The Gazette

Cedar Rapids
26°

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Trees serve as nature's engineers in cities

A house sparrow perches in a young budding tree in downtown Cedar Rapids on Friday, March 31, 2017. (Liz

The Evolution of Infrastructure :: From Sanitary to Sustainable

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College of the Environment

Inland Tree & Landscape Conference
Spokane Washington
1 February 2019

Outline

sanitary to sustainable city
green infrastructure solutions
stormwater management
examples – co-design for co-benefits
trees/nature in cities & human health
(mental health & wellness)

sanitary city

efficient and hygienic
supply & removal
    of materials and services
natural systems disconnect

Industrial Age – city squalor

credit: BlendSpace

credit: blogs.isb.bj.edu.cn

Filthy Cities!

08/04/2005

Baltimore: Public Works Museum
STORM DRAIN

SANITARY
STORM DRAIN

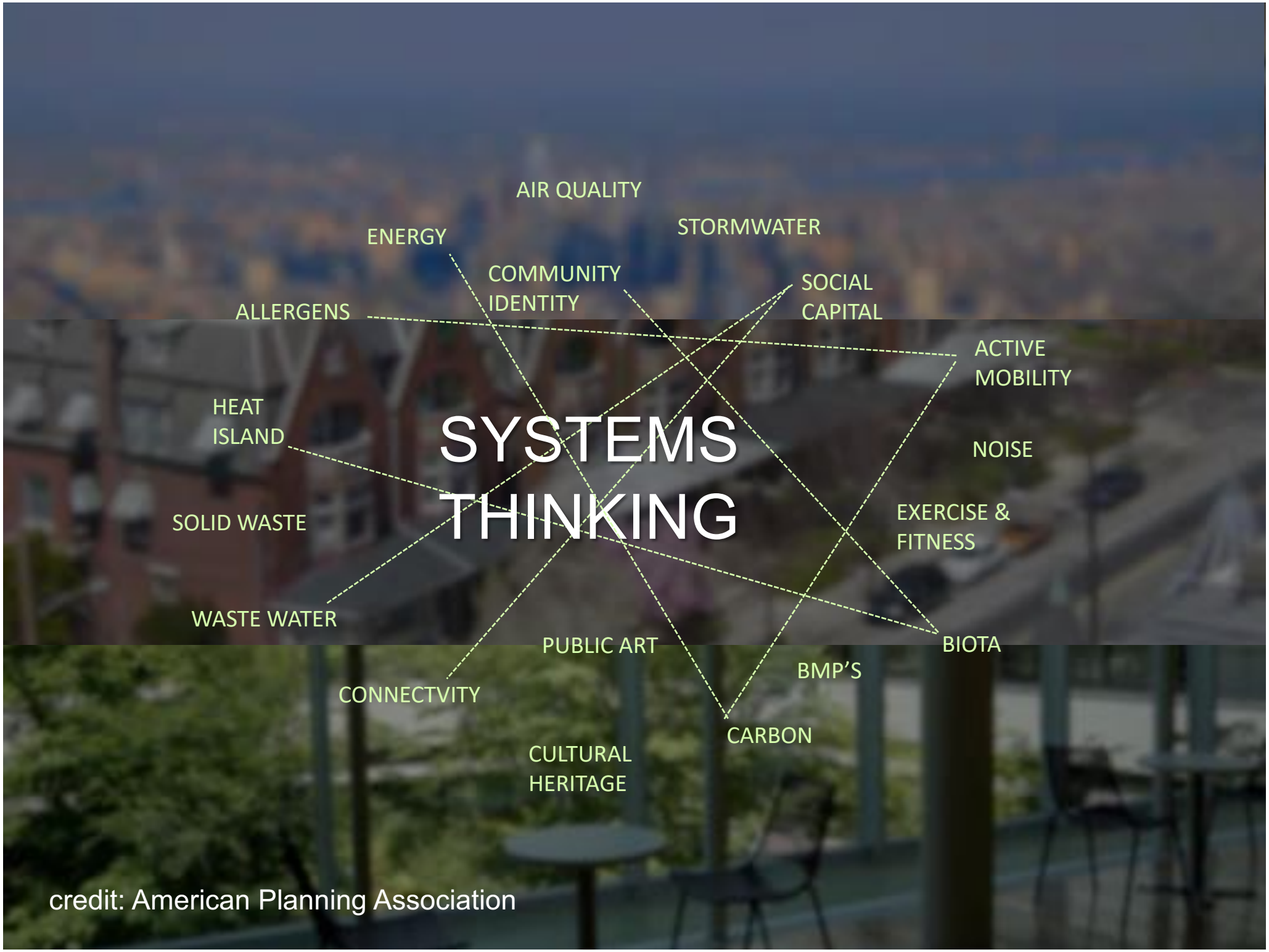
credit: Leann Andrews, University of Washington

