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Green Building and Development as a Public Good

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1. Introduction

Canadians know that the built environment – homes, offices, factories, roads, infrastructure, etc. – holds a key to a sustainable and healthy future. The energy and environmental demands of the built environment will undergo substantial changes in the years ahead. Several pressures exist: looming carbon cap and trade legislation, shrinking energy resources and, perhaps most important, evolving attitudes toward our consumption and production patterns. Still, the path to greener built environments is barely marked and obstacles remain. Take, for example, Ontario's recent *Green Energy Act*, which recognizes and seeks to reduce the impact of the attitude of "Nimbyism" (not in my backyard) – a real challenge to new ways of building and using homes, offices and transportation corridors – in the installation of alternative energy sources such as large-scale wind turbines.[1] Like the *Green Energy Act*, green building and development faces a classic policy paradox: we collectively agree that improvements are needed in the built environment but we are caught in a whirlwind of information and debate about how to move forward. We are motivated by widespread adoption of green ideals but stymied by issues related to implementation. The purpose of this paper is to set out this basic policy paradox and discuss ways that we can move forward.

2. The Scope of Green Building and Development

One-third of Canada's energy use goes to running our homes, offices and other buildings. The federal government's Office of Energy Efficiency (at Natural Resources Canada) reports that a corresponding one-third of our current greenhouse gas (GHG) emissions come from the built environment. This is a large proportion that can be addressed in both the short and long term by modifying how we build and how we use our homes and offices. Addressing the performance, energy use and GHG emissions connected with our built environment is an urgent public policy issue for at least two reasons. First, related to energy and GHG emissions, we know that our use of the built environment involves much more than individual buildings. The single largest energy and emissions contributor related to our built forms is at the community level rather than the individual office/dwelling level, specifically in private transportation. When we add personal road transportation, such as automobile use for the journey to work, we nearly double the GHG emissions attributed to our use of the built environment. Personal road transportation accounts for 51% of the average household GHG "budget," as compared with space heating at 28%, water heating at 9% and appliances at 8%. Second, and more broadly, the production and use of the built environment involves not only energy demand and GHG emissions but also the following:

- land consumption – often of valuable agricultural land;
- provision of infrastructure; and
- materials use and, as a by-product, material waste.

[1] See, for example, the following article: Hamilton, T. 2009. "Province to fast-track wind turbine projects." *Toronto Star*, February 21. Available at www.thestar.com/article/591043.

All of this is particularly important in the Canadian context where the construction of homes and roadways connects the country's primary sector (still today a backbone of the Canadian economy in terms of our trade relationships and a source of foreign direct investment strength) with the final demand for fixed capital to be put in place.

Given these pressing concerns about the ways that we build and use our homes, offices and the transportation and communication networks between them, it is important to take stock of the scope of the emergent green building and development (GBD) domain as laid out in Table 1. Selected GBD examples are given in the table and several more could be described, however the main point of this table is to present a framework of the two principal dimensions involved:

- GBD issues, including design and construction, technologies associated with water and waste water, electrical and appliance/mechanical systems and, of course, consumer behaviours; and
- the built environment itself, divided between individual buildings on the one hand and the community scale (transportation mode, connectivity) on the other.

The latter dimension is itself divided between "retrofits" and new building. New building provides about 1.5% of the entire built environment per annum on average. Though small in the near term, what we build now will be of lasting and ever growing importance. The short-run impacts of our efforts in new building are offset, potentially, by our work on retrofitting existing (and especially older) buildings and communities, which, again owing to longevity, represent not only the vast majority of dwellings, roads, factories and offices today but also a legacy of inefficient built forms from years and decades past.[2]

Table 1. The Scope of Green Building and Development (GBD) – Selected Ideas and Examples

GBD Issue	Built Environment			
	Buildings		Neighbourhood/Community	
	Retrofit	**New Building**	**Retrofit**	**New Building**
Design/ Construction	Incentive programs for upgrading energy/ environmental performance	Passive solar heating and ventilation	Densification – to make commercial and public transportation viable	Fused transportation grids
Technology	Upgraded heating and cooling	Performance-rate mechanicals for water heating and conservation	Community and/or household energy systems (e.g. geothermal)	Bioswales or permeable surfaces for rainwater capture
Behaviour	Consumer education on product and design choices	Densification – allowing ancillary apartments	Community engagement for green (re)development	Encouraging/ inducing walkability

[2] There is more to the trade-off between retrofitting existing built environments versus new construction. Though the arguments are important, we simply note here that there is ongoing debate about how to approach "existing versus new building."

