SUSTAINABLE URBANISM & GREEN NETWORKS
OUTLINE

1. Principles of sustainable urbanism
2. Sustainable urbanism in Vancouver

Two Case Studies:
3. Wesbrook Place at UBC
4. Olympic Village in Vancouver
The American (and Canadian) Dream > single family detached house > sprawl

Love affair with the automobile > huge GHG outputs

An indoor, mechanically supported lifestyle > nature deficit + obesity

Consumer society > acquisition of more and more stuff > larger houses, more waste

CLIMATE CHANGE

UNSUSTAINABLE ECOLOGICAL FOOTPRINT/CAPITA

OBESITY - A HUMAN HEALTH CRISIS

WATER DEPLETION AND POLLUTION

MOUNTAINS OF WASTE
Sedentary lifestyles & lack of exercise

- Anxiety
- Cardiovascular disease[^15]
- Migraines
- Breast & colon cancer
- Depression
- Diabetes
- Gout
- High blood pressure
- Skin problems
- Mortality in adults
- Obesity
- Osteoporosis
- Scoliosis & back problems
Responding to climate change and our coming energy challenge without a more sustainable form of urbanism will be impossible.

Peter Calthorpe 2013
Cities contribute 70% of global CO2 emissions.

Megacities project [megacities.jpl.nasa.gov](megacities.jpl.nasa.gov)

Image: The Vulcan Project, Purdue University and NASA
Center city dwellers produce only 25% of CO2 as compared to outer suburb dwellers

Metropolitan Transportation Commission

2006 Average weekly CO2 emissions per household, San Francisco area
Estimated annual GHG emissions from weekday urban car trips

CMHC Travel Tool 2001
### 2011 Metro Vancouver Mode Splits

<table>
<thead>
<tr>
<th>Area</th>
<th>Walk</th>
<th>Bike</th>
<th>Transit</th>
<th>Auto Passenger</th>
<th>Auto Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Vancouver</td>
<td>11%</td>
<td>14%</td>
<td>16%</td>
<td>57%</td>
<td>27%</td>
</tr>
<tr>
<td>Pitt Meadows_Maple R</td>
<td>6%</td>
<td>6%</td>
<td>19%</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>Langley's</td>
<td>7%</td>
<td>3%</td>
<td>19%</td>
<td>70%</td>
<td>11%</td>
</tr>
<tr>
<td>South of Fraser</td>
<td>8%</td>
<td>10%</td>
<td>18%</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Richmond_S Delta</td>
<td>9%</td>
<td>12%</td>
<td>17%</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Northeast sector</td>
<td>7%</td>
<td>11%</td>
<td>18%</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Burnaby_New West</td>
<td>9%</td>
<td>21%</td>
<td>15%</td>
<td>54%</td>
<td>31%</td>
</tr>
<tr>
<td>Vancouver_UEL</td>
<td>5%</td>
<td>18%</td>
<td>22%</td>
<td>13%</td>
<td>43%</td>
</tr>
<tr>
<td>North Shore</td>
<td>10%</td>
<td>11%</td>
<td>17%</td>
<td>61%</td>
<td>22%</td>
</tr>
</tbody>
</table>

2011 Metro Vancouver Regional Trip Diary
ACTIVE TRANSPORTATION RATES V. OBESITY

- **Vancouver**
  - Walk/cycle commuting: 26%
  - Walk/cycle errands: 15%
  - Obesity: 38%

- **North Shore**
  - Walk/cycle commuting: 11%
  - Walk/cycle errands: 16%
  - Obesity: 20%

- **Surrey**
  - Walk/cycle commuting: 7%
  - Walk/cycle errands: 11%
  - Obesity: 28%

My Community My Health data: [https://www.myhealthmycommunity.org/Results/CommunityProfiles.aspx](https://www.myhealthmycommunity.org/Results/CommunityProfiles.aspx)
SUSTAINABLE URBANISM + WALKABLE NEIGHBOURHOODS
COMPLETE COMMUNITIES

The Urban Task Force, Australia
COMPACT COMMUNITIES
mixed uses and densities - to support good transit and commercial services

ARIZONA SPRAWL
(below 35 people/hectare)
(Tim Roberts Photography Shutterstock)

X NOT THIS

OLYMPIC VILLAGE, VANCOUVER BC
(> 100 people/hectare)

✓ THIS
COMPLETE COMMUNITIES
jobs, services, schools, parks close to people’s homes