Images taken in the Community of Claverito, Iquitos, Peru

sustainable city

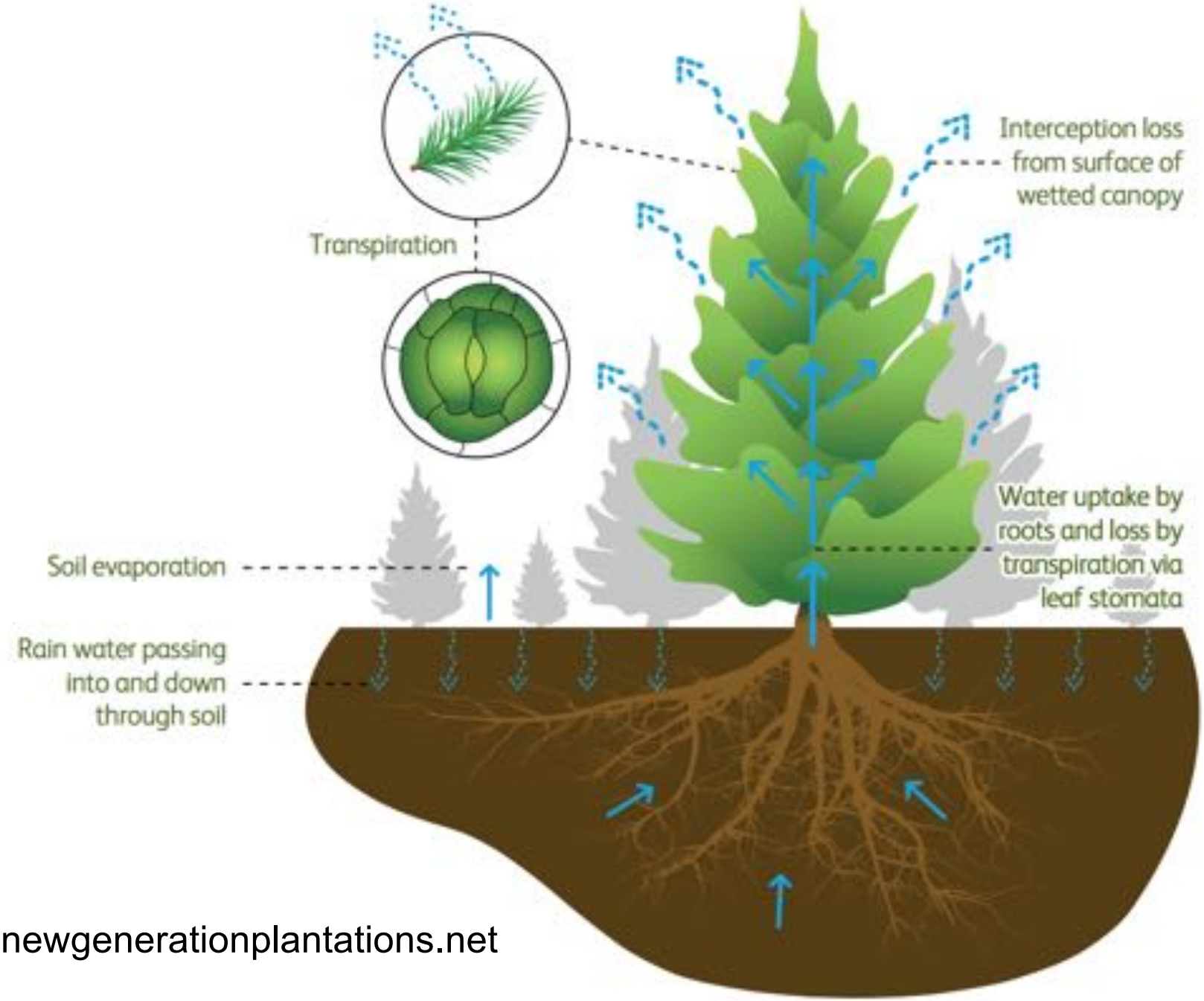
ecological function,
green infrastructure, &
‘revealed’ processes

Pincetl, S. 2010. From the sanitary city to the sustainable city. Local Environment


AIR QUALITY
ENERGY
STORMWATER
COMMUNITY IDENTITY
SOCIAL CAPITAL
ALLERGENS
ACTIVE MOBILITY
HEAT ISLAND
SYSTEMS THINKING
NOISE
SOLID WASTE
EXERCISE & FITNESS
WASTE WATER
BIOTA
PUBLIC ART
BMP'S
CONNECTVITY
CARBON
CULTURAL HERITAGE
credit: American Planning Association

Green Infrastructure

systems solutions
ecology that works
co-design for co-benefits



credit:newgenerationplantations.net

measure the canopy of a city

i-Tree™

Eco (UFORE)

Streets (STRATUM)

