



March 4, 2019

**A BIOPHILIC CITY**



## SURVEY

Immerse yourself in this image/ as if you are there.

***If I were in this place, it would make me feel less stressed.***

(See survey on Canvas)

15 seconds per slide

















4

















8











## TODAY: BIOPHILIC CITY

Nature in cities

Biophilic city concept

Essentials of a biophilic city

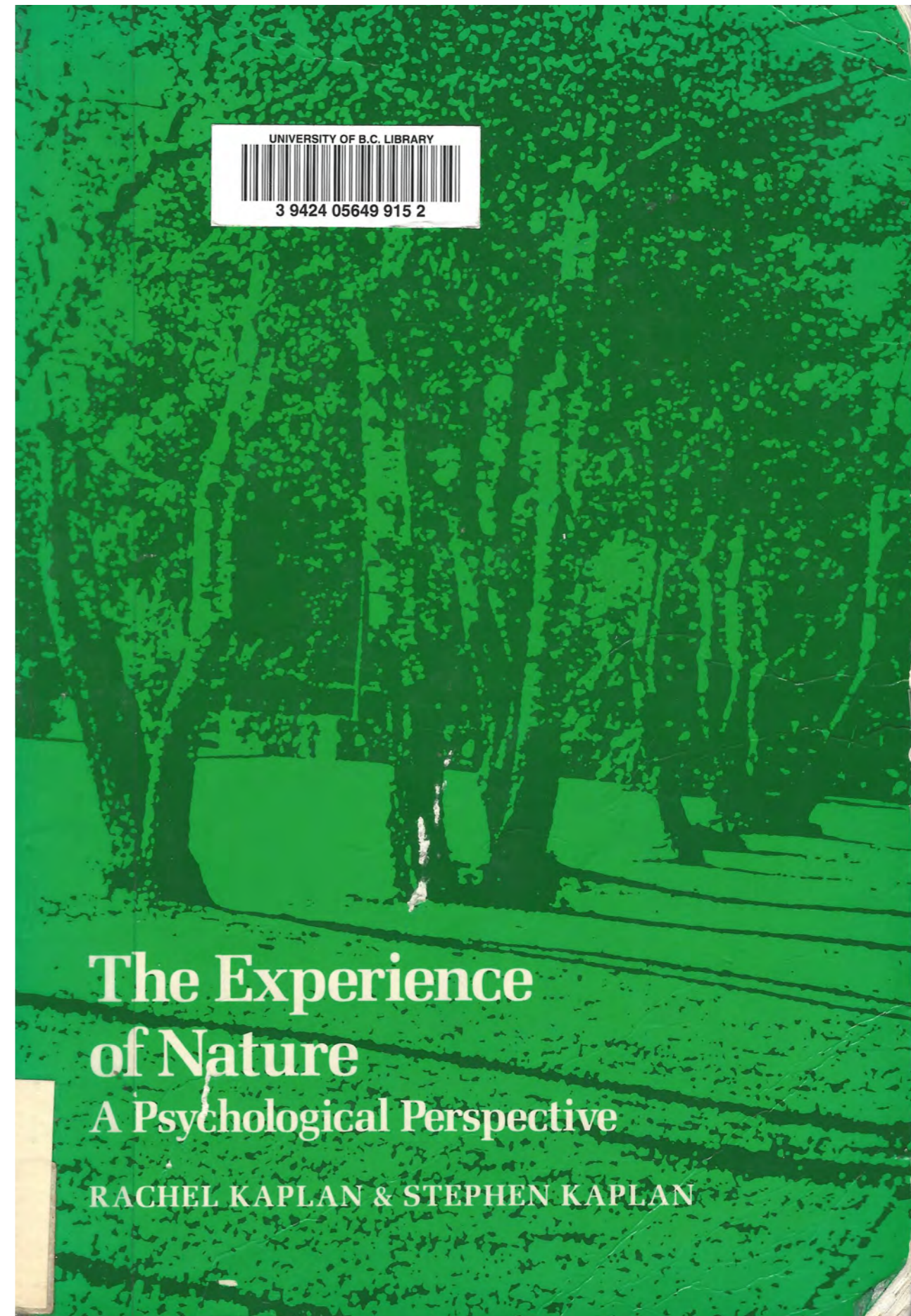
Measuring the biophilic city



1989 Rachel Kaplan and Stephen Kaplan  
**The Experience of Nature**  
A Psychological Perspective

ACROSS CULTURES (and individual differences):

- strong *PREFERENCE FOR NATURAL SCENES*  
(vs. human-influenced scenes)
- different people, different cultures prefer  
different “nature”
- people derive benefits from contact with nature
  - nature is restorative





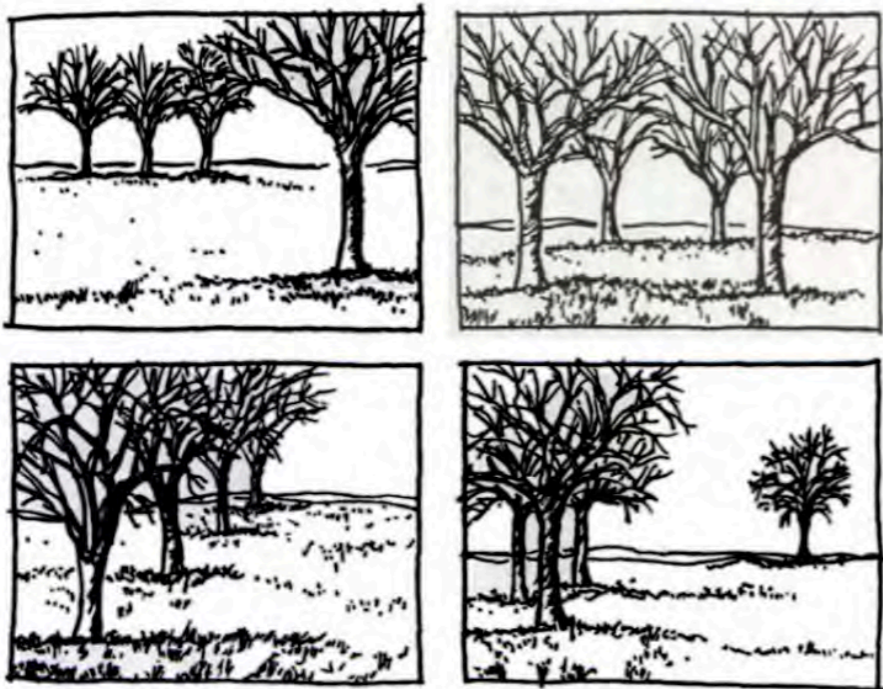
# With People in Mind

1998

A “pattern language” for designing restorative environments



DESIGN AND MANAGEMENT OF EVERYDAY NATURE



*An environment is defined by its contents and their organization.*

RACHEL KAPLAN, STEPHEN KAPLAN,  
AND ROBERT L. RYAN

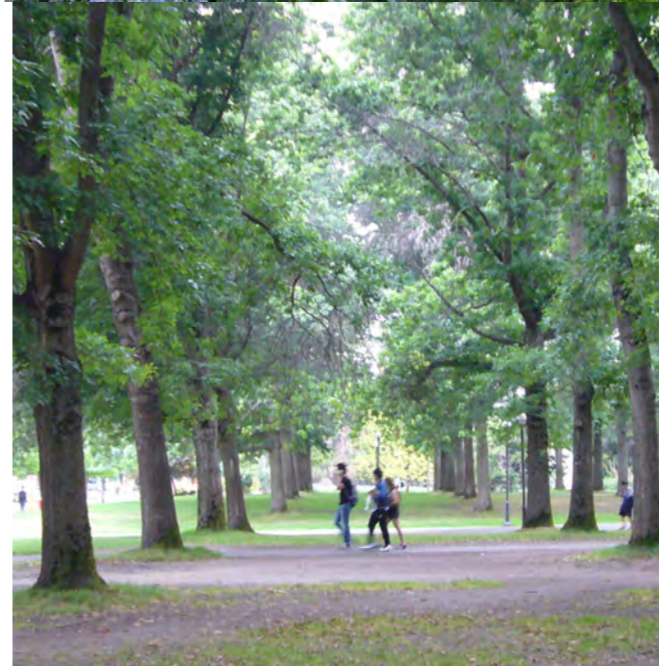


# KAPLANS- WHAT IS NATURE?

NATURE:  
*broad and inclusive definition*

street trees  
yards  
gardens  
parks  
abandoned lots  
meadows  
forest  
wilderness

