recommended making the Toronto Green Development Standard mandatory for all new developments.

Toronto City Council approved a revised standard, the Toronto Green Standard, in December 2008. The revised TGS has a two-tiered structure: Tier 1 standards are required and are validated during the planning process, while Tier 2 outlines an optional higher level of environmental performance-based incentives.

The city adopted the revised TGS largely because of a cost–benefit study which considered green building standards from the perspective of return on investment, lifecycle cost and simple payback. The study took a long-term perspective, looking at such issues as the associated energy savings, health costs related to air quality, and the avoidable expense of water and wastewater expansion.

The TGS implements many of the policies outlined in Toronto’s official plan, such as encouraging energy-efficient buildings and using stormwater as a resource. At the same time, the TGS integrates targets from the city’s Wet Weather Flow Management Master Plan and fulfils the Toronto Environmental Plan’s recommendation to improve building design.

The city’s energy efficiency office had an important role in implementing the TGS using the BBP–NC program, which gives incentives for new developments that meet TGS targets. In this way, BBP–NC complements the TGS. The BBP–NC application form has been incorporated into the TGS checklist. In order to confirm that TGS standards have been met, new developments require validation at two points: the site plan stage and the post-construction stage. BBP–NC uses engineering estimates and advanced building modeling tools to calculate anticipated energy savings and the related emissions reductions. To further validate these estimates, monitoring continues throughout the lifecycle of the building. Monitoring is based on energy billing data and other parameters such as temperature, humidity and indoor air quality. Monitoring also takes into account social benefits such as number of staff trained, number of jobs created by the development and improvements in quality of life.

An important goal of the program has been to create a culture of sustainability at all levels of the municipal government and throughout the development community, building capacity within the city to understand and promote green development. Staff training courses and design charrettes were used to train 180 municipal staff on the TGS and BBP–NC. The city also produced a video on the importance of green development and provided information via intranet. The city is developing a more substantial training course on both programs that will train over 1,000 staff whose duties include capital project management and development review.

Externally, the city engaged stakeholders through surveys, newspaper and magazine articles, promotional materials and presentations at professional symposia. In addition to holding face-to-face meetings with representatives of neighbouring municipalities, Toronto has taken part in the FCM Sustainable Communities Conference, the 2007 Capacity Building Workshop and the FCM–ICLEI Partners for Climate Protection program. The Green Development Standard also received funding through FCM’s Green Municipal Fund.

Results

- The combined implementation of the TGS and BBP–NC is expected to save the city approximately \$1.2 billion in infrastructure expansion and health care costs over the next 25 years.
- The two programs will work together to cut CO₂-equivalent emissions by approximately 3,500 tonnes for multi-unit residential buildings and 3,000 tonnes for office buildings.
- Payback periods for buildings that meet TGS specifications range from five to seven years, with overall returns on investment in the 20 to 30 per cent range. These benefits are achieved even without considering the full economic, social and environmental benefits of green development, such as reduced need for infrastructure expansion.
- Of the developments in the TGS database, 51 are expected to achieve energy efficiency levels 25 per cent better than those outlined in the Model National Energy Code for Buildings (MNECB).
- To date, 17 buildings have been constructed under the BBP–NC program. Condominiums have achieved 27.9 to 45.7 per cent greater efficiency than the levels outlined in the MNECB, while office buildings have achieved 30.5 to 63.7 per cent greater efficiency.
- The TGS has mainstreamed green development by embedding sustainable design practices into the city's standard, requisite planning process.

Lessons Learned

- SET PERFORMANCE MEASURES THAT ARE ACHEIVEABLE AND EASILY VALIDATED. This is the rationale behind the revised, two-tiered TGS, Tier 1 of which outlines minimum performance measures. "In the revised TGS, we tightened up the performance measures in terms of clarity and preciseness so that they could be more easily validated," says Jane Welsh of the City of Toronto's planning division.
- HAVE AN EXTENSIVE COMMUNICATION STRATEGY. A communication strategy that targets both internal staff and the development community is important for the uptake of these types of programs. Community consultation was particularly instrumental to the success of the BBP–NC program. When the TGS was first launched, only about 60 per cent of development applicants were applying for the program, but the communications strategy has significantly raised awareness.
- USE A "CARROT AND STICK" APPROACH. The "carrot and stick" approach of having minimum performance standards and using incentives to reward superior innovation has worked well to foster sustainable design, and could easily be replicated by other cities.
- TAILOR DEVELOPMENT STANDARDS TO THE LOCAL BIOREGION. The bioregional approach produced a workable, made-in-Toronto solution. Creating a green development standard requires knowledge of the particular environmental issues faced by a municipality. Performance measures can then be identified that best address those issues.

Related and Future Initiatives

In February 2009, Toronto City Council adopted a new bylaw that will refund 20 per cent of the development charge as an additional incentive for all new developments that achieve Tier 2 of the TGS. The new bylaw comes into effect on May 1, 2009. City council is also considering an amendment to the official plan that would incorporate a number of sustainable design elements from the TGS such as cool roofs and paving, rainwater harvesting, sustainable stormwater management systems and native, drought-resistant plants. Toronto has also required the inclusion of the TGS checklist as part of subdivision and site plan applications.

Partners and Collaboration

City of Toronto

FCM Green Municipal Fund

Ontario Ministry of Energy

Ontario Ministry of Environment

Ontario Ministry of Municipal Affairs and Housing

Ontario Centres of Excellence

Contact Information

Gary Wright, Chief Planner and Executive Director of Planning Division

City of Toronto, Ontario

Tel: 416-392-8772

E-mail: gwright1@toronto.ca

Websites: www.toronto.ca/planning/greendevlopment.htm www.toronto.ca/energy/bbp-nc.htm

Photo Information

Photo Caption: Retrofitting of the Phoenix Place Apartments in Toronto's Parkdale neighbourhood is being carried out based on green design principles specified in the TGS. Features include increased building insulation, green roofs, heat recovery and a solar wall.

Photo Credit: City of Toronto