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**CUTTING GREEN TAPE:
AN ACTION PLAN FOR REMOVING
REGULATORY BARRIERS TO GREEN
INNOVATIONS**

West Coast Environmental Law



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INTRODUCTION

REGULATION ESSENTIAL

Regulation of land-use, building materials and building designs serves important societal functions. There are many examples from both recent and earlier history that underline the need for appropriate regulation of buildings and land use. Thousands were killed when buildings collapsed in Kobe, Japan in 1995; hundreds of condominiums built in Vancouver in the 1980s require extensive repairs due to faulty design and construction; a massive supermarket collapsed at Burnaby's Metrotown in 1988; the Great Fire of Vancouver destroyed much of the fledgling city in 1886; and applications to build polluting industrial plants close to residential areas are all too frequent.

BUT REGULATION CAN INHIBIT GREEN INNOVATION

But regulation can also inhibit the adoption of green designs and technological innovations that are essential to healthy, sustainable communities — in some cases without continuing to serve another social policy objective (like fire, health, or safety). A Canadian Mortgage and Housing Corporation report states:

“Housing industry innovators and CMHC staff involved in demonstration projects report constant frustrations and delays when attempting to implement new land use patterns or environmental technology in leading edge innovative housing. Many of these impediments come from the regulatory process, either through relevant building code or various planning, zoning and health regulations. This should come as no surprise, since innovative buildings, almost by definition are likely to violate some code requirements or zoning regulations. The problem is that the frustrations and delays have such a personal and financial cost for the owner and their consultants, that the take-up of healthy housing principles and the implementation of more sustainable development is inhibited.”

GREEN INNOVATION ESSENTIAL

To the extent they affect urban growth patterns and building design, these regulatory barriers can be major impediments to overall sustainability. Low density, car-oriented developments foster dependence on light duty vehicles, with associated increases in greenhouse gas emissions, air pollution, urban run off, congestion, diminished land values and increased traffic accidents. Building and urban development designs are directly related to emissions for home heating, emissions from power generation, urban run off, water use and waste creation. There are often synergistic effects in urban design: for instance, reduced water use can reduce energy use for water pumping and waste water treatment. All of the above environmental impacts are associated with a host of other economic and social impacts: e.g., liveability, infrastructure costs, costs of doing business and health. These effects are very long lasting. The design of a house will affect greenhouse gas emissions for 50 to 100 years, and car dependant developments can affect greenhouse gas emissions for hundreds of years as they lock our urban areas into inefficient land use patterns.

THE PURPOSE OF THIS DRAFT ACTION PLAN

In 2001, West Coast Environmental Law Research Foundation set out to develop an action plan for how the need for sustainable communities could be accommodated within the current regulatory framework. We set out to identify green building practices, regulatory barriers to green practices and explore potential solutions to regulatory barriers. Our goal is to evaluate and prioritize solutions, both in terms of whether the solution is feasible, whether it would make an impact in the uptake of green practices, and whether the green practices have a major impact on creating sustainable communities.

SCOPE OF CONSULTATION TO DATE

In developing this draft Action Plan, we have consulted widely and reviewed a broad range of literature. We have consulted with municipal officials, provincial and federal government officials, lawyers for municipalities, developers, architects, engineers and academics. In all, we have interviewed over 40 individuals and reviewed several dozen reports.

The full results of our research and interviews are set out in Appendix 'E'. The Action Plan that begins on page 11, attempts to distil this considerable volume of green building practices, barriers and solutions into a set of practical, achievable steps towards removing unnecessary regulatory barriers.

YOUR FEEDBACK ESSENTIAL

This draft Action Plan is still a living document that needs refinement. In the spirit of promoting discussion that will lead to more refined solutions, we have presented virtually all of the potential solutions provided to us in the course of the research/interviews. We are seeking your feedback as to whether the solutions identified are feasible, likely to be effective and whether they tackle the largest barriers to sustainable building design and community planning. We would also appreciate your assistance in identifying relevant resources that are not noted in the draft Action Plan.

WHAT CONSTITUTES A REGULATORY BARRIER?

West Coast Environmental Law often advocates for stronger environmental regulation, but in the draft Action Plan our purpose is not to design regulations that require sustainable buildings or communities. Instead, we are aiming to remove barriers that exist in the current regulatory regime in order to promote more green building practices without compromising other important social policy objectives (especially fire, health and safety objectives).

Early in the project, it became very clear that what constitutes a regulatory barrier is often unclear because of the intertwined nature of development economics and building and land use regulation. Economic barriers may be the result of regulations, and informational barriers may combine with regulatory regimes to create a regulatory barrier. Generally, where a barrier either makes the regulatory system more cumbersome for innovative projects, or where a regulation creates an economic or other barrier, we have treated them as regulatory barriers. Examples of issues we have considered that cannot be neatly categorized as regulatory or non-regulatory barriers include:

- Development Cost Charges — bylaws make green innovations less competitive by failing to account for green developments lower impact on municipal infrastructure costs.

- Liability — fear of being sued makes building inspectors more reluctant to approve an innovative design. A similar fear may make some building professionals less willing to recommend innovative practices.
- Information — lack of information or education makes it difficult for building inspectors to determine whether a proposed innovation provides protection to the public equivalent to that of prescriptive Code requirements. Similarly, lack of knowledge in innovative areas is a barrier for design professionals and developers.

The distinction between non-regulatory and regulatory barriers is in many ways artificial, but for the purposes of this report it is necessary. **The LEED BC Steering Committee is sponsoring a separate report on non-regulatory barriers, and ultimately the two reports may be combined to allow a seamless discussion.**

THE FUTURE IS NOW

WHAT ARE GREEN BUILDINGS AND GREEN COMMUNITIES?

In the fourteen years since the release of the Report of the World Commission on Environment and Development (the “Brundtland Commission”) every sector participating in urban, economic and social development has been motivated to respond to the sustainability imperative defined by the Commission: “to sustain human progress through development without compromising the ability of future generations to sustain themselves.”

In the fields of community planning and building design the response has been a rapidly maturing knowledge and practice of ‘alternative design standards’ and ‘green building development’. The full spectrum of green development merges several agendas of environmental, social and economic importance into a new integrated model for urban planning and construction. Some of the characteristics of green building and green community development are:

- Buildings that are used and cherished by generations because they are ‘architecturally beautiful’, and are graciously flexible in their uses over time (like some schools in Sweden that are built to convert to condos when enrolment drops off). Older warehouse space is a classic example (e.g., Yaletown in Vancouver).
- Largely focused on adaptive reuse and or renovation of *existing building stock* and as a result capitalizing on enormous earlier investments in labour, energy and materials. In addition, since Canada adds to its building stock at only a very small rate each year (in the nature of 1 or 2 percent), a change that makes it easier to ‘green’ an existing building could have a considerably broader impact than a comparable change for a new building.
- Compact approach to cities and communities that preserves the natural setting, protects agricultural land, and supports public transit.
- Providing places to live, work and shop in the same neighbourhood.
- The repair and redevelopment of ‘brownfield sites’ — abandoned or underused properties where past activities have caused real or suspected environmental contamination.
- Minimizing impacts on natural hydrology by minimizing impermeable surfaces and other stormwater best management practices.
- Design features and technologies that (1) minimize dependency on non-renewable energy sources, (2) maximize the use of renewable energy sources such as solar heating, and natural ventilation and cooling, (3) reduce energy and water consumption and waste water release, and (4) minimize solid waste from construction, operation and renovation.
- Emphasis on the use of systems, components and materials that reduce the depletion of raw materials and minimum release of wastes (especially toxic wastes) in their production, use, re-use and disposal.

- Emphasis on the design of indoor environments that enhance and protect the health and well-being of people.
- Emphasis on social and economic equity, local economy and fair trade.

Green buildings and green communities are not only more ecologically responsible, they are also typically healthier and cheaper. A growing body of literature highlights productivity and absenteeism benefits for green buildings. Green buildings and green communities also make economic sense because they can provide considerable savings in both capital and operating costs. The Vancouver Island Technology Park — the only Leadership in Energy and Environmental Design (LEED)-Gold certified building in Canada — is a reclaimed hospital and did not set out to be a ‘green building.’ VITP developers say LEED-Gold certification was achieved not only without any extra cost, it actually made it easier to stay on budget.

THE FUTURE IS NOW

Green buildings and green communities are not futuristic, utopian concepts. Today and every day, BC planning, design and construction professionals are seeking the necessary permissions to try innovative green designs. Many are successful, but regulatory barriers and costly processing delays discourage many others.

Here are some examples of successful green building practices in Canada:

PLANNING

Multi-use development, such as the Capers Project at 2211 West Fourth, embraces the philosophy that people should be able to live, shop and work all in the same neighbourhood, or even the same building. Compact, diverse neighbourhoods promote independence of movement, especially for the young and the elderly. Automobile dependence is lessened, and community safety is increased in round-the-clock presence of people.

Increased development density offers the potential for neighbourhoods to make full use of existing urban services, and increases the affordability of amenities such as parks and transit. Kitsilano, in Vancouver, is an example of a neighbourhood that has increased density through infill while not compromising quality of life. Sprawl is reduced, helping to relieve the pressure on wild spaces and farmland on the edges of urban areas. Secondary suites and coach houses can achieve densification, without sacrificing community character.

Brownfield development, such as the Selkirk waterfront development in Victoria (built on a former sawmill site), revitalizes abandoned or contaminated lands and brings them into productivity. Often brownfield sites are located near the core of urban spaces, meaning brownfield development makes efficient use of existing infrastructure. Brownfield sites can “green” post-industrial cities, by providing more parkland and residential space located near urban amenities.

INFRASTRUCTURE

Narrow streets can help increase density without sacrificing quality of life. Reduced roadway width has been proven to act as a traffic-calming device, making neighbourhoods safer for pedestrians, cyclists, and children playing. The mainly rural municipality of the Highlands in Greater Victoria has narrower streets, preserving more farm and forest land. Vancouver's 'courtesy streets' in the West End, Kitsilano, Commercial Drive and other neighbourhoods are noted worldwide.

Local stormwater management using natural drainage swales, green roofs, and local treatment systems can help reduce water pollution, and water consumption. Water that would otherwise be funnelled into the sewer system can be used instead for local irrigation. As an added benefit local stormwater management can lessen damage to streams caused by human-induced surges. The Oaklands Development in Burnaby treats stormwater through a biofiltration pond constructed in a local park. A vegetated swale follows existing drainage patterns, and facilitates infiltration through a meadow area. This natural stormwater system provides the community with a beautiful pond that is frequented by local residents and wildlife alike.

Local waste water treatment turns human sewage into valuable by-products and reduces demand for expanded central treatment facilities. Innovative, effective, and reliable local waste water treatment systems separate grey water from toilets for treatment and reuse. Using biological systems the waste water, without chemical inputs, can be brought back to a level that is safe to drink. A biofiltration system at the University of British Columbia produces potable water, and a living sewage treatment plant in Bear River Nova Scotia has become a tourist attraction (the only sewage treatment plant in Canada that can make that claim), and will soon be producing cut flowers for market.

BUILDING SITING, ORIENTATION, FORM, MATERIALS AND REUSE

Renovation of existing building stock helps to meet demand for buildings by renovating existing buildings instead of constructing anew. By preserving buildings, demolition and construction waste are eliminated, and embodied energy in the existing building materials is conserved. Furthermore, cultural and architectural heritage is preserved ensuring protection of built environment diversity. The Vancouver Island Technology Park in Victoria is the redevelopment of a long-term care facility into offices for high tech workers. It is the first project in Canada to receive a LEED Gold certification under the US Green Building Council's Leadership in Energy and Environmental Design (LEED v2.0) rating system. Another excellent and much older example is Sinclair Centre in downtown Vancouver, a highly successful adaptive reuse of several heritage buildings into new offices and retail.



(Picture: Vancouver Island Technology Park, source: Vancouver Island Technology Park website).

Solar and daylight access laws protect access to sunlight and daylight. Studies have shown that natural daylight is an important feature in promoting health and productivity. Protection of solar access would allow people to rely on passive solar and could lead to energy conservation and enhanced environmental quality. The Sechelt Justice Services Building layout and location was carefully chosen to take advantage of daylight, passive solar heating, and prevailing breezes for natural ventilation, reducing energy demand.

Deconstruction and salvage offers large potential to reduce demand for raw materials, reduce waste, and stimulate the salvage business. Instead of “smash and dispose” buildings are carefully deconstructed and salvageable parts are incorporated into new or existing building stock. The City of Vancouver has recognized that reused timber from old-growth forests can actually be of better quality than new timber from second-growth trees.

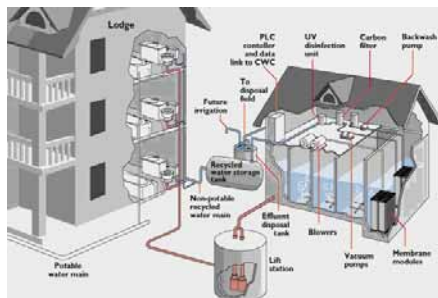
Green roofs can be anything from low maintenance grasses to complex gardens. Green roofs offer multiple benefits, including the capacity to control runoff and treat stormwater, generate oxygen and sequester carbon, and provide habitat, vegetable, flowers and occupant amenities. Rain water is allowed to slowly discharge into the receiving environment at a more natural pace. Green roofs also can help filter atmospheric pollution, reduce ‘urban-heat-island effect’ and can act as an insulating layer. One of the best-known examples of green roofs in Canada is the Vancouver Public Library.

Alternative materials such as strawbale and cob highlight local craftsmanship and materials while minimizing waste, chemicals, and pollution. Strawbale and cob buildings have high levels of energy efficiency while using materials that have low embodied energy. Alternative materials lend themselves to increasing diversity in the built environment. Mountain Equipment Coop utilized strawbale construction for one of the walls in their Ottawa store. Linda Chapman, one of the building's architects, explained the resilience of strawbales as a building material. "It's very good as insulation, plus it's a non-toxic, natural material that doesn't give off any gas," she said.

BUILDING PLUMBING SYSTEMS

Waterless Urinals have been adopted as a standard by the US federal armed forces and Mountain Equipment Co-op. Instead of wasting potable water, waterless urinals use an odourless fluid that floats on top of residual urine. Costs are much lower than maintaining a conventional urinal, and obviously water consumption is reduced. As an added benefit, waterless urinals reduce user exposure to pathogens since their growth in urine requires moisture.

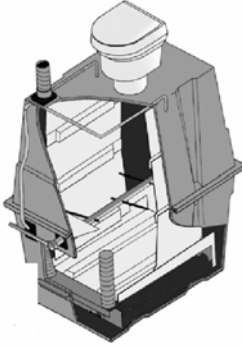
Collection of grey water and rain water from baths, laundry machines, and roofs can



greatly reduce potable water requirement. Examples of uses include irrigation and toilet flushing. The level of treatment required depends on the intended use of the reclaimed water. As irrigation accounts for twenty to forty percent of water use, and eighty percent or more of a typical commercial buildings' water use is due to toilet and urinal flushing, the collection and reuse of grey water and rain water can greatly assist water conservation.

(Picture: Sooke Harbour House grey water and rain water collection system, source: Sooke Harbour House website).

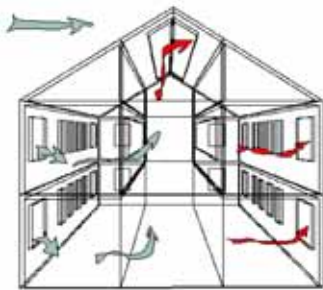
Composting toilets use natural biological digestion processes to treat human waste. The end result is odourless, uncontaminated, nutrient-rich compost material suitable for landscape application. Since they use no water for flushing, composting toilets can reduce potable water consumption in commercial buildings by one-third, and in residential buildings by up to one-fourth. Composting toilets can help eliminate a major cause of rural groundwater contamination, malfunctioning septic systems. By reducing sewage loads, widespread compost toilet use can also reduce environmental impact on water bodies where raw and semi-treated sewage is currently discharged, such as the Georgia Strait and the Fraser estuary. The C.K. Choi Building at the University of British Columbia has installed composting toilets, reducing volume of waste produced by 90% and has saved over 6,750 litres of water a day for more than five years.



(Picture: Large Composting toilet. Source: Advanced Composting Systems, Environmental Building News).

BUILDING SYSTEMS

Natural ventilation and cooling systems use wind and heat-induced air movement in buildings to reduce mechanical equipment and energy consumption. Operable windows, vents and open plans are preferred by occupants and produce an attractive aesthetic. Natural ventilation design features include clerestories, wind scoops, and “solar towers” that project above the roofline, designed to draw warm air from the building and induce outdoor air to enter via occupant-controlled windows and vents. Other design features for natural ventilation include open atria and interconnected floor areas, and underground ducts which temper incoming air temperatures. Design for natural ventilation and cooling involves shaping the building to induce internal airflow, while controlling noise transmission. Natural ventilation has considerable potential to help reduce energy consumption, as 15% of energy use in BC buildings is due to mechanical air conditioning.



(Picture: Natural Ventilation & Cooling Air Flows, source: Environmental Design Solutions Limited website).

SOLAR COLLECTORS

Solar energy can be collected in used in buildings by utilizing passive solar heating, to heat service water, or to generate electricity. Even in B.C.'s relatively cloudy climate, solar water heaters are still cost-effective in most locations; the fuel is free, and their use reduces consumption of electricity, oil or gas. Photovoltaic (PV) modules collect sunlight and convert it directly into electricity, which can be fed directly into the provincial grid, or stored in batteries for later use. Recent developments have integrated solar photovoltaic and hot water collectors into roof or wall surfaces reducing costs since exterior finishes serve dual functions. A retrofit of the Telus Building in downtown Vancouver integrated solar panels into the new glazed double wall, generating electricity that runs fans used to ventilate the buffering plenum. It operates as needed with the sun, requiring no battery storage or expensive controls.

Grid-interconnected local electricity generation has high potential to reduce demand on non-renewable resources and strained electrical transmission and distribution networks. Distributed generation of electricity includes renewable energy sources such as photovoltaics, tidal, wind and microhydro, generation of electricity using waste heat from industrial or commercial processes, and, in the near future, fuel cells. Distributed generators can turn communities from being consumers of energy, to producers. Distributed generation offers benefits in the form of increased service reliability, energy cost savings, and possibly revenue from excess power sold to others. Electric utility operations can also benefit: small distributed-generation facilities can reduce transmission losses, improve quality of service to outlying areas, and delay or eliminate the need to build new large central generating plants.

WHY AREN'T ALL BUILDINGS GREEN?

Clearly green development is not today's standard of practice. Though green development is much better understood now than it was only a few years ago, the mainstream of land and building development activity has not rapidly advanced for a number of reasons. The regulatory reasons, of course, are addressed in this report. Non-regulatory reasons such as markets, information and awareness within the building industry, taxes and incentives will be addressed only peripherally in this report. **Non-regulatory barriers will be specifically identified and addressed in a separate report.**

The researchers and professionals who contributed to this report have identified dozens of regulatory barriers (summarized in Appendix 'E'). In general, these barriers can be described as

- Zoning bylaws
- Development Standards
- Development Cost Charges
- Approval Processes for Rezoning and Development Permits
- Approval Processes for Building Permits and Occupancy Permits
- Code Requirements

- *Health Act Requirements*

Fortunately, the people that contributed to this report have also identified dozens of potential solutions. The Action Plan that follows attempts to distil these solutions into practical, actionable steps towards change.

Some positive regulatory change is already on the horizon. Within two or three years, the National Building Code will be revised to clearly set out the 'intent' of each of the 6000 building, fire and plumbing provisions (see Appendix 'B'). As a result, the new Code is expected, at a minimum, to increase the frequency of requests for alternative ways to meet the Code, and make it simpler for regulators to assess requests for equivalency. If combined with reform of other key regulatory and non-regulatory barriers, the new Code presents a considerable opportunity to advance green building and community practices in British Columbia.

CUTTING GREEN TAPE — AN ACTION PLAN

CREATE SMART BYLAWS GUIDEBOOK

SUMMARY

Many of the largest barriers to sustainable communities and sustainable buildings are the result of municipal bylaws. Zoning requirements can create both obvious barriers, such as restrictions on infill and mixed use, and less obvious barriers such as disincentives to using passive solar heating and natural ventilation. Development standards can restrict the use of narrower roads or alternative storm-water systems, and municipal approval processes often encourage status quo approaches.

CMHC analysis and research for this project consistently identified re-zoning and variances as being major hurdles to green developments. Many developers stated that the time, cost and uncertainty of zoning changes or variances was a key factor in not pursuing green developments.

Thus, encouraging reforms in zoning bylaws, alternative development standards, and development permits and development processes is essential. There are a number of resources available to municipalities that wish to move to more sustainable communities and buildings. However, there are gaps in these resources; the resources are often ill-suited to the British Columbia situation, and there is not a comprehensive guide that describes and gives the resources to municipalities regarding how they can pursue smarter, greener bylaws.

We propose creation of a “Smart Bylaws Guidebook” for municipalities on reforming their zoning bylaws, development standards and development approval processes. This would be an important tool for municipalities, especially smaller municipalities, intent on removing barriers to green development.

DETAILED DESCRIPTION

Develop a guidebook for local governments (municipalities and regional districts) that includes: a checklist of issues for municipalities to consider in greening bylaws and development processes; options and research supporting regulatory reform; best local government practices; model bylaws; success stories; and links to useful resources.

The audience will be senior and line local government staff, especially building and planning staff in smaller jurisdictions with limited resources. The Guidebook will also facilitate local politicians work on smart growth and community advocacy for green buildings and communities.

The guidebook will provide a broad-brush review of the issues, as well as facilitating detailed reforms of specific areas. It will be solutions oriented — recognizing the important concerns that lead to many restrictive bylaws, and attempting to define sustainable solutions that meet all our needs. The guidebook will be designed to be updated as statutory amendments give local governments greater flexibility, as more research becomes available, and as new success stories emerge.

Topics covered could include

- Infill, mixed use and density reforms for Zoning & Official Community Plans. Subtopics include:
 - maintaining single-family residential ambiance, while allowing secondary or tertiary suites;
 - use of development permits and comprehensive development zoning; and
 - use of performance standard zoning (allowing administrative approval of uses that are not designated as allowable, but meet certain criteria such as traffic generation, hazards, noise, vibration) and alternative zoning (uses allowed if conditions met).
- Density adjustments to encourage compact communities and protect natural amenities. Subtopics include:
 - density bonusing and transfers to encourage compact communities and protect natural amenities; and
 - average lot size and maximum lot size bylaws to protect natural amenities and encourage compact development.
- Industrial land use policies and incentives for brownfield development. Subtopics include:
 - preserving space for industrial uses that are travel sensitive and need to be located near urban cores;
 - incentives for and facilitation of brownfield development; and
 - co-generation in industrial areas.
- Development Cost Charge (DCCs) reform. Subtopics include:
 - charging DCCs on basis of area; and
 - reducing DCCs for developments that that put less demand on municipal infrastructure.
- Parking Bylaw Reform to encourage reduced vehicle dependence and more efficient land use. Subtopics include:
 - re-assessing parking requirements for secondary suites, residential and commercial uses;
 - cost of parking, the relationship between parking needs and other variables such as transit proximity (see section below on Parking);
 - alternatives to minimum parking requirements; and

- model bylaws/development permits relaxing parking requirements based on proximity to transit, mixed use or investments in transportation alternatives, or rehabilitation of existing buildings.
- Development approval process reform to facilitate renovation, material salvage and other green building practices. Subtopics include:
 - integrated permitting processes (see Change Permitting Process);
 - fast tracking for green projects; and
 - training for permit officials in sustainable practices and green practice information sources.
- Reforming development standards to encourage efficient land use patterns. Subtopics include:
 - road widths and Road permeability;
 - road and building lot orientation for solar access; and
 - surface stormwater best management practices.
- Zoning reform to encourage buildings that have longer life spans and are more energy efficient. Subtopics include:
 - building height relaxations to allow increased floor to floor height for use of natural ventilation, daylight access or adaptability to other uses;
 - height and set back restrictions for solar collectors;
 - reforming aesthetic design standards to facilitate solar collectors and other renewable energy devices; and
 - relaxing sideyard (non-fire related) and FSR and zoning envelope restrictions to allow for thicker walls (either for insulation or alternative materials¹).
- Protecting Ecological Amenities and Green Space:
 - density bonusing for protection of amenities;
 - open space subdivision bylaws;²
 - OCP provisions for ecologically sensitive areas; and
 - Comprehensive Development zones for protecting ecological features.

¹ Done in Vancouver as a result of Barrett Commission recommendations.

