

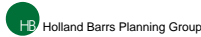


## Sustainability Block

Prepared for:  
The District of Squamish

Prepared by:  
Holland Barrs Planning Group

April 2008



## Introduction

- The District of Squamish's "Bridging to the Future" report identified several "catalyst" projects.
- One of the proposed catalyst projects is the creation of a SMART GROWTH BLOCK or SUSTAINABILITY BLOCK
- It is an extension of the recent Smart Growth on the Ground Concept Plan - it is proposed that a specific block (or cross-section of blocks) be redeveloped as a showcase of the many design innovations for streetscapes, landscapes, and technologies.



## The Smart Growth (Sustainability) Block is:

- intended to act as a catalyst for smart growth development in Squamish by exploring and eventually implementing examples of innovative infrastructure, urban design and energy efficiency initiatives at the block scale as well as delivering more pedestrian-friendly streetscapes and building design.
- likely to incorporate and could become the showcase for other CEP sub projects such as District Energy, Renewable Energy/Electricity, Building Energy Efficiency, Transportation Hub as well as smart growth concepts such as pedestrian friendly streetscapes, parking management, alternative fuel supply etc.
- intended to provide learning opportunities for District of Squamish (DoS), landowners, developers, consultants and other stakeholders and provide information for DoS staff and key stakeholders about the challenges and opportunities for applying smart growth, green building and sustainable energy principles to a block in Squamish that can be applied more broadly.
- intended to help advance Kyoto targets and the District's One Tonne Challenge. This will require a profound transformation in urban design and lifestyle expectations for new and existing residents - this catalyst project can demonstrate the allure of mixed-use, energy-efficient, pedestrian-friendly living in Squamish.
- a showcase of design, policy and technology approaches



## Objectives

- Collaborative learning between the District, landowner/developer, utilities and technical consultants
- Improved environmental, social and economic performance
- Reduced operating costs
- One time and on-going educational opportunities
- Integrated design
- A project that all involved can be proud of
- A catalyst for improved development and design



## Candidate Sites - Blocks 41, 44, & 45



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## Views of the sites



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## Site Selection

- The candidate sites were selected for a number of reasons:
  - Brownfield site in Downtown Squamish
  - Developer willing to explore concepts and ideas of sustainability block
  - Selected blocks are in a fairly advanced state of planning (timing right)
  - Opportunity for higher density/mixed use
  - The blocks are “Gateways” to the Peninsula and therefore have a high profile
  - Findings would be applicable to other oceanfront/downtown sites
  
- The Westmana Development Corporation, which has extensive land holdings on the Squamish Oceanfront Peninsula, has agreed to work with the District of Squamish to explore the idea of the Sustainability Block on one of their land parcels:
  - Block 41;
  - Block 44; or
  - Block 45.
  
- The exercise is exploratory - the ideas generated could usefully be applied to other blocks and other developers/landowners in the Downtown or Oceanfront Peninsula.



## The Sites Present Great Opportunities





## Current Plans



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## Challenges & Goals of Sustainability

### Address these things:

- Climate Change / Air Quality ↔ Reduce Emissions
- Fossil Fuel & Energy Supply ↔ Use Renewable Energy / Efficiency
- Waste / Resource Scarcity ↔ Reduce Waste / Recycling
- Water Quantity/Quality Supply ↔ Better Water Management
- Ecosystem Damage ↔ Ecological Design / Protection
- Food Supply / Quality / Security ↔ Organic / Local Supply

### While Maintaining or Enhancing:

- Economic Prosperity / Viability ↔ Diverse, Local, Prosperous Economy
- Social and Community Health ↔ High Individual and Community Health
- Mobility ↔ Convenient, Comfortable Transportation

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## Levers for Change - Key Elements of the Sustainability Block