SIZE:  
views—forests—yards—pots on a balcony

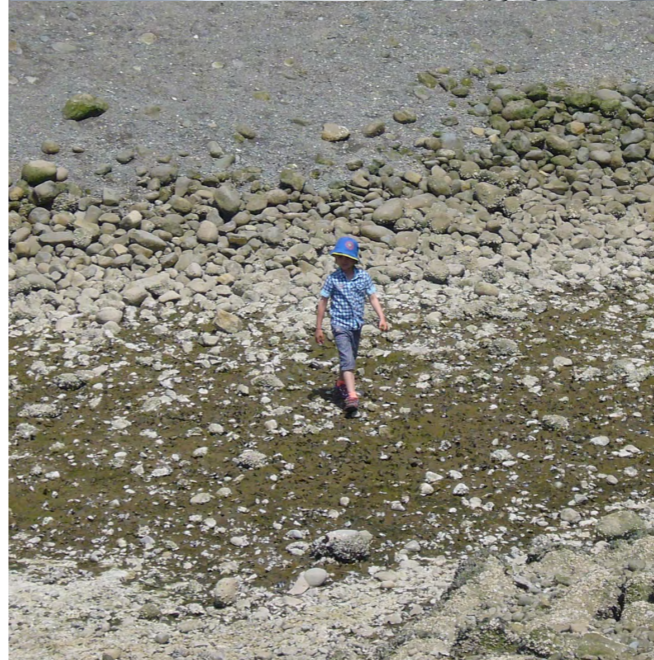
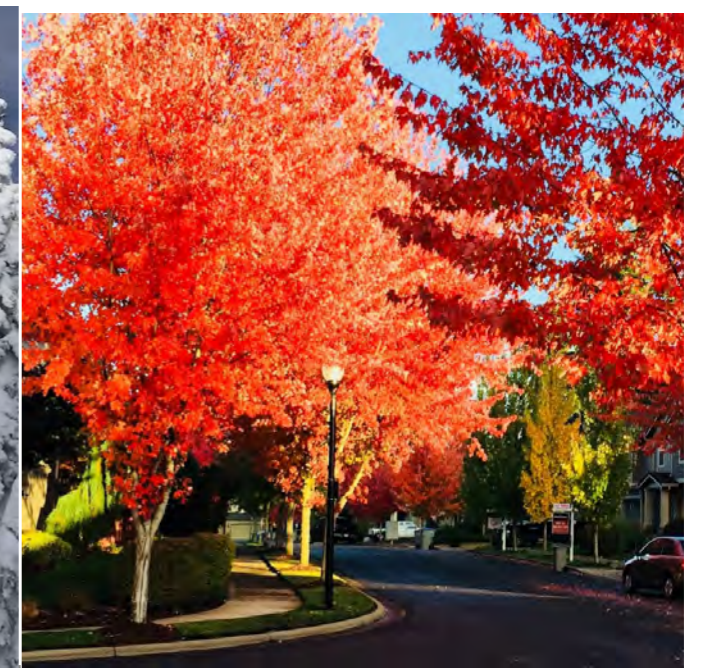




# KAPLANS- WHAT IS NATURE?

NATURE:  
*broad and inclusive definition*

green  
blue  
white  
brown  
yellow  
red





# QUALITIES OF RESTORATIVE LANDSCAPES

## **RESTORATIVE:**

relief from mental fatigue and stress  
“cognitive quiet”

## **BEING AWAY:**

conceptually different context than usual  
being away- in one’s head

## **COMPATIBILITY:**

biophilia/ compatibility with nature  
wholeness/ at one with...ZEN



Ryoanji, Kyoto, Japan

Source: Wikipedia- no other image source



# KAPLANS- PROPERTIES

- **EXTENT-** in a whole other world:

*wilderness* = physical extent  
vs

*nearby nature* = perceptual extent

- **FASCINATION:**

stimulus/involuntary attention  
(preference for scenes involving mystery)

- best if mind can connect to a larger pattern/  
larger nature



Olympic Village- view to north



# KAPLANS- PROPERTIES

- **COHERENCE**- must be able to understand it
  - **MYSTERY**- the promise of something (i.e. wildlife) is preferred.  
(The promise of something more to be learned if at the scene.)
- **LEGIBILITY**- settings for functioning in a competent, comfortable, and safe way
- **WHY?** -not necessarily understood- people may not be able to explain nature preferences





## KAPLANS- LESSONS FOR THE CITY

- **PROXIMITY** is essential

- “if greens are more than 3 minutes away from home, distance overwhelms need”  
(Alexander et al *A Pattern Language*)

- **PERCEIVED DISTANCE** on foot
  - **perceived availability**/  
not necessarily frequency of use

- **SIZE**- Is vastness necessary?  
**NO**- many small spaces close to home  
familiarity/safety  
perception of extent  
being away

- **WORK** access to nature (visual or physical)  
lowered job stress and increased satisfaction