So what are the basic GBD issues at the individual building level? As shown in Table 1, we can categorize these first by design and construction, where the building envelope and materials have the greatest long-term impact on performance and energy efficiency. Orienting buildings to take the most advantage of passive solar heating, natural ventilation and seasonal shade are classic examples. Similarly, the building envelope can deliver the greatest reduction in heating and cooling consumption independent of high-efficiency climate control systems. Technology itself is important and enters the building-scale picture primarily via product manufacturer's delivery of always-improving appliances such as furnaces, dishwashers and low-flow toilets. Finally, behaviour in this context has to do with the ways in which we use our homes and offices but also perhaps with how we think of their design and construction. As consumers, and increasingly as workers, we learn to conserve water and turn out lights when not in use. The more informed consumer can also exercise options in the design/construction and technology domains when it comes to (re)building or moving. In fact, behaviour modification may be the least expensive but most difficult GBD front. When we sum the millions of individual decisions that go into the consumption and use of the built environment, we realize that modifying behaviour may be where the greatest rewards lie, but also the greatest challenges.

What about the neighbourhood/community scale? Building codes affect how we design and construct individual buildings but the community scale is a matter of zoning regulation, planning and policy on land use compatibility. For example, permeable surface technology may be available to better capture rainwater, though experiences with applications are few and approvals are possibly risky. Designers may envision walkable communities that reduce automobile dependence, yet more compact and dense development may bring incompatible land uses into closer contact. Nimbyism is a typical outcome. Here again, consumers may see the health and development benefits of walkability but may be unwilling to forego private transportation. Telecommuting is another example. Policies that foster and leverage information and communication technologies in a knowledge economy can have the complementary environmental benefit of reduced energy use and emissions, though this kind of reorganization involves substantial changes to work relationships. Though we have only scratched the surface here, we see how quickly GBD ideas in wide acceptance present opportunities but also run into difficulties of implementation. What are some of the basic challenges?

- **The green premium and affordability:** It costs more to implement GBD, although the up-front cost is coming down all the time. This is most apparent at the household level, where the cost of green design and technologies is often offset against other features or calculated in simple life cycle terms (without a discount rate over the occupancy and building time horizons). Nevertheless, even if long-run savings in household and infrastructure costs far outstrip initial costs (even holding energy prices constant), up-front costs are still seen as a barrier.
- **Labour (re)training:** This refers to the adaptation needed to incorporate green design and construction in new building and renovation. The construction trades in particular are responsible for installing new and unfamiliar green building products. What is involved in ensuring that new materials and methods are incorporated properly?

- **Risk and liability:** This is perhaps the most important point from a governance perspective. How do we encourage GBD risk-takers and early leaders while at the same time protecting the public's interest? There are serious liability issues to be confronted in delivering new home, work and publicly shared environments that have to be safe and operational while also being sustainable from the construction and use points of view. The answer implicates not only producers and consumers but also municipalities and governments in their construction approvals.
- **Financing:** Retrofitting houses, buildings and community infrastructure and delivering new developments rely on capital. How will financiers rate the credit-worthiness of builders, developers and projects that represent the leading edge in GBD but also perhaps considerable risk vis-à-vis established methods? Why fund the new and avant-garde?
- **Consumer acceptance and choice:** As discussed earlier, there is widespread acceptance of the ideals of GDB. However, plenty of confusion exists over what to prioritize (e.g. technological solutions or behaviour modification) as well as considerable "greenwashing" – overuse of "eco" and "green" labelling and branding, particularly where there are no environmental benefits. Also, depending on the region, over 10 green building standards currently exist in Canada. How do builders choose among them in bringing new homes to the market? Which standard(s) should serve as the model in retrofitting houses and buildings? How do consumers choose?

