

# Innovative Strategies

Ideas for Sustainable Communities



CENTRE FOR CIVIC GOVERNANCE

Innovative Strategies Series  
Volume 1

Innovative Strategies:  
Ideas for Sustainable Communities

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Volume 1

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# INTRODUCTION

Municipalities and school boards are the first order of governance for community members. They work to bring communities together, make key infrastructure decisions, protect our natural environment, shape our local economies, safeguard public education, and develop healthy schools. They are perfectly placed to contribute to the environmental, social, cultural, and economic sustainability challenges emerging for our communities.

At Columbia Institute's Centre for Civic Governance, our goal is to inform, inspire, and connect community leaders who are using progressive policies to build inclusive, sustainable communities. We share the proceedings from our inaugural Governance Forum in Ontario in order to inspire and inform community building across Canada.



## PART 1

# 'LEED'ing Ideas for Building Green

How can you LEED the way to green buildings in your municipality or school district? Not entirely sure what LEED is? This section features a roster of Leadership in Energy and Environmental Design (LEED) professionals, including an engineer, two design experts, and an architect, who will explain the ins and outs, reveal the importance of building green, show you ideas of how to make it feasible in your jurisdiction, and use innovative examples of LEED buildings to show you what's possible.

# The ABCs of LEED

STEVEN CARPENTER is the founder and president of Enermodal Engineering, a firm that specializes in the design of energy efficient buildings.

LEED – Leadership in Energy and Environmental Design – is a green building system developed by the Canada Green Building Council, based on a system established by the US Green Building Council. LEED began in the mid-1990s when a group of organizations representing professionals, manufacturers, and government agencies got together to create a green building rating system. In the US they released the first version of LEED standards in the year 2000. Shortly after that the Canada Green Building Council was formed and in late 2004 LEED standards for Canada were released. These standards have attracted an amazing amount of interest since that time.

## > MORE THAN NEW BUILDINGS

When people say they are doing a LEED building, they are usually talking about new construction, or what we call LEED-NC. But LEED goes far beyond new construction, which is only one part of the construction picture.

There are also LEED certifications for building interiors for people who are renting and LEED for building shells for developers putting up outer buildings. Most municipalities own and occupy buildings, so they would be concerned with the NC system.

There's another system called LEED-EB for existing buildings. This system focuses on the operation and maintenance of existing buildings. It has been in use in the US for a couple of years and we are looking at bringing it into Canada. Regular LEED also applies to major retrofits, in which mechanical systems are replaced (as in ice rinks).

## > LEED'S POINT SYSTEM

LEED works by a point system. There are a total of 70 points available for each building project. If you earn 26 points, you have reached the certified level, or LEED Bronze. LEED Silver is achieved if you get 33 points, Gold for 39 points, and 52 points earns you the Platinum level. One thing I like about the LEED certification system is that the first level is easy to achieve. Even bottom-line oriented private sector developers can easily get LEED certified and not break the bank.

Often we hear from municipalities that are eager to demonstrate that they are forward-thinking and so are aiming for the LEED Platinum level. However, LEED Platinum is a very challenging level that the best designers are working hard to get to. Of all the 70 buildings certified in Canada, only one is platinum. The second platinum certification is coming soon.

Points are awarded equally for energy efficiency, water conservation, the materials used to make the building – whether they are recycled or are local materials, site development, measures to deal with storm water, and measures taken to discourage car use. Another criterion that many people find surprising is the quality of the building's indoor environment. LEED also deals with questions like natural lighting, occupant control of workspaces, and operable windows, among other things. So LEED is not only looking at creating a healthy outdoor environment, but a healthy indoor environment, too.

## > LEED IN CANADA

To date LEED in Canada has been more popular on the west coast. There are approximately 70 LEED certified buildings in Canada, including 17 or 18 in Ontario. A building is certified when a builder has actually designed and built the building, collected all the documentation,

submitted it to the Canada Green Building Council, and the building has gone through a third-party review.

There are about 500 buildings across Canada that have registered for LEED. Builders register as soon as they've decided they want to build a LEED-certified building. When everything is added up, there is roughly about 50 million square feet of green building activity in Canada, with a construction value of about \$10 billion.