² Over 50 US communities have adopted such bylaws, creating zones that retain 50-80% of the site for open space. Surrey has approved such a bylaw in principle.

PRIORITIES

High potential for widespread impact on largest barriers to green buildings and communities. Practices such as infill have very high environmental potential and high potential adoption rates. Short-term window of opportunity for some funding sources.

The priorities for the Guidebook will be guided by the likelihood of a reform being adopted, the likelihood of green practices being adopted once reforms are in place and the environmental impact of the green practices. This will be assessed given the target audience (smaller jurisdictions) and the current state of legislation (e.g., performance based zoning would only be discussed at any length if allowed under the *Local Government Act*).

Based on this, our initial assessment is that the following topics would be priorities in the Guidebook:

- Infill, mixed use and density reforms for Zoning & Official Community Plans.
- Density adjustments to encourage compact communities and protect natural amenities.
- Development Cost Charge (DCCs) reform.
- Development Standard Reform (Roads and Stormwater).
- Development approval process reform to facilitate renovation, material salvage and other green building practices.
- Protecting Ecological Amenities and Green Space.

BACKGROUND & ANALYSIS

CMHC analysis and research for this project consistently identified re-zoning and variances as being major hurdles to green developments. Many developers stated that the time, cost and uncertainty of zoning changes or variances was a key factor in not pursuing green developments. Thus, encouraging reforms in zoning bylaws, alternative development standards, and development permits that facilitate green development is essential.

Currently, the best available resources include the Centre for Watershed Protection's *Better Site Design: A Handbook for Changing Development Rules in Your Community*. While an excellent resource, it is restricted to site design issues, not dealing with many of the topics we are proposing to address (density, use, development approval processes, performance zoning, zoning and green building technologies, development cost charges, or brown fields). Examples are American and the discussion does not reflect the idiosyncrasies of BC law. Similarly the American Planning Institute's recently published *Growing Smart Legislative Guidebook* is an excellent resource, but focuses on state growth management legislation and municipal actions in a context where local government has less autonomy. Other valuable resources are the Congress for the New Urbanism (US) website, which provides an excellent source of model bylaws for smart growth; the Department of Fisheries and Ocean's stewardship bylaw series; and the Federation of Canadian Municipalities Affordability and Choice Today website, which provides a number of valuable case studies.

The proposed guidebook would draw on these resources, but have a broader focus than any one of them and be appropriate to the BC context.

It is proposed that an NGO is best suited for writing such a guide, because there is greater freedom to identify solutions that 'push the envelope' of standard practice. On the other hand, this must be tempered by a need to identify solutions that are practical and have reasonable chance of adoption. Completion of this work by an NGO also has the advantage that it provides access to foundation funding, and the guidebook can be written in a way that helps empower citizen groups seeking meaningful change.

The Guidebook should not be constrained to a barriers removal Guidebook, but should also deal with positive incentives for green practices.

BARRIERS MITIGATED

Density Restrictions

Use Restrictions

Minimum Parking Requirements

Development Cost Charges

GREEN PRACTICES FACILITATED

Mixed Use (see Appendix E, L1)

Increased Density, Infill, Secondary Suites, Coach Houses (L2)

Reduced Parking (L4)

Natural Ventilation (H1)

Re-use of existing buildings (L3, M5)

Reliance on Natural Lighting (S1)

Solar Collectors (S1)

NEXT STEPS

The Province through the LEED BC Steering Committee should support the development of the Handbook.

West Coast Environmental Law is currently raising funds to complete a handbook and will be establishing a steering committee to guide the project. West Coast Environmental Law is seeking to launch the project in August 2002 with completion in July 2003. Contact Chris Rolfe at 604-601-2512.

ADDRESS NEED FOR MORE PUBLIC EDUCATION

SUMMARY

The Guidebook identified above provides a technical 'how to' guide to developing zoning bylaws that are sustainable and respect the desire of communities to maintain a particular ambiance. But changing those bylaws is not simply a technical issue; it is also a political issue. Currently, awareness of the range and benefits of green planning and design is not

widespread. Often, grassroots opposition from neighbours concerned with increasing traffic, noise, loss of neighbourhood ambiance and loss of property value can be major barriers to greener neighbourhoods and developments. Much of this opposition is based on misconceptions and a lack of understanding regarding the implications of different development patterns. A program of public education to increase public and political support for compact communities would help overcome these barriers.

DETAILED DESCRIPTION

Develop educational material highlighting successful demonstrations of mixed use, densification, building rehabilitation. Material should emphasize benefits such as air pollution, safety, reduced auto dependency and greater affordability of public amenities in denser settings. Development of educational material appropriate to different settings, e.g., highlighting smart growth developments in commercial areas (e.g., 2211 W. 4th), single-family residential areas (e.g., coach house developments in Cambie & West 10th area), smaller communities and in greenfields areas. Ideally, material could be developed for several different audiences: (a) material aimed at diffusing opposition for presentations to concerned citizen's and civic officials and administrators, to be used by municipalities as part of briefings, presentations and public meetings; and (b) material for building positive public support.

Some material already exists in this regard and is in use. For instance, Smart Growth BC has developed slideshow/power point presentations for small communities and more urban areas; is developing fact sheets on smart growth issues and flyers for community newspapers discussing smart growth issues in the lead up to civic elections. In the long run, it is considering development of videos that cover similar topics that could be aired on local TV stations. This action item is likely to be implemented; however, the extent of implementation is dependent on funding availability.

Another activity that could support educational programs is the development of credible financial analyses showing the benefits of compact communities and mixed use. This was identified as a high priority by several of the public workshops that preceded the launch of Smart Growth BC. (See Establish 'Case' for DCC Reform).

PRIORITY

This action item has high potential for widespread impact on the largest barriers to green buildings and communities. Practices such as infill and secondary suites often face opposition, but have strong potential if bylaws are reformed and have significant environmental impacts. No priorities within this action item have been identified, but priorities are likely to depend on funding availability.

BACKGROUND & ANALYSIS

During the period 1998 to 2001, staff at West Coast Environmental Law and the University of Victoria Eco Research Chair met with community groups and local politicians around the province discussing steps that could be taken to further smart growth. Public opposition and political scepticism regarding increased density and mixed use was consistently identified as a major factor blocking progress. Such opposition is often related to fears regarding noise, deterioration in the character of a neighbourhood etc.

Participants in the workshops identified the need for material that could be used to help educate politicians and the public regarding the advantages of smart growth. These include:

- slide shows tailored to different settings highlighting successful smart growth strategies;
- reports presenting the financial case for smart growth options; and
- fact sheets on different smart growth issues.

Smart Growth BC was created in 2000 in part to develop materials for grassroots groups that they could use in educating public officials and the public. Smart Growth BC continues to be the most active organization on Smart Growth issues at a grass roots level.

There are significant advantages to having a NGO education campaign separate from any government action. Current cut backs limit the potential for government sponsored education programs, and government may not provide as forceful a smart growth advocacy message.

BARRIERS MITIGATED

Single Use Zoning

Restrictive Density Requirements

Parking Requirements

GREEN PRACTICES FACILITATED

Mixed Use Development

Reduced Parking

Infill

Increased Density

Secondary Suites

NEXT STEPS

The LEED BC Steering Committee should take steps to ensure an education program is developed for BC. In furtherance of this the Steering Committee could bring together public, NGO and private sector leaders and stakeholders to coordinate educational efforts, find funding opportunities and develop partnerships. Smart Growth BC should continue to be active in this area on Smart Growth issues at a grass roots level, and continue to seek funding to continue its work. Other possibly interested organizations include Urban Development Institute, and Intergovernmental Relations Division of Ministry of Community, Aboriginal and Women's Services.

REVIEW REGIONAL GROWTH STRATEGIES PROVISIONS

SUMMARY

Strengthening the Regional Growth Strategies provisions of the *Local Government Act* could shift municipal bylaws towards increased density and mixed use in appropriate areas. Currently, regional strategies are largely dependent on consensus among municipalities, are not required to meet any sustainability objectives, and regional plans are not clearly binding on zoning bylaws and infrastructure investments. A review of the regime could be undertaken within the next few years to: (a) determine the effectiveness of the existing Part 25 (b) build a case for reform; (c) propose reforms. This is an important action item, but would likely be more effective in several years when there will have been a greater track record on which to assess the regional growth strategies regime.

DETAILED DESCRIPTION

Many persons interviewed for this project identified strengthened regional growth management legislation as an important tool to ensure the adoption by municipalities of bylaws and policies that allow and promote more sustainable growth patterns. A number of problems with the Regional Growth Strategies provisions of the *Local Government Act* (Part 25) were identified: a focus on consensus that allows parochial politics to triumph over a shift to sustainable communities that has broad public support; a weak link between regional growth strategies and official community plans; a weak link between OCPs and zoning bylaws; lack of sustainability criteria that regional plans must meet; potential for provincial or federal infrastructure investments that are contrary to regional strategies.

West Coast Environmental Law has strong concerns about the effectiveness of Part 25 of the *Local Government Act*, and favours approaches similar to legislation in Oregon or Maryland. However, review of experience under Part 25 is likely necessary to build a stronger case for amending Part 25. Regional growth strategies could be reviewed to see whether or not they ensure: consistency of regional plans with sustainability criteria; consistency of regional plans and publicly supported objectives; consistency between plans and provincial, regional and municipal capital expenditures; and consistency between plans and municipal level bylaws.

BACKGROUND AND ANALYSIS

The Regional Growth Strategies provisions of the *Local Government Act* were only introduced in 1995, with only four regional districts having completed regional growth strategies. Thus, it may be too early to complete a good analysis of whether the Act is working, as there is a delay between the completion of a regional growth strategy and the effects of the strategy being felt.

In addition, there does not appear to be any political appetite to strengthen the Act at this time. Based on this we believe, that while overhaul of the Regional Growth Strategies is important, review of the Act's effectiveness is not an immediate priority.

PRIORITY

High in the long-term. Low in the short-term. No priorities were identified within this action item.

BARRIERS MITIGATED

Density Restrictions

Use Restrictions

Minimum Parking Requirements

GREEN PRACTICES FACILITATED

Reduced Sprawl, protection of agricultural land and green space;

Mixed Use

Increased Density, Infill, Secondary Suites, Coach Houses

Reduced Parking

NEXT STEPS

Within the next year or two, municipal, regional district and provincial officials should be contacted to see whether there is an appetite to re-assess the effectiveness of Growth Strategies legislation. If there is no willingness to undertake this review at a provincial level NGOs (WCEL or Smart Growth BC) should consider completing a ten year review of the Act.

EXAMINE RELATIONS BETWEEN DEVELOPMENT VARIABLES AND AUTOMOBILE USE, PARKING DEMAND

SUMMARY

Accessible research on the relation between demand for parking spots and local land use, transit availability and other factors will help support reductions in municipal parking requirements, and help support reform of development cost charges for road services.

DESCRIPTION

Develop a manual that provides guidance on reducing minimum parking requirements to reflect local use patterns and local variables (such proximity to transit nodes). The purpose of this manual is to shift municipalities away from parking generation ratios that lead to excessive parking supply. It would shift municipalities away from using US data that may be inappropriate to Canada and does not reflect local variables such as proximity to amenities or transit nodes.

PRIORITIES

This action item has been identified as having a medium priority in the short-term. Parking management as a transportation demand management tool is likely to be a more effective strategy than simple reduction in minimum requirements, but parking management needs to be combined with other measures such as increasing the availability of transit, and increasing local powers to tax parking. Constraints in these areas may limit the potential for use of parking management in areas outside the GVRD.

BACKGROUND & ANALYSIS

Much has been written on the cost of parking spaces and how requiring parking spots decreases home affordability and the extent to which municipalities require parking in excess of actual needs. There is also a large number of successful demonstrations of relaxed parking requirements without significant problems.

Major impediments to reduction in minimum parking ratios (or imposition of maximum ratios) are:

- A reluctance to use parking supply as a tool for encouraging alternatives. Although there is some political reluctance to limit parking; some local governments have found parking management, combined with transit investments, is a politically feasible transportation demand management strategy.
- Municipalities' use of standard US Parking Generation data³ to determine minimum parking requirements. Standard ratios often lead to an oversupply of parking and do not take into account local factors such as accessibility to transit and proximity of employment, or provision of transportation alternatives as part of a development.
- Resistance to allowing shared parking in zoning (e.g., allowing the same space to be used for commercial parking by day and residential by night).

Solving the first problem is outside the parameters of this report (it does not relate to removal of regulatory barriers; although certain action items in the Empowering Green Bylaws section would help in this regard).

Some local governments have adapted parking requirements to local situations. For instance, City of Vancouver has differing requirements in different parts of the city, and, both Vancouver and Victoria have tailor made requirements for a number of developments.⁴ Surrey reduced parking requirements at one development based on commitments by the developer to implement a transportation demand management program. Guidance on adapting parking requirements to local situations would assist other municipalities in building flexibility into their bylaws.

Interviewees noted that for some developments the market requires provision of parking commensurate with minimum parking requirements. In these areas, reduction or elimination of minimum parking requirements may not reduce provision of parking. For these areas, interviewees felt that either maximum parking requirements, mandatory pricing of off-street parking (not currently allowed under section 906 of the *Local Government Act*), taxing of parking stalls (not currently allowed under the *Local Government Act*) and investment in transit would be necessary as an overall strategy to achieve a modal shift.

³ US Institute of Transportation Engineers (1987) *Parking Generation*.

⁴ The Greystone Development near Joyce Street Station, Victoria's Kool Aid low income housing project, and Victoria's Harris Green project.

BARRIERS MITIGATED

Mandatory Parking Requirements

GREEN PRACTICES FACILITATED

Reduced Parking

Transportation Demand Management

NEXT STEPS

- The Province (through the LEED BC Steering Committee) should consider commissioning a contract to develop guidance on parking requirements that reflect local need. This subject is currently on TransLink's long-term workplan, but is a low priority. It may be possible to increase the priority of this work through using other funds for leverage. Possible researchers include TransLink Strategic Planning staff and the Victoria Transportation Policy Institute. Possible sources of funding include the Ministry of Community, Aboriginal and Women's Services (if partners identified).
- West Coast Environmental Law will also seek funding for research as part of its emerging Sustainable Land Use Program.
- Once the research is completed, it should be made publicly available, and Smart Bylaws Guidebook should be revised to reflect it.

ESTABLISH 'CASE' FOR DCC REFORM BY ANALYSING FINANCIAL IMPACTS OF GREEN DEVELOPMENTS

SUMMARY

Most participants in our work emphasized that they thought DCCs had a significant impact on the form of development. Reforming DCCs to encourage reduced demands on municipal infrastructure, following a user pay principle, could aid greatly in encouraging greener communities and buildings. Credible research into the costs and savings of real-world resource efficient projects will probably be necessary to make the business case for reform of DCCs to account for green developments' lower impact on municipal infrastructure costs. Such research and financial analysis would support amendments to the DCC Best Practices Guide, changes to the *Local Government Act* that allow negotiated reductions in DCCs for green developments, and/or model DCC bylaws. Financial analysis could extend to municipal costs not covered by DCCs, e.g., supply of transit, provision of police, fire and ambulance services, etc. This would be valuable supporting information for the public education component.

DETAILED DESCRIPTION

Collate existing research, identify gaps, and commission additional research necessary to support DCCs that recognize the lower servicing costs of green buildings and commitments. Include research and financial analysis on:

- relation between lot/unit size and servicing costs;

- green building practices and utility servicing costs;
- proximity to amenities/transit and road servicing costs; and
- relation between density, municipal servicing costs and capital requirements.

Such work should be designed to make a case for amendments to the Ministry of Community, Aboriginal and Women's Services' *Development Cost Charges Best Practices Guide*. The current guide supports relatively simple approaches to DCCs that do not differentiate between green and other developments. Ministry staff have stated that the Development Finance Review Committee is open to considering revisions to the best practices guide. A request for revisions would need to be accompanied by a substantive case that uses examples with details and financially analyzes the timing and degree of cost savings to municipalities.

Financial analysis showing savings to municipalities would also support reforming the DCC provisions in the *Local Government Act* to allow negotiation of DCC waivers (or partial waivers). See Empower Green Bylaws section.

The financial analysis would also support model DCC bylaws that take into account green building variables and transit proximity. See Handbook on Green Communities Bylaw Reform.

Finally, financial analysis could extend to municipal costs not covered by DCCs, e.g., supply of transit, provision of police, fire and ambulance services, etc. This would be valuable supporting information for the public education component.

PRIORITIES

Medium to high priority. No priorities identified within the action plan.

BACKGROUND & ANALYSIS

Most participants in our work emphasized that they thought DCCs had a significant impact on the form of development. It was noted that the City of Ottawa eliminated DCCs in the city core and has noticed a resulting impact. Within BC, there is no common practice. Some municipalities charge DCCs on the basis of floor space, some on number of units, some on number of lots, or size of lots. Often DCCs are applied on a municipal average rather than identifying areas where concentration of growth avoids increased costs.

Based on this we believe the reform of DCCs is an important step. While we expect some concerns regarding the administrative cost of reformed DCCs, it's not clear that greener DCCs would be more expensive to administer. One Ontario study concluded there was "no evidence that an average cost approach was more efficient in terms of administrative resources needed to negotiate charges with developers."

Municipal Enforcement of DCC variables

Municipalities may be reluctant to reduce DCCs in exchange for promises from developers that are difficult to enforce (e.g., promises to use low water flow fixtures or to provide car coops). To partially remedy this problem we have recommended changes to covenant

provisions in the *Land Title Act*; the proposed changes would allow municipalities to make such promises legally binding over time (see Empowering Green Bylaws). Demonstration projects may help establish whether or not covenants are a sufficient enforcement tool.

Questioning Assumptions

During the discussions on DCCs one stakeholder questioned some of the assumptions underlying proposed DCC reform. In particular, concerns were raised that:

- large DCCs for developments on the urban fringe simply reduce the price paid by developers for land are not an effective incentive to curb sprawl.
- local governments are 'addicted' to growth and support greenfield developments because of the higher DCC revenue.

On the other hand:

- any elasticity in the supply of green field sites presumably means that DCCs on such sites are passed on to developers or home purchasers, thus providing an incentive for developers to develop elsewhere or purchasers purchase elsewhere.
- legal requirements that DCCs be kept in separate accounts for infrastructure related to development, should, in theory, ensure against local governments having a vested interest in encouraging developments that have higher DCCs. In addition, it is not clear whether there is a vested interest in encouraging developments with larger DCCs where they also impose higher development costs.

These issues require further consideration. At time of writing, it is not clear whether the stakeholders concerns militate against proposed DCC reform.

BARRIERS MITIGATED

Development Cost Charges not reflecting lower financial impacts of green developments.

GREEN PRACTICES FACILITATED

Infill and increased density

Mixed use

Reduced parking

Grey water re-use

Rain water capture

Waterless urinals

Local stormwater absorption

Local waste water treatment

NEXT STEPS

- West Coast Environmental Law to discuss points raised under ‘questioning assumptions’ with experts in field.
- The Province (through the LEED BC Steering Committee) should assess potential for commissioning research. Possible researchers include Urban Systems Consulting. West Coast Environmental Law will also seek funding for research as part of its emerging Green Communities Program. Possible sources of funding include the Ministry of Community, Aboriginal and Women’s Services (if other funding partners identified).
- Once the case has been made for DCC reform, contact the ADM, Local Government Department, Ministry of Community, Aboriginal and Women’s Services to discuss revisions to best practices guide.
- Revise Smart Bylaws Guidebook to reflect results, including model DCC bylaw.
- Encourage local governments to amend DCCs.

EMPOWER GREEN BYLAWS

SUMMARY

The *Local Government Act* often places tight restrictions on what local governments can do, in many cases leaving local governments incapable of practically removing barriers to green development. This Action Plan recommends the Province seek support for a series of amendments to local government legislation in order to empower municipal actions that facilitate green buildings and green developments. The ongoing Community Charter process offers an important opportunity to get some of these changes made quickly.

DETAILED DESCRIPTION

Develop and seek support from UBCM and other key parties for a package of amendments to the *Local Government Act* that would allow municipalities to remove current barriers to green developments. Amendments include:

DCCs

1. **Reform DCCs to fund road, transit and other alternative transportation improvements.** Currently, section 933 of the *Local Government Act* allows regional district boards or municipal councils to impose development cost charges to cover the capital costs of providing roads to service the development. The Act does not allow DCCs to fund transit, even though (outside Greater Vancouver and Victoria) transit services are partially funded by local government and provided under agreements among local government, BC Transit and private operators. The Act would also need to be amended so that regional transit authorities (TransLink and the Greater Victoria Transit Commission) can impose DCCs.

2. **Provide power to negotiate lower DCCs for developments that have lower servicing costs.** Subsection 933(11) of the *Local Government Act* prohibits local governments from waiving or reducing DCCs. The *Local Government Act* could be amended to allow officials to negotiate case specific reductions in DCCs for developments that incorporate innovative methods that reduce demand on local services. In the past, charges were negotiated under Land Use Contracts, but this system was replaced by DCCs to avoid what developers perceived as ‘gouging’ by municipalities — forcing developers to pay amounts unrelated to the costs imposed by their development. A system of negotiating partial waivers from standardized fees, so long as it is based on clear criteria, should be workable.
3. **Remove DCC exemption for building permits for buildings with less than four units.** DCCs charged as an equal amount per subdivision lot tend to encourage larger lot sizes because the DCC forms a smaller portion of overall development costs. For this reason, DCCs based on floor space are often advocated as better for encouraging smart growth. (See Appendix D). However, the *Local Government Act* may encourage municipalities to impose DCCs on the basis of subdivision units rather than floor space. Under section 933(4), building permits for less than four units are exempt from payment of DCCs, but no similar exemption applies to subdivision units. Section 933(4) thus encourages use of DCCs based on subdivision units.

Density Bonusing

4. **Density Bonusing for Green Developments.** Empower zoning bylaws that increase density (or allow a transfer of density to appropriate locations) where developers meet certain green development criteria. Currently section 904 of the *Local Government Act* allows an increase in density based on provision or conservation of amenities and provision of affordable or special needs housing. This could be widened to allow municipalities to consider green building or green development practices. (E.g., provision of more dwelling units, or buildings that meet LEED certification standards, remediation of contaminated sites, might be as a basis for increasing density.)

Parking

5. **Allow developer cash payments in lieu of parking space to be spent on transportation demand management (TDM) or transit.** Section 906 (parking space requirements) provides that developers’ payments of cash in lieu of parking space requirements are restricted to provision of off-street parking. This could be amended to allow investment of such funds in transit or TDM services.
6. **Allow creation of neighbourhood improvement areas where parking meter fees are dedicated to neighbourhood improvement.** Reductions in minimum parking requirements or imposition of parking fees for commercial uses are often problematic because of the tendency of drivers to park in neighbouring residential areas. This problem can be solved by imposing pay parking in residential areas, but the latter is politically unpopular (even if local residents only pay a nominal fee). To overcome this problem, the *Local Government Act* could be amended to create neighbourhood improvement areas. In such an area, neighbours could agree to metered on-street parking (most likely nominal fees for residents), but funds are earmarked for local

improvements (e.g., traffic calming, upgrades to local parks). This would be similar to the 'voluntary taxation' provisions of business improvement areas in section 651.1.

Enforcement

- 7. Allow municipalities to enforce green development commitments.** If municipalities cannot enforce green development commitments (e.g., provision of car-share cooperatives are currently difficult to enforce), they will likely be reluctant to reduce DCCs or parking requirements, or allow increased density, in exchange for such commitments. Section 219(5) of the *Land Title Act* could be amended so that a landowner can bind herself and subsequent owners to provide TDM services or car-share co-ops. Provision of such services would become an amenity that must be maintained under a covenant. Alternatively, the development permit provision of the *Local Government Act* could be amended.

Brownfield Sites

- 8. Amend the *Local Government Act* to allow aid in the clean-up of brownfield sites.** In some areas, redevelopment of brownfield sites in areas ideally suited for infill does not occur either because the sites are orphaned (i.e., there is no party responsible for clean up) or because government does not order a clean up and it is less expensive for the owner to keep the site undeveloped or limit its use. This is generally not a problem in Vancouver, where high land value leads to remediation of brownfield sites. To overcome the financial barriers to redevelopment of sites, the *Local Government Act* could be amended to allow various municipal incentives to redevelopment. These include:
 - Defining 'business promotion scheme' to include redevelopment of brownfields sites. Currently under section 651.1, municipalities can tax businesses within a business improvement area to fund a business promotion scheme, and they can grant money to an applicant for the purposes of implementing the scheme. Business promotion schemes include the encouragement of business, the conservation of heritage property, and the beautification of municipal owned land and buildings. Extension of schemes to include brownfield redevelopment can be justified on the basis that local businesses are likely to benefit from redevelopment of adjacent brownfields. Local businesses also have the opportunity to vote on being included within an improvement area. Ontario has made similar changes in their recent *Brownfields Statute Law Amendment Act*.
 - Allowing municipalities to freeze or abate property taxes on brownfield sites. Currently, this is prohibited by section 184. Ontario has made similar changes in their recent *Brownfields Statute Law Amendment Act*.