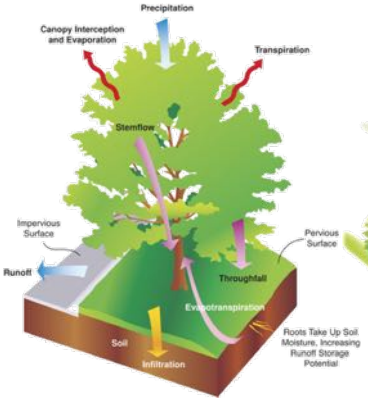
Hydro

Vue

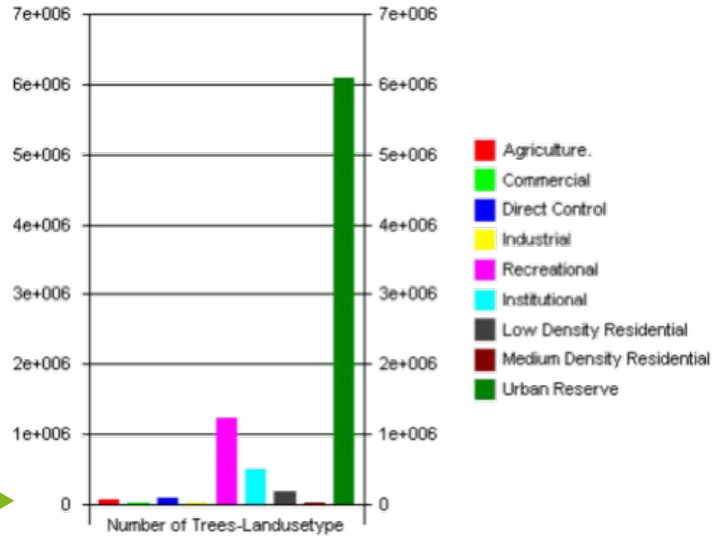
tools provided by USDA Forest Service

STRUCTURE

FUNCTION



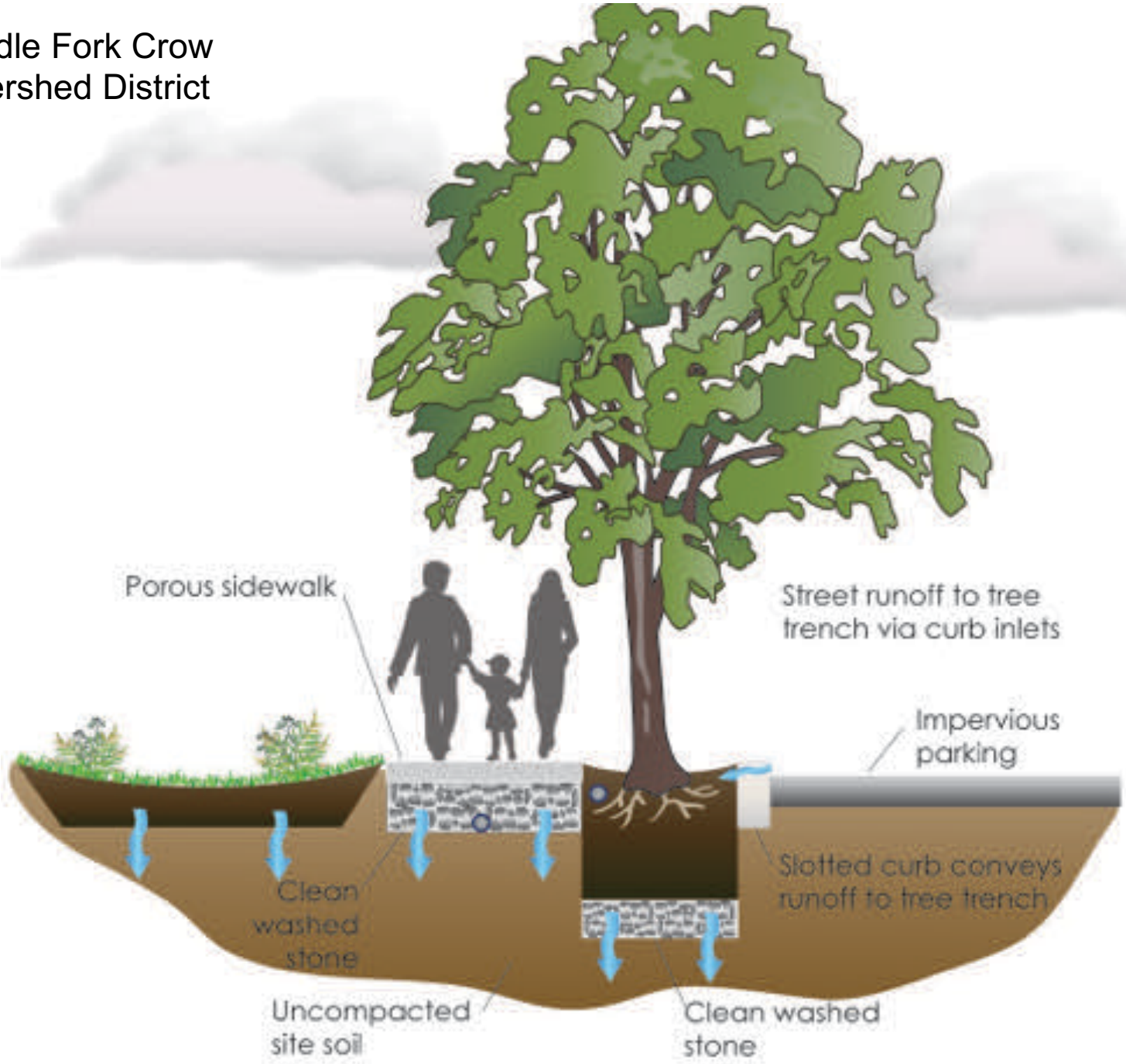
VALUE