In Ontario a number of towns and cities – Kitchener-Waterloo, Kingston, Vaughan, Toronto – have mandated LEED for all of their municipal buildings. The York Region and the Region of Waterloo have also mandated LEED for all of the buildings that they build. In most cases those groups have selected LEED Silver as the level they are targeting to achieve, with the exception of the City of Vancouver, which is aiming to achieve LEED Gold.

The most interesting development is East Gwillimbury in the York Region, which is the only municipality in Canada or North America that has mandated LEED for all buildings, including private sector buildings. East Gwillimbury is a very small municipality and it will be interesting to see how the private sector reacts to having LEED as a mandated environmental standard.

Outside the municipal sector, the federal government has set LEED Gold as the standard for all federal government buildings. Infrastructure Ontario is using LEED certification for their buildings.

## > LEED-ING EXAMPLES

Builders have designed buildings so inefficiently and so poorly that they can easily make dramatic improvements in performance. It's embarrassing

**Builders have designed buildings so inefficiently and so poorly that they can easily make dramatic improvements in performance.**

that it's so easy to reduce our water and energy use by two-thirds. We make these reductions by collecting rain-water off the top of the building into a buried cistern, and use it for flushing toilets, the cold side

of the laundry, and to wash down the building and vehicles.

To show how LEED works, below are a couple of projects with which our firm has been involved.

#### THE PARAMEDIC SERVICES HEADQUARTERS IN OTTAWA

- Slightly larger than 100,000 square feet;
- Includes ambulance, training and administration facilities;
- LEED Canada certified, the entry level;
- Low water use fixtures, heat recovery from the ventilation air, and the use of low off-gassing materials; and
- Greenguard certified furniture used in the offices.

#### THE REGION OF WATERLOO EMERGENCY MEDICAL SERVICES FACILITY

- The second building to be LEED certified in Ontario;
- LEED Gold; and
- Uses 66 per cent less water, 67 per cent less energy, and 75 per cent less construction waste.

#### THE NEW TWIN PAD FOR THE CITY OF KITCHENER

- Includes a double ice rink, plus other recreation facilities;
- Rather than dumping the heat that is removed when cooling the arena ice, waste heat is recovered and used to heat the arena via radiant floor heating and radiant heating in the seats, resulting in a 60 per cent energy savings; and
- Rainwater is collected off the roof for ice resurfacing, avoiding the need for chemical systems to make Kitchener's hard water soft enough for ice.

#### THE TORONTO REGION CONSERVATION AUTHORITY ENVIRONMENTAL WORKSHOP

- 11,000 square foot building just submitted for LEED Platinum certification, the first in Ontario;
- Composting toilets and waterless urinals;
- No sewage water is produced; and
- Small septic system deals with water from lab sinks.

#### THE NEW CAMBRIDGE CIVIC ADMINISTRATION BUILDING

- Submitted for LEED Gold certification;
- Plant biowall that purifies the air; and
- Atrium for natural office lighting.

## > FOUR STEPS TO GREEN BUILDINGS

Here are the top four things to consider in order to get a green building in your municipality:

### STEP ONE: ACHIEVE OWNER COMMITMENT

In the case of municipal buildings, a strong commitment is necessary from municipal council, reflected in a resolution that is carried through to staff, the design team and the construction team. We have sometimes found that LEED certified buildings are harder to achieve than LEED Platinum because often the people that want LEED certified are aiming for the lowest level because they are unwilling to change the way they do things. Even for LEED certified, you've got to do things differently.

### STEP TWO: GET THE PROCESS RIGHT

Since LEED is about changing the way we design and build buildings, we must do things differently. One of these things is the process we go through to deliver buildings. It becomes necessary to spend a lot more time at the concept design stage figuring out what you want in the building. The integrated design process involves getting all the players together, including getting feedback from building users on new design features. A traditional design team will give you a traditional design, so for LEED buildings you need someone on the team who is looking out for the environment.

### STEP THREE: SET A SEPARATE BUDGET FOR LEED

While the cost of green building is not great, the environmental features are susceptible to so-called value engineering. When a project comes in over budget, LEED gets blamed for every cost overage that occurs. Look at the paybacks down the road in savings. Once that has been considered, green buildings are your best investment.