Permitting

- 9. Enable municipalities to require bonding for site clean up when deconstruction permits are issued prior to issuance of a building permit.** A combination of factors make deconstruction less attractive than demolition: (a) demolition is faster than deconstruction, (b) delays are expensive for developers, especially when carrying financial cost, and (c) some municipalities will not issue a demolition permit (for the

purpose of deconstruction or demolition) prior to issuance of a building permit. This barrier could be mitigated if *deconstruction* (not demolition) permits were issued prior to building permits; however, municipalities are concerned that this could lead to sites with partially demolished buildings or vacant lots being abandoned. Allowing municipalities to require bonding from contractors to complete deconstruction within a reasonable time and remedy unsightliness within a reasonable time-frame, would help overcome this problem.

Streamlining Variances

- 10. Allow administrative approval for minor adjustments.** The *Local Government Act* allows Boards of Variance to allow minor variations in the site and size restrictions for buildings where meeting the restrictions is alleged to cause hardship by the owner (section 901). The board of variance approach has been critiqued as cumbersome. Administrative approvals could be approved for minor variations (with limits defined in bylaws) needed to accommodate green building practices. Also, “facilitation of environmentally sound building practices” could be added to “hardship” as a ground for variances. Administrative approval of minor variances would be consistent with practice under the *Vancouver Charter* where the director of planning is given significant latitude to approve variations (but the grounds for variance are limited).
- 11. Allow development variance permits to allow prescribed variations in density.** For more significant variations in zoning requirements, councils can issue development variance permits under s. 922. Development variance permits do not, however, allow variations in density or use. Minor increases in density (within limits prescribed by bylaw) could be allowed under development variance permits, or through administrative approvals. For instance, under the *Vancouver Charter*, the Director of Planning can allow density increases (but may not allow multifamily projects in single family zones).
- 12. Authorize ‘performance-based zoning’.** Multiple uses compatible with neighbouring uses can be facilitated through performance standard zoning (e.g., allowing discretionary approval of uses that are not designated as allowable, but meet certain criteria such as traffic generation, hazards, noise, vibration). This approach is used in several US cities and in Saskatchewan. However, the *Local Government Act* currently does not allow performance based zoning.⁵ This approach streamlines approvals for multiple use, and was recommended by a 1997 Ministry of Municipal Affairs report, “Tools of the Trade, Local Government Planning in British Columbia”.

PRIORITIES

Phase One of the Community Charter Process (see below) provides a short-term window of opportunity to seek amendments dealing with local government regulatory powers (not including land use powers). A second phase, in several years, will provide a window of opportunity for reform to land use regulation provisions. Based on West Coast

⁵ Arguably the Act allows municipalities to allow uses that meet certain criteria; however, this may be difficult to implement without an administrative approval process, and is open to attack that an activity or business is in being regulated, not land use itself.

Environmental Law's understanding of the split between Phase One and Phase Two, the following reforms fall into Phase One and are an immediate priority:

1. Enable municipalities to require bonding for site clean up when deconstruction permits are issued prior to issuance of a building permit.
2. Amend the *Local Government Act* to allow aid in the clean up of brownfield sites.
3. Allow municipalities to enforce green development commitments.
4. Allow creation of neighbourhood improvement areas where parking meter fees are dedicated to neighbourhood improvement.

Of these our initial assessment is that items 1 and 4 have the greatest potential impact.

BACKGROUND & ANALYSIS

The Community Charter Council — a municipal-provincial advisory committee — is currently drafting Community Charter legislation which will be submitted as a white paper in the spring of 2002 Legislative Session. The Province has promised further consultation during the spring and summer before the Charter is brought back into the Assembly for adoption in the fall of 2002.

The Community Charter process provides a key window of opportunity to empower municipalities with regard to the issues discussed above. This is especially true because a key element of the Community Charter Proposal is to broaden the regulatory powers of municipalities, allowing municipalities to define where and how they want to act in a particular area.

As many of the above amendments have either been suggested in past government documents or have been informally suggested by local officials, there appears to be a potential for support. It may be possible to receive support for the proposals from the GVRD, TransLink or the Union of BC Municipalities.

BARRIERS MITIGATED

Development Cost Charges

Minimum Parking Requirements

Siting and Dimension Restrictions

Density Restrictions

Use Restrictions

Permitting Requirements for Land Use

Restrictions on Development of Contaminated Sites

GREEN PRACTICES FACILITATED

Transit Oriented Developments, Investments in Transit, Reductions in Parking

Water Conservation Practices (Grey water re-use, rain water use, waterless urinals, composting toilets)

On-site waste water treatment

On-site stormwater Infiltration

Green Buildings

Clustering of Development

Mixed Use

Increase Density

Redevelopment of Brownfield Sites

Deconstruction and Recycling of Building Materials

NEXT STEPS

- West Coast Environmental Law to prepare brief document supporting Community Charter provisions consistent with the above recommendations. Document to be submitted to members of Community Charter Council.
- On release of white paper, West Coast Environmental Law to review white paper and prepare submissions in support of flexibility to achieve above aims. West Coast Environmental Law to prepare brief in support of the identified reforms.
- LEED Steering Committee members to refer brief on white paper to GVRD, Director of Strategic Planning at TransLink, UBCM and Ministry of Community, Aboriginal and Women's Affairs to informally gauge support for reforms, and seek support specific reforms.
- West Coast Environmental Law to refer brief on white paper to TransLink officials to informally gauge their support and seek endorsement.

IMPLEMENT PROGRAM FOR BUILDING INSPECTORS: DEMONSTRATION PROJECTS, PROFESSIONAL DEVELOPMENT, AND INNOVATIVE PRACTICE TESTING,

SUMMARY

Where building codes prevent or fail to address green innovations, proponents of green innovations are left to seek approval for an 'equivalency' from local government inspectors. In many cases, particularly in smaller jurisdictions, building officials are reluctant to consider or approve equivalencies because they are unfamiliar with a solution and don't have access to information on its efficacy.

Lack of information, awareness, and familiarity with green building practices can also lead to institutional barriers (e.g., builders use standard practices, because that is what they are familiar with), and economic barriers (e.g., it costs more for engineers to investigate practices that they are unfamiliar with). While the recommendations below address only regulatory

barriers, strategies to increase awareness and access to information for regulatory officials should likely be combined with similar efforts directed at the rest of the development community.

The informational needs of different members of the community may be different. For example, the focus of education for inspectors should be technical, whereas developers will be more interested in economic issues, but there is clear overlap. Resistance to innovation from building inspectors may be reduced by increased recognition of the economic and environmental benefits of green practices.

We are all strongly persuaded and inspired by examples. This is particularly true in the design professions and building industry. We know from the history of energy efficient building design, demonstration programs and code development dating from the 1970s that a few landmark projects and programs have had an extraordinary impact on the entire field. The same is true today of sustainable buildings. A few leaders can really inspire key decision makers, a few high-profile projects attract a large amount of attention, and a relatively small program like LEED can begin to slowly shift the course of an entire industry.

In addition to addressing the code limitations themselves, this Action Plan recommends that the Province (through the LEED BC Steering Committee) implement a program *for building inspectors* that would consist of a professional development program, demonstration sites, and technology and material testing projects.

DETAILED DESCRIPTION

Professional Development for Building Professionals

- Develop and implement a Professional Development Program for regulatory officials (building inspectors, electrical and plumbing inspectors, engineering staff, health inspectors) on green building and community practices. Collaborate with design, construction professional bodies and educational institutions.
- Cover as general topics in the program: Leadership in Energy and Environmental Design (LEED) certification, equivalencies and the anticipated 'objective-based' national code, and the concerns and realities associated with liability. Liability related topics could include, existing strong protection for individuals from liability, the trend away from naming individual building inspectors as result, and further protections offered by certification processes, etc. (see section on liability in this Action plan).
- Include sessions on specific green practices such as alternative materials, alternative plumbing and waste water systems, alternative energy systems and computer aided design tools for natural ventilation and cooling.
- Organize tours for building officials of leading-edge green buildings in BC (including demonstration sites described below).
- Partner with organizations that already run professional development programs for regulatory officials. Discuss partnership/sponsorship with the Local Government Management Association of BC, the Royal Architecture Institute of Canada (currently considering a 'green buildings course'), and/or the 'City Program' at Simon Fraser

University. Consider partnerships with non-government organizations, local universities and colleges, and union and apprenticeship programs.

- As a secondary priority, consider reserving space in program for developers and design professionals.

Demonstrate Performance, Safety, and Economics of Innovative Practices

- Design communications and media plans to expose and celebrate BC's existing successful green building/community projects (e.g., the Vancouver Island Technology Park — Canada's first LEED-Gold certified building and a rehabilitated hospital). The primary message should be the safety, environmental performance, economic performance and transferability of green building and community practices.
- Seek out new opportunities to demonstrate green building and community practices. Look for partnerships, for example, with the Province's 'sustainable' Whistler bid.
- Investigate changes to municipal infrastructure funding mechanisms to cover costs of demonstration projects that reduce demand on municipal infrastructure. Senior government infrastructure programs or agencies such as CMHC, NRC, and NRCan could either assist in the demonstration of green technologies or cover the risk of such technologies (either by insuring against liability or paying/posting a bond for back up systems). Existing funding mechanisms for demonstration projects (primarily the FCM's Affordability and Choice Today program) could be expanded. This can be justified on the basis that the demonstration project has a value to the general public. The government would need to negotiate agreements on a case-by-case basis, or would need to designate certain practices that they are willing to insure or on which they are willing to pay for back up systems. While government is likely to reject some projects as too risky, a program specifically aimed at insuring innovation should help innovation. Part of the money could come from the existing Canada-BC Infrastructure program and the Green Municipal Funds.

Provide More Opportunities to Share and Conduct Innovative Practice Testing

- Establish a web-based 'Clearinghouse for Green Buildings Technology and Materials Test Results' upon which qualified organisations, local governments and independent testing facilities can post test results of new technologies and materials and save others the costs/delays of doing so.
- Establish formal or informal networks among local governments to share pilot project results and other 'green practice' experiences. For example, the City of Saanich approved use of waterless urinals at the Vancouver Island Technology Park only the condition they be monitored and removed if they don't work. Other local governments are now contacting the City of Saanich for monitoring results. Other examples of pilot project results that should be shared are the Provincial 'Green Buildings' program and New Westminster's Fire Hall No.1. A central website and database may be helpful for this purpose — drawing province-wide contributions from building, planning officials, and professionals. More effective would be a 'P3' funded and administered "Planning and

Building Performance Institute” which would be responsible for gathering and sharing BC research into long-term performance of innovative planning and design practice.

- Help find funding for ‘interactive research buildings’ like the proposed Centre for Interactive Research on Sustainability (CIRS) at the University of British Columbia. The CIRS building, proposed by the Sustainable Development Research Institute, would be used as a laboratory and research vehicle for the operation, monitoring and assessment of sustainable building products and practices. The building’s design would be flexible so that the building could adapt to rapid changes in technology, and would test different construction techniques, waste water treatment and materials. In addition to technology testing, the CIRS would test the reaction of building occupants to the technology (e.g., use of alternative toilet facilities).
- Investigate partnerships with existing testing and demonstration programs for innovative practices and materials with environmental benefits (i.e., facilitate CCMC approvals, or development of CSA standards).

PRIORITIES

All of the recommendations in this section should be considered high priority. The proposal to create a Planning and Building Performance Institute, and the proposal to help find funding for CIRS will each require significantly more funding to accomplish, and as a result, may need to be pursued over a longer time frame.

BACKGROUND & ANALYSIS

A recent National Research Council report, *Innovation in the Housing Industry* (Holman), concluded that the main barriers to innovation appear to be regulations and risk (see Appendix A). A major concern of participants in that report was the ability of local government officials to respond to requests for equivalencies.

Interviewees for this report identified demonstration sites, a professional development program, and technology and material testing projects, as solutions to several regulatory barriers.

With regard to education of building inspectors on liability and certification issues, to some extent this education is already offered by municipal law firms. The Vancouver firm, Lidstone, Young Anderson, for instance, offers annual seminars and has produced several briefs on this topic. All municipalities are invited to these seminars. These seminars and briefs may not, however, highlight the protections available to individual building inspectors and may not attract building inspectors. As a result, there may be some unjustified fears with respect to liability among operational staff.

There are a number of ways of addressing risk associated with innovative practices and reducing liability for local governments. These are also addressed in sections dealing with liability reform, and underwriting risk. For more details, see also Appendix C.

BARRIERS MITIGATED

All code-related barriers.

GREEN PRACTICES FACILITATED

Green Practices where a need for testing, demonstration and education has been identified include:

Green Roofs

Composting Toilets

Alternative Materials

Alternative Stormwater Systems

Grey water Systems

Rain water Systems

NEXT STEPS

- LEED BC Steering Committee engages the Local Government Management Association of BC, the Royal Architecture Institute of Canada, and the 'City Program' at Simon Fraser University in discussions about sponsoring/implementing a Professional Development Program for regulatory officials on Green Practices.
- LEED BC Steering Committee organizes tours for building officials of leading edge green buildings in BC (including demonstration sites described above). Possible funding sources include the 'Affordability and Choice Today' program of the Canadian Federation of Municipalities.
- LEED BC Steering Committee design communications and media plans to expose and celebrate BC's existing successful green building/community projects.
- LEED BC Steering Committee meet with representatives of the Whistler bid, etc. in order to seek out new opportunities to demonstrate green building and community practices.
- LEED BC Steering Committee approach CMHC, NRC, and NRCan in order to investigate changes to municipal infrastructure funding mechanisms to cover costs of demonstration projects that reduce demand on municipal infrastructure.
- LEED BC Steering Committee investigates partnering/funding opportunities to establish a web-based 'Clearinghouse for Green Buildings Technology and Materials Test Results'. Possible funding sources include Sustainable Development Technology Canada Foundation.
- Local Governments establish formal or informal networks among local governments to share testing results and experiences with 'green practices.'
- LEED BC Steering Committee help locate funding sources for 'interactive research buildings' like the proposed Centre for Interactive Research on Sustainability (CIRS) at the University of British Columbia, and partnerships with existing testing and demonstration programs at CCMC and CSA. Possible funding sources include Sustainable Development Technology Canada Foundation.

EXAMINE LIABILITY ISSUES

SUMMARY

Regardless of the actual risk of a system failing, green innovations tend to be perceived as risky because innovation, by its very nature, sometimes involves risks. Local governments may be reluctant to approve innovative green designs because of the perceived risk that they will be sued if the system fails.

Municipal officials and the municipalities can be found liable in negligence in approving a faulty design, negligence in inspection or negligence in the construction or approval of an inadequate storm sewer system. Municipal governments are particularly fearful of liability because of their 'deep pockets' and the fact that under joint and several liability they may be ultimately responsible for 100% of damages even though only five percent at fault.

Reforms to liability provisions in the local government legislation or under the *Negligence Act* could help reduce these barriers. The potential for reform is good at the present time because of sweeping reforms to both local government legislation (the Community Charter process) and a pending Provincial discussion paper on liability reform.

However, further consideration is needed. Protecting municipalities from risk could effectively transfer risk onto homeowners and third parties who suffer the consequences of failed innovations. And protection from liability could lead a lower standard of care by inspection officials. Views of all stakeholders need to be considered before undertaking liability reform. Moreover, there are alternatives to reforming the laws of liability. Other action items seek to reduce risk by increasing knowledge, increased testing of building materials, and insuring against risk (see pages 30 to 34 and pages 38 to 40 and Appendix C).

DETAILED DESCRIPTION

Engage UBCM, Ministry of Attorney General and the Ministry of Community, Aboriginal and Women's Services regarding liability reform. Options to consider include:

- **Amend *Local Government Act* s. 288 to provide limitations of liability related to green sewer and drainage systems.** Currently, municipalities are protected from certain actions⁶ if damages arise out of the malfunction of sewers systems or water drainage systems. However, courts have said that this does not protect municipalities if the damage was not the inevitable consequence of building a sewer system taking into account costs and available alternatives.⁷ This could be amended so that it blocks liability for approving or installing innovative storm-water or sewage treatment system. Alternatively, liability for such systems could be limited to cases of gross negligence, or cases where the municipality has not weighed the risks of innovative systems against the

⁶ Actions based in nuisance or the rule established in *Rylands v. Fletcher*. Section 288, *Local Government Act*, R.S.B.C. 1996, c. 323.

⁷ *Form-Rite Contracting Ltd. v. Prince George (City)* (1999), 69 B.C.L.R.(3d) 372 (S.C.).

benefits.⁸ These different formulations provide decreasing comfort to municipalities, but involve less dramatic departures from the common law.

- Amend *Local Government Act* s. 289 to provide **limitations** of liability related to issuing building **permits for green practices**. Section 289 shields municipalities from liability for failure to enforce the Building Code, but does not apply to negligent inspections, failure to inspect, negligent approvals or negligent permit issuance.⁹ Municipal officials could be provided with either an absolute or limited protection of liability for approving green building practices that do not meet prescriptive Code requirements. The protection could be absolute or alternatively, liability for such systems could be limited to cases of gross negligence, or cases where the municipality has not weighed the risks of innovative systems against the benefits.
- **Amend *Local Government Act* to provide protection analogous to the *Vancouver Charter***. Under s. 294(8) of the *Vancouver Charter*, the City and its employees have an exemption from liability for any inspection, approval or permitting of buildings.
- **Amendments to the *Negligence Act* to end, or limit, joint and several liability**. Under the BC *Negligence Act*, defendants are jointly and severally liable for the full amount of a damage award, unless contributory negligence on the part of the plaintiff can be established. What this means is that if a local government was found 5 percent at fault and a developer was 95 percent at fault, both are on the hook for the entire amount. If the developer were bankrupt or unable to pay the award then the local government would be faced with paying the entire amount. Government could amend the *Negligence Act* to establish proportional liability for local governments (as opposed to joint and several). This would ensure that municipalities who are only at fault to a small degree are not liable for the majority of damages. Risk is shifted onto plaintiffs who suffer damages, because when other negligent parties (designers or builders) are unable to pay damages, plaintiffs can no longer recover damages from the deep pockets of municipalities. Use of this strategy may increase municipalities' willingness to approve green practices.

Municipalities should also be encouraged to provide automatic indemnities for municipal permitting officials. These officials already have extremely effective protection from liability under section 287 of the *Local Government Act*, but may be made parties to a suit against the municipality (an unfortunate legal practice intended to put pressure on the municipality). As municipalities are already vicariously liable for the actions of their officials, offering an indemnity to all permitting officials does not significantly increase the exposure of the municipality, but may offer some comfort to officials.

PRIORITIES

This Action item has a high priority in the short-term due to the window of opportunity created by Provincial review of liability principles. However, careful public consideration

⁸ This formulation provides protection from absolute liability associated with the Rule of *Rylands v. Fletcher*.

⁹ Section 289, *Local Government Act*, see also *Wilson v. Robertson* (1991), 43 C.L.R. 117 (B.C.S.C.).

needed before any amendments. This is particularly true of far reaching amendments such as changes to the *Local Government Act*.

BACKGROUND & ANALYSIS

A fuller discussion of liability issues is attached as Appendix C.

Innovative practices, whether they are green or not, inherently carry a risk. Because there is less familiarity with the methods they are likely to be perceived as riskier, and may indeed be riskier. Currently the risk of an innovative practice failing may end up being borne by the builder, the municipality, the designer, the property owner and even (in some cases) third parties who suffer damages as a result of an innovative practice.

Changes to liability provisions in the *Local Government Act* or *Negligence Act* do not reduce risk. They simply stop the transfer of risk from a person who has suffered damages (or their insurer) to a person who is alleged to be at fault in causing the damage (e.g., the municipality). But they are aimed at increasing the willingness of local government officials to approve innovations that are perceived as risky.

Any changes to the rules of liability need to consider the rationale underlying current rules. The rules of liability for negligence have developed over centuries to fulfill two important social needs: encouraging individuals and government to exercise care in going about their business; compensating individuals for loss for damages that others' negligence has caused.

Liability reform is only one means of increasing the willingness of municipal building inspectors to accept risk. Other options are discussed elsewhere in this report and a full discussion of liability and possible responses is found in Appendix C. Other options include Innovative Practice Testing, Demonstration and Education (including educating inspectors on liability risks); Underwriting and Insuring Against Risk; and Changes to the Permitting Process. Several of the other options have significant benefits as compared to liability reform in that they are likely to lead to a fairer distribution of risk, or lead to Code equivalency assessments being based on improved knowledge.

On the other hand, other means of dealing with risk may be politically difficult, requiring government funding or involving a cost being placed on developers and builders. In comparison, the Community Charter Process and a pending Ministry of Attorney General discussion paper on liability reform provide a window of opportunity for reform of liability provisions.

Finally, it is difficult to assess the extent to which liability reform changes will affect behaviour of building inspection officials. As a matter of professionalism, building inspection officials will likely only approve an innovative practice where they have reasonable comfort that it is equivalent to Code. For instance, it is not clear to what extent City of Vancouver officials are more open to innovation due to their better liability protection. Our overall assessment is that it will likely be easier to get green innovations approved if municipalities are protected from liability, but liability reform is not a panacea for dealing with risk.

BARRIERS MITIGATED

Building approvals for Innovative Practices

GREEN PRACTICES FACILITATED

Local storm-water absorption

Natural ventilation and cooling

Renovation of existing building stock

Local waste water treatment

Local energy generation

Use of Alternative, non-listed, used and reprocessed materials

Composting toilets

Waterless urinals

NEXT STEPS

- The Province (through the LEED BC Steering Committee) should engage UBCM, Ministry of Attorney General and the Ministry of Community, Aboriginal and Women's Services regarding liability reform.
- West Coast Environmental Law to review upcoming paper on liability reform and report to the LEED BC Steering Committee.

SEEK WAYS TO UNDERWRITE AND INSURE AGAINST RISK

SUMMARY

In circumstances where codes or development standards prevent or fail to address green innovations, proponents are left to seek approval for an 'equivalency' from local government inspectors. With limited experience with green practices, building officials respond to perceived risks by either denying approval or by requiring extensive 'back-up' or 'redundant' systems to protect public safety in the event the green practice fails. In addition to addressing code limitations and development standards themselves, this Action Plan recommends the Province investigate ways to underwrite the risk of failure in the public interest, or require others to do so.

DETAILED DESCRIPTION

- Investigate the feasibility of the Province or Federal Government underwriting the risk of green practice failure in carefully chosen, green building demonstration projects.
- Investigate the feasibility of the Province requiring builders/developers to pay into a guarantee system. Risk would be transferred away from municipalities and owners and onto builders and developers. (A guarantee differs from liability insurance in that it covers the cost of repairing a system failure whether or not a builder, developer, designer or municipality is legally liable based on contract or negligence.) A system would still be

necessary to ensure green practices do not pose an undue risk to human health or life. Examine whether the model implemented in the Waste Management Act Municipal Sewage Regulation (WMAMSR) is transferable generally to green building practices. The WMAMSR was designed to address problems when private sewage systems in residential developments failed—forcing local governments and the Province in many cases to pay for the clean up. Under the WMAMSR, a developer can choose between posting financial security (held and ‘risk managed’ by the developer) and a developer-designed ‘assurance’ plan that demonstrates adequate technical, financial and management capacity to address any failures. Both local governments and the developer industry endorsed this model.

- Explore the possibility of private foundations, and/or the Municipal Financing Authority funding a program to underwrite risk in some circumstances.

PRIORITIES

All recommendations should be considered medium to low priority because of limited political potential.

BACKGROUND & ANALYSIS

The issue of risk of failure and innovation is nicely summarized in the March 2002 Issue of *Sustainability Now* — a newsletter from BC’s Association of Professional Engineers and Geoscientists:

Municipalities, citizens, and professionals are understandably concerned about the potential risks of venturing into uncharted territory. No one wants to bear the brunt of the potential risk of failure. But there are two sides to this sword — the other being the consequences of doing nothing or staying with conventional end-of-pipe solutions.

Some interviewees argued that since environmental innovation will result in public benefits, the public through its governments should help assume part of the risks.

There are a number of ways of addressing risk associated with innovative practices and reducing liability for local governments. These are covered in sections dealing liability reform, demonstration projects, and this section. For more details, see Appendix C.