A range of stakeholders are implicated in the questions asked here. Municipalities are closest to the construction and design process given their front-line role in issuing permits and approvals. Builders and developers, from which the leaders and risk-takers will emerge, provide the built environments that we occupy and use. And of course consumers, whether the household or the office building tenants will also be concerned with the built environments that they occupy. Since we are early on in the life cycle of GBD, we have little tradition to draw upon for guidance and, worse still, no locus of reliable and independent advice and information exchange to establish, develop and maintain a discourse on the range of issues at hand.

3. How Can We Move the GBD Agenda Forward?

This question is about how we bring multiple stakeholders together to build a dialogue where their interests and priorities identify challenges and create opportunities for GBD. In the absence of identifiable and reliable knowledge transfer, co-development and dissemination on GBD governance, stakeholders will continue to misunderstand each other's purposes, opportunities will be missed and, ultimately, the creation of greener built environments will stall. A catchphrase that seems to capture both the widely held intentions and the uncertainties of GBD is the "triple bottom line": the economic, environmental and social value added by GBD. How can we get there?

The experience of two community-based forums in London, Ontario, in 2008 can be used to demonstrate the need and opportunity for GBD knowledge transfer, co-development and exchange.[3]

[3] The first forum was held on March 19, 2008 (see http://geography.ssc.uwo.ca/faculty/buzzelli/publications/gb_forum_final_report.pdf), and the second on December 2-3, 2008 (http://geography.ssc.uwo.ca/faculty/buzzelli/publications/gb_forum2.pdf). For further details, see the links provided.

The forums were the first of their kind in the region and were convened by the author in co-operation with the London Home Builders' Association and the City of London. Initially, participants were willing but viewed the forum with some scepticism. It became clear early on that stakeholders knew little or nothing of each other's current thinking on GBD purposes, intentions and roles, yet misunderstanding was soon supplanted by co-operation. By the end of the working day of the first meeting in March, there was a consensus that another forum should be held, and this resulted in the second event in December 2008. More importantly, the discussion, reports and new collaborative contacts have led to a more permanent working group, providing terms of reference and ongoing support for the City of London's Green Development Strategy.[4]

Were the forums an effective way to transfer GBD knowledge, co-development and dissemination? From the first meeting, we learned the following:

- **LEEP** – the London Energy Efficiency Partnership – is a multi-stakeholder tool kit, now widely cited across Canadian centres, developed to inform builders and developers, among others, of GBD products and processes. The tool kit shows promise for knowledge transfer and dissemination of GBD.
- **Public outreach and education:** There was a broad-based consensus that consumers and households will themselves need to adapt in order to understand, accept and ultimately seek out green building design, technologies and features at the housing unit and community levels. The demand cannot come from the construction industry alone.
- As we will see in the "dot democracy" exercise results below, there was some consensus around the notion that **there is no single approach or fixed set of "solutions" to the provision of green built environments**. A related issue was the broad-based support for locally sensitive means of building green rather than a regulated or mandated system that may negate or disregard region-specific issues.
- There was a consensus that, in order for fundamental change to be made:
  a. the **right people need to be in the room**. We've taken one giant step in this direction, however, key processes need better representation for more headway.
  b. **governance structures**, involving co-operative and collaborative approaches, will need to be developed so that we adapt to delivering alternative kinds of built environments. More is said of this below.
- Finally, there was an undercurrent of acknowledgement that **building (and living) green is expensive** and that we must bear this in mind as we develop strategies to implement green built environments. Costs will inevitably come down with time, but it was agreed that green building should not be cost-prohibitive in the early years of market penetration.