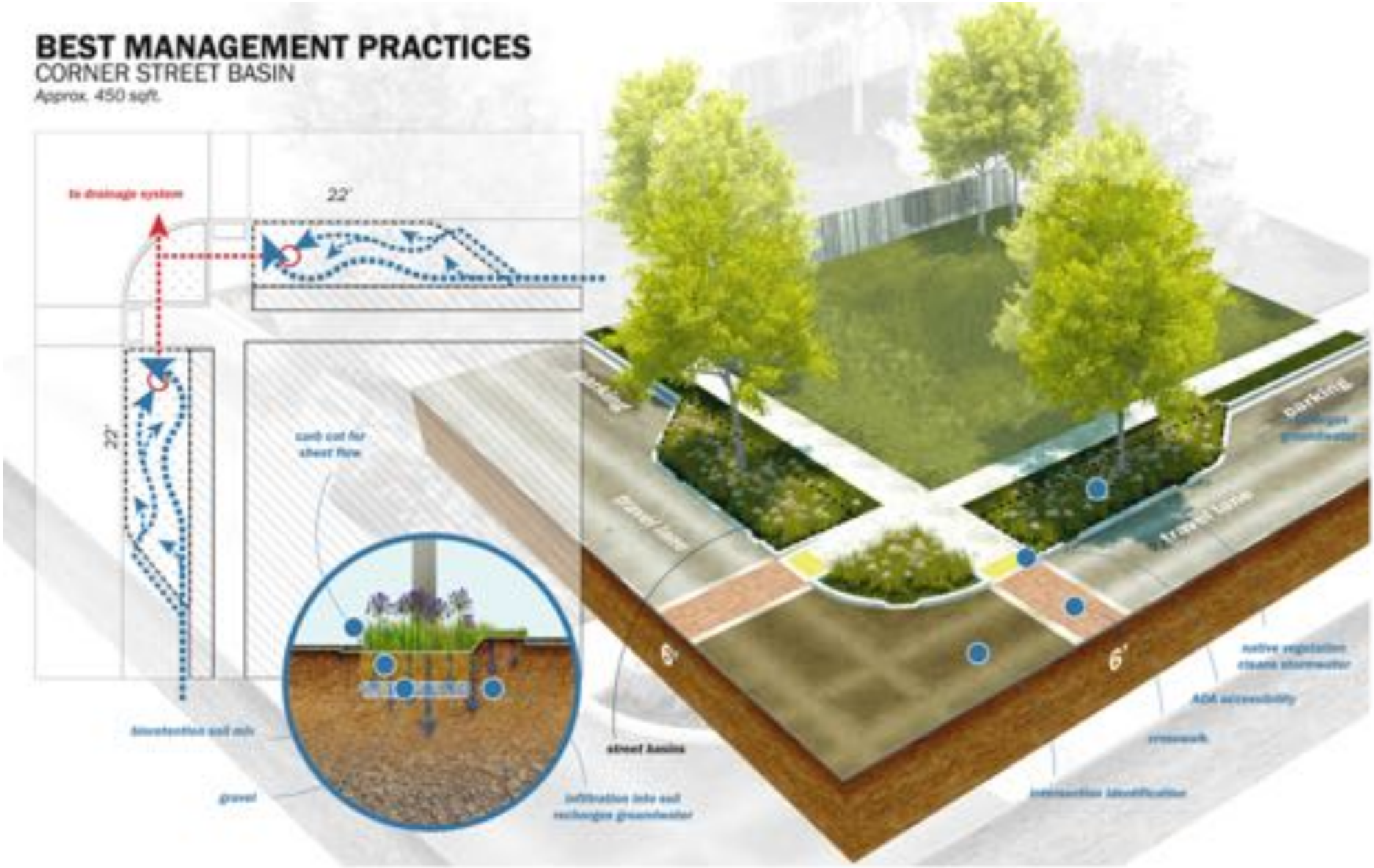


MANAGEMENT

photo credits: Seattle i-Tree Training by Al Zelaya

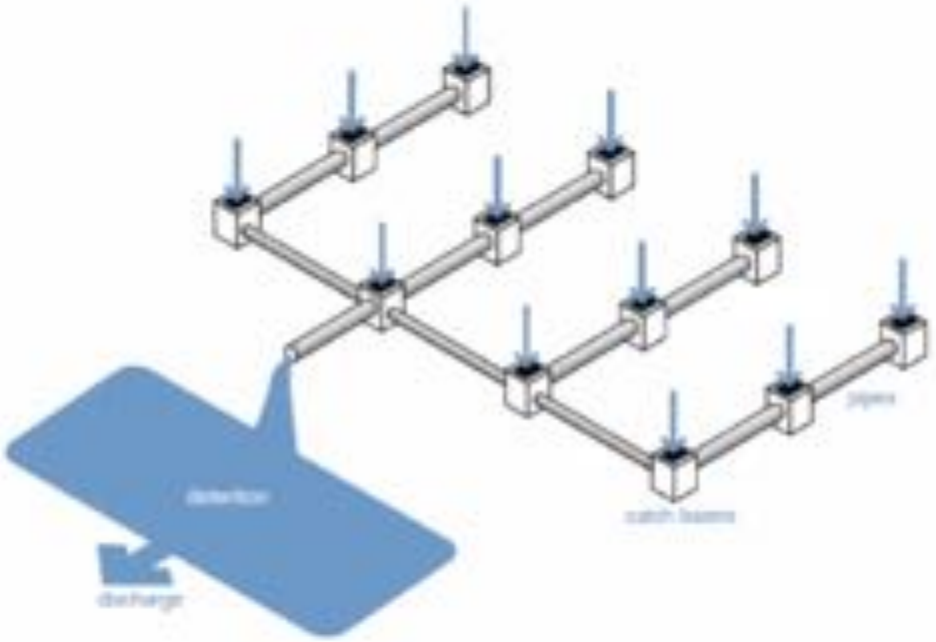
credit: Middle Fork Crow River Watershed District