BARRIERS MITIGATED

All code-related barriers.

GREEN PRACTICES FACILITATED

Green Roofs

Composting Toilets

Alternative Materials

Stormwater Systems

Grey water Systems

Rain water Systems

NEXT STEPS

- LEED BC Steering Committee engage the Province, the federal government, local governments, developers and the green building/community design community in a discussion about the merits of:
 - the Province or Federal government underwriting the risk of green practice failure in carefully chosen, green building demonstration projects, and/or
 - the Province requiring builders/developers to pay into a guarantee system.

Engage, in particular, local governments and developers who participated in the process to reform the Waste Management Act Municipal Sewage Regulation.

- LEED BC Steering Committee explore the possibility of finding funding for a program to underwrite risk in some circumstances. Explore with the Municipal Financing Authority as an idea that could lower local government costs in the long term.

CHANGE PERMITTING PROCESS

SUMMARY

Today and everyday, BC planners, designers and construction professionals are seeking the necessary approvals to try something green and innovative. Many are successful (see ‘The Future is Now’ above), but many others are either unsuccessful or drop the innovative idea to avoid costly processing delays. In general, the regulatory barriers identified by interviewees are these:

- Sequential permitting processes that don’t allow integrated design teams to at any point ‘tell the whole story’.
- Time and money associated with persuading regulators to approve ‘equivalencies’ for projects that will ultimately require significantly less local services.
- Difficulty, in some cases, for local officials to reconcile the language of bylaws with the language of broader planning documents.

To address these regulatory barriers, this Action Plan recommends local governments implement ‘integrated approval’ processes and/or ‘front of the line’ incentive programs, and address issues associated with demolition permit timing and recycling bin charges. The Action Plan also recommends the Province, through the LEED BC Steering Committee, investigate the merits of ‘competitive’ building approval processes, and ‘innovative option’ permits.

DETAILED DESCRIPTION

- Local governments should implement ‘integrated permitting processes’ that can respond to ‘integrated building design’ processes that are becoming more and more common. In these processes, a designer can show regulators what she wants to achieve, and regulators

can make a judgement about the entire project, subject to details being ironed out. The City of Vancouver has experimented with this type of review process, and continues to be interested in finding a way to practically implement one. The local government in Ashland, Oregon established a 'Division of Community Development' that consolidates the planning, conservation and building departments. The result is reported to be more green developments and less interagency disagreements. To maximize the local benefits of this process, local governments should consider mandating for all major projects both an integrated design process and community 'charettes' (e.g., all parties discuss vision/objectives for proposed development in early stages of project).

- Local governments should establish 'front of the line' processes for building applications that meet specified 'green building/community' criteria like commitment to LEED BC gold or silver certification. The State of Connecticut has established a front of the line process (and other incentives) for applicants meeting 'sustainability criteria' like ISO 14000 or *The Natural Step*. The City of Vancouver already fast-tracks building permits for heritage and social housing projects. As an alternative to a 'front of the line' process, local governments should consider adopting the City of Vancouver's 'Certified Professional Process' (CPP). Under the CPP, proponents hire outside consultants to review plans for compliance with codes, and the City commits to processing applications within two weeks. City officials do not usually conduct more than a cursory review of the application, and do not conduct inspections. If the application is done right, the City refunds up to 40% of the permit fees.
- Local governments should investigate the timing of demolition permit, building permit, and development permit processes to ensure building deconstruction and re-use of materials is not unnecessarily restricted (see discussion on 'bonding' in 'Empower Green Bylaws'). Among interviewees there was some controversy on this point. The objective of any regulatory reform should be to allow developers and demolition companies timely access to the building for stripping and deconstruction while still protecting the public from the practice of demolishing a building without replacing it.
- Local governments should eliminate bylaws that charge builders if they put recycling bins on city streets. This is a barrier to recycling on construction sites as builders are typically unwilling to pay these fees for a second bin required for recycling. The municipal charges also wipe out any savings from recycling.
- The Province (through the LEED BC Steering Committee) should investigate the merits of creating a 'competitive' building approval process similar to processes created in Australia. In Australia, several states have replaced local government building inspections and approvals with a competitive system open to private sector building firms. The result is reported to be more innovation and shorter approval times as private sector companies emerge to 'specialize' in the knowledge and approval of innovative designs and technologies. In order to attract private sector interest, the states have had to implement ten-year liability caps, and proportional liability. The main difference between this Australian model and a certification system is the Australian model avoids the costly delays associated with seeking certification from different people for each proposed innovative feature (e.g., green roof, composting toilet, etc.). Many citizens of BC are likely to be opposed to the idea because of a real or perceived reduction in public trust and accountability for inspections and approvals vital to the public interest. Careful

analysis and public debate of these issues and the concept's effectiveness will be necessary.

- The Province (through the LEED BC Steering Committee) should investigate the merits of 'innovative option permits' — allowing the trial use of innovative materials at the applicants risk. To address concerns about the risk of future owners, the Province should also investigate requiring the applicant to register a note on his or her title.

PRIORITIES

All recommendations should be considered high priority, but careful analysis and public debate of the 'competitive approval' idea is needed.

BACKGROUND & ANALYSIS

'Integrated permitting' is recommended by a recent National Research Council report, *Innovation in the Housing Industry* (Holman), and a report prepared for Environment Canada, *Green Development Scoping* (Sandborn). The idea was also an idea raised by several Action Plan interviewees. Although one BC design firm interviewed reported that early meetings with local government officials can accomplish the same objective for larger projects, another reported that developers often drop innovative ideas if they begin to attract resistance from local officials. A case study of the City of Vancouver pilot project is available on the *Affordability and Choice Today* (ACT) website.

Once the objective-based national code is in place, it will be particularly important for local governments to have permitting processes that respond well to requests for equivalency. The new code will make it considerably easier for designers and building officials to determine the code 'objective' against which any request for an equivalency will be assessed (see summary of national code process in Appendix B).

For a typical project, one local government official estimated that obtaining a development permit takes 80% of the time, and building permits 20% of the time.

BARRIERS MITIGATED

All local government related barriers.

GREEN PRACTICES FACILITATED

All

NEXT STEPS

- The Province, through the LEED BC Steering Committee, should bring designers, developers and local government officials together to discuss the merits of each local government establishing an 'integrated permitting process'. To support this discussion, the LEED BC Steering Committee should review as potential models the City of Vancouver's experimental process, and the process established by the local government in Ashland, Oregon.

- The Province, through the LEED BC Steering Committee, should bring designers, developers, and local governments together to discuss the merits of each local government establishing a ‘front of the line’ process for building applications that meet specified ‘green building/community’ criteria like LEED BC gold or silver certification. To support this discussion, the LEED BC Steering Committee should review as potential models the processes in operation in the State of Connecticut and at the City of Vancouver.
- Local governments should invite local building demolition companies to meet and discuss regulatory barriers, if any, associated with the timing of demolition permit, building permit, and development permit processes.
- Local governments should eliminate bylaws that charge builders if they put recycling bins on city streets.
- The Province, through the LEED BC Steering Committee, should bring designers, developers, and local governments together to investigate the merits of creating ‘competitive’ building approval processes similar to processes created in Australia.
- The Province, through the LEED BC Steering Committee, should bring designers, developers, and local governments together to investigate the merits of ‘innovative option permits’ — allowing the trial use of innovative materials at the applicants risk.
- West Coast Environmental Law should include ideas from this section in ‘green handbook’ above.

CONTAMINATED SITES REGULATION

Issues associated with brownfield redevelopment are highly contentious and complex. A number of processes have discussed actions that would facilitate brownfield redevelopment. These include the National Roundtable on the Environment and Economy that issued a 1998 document called *State of the Debate on the Environment and the Economy: Greening Canada’s Brownfield Sites*. The Contaminated Sites Implementation Committee (a multi-stakeholder committee involving industry, NGOs, lawyers and government officials) has also done considerable work on brownfield issues, but is currently moribund.

BC is generally regarded as having amongst the best contaminated sites legislation in Canada.¹⁰ Many of the reforms recently enacted in Ontario’s *Brownfields Statute Law Amendment Act* are already in place in BC.

On the basis of interviews, there were no well-defined solutions offered for dealing with contaminated sites. West Coast Environmental Law has identified certain reforms to BC laws — such as a shift to private sector certification of remediation plans — which could reduce barriers to brownfields redevelopment. However, these reforms raise substantial concerns regarding protection of public and environmental health. Based on this analysis, no actions

¹⁰ See page 25, Delcan Corporation, *Removing Barriers: Redeveloping Contaminated Sites for Housing*, Ottawa: National Roundtable on the Environment and Economy and the Canadian Mortgage and Housing Corporation, 1997.

are identified to deal with brownfields sites other than those listed under Enabling Green Bylaws, above.

ADDRESS FIRE & SAFETY BARRIERS

SUMMARY

Fire and safety requirements are clearly in place to serve two serious public policy objectives — fire prevention and safety. But green building/community design professionals encounter situations where code requirements prevent, or fail to consider, green building practices that could vastly improve environmental performance without compromising fire and safety objectives. One example is the emergency access standards requiring specified widths, turning radius of largest emergency vehicles, and surfaces permitted for emergency vehicles. These requirements no longer reflect today's emergency vehicle technology and limit the environmental benefits associated with increased density and smaller road surfaces.

This Action Plan recommends the Province investigate safe alternatives to fire and safety provisions that would serve green building/community objectives. Specific recommendations are to review emergency access requirements to identify safe alternatives, shift to smaller emergency vehicles, investigate banning lane parking, and review 'compliance alternatives' that would accommodate the rehabilitation of older buildings.

DETAILED DESCRIPTION

- Review emergency access requirements to identify safe alternatives that would among other things accommodate reduced side lot requirements for coach houses, and 'reinforced turf' green driving surfaces.
- Shift to smaller emergency vehicles to allow narrower road widths and use of lanes for fire access. Smaller European and Asian vehicles are on the market. In response to access failures during earthquakes, Japan has purchased motorcycles with high pressure mist systems. Investigate whether Workers Compensation Board requirements indirectly require large vehicles.
- Investigate potential for banning parking in lanes to facilitate emergency vehicle access (Parking in lanes may already be banned, but just not enforced because emergency services do not respond via lanes unless absolutely necessary).
- Investigate models for 'alternative compliance' or partial fire code exemptions in order to encourage more building rehabilitation. Include in the investigation, the City of Vancouver's 'alternative compliance' experience with older buildings in Gastown and Yaletown. Identify potential for changes in policy that maintain safety while facilitating redevelopment.
- Research the potential for a 'Rehabilitation Code' to specifically address building restoration. Several US states have rehabilitation codes that balance the heritage and environmental benefits of building restoration against safety concerns for seismic, fire, handicapped access. The rehabilitation codes of New Jersey and Maryland are generally

considered to be the best models. A first step could be a meeting between US experts, National Code experts, Vancouver officials and Provincial government representatives.

- Amend code to specifically address how to demonstrate equivalent performance to Code requirements using natural ventilation design analyses. Examples include requirements for fire and smoke separations between different suites, occupancies and spaces; requirements for duct smoke and fire dampers that connect different fire compartments; and smoke and fire control in interconnected floor spaces and mezzanines. Specifically address, in addition, addressing fire risk associated with green roofs, fire separation provisions for thicker walls, and fire resistance requirements limiting wall-integrated solar collectors near property lines.

PRIORITIES

All recommendations should be considered medium priority, but it will likely be easier to start with access requirements and 'alternative compliance' models.

BACKGROUND & ANALYSIS

For a discussion on emergency access, see von Hausen's, Michael, *Alternative Development Standards Report*.

The City of Vancouver has a number of programs that may serve as models for many of these issues. In addition to the Gastown 'alternative compliance' example mentioned above, the City has attempted to address narrower roadway — the recent edition of the bylaw allows access routes of 6 m width which may accommodate most designs to provide fire department access to within 45 m of buildings. In response to the Barrett Commission, the City has attempted to accommodate thicker walls in its zoning bylaw — but it is not clear whether the bylaw addresses fire separation requirements or only applies to zoning setbacks.

Green roofs are currently not regulated under building codes, and fire risk can be addressed by appropriate designs.

BARRIERS MITIGATED

Fire/emergency rules requiring access from principal street to all suites.

Cost of rehabilitating older buildings up to fire code (particularly brick buildings).

Emergency access standards requiring specified widths, turning radius of largest emergency vehicles and surfaces permitted for emergency vehicles.

Addressing fire risk associated with green roofs.

Fire separation provisions for thicker walls.

Requirements for fire and smoke separations between different suites, occupancies and spaces.

Requirements for duct smoke and fire dampers that connect different fire compartments.

Smoke and fire control in interconnected floor spaces and mezzanines.

Fire resistance requirements limiting wall-integrated solar collectors near property lines.

GREEN PRACTICES FACILITATED

Increased development density (L2)

Building rehabilitation (L3(b))

Reduced roadways (I1)

Local storm-water absorption (green roofs) (I2)

Building horizontal projections (S4) (thicker walls)

Natural ventilation and cooling (H1)

Solar collectors (H2)

NEXT STEPS

- The Province, through the LEED BC Steering Committee, should bring designers, developers, local governments and fire officials together to:
 - review emergency access requirements to identify safe alternatives;
 - investigate ways to shift to smaller emergency vehicles;
 - investigate whether Workers Compensation Board requirements indirectly require large vehicles;
 - investigate potential for banning parking in lanes to facilitate emergency vehicle access; and
 - investigate models for 'alternative compliance' or partial fire code exemptions in order to encourage more building rehabilitation.
- The Province, through the LEED BC Steering Committee, pursue formal changes to the national fire code by engaging the Canadian Commission on Building and Fire Codes (CCBFC). BC representatives on the CCBFC are Steven Hart (architect) of Vancouver, Tim Lehahan of Vancouver, Gordon Murdock (engineer, City of Vancouver), Russ Riffell (engineer) of Vancouver, and Jack Robertson (Manager of Building Policy, Province of BC). The fire officials on the CCBFC are Robert Cormier of Halifax, Rick McCullough of Regina, and Gary Richardson of Ottawa.

ADDRESS BUILDING CODE, PLUMBING CODE, ENERGY CODE AND RELATED BARRIERS

SUMMARY

A considerable number of green building/community practices are prohibited or discouraged by building, plumbing, and energy codes. Although there are limited references to energy in the Building Code, and the City of Vancouver has an energy code for commercial buildings, otherwise the energy codes are generally voluntary in BC. Designers and builders, however, must comply with them in order to qualify for important financial incentives.

This Action Plan recommends specific changes to the codes that would accommodate green building/community practices — while still maintaining important public safety protections. All of the ideas have been generated by participants to *Cutting Green Tape*. Because of their technical nature, this Action Plan does not scrutinize the ideas, but reports them in the interest of encouraging further discussion.

Some positive regulatory change is already on the horizon. By 2004, the national building and plumbing codes will be revised to clearly set out the 'intent' of each provision. As a result, the new 'objective-based' codes are expected, at a minimum, to increase the frequency of requests for alternative ways to meet the codes, and make it simpler for regulators to assess requests for equivalency. The Action Plan recommends rapid adoption of this objective-based code in BC.

In parallel with the 'objective-based code' process, the codes are being updated to reflect several hundred 'technical' changes. To implement the recommendations set out below, the Action Plan recommends the Province pursue technical changes where appropriate, and where it is not appropriate, establish a clear process for obtaining an equivalency.

DETAILED DESCRIPTION

General

- The Province should rapidly adopt the National 'Objective-based' Code for BC (expected 2004 — see Appendix B) by amending the British Columbia Building Code Regulation (B.C. Reg. 295/98) under the *Local Government Act* at the appropriate time.
- In advance of 2004, the Province should examine its process for adopting the national codes with a view to finding greater speed, efficiencies, and quality. Several interviewees expressed concerns about the level of code expertise in the Province. Some interviewees have suggested automatic adoption. Others have suggested the Province and local governments should establish a provincial version of the Canadian Commission on Building and Fire Codes (CCBFC) — the volunteer organization that prepares and maintains the model national fire, plumbing, and building codes. The mandate of this provincial organization — made up of BC designers, developers, building, plumbing and fire officials — would be to:
 - foster innovation;
 - keep abreast of technology changes;
 - help adopt the national 'Objective-based' Code for BC;
 - develop BC-based expertise on the application and interpretation of the objective-based Code; and
 - periodically make recommendations for substantive code changes.

A recent GVRD customer needs survey indicates support for such an organization.

- As the 'next stage' of the national code evolution beyond 'objective-based' code, the Province should persuade the CCBFC to review the fire, building, and plumbing codes from the perspective of creating buildings with a long lifecycle. Some interviewees have suggested the current versions focus on short-term precautions at the expense of promoting buildings that will have a long life span (examples are requirements for building envelopes, air exchange, heating and cooling). During this review, the CCBFC should seek a greater understanding of how fixing one problem might adversely affect another prescribed solutions.

Building Code

- Amend Building Code (or provide clear rules for equivalency) to:
 - provide greater flexibility for heating and cooling (e.g., Code requires heating source in every room — resulting in poor efficiency baseboard heaters);
 - recognize and incorporate more technical standards for alternative materials (currently standards are often limited to CSA standards, but certification authorities in the US and elsewhere are more inclusive). Building codes generally only recognize conventional construction materials — seeking engineer certification for alternative materials is onerous for applicants. Some alternative materials may be evaluated by the Canadian Construction Material Centre (www.nrc.ca/ccmc/home_e.shtml). Note: at least one interviewee cautioned against the idea of more technical standards;
 - add well-defined Building Code criteria on how to demonstrate equivalent performance to Code requirements using natural ventilation design analyses (criteria should specifically address fire and smoke safety issues of natural ventilation design strategies). Currently, the Code discourages natural ventilation by requiring mechanical ventilation systems for most buildings, requiring screening and weather shielding for intake and exhaust outlets, and prohibiting the use of 'public corridors' and stairways as return-air plenums; and
 - allow the interconnecting of appliances (e.g., taking the heat from one appliance (refrigerator) and using it to heat water).
- Research the potential for a 'Rehabilitation Code' to specifically address building restoration. Several US states have rehabilitation codes that balance the heritage and environmental benefits of building restoration against safety concerns for seismic, fire, handicapped access. The rehabilitation codes of New Jersey and Maryland are generally considered to be the best models. A first step could be a meeting between US experts, National Code experts, Vancouver officials and Provincial government representatives.
- Consider amendments to either the code or the *Local Government Act* (as appropriate) to allow municipalities to consider performance guarantees, warranties and security offered by the private sector when determining equivalencies. The *Local Government Act* might also be amended to allow arrangements similar to those under the Waste Management Act Municipal Sewage Regulation (WMAMSR). Under the WMAMSR, the developer can choose between posting financial security (held and 'risk managed' by the developer) and a developer-designed 'assurance' plan that demonstrates adequate technical, financial

and management capacity to address any failures. Local governments and the developer industry endorsed the WMAMSR model.

Plumbing Code

Amend Plumbing Code (or provide clear rules for equivalency) to:

- Recognize ‘interconnection of two water supplies,’ and ‘split plumbing systems’ and remove the requirement that all water piped to any fixture be potable. Changes recommended by a CMHC-commissioned paper include:
 - require colour code or labeling of pipe and plumbing components carrying non-potable water;
 - set guidance on appropriate backflow preventers and cross-connection prevention for reuse systems;
 - allow parallel potable and non-potable systems with pressure differences between them; and
 - define approved locations of non-potable water pipes within a building and trenches.
- Define standards that recognize on-site treatment alternatives that eliminate the need for a direct connection to a local municipal sanitary sewer system.
- Review and update definitions of “fixtures” and “water closets” for plumbing sizing; review safety requirements for shafts (e.g., sprinkling) and operating/maintenance concerns; define operation/maintenance instructions for composting toilets to be permanently affixed to the building; and address concerns of inspectors who unnecessarily require ‘future retrofits’ (e.g., oversized piping to ensure toilet can be replaced by conventional toilet).
- Update tables of ‘fixture units’ in order to reflect actual flow to fixtures in order to accommodate current water conserving fixtures and technologies and allow engineered pipe sizing.
- Define appropriate standards for grey water systems for buildings and residences (perhaps defining different standards for buildings that will not be frequently used by children or pets).

Energy Code

- Work with national, provincial and professional bodies to amend the Model National Energy Code (MNEC), ASHRAE Standard 90.1-1999, and Natural Resources Canada’s Commercial Building Incentive Program (CBIP) to:
 - establish measured baselines for energy cost budgets or reference models for building simulations, and

- recognize innovative architectural and systems energy-efficiency approaches.
- Collaborate with federal, provincial and local government agencies to encourage adoption of building energy codes.
- Strengthen provincial and local government capacities and resources to update, maintain and enforce building energy codes.

Federal Regulation of Electricity Sales

- Amend the federal *Weights and Measures Act* and/or the federal *Electricity and Gas Inspection Act* regulations to allow landlords and strata councils to use 'unofficial' metering equipment to allocate energy costs among strata members or tenants. Strata councils and landlords commonly estimate and allocate energy costs on an 'area basis'. Area-based estimates are highly inaccurate and don't encourage energy savings nearly as much as metered use. The current requirement for approved devices and certified inspections is likely unnecessary (a high degree of accuracy is unnecessary for this purpose) and makes sub-metering unaffordable. Amendments should address the danger of landlords trying to profit by using fraudulent meters.

PRIORITIES

With one exception, all recommendations should be considered high priority. The one exception is the general proposal to rewrite the codes from the perspective of creating buildings with a long lifecycle. This is clearly a difficult, long-term objective, but an objective that would bear substantial fruit. It should be considered medium priority.

BACKGROUND & ANALYSIS

Two recent reports, one Canadian and one American, identified building codes as regulatory barriers to innovative building practices: see *Innovation in the Housing Industry* (Holman), and *The Future of Regulations for Sustainable Building* (Eisenberg). The Eisenberg paper includes a helpful 'checklist' for gaining alternate approvals that should be transferable to BC, and supports the idea (recommended above) that future building codes should address safety, health, and general welfare of buildings over their entire lifecycle:

Building codes are designed to protect the public safety, health and general welfare in relation to the built environment. The modern evolution of building codes results in buildings that are generally safe in terms of structure, fire safety, means of egress, and other injury-causing hazards. What they have not addressed is a larger set of consequences that are also safety, health, and general welfare issues but at a different, larger scale. These are often cumulative effects and impacts that occur away from the building site, often occurring over longer timeframes than the design and construction cycle for buildings. They also include health effects that have not previously been considered relevant to codes, such as indoor air and environmental quality or the toxicity of materials and/or the processes used to acquire, make, or install them. [at p. 1]

A 1998 report by the Center for Study of Responsive Law in Washington D.C. reached similar conclusions: see *How Building Codes Affect Sustainable Development* (Capretz).

With few exceptions, interviewees suggested the recommended changes. A systematic review of the changes by Code experts was beyond the parameters of this report.

BARRIERS MITIGATED

Building

Code requires heating source in every room — resulting in poor efficiency baseboard heaters.

Building codes generally only recognize conventional construction materials — proving compliance and seeking engineer certification is onerous for applicants.

Code references to standards that must be met for approved use: Listing is time consuming and expensive, making innovation by small companies very difficult.

Code requirements are often difficult or prohibitively expensive to meet in older building stock (e.g., costly seismic upgrades for older buildings in Victoria leave them largely vacant).

Lack of consideration in national/BC building codes — alternative means typically require extensive analysis and documentation (see below).

Code requirement for mechanical ventilation system in almost all buildings (see below).

Code requirements for screening and weather shielding for intake and exhaust outlets (see below).

Code prohibitions against use of “public corridors” and stairways as return-air plenums.

Code does not permit interconnecting of appliances.

Plumbing

Provincial plumbing code required direct connection to local municipal sanitary sewer where one exists.

Plumbing Code requirement for all water piped to any fixture to be potable.

Interconnection of two water supplies and split plumbing systems prohibited by plumbing code.

Code barriers related to safety and health (small children falling into shafts), and ‘future retrofits’ (requiring oversized piping to ensure toilet can be replaced by conventional toilet).

Plumbing code has no specific prohibitions, but inspectors unfamiliar with the technology require additional documentation and references.

Lack of guidance in Plumbing Codes for non-potable water systems (see next one).

Functionally, plumbing codes greatly inhibit widespread use of local waste water treatment and grey water reuse (e.g., every water distribution system must be connected to a public water main or a private potable water supply system; and only “potable water” can be used for fixtures).

Plumbing code requires prescriptive Fixture Unit sizing which does not allow engineered pipe sizing.

Energy

Model National Energy Code (MNEC), ASHRAE Standard 90.1-1999, and Natural Resources Canada's Commercial Building Incentive Program (CBIP) discourage or limit the range of energy-efficient approaches that might be examined by a design team.