Toward the end of the first forum an interesting "dot democracy" exercise shed light on what participants felt were important issues and distractions in GBD. They were asked simply: "What makes a community green?" Overall, there was considerable spread among several choices, but flexible green building standards and energy efficient design received the greatest share of "votes."

[4] For more details, visit the City of London's Green Development Strategy web page at www.london.ca/d.aspx?s=/Planning/Green_Development_Strategy.htm.

At the other end of the spectrum, few endorsed the idea of mandated green building standards and community-level issues like green open space. Between the extremes was a host of issues with considerable variation.

The second GBD forum built directly upon the first by picking up on the point that governance structures are critical for advancing GBD. Forum participants expressed the following:

- GBD should be viewed **holistically.**
- GBD should capitalize on **existing regulation while also developing incentives** and should build on existing strengths and best practices.
- A GBD strategy must be **regionally relevant** and harness many of the initiatives already under way, and at the leading edge, in the region.
- The region needs to devise a method for promoting, but not punishing, **risk-taking.**
- **Leadership** is key. Participants recognized that the two forums demonstrated leadership by the stakeholders involved and that it should also be fostered within and across organizations.
- The right **measurements** must be developed in order to monitor progress and assess outcomes.

4. Concluding Remarks

What can we take away from these experiences for advancing GBD? There are several key issues worth restating here.

- Perhaps most important is that a balanced policy and policy development framework is needed, providing a balance between (a) higher-level guidance, knowledge sharing and co-development, and (b) the municipal scale of administration and action. Local areas must work to develop their governance structures to encourage and put into (best) practice GBD strategies and methods. Cities, builders, consumer groups and others will have to work through the as yet unseen plans, challenges and opportunities in delivering environmentally and energy-sustainable built environments. That being said, municipalities – particularly those new to GBD – will find the first steps the most prohibitive. While local areas will have their own particular circumstances and opportunities, relevant lessons from other jurisdictions may be lost if we do not think of mechanisms for ongoing, consistent and informed exchange. Like the proverbial child in the village, s/he has the capacity to grow and develop but the village – in this case the wider community of municipalities and higher levels of government (for example) – can and should nurture the process. Higher-order knowledge development and transfer is therefore equally important.

With a balanced policy framework in place, the remaining points – indeed, the GBD agenda itself – can move forward.

- Collaboration is needed. GBD involves multiple stakeholders because it is new, complex and involves risk. Risk-spreading may be necessary for new and bold developments that achieve the greatest rewards. We are at the beginning of the GBD "product life cycle," and risk-takers and leaders should be encouraged while, at the same time, the public's interest should be protected.

Industry champions will emerge but will find little incentive to take the lead or remain out front if GBD plans are consistently forestalled and if they can revert back to standard building methods, materials and products.

- An issue that has been rather more subtle in the discussion and which could be critically important in moving GBD forward is the opportunity to capitalize on local regional policy co-benefits. Building green often means building healthy environments and/or using infrastructure more efficiently or reducing energy demands. At the local level, related policy levers may be used to propel both GBD and other priorities. For instance, regions that target youth (aged 18-35 years) attraction and retention could draw upon and contribute to GBD and green branding generally, since the latter issue is also associated with younger cohorts. Similar examples of interconnected policy thinking can be made of infrastructure, poverty and health, for example.

What we have done in this paper is to highlight some of the key issues facing GBD as it will – and some would say must – unfold at the local level. Whether tackling risk and liability, financing or the green premium, local regions must set their sights on governance structures that foster, develop and disseminate expertise, and they must do so collaboratively among key agents. Though many of the issues like risk-spreading are generic, they must nonetheless be worked out by the unique set of actors, circumstances and projects from one region to the next. At this stage, we can only peer into the future and wonder what we might see one or two decades down the road. Surely a significant part of the story will pivot on the local and collaborative efforts that will at first develop slowly and then be taken for granted as the new "normal." One might say that the future inevitably will be green, though how quickly we get there will depend on how we plan for it now.

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