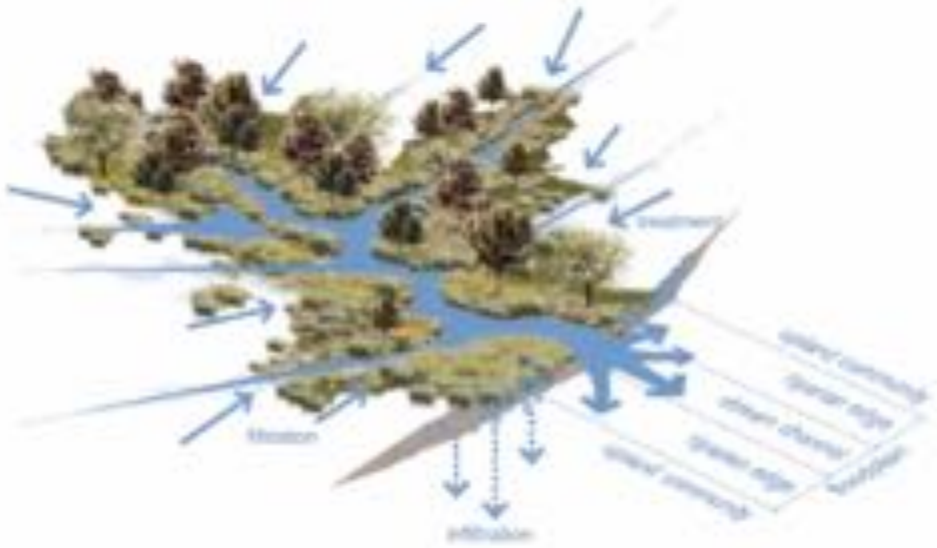
credit: georgetownclimate.org

Grey Infrastructure



Drain, direct, dispatch

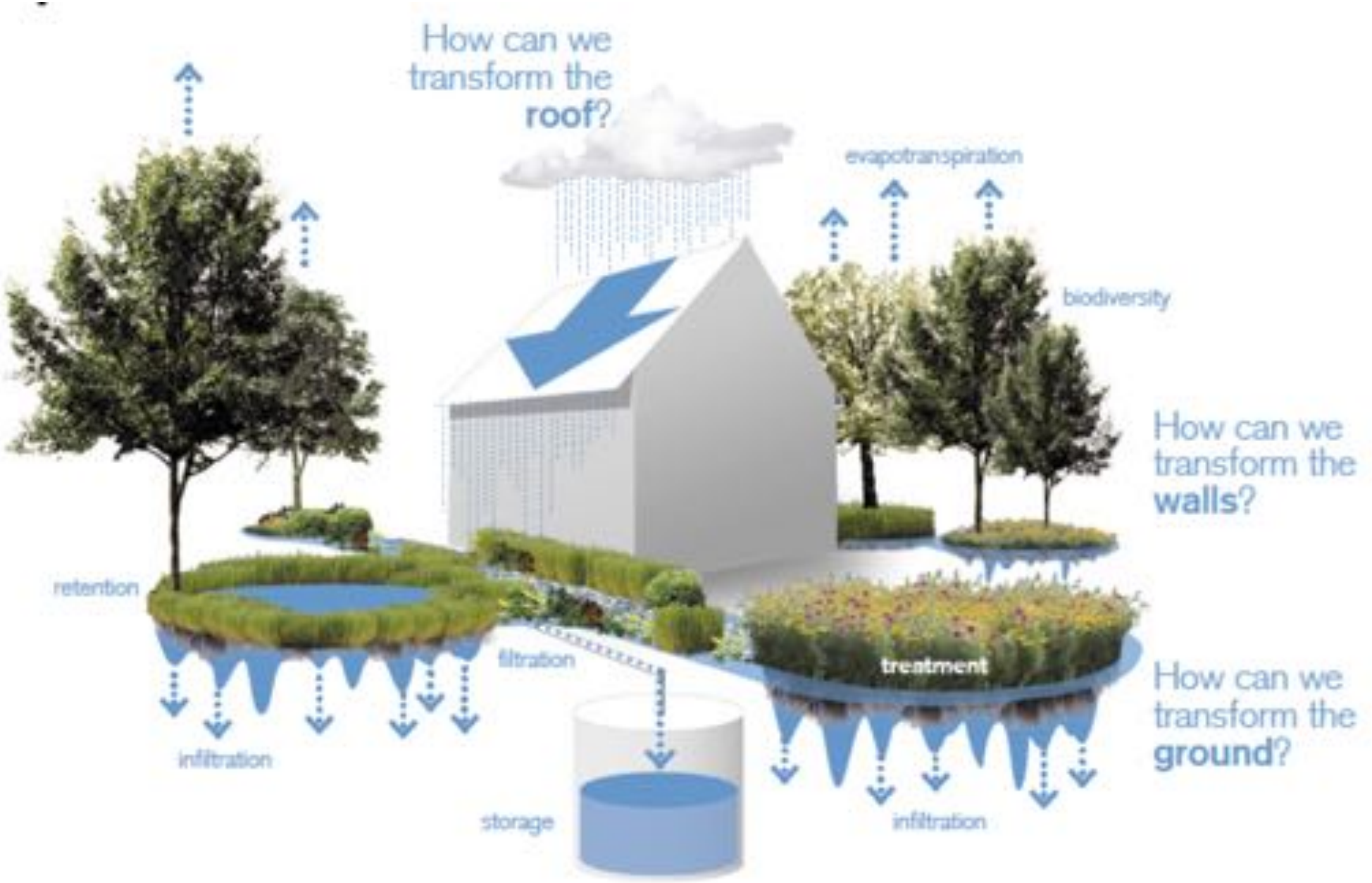
Green Infrastructure



Slow, spread, soak

Source: *Low Impact Development: A Design Manual for Urban Areas*, 2010

stormwater retention



Low Impact Development: A Design Manual for Urban Areas, 2010

green infrastructure tools & strategies

= mini parks?

credit: Seattle Public Utilities

credit: Cliff Mass

Green Stormwater Infrastructure :: Hermosillo, Mexico (6 inch rainfall)

GREEN INFRASTRUCTURE

FOR DESERT COMMUNITIES

Watershed Management Group

Outline

sanitary to sustainable city
green infrastructure solutions
examples – co-design for co-benefits
trees/nature in cities & human health
(mental health & wellness)

stormwater management

Stormwater Management

Thornton Creek Water Quality Channel (Seattle, SvR Design)
1 hectare, treats runoff from 275 hectares (1 hectare = 2.47 acres)

Tanner Springs Park

Portland OR

linked to active living network

neighborhood
social cohesion

environmental
education &
social learning

Historic 4th Ward Park - Master Plan
August 2009
BeltLine
City Hall East
North Avenue
Art Fast Bosque
Event Lawn
Stormwater Retention
Grand Entry
Open Lawn
Large Dog Park
Community Garden
Cistern
Garden Shed
Playground
Urban Forest and Stream
Restroom
Splash Pad
Footbridge
Small Dog Park
Urban Forest
Lawn Overlook
Wildflower Meadow
Entry Lawn
Stormwater Retention
Sports Field
Playground
Restroom
Skate Park
Willoughby Way Extension
Freedom Parkway
WPI Wood Partners Inc.