GREEN PRACTICES FACILITATED

Local waste water treatment (I3)

Rain water collection and use (I4)

Building height projections (S2)

Building horizontal projections (S4)

Alternative materials (M1)

Non-listed materials (M2)

Renovation of existing building stock (M5)

Composting toilets (P1)

Waterless urinals (P2)

Non-potable water use (P4)

Water Pipe Sizing (P6)

Natural ventilation and cooling (H1)

Interconnecting appliances (E3)

NEXT STEPS

- The Province, through the LEED BC Steering Committee, should bring together green building/community professionals, local governments, and provincial building and plumbing code administrators to examine each of the recommendations above. For those that merit further pursuit, the Province should initiate a meeting with the Canadian Commission on Building and Fire Codes (CCBFC) to see if they can be accommodated in the current round of 'objective-based' code changes, or technical code changes.

ADDRESS *HEALTH ACT* BARRIERS

SUMMARY

Regulations under the *Health Act* group grey and black water together as domestic sewage. Without a clear differentiation between grey and black water, and recognized standards for safe design, treatment quality and operations, Health Officials are reluctant to allow treatment systems for grey water re-use. The *Sewage Disposal Regulation* could be amended to facilitate the use of alternative local treatment systems, including systems designed for grey water only.

DETAILED DESCRIPTION

Amend the *Sewage Disposal Regulation*

Currently the Sewage Disposal Regulation, created under the BC *Health Act*, doesn't differentiate between treatment systems for grey water (water-carried wastes from drinking, culinary purposes and cleaning) and black water (toilet and urinal water). This discourages systems that treat grey water for re-use. In addition, the regulation could be interpreted as not allowing grey water re-use without treatment. Amendments to the Sewage Disposal Regulation should:

- give separate definitions for grey water and black water; and
- set differing standards for design and treatment for grey and black water.

BACKGROUND & ANALYSIS

CMHC has identified that health concerns and health officials are the prime barriers to on-site water reuse. While there is not a specific prohibition on on-site water reuse, the *Sewage Disposal Regulation* and Public Health officials act as a de facto prohibition against widespread adoption of grey water reuse systems. While toilet flushing and subsoil irrigation are the only reuses that are likely to gain acceptance in the current regulatory and health protection climate, over time treated grey water is likely to be considered for more widespread applications.

We understand the Ministry of Health is currently amending the regulation. Amendments to the regulation could lead to substantial water and costs savings while still protecting public health. Instead of requiring potable water for flushing of toilets and watering of lawns, water from washing vegetables or doing the laundry could be reused.

BARRIERS MITIGATED

Restrictions on grey water reuse.

Restrictions on innovative local waste water treatment systems.

GREEN PRACTICES FACILITATED

On-site water reuse.

NEXT STEPS

- LEED BC Steering Committee to contact the Ministry of Health to ensure that these issues are considered during the current amendment process.

PROMOTE ALTERNATIVE DEVELOPMENT STANDARDS

SUMMARY

While greenfield development is generally seen as less favourable than infill, or brownfield development, it can be done in such a way to minimize its ecological footprint. Alternative Development Standards would allow traditional grid development patterns similar to those found in the Kitsilano neighbourhood of Vancouver, while still protecting streams through natural storm-water absorption, detention and treatment. Unfortunately, some provincial and local government development standards such as minimum road width standards, requirements to connect to municipal storm sewers, and requirements for impermeable surfaces, restrict such innovative developments.

People identified to date who have expertise in this area include Patrick Condon from the James Taylor Chair in Landscape and Liveable Environments and Michael von Hausen. Alternative development standards (ADS) are more environmentally sound than conventional development techniques, while still producing very liveable and desirable communities. This Action Plan recommends that the Province (through the LEED BC Steering Committee) and local governments continue to work on developing and promoting ADS with an ecological underlay.

DETAILED DESCRIPTION

Continue Development of Alternative Development Standards

- LEED BC Steering Committee should support the significant work already underway on defining ADS such as reduced road widths, reduction in impermeable surfaces, and environmentally sensitive storm-water alternatives. Work on standards should continue, with an eye to adopting them to a BC context, and increasing specificity and preciseness.

Promote ADS amongst Regulatory Officials

The LEED BC Steering Committee should work individuals and groups who have expertise in this area such as the James Taylor Chair and Michael von Hausen to:

- Seek out existing examples of alternative development standards to use as demonstrations of the performance, costs, safety, and liveability of ADS;
- Establish a mechanism for sharing knowledge, standards and sample ADS by-laws;
- Include ADS in any Professional Development Program developed for regulatory officials (see recommendations under Innovative Practices section);
- Prepare and disseminate educational material for public officials outlining the advantages (ecological, social, and economic) of alternative development standards. Topics covered should include: road width and road safety; reduced storm-water flow and ecological amenities; and increased density and improved community services.

PRIORITIES

As an initial step, the LEED BC Steering Committee should contact the James Taylor Chair and Michael von Hausen to determine what work has been undertaken regarding ADS, and to define areas where collaboration is possible.

BACKGROUND & ANALYSIS

As compared to sprawling residential developments typical of most greenfield residential developments, alternative development standards has the potential to:

- Increase density from 11 people per acre to 51 people per acre (a level making transit fiscally self sufficient);
- Decrease pavement coverage by 72%;
- Reduce walking distance to commercial or transit nodes from 12 to 2 -5 minutes;
- Increase the amount of public open space per development unit by 80%;
- Decrease the average utility run by 72%; and
- Decrease total permeable surfaces by only 4%.

Although new greenfields developments are only a small portion of total building stock existing in BC the potential to make dramatic improvements in sustainability is substantial. Neo-traditional planning with narrower streets, lanes and smaller front yards to achieve an intended scale and character is now being tried in several areas in the province. Internationally, communities that have been developed incorporating alternative development standards have generally been environmental, social and commercial successes.

Two key limitations have emerged in relation to the proposed alternative development standards for traditional neighbourhoods with an ecological underlay:

- Road widths and diameters of turnarounds are influenced by the required turning radius of the largest emergency vehicle anticipated. This would typically be a large ladder truck, even if such a vehicle is likely to never be used in the area. Lane systems are not recognized as emergency access routes. While there are potential solutions to these issues, they are likely to be slow in occurring — requiring changes in emergency equipment and Workers Compensation Regulations that require large fire trucks.
- Reliance on natural storm-water infiltration systems (such as natural drainage swales) may be inhibited by low permeability of soils in some areas of BC, and lack of reliable, detailed and site-specific standards for design and construction raise municipalities' fear of liability if storm-water systems fail (see Appendix C for discussion of Liability, and section on Liability Reform and Education for discussion of solutions).

Nonetheless, there is clearly room for shifts in alternative development standards among most municipalities in BC, and the market has proven very receptive to neo-traditional developments. The City of Vancouver, the Municipality of Vancouver, the Islands Trust, and the District of the Highlands have all started to move towards narrower roads. Creative layouts using hammerheads and turnarounds have ensured that the fire department has access to within 45 metres of building entrances, while not requiring wide roads. Resources to facilitate alternative development standards are a high priority.

BARRIERS MITIGATED

Density Restrictions

Use Restrictions

Parking Restrictions

GREEN PRACTICES FACILITATED

Mixed Use

Increased Density, Infill, Secondary Suites, Coach Houses

Reduced Parking

NEXT STEPS

- LEED BC Steering Committee meet with the James Taylor Chair and Michael von Hausen to seek out opportunities to further the work of The ADS Project.

APPENDIX 'A': ANNOTATED REFERENCES

ALTERNATIVE DEVELOPMENT STANDARDS

PUBLICATIONS

CMHC-ACT Subdivision Regulations. Meeting Small-Town Needs, case study, Sackville NB, 1998. In this ACT, case road classifications were redefined and widths decreased. Private roads were also allowed.

Condon, Patrick, and Teed, Jacqueline (1998) "Alternative Development Standards for Sustainable Communities Design Workbook" University of British Columbia James Taylor Chair in Landscape and Liveable Environments. Proposes alternative development standards, and provides comparison with traditional neighbourhoods and typical suburban sprawl developments. Available at <http://www.sustainable-communities.agsci.ubc.ca/orderbody.html>.

District of the Highlands, http://highlands.bc.ca/municipal_office/index.spml. The Highlands provides a good example of narrow road width standards.

Energy Pathways Inc., Alternative Development Standards for Affordable Housing in Ottawa-Carleton, Ottawa: Affordability and Choice Today, May 1994. <http://www.actprogram.com/english/casestudies/pdf/lrmoce.pdf>. The Regional Municipality of Ottawa-Carleton conducted research that indicated alternative development standards such as reduced right-of-way width could lead to significant savings in site-servicing and land costs. A charrette was held, and then a 165-unit demonstration project was built.

Kinnis, Rosemary and Bryan McNamara, Reducing Land Development Costs in Moncton, New Brunswick, Ottawa: Affordability and Choice Today, October 1995. <http://www.actprogram.com/english/casestudies/pdf/PB0177-7.pdf>. Changes to development standards were recommended, such as reducing lot size and allowing interior lots, to increase housing affordability. Not all recommendations completely mesh with ideas of greening communities, such as reducing the percentage of land set aside for public use.

Ministry of Community, Aboriginal & Women's Services, Local Government Division, "Alternative Development Standards" <http://www.marh.gov.bc.ca/GROWTH/MAR1997/ads.html>. Site contains several examples in BC where alternative development standards have been adopted, including Kettle Valley (Kelowna), Clover Valley Station (Surrey) and Lantzville (Nanaimo).

von Hausen, Michael, Alternative Development Standards report (unpublished). A draft survey of measures being taken by selected local and regional governments in BC to allow more sustainable land development practices.

WEBSITES

James Taylor Chair in Landscape and Liveable Environments, www.sustainable-communities.agsci.ubc.ca/

ALTERNATIVE POWER GENERATION

PUBLICATIONS

Independent Power Assn. of BC, (November 2001), *BC Electricity Market Reform*, Submission to the BC Energy Policy Dev. Task Force.

Jaccard, Mark, *Review of Regulation and Deregulation*, Task Force on Electricity Market Reform, (Min. of Competition, Science and Enterprise).

Micro Power Connect; Connecting Micro Power to the Grid, Natural Resources Canada and Electro-Federation Canada, 2001 A review of codes and standards for grid interconnection of small power systems in Canada.

Pape, Andrew, (1999), *Clean Power at Home*, Vancouver: David Suzuki Foundation, available online at: <<http://www.davidsuzuki.org/files/Clean.pdf>>.

Describes and analyzes net metering as a strategy for encouraging local, distributed and renewable power generation. Describes net metering requirements in other Canadian and US jurisdictions.

WEBSITES

Energy Alternatives, www.energyalternatives.ca. This site contains a collection of resources and hosts a series of discussions on alternative energy issues.

CONTACTS

Pape, Andrew, Pembina Institute.

Smiley, Eric, BC Institute of Technology.

CONTAMINATED SITES

PUBLICATIONS

Clayton Research, "Brownfield Redevelopment: From Liability to Opportunity", Clayton Housing Report, Vol. XI, July 2001. Outlines policies supporting brownfield redevelopment, as well as potential risks and benefits to the developer and the public at large.

Ontario Ministry of Municipal Affairs and Housing, "*Brownfields Statute Law Amendment Act: Backgrounder*" available at: <http://www.mah.gov.on.ca/inthenews/backgrnd/20011101-12e.easp>. A discussion of the new *Brownfield Statute Amendment Act* that is aimed at encouraging redevelopment of brownfields and smarter patterns of growth.

Ontario's *Brownfields Statute Amendment Act*, S.O. 2001, c.17.

DENSITY, MIXED USE

MODEL BYLAWS

Bucks County Pennsylvania, *Performance Zoning Model Ordinance*, (January 1996), Bucks County, Pennsylvania, available at <http://www.sustainable.doe.gov/codes/bucks.shtml>. Presents a zoning method with a primary objective of protecting natural resources and a secondary objective of providing flexibility in the design of residential development.

Congress for the New Urbanism, www.cnu.org/pdf/code_catalog_8-1-01.pdf. This is an excellent source of model bylaws for new urbanism.

Dade County, Florida master planning zoning, information available at: <http://www.co.miami-dade.fl.us/planzone/aboutus.htm>. Dade County does zoning on a 50-200 acre community scale, necessitating mixed-use and green space in every community.

Fisheries and Oceans Canada, "Model Stewardship Bylaw series", information available at: www-heb.pac.dfo-mpo.gc.ca/english/publications/PDF/urban_sum.pdf.

North Vancouver District Residential Zoning, allowing secondary suites in all residential areas.

Sidney British Columbia Bylaw re secondary suites for handicapped/elderly.

Victoria Harris Green. Information available at: http://www.city.victoria.bc.ca/business/development_pub.shtml.

Vancouver Zoning Bylaws for Residential Areas, provide examples of flexibility while maintaining neighbourhood ambience, information available at: www.city.vancouver.bc.ca.

Waste Management Act Municipal Sewage Regulation, (BC Reg. 129/99).

City of Vancouver, RT zoning (allows coach houses and suites), available at: <http://www.city.vancouver.bc.ca/commsvcs/planning/wpu.html>.

PARKING

Energy Pathways Inc., *Condominium Apartment Parking Standards in Mississauga, Ontario*, Ottawa: Affordability and Choice Today, November 1994.

<http://www.actprogram.com/english/casestudies/pdf/PB139.pdf>. As a result of excessive parking requirements, there were at least 35% more spaces per resident than were actually required. Lower requirements were recommended that actually reflected household vehicle-use characteristics of residents, rather than the general population. As a result of the study Mississauga has reduced its parking requirements.

Smith, Steven, JHK Associates, (September 1983) *Model Parking Code Provisions to Encourage Ridesharing and Transit Use*, for US Federal Housing and Welfare Administration.

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American Planning Association, Guidebook User Guide, CD-ROM, The *Guidebook* and its accompanying *User Manual* are the culmination of APA Research Department's seven-year Growing Smart project, an effort to draft the next generation of model planning and zoning legislation for the US. A unique feature of the *Guidebook* is the variety of options provided for statutory reform instead of a one-size-fits-all model. Commentary provides background information (including summaries of key state statutes), describes pros and cons of legislative alternatives, and makes suggestions concerning implementation.

CitySpaces Consulting Ltd., The Regulatory Environment for Ground-Oriented, Medium Density Housing Greater Vancouver, March 1998. Report includes summary of municipal regulations surrounding medium density housing in the lower mainland. Summaries include current zoning practices, barriers to higher density zoning, parking requirements, and future trends.

CMHC-ACT Artisan Community, Saint-Genevieve Que., 1994. Available at: <http://www.actprogram.com/english/casestudies/pdf/PB0177-45.pdf>. Zoning changes made for mixed-use compact development. Shops, studios and residences are combined.

CMHC-ACT, Two Generational Housing, Anjou Quebec 1991. This project developed sample zoning adaptations to allow suites and infill houses on single family parcels.

Compass Resource Management Ltd and The ARA Consulting Group, A Tool Kit for Community Energy Planning in BC, BC Energy Aware Committee, April 1997. Comprised of three parts, the first part is an introductory guide for elected officials, planners and developers on understanding energy impacts and how to use energy planning as a lever in meeting broader sustainability goals; Part II, Energy Ideas for Community and Regional Planning, is a set of strategies that can be applied in community planning processes; and Part III is an annotated list of resources for community energy planning.

Curran, Deborah, Environmental Stewardship and Complete Communities: A Report on Municipal Environmental Initiatives in British Columbia 1999, Victoria: Eco-Research Chair of Environmental Law and Policy, 1999. General discussion on potential solutions to the barriers facing green building by pointing to various community initiatives that encourage smart growth.

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Energy Pathways Inc., Downtown Revitalization: City of Drummondville, Ottawa: Affordability and Choice Today, March 1996. <http://www.actprogram.com/english/casestudies/pdf/PB0177-5.pdf>. A study to determine the financial and technical feasibility of revitalizing a downtown district of Drummondville. Changes to zoning by-laws and the official community plan allowed for the creation of downtown residential districts.

Energy Pathways Inc., Innovative Rooming Houses, Ottawa: Affordability and Choice Today, September 1995. <http://www.actprogram.com/english/casestudies/pdf/PB0177-8.pdf>. In a low income neighbourhood in Montreal, an innovative rooming house was constructed that contained a small kitchen and bathroom. Because of the innovative design and their small dimensions zoning regulations needed to be changed, reducing requirements for unit area and parking.

Energy Pathways Inc., Mount Pearl Residential Intensification Study Ottawa: Affordability and Choice Today, November 1996. <http://www.actprogram.com/english/casestudies/pdf/PB0177-24.pdf>. This study looked at infill opportunities in a suburban community in Newfoundland. While few policy or regulatory barriers were identified, recommendations were made to add residential intensification policies to the City's municipal plans.

Energy Pathways Inc., Revitalizing the Bank Street Corridor Ottawa: Affordability and Choice Today, October 1995. <http://www.actprogram.com/english/casestudies/pdf/PB0177-1.pdf>. This study examined regulatory changes to try to revitalize Ottawa's downtown core. By-law changes addressed right-to-light issues, setbacks, density and parking. The project is intended to encourage higher density housing forms, the elimination of wasted open spaces, reduced parking requirements and roadway allowances and the minimization of undesirable uses, such as surface parking lots.

Energy Pathways Inc., Small Lot Housing Ottawa: Affordability and Choice Today, May 1998. <http://www.actprogram.com/english/casestudies/pdf/PB0177-52.pdf>. Charlottetown conducted a review of its regulations regarding infill development. The City discovered they were too reliant upon variances and re-zoning related to infill projects. The project team recommended a revision of their by-laws to give greater flexibility.

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Greater Vancouver Regional District, Liveable Region Strategic Plan, available at: http://www.gvrd.bc.ca/services/growth/lrsp/lrsp_toc.html. Plan provides the framework for decisions surrounding land use planning and transportation.

James Taylor Chair in Landscape and Liveable Environments, The ADS Project, available at <http://www.sustainable-communities.agsci.ubc.ca/projects/ADS.html>. A comparison of

different types of neighbourhoods: status quo pattern, traditional pattern, and traditional pattern with ecological underlay. Using hard data, the project shows potential for neighbourhoods to be 'greener' while improving quality of life.

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Kinnis, Rosemary, Zoning and Innovative, Affordable Infill Housing Ottawa: Affordability and Choice Today, June 1995. <http://www.actprogram.com/english/casestudies/pdf/PB0177-17.pdf>. An examination of impediments to affordable infill housing in the City of Montreal's zoning by-laws. Changes were recommended to zoning regulations dealing with building height, building line, stairways, emergency exits, setbacks, determination of mean roof level, and parking spaces required of each building.

Kinnis, Rosemary, and Scherlowski, David, Legalization of Secondary Suites in Surrey, B.C., Ottawa: Affordability and Choice Today (A.C.T.), July 1997. Focus is on using changes to regulations that allow secondary suites, and corresponding benefits for housing affordability.

Moyes, Rowena, Review of Performance-Based Zoning Ottawa: Affordability and Choice Today, March 1998. <http://www.actprogram.com/english/casestudies/pdf/PB0177-48.pdf>. Morinville, Alberta identified the pros and cons of the performance-based planning approach. Ultimately they concluded that some hybrid system of performance and prescriptive zoning is probably the best answer.

Moyes, Rowena, SPROUT: Infill Housing for Young, Middle-Income Families Ottawa: Affordability and Choice Today, August 1997. <http://www.actprogram.com/english/casestudies/pdf/PB0177-44.pdf>. An infill demonstration project in Montreal, SPROUT is a small, affordable detached and freehold townhome that has built in capacity to grow up to three times their initial habitable area.

Moyes, Rowena, Zoning Standards and Design Guidelines for Infill Housing and Redevelopment Ottawa: Affordability and Choice Today, March 1997. <http://www.actprogram.com/english/casestudies/pdf/PB0177-33.pdf>. Suggested changes to conventional zoning and design guidelines to allow for infill housing, and higher density neighbourhoods. The City of Saint John developed zoning standards and design guidelines for infill housing that protect the existing heritage character of a neighbourhood. Design guidelines have assisted in clarifying what types of infill projects are appropriate.

San Francisco Planning and Urban Research Association (1998) Zoning for More Housing. Available at: <www.spur.org/hsg2report.htm>. Although generally specific to San Francisco, provides an example of modest recommendations, considering factors such as political opposition. Recommendations for rezoning including city-wide density bonusing for projects that provide affordable units, increased heights and densities along neighbourhood commercial corridors and major transit routes; and increased housing density permitted on downtown (TDR's).

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Word-Works Communications Services, [The Inclusion of Made-to-Convert Lots in a New Plan of Subdivision](#), Ottawa: Affordability and Choice Today, September 1996.

<http://www.actprogram.com/english/casestudies/pdf/PB0177-32.pdf>. In a new subdivision in London, Ontario the zoning by-law included a special definition for made-to-convert homes. Forty-eight of the 312 total lots were zoned specifically for houses with secondary suites.

PROGRAMS

Maryland Department of Housing and Community Development. The Models and Guidelines Program for Infill and Smart Neighbourhood Development promotes infill development in existing communities and compact new development. The Maryland Department of Planning provides model tools to provide increased flexibility within development standards to facilitate infill and compact mixed-use developments. The models are voluntary for local governments to adopt, and state incentives are offered for local governments that choose to adopt the models or substantially equivalent ordinances.

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SPOT ZONING

District of Highlands "Spot Zoning" Information available at: http://highlands.bc.ca/municipal_office/index.spm. Much of the zoning done in the Highlands is specific spot zoning to protect ecological amenities.

WEBSITES

Smart Growth BC, www.smartgrowth.bc.ca. Smart Growth BC's website is a treasure trove of information on issues surrounding zoning, densification, infill and more.

Urban Ecology, "Right to Light summary" available at: <http://www.urbanecology.org>.

CONTACTS

Smart Growth BC

DEVELOPMENT COST CHARGES

PUBLICATIONS

British Columbia, Ministry of Municipal Affairs and Housing, (2000) Development Cost Charges Best Practices Guide. Provides extensive guidance on development and administration of DCCs. Developed with input from municipalities, developers, and home builders. Available at www.marh.gov.bc.ca/GROWTH/PUBLICATIONS/.

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CONTACTS

Patrick Condon, James Taylor Chair in Landscape and Liveable Environments.

EMPOWERING GREEN BYLAWS

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California Integrated Waste Management Board, "Task Two Report: Green Buildings Program Needs Assessment" (CIWMB, December 2000).

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Natural Strategies LLC, The Economics of Green Building, California Integrated Waste Management Board Task Three Report, April 2001. The environment and health benefits of green building are outlined, as well as the long-term economic benefits.

PROGRAMS

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<http://www.ci.austin.tx.us/greenbuilder/default.html>. The City of Austin has adopted a comprehensive green building including a front of the queue for permitting for green buildings.

WEBSITES

Centre of Excellence for Sustainable Development

<http://www.sustainable.doe.gov/landuse/lucodtoc.shtml>. Provides a wealth of information, including model bylaws for solar access and smart growth material.

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<http://www.marh.gov.bc.ca/LGPOLICY/MAR/TRADE/contents.html>. This report summarizes survey results from local planners on potential changes to the *Municipal Act* (now the *Local Government Act*).

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DEMONSTRATION PROJECTS

Vancouver Public Library

GENERAL (INNOVATION PRACTICE TESTING)

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WEBSITES

Canadian Construction Materials Website: www.nrc.ca/ccmc/home_e.shtml. Provides an evaluation of some alternative materials.

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PUBLICATIONS

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PARKING

PUBLICATIONS

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WEBSITES

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preparing construction drawings and performing selective demolition concurrently rather than sequentially. The building permit approvals follow the selective demolition.

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CONTACTS

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EcoTek Ltd., Kimron Rink (604 882-2999), Solar Aquatics alternative sewage treatment systems in BC.

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APPENDIX 'B': OBJECTIVE-BASED CODE

BUILDING, FIRE, AND PLUMBING CODES

The National Building Code of Canada, the National Fire Code of Canada, the National Plumbing Code of Canada, the National Housing Code of Canada and the National Farm Building Code of Canada (collectively 'the National Code') are prepared and maintained by the Canadian Commission on Building and Fire Codes (CCBFC) and are published by the National Research Council. The National Code is a model code only, and does not become binding until adopted by a provincial or local government. The British Columbia Building Code Regulation (B.C. Reg. 295/98) under the *Local Government Act* (R.S.B.C. 1996, c. 323) adopts the National Code for BC and, subject to changes set out in an appendix to the regulation, establishes it as the BC Building Code.