- Location and Context
- Density and Mixed Use
- Pedestrian Oriented Street Design
- Alternative Transportation
- Parking
- Building Performance
  - Energy efficiency
  - Water and liquid wastes
  - Materials, solid wastes, durability
  - Indoor Environment
- Energy Supply - e.g. District Energy System, Renewables
- Multi-purpose open space design
- Economic Development
- Learning opportunities
- Building Operation and User Behaviour

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## Combining these in a "Sustainability Matrix"

Goals \ Levers	Reduce Energy & Emissions	Water, Stormwater and Liquid Waste	Reduce Resources and Solid Waste	Maintain Ecosystem integrity	Improve Individual & Community Health/Well-being	Increase Economic Vitality, Stability and Opportunity
Density and Mixed use						
Pedestrian Design						
Alternative Transport						
Parking						
Energy Efficient Buildings						
District Energy						
Water and Liquid Waste						
Materials and Solid Waste						
Open Space Design						
Economic Development						
Building Operation						

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## Location and context

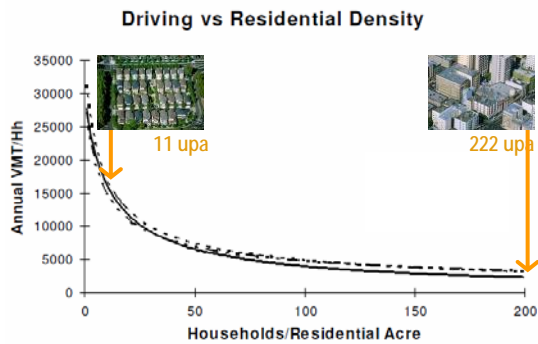


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## Density and Mixed Use



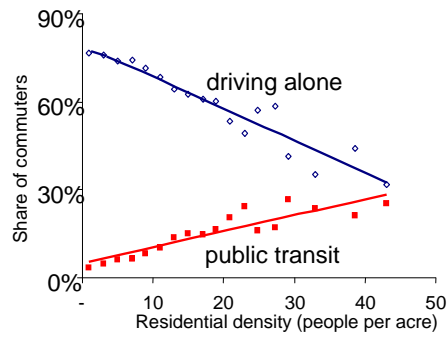
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## Density, Driving and Transit Use:

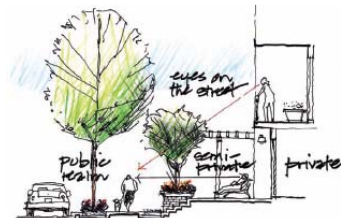
- Denser communities have less SOV's (single occupant vehicles)
- Denser communities use transit more



Source: Hotzclaw et al., 2002



## Pedestrian Oriented Street Design





## Alternative Transportation



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## Parking

- Underground
- On street
- Standards



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## Energy Efficient Building Design



Energy efficient building envelope - White Rock Operations Building, White Rock, BC (LEED Gold)



Insulation - Green Roofs

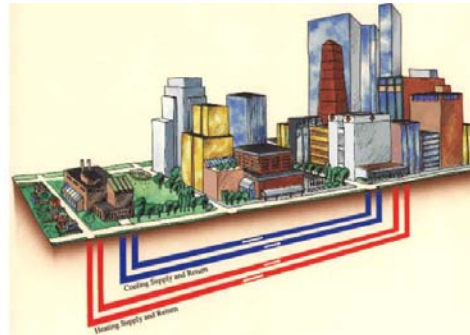
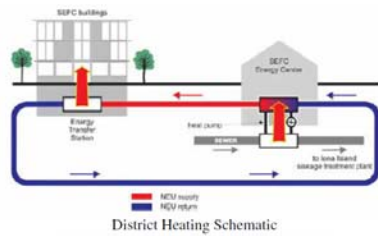
Mountain Equipment Co-op, Winnipeg, Manitoba (LEED Gold)



Natural lighting, Solar orientation



## Energy Supply - District Energy System





## Water and liquid waste management



Rain garden

Living machine  
wastewater  
treatment



Low-flow fixtures and metering



xeriscaping



## Open Space Design





## Materials and Solid Wastes



Low VOC Materials



Convenient Recycling



Composting



Construction Waste Management

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## Economic Development



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## Building Operation and User Behaviour