Low density single family residential

X NOT THIS

WESBROOK PLACE AT UBC

✓ THIS
CONNECTED COMMUNITIES
street networks that prioritize transit, biking and walking over vehicles

X NOT THIS

Vancouver Olympic Village, Vancouver BC

√ THIS
ACCESS TO NATURE
a 5 - 10 minute walk from home to urban greenspace

SMITH PARK AT WESBROOK PLACE

HABITAT ISLAND AT OLYMPIC VILLAGE

✓ THIS

✓ THIS
THEMES:
compact, complete & diverse neighborhoods
connectivity & accessibility for people
reconnect the city’s ecological structure
“working” urban forests/ green infrastructure
water health & balance
VOCABULARY

GREEN  serving primarily ecological functions

GRAY  serving primarily urban functions

NETWORK  spatial corridors and systems

FABRIC  residual spaces ‘within’ networks

Villebois, Wilsonville, OR 2003
SUSTAINABLE URBANISM: Vancouver Region

4 GOALS

1. Protect the Green Zone

   Protect the agricultural land reserve
   Protect the watershed & ecosystem resources
2. **Compact Metropolitan Region**
   - Growth centers
   - Infill development
   - Compact forms of housing

3. **Complete communities**
   - Jobs, services, recreation close to residences

4. **Transportation choices**
   - Improving transit
   - Improving bicycle networks
   - Walkable neighborhoods
Vancouver Case Studies:

Wesbrook Place, UBC

Southeast False Creek
EACH CASE STUDY:
Compact community
Complete community
Connected community
Green fabric
Green networks
WESBROOK PLACE
University of British Columbia
UBC CLIMATE ACTION PLAN (2010)

Convert to district energy using renewable energy

Require green buildings

House 50% students on campus

Increase family housing near campus

50% of Point Grey residents study or work on campus

Both campus and communities- more “complete”

Increase alternate modes of travel to campus
UBC - A COMMUTER CAMPUS
12 kilometres from downtown

UBC STATS:
~63,000 people per day on campus

12,000 permanent residents on Point Grey*

16% of daytime population live on campus

~10,000 students, faculty, staff live on campus

Weekdays: 138,200 trips to/from campus
÷ 2 directions= 69,100
More trips than people!

* Statistics Canada- 2011 census
WESBROOK PLACE
An urban village in the woods

Plan completed in 2005
First residents moved in 2008

NOTABLE FOR:
A compact, pedestrian-oriented community

Adds full time residents to a commuter campus

50% of residents study or work at UBC

Green network-off-street pedestrian paths habitat connections

Requires green buildings
COMPACT COMMUNITY

SITE: 55.6 ha
6225 units at build-out
12,500 people

at completion:
225 people /hectare

EMPLOYMENT

Primarily at UBC
~ 14,000 faculty and staff
> 50,000 students
COMPLETE COMMUNITY

SERVICES
Grocery store/pharmacy
Liquor store
Bank
Dentist, eyecare
Healthcare
Restaurant/pub
7 food services (deli, coffee, fast food)
8 other services
COMPLETE COMMUNITY

COMMUNITY CENTRE

SCHOOLS
1 High school
Future elementary school on site

DAYCARE
75 daycare spaces on site
~ 750 daycare spaces on UBC campus

Top: Community Centre
Image by Robert Stefanowicz
Bottom: Playground in Smith Park
CONNECTED COMMUNITY

- Fine-grained network
- Walkable streets
- Separated greenway network
15 hectares of parks, open spaces
27% of site is green space

4 parks
4 playgrounds
Playing fields

100% within 5 minute walk of green space
HABITAT/TREE PROTECTION

2003- the site before development

WESBROOK PLACE
4.6 ha or 10% of site are protected forest buffers
HABITAT CONNECTIVITY

1400 trees planted from 2005 - 2015

420 planted in public spaces

~ 40% of trees are native trees
GREEN NETWORKS

Regionally important habitat areas

UBC South Campus
Green spaces and networks
LOCAL FOOD: UBC FARM

CENTRE FOR SUSTAINABLE FOOD SYSTEMS
academically rigorous and globally significant research into sustainable and secure food future

24 hectare “living laboratory” grows over 200 varieties of fruits, vegetables, and herbs

Public market every Tuesday & Saturday
June to October
HARLAND BARTHOLOMEW PLAN 1928 Proposed pleasure drives system
City of Vancouver 1995 GREENWAYS PLAN
A system of paths for **walking and cycling** across the city.
OLYMPIC VILLAGE
NOTABLE FOR