The last edition of the National Code is 1995, and it is normally updated every 5 years. Two revision processes are currently underway: preparing an "objective based" version of the code, and a regular 'technical' revision. Because of the magnitude of the work necessary to prepare the objective based version, the next edition is not expected until 2004.

The current National Code is a mixture of prescriptive and 'performance-based' provisions. Some are a combination (e.g., if two buildings share a common wall, the wall must have a fire-resistance rating of 1 hour, but the National Code prescribes how the testing is to take place) [check example].

The current National Code also has a provision for 'equivalence' — which allows designers and builders to try something different, if the something different can still meet the 'intent' of the relevant code provision. Unfortunately, it has not always been easy to determine the 'intent' of a code provision. The purpose of the 'objective-based' code exercise is to identify and clearly articulate the 'intent' of each code provision.

Under the multi-stakeholder leadership of the Canadian Commission on Building and Fire Codes (CCBFC), the National Research Council has now reviewed every element of over 6,000 code provisions in an effort to determine the intent. The result is a database of over 12,000 records (see www.ccbfc.org).

Proposed objectives were successfully tested through public consultations in 2000 and 2001. The next step is to convert the 1995 National Code and conduct further public consultations. The new Code is expected to look very similar to the 1995 Code, except that in addition to the traditional 'acceptable solution', the Code will spell out the objectives, sub-objectives, and functional requirements that a proposed alternative solution must satisfy.

As a result, the new Code is expected, at a minimum, to increase the frequency of requests for equivalencies and make it simpler for regulators to assess requests for equivalency. Together with the removal of key regulatory and non-regulatory barriers, the new Code presents an considerable opportunity to advance green building practices in British Columbia.

The new Code is also likely to reflect several hundred technical changes.

Contact: John Haysom, Technical Advisor, Canadian Codes Centre, National Research Council Canada (613-993-0043), Manager of the National Code code revision process.

ELECTRICAL CODE

The Canadian Electrical Code (most recent edition 2002) is developed by the Canadian Standards Association. The B.C. Electrical Code Regulation (B.C. Reg. 330/98) under the *Electrical Safety Act* (R.S.B.C., 1996, c. 109) adopts the Canada Electric Code for BC, and subject to changes set out in an appendix to the regulation, establishes it as the BC Electric Code.

APPENDIX 'C': LIABILITY AS A BARRIER TO GREEN BUILDING

SNAPSHOT

Innovative practices inherently bring with them a degree of risk. Currently the risk of an innovative practice failing may be borne by the builder, the municipality, municipal employees, the designer, the property owner and even third parties who suffer damages as a result of an innovative practice. It is the fear of liability that causes reluctance to proceed with any practice that strays from the tried and true.

Ultimately, the best way to deal with the liability issue would be to eliminate the added risk, or perception of risk, associated with green practices. Rigorous testing of green building projects, education of builders and the public, and extensive use of green building demonstration projects could reduce the risk of using new technologies while keeping failures to a minimum. Of course, reducing the risks to negligible amounts would involve significant costs. Another alternative would be to examine whether a reallocation of risk could encourage more green building innovation.

There are four categories of potential solutions we have outlined:

- Risk, or the perception of risk, is eliminated or reduced through demonstration projects and incorporating redundancies.
- Liability of parties can be limited. The legislature can improve statutory provisions that provide full or partial immunity for municipalities and municipal officials or impose other restrictions on legal actions against municipalities. Municipalities can adopt policies aimed at shielding themselves from liability.
- Risk can be transferred onto engineers, architects, or owners.
- Risk can be distributed through insurance/guarantee programs that require investment up front to eliminate liability down the road.

Each option brings with it different costs and different benefits. A preferred solution would be an allocation of the risk that facilitates green building, while still being defensible on other public policy grounds.

We are interested in receiving feedback as to what solutions you foresee to distribute the risk in such a way to remove the barrier to green building, while protecting the public interest.

OBJECTIVE

We want to promote the use of more innovative green building practices.

THE PROBLEM

Innovative practices, whether they are green or not, inherently carry a risk. Because there is less familiarity with the methods there are likely to be perceived as riskier, and may indeed be riskier. Currently, the risk of an innovative practice failing may end up being borne by the builder, the municipality, the designer, the property owner and even (in some cases) third parties who suffer damages as a result of an innovative practice. Third parties and homeowners bear the risk because their property may be damaged (or have less value) because of a failed practice. Builders, municipalities, and designers bear a risk because they may be sued and found liable for negligence or breach of contract. It is the fear of liability that causes reluctance to seriously consider any practice that strays from the tried and true.

HOW DOES LIABILITY COME INTO PLAY

- The designer is responsible in contract to the developer and/or owner and also has a duty of care to the owner. Risk can also be transferred from municipalities to designers when municipalities ask designers to sign off as a condition of approving an innovative practice. That could lead to designers being liable for professional negligent misstatement and scares off professionals.
- Municipal officials and the municipalities can be found liable in negligence in approving a faulty design or negligence in inspection. For instance, courts have found municipalities liable for flooding of homes located below a new development, because the flooding was caused in part by approval of an inadequate storm sewer system.
- The owner bears risk simply through owning the building and having to pay if no one else is responsible or if time limits to bring a claim have lapsed. Courts may also find them liable if an innovative system (e.g., for storm-water containment or sewage treatment) fails and a neighbour suffers.
- The builder can be found liable for negligent construction or breach of contract.

EXTENT OF THE BARRIER

- 15 percent of builders across Canada reported that they had decided against using a particular product or new construction technique because they were concerned about potential liability.
- Municipal governments are particularly fearful of liability because of their 'deep pockets'. Under the BC *Negligence Act*, defendants are joint and severally liable for the full amount of a damage award, unless contributory negligence on the part of the plaintiff can be established. What this means is that if a local government was found 5 percent at fault and a developer was 95 percent at fault, both are on the hook for the entire amount. If the developer were bankrupt or unable to pay the award then the local government would be faced with paying the entire amount. The potential for risk being transferred to municipalities is increased by the practice of developers incorporating a numbered company for the purpose of a specific development. On completion of the development, the numbered company is either wound up, or drained of assets. This often effectively shields the individuals involved from liability, shifting risk onto the municipality, owners and third parties.

- Many officials interviewed for this report felt that municipal fears of liability were a significant factor in not having a project approved. One interviewee noted that Victoria had eliminated equivalency provisions for heritage buildings due to fear of liability.
- While the *Local Government Act* provides municipalities with various protections against liability, the provisions are often limited or courts have interpreted them narrowly, allowing successful actions against municipalities. For instance, municipalities are protected from certain actions¹¹ if damages arise out of the malfunction of sewers systems or water drainage systems. However courts have said that this does not protect municipalities if the sewer system was working properly but was simply inadequate for the demands on it;¹² or if the damage was not the inevitable consequence of building a sewer system taking into account costs and available alternatives.¹³ Another section shields municipalities from liability for failure to enforce the Building Code, but does not apply to negligent inspections, failure to inspect, negligent approvals or negligent permit issuance.¹⁴
- Municipal officials have a very strong protection against liability for acts or omissions in the course of their duties.¹⁵
- The City of Vancouver (both the City itself and its employees) has an absolute exemption of liability for any of its plan checking or building inspection activities through the *Vancouver Charter*.¹⁶

LIABILITY OBJECTIVE

As part of West Coast Environmental Law's work, we want to examine potential solutions to the liability barrier. We have organized potential solutions into four categories: Reduce/eliminate risks, limit risk, transfer risk, and/or insure/underwrite risk. Many of our proposed 'solutions' could fit into multiple categories.

REDUCE RISK

The following solutions reduce the risk of a failure, but involve a cost being placed on government. This approach can be justified on the basis of spreading costs in order to achieve the greater good of sustainability:

1. The province or federal government could cover costs of redundant systems: risk transferred away from owners, designers, builders and municipalities.

¹¹ Actions based in nuisance or the rule established in *Rylands v. Fletcher*. Section 288, *Local Government Act*, R.S.B.C. 1996, c. 323.

¹² *Medomist Farms Ltd. v. Surrey (District)* (1989), 62 B.C.L.R.(2d) 168 (C.A.) aff'g 1 M.P.L.R. (2d) 46 (B.C.S.C.).

¹³ *Form-Rite Contracting Ltd. v. Prince George (City)* (1999), 69 B.C.L.R.(3d) 372 (S.C.).

¹⁴ Section 289, *Local Government Act*, see also *Wilson v. Robertson* (1991), 43 C.L.R. 117 (B.C.S.C.).

¹⁵ See sections 287 and 287.2.

¹⁶ See section 294(8).

Initial assessment of potential: very good. Either senior government infrastructure programs or agencies such as CMHC could cover the risk (either by insuring against liability or paying for redundant back up systems) of innovative green practices. This can be justified on the basis that the demonstration project has a value to the general public. The government would need to negotiate agreements on a case-by-case basis, or would need to designate certain practices that they are willing to insure or on which they are willing to pay for back up systems. While government is likely to reject some projects as too risky, a program specifically aimed at insuring innovation should help innovation. Part of the money could come from the existing Canada-B.C. Infrastructure program and the Green Municipal Funds. By demonstrating the performance and utility of new practices, over time, everyone involved will have a lessening fear of liability.

2. Municipalities can require redundant systems that eliminate risk: costs transferred onto developers and owners.

Initial assessment of potential: negative. In some cases, municipalities can (and have) insisted on a redundant conventional system as a back up to an innovative system. For instance, Surrey — which had previously been found liable for approving a development with an inadequate storm-water system that caused flooding to neighbouring lands — has insisted on a back up storm-water sewage system to cover the risk that an innovative infiltration system might fail. This eliminates the cost savings from the innovative system, and threatens to make the innovative system uneconomic. In the absence of other components, this does not appear to be an effective solution. Nonetheless, redundant systems have the advantage that they ensure against a major failure. Such a failure — even if avoidable in later projects — could irreversibly set back interest in green systems.

LIMIT LIABILITY

The following potential solutions shift risk onto plaintiffs that have suffered damage as they can no longer recover damages from municipalities. These strategies may increase municipalities' willingness to approve green practices, but may simply move the 'barrier' to another location, or impose a risk on an innocent third party or an unwitting property owner.

3. Amend *Local Government Act* s. 288 to provide limitations of liability related to green sewer and drainage systems: risk transferred to owners and third parties.

Initial assessment of potential: good. The protection against liability for damage resulting from malfunctioning sewer systems could be amended so that it blocks liability for approving or installing innovative storm-water or sewage treatment system. Alternatively, liability for such systems could be limited to cases of gross negligence, or cases where the municipality has not weighed the risks of innovative systems against the benefits.¹⁷ These different formulations provide decreasing comfort to municipalities, but involve less dramatic departures from the common law.

¹⁷ This formulation provides protection from absolute liability associated with the Rule of Rylands v. Fletcher.

4. Amend *Local Government Act* s. 289 to provide limitations of liability related to issuing building permits for green practices.

Initial assessment of potential: reasonable, but possible resistance from legal community. Municipal officials could be provided with either an absolute or limited protection of liability for approving green building practices that do not meet prescriptive Code requirements. The protection could be absolute or alternatively, liability for such systems could be limited to cases of gross negligence, or cases where the municipality has not weighed the risks of innovative systems against the benefits.

5. Amend *Local Government Act* to provide protection analogous to the *Vancouver Charter*.

Initial assessment of potential: reasonable, but has potential public policy concerns. Under s. 294(8) of the *Vancouver Charter* the City and its employees has an exemption from liability for any inspection, approval or permitting of buildings. Providing this type of protection may make the local government more willing to accept green building projects, however the liability will be shifted onto the developer and the consumer. It is difficult to determine whether this protection has increased readiness to accept green building in Vancouver.

6. Municipalities can attempt to frame decisions to approve green practices as policy decisions: risk transferred away from municipalities to owners or third parties who suffer damage.

Initial assessment of potential: limited. Under the common law, governments are not liable for policy decisions that cause damage, but are liable for the negligent implementation of policy decisions. For example, a government will not be liable for a budgetary decision to eliminate lighthouses causing a tragedy at sea, but they will be liable for a lighthouse keeper's lack of care causing a lighthouse to fail, in turn causing a tragedy at sea. A municipality could attempt to, by bylaw, identify certain innovative practices that it wishes to approve, despite their riskiness, because of competing environmental, social or economic considerations. This strategy may not be successful as the dividing line between policy and implementation of policy is vague.

7. The Province can amend the *Negligence Act* to end, or limit, joint and several liability: risk transferred away from municipalities to owners or third parties suffering damage.

Initial assessment of potential: significant. Government could amend the *Negligence Act* to establish proportional liability for local governments (as opposed to joint and several). This would ensure that municipalities who are only at fault to a small degree are not liable for the majority of damages. Risk is shifted onto plaintiffs who suffer damages, because when other negligent parties (designers or builders) are unable to pay damages, plaintiffs can no longer recover damages from the deep pockets of municipalities. Use of this strategy may increase municipalities' willingness to approve green practices.

TRANSFER OR VOLUNTARY ASSUMPTION OF RISK

8. Owners can assume risk: risk transferred away from designers, builders and municipalities.

Initial assessment of potential: very limited. Currently, the purchaser of a green building could, as part of the purchase agreement, accept the risk of a green practice. A home purchaser passionately committed to environmental protection could, for instance, agree to indemnify the municipality, builder and designers for the costs of any suits brought against them due to the failure of a green practice, and promise to not sue those parties. Municipalities, builders and designers still bear some risk. For instance, they could be sued by a third party (e.g., a neighbour or the subsequent purchaser), and the owner may not have sufficient financial resources to indemnify the other parties. In theory, the *Land Title Act* could be amended to allow an indemnity and hold harmless agreement to be registered against title, binding subsequent property purchasers. However, such a practice is likely to discourage purchasers of green developments and reduce the willingness of financial institutions to lend to buyers.

9. Municipalities can require professional engineers or architects to certify innovative designs: risk transferred to design professionals.

Initial assessment of potential: limited. A municipality cannot be held liable for issuing a building permit for a development that does not comply with the building code if a professional engineer or architect has certified the development as meeting Code requirements.¹⁸ Insisting on certification transfers risk onto professionals and their insurance. Architects and engineers already are mandated to carry insurance. While this practice may increase the willingness of municipalities to approve green practices, it may reduce the willingness of professionals to propose such practices, especially where the effectiveness of the approach cannot be known beforehand.

10. Provincial government could privatize approvals/permitting/inspections of buildings: risk transferred away from municipalities onto private companies.

Initial assessment of potential: limited. Many states in Australia have allowed for private sector building certifiers. This has replaced the traditional monopoly of local government building officials in this area, and has led to competition among various private sector building certifiers. Privatization has been accompanied by shortened limitation periods and proportionate liability. Competition brings with it a potential to allow for change and innovation. Potentially green-building certifiers could arise. Judging from the Australian experience, the time needed to get approval for innovative projects could be substantially reduced, thereby making it more economically feasible. The downfall is that private certifiers would not be as concerned with the public interest and may be reluctant to accept perceived risk from innovative projects.

INSURING/UNDERWRITING RISK

11. The province could require professional liability insurance for builders/developers: risk transferred away from municipalities and owners; increased costs borne by builders/developers and owners.

Initial assessment of potential: limited. Liability insurance only covers risks of liability, usually liability for negligence. An insurance regime shifts risks away from

¹⁸ Section 290 of the *Local Government Act*.

municipalities, who will not pay large portions of damages because they have deep pockets. It also shifts risk away from owners, who have a greater chance of collecting damages (where the builder or developer is negligent) because the builder/developer has deep pockets (their insurer). To the extent municipalities or designers are at fault, professional liability insurance for builders and developers does nothing to shift responsibility away from municipalities or professional designers. This may mitigate builders and developers reluctance to innovate (although desire to avoid litigation — even if insured — may still be significant) but does little to improve the willingness of municipalities to approve, or designers to design, green buildings and systems. It is also unclear to what extent builders and developers are already insured.

12. The province could require builders/developers to pay into a guarantee system: risk transferred away from municipalities and owners; costs borne by municipalities and owners.

Initial assessment of potential: limited to good. A guarantee differs from liability insurance (as outlined in Option 11) in that it covers the cost of repairing a system failure whether or not a builder, developer, designer or municipality is legally liable based on contract or negligence. The guarantee could cover failures related to innovative green practices. A system would still probably be necessary to ensure green practices do not pose an undue risk to human health or life.

APPENDIX 'D': GREENING DEVELOPMENT COST CHARGES

WHAT ARE DEVELOPMENT COST CHARGES?

Development Cost Charges (DCCs) are levies local government impose on developers under the *Local Government Act*.¹⁹ They are paid by developers on approval of subdivisions or issuance of building permits. DCCs are intended to cover the capital costs of providing roads, sanitary sewers, water, drainage and parks for the development, and are kept in a special fund for these purposes. Where regional districts supply these services, they can impose a DCC bylaw and municipalities are required to collect the fee.

A local government may vary the rate they charge depending on:

- different zones or specified areas;
- different uses;
- different capital costs as they relate to different classes of development; or
- different sizes or different numbers of lots (or units) in a development.²⁰
- The structure of DCCs varies from municipality to municipality. For instance:
 - The City of Vancouver charges an equal amount per square meter of allowable floor space, with exact amounts varying by zone and use;
 - Kelowna charges on an equal amount per subdivision lot or residential unit, with exact amounts varying by zone; and
 - North Vancouver District charges an equal amount per single family residential units with lower charges for homes on smaller lots.

The provincial best practices guide for DCCs recommends imposition of DCCs based on average costs over the entire municipality, except where significant disparities in costs exist. For residential development the guide recommends imposition of fees on a per unit basis.

PROBLEMS WITH DCCS

DCCs are sufficiently high (e.g., up to \$20,000 per unit in Greater Vancouver) that they can provide a significant incentive to encourage or discourage certain types of development. There are three barriers to green development which arise from the application of DCCs:

¹⁹ R.S.B.C. 1996, c.323.

²⁰ The *Local Government Act*, s. 934(3).

- **Encouragement of larger lots and larger units.** DCCs charged as an equal amount per subdivision lot encourage larger lot sizes because the DCC forms a greater portion of development costs for smaller lots. Similarly, DCCs charged as an equal amount per residential unit encourage larger unit sizes. Both practices encourage housing that is less affordable and less compact. Charging equal costs per lot also ignores cost savings to municipalities from smaller lot sizes. The cost savings of smaller lots include:
 - shorter water and sewer main runs per lot/unit;
 - reduced costs of servicing more compact developments with transit;
 - reduced road dependency for more compact developments;
 - reduced water demand for irrigation; and
 - reduced stormwater flow per unit or lot.

- **Failure to consider reduced demand on infrastructure.** DCCs rarely vary with regard to factors other than number of units or lots, size of units or lots, use and zone. We are not aware of any DCCs that reflect the reduced demand a green development places on municipal infrastructure. Green developments thus tend to subsidize standard development practices. Possible variables that could be accounted for in the imposition of DCCs include:
 - Brownfield redevelopment and infill vs. Greenfield development, and impact on demand for road services, or extensions of water, storm sewer and sanitary sewer mains;
 - Proximity to transit and reduced demand on roads;
 - Use of alternate waste treatment systems or grey water re-use that reduce demand on sanitary sewers;
 - Use of water conservation methods that reduce demand on water; and
 - Undertakings to provide alternate transportation services.

- **Limitation to road transportation infrastructure.** DCCs can only be used to fund roads, not alternative transportation infrastructure (beyond roadside infrastructure such as bus bulges).

GREENING THE DCC

In the mid-1990s, The Urban Development Institute, Pacific Region, undertook a study of charging DCCs on a square foot basis. They found that charging per square foot presented the best solution to providing developers with an incentive to build a mix of housing size. Thanks in part to the report some municipalities, including the City of Vancouver, have switched to a buildable square foot (habitable floor area) basis.

Additional solutions to green DCCs include:

1. Develop educational material to encourage DCCs on buildable area (lot or building) basis, with differentials for zones that impose higher costs. Development of educational material could assist smart growth advocates encouraging changes to local bylaws. Material by James Taylor Chair (see references) is already valuable in this regard.
2. Amend Development Cost Charges Best Practices Guide to encourage charges on a buildable area basis, with greater attention to green development factors. The current guide generally supports relatively simple approaches to DCCs that do not differentiate between green and other developments.
3. Provide municipalities with research on relation between lot/unit size and servicing costs and proximity to amenities/transit and road servicing costs. Generally applicable research on the relation between density and municipal servicing costs could help municipalities draft DCCs that encourage more sustainable development.
4. Draft model DCC bylaws that take into account green building variables and transit readiness. A model by-law that could be easily adjusted to local needs could increase the likelihood of municipalities adopting green DCC bylaws.
5. Amend *Local Government Act* to allow reduction in fees for green developments. Local governments are generally prohibited from waiving or reducing DCCs. The *Local Government Act* could be amended to allow officials to reduce DCCs for developments incorporating innovative methods that reduce demand on local services.
6. Amend *Local Government Act* to allow imposition of DCCs to cover transit-servicing costs. The *Local Government Act* and *Greater Vancouver Transportation Authority Act* could be amended to allow DCCs to cover the cost of providing transit to a new development.
7. Amend *Local Government Act* to remove DCC exemption for building permits for buildings with less than four units. The *Local Government Act* may encourage municipalities to impose DCCs on the basis of development units rather than floor space. This is because building permits for less than four units are exempt from payment of DCCs, but no similar exemption applies to subdivision units. This may encourage municipalities to choose DCCs based on subdivision units, so that they can avoid the exemption.²¹

RESISTANCE TO CHANGE

Municipalities have resisted adopting a square-foot approach to DCCs, citing administrative inconvenience as the main reason. Given the experience of municipalities with rates that vary by zone, use and lot/unit size, this resistance may be relatively easily overcome. Similarly, there appear to be no particular administrative difficulties in defining zones of cities that are closer to amenities and transit and can be expected to place less demand on road infrastructure.

Resistance may be greater to DCC bylaws that vary according to adoption of green practices. There may be an administrative cost to evaluating or verifying the adoption of such practices.

²¹ See page 25, Development Cost Charges Best Practices Guide.

Municipalities may also fear that practices initially implemented (e.g., low water flow fixtures, provision of car share coops) may not be maintained over time.

There may also be resistance to provisions for reducing DCCs on a case-by-case basis for green developments. There is a widespread perception that negotiation on a case-by-case basis is more expensive administratively (although an Ontario study concluded that there was “no evidence that an average cost approach was more efficient in terms of administrative resources needed to negotiate charges with developers”²²).

²² See Tomalty.

APPENDIX 'E': SUMMARY OF GREEN PRACTICES, BARRIERS AND SOLUTIONS

GENERAL

G1 GENERAL

GREEN PRACTICE CODE/DESCRIPTION

Ideas for encouraging green building practices generally (across specific categories).

REGULATORY BARRIERS

- Sequential permitting processes that don't allow integrated designers to at any point 'tell the whole story'.
- Time and money associated with persuading regulators to approve 'equivalencies' for projects that will ultimately require significantly less local services.
- Difficulty, in some cases, reconciling the language of bylaws with the language of planning documents.

POTENTIAL SOLUTIONS

- To generate more solutions or to refine solutions, set up facilitated brainstorming meeting with handful of creative thinkers.
- Adopt regulation-development process that amalgamates the regulations and subjects proponents to a single, coordinated review. An integrated green building design process demands an integrated (non-sequential) permitting process (note City of Vancouver experiment and 'growing pains' related to lack of facilitation and slow institutional change). Proponent can show regulators what she wants to achieve, regulators can make judgement about whole project, subject to details being ironed out. Proponent to be offered opportunity to demonstrate innovation is safe, and/or post performance bond. [Note: may be easier for smaller local governments to implement.]
- Seek funding for demonstration projects from NRC, NRCan, and the Universities.
- 'Front of the queue' process for green buildings (note: existing City of Vancouver 'green door' policy, and existing State of Connecticut legislation; note also potential conflicts with competing 'front of the line' processes for other social policy objectives like heritage and social housing).
- City of Ottawa eliminated DCCs in the city core and has noticed some impact.
- Seek government role in risk sharing/insurance programs (government assumes risks, payback to society would pay back investment — net winner overall). One advantage of shared-risk is that everyone 'buys into' the project.