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## Learning opportunities



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## Sustainability Block Precedents

### Built

- Caper's Block - Vancouver
- BedZED, London, UK
- Mole Hill, Vancouver

### Under Development

- Dockside Green

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## Caper's Block, Vancouver



- Context and Location
  - West 4<sup>th</sup> Avenue, Vancouver - urban high street
  - Redevelopment of a former auto dealership
- Density and Mixed Use
  - 2.5 FSR
  - First floor - ground-oriented retail
  - Second floor - offices
  - Third/fourth floors - residential
- Pedestrian Oriented Street Design
  - Pedestrian scale
  - Narrow 25 foot bay storefronts to create pedestrian interest
  - Street furniture in courtyards for rest and people-watching
  - Street front retail continuity

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## Caper's Block, Vancouver

- Alternative Transportation
  - Fine-grained pedestrian connections through the block
  - Located on frequent-service transit route
- Parking
  - Underground pay parking & on-street parking



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## Caper's Block, Vancouver



- Building Performance
  - Filtered water system
  - Garbage recycling program
  - Double-wall rainscreen for durability & noise reduction
  - Courtyard light wells provide residents with views and sunlight
- Energy Supply
  - Geothermal energy - ground source heat pump for heating & cooling
  - High-efficiency gas fireplaces
- Economic Development
  - Anchor tenant - Capers Market
  - Retail
  - Offices

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## Caper's Block, Vancouver



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## BedZED, London, UK



- Context and Location
  - 1.7 hectare site close to downtown London
  - Brownfield redevelopment - former sewage treatment facility
- Density and Mixed Use
  - site includes 82 residential units and 2500m<sup>2</sup> of commercial space and live-work units
- Pedestrian Oriented Street Design
  - Pedestrian-only mews separating buildings
  - Parking located adjacent to the local street around the perimeter of the site
  - Slow speed limits, increased lighting, & creative design

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## BedZED, London, UK



- Alternative Transportation
  - Cycling promoted through storage facilities for each unit, maintenance sessions, & cycling event listings
  - Located on two bus routes & within 15 minutes of two train stations servicing London
  - Car share program
  - Free parking for electric vehicles and free charging provided
- Parking
  - Parking per unit ratio of 1:1
  - Only car-share vehicles will have allocated spaces
  - Residents parking and commercial parking will double up



## BedZED, London, UK



- Building Performance
  - Super insulation, a high-quality passive ventilation system and multi-layered windows
  - Green roofs with rooftop gardens and sedum matting
  - Runoff from roof collected & stored for greywater recycling
  - Energy efficient appliances
  - Stormwater management plan: porous pavement, green roofs, swales, rainwater collection
  - On-site wastewater treatment plant
  - In-suite recycling units
- Energy Supply - e.g. District Energy System, Renewables
  - Biomass woodchip-fueled system
  - Photovoltaic roof-mounted panels



## BedZED, London, UK



- Economic Development
  - Live-work
  - Commercial space
- Learning opportunities
  - Resident's Manual on energy & water efficiency
  - Literature & programs on reducing vehicle use - encouraging walking or cycling
  - Educational space for learning about sewage treatment
  - Information on maintaining a vegetable garden
  - General information on sustainable living
- Building Operation and User Behaviour
  - Electricity meters



## BedZED, London, UK





## Mole Hill, Vancouver, BC



- Context and Location
  - Located in the heart of Vancouver's West End
  - In one of the highest density neighbourhoods in N America
  - Re-development & restoration of 27 heritage homes
  - Mole Hill: 2.5 FSR
- Density and Mixed Use
  - 170 units of non-market housing for low-income singles, families, seniors and long-time residents of the block
  - St. Paul's Heart Home: provides housing for heart transplant patients
  - Watson House: A transition house for people with mental health issues
  - Dr. Peter Centre: for persons living with HIV/AIDS