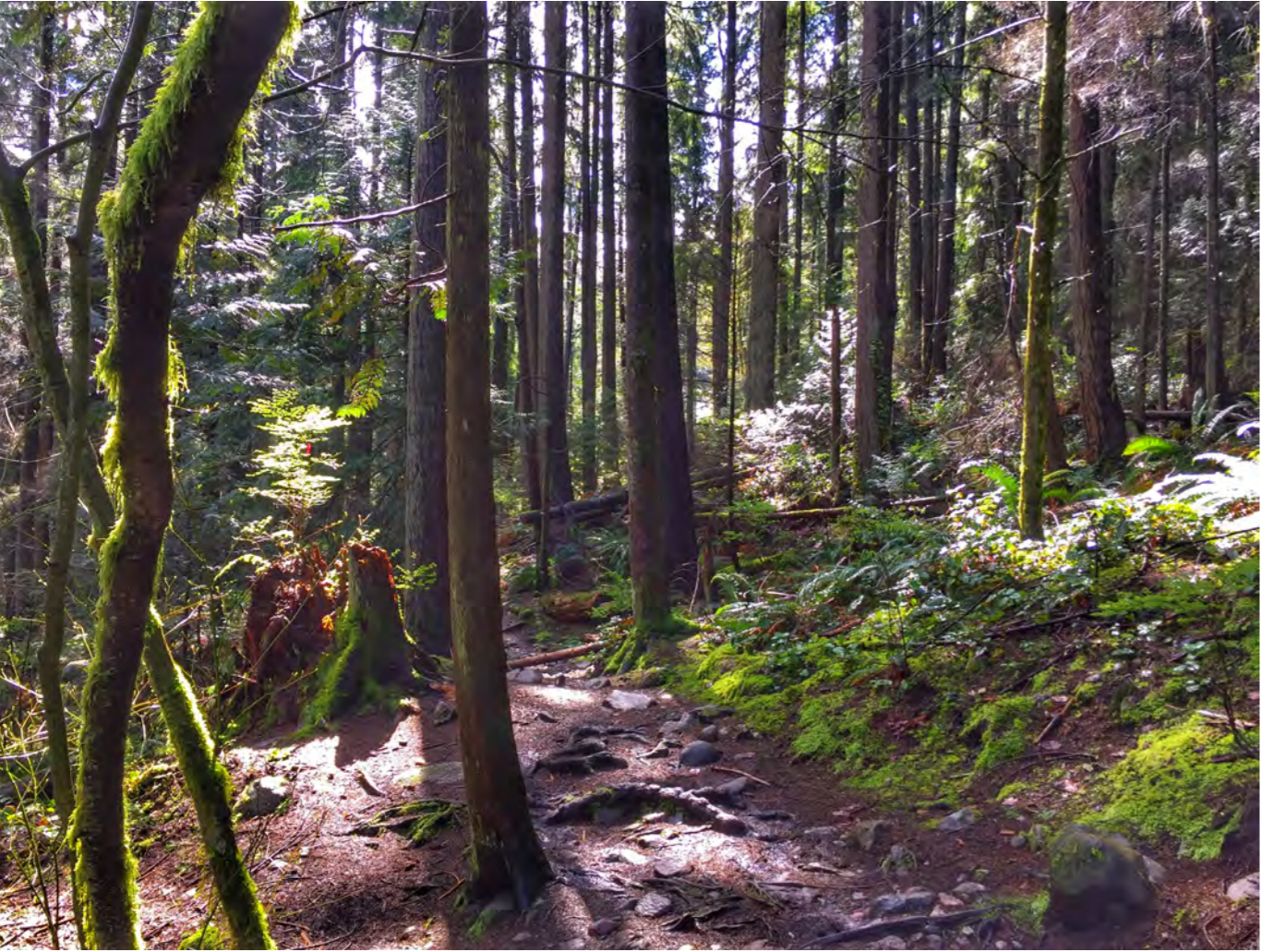


Greenacre Park, New York, 1971

Source: ephemeralnewyork.com



## *KAPLANS- LESSONS FOR THE CITY*



- **TREES COUNT**-views or experiences of trees in urban setting IS nature

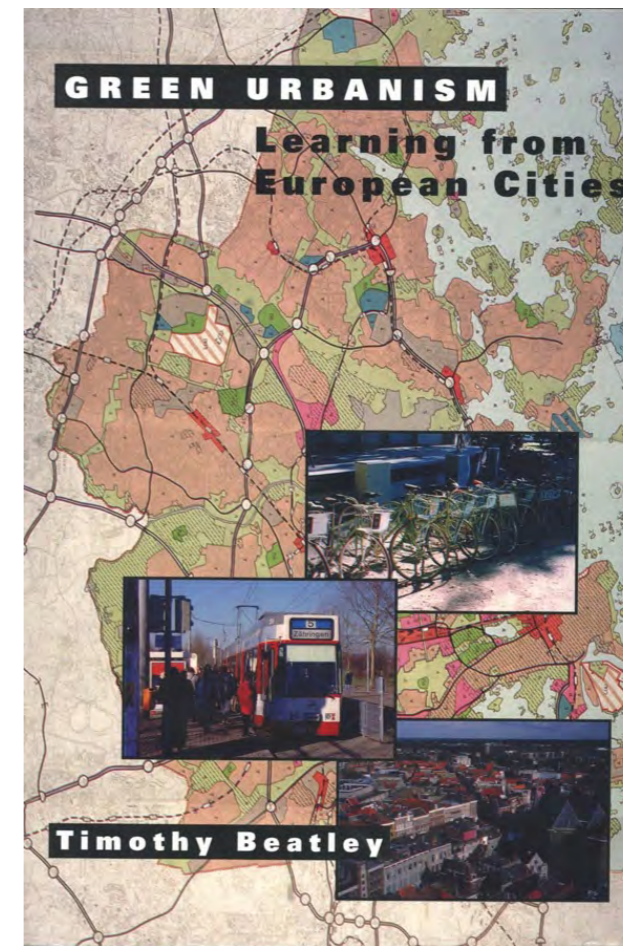
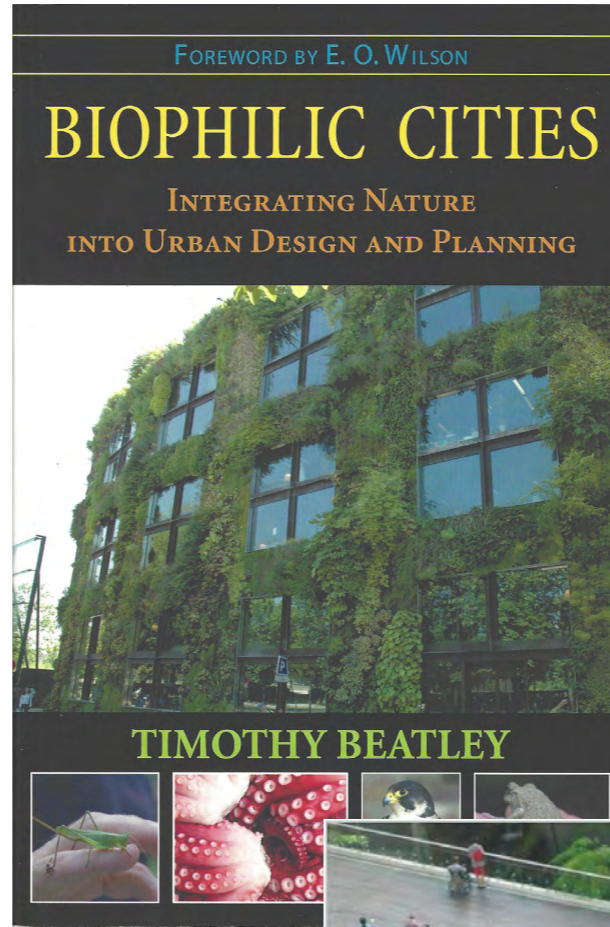


# ACCESS TO NATURE IN CITIES -important for mental well-being





# TIMOTHY BEATLEY & BIOPHILIC CITIES

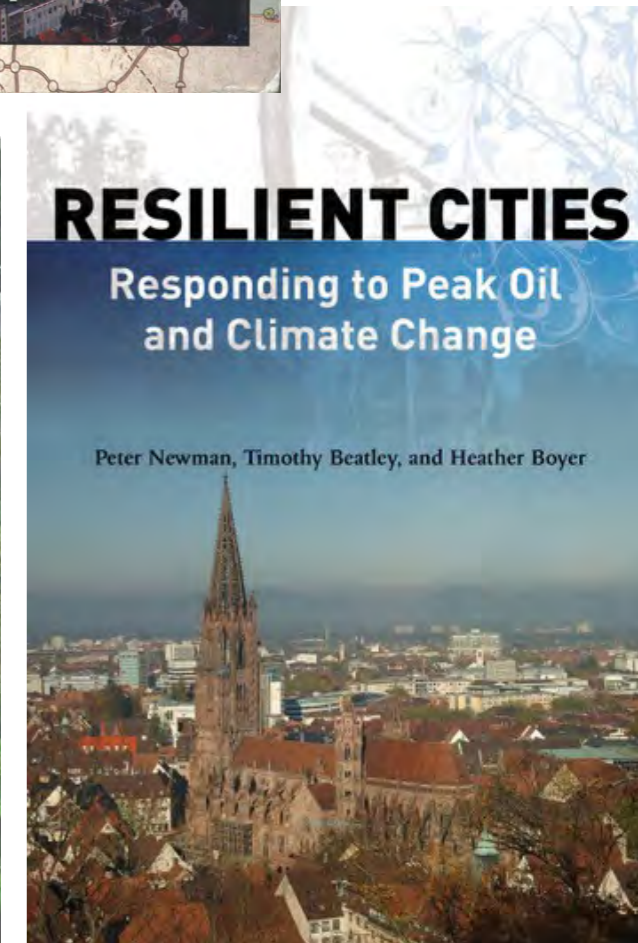
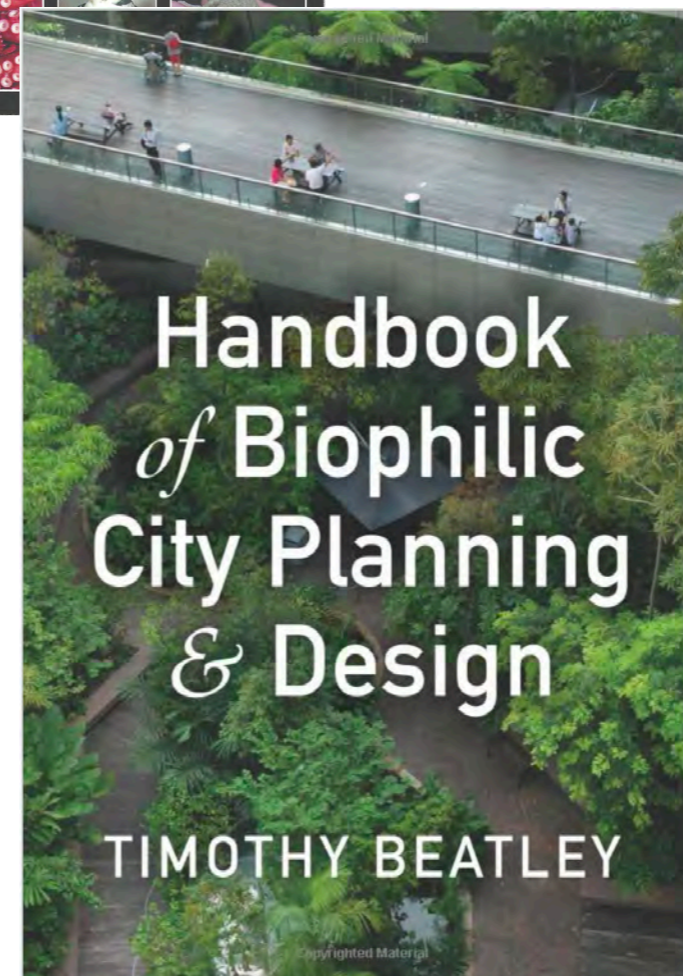