- Province and local governments should adopt ‘national Code-like’ multi-stakeholder process for adopting and interpreting national Code, and for fostering innovation [a ‘process that involves a full range of individuals who together represent the relevant expertise and representative interests.
- Municipalities should permit instruments such as performance guarantees or warranties offered by the private sector as part of their requests to provide innovative solutions.
- Code authorities should train building officials at the municipal level.
- Municipalities should incorporate policies to accommodate innovation I municipal planning and development guidelines.
- Municipalities should establish a competitive code administrative system that would give builders a choice of accredited inspectors (Refer to Greg Lampert paper and pers. comm. “Australian system has fostered Innovation”, made the system faster, and avoided expense of serial certification. Note also need to implement 10-year liability cap, and proportional liability in order to attract private sector interest).
- Municipalities should permit their building officials to make some discretionary judgements in regard to code interpretation and equivalencies.
- Provinces and municipalities should protect staff from liability.
- Make DCCs variable to reflect costs of green infrastructure.
- Conduct further analysis of financial aspects of DCCs (e.g., green building savings may be long-term). Partner with someone like Will Strange, UBC Commerce professor.
- Develop education programs, educational literature for administrators/civic officials so they can better understand the actual risk of liability [recommended contact: Bill Bulhozer at Lidstone Young].
- Examine flexible ‘insurance’ model in the Waste Management Act Municipal Sewage Regulation — developer can choose between posting financial security (held and ‘risk managed’ by the developer) and a developer-designed ‘assurance’ plan that demonstrates adequate technical, financial and management capacity to address any failures. Model was endorsed by both local government and developer industry.
- Work with Municipal Financing Authority to explore lower costs associated with green developments.
- To address liability issues, work with Municipal Insurance Association (whose members are involved in half of outstanding ‘leaky condo’ suits).
- Provide an exemption of zoning appeal for projects that meet certain density/green building requirements (appeals are costly and time consuming and developers tend to drop projects rather than risk an appeal).

- Waive or reduce DCC requirements depending on density, affordability, access to transit, etc.
- Create LEED or 'green building' web-based clearinghouse for information — profiling BC LEED-certified and other innovative buildings, etc. (good contact: course materials for course at Royal Architecture Institute of Canada).
- For 'liability issue', address fears of building inspectors through a 'continuing education' program sponsored by the local government management association.
- For 'liability issue' investigate more insurance options (e.g., City of Victoria taking out 10-year 'omission insurance' for Conference Centre), financial impacts of insurance rates (described as 'not that expensive' now, and not likely to change because of any change to small-market BC laws).
- For building code revision: review building code from the perspective of (1) creating buildings with a long life cycle — the current code prescribes practices that do not achieve long life cycle buildings (e.g., building envelopes, air exchange, heating and cooling), and (2) understanding how fixing one problem might adversely affect another prescribed solution (e.g., changes to building envelopes for energy efficiency purposes did not take into account differential heating for east-facing walls — resulting in leaks).
- Look for opportunities to partner in 'demonstration projects' with the Province's 'sustainable' Whistler bid, and with the proposal for a green building testing facility at UBC.
- Demonstration project idea: Build on informal local government support for prospect of collecting rain water on a roof, storing it in the basement, taking the heat out of it to be used for other purposes, and using it to flush toilets.
- Consider 'performance-based zoning': as long as land uses meet standards related to noise, traffic, vibration, air pollution, glare, humidity, fire and explosion hazard (among others), different uses can co-exist, regardless of the nature of the activities in the building.
- Develop a program mandating charettes/DMB for major projects (e.g., all parties discuss vision/objectives for proposed development in early stages of project).

RELEVANT STUDIES, CONTACTS, ETC.

- Holman, L, "Innovation in the Housing Industry" (Ottawa: National Research Council, 2001), www.nrc.ca/irc.
- Lampert, G., "Australian Building Regulation and Liability Reforms — An Update" (Ottawa: Canadian Home Builders Association, Sept 2000) www.chba.ca/news/news.html.
- Lampert, G., "Australian Building Regulation and Liability Reforms" (Ottawa: Canadian Home Builders Association, Sept 1999): www.chba.ca/news/news.html.

- efem arkitektkontor, “Houses Without Heating Systems” (http://www.ebd.lth.se/avd%20ebd/main/Gothenburg/Folder_Lindas_EN.pdf): Successful ‘Recovered heat’ demo project near Goteborg, Sweden: ~3650 heating degree-days (17deg.C base; Vancouver has 2924 HDD, 18 deg. C base), the envelope is superinsulated; most windows face south, with overhangs for summer solar control; and energy-efficient lighting & appliances were used (i.e., low internal heat gains). Report says that construction costs were similar to standard Swedish terrace housing.
- Moyes, R., “CHBA Background Paper: Municipal Accountability for Regulation” (Ottawa: Canadian Home Builders Association, September 2001).
- Moyes, R., “Liabilities in the Residential Sector” (Ottawa: Canadian Home Builders Association, January 1999).
- Advanced Buildings Technologies and Practices: www.advancedbuildings.org.
- Eisenberg, D., Done, R., and Ishida, L., “Breaking Down the Barriers: Challenges and Solutions to Code Approval of Green Building Development”, (Tucson: Centre for Appropriate Technologies: 2002) www.dcat.net/codes/codes.html.
- California Integrated Waste Management Board, “Task Two Report: Green Buildings Program Needs Assessment” (CIWMB, December 2000).
- GVRD Customer Needs Survey Results (D.H. Weber and Associates, November 10, 2000).
- City of Austin’s Green Building Program: <http://www.ci.austin.tx.us/greenbuilder/default.html>.
- Center of Excellence for Sustainable Development (model bylaws for solar access, smart growth, etc.): <http://www.sustainable.doe.gov/landuse/lucodtoc.shtml>.

COMMENTS

- Cross reference list of green building practices with LEED BC draft certification categories.
- For non-regulatory barrier study, pursue (1) convincing banks to offer preferred rates for better performing, more saleable buildings, and (2) working with the Real Estate industry to find out why housing prices don’t reflect durability, lower operating costs, and improved health.
- For introduction (what is a ‘green building’), and for non-regulatory barrier study: Encourage construction of (1) more long-lasting, ‘architecturally beautiful’ buildings that generation after generation will cherish, (2) ‘future-proof’ buildings like the schools in Sweden that can be converted to condos when enrolment drops off, and (3) getting the benefit of ‘embodied’ energy in existing building stock.
- Consider now-disbanded Alberta program that helped companies test innovative products (grants of \$1million added \$59 million to the economy).

LAND USE

L1 MULTI-USE DEVELOPMENT

GREEN PRACTICE CODE/DESCRIPTION

Planning for close proximity between homes, workplaces, schools and services.

REGULATORY BARRIERS

- Exclusionary land use patterns (embedded in OCPs, zoning and municipal policies).
- Lack of performance-based zoning and adjacency decisions.

POTENTIAL IF BARRIER REMOVED

Significant potential to create more walkable, liveable, and complete communities and improve problems associated with urban sprawl and automobile dependence.

POTENTIAL SOLUTIONS

- Promote sustainable, complete community patterns in OCP.
- Introduce Comprehensive Development and Multi-use zones and 'spot zoning' for rural areas (custom designing each site using primarily ecological features).
- Phase-out some zoning exclusions [Expand the range of conditional uses in zoning district schedules].
- Information campaign promoting mixed uses and complete communities.
- Education for public officials, development community, and for general public; demonstration projects.

RELEVANT STUDIES, CONTACTS, ETC.

- Potential model for comprehensive development zone: Dade County, Florida which does zoning on a 50-200 acre community scale, necessitating mixed-use and green space in each community.
- Potential model for 'spot zoning': Highlands (Greater Victoria).

COMMENTS

- Public acceptance at root of regulatory barrier.

L2 INCREASED DEVELOPMENT DENSITY

GREEN PRACTICE CODE/DESCRIPTION

Increased multi-family areas, infill, small lot subdivision, division of existing buildings into suites, in order to increase the range of housing in each neighbourhood and increase efficiency of transportation/utility infrastructure.

REGULATORY BARRIERS

- Low density requirements, restrictions on suites [Note: secondary suites have been in Vancouver's RSI for two years].
- Restrictions on secondary suites and infill development, units/lot, setbacks, percentage site coverage, etc.
- Minimum parking requirements, zoning bylaws that restrict number and location of private entrances.
- Fire/emergency rules requiring access from principal street to all suites.
- Side-yard requirements for access to coach houses at the back of lots (16 ft) discourage more infill.
- [The recent edition of the City of Vancouver's Building Bylaw allows access routes of 6 m width which should accommodate most designs. Alternatives include creative layouts using hammerheads, turnarounds etc. to provide fire dept access to within 45 m of building entrances.]

POTENTIAL IF BARRIER REMOVED

- Significant potential to make better use of developed land, existing infrastructure, buildings stock, and to reduce automobile dependence.
- Increased commercial opportunities within the neighbourhood by providing critical market densities.

POTENTIAL SOLUTIONS

- Create zoning that permits infill options (coach houses, granny flats, secondary buildings, 'row houses' (the housing form that best supports public transit), use of excess 'bedroom' capacity in city neighbourhoods (e.g., finding incentives for 'empty nesters' to downsize and make room for young families).
 - Legalization of secondary suites through zoning reform in all single family areas.
 - Allow smaller lot sizes.
 - Provide more opportunities for fee simple.

- Remove/reduce sideyard requirements for coach houses.
- Consider provincial government intervention because it is difficult for local governments to overcome local resistance to density.
- Re-assessment of parking requirements for residential areas regarding secondary suites.
- Demonstrations projects done well to change attitudes and prejudices.
- Education for public officials and for general public.
- Reassessment of Growth Strategies Legislation.
- Review of emergency access requirements to identify safe alternatives.

COMMENTS

- For non-regulatory study: (1) look at incentives like allowing 'empty nesters' to place proceeds from the sale of their home into RSPs in order to make room for younger, larger families, (2) look at 'full cost accounting' to change development behaviour, (3) consider concept of closing side streets, selling the land, building new fourplexes, and buying parks and other community features with the proceeds.
- Note: recent edition of the City of Vancouver's Building Bylaw allows access routes of 6 m width which should accommodate most designs. Alternatives include creative layouts using hammerheads, turnarounds etc. to provide fire dept access to within 45 m of building entrances.

L3(A) BROWNFIELD DEVELOPMENT

GREEN PRACTICE CODE/DESCRIPTION

Redevelopment of contaminated land in urban areas.

REGULATORY BARRIERS

- City industrial use zoning and policy restrictions.
- Development standards (new services).
- Contaminated sites standards and regulations at provincial and federal level.

POTENTIAL IF BARRIER REMOVED

Substantial capacity to develop and “green” the downtowns and waterfronts of older areas in cities.

POTENTIAL SOLUTIONS

Extend zoning relaxations

- Permit creative management of contaminated soils on larger sites.
- Change land use policy to encourage brownfield development through various incentives.
- Demonstration projects on cost-effective ways to deal with brownfield sites.
- Shared liability for contaminated sites (e.g., funds, insurance) [True but not related to business risk].
- Better examination of long-term bio-remediation alternatives.
- Amend *Local Government Act* to (1) authorize local governments to exempt brownfield areas from property tax (existing authority only covers industrial land or business land), (2) authorize variable tax rate systems, and (3) authorizing local governments to designate brownfield sites as improvement districts (thereby enabling a bunch of tools including tax breaks, grants and loans). Changes would model the Ontario *Brownfields Statutes Amendment Act*.

RELEVANT STUDIES, CONTACTS, ETC.

- Ontario's *Brownfields Statute Amendment Act*, S.O. 2001, c. 17).
- Clayton Research, “Brownfield Redevelopment: From Liability to Opportunity,” 1 Clayton Housing Report (Vol. XI) 1 (July 2001).

COMMENTS

- Note: contaminated sites are regulated under provincial legislation, but the City of Vancouver is statutorily bound to enforce them.

L3(B) BUILDING REHABILITATION

GREEN PRACTICE CODE/DESCRIPTION

Re-use of existing building stock with or without additions.

REGULATORY BARRIERS

- Zoning standards (such as parking).
- Seismic standards.
- Fire codes.
- Social amenity requirements, community amenity charges on retrofits.

POTENTIAL IF BARRIER REMOVED

Substantial capacity to

- retain and redevelop existing building stock;
- preserve heritage;
- reduce construction waste stream; and
- preserve 'existing stock,' 'sunk investments', and 'embodied energy'.

POTENTIAL SOLUTIONS

- Extend zoning relaxations to accommodate issues associated with older and retrofitted buildings.
- Reduce community amenity contributions required for more expensive retrofits and upgrades.
- Address building code issues.
- Demonstration projects of successful retrofits.
- Partial exemptions from seismic or fire standards where needed [Note: relaxation of seismic standards and fire codes would be contrary to City of Vancouver policy and create acute liability problems. Alternative methods of compliance should be evaluated (e.g., Gastown where some flexibility was approved on the condition of voluntary upgrades over 20 years).
- Review why seismic requirements for residences are less stringent than those for offices.

- Review potential barriers arising from competing 'social policy' objectives: environment, heritage, social housing.
- Incentives such as density bonuses, front of line privileges, etc.
- Establish salvage material exchanges.
- Provide professional assessment expertise.

RELEVANT STUDIES, CONTACTS, ETC.

- Recommended contacts: Paulo/Guido Pelee, developers of old 'Birks Building' at the corner of Granville and Hastings.

COMMENTS

- For non-regulatory study, pursue exemption from parking/DCC requirements as an incentive.

L4 REDUCECD PARKING ALLOTMENT

GREEN PRACTICE CODE/DESCRIPTION

Changes to parking requirements based on formulas applied by floor area or number of suites.

REGULATORY BARRIERS

- Parking bylaws.
- Engineering modelling and assumptions that staff refer to when considering applications.

POTENTIAL IF BARRIER REMOVED

Substantial potential for:

- increasing the redevelopment of inner city sites.
- freeing up development funds for innovative green approaches and social amenity contributions.
- create safer, quieter, more pedestrian-friendly residential areas and improved air quality.

POTENTIAL SOLUTIONS

- Public education and local government policy reform to increase support for alternatives to parking spaces and reduce parking requirements where access to transit exists.
- Changes to *Local Government Act* parking bylaw and development permit provisions. Changes would empower municipalities to require/allow alternatives to parking spaces such as investment in transit, investment in car share, coops, bicycle infrastructure, covenants to provide TDM services.
- Draft model bylaws.
- Encourage temporary trade-offs (i.e., park in lot across the street for 5 years, then reduce to zero).
- Develop mixed-use neighbourhoods so cars aren't necessary (e.g., people won't need to drive as much).
- Changes to modeling approaches that do not consider non-vehicle modes.
- Education of engineering departments on the multiple objectives of green urban development to mitigate the single-objective focus of transportation engineering approaches.
- Reduce parking requirements at appropriate sites to accurately reflect parking demand.

RELEVANT STUDIES, CONTACTS, ETC.

- Recommended contact: Paul Pinsker, City of Vancouver.
- Potential model for measuring parking demand: Mississauga (parking demand study concluded 35% over budget for parking).

COMMENTS

Non-regulatory:

- Parking requirements typically driven by tenants (not municipalities)—need to get consensus from realtors.

L5 LAND TENURE REFORM

GREEN PRACTICE CODE/DESCRIPTION

Reforms to ensure affordability in urban areas and increased density such as smaller lots, shared ownership where several families share one home, and land/housing 'trusts' (land held in trust with homeowner having ownership of improvements only).

REGULATORY BARRIERS

- *Strata Property Act* cumbersome, not well suited to home-sharing, makes high-density living unattractive (rules set by limited set of neighbours).
- Zoning restricts strata subdivisions (even in situations where two families in home legal).
- *Assessment Act*, *Local Government Act*, and *Taxation (Rural Areas) Act* require taxation of land and improvements at same rate.
- Planning regulations favour condos for innovation; but the market prefers freehold.

POTENTIAL IF BARRIER REMOVED

- Land/housing trusts likely have limited potential due to homebuyers' desire for appreciation on land value.
- Potential for home sharing is greater.
- Smaller lots permit creative smaller developments, increased densities and more affordable housing.

POTENTIAL SOLUTIONS

- Allow tenants in common to register sharing agreement against title.
- Develop a program to support 'small lot' developments in existing single family areas, where larger lots are the norm.
- Make freehold title available — with appropriate management system.

RELEVANT STUDIES, CONTACTS, ETC.

- Geller, M., "Taking the Condo out of the Box", Vancouver Sun.

INFRASTRUCTURE SERVICES

I1 REDUCED ROADWAYS

GREEN PRACTICE CODE/DESCRIPTION

Reducing roadway allocations (typically 20-35% of land area). Add greenway on each side of road to allow for storm run-off, trees and planting and protected sidewalks/bike paths.

REGULATORY BARRIERS

- Development standards (based on traffic studies, maintenance and snow-clearing assumptions).
- Emergency access standards (required specified widths, turning radius of largest emergency vehicles, and surfaces permitted for emergency access).
- Innovative, dense developments with narrow roads often have to become condo to get around road width issues.
- [The recent edition of the City of Vancouver's Building Bylaw allows access routes of 6 m width which should accommodate most designs. Alternatives include creative layouts using hammerheads, turnarounds etc. to provide fire dept access to within 45 m of building entrances.].

POTENTIAL IF BARRIER REMOVED

- Coupled with smaller lots, neighbourhood density can increase from 15 dwellings/Ha (typical) to 22 [or more].
- Infrastructure costs associated with roads are reduced to the developer, making green, innovative and amenity contributions more feasible.
- Reduced energy consumption in roadway construction and maintenance, as well as reduced impermeability of neighbourhood.

POTENTIAL SOLUTIONS

- Introduce small, quick response emergency units (e.g., purchase "smaller urban (European) fire trucks" for future vehicle replacements; in response to access failures during earthquake, Japan has purchased motorcycles with high pressure mist systems).
- Design alternatives to turning radius (including 'grasspave' and other techniques in parks, greenspaces, and low-traffic parking lots — to support emergency vehicles while still allowing grass to grow).
- Prohibit parking in lanes in order to secure fire response access.
- Develop/promote model alternative development standards (like ACT).

- Educate public, public officials re safety and road width and cost savings.

COMMENTS

- Note: recent edition of the City of Vancouver's Building Bylaw allows access routes of 6 m width which should accommodate most designs. Alternatives include creative layouts using hammerheads, turnarounds etc. to provide fire dept access to within 45 m of building entrances.

12 LOCAL STORMWATER ABSORPTION

GREEN PRACTICE CODE/DESCRIPTION

Green roofs and/or on site systems to divert stormwater from municipal system and irrigate vegetation, recharge groundwater [local geology permitting]. Create catchment areas on all sites and biofiltrate, replace asphalt lots with ground- or grass-pave, move water off roof through site water features to reduce stormwater impact on city services.

REGULATORY BARRIERS

- Fire risk (green roofs).
- Stormwater connections are sized regardless of local absorption capacity.
- Development standards requiring connection to storm drain, and 'construction norms'.
- Local government fear of liability for flooding, requirements for a redundant system, or expertise to be able to check engineered systems.
- Development Cost Charges (DCCs) fail to recognize cost savings.

POTENTIAL IF BARRIER REMOVED

- Variable capacity to reduce water pollution, flows and water consumption in relation to irrigation.
- Significant savings to local governments for lessened treatments.
- Lower costs to developers.
- Cost savings on reduced infrastructure requirements and treatment of stormwater in treatment plants.
- More opportunities to restore small local watersheds for salmonid habitat enhancement.
- [Green roofs are currently not regulated under building codes, and fire risk can be addressed by appropriate designs.]

POTENTIAL SOLUTIONS

- Stronger stormwater regulations (flow and quality).
- Stormwater sizing allowances for alternative systems.
- Guidelines for acceptable alternatives.
- Educate public/public officials.
- See 'Liability and Risk' paper.

- DCC reform.
- Allow/mandate catchment areas, ground/grass-pave, roof collection.

COMMENTS

- Note: Green roofs are currently not regulated under building codes, and fire risk can be addressed by appropriate designs.

13 LOCAL WASTE WATER TREATMENT

GREEN PRACTICE CODE/DESCRIPTION

Innovative, effective, reliable (but not well-known) local waste water treatment systems that separate grey water from toilets for treatment and reuse that may be appropriate for certain sites in certain infrastructure systems.

REGULATORY BARRIERS

- *Health Act* Sewage Disposal Regulation requires septic tanks or mechanical/chemical treatment for grey and/or black water.
- Alternate grey and black water systems not recognized by local health authorities and building inspectors.
- Split plumbing systems prohibited by plumbing code [too expensive anyway: best is rain water for sinks, discharge].
- DCCs discourage practice [is this true, or could DCCs be used to encourage different practices?].
- Some local governments (e.g., Fraser Fort George RD) don't allow septic or innovative systems, and residents as a result are forced to build lagoons that occupy acres of land.
- Multi-party agreements with regional agencies to manage and pay for waste water treatment at the regional scale — especially to a lower level (primary v. tertiary treatment).
- Provincial plumbing code required direct connection to local municipal sanitary sewer where one exists.

POTENTIAL IF BARRIER REMOVED

- Great potential in both serviced and unserved areas for saving large volumes of treated water and irrigating landscapes (subject to health concerns), flushing, car washing, etc.
- Large potential in unserved areas for better groundwater protection and nutrient recycling.
- Significant savings to municipalities (less treatment).

POTENTIAL SOLUTIONS

- Sewage Disposal Regulation: differentiate between grey water and black water.
- Include alternative treatment systems in small flow regulations.
- Reform plumbing code to recognize alternatives (CMHC has developed specific recommendations).

- DCC reform.
- In buildings, show potable water separately — all sinks for hardwash only and grey water.
- Relax restrictions for buildings without pets or children (e.g., institutions, commercial buildings, some offices).
- Address a decentralized, local (non-regional) sewage treatment strategy.
- Ensure cost savings of reduced flows to regional facilities are available to the developer to offset operating costs or decentralized systems.

RELEVANT STUDIES, CONTACTS, ETC.

- National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices (upcoming guide from the Canadian Waste Water Association).

14 RAIN WATER COLLECTION AND USE

GREEN PRACTICE CODE/DESCRIPTION

Collection of rain water for bathing, washing, gardening and flushing.

REGULATORY BARRIERS

- Plumbing Code requirement for all water piped to any fixture to be potable.
- Interconnection of two water supplies and split plumbing systems prohibited by plumbing code [Water storage tanks too expensive — go to drip irrigation, low water plants, etc. Possible to collect 12 inches of rain water on roofs or collect in pond].
- DCCs discourage practice fail to recognize cost savings.

POTENTIAL IF BARRIER REMOVED

- Great potential for water use reduction in unserved areas (subject to health concerns).
- Modest potential in served areas (subject to health concerns).

POTENTIAL SOLUTIONS

- Amend plumbing code related to potable water (i.e., CHMC recommendation).
- Demonstration projects.
- DCC reform.

15 LOCAL ENERGY GENERATION

GREEN PRACTICE CODE/DESCRIPTION

Producing renewable energy locally in grid-connected areas to reduce demand on utilities (e.g., building-integrated photovoltaics, thermal co-generation).

REGULATORY BARRIERS

- Expense associated with interconnection requirements [note: non-regulatory].
- Inability to obtain net metering agreements for small power systems (i.e., Deducting local power generated at meter).
- BC Hydro limit for local systems of 5.5 kVA (very small).
- Design guidelines for areas that will not support visible energy infrastructure.
- Zoning that does not permit 'industrial uses' such as generating energy (co-gen) within various high-load areas.
- Lack of set policy for buy-back credit for providing generated electricity back to the grid.
- Local development permit/building appurtenances bylaws limiting exterior appearance and extraneous elements (solar panels, PV panels, co-gen plant appurtenances, etc.).

POTENTIAL IF BARRIER REMOVED

- Fairly small at this time for low density residential areas, largely due to high cost of renewables.
- [Long-term potential is good: Significant long-term efficiencies].
- Potentially high future opportunities for district systems, ground source, ocean source and small-scale PV to support some small, occasional demands.
- Significant opportunities to offset peak flow demands.

POTENTIAL SOLUTIONS

- Changes to electrical utility policy to foster net metering, local (micro) grids, and local generation with realistic technology and payments.
- Changes to zoning and design guidelines to encourage well-designed and appropriate energy generation technology.

BUILDING SITING AND FORM

S1 SOLAR AND DAYLIGHT ACCESS

GREEN PRACTICE CODE/DESCRIPTION

Protecting access to sunlight and daylight (allowing people to rely on passive solar) can lead to energy conservation, and enhanced environmental quality [Two separate categories: (1) daylight — design to avoid glare and heat gain, and (2) solar heat gain — use to reduce energy load].

REGULATORY BARRIERS

- Lack of 'emphasis' in policy and zoning—current massing requirements/shadow analysis is more comfort/aesthetic than energy oriented.
- Views considered more than light.