Brownfield redevelopment
2010 Olympics Athletes Village
LEED Platinum neighborhood
Completing the Seaside Greenway

Integrates habitat, water & agriculture
BUILD-OUT

SITE: 32 hectares
~5500 dwellings

12,000 people

GROSS DENSITY = 375 persons/hectare
COMPLETE COMMUNITY

COMMERCIAL:
Full Grocery Store
Cafes & Pubs
Drug Store
Liquor Store
Lots of shops

CIVIC:
Large community center
1 Elementary school
3 big, 8 small daycares
1 religious center

Central Square
MULTI-MODAL:
- Pedestrian
- Bicycle
- Bus
- Streetcar
- Rapid transit
- Water ferry
- Co-op cars

TARGET:
60% of all trips to be NON-auto based
GREEN FABRIC AND GREEN NETWORKS

32% of the land is reserved for Public Open Space

Aerial view of Hinge Park (turned 90°)
PUBLIC WATERFRONT
HINGE PARK:
PARK + PLAYGROUND + HABITAT + GREEN INFRASTRUCTURE
Wildlife returning to False Creek
- Eagles
- Waterfowl
- Songbirds
- Beaver
- Coyotes
- River otter
- Herring

Beaver dam and birdhouse in Hinge Park
GREEN INFRASTRUCTURE

Stormwater wetland

Harvest rainwater for irrigation

40% effective impervious area

50% of roofs green

90% Native Plants
GREEN NETWORKS

City-wide function: The last leg of a 25 km waterfront greenway

Connections to adjacent neighborhoods
> 7000 people observed over 7 months
437 to 1200 people per hour
METHODS- How did we do the research?

Video & mapping Tracking + Questionnaires

Jan Gehl and Birgitte Svarre, DATE
DOING WHAT?

90% moving
10% “staying”

66% moving
34% “staying”

58% moving
42% “staying”

65% came once/week or more
68% were walking, jogging, cycling, exercising
50% arrived on foot + 18% on bicycles
WHY DID THEY COME?

80% of people on the greenway reported coming for the views

<table>
<thead>
<tr>
<th>Most important green features of neighbourhood</th>
<th>Most important nature benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban parks</td>
<td>Breathing fresh air</td>
</tr>
<tr>
<td>3.64</td>
<td>3.50</td>
</tr>
<tr>
<td>View of the ocean/mountains</td>
<td>Relieving stress</td>
</tr>
<tr>
<td>3.32</td>
<td>3.50</td>
</tr>
<tr>
<td>Presence of tree lined streets</td>
<td>Enjoying the view</td>
</tr>
<tr>
<td>3.00</td>
<td>3.15</td>
</tr>
<tr>
<td>Community gardens</td>
<td>Feeling restored</td>
</tr>
<tr>
<td>2.92</td>
<td>2.90</td>
</tr>
<tr>
<td>Private gardens</td>
<td>Seeing wildlife</td>
</tr>
<tr>
<td>2.24</td>
<td>2.50</td>
</tr>
</tbody>
</table>

(Most important = 5, least important = 1, scores were weighted averaged)
<table>
<thead>
<tr>
<th><strong>Sustainable Urbanism:</strong></th>
<th><strong>Green space functions:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact communities</td>
<td>Social, political activity</td>
</tr>
<tr>
<td>Complete communities</td>
<td>Day to day human interaction</td>
</tr>
<tr>
<td>Connected communities</td>
<td>Recreation</td>
</tr>
<tr>
<td>Access to nature</td>
<td>Connectivity/ Transportation</td>
</tr>
<tr>
<td>+</td>
<td>Climate mitigation</td>
</tr>
<tr>
<td>High performance buildings</td>
<td>Wildlife habitat</td>
</tr>
<tr>
<td>Green infrastructure</td>
<td>Stormwater management</td>
</tr>
<tr>
<td></td>
<td>Food production</td>
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</table>
BC’S SUSTAINABLE URBANISM

COMPACT & COMPLETE + WALKABLE + BIOPHILIC

COMPACT
MIXED USES
TRANSIT
DIVERSE HOUSING

J O B S
S E R V I C E S

F I N E N E T W O R K
C O N N E C T E D
D I V E R S E S E A T I N G

C O M F O R T A B L E P U B L I C R E A L M
D I V E R S E L A N D S C A P E S
F U N C T I O N I N G E C O S Y S T E M S

W I L D L I F E
N E A R B Y N A T U R E

INTERDEPENDENT ATTRIBUTES
INTERDEPENDENT ATTRIBUTES
QUESTIONS?