Wikipedia:

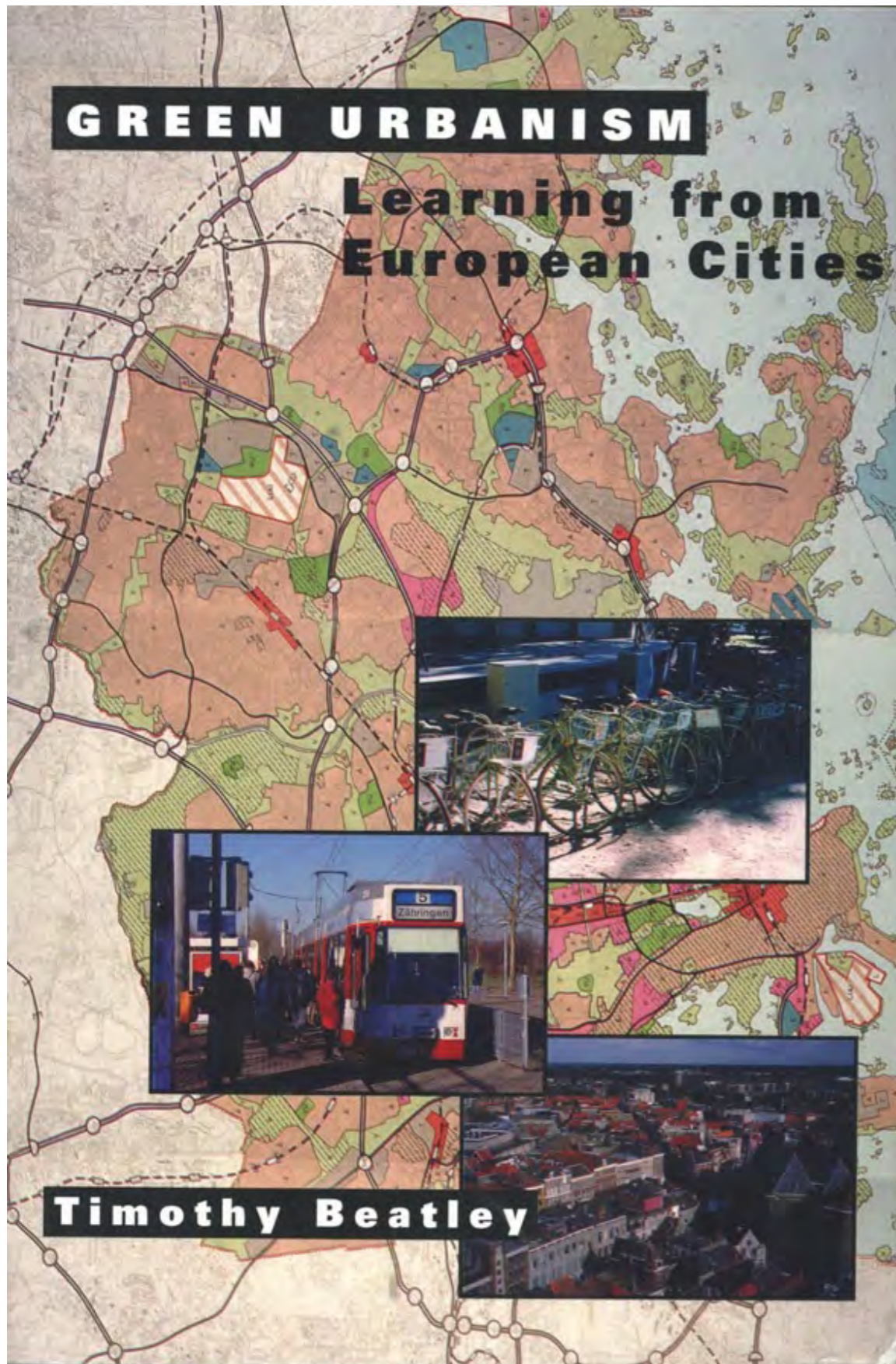
Dr Timothy Beatley is an internationally recognized sustainable city researcher and author. (University of Virginia)

Coined:

green urbanism  
biophilia cities







2000

## CORE ATTRIBUTES of SUSTAINABLE URBANISM

Compact communities

Complete communities

Connected communities

**Biophilia (access to nature)**

+

High performance buildings

High performance (green) infrastructure



2011 Timothy Beatley

# Biophilic Cities

Integrating Nature into Urban Design and Planning

## What is a Biophilic City?

**IF**

Biophilia suggests that there is an evolutionary and biological need for contact with nature,

**THEN**

*A biophilic city is a green city, a city with abundant natural systems that are visible and accessible to urbanites.*

FOREWORD BY E. O. WILSON

# BIOPHILIC CITIES

INTEGRATING NATURE  
INTO URBAN DESIGN AND PLANNING



**TIMOTHY BEATLEY**



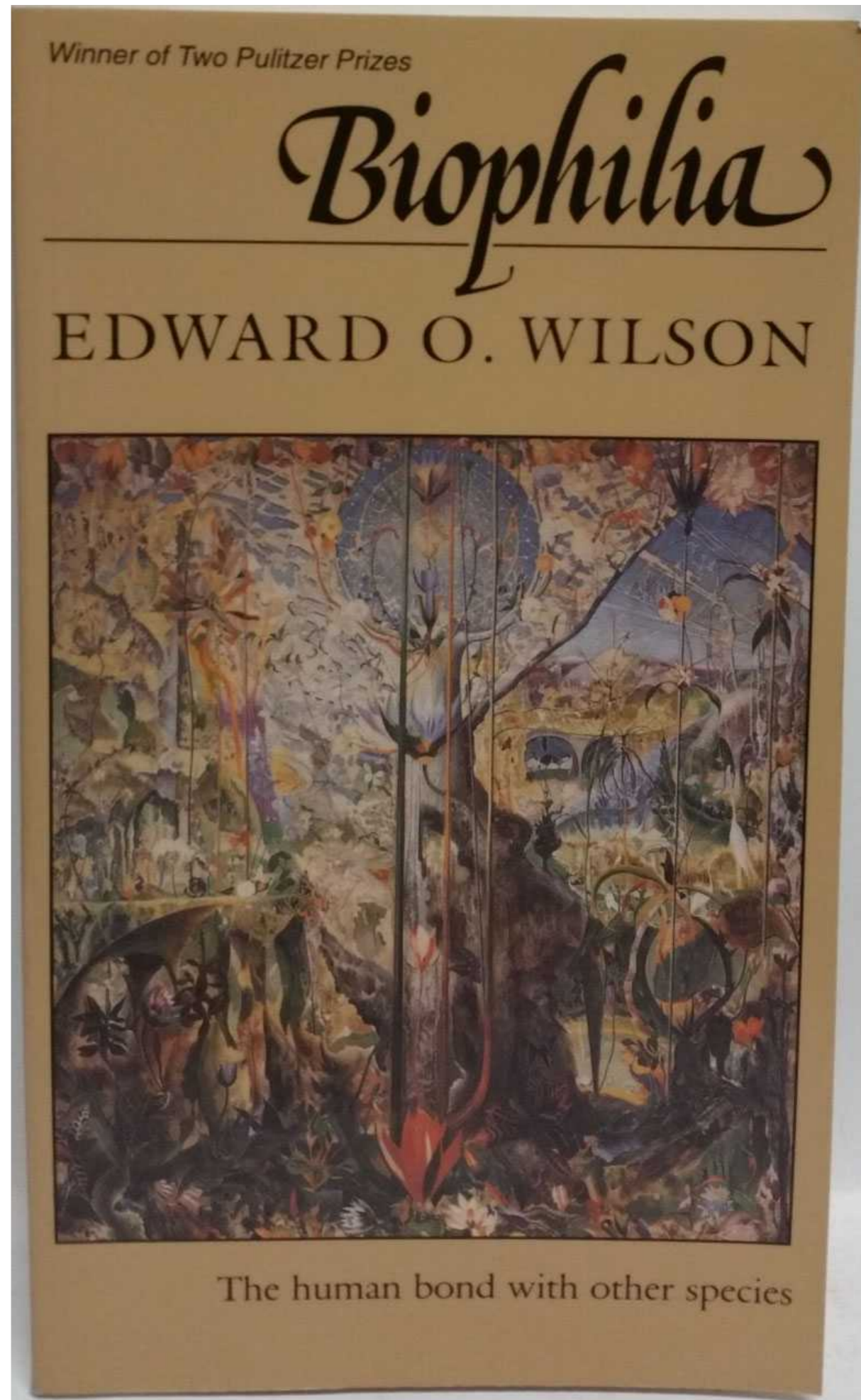


1984 Edward O. Wilson

# Biophilia

The human bond with other species

*Humans possess an innate tendency to affiliate with other forms of life.*





What did Wilson mean by “biophilia”?