Historic Fourth Ward, Atlanta

Clear Creek Basin, 2 acre stormwater detention lake,
17 acres of greenspace & parks amenities

nature in cities for human health

quality of life
livable places
disease prevention
health promotion

WHO Health Definition

A state of complete
physical, mental, and social well-being
and not merely the absence
of disease or infirmity (1946)

Determinants of Health

Green Cities: Good Health

www.greenhealth.washington.edu

Sponsors:
USDA Forest Service, U&CF Program
University of Washington
NGO partners

Thanks!
to U of WA students:
Katrina Flora
Mary Ann Rozance
Sarah Krueger

Research Reviews & Summaries

Community Building
Local Economics
Place Attachment & Meaning
Crime & Fear
Safe Streets
Active Living
Reduced Risk
Wellness & Physiology
Healing & Therapy
Mental Health & Function
Work & Learning
Culture & Equity
Lifecycle & Gender

Local Economics

RSS Feed Print

Trees in cities are not grown and managed for products that can be bought and sold on markets, but they do provide many intangible services and functions! This article serves two purposes. First, it introduces valuation methods that are used to convert intangible benefits to dollar sums.[1,2] Then, it shows how nonmarket valuations can support local decision-making.

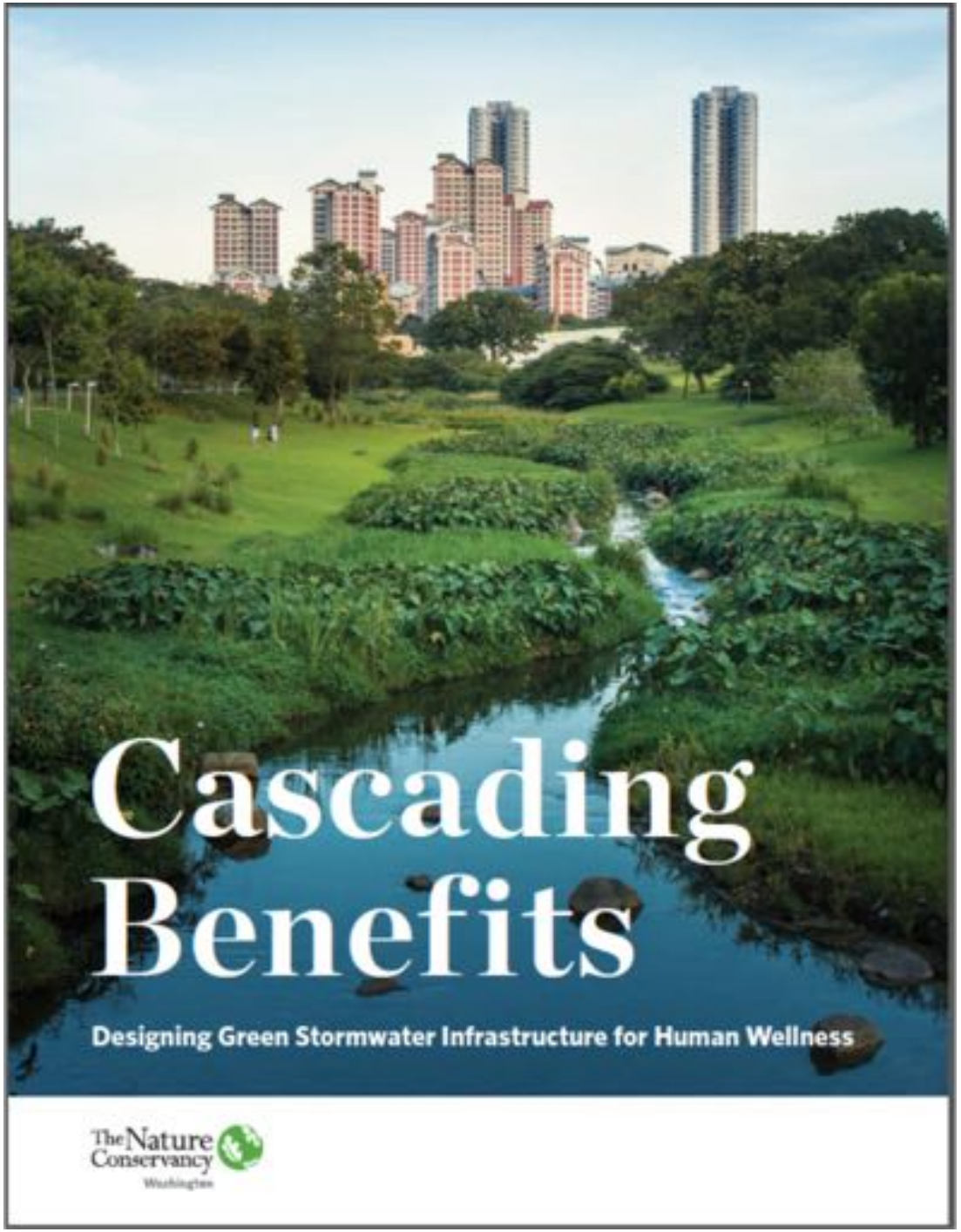
street trees boost market value of houses, providing tax revenue for communities

Fast Facts

- The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of $1.35 billion, potentially increasing annual property tax revenues $15.3 million.[9]
- A study found 7% higher rental rates for commercial offices having high quality landscapes.[14]
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.[34]
- Shoppers indicate that they will travel greater distance and a longer time to visit a district having high quality trees, and spend more time there once they arrive.[34]

Design Ideas

enhance aesthetics & appeal
create great places
encourage health behaviors & outcomes



co-author:

co-author & printing:

The Nature Conservancy

sponsors:

Willamette Partnership

Oregon Public Health Institute

The Green Infrastructure Leadership Exchange

green infrastructure & reduced crime

Philadelphia

reduction in narcotics arrests (18–27 %) for green not gray

vs. 65% increase across city

Kondo et al. 2015.
Journal of Public Health

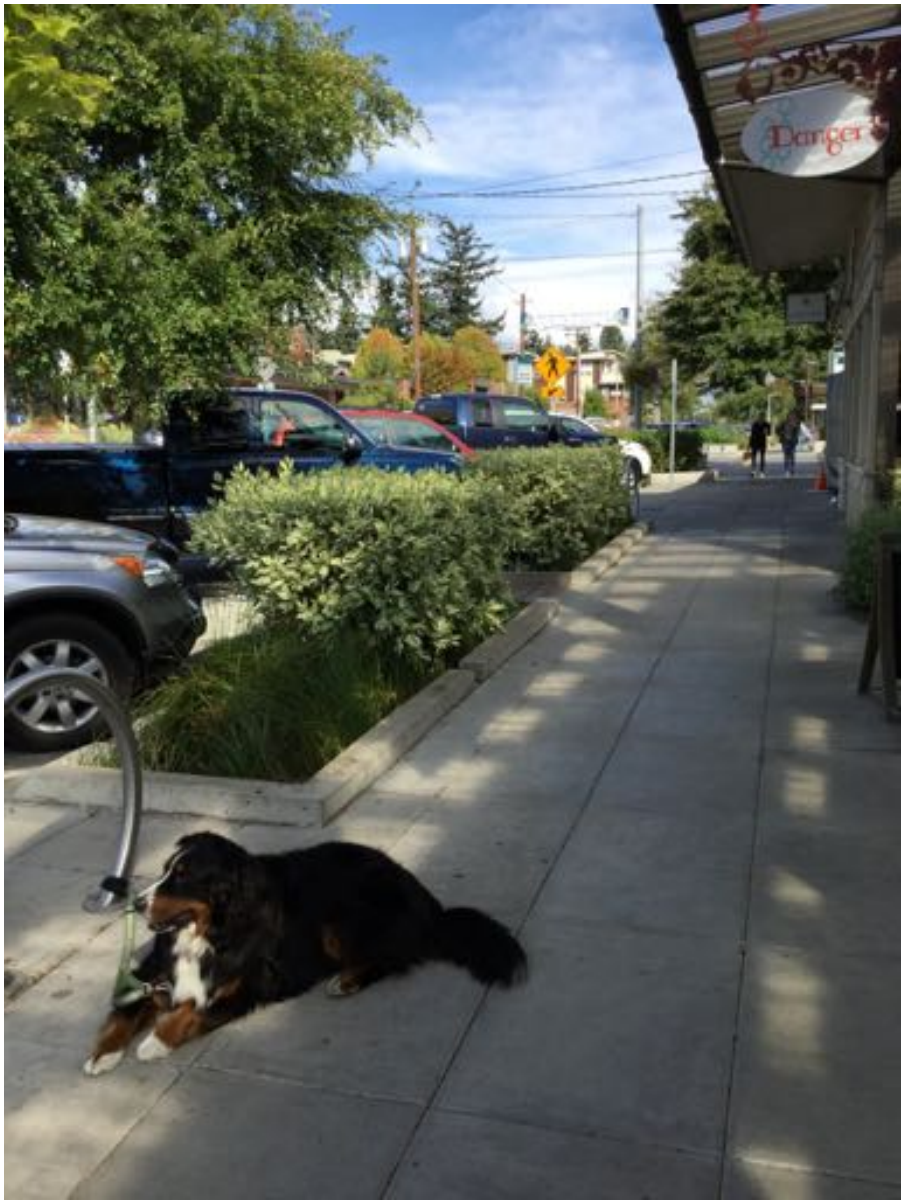
BEFORE

AFTER

credit: SvR | MIG

Winslow, Bainbridge Island, Washington

retail district green stormwater infrastructure



management for co-benefits - retail

place making:
vertical + horizontal surfaces

design
concept

design concept

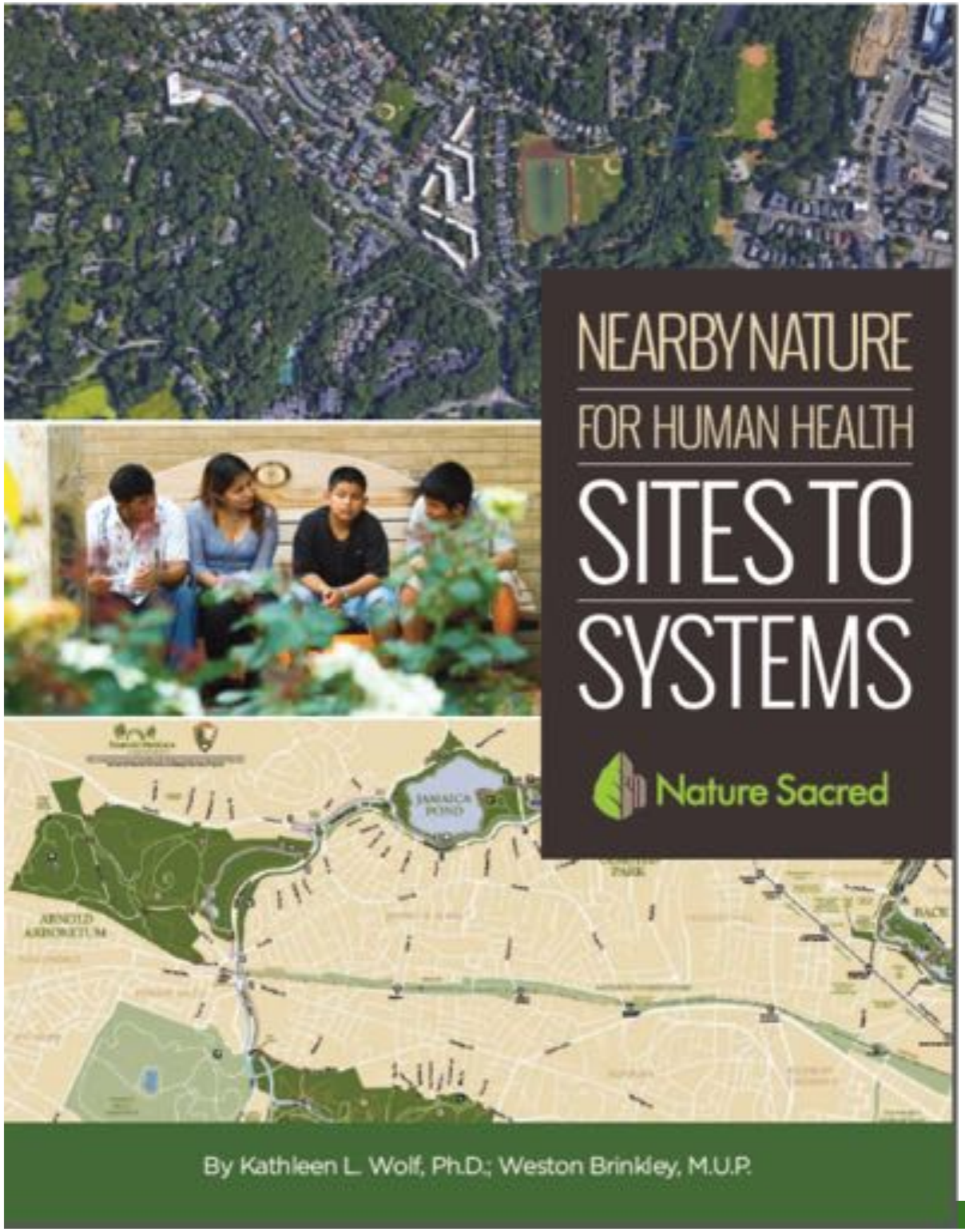
bring people in!