POTENTIAL IF BARRIER REMOVED

- Depends on type of development and climate zone. Daylight and sun already considered in Toronto and some BC city bylaws—these considerations must be balanced with density issues and other community needs.
- [Significant reduction in energy demand and enhanced reliability for local energy systems].
- Lowered energy use, more energy efficient buildings, potentially up to 30% or more compared to conventional buildings.

POTENTIAL SOLUTIONS

- Solar and daylight planning policy directives.
- Reform planning bylaws to define solar rights.
- Model policy guidelines.
- Educate public, public officials and the development industry on design that utilizes passive solar strategies.

RELEVANT STUDIES, CONTACTS, ETC.

- 'Right to Light summary': <http://www.urbanecology.org>

S2 BUILDING HEIGHT PROJECTIONS

GREEN PRACTICE CODE/DESCRIPTION

Increased floor-to-floor height to enhance long-term adaptability and daylight access.
[Eliminate suspended ceilings].

REGULATORY BARRIERS

- No allowance in development envelopes, zoning and guidelines for green design features that may increase building height, or for additions of height to permit financial offsets for green development capital costs.
- Height restrictions in building codes make it difficult to bring in fresh air — resulting in poor air quality for many apartment buildings; and restrict options for heating and cooling (Code requires heating source in every room — resulting in poor efficiency baseboard heaters).

POTENTIAL IF BARRIER REMOVED

- Modest due to other factors limiting allowable height — most valuable in environments where density limits are important to developers (urban areas) and where existing heights are already significant.
- Densification (see L5).

POTENTIAL SOLUTIONS

- More flexibility in zoning bylaws for features that demonstrate environmental payback.
- Policies for height relaxation where merit can be demonstrated — possibly linked to green building assessment programs such as LEED (i.e. additional height permitted for increased green performance scores).
- Allow exchange of increased building height for green building amenities such as natural ventilation, green roofs, etc.

S4 BUILDING HORIZONTAL PROJECTIONS

GREEN PRACTICE CODE/DESCRIPTION

Thicker walls for insulation, alternative materials (straw, earth); deep roof projections for weather protection and durability, awnings and sunshades for natural ventilation and cooling.

REGULATORY BARRIERS

- Zoning envelope too restrictive.
- Calculation of building dimensions (floor area) penalize thicker walls.
- Building code fire separation provisions.
- [City of Vancouver has already accommodated thicker walls in Zoning bylaw in addressing Barrett Commission on Leaky Buildings.]

POTENTIAL IF BARRIER REMOVED

Huge potential for better performing buildings, better energy efficiency.

POTENTIAL SOLUTIONS

- Relaxation of zoning envelope restrictions (non-fire related).
- Sideyard and FSR calculations for thickened walls based on inside measurement.

COMMENTS

- Note: City of Vancouver has already accommodated thicker walls in Zoning bylaw in addressing Barrett Commission on Leaky Buildings.

S6 EXTERIOR BUILDING ACCESSORIES

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

- Design guidelines requiring certain character expressions in neighbourhoods.
- Local development permits and zoning bylaws for building appurtenances (see I5).

POTENTIAL IF BARRIER REMOVED

Potential for increasing building performance.

S6 BUILDING SHADING BY LANDSCAPING FEATURES

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

Potential issues with tree bylaws in some areas where existing trees may significantly hamper solar access.

POTENTIAL IF BARRIER REMOVED

Small potential for increased performance at an overall scale analysis.

POTENTIAL SOLUTIONS

Include clauses in tree bylaws that permit removal of trees that limit green building performance, with provisions the tree is replaced elsewhere — on the site or nearby park.

S7 DAYLIGHTING

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

See S1.

BUILDING ENVELOPE AND MATERIALS

M1 ALTERNATIVE MATERIALS

GREEN PRACTICE CODE/DESCRIPTION

Use of straw bales, cob, rammed earth, cordwood log stackwall, and other alternative building materials.

REGULATORY BARRIERS

- Building codes generally only recognize conventional construction materials ('brand names') — proving compliance and seeking engineer certification is onerous for applicants.
- Design guidelines that require the use of various materials and colours and massing patterns that may not be consistent with alternative materials.

POTENTIAL IF BARRIER REMOVED

- Limited but significant. Use of unprocessed, native materials reduces dependence on manufactured materials.

POTENTIAL SOLUTIONS

- Develop technical standards (CSA/MC) for alternative materials and incorporate into codes.
- Allow 'innovative' materials to be more readily considered.
- Ensure design guidelines do not foreclose on the use of alternative materials in the appropriate environments.

RELEVANT STUDIES, CONTACTS, ETC.

- Alternative materials may be evaluated by the Canadian Construction Materials Website: www.nrc.ca/ccmc/home_e.shtml.

M2 NON-LISTED MATERIALS

GREEN PRACTICE CODE/DESCRIPTION

Use of materials like fly-ash and waste paper in building materials (e.g., in foundation block systems) that have not been CSA approved or listed as “approved” by an agency like the Canadian Construction Materials Centre (CCMC).

REGULATORY BARRIERS

- Code references to standards that must be met for approved use: Listing is time consuming and expensive, making innovation by small companies very difficult.

POTENTIAL IF BARRIER REMOVED

- Potential to reduce demand for raw materials, reduce waste, utilize waste resources, promote sustainable business development, and make construction more affordable.

POTENTIAL SOLUTIONS

- Further assistance programs for testing of innovative materials with environmental benefits.
- “Innovative option” permits that allow trial use of innovative materials at applicant’s risk.
- Assistance programs to insure risk of innovative pilots (see ‘Liability Paper’).

COMMENTS

- Thorough evaluation of construction materials is essential to the success of this initiative. Failure on the scale of the ‘leaky condo’ crisis may stifle the program at birth.
- Note City of Vancouver’s informal support for using up to 30% flash in residential foundations (additional drying time concerns reported to be ‘negligible’).

M3 USED AND REPROCESSED MATERIALS

GREEN PRACTICE CODE/DESCRIPTION

Use of materials (e.g., timber and framing lumber, brick, stone, structural and architectural metals and doors) that have been removed from other uses for “raw’ reuse, or reprocessed for another use.

REGULATORY BARRIERS

- Barriers are small: If used for structural or building envelope application, materials must be graded or certified by a qualified professional.

POTENTIAL IF BARRIER REMOVED

- Potential to reduce demand for raw materials, reduce waste, utilize waste resources, promote sustainable business development, and make construction more affordable.

POTENTIAL SOLUTIONS

- None known; regulatory constraints are reasonable.

COMMENTS

- Thorough evaluation of construction materials is essential to the success of this initiative. Failure on the scale of the ‘leaky condo’ crisis may stifle the program at birth.

M4 DECONSTRUCTION SALVAGE

GREEN PRACTICE CODE/DESCRIPTION

Deconstruction of buildings and civil works to optimize recovery of materials as an alternative to more prevalent “smash and dispose” demolition.

REGULATORY BARRIERS

- WCB site liability and public liability insurance: On larger projects, severe access restrictions prevent outside contractors from qualifying for deconstruction, prevent public demolition sales [Note: at least one industry representative doesn't find WCB to be a barrier. See also different views in comments column].
- Municipal demolition permits are required to begin removing materials, but are usually not issued until the building permit is fully processed — allowing little or no time for deconstruction. [Note: it is possible to get a demolition permit before getting a building permit if for stripping the building as opposed to actual demolition. Note also that only the City of Vancouver will not issue a demolition permit until the development permit is ready (to prevent buildings being taken down and not replaced)][Note: in the City of Vancouver, demolition can usually commence well before the building permit is issued, except for demolition of residential rental buildings].
- Other municipal by-laws and/or policies e.g., property tax assessment (developer has to pay as long as building is standing); residential tenancy by-law (preserve rental space).

POTENTIAL IF BARRIER REMOVED

- Large potential to reduce demand for raw materials, reduce waste, and stimulate the salvage business, provide source of quality building materials to the local building industry.
- [Note: there may be only a 20-year window for this industry because modern construction practices (e.g., nail guns and glues) and 'rotting' will render most of the material useless].

POTENTIAL SOLUTIONS

- Address liability issues related to site access.
- Change demolition permit timing, substituting other means to ensure site is not left vacant or abandoned (letters of contract or bond instruments?).
- Create integrated approval process (as opposed to sequential).
- Create 'front of the queue' process for green building applications (e.g., if goal is LEED gold or silver).
- Address 'structural integrity' issues in Code.

RELEVANT STUDIES, CONTACTS, ETC.

- Discovery Economic Consulting, *Using Tax Shifting and Tax Incentives to Promote the Deconstruction/Renovation Industry*, (Victoria: Ministry of Environment, Lands and Parks, 2001).
- Catalli, V., and Williams, M., "Designing for Disassembly", *Canadian Architect* 27 (January 2001).
- Taggart, J., "Salvaged Materials in New Buildings" *Canadian Architect* 32 (January 2001).
- Grant, Brian, "Developing a Provincial De-construction Strategy," UBC Continuing/Distance Education for Engineering and Architecture in Conjunction with the GVRD (February 11, 1999).

COMMENTS

Address:

- Infrastructure works e.g., bridges have limited potential for deconstruction but great potential for recycling.
- WCB does not have special regulations for deconstruction. The same regulations apply to both demolition and deconstruction projects.
- This is governed by municipal by-laws not WCB.
- It is important to municipalities that there be a continuous process from initial salvage work to building deconstruction and final demolition. What they do not want is a building that is partially deconstructed and left sitting there for any period of time until the remainder is demolished.

For non-regulatory study

- Underpricing of transportation, landfilling, natural resources, energy and overpricing of labour means recycled materials have to compete with low cost of new materials.
- Cost relationship between value of salvage materials, cost of salvaging, and cost of landfilling.
- Market is undeveloped which means that matching buyers and sellers for quantities, dates and locations is difficult, while transport and storage is prohibitively expensive.
- Non-conformity in grade enforcement by inspectors means unpredictability.
- Damage resulting from deconstruction.
- Labour costs high on union sites.
- Non-uniform tipping fees, hauling costs and infrastructure available in province.

- Lack of tax incentives.
- Current strength of market is due to early 1990s landfill ban on drywall. Once drywall is removed, it became very easy to salvage insulation, electrical boxes and two-by-fours. GVRD is considering a similar landfill ban on wood, but must address lack of markets for painted wood products first.

M5 RENOVATION OF EXISTING BUILDING STOCK

GREEN PRACTICE CODE/DESCRIPTION

Meeting demand for buildings by renovating existing building instead of constructing new buildings.

REGULATORY BARRIERS

- Code requirements are often difficult or prohibitively expensive to meet in older building stock (e.g., costly seismic upgrades for older buildings in Victoria leave them largely vacant).
- *Assessment Act*, *Local Government Act*, and *Taxation (Rural Areas) Act* require taxation of land and improvements at the same rate — providing an incentive to tear buildings down, rather than leave them standing to renovate.
- [City of Vancouver building By-law contains numerous relaxations for existing buildings].

POTENTIAL IF BARRIER REMOVED

- Enormous potential: reuse and renovation of existing buildings reduce waste and save energy.

POTENTIAL SOLUTIONS

- Move Code towards “objective-based” standards (e.g., allow residents timely escape) and away from costly and prescriptive standards.
- Change property tax structures to provide renovation incentives.
- Permit reduced community amenity charges and DCCs to offset excess retrofit costs where appropriate.

RELEVANT STUDIES, CONTACTS, ETC.

- [Heritage Canada report].

COMMENTS

- Objective-based codes are in the process of development and should be issued by 2004-2005 in Canada. The City of Vancouver building By-law contains numerous relaxations for existing buildings.

Non-regulatory barriers:

- Income tax distortions on renovations.
- Underpricing of heritage value in community.
- Remove disincentives (many buildings are torn down because they are taxed while empty and waiting a new use, or because landowner can get revenue from parking).
- Tax structures usually favour empty lots over vacant buildings leading to an incentive to tear down old buildings rather than leave them standing and eventually renovate them.

BUILDING PLUMBING SYSTEMS

P1 COMPOSTING TOILETS

GREEN PRACTICE CODE/DESCRIPTION

Use of natural biological digestion processes to treat human waste.

REGULATORY BARRIERS

- Plumbing/Health authorities unfamiliar with process (require a full standard disposal system) for grey water [Composting toilets replace black water not grey water].
- Reduced water consumption/sewage capacity not reflected in 'DCCs'.
- Code barriers related to safety and health (small children falling into shafts), and 'future retrofits' (requiring oversized piping to ensure toilet can be replaced by conventional toilet).
- *See also p4 'non-potable water use' and I3 'local waste water treatment'.*

POTENTIAL IF BARRIER REMOVED

- Clean, uncontaminated, nutrient-rich compost material suitable for landscaping application.
- Reduce potable water consumption in commercial (1/3) and residential (1/4) buildings.
- Eliminate malfunctioning septic systems (major cause of groundwater contamination).
- Reduce raw/semi-treated sewage load into waters (GVRD/CRD).

POTENTIAL SOLUTIONS

- Focused education for health authorities, plumbing inspectors.
- Research program and pilot projects.
- Change plumbing code to require operation/maintenance instructions to be permanently affixed to building.
- Encourage adjustments to DCCs for sewage and potable water connections, piping, and plant capacity.
- Codes: address definition of "fixtures" and "water closets", safety requirements for shaft dimensions, and operating/maintenance concerns.
- Create CSA composting toilet performance standards.

P2 WATERLESS URINALS

GREEN PRACTICE CODE/DESCRIPTION

Use of an odourless fluid and specially designed waste-traps to eliminate need for flushing water.

REGULATORY BARRIERS

- Plumbing code has no specific prohibitions, but inspectors unfamiliar with the technology require additional documentation and references.
- Slope requirements for installed waste water piping.
- Few municipalities recognize water consumption benefits when adjusting DCCs.
- Lack of correct “fixture flow rates”.

POTENTIAL IF BARRIER REMOVED

- Moderate potential to reduce water consumption.
- Costs are much less than for conventional toilets.

POTENTIAL SOLUTIONS

- Focused education.
- Revise Plumbing Codes to update tables of ‘fixture units’ in order to reflect current water conserving fixtures and technologies.
- Create CSA waterless urinal performance standards.

P3 SALVAGE OF PLUMBING FIXTURES AND PIPING

GREEN PRACTICE CODE/DESCRIPTION

Re-use of salvaged plumbing fixtures—common in owner-built homes, but rare in commercial and institutional projects.

REGULATORY BARRIERS

- Building Code does not prohibit re-use, but sets maximum water use standards for toilets.

POTENTIAL IF BARRIER REMOVED

- Limited potential to reduce material consumption, especially if old fixtures are not efficient.

POTENTIAL SOLUTIONS

- None recommended:
 - Maximum water use standards are integral to the concept of sustainable buildings.
 - Reuse is not recommended for fixtures and fittings that use more water than allowed by current regulation.
 - Difficult or impossible to demonstrate through permanent labelling that salvaged material is certified to comply with the relevant standard cited by the Code.

P4 NON-POTABLE WATER USE

GREEN PRACTICE CODE/DESCRIPTION

Collection of grey water (from baths, clothes washers, etc.) and rain water for irrigation or toilet flushing.

REGULATORY BARRIERS

- Lack of guidance in Plumbing Codes for non-potable water systems.
- Functionally, plumbing codes greatly inhibit widespread use (e.g., every water distribution system must be connected to a public water main or a private potable water supply system; and only "potable water" can be used for "all fixtures").
- Unrealistic or inappropriate application of potable water quality standards and guidelines.
- No non-potable water quality guidance for designers or regulators.
- Few municipalities recognize water consumption benefits when adjusting DCCs.

POTENTIAL IF BARRIER REMOVED

Attractive targets for water conservation because irrigation accounts for 20-40% of water use, and toilet and urinal flushing accounts for 80% (commercial) and 33% (residential) of use.

POTENTIAL SOLUTIONS

- Update plumbing code technical requirements (particularly recognition that not all fixtures require potable water).
- Amend plumbing code to:
 - colour code or label of pipe and plumbing components carrying non-potable water;
 - set guidance on appropriate backflow preventers and cross-connection prevention for reuse systems;
 - allow pressure differences between potable and non-potable systems; and
 - allow location of non-potable water pipes within a building and trenches.
- Address health concerns by:
 - focused education of health authorities and plumbing inspectors; and
 - research program, long-term monitoring, pilot projects.

P5 SEWAGE CONVEYANCE AND TREATMENT

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

See P1.

P6 WATER PIPE SIZING

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

- Plumbing code requires prescriptive Fixture Unit sizing which does not allow engineered pipe sizing.
- Local municipalities do not have the expertise to check any 'engineered pipe sizing' systems.

POTENTIAL IF BARRIER REMOVED

Reduces consumption of materials (piping and trim).

POTENTIAL SOLUTIONS

- Change plumbing codes to reflect the use of actual flow to fixtures.
- Educate local governments.

BUILDING HVAC SYSTEMS

H1 NATURAL VENTILATION AND COOLING

GREEN PRACTICE CODE/DESCRIPTION

Use of sophisticated computer programs that allow designers to explore different natural air movement alternatives.

REGULATORY BARRIERS

[Depends on specific feature]

- Lack of consideration in national/BC building codes — alternative means typically require extensive analysis and documentation.
- Code requirement for mechanical ventilation system in almost all buildings.
- Code requirements for screening and weather shielding for intake and exhaust outlets.
- Code prohibitions against use of “public corridors” and stairways as return-air plenums.
- Requirements for fire and smoke separations between different suites, occupancies and spaces.
- Requirements for duct smoke and fire dampers that connect different fire compartments.
- Smoke and fire control in interconnected floor spaces and mezzanines.
- Difficulty verifying compliance with ventilation rates and thermal comfort.
- [The City of Vancouver has adopted energy conservation regulations based on ASHRAE 90.1 and the National Energy Code. City regulations do not discourage designers from innovative energy efficient designs, they encourage it through ASHRAE/NEC performance standards.]

POTENTIAL IF BARRIER REMOVED

Considerable potential: 15% of energy consumption in BC buildings is due to mechanical air conditioning; reducing need for mechanical air conditioning reduces capital costs.

POTENTIAL SOLUTIONS

- Increase awareness of computer-aided design tools and natural principles (e.g., what air will do).
- Well-defined Building Code criteria on how to demonstrate equivalent performance to Code requirements using natural ventilation design analyses (criteria should specifically address fire and smoke safety issues of natural ventilation design strategies).

- Education of design professionals and regulatory authorities on natural ventilation benefits, design techniques, procedures and analysis tools.

COMMENTS

- The City of Vancouver has adopted energy conservation regulations based on ASHRAE 90.1 and the National Energy Code. City regulations do not discourage designers from innovative energy efficient designs, they encourage it through ASHRAE/NEC performance standards.

H2 SOLAR COLLECTORS

GREEN PRACTICE CODE/DESCRIPTION

Collection of solar energy to heat buildings, heat service water or generate electricity.

REGULATORY BARRIERS

- Fire resistance requirements in building codes may limit wall-integrated collectors near property lines.
- Zoning bylaws limiting 'unsightly equipment', building shape/height, selection of exterior finishes.
- Lack of protection for a property owner's 'solar rights'.
- [In the City of Vancouver, building codes should not impede the use of solar collectors on a roof. Photo-voltaic cells and solar water convection devices are not restricted].

POTENTIAL IF BARRIER REMOVED

Solar water heaters are cost-effective (on lifecycle basis) in most BC locations. Market barriers exist for energy generation (see for example E2).

[Potential is significant reduction of energy demands and thus increased viability of micro-renewable-based energy generation systems].

POTENTIAL SOLUTIONS

- Encourage adoption of zoning requirements that protect solar access during the heating season. (e.g., Boulder, Colorado).
- Encourage zoning requirements that specifically conditionally exempt solar collectors from set back/height restrictions and aesthetic restrictions.
- Educate tradespeople and designers.
- Shift incentives.

COMMENTS

- In the City of Vancouver, building codes should not impede the use of solar collectors on a roof. Photo-voltaic cells and solar water convection devices are not restricted.

H3 USE OF SALVAGED EQUIPMENT

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

None identified.

H4 ENERGY SIMULATION STANDARDS

GREEN PRACTICE CODE/DESCRIPTION

Powerful analytical tool that allows designers to assess and optimize energy savings of different building strategies.

REGULATORY BARRIERS

- Rules established for the convenience of regulators when checking simulations discourage innovative approaches. For example:
 - (e.g., energy savings from optimising building shape or window placement for passive solar heating are not measured;
 - unrealistic Reference model for heat pumps, inaccurate energy savings projections for buildings that avoid mechanical air-conditioning; and
 - inability to model natural airflows, or radiant heating and cooling).
- Few jurisdictions have adopted standards that establish consumption limits.
- [For the City of Vancouver, current versions of ASHRAE standards allow performance-based design which will circumvent most of these concerns.]

POTENTIAL IF BARRIER REMOVED

Energy savings of 25-60% or more, often with little or no increased capital cost.

POTENTIAL SOLUTIONS

- Change rules for checking simulations (e.g., factor passive solar into simulations, allowing designs that provide and ensure energy savings equivalent to prescriptive requirements for climatic zone).
- Encourage wide adoption of standards.
- Provide more incentives for simulations and discourage prescriptive path compliance for complex buildings.
- Adopt/enforce MNEC or require LEED-rating for buildings.

COMMENTS

- For the City of Vancouver, current versions of ASHRAE standards allow performance-based design which will circumvent most of these concerns.
- For non-regulatory study: consider (1) BC Hydro's e.Points system — customers collect points for energy savings and can use them to offset costs of any hard-wired energy efficiency projects (City of Vancouver has 12 buildings participating), (2) BC Hydro's proposed 'buy back' funding incentive (under which BC Hydro would buy back power saved through any energy saving project), (3) BC Hydro program to reduce energy consumption in computer-related equipment and vending machines.

BUILDING ELECTRICAL SYSTEMS

E1 USE OF NON-LISTED AND SALVAGED ELECTRICAL EQUIPMENT

GREEN PRACTICE CODE/DESCRIPTION

Re-use of used, but still serviceable electrical equipment in order to reduce waste, disposal, and pressure on non-renewable resources.

REGULATORY BARRIERS

- Lack of international harmonization of electrical standards.
- Lack of product alternatives as a result of difficulty and expense of testing alternatives, and obtaining approval from authorities such as the Canadian Standards Association, Underwriters Laboratory and / or the Canadian Electrical Association.
- Re-certification required in some cases.

POTENTIAL IF BARRIER REMOVED

- Reduced waste, disposal, and pressure on non-renewable resources.
- Increased choice of products for designers (difficult to quantify).

POTENTIAL SOLUTIONS

- Harmonize standards.
- Financial/administrative aid to help equipment certification.

E2 GRID-INTERCONNECTED LOCAL ELECTRICITY GENERATION

GREEN PRACTICE CODE/DESCRIPTION

Connection of small distributed electricity generators to the centrally-controlled electricity grid.

REGULATORY BARRIERS

- Utility business practices result in difficult and lengthy procedures for project and interconnection approvals (process is currently both time-consuming and expensive, and prices for power sold to BC Hydro are significantly lower than those of power purchases).

POTENTIAL IF BARRIER REMOVED

High potential (see I5) to reduce demand on non-renewable resources.

POTENTIAL SOLUTIONS

Changes to electrical utility policy to foster net metering with realistic technology and payments.

COMMENTS

- For non-regulatory study: (1) Safety issue (uncertain whether individual homes are maintaining system), (2) Cost (infrastructure is sophisticated and too costly to set up net metering systems for small local electricity generators), (3) adopt model national energy code, and establish energy inspectors or require mandatory certification by professionals in order to address existing health and safety workload issues.

E3 INTERCONNECTING APPLIANCES

GREEN PRACTICE CODE/DESCRIPTION

Making use of the wasted heat of all appliances (e.g., air conditioner, fridge) to heat domestic water, etc.

REGULATORY BARRIERS

- Code does not permit interconnecting of appliance.

POTENTIAL IF BARRIER REMOVED

Significant potential to capture waste heat from appliances.

POTENTIAL SOLUTIONS

- Allow interconnection of appliances.

CONSTRUCTION WASTE MANAGEMENT

C1 MATERIAL RECYCLING PRACTICES

GREEN PRACTICE CODE/DESCRIPTION

REGULATORY BARRIERS

- Under bylaw, most municipalities charge builders if they put recycling or waste bins on city streets. This is a barrier to recycling on construction sites as builders are typically unwilling to pay these fees for a second bin required for recycling. The municipal charges also wipe out any savings from recycling.

POTENTIAL IF BARRIER REMOVED

If barrier is removed for recycling bins only an increase in recycling activity could result.

POTENTIAL SOLUTIONS

- Requires change to municipal by-laws.

COMMENTS

- Education is always a benefit/

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