**bio-** organisms, species, habitats (natural settings)

**philia-** attractions, positive feelings

*“the innate tendency [of human beings] to focus on life and life-like processes.”*



## Wilson: Concluding thoughts about biophilia:

The PARADOX of humanity:

- *humans first*- the drive to personal fulfillment and personal freedom leads to loss of nature  
yet
- humanity is *dependent* on the natural world to sustain us

## Beatley: Biophilic tendencies can atrophy

- urban populations are disconnected from nature
  - weak affinities/ weak knowledge



## ***A BIOPHILIC CITY***

*“In the course of everyday life residents see, and experience rich nature— plants, trees animals.”*

Beatley, page 45

- about **physical conditions** and urban design —  
easily accessible, abundant parks, green features, urban wildlife, walkable environments
  - also about the **sprit of the place**— emotional commitment, concern about nature, curiosity, lifestyles....
- people’s **engagement** with and **knowledge** of nature



Kitsilano Beach in winter



# ***A BIOPHILIC CITY- 4 Essential components***

**BIOPHILIC URBAN FORM**

**BIOPHILIC KNOWLEDGE**

**BIOPHILIC ACTIVITIES**

**BIOPHILIC GOVERNANCE**



# A BIOPHILIC CITY- Essential components

## URBAN FORM

- easily accessible nature
- wild nature/wildness
- celebrate the forms & functions of nature

## URBAN SYSTEMS

- mimic natural processes (emulate natural systems)
- ecological restoration/repair
- biomimicry (cradle to cradle systems thinking)

Lloyd Crossing, Portland, OR  
 Pre and post development tree canopy and rainwater  
 Mithun Associates





# URBAN FORM/GREEN FORM

## CITY SCALE

### URBAN FORM

COMPACTNESS AND DENSITY  
— foundation for biophilic cities

### WALKABILITY

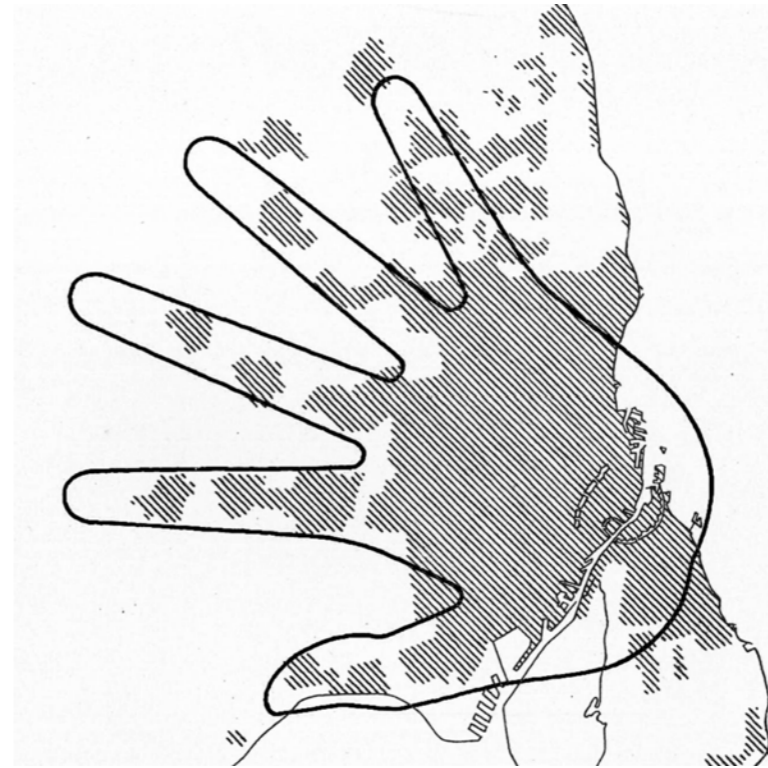
— gets people out of doors

### GREEN FORM

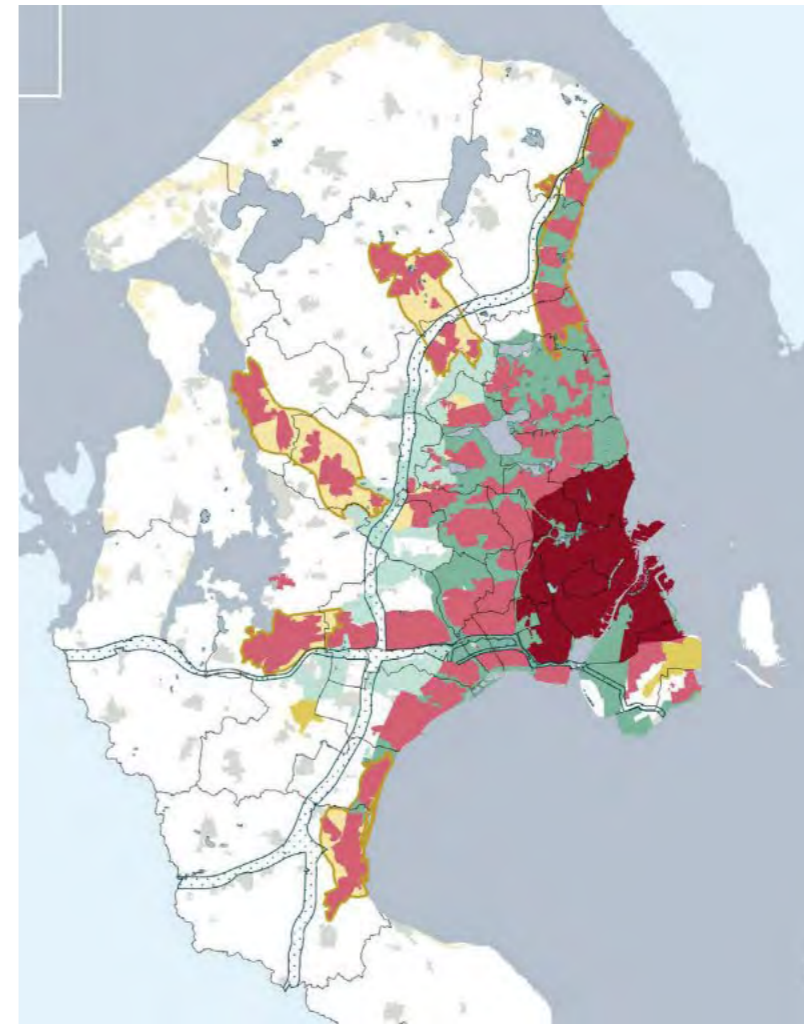
greenbelts (London, Paris, Hamburg, Toronto)

green fingers (Copenhagen)

green networks (Minneapolis)



Copenhagen: the 1947 Fingerplan -urban development should be maintained in the dense hand-held palm and along the five-finger transport corridors. Source: [buildingcentre.co.uk](http://buildingcentre.co.uk)



2016 Plan remains intact Source [ing.dk](http://ing.dk)



# URBAN FORM/GREEN FORM

## CITY SCALE

*Paris' Green Belt in the 21st century –  
Yesterday, today, tomorrow?*  
Paris Urbanism Agency, 2013