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## Mole Hill, Vancouver, BC



- Pedestrian Oriented Street Design
  - Laneway was modeled after the Dutch concept of "Woonerf": a street which gives precedent to pedestrians
  - Greenways through the neighbourhood
- Alternative Transportation
  - Quick walk to amenities: community centres, theatres, libraries, restaurants, the waterfront
  - Access to downtown transit network with connections to sky train, train stations, and regional bus network
- Parking
  - Four spots dedicated to the Vancouver Co-operative Auto Network

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## Mole Hill, Vancouver, BC



- Building Performance
  - Preserving and restoring of all city owned heritage homes
  - A focus on energy-efficient lighting and appliances also helps minimize energy use
  - Construction materials with recycled content
  - Natural lighting
- Energy Supply - e.g. District Energy System, Renewables
  - Geo-thermal: energy-efficient heat exchanging pumps

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## Mole Hill, Vancouver, BC



- Economic Development
  - Daycares
  - Public/private/non-profit partnerships
- Learning opportunities
  - Community Gardens
  - Summer months, a Farmer's Market offers a selection of locally produced food
  - A unique leasing and partnership agreement with the city and the province could be replicated by other organizations
- Building Operation and User Behaviour
  - COHO Management, which usually provides services to Co-operative Housing initiatives, administrates the day to day upkeep and management of Mole Hill

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## Mole Hill, Vancouver, BC



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## Dockside Green, Victoria, BC



- Context and Location
  - 15 acres on Victoria's waterfront
  - Brownfield site
- Density and Mixed Use
  - High-density, mixed use development
  - 1.3 million sq. ft of office, residential, retail, and commercial
  - 73 u.p.a.
  - Broad housing mix: seniors housing, live-work, work-live, small and large units
  - Affordable housing (target 26 affordable market units and 49 low-income rental units)

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## Dockside Green, Victoria, BC



### Pedestrian Oriented Street Design

- Central pedestrian greenway
- Extension of Galloping Goose Trail through the site
- Enhanced pedestrian experience: tree planting, public art, interpretive signage

### Alternative Transportation

- Vehicle sharing program
- Mini-transit system focusing on key drop-off points downtown
- Bike lanes, trails, and public & residential bike racks
- Harbour Ferry
- Subsidized bus passes for affordable housing
- Parking
  - Parking stalls for car-share vehicles
  - Selling parking separately from the housing units

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## Dockside Green, Victoria, BC



- Building Performance
  - High efficiency buildings: energy modeling projects 50 to 52% savings
  - LEED certification
  - Sustainable & local materials
  - 100% of all sewage treated on site
  - Potable water savings: 66.5% (70 million gallons per year)
  - On-site stormwater treatment - naturalized creek & pond system
  - 90% of construction waste diverted from landfill
- Energy Supply - e.g. District Energy System, Renewables
  - Biomass Cogeneration Facility (centralized waste wood gasification plant) for electricity & heating.

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## Dockside Green, Victoria, BC



### Economic Development

- Commercial centre with local businesses e.g. pubs, bakery, health food store, restaurants
- Community amphitheatre
- Live-work, work-live

### Learning opportunities

- Developing local training and education initiatives
- Sustainability Centre
- Renewable energy technologies demonstrated on site as part of environmental education plan
- Historical, aboriginal, and environmental signage & public art
- Building Operation and User Behaviour
  - Annual Sustainability Reporting -performance & accountability



## Dockside Green, Victoria, BC





## Discussion Questions (for breakout groups)

1. What additional objectives should the Sustainability Block be trying to achieve?
2. What elements of design, infrastructure, building standards etc. should/could the sustainability Block contain?
3. Are there synergies between certain uses/tenants that should be explored?
4. What are the marketing opportunities for the Sustainability Block?
5. What are the barriers/challenges to making this a reality and what key policies and strategies should be employed to make this happen? (e.g. Zoning/Development Control variances & amendments).