### STEP FOUR: CHOOSE SUBSTANCE OVER SIZZLE

There are a lot of green technologies. Green roofs, for example, are good in some buildings and they're not good on other buildings. In the end, it's the ultimate environmental benefit the building user wants. Designers and users should look at the benefits they want rather than choosing particular technologies.

# New Educational and Research Work at the Kortright Centre

**ANDREW BOWERBANK** is the Executive Director of the World Green Building Council, formerly the Executive Director of the Greater Toronto Chapter of the Canada Green Building Council, and Manager of Sustainable Development for the Toronto and Region Conservation Authority.

There is a great deal going on today with green buildings. There's a big shift in the marketplace that will make this change work, but those of us who are concerned with sustainability must work to encourage this movement.

## > THE TORONTO AND REGION CONSERVATION AUTHORITY

The Toronto and Region Conservation Authority (TRCA) goes back 50 years, looking after the river valley corridors and the watersheds in the Greater Toronto Area. The Authority owns many important pieces of parkland, including the sites of the Toronto Zoo and the Ontario Science Centre.

A major problem we face today is buildings encroaching on our protected waterways. With the population of the GTA due to increase by about 40 per cent by 2020, we at the TRCA are asking ourselves

whether we are going to be able to continue to maintain the level of protection for waterways as we have for the past 50 years. We are asking if we can consider a new mandate for the TRCA that encompasses sustainable development.

Looking at the history of the TRCA and other conservation authorities, our mandates have shifted many times already. We now have a mandate for education, which we carry on in our residential field centres, and at the Kortright Centre for Conservation in Woodbridge, which is located between Rutherford Road and Major Mackenzie Drive, and along Islington Avenue west of Highway 400.

## > LIVING CITY CAMPUS

The 325 hectare Kortright Centre has become Ontario's premier environmental and renewable energy education and demonstration centre, and today the TRCA is developing the Living City Campus at the Kortright Centre.

Kortright seemed to be an ideal place to create a centre for green building design and technology. By allowing people to kick the tires of these emerging technologies, we can build confidence in what we are trying to do with green buildings.

We have been told by the US and Canada Green Building Councils that we will have the largest concentration of green building types in North America at Kortright when the Living City Campus is completed. A unique feature of this project is that we will not be touching any of the natural features that exist at Kortright. We are trying to create a relationship between the natural and the built environment and determine whether that is possible in an urban context.

We're looking at six main areas of research at the Living City Campus: core research, design technology, biodiversity, energy conservation, sustainable living practices such as urban agriculture and biofuels, and preservation of natural wetlands.



The Living City Campus is not just a vision any more, we've got buildings on site. The Earth Rangers Building is the first LEED Gold building in the York region. This building delivers environmental education to younger people through school programs. The building's design is part of that education.

## > NEW INITIATIVES

The Archetype Sustainable House project is under way and it's supposed to demonstrate the best in sustainable green design for new communities coming up. This initiative will hasten the day when LEED-certified residences can be built.

Beyond Kortright, we are looking at green buildings such as the TRCA's new Restoration Services Building in Vaughan, which has been awarded LEED Platinum status. This building provides a place for our habitat regeneration and restoration projects, and minimizes its own impact on the environment.

The TRCA is looking at a \$20 million opportunity from Ryerson University to build a Centre for Sustainable Technology Research. Ryerson is also considering working with Seneca College on that centre.

We've won a friendly competition to host the headquarters for the World Green Building Council, which will be hosted in the LEED Gold Earth Rangers Building at Kortright.

The WorldGBC has developed partnerships with a variety of organizations including the World Business Council on Sustainable Development and the Clinton Foundation to develop its environmental work.

There's a new initiative from BC called the Living Building Challenge. It's a challenge that goes beyond LEED Platinum. It looks at net zero energy, zero water waste, and using only salvaged materials in its construction. This initiative looks at actually giving back to the land as opposed to causing any impact whatsoever.

The Authority looks forward to building on its work to date with initiatives such as new educational facilities and challenges such as the living building and more environmentally sensitive modes of transportation.