*Easily accessible and  
abundant nature*



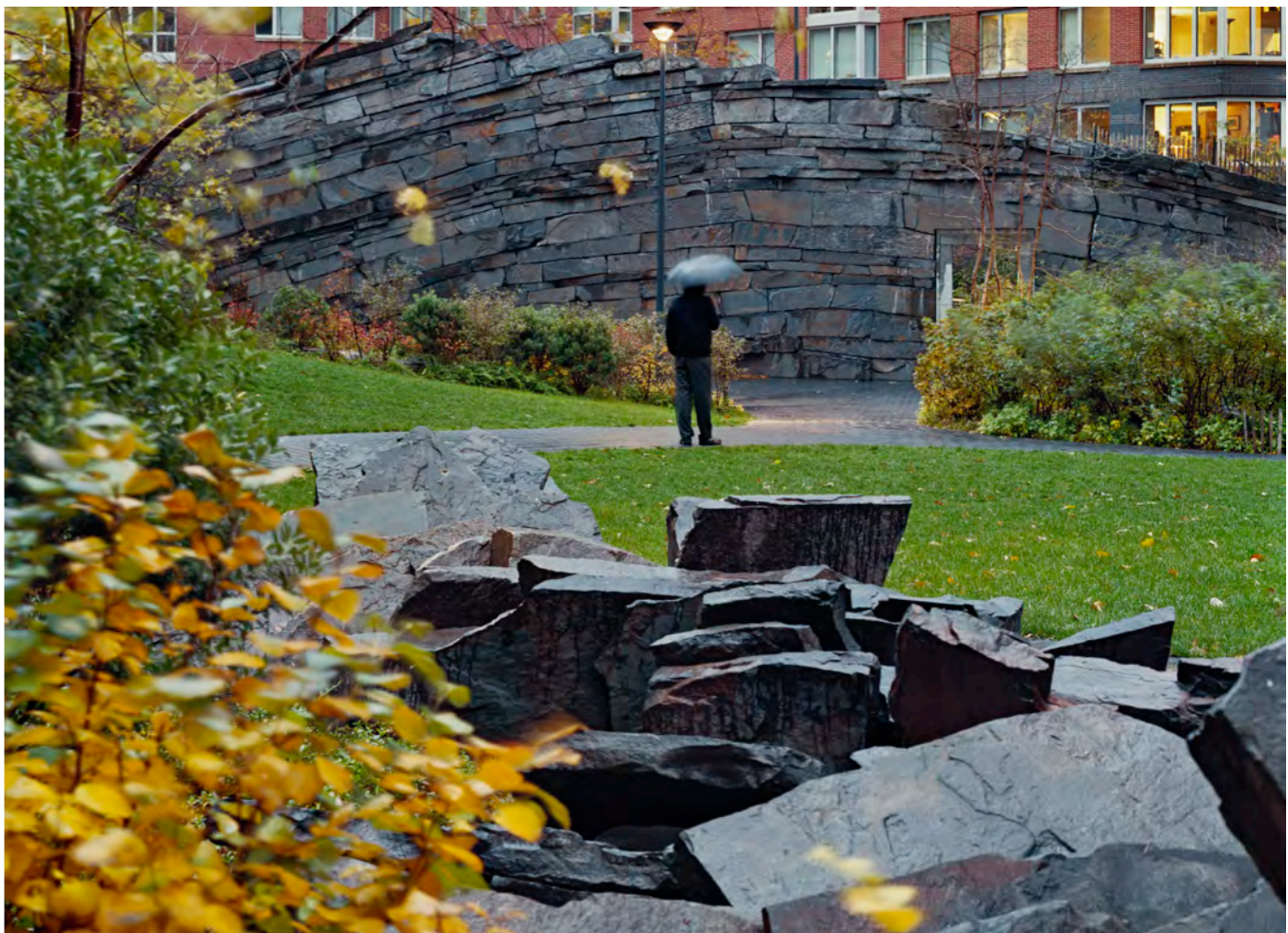
Thanks to Huihui and Huijing for introducing this.



# WILDNESS & HABITAT

## INSERT WILDNESS (& HABITAT)

- remove pavement/insert green
- reclaim urban infrastructure
- habitat values in urban planting



Top: Bloomingdale Trail, Chicago  
and

Bottom: Teardrop Park NYC,  
Michael VanValkenburg Associates, Landscape Architects



# Bloomingtondale Trail aka the 606, Chicago



Designed by Michael van Valkenberg Associates (MVVA). All images by MVVA.



# BIODIVERSITY

*HIGH LINE- retrofitting the city to insert biophilic functions*

*add wildlife habitat*

*add ecosystem functions*





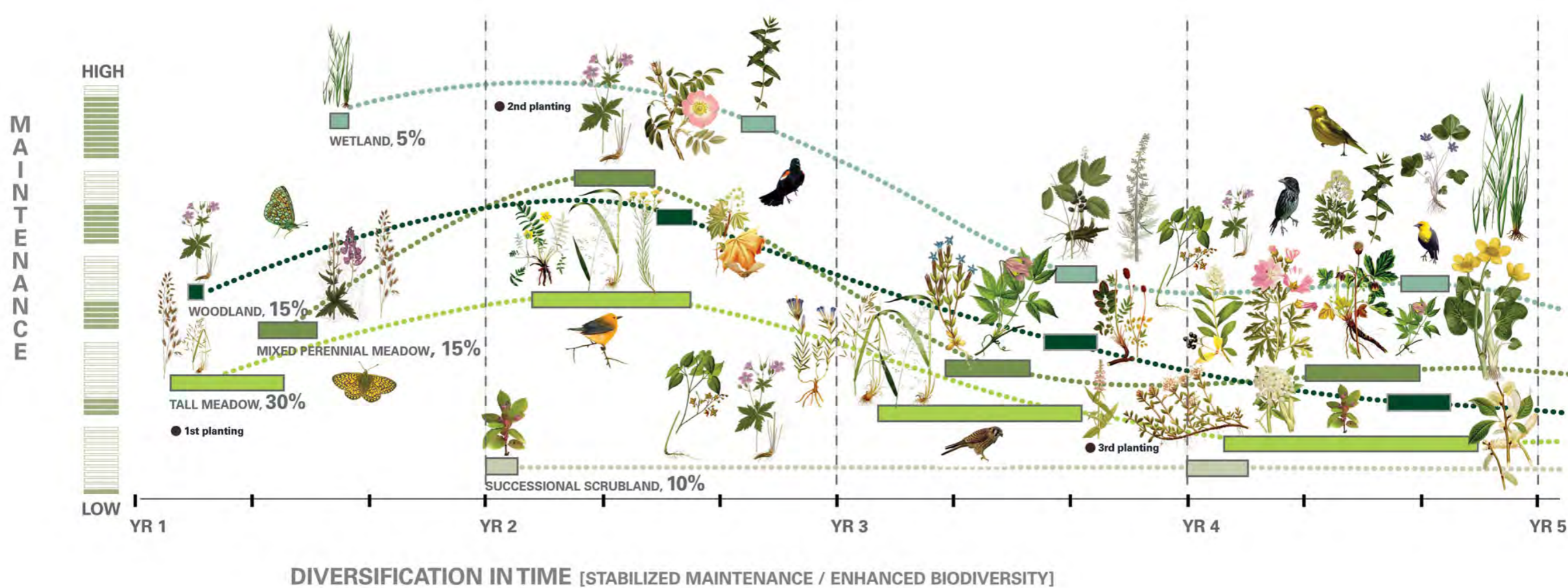
# A BIOPHILIC CITY

*“A biophilic city is a biodiverse city.”*

page 45

*Beyond scenery*

*Biodiversity & wildness*



James Corner Field Operations- The High Line- biodiversity strategy

Source: [backspace.com/notes/images/ecology\\_Phasing+Emergence](https://backspace.com/notes/images/ecology_Phasing+Emergence)



# MIMIC NATURAL PROCESSES— URBAN FOREST

*clean air*  
*reduce heat island*  
*infiltrate rainwater*

- PLANT TREES

New York: Plant 1 million new trees ✓  
70% on public land  
([milliontreesnyc.org](http://milliontreesnyc.org))

Vancouver: Plant 150,000 new trees  
(incomplete)

- INCREASE TREE CANOPY COVER

American Forests: every city should set a target

New York	24%	2006	30%	2036
Portland	30%	2014	33%	by??
Seattle	23%	2007	30%	2037
Toronto	27%	2008	40%	2060
Vancouver	18.60%	2010	28%	2030