design concept

orient seating to nature!

design concept

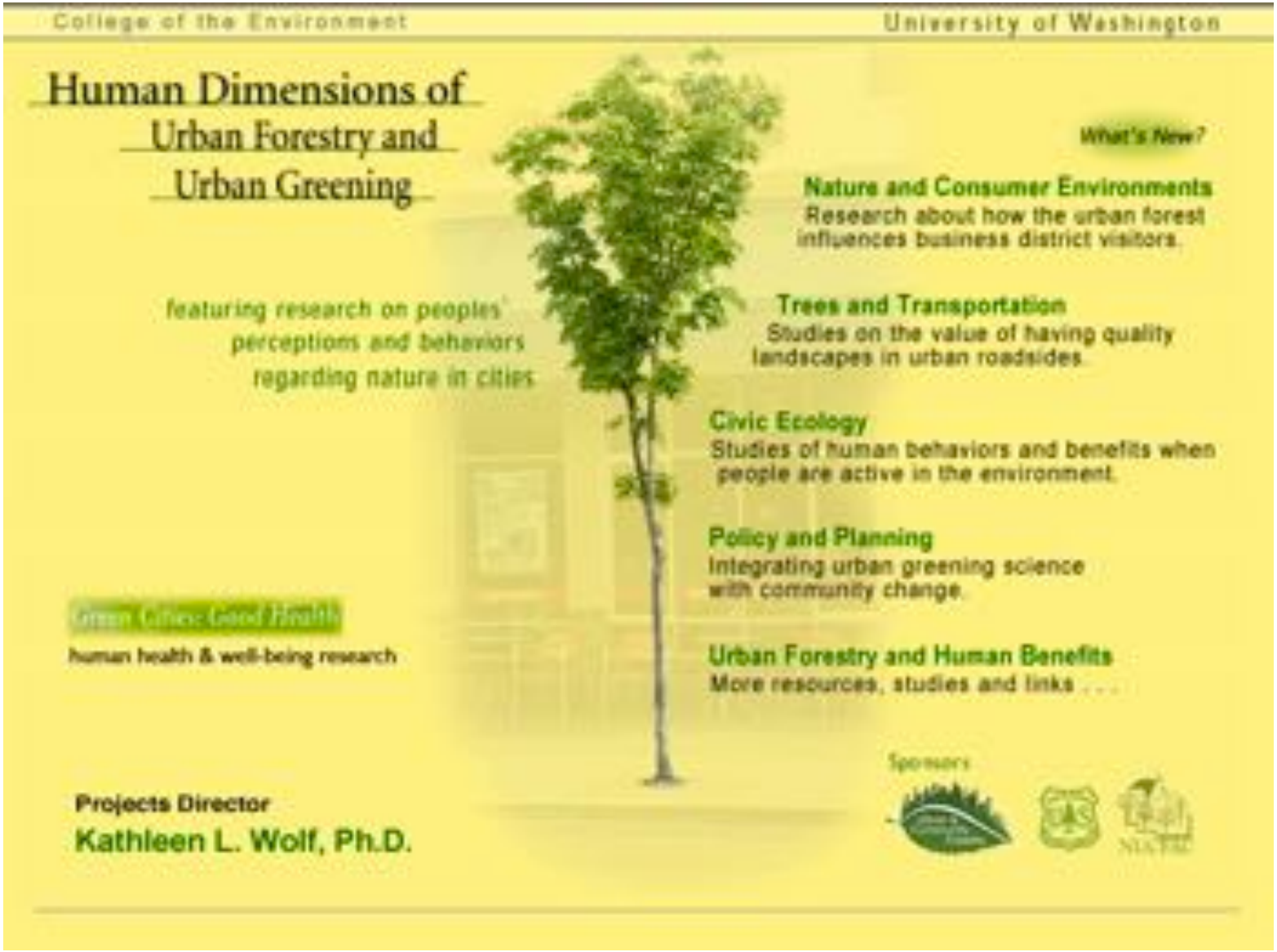
enable
biodiversity &
soft fascination



spatial linkages: the city becomes a park

TKF Foundation :: Nature Sacred initiative

Summary

sanitary to sustainable cities
green infrastructure solutions
nature in cities & human health
co-design for co-benefits
improved human habitat
trees are essential!

www.naturewithin.info