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# Renewing Our Apartment Towers

GRAEME STEWART is a designer with E.R.A. Architects and has worked on a number of projects involving some of Toronto's major historic sites.

MICHAEL MCCLELLAND is a registered architect with more than 20 years of experience and a founder of E.R.A. Architects.

## > LOOKING AT THE SUBURBS

E.R.A. Architects is a firm that works with heritage buildings. We also focus on social equity and appreciating existing buildings. With these things in mind, we wanted to look at the issue of sustainability within an urban framework.

Our efforts to make the suburbs more sustainable have materialized in the Sustainable City Tower Renewal Project. We wanted to take on the suburbs with love and appreciation. The point of this project, which also involves the Canada Mortgage and Housing Corporation and the University of Toronto, is to produce significant increases in energy efficiency, renew and update existing building stock, encourage social investments, enable entrepreneurship, and strengthen communities across the city and region of Toronto. We also want to provide workable models for appropriate and thoughtful intensification and relate them to current patterns of transit and existing clusters of densification. We want to shift urban design to encourage a clean and beautiful city.

But the buildings we are focusing on are those that people hate the most: high-rise residential towers, which we define as having 12 or more stories. These buildings are everywhere and the Toronto region and Ontario are unique for having more of these buildings than anywhere else in North America. Most people go out of their way to ignore these buildings, but a lot of people live in them.

In 1968 Buckminster Fuller, the geodesic dome architect, said, “In Toronto an unusually large number of high-rise towers poke above the landscape, miles from downtown. This type of high density development is far more progressive and better able to deal with the future than the endless sprawl of the US.” So 40 years later we are going to see if that is true.

## > URBAN SPRAWL

There’s a belief that these apartments are mostly situated downtown, but in Toronto, the opposite is true: they are equitably placed in all parts of the region. In reality this is the environment most people live in.

Back in 1954 municipal planners and leaders were as concerned with urban sprawl as we are today. They decided to make new communities compact. It is interesting to note that when these towers were built they didn’t break up existing neighbourhoods.

At the time, these buildings were considered sexy. People wanted them like they want condos in the current condo boom. Last year there were 15,000 condos built in the Greater Toronto Area. In 1968 twice as many of these high-rise apartment units were built. Although we don’t think of Toronto as being a high-rise city, Toronto has the second largest number of these high-rise residential towers in North America and twice as many as Chicago.

An important issue today is that many of these high-density areas are related to low incomes. In many cases, these areas are under-served by transit and the situation doesn’t seem to be improving. Something must be done around these issues.

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## > RETROFITTING TOWERS ISN'T NEW

Many of these towers are energy inefficient – more energy inefficient than single-detached homes – which will surprise most people. These towers were built before insulation was required and they were built with single-glazed windows.

The best thing about these buildings is that they are extremely easy to retrofit. Putting in insulation, solar water heaters, and urban gardens can make these buildings attractive and make them candidates for LEED certification. And because these towers are so similar, a retrofit job on one building is easily repeatable. We can make major cuts in energy use and CO<sub>2</sub> emissions.

There is a precedent for this idea. In Europe most cities are surrounded by high-rise tower blocks that began to be retrofitted a decade ago. In Moscow they changed the wastelands that used to surround these buildings into shops and cafes. Other cities in Europe are retrofitting buildings and improving living standards. It's easier there because most buildings are owned by the government.

## > INCENTIVES NEEDED

In Toronto the challenge is that these buildings have a variety of owners. We need to develop incentives to encourage owners to retrofit these buildings, because demolishing them is a short-term and irresponsible way of looking at this problem. The windows are failing, so they need to be fixed. But the fundamental infrastructure of each building is fine. The concrete in these buildings could last another 200 years.

Owners have to be given incentives to invest in these buildings. They are falling apart right now because their owners don't want to invest in them. With our work on this project, we hope that maybe these areas can accept new densities in beneficial ways.

If the owners put in new windows, new insulation, new services such as Internet connections, new cladding, and enclosed some balconies, many could wind up looking completely different.

The communities in these buildings are vibrant and we are looking at how we can make them work better. Retail shops and gardens in these buildings and subway stops nearby would get people out of their cars. Investing in these buildings would maintain affordable housing. We can't allow these buildings to gentrify.