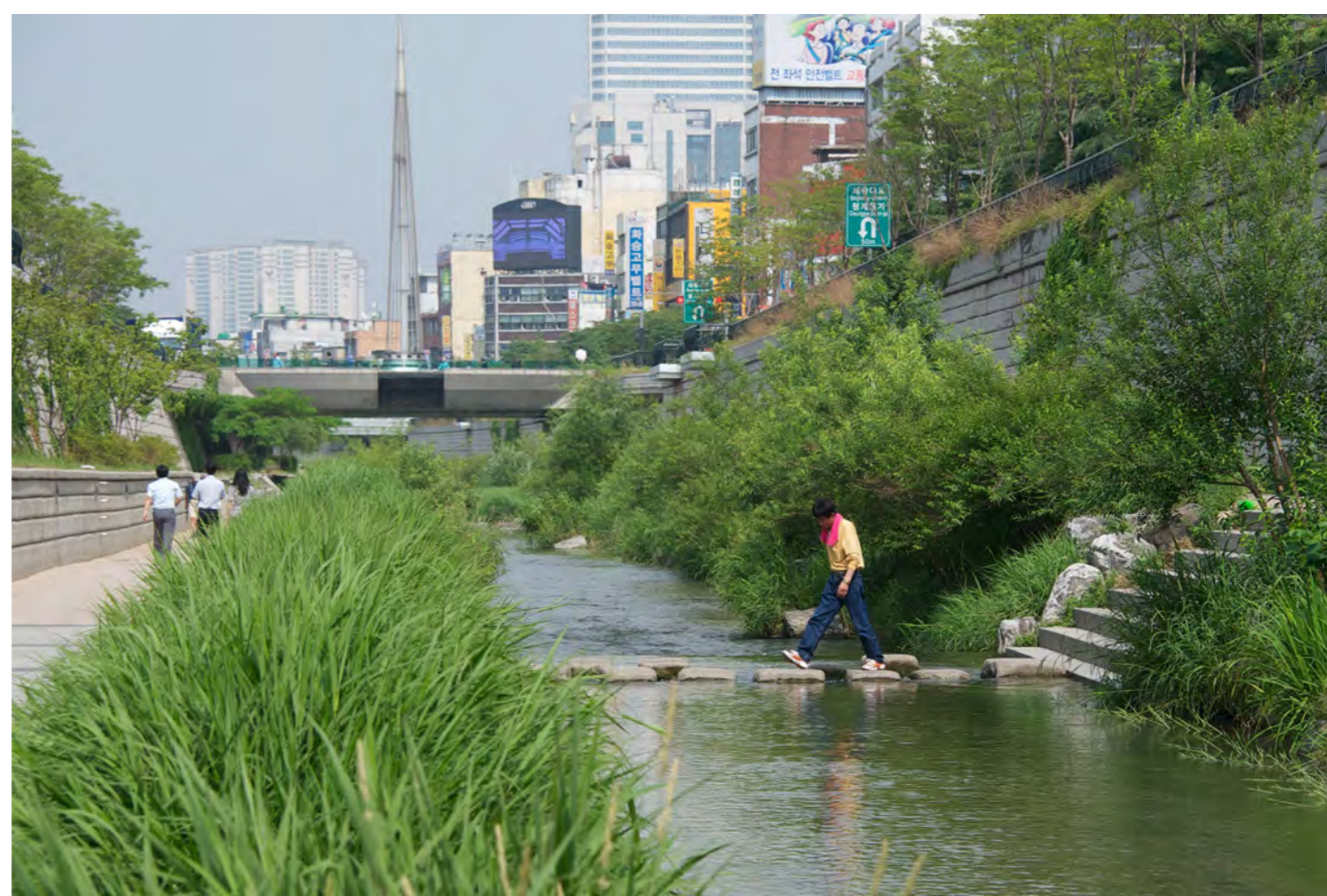
# ***MIMIC NATURAL PROCESSES— RESTORING URBAN HYDROLOGY***

*water as a resource  
clean urban water  
access to water*

- restore river systems
- restore urban hydrology

biodiversity up by 639%  
reduces urban heat island  
adds flood protection

Cheonggyecheon River, Seoul, South Korea  
Top source: BrianKusler via Flickr  
Bottom: listel.com





*CHEONGGYEHEON RIVER, SEOUL, S. KOREA*



<https://www.landscapeperformance.org/case-study-briefs/cheonggyecheon-stream-restoration>



# ***MENOMONEE RIVER VALLEY RESTORATION***

*Milwaukee, WI*

Brownfield restoration

Created habitat

Flood management

Stormwater wetlands

+

Public park

Wenk Associates Landscape Architects

all images from their website





# URBAN AGRICULTURE

## URBAN AGRICULTURE

*Active engagement with managing and growing*

- agriculture in the city
- community gardens
- rooftop gardening

UBC Farm

Olympic Village community garden





# ***A BIOPHILIC CITY- Essential components***

## **URBAN FORM**

- easily accessible nature
- mimic nature

(i.e. don't foul your nest; use waste as a resource)

- celebrate the shapes and forms of nature

## **BIOPHILIC ACTIVITIES**

- celebrate the unique regional geography and ecology
  - citizens participating in nature
  - creating community through nature
- connected to climate/ celebrating climate

## **BIOPHILIC KNOWLEDGE**

- citizens who are knowledgeable about local ecology
- citizens with deep knowledge of natural history

## **BIOPHILIC GOVERNANCE**

- priority placed on ecological restoration
- cities invest in ecological education of citizens
- cities work to protect nature beyond their borders



# MEASURING THE BIOPHILIC CITY— How do we know if we have it?

## INDICATORS OF A BIOPHILIC CITY

Physical conditions and infrastructure

Activities

Attitudes and knowledge

Institutions and Governance

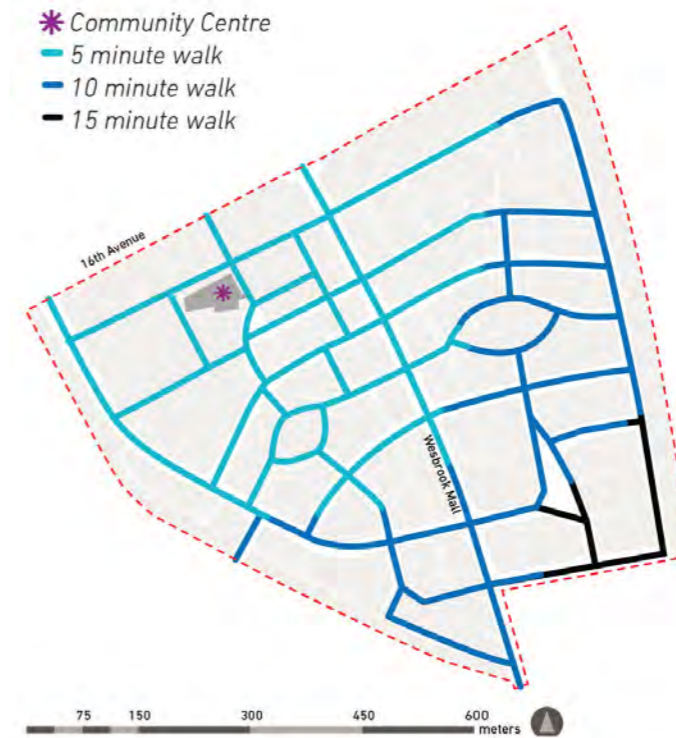


Figure 2.16 Walking Distance from Community Centre



Figure 2.14 Walking distances from the playgrounds to residences



# INDICATORS OF A BIOPHILIC CITY

## *Spatial indicators*

% population within 100 metres of park/  
greenspace

Is the greenspace connected?

% of city land area in wild or semi-wild nature

% of area with tree canopy cover

% of area with forest cover

Number (per capita) of green elements

Kilometres per capita of walking trails

Number of community garden plots per capita



City of Vancouver- 2013 Marpole Plan  
Top: access to parks; Bottom: access to transit  
(created by UBC elementsLab)



# INDICATORS OF A BIOPHILIC CITY

## Activities & knowledge

% of population active in nature/outdoor clubs

% population engaged in volunteer nature restoration

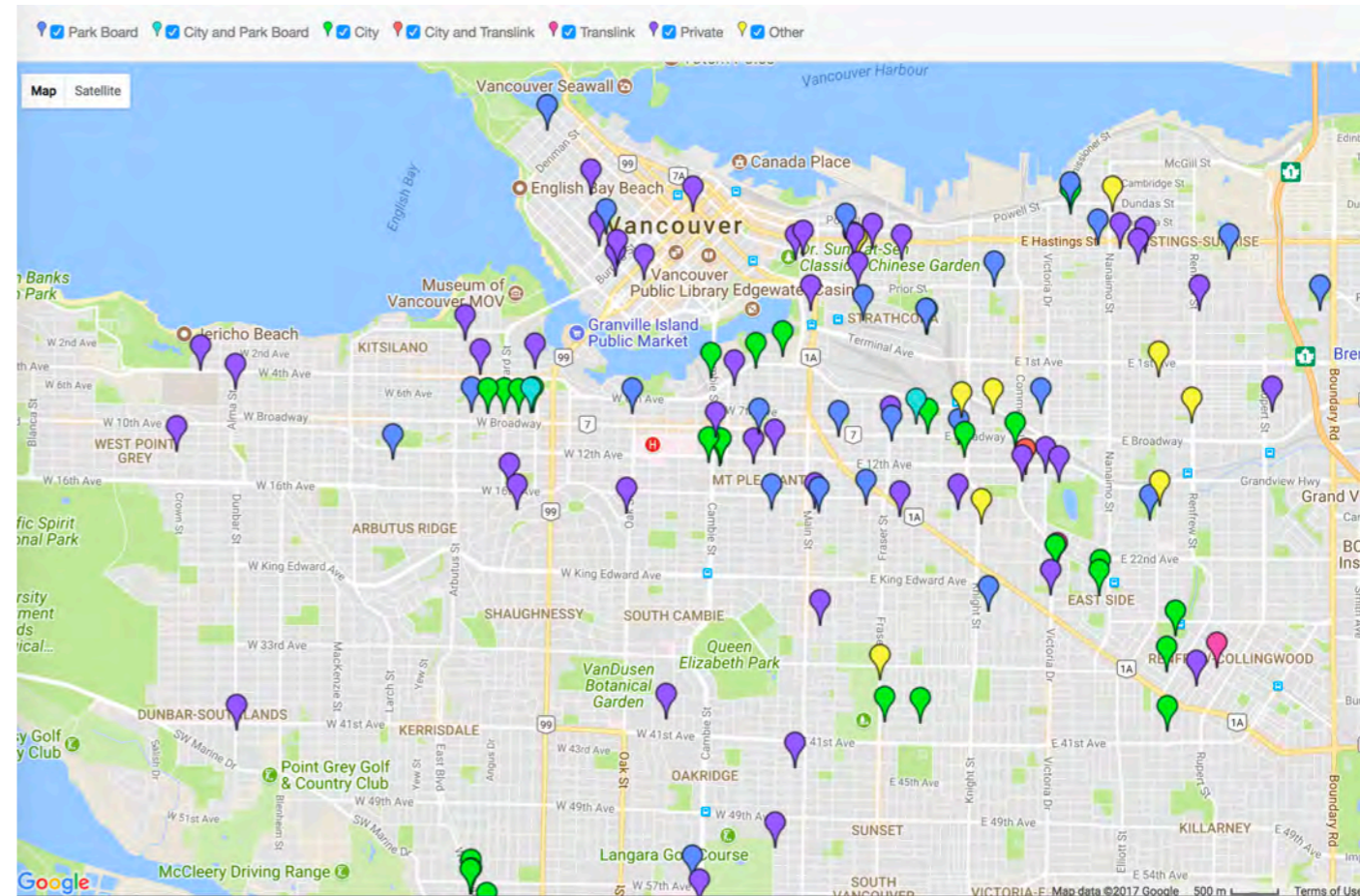
% of their time residents spend out of doors

% of residents who actively garden

Extent of recess and outdoor playtime (% of total school day)

% population that can recognize common flora and fauna

Extent to which residents are curious about the natural world



City of Vancouver

97 community gardens/ 3900 plots in Vancouver

**~6.4 plots/1000 people**

<http://vancouver.ca/people-programs/community-gardens>.



# INDICATORS OF A BIOPHILIC CITY

## *Governance*

VANCOUVER

UBC

Adoption of local biodiversity plan or strategy

✓

x

Local biophilic support organizations (museums)

✓ ✓ ✓

Priority given to environmental education

?

✓

% local budget going to conservation, restoration

very small

very small

Adoption of green building building and planning codes

✓

✓

Number of city-supported biophilic projects

?

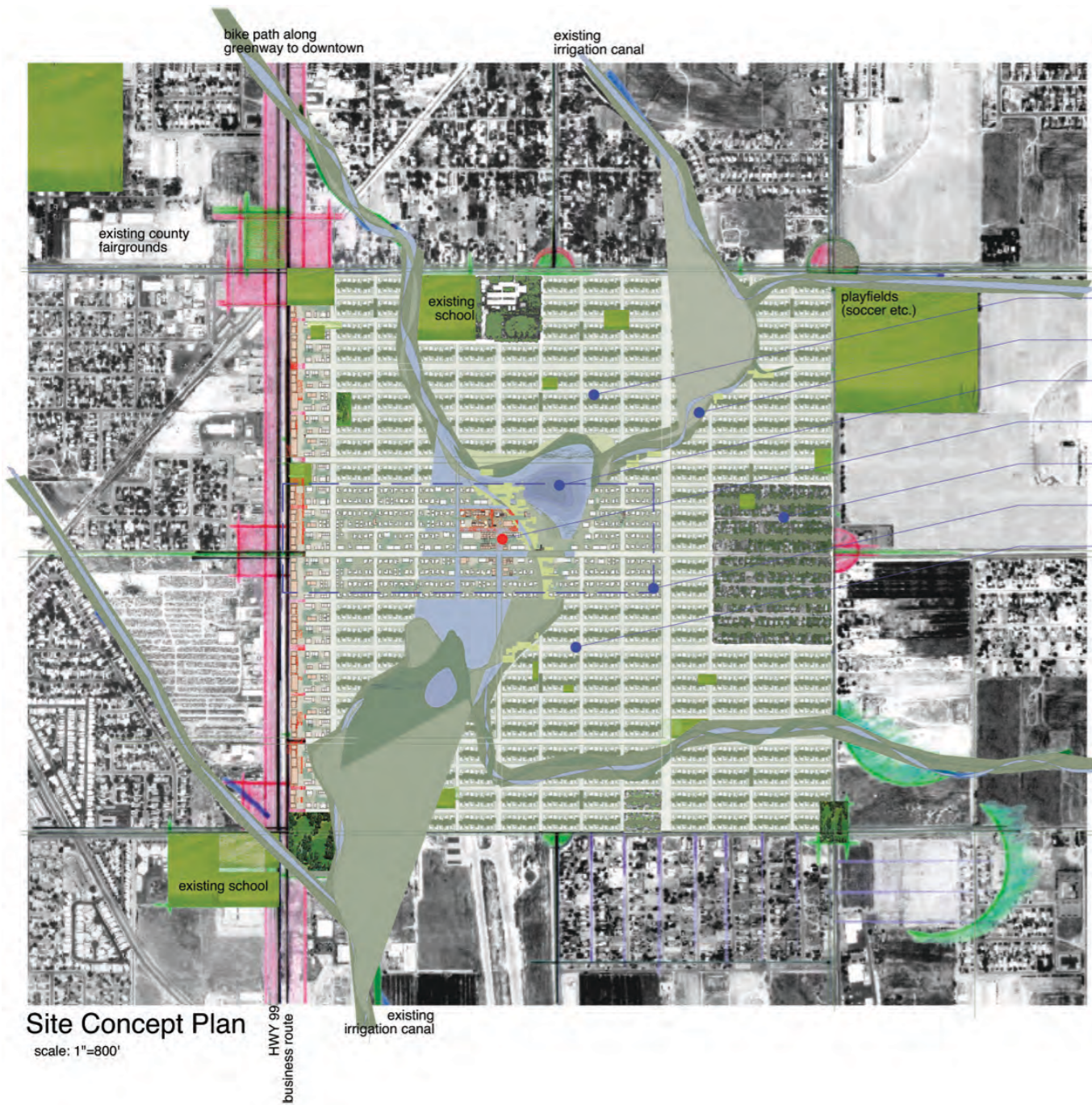
?

Adoption of urban forest plan or strategy

✓

x





## CONCLUDING TAKE-AWAYS

People have an affinity for nature

“Nature” is different for different people/cultures

Access to nature improves human physical and mental health

## ESSENTIAL ELEMENTS OF A BIOPHILIC CITY

Accessible nature

More wildness in cities

Mimic nature/natural processes

Repair ecosystems

“Working” landscapes



QUESTIONS?  
COMMENTS?