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College of the Environment University of Washington

## Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples' perceptions and behaviors regarding nature in cities

**What's New?**

- Nature and Consumer Environments**  
Research about how the urban forest influences business district visitors.
- Trees and Transportation**  
Studies on the value of having quality landscapes in urban roadsides.
- Civic Ecology**  
Studies of human behaviors and benefits when people are active in the environment.
- Policy and Planning**  
Integrating urban greening science with community change.
- Urban Forestry and Human Benefits**  
More resources, studies and links . . .

**Green Cities: Good Health**  
human health & well-being research

**Projects Director**  
**Kathleen L. Wolf, Ph.D.**

Sponsors



# **The Evolution of Infrastructure :: From Sanitary to Sustainable**



Kathleen Wolf, Ph.D.  
Research Social Scientist

University of Washington (Seattle)  
School of Environmental and Forest Sciences  
College of the Environment

## **Vinterkonferanse**

Oslo Norway  
5 Februar 2019





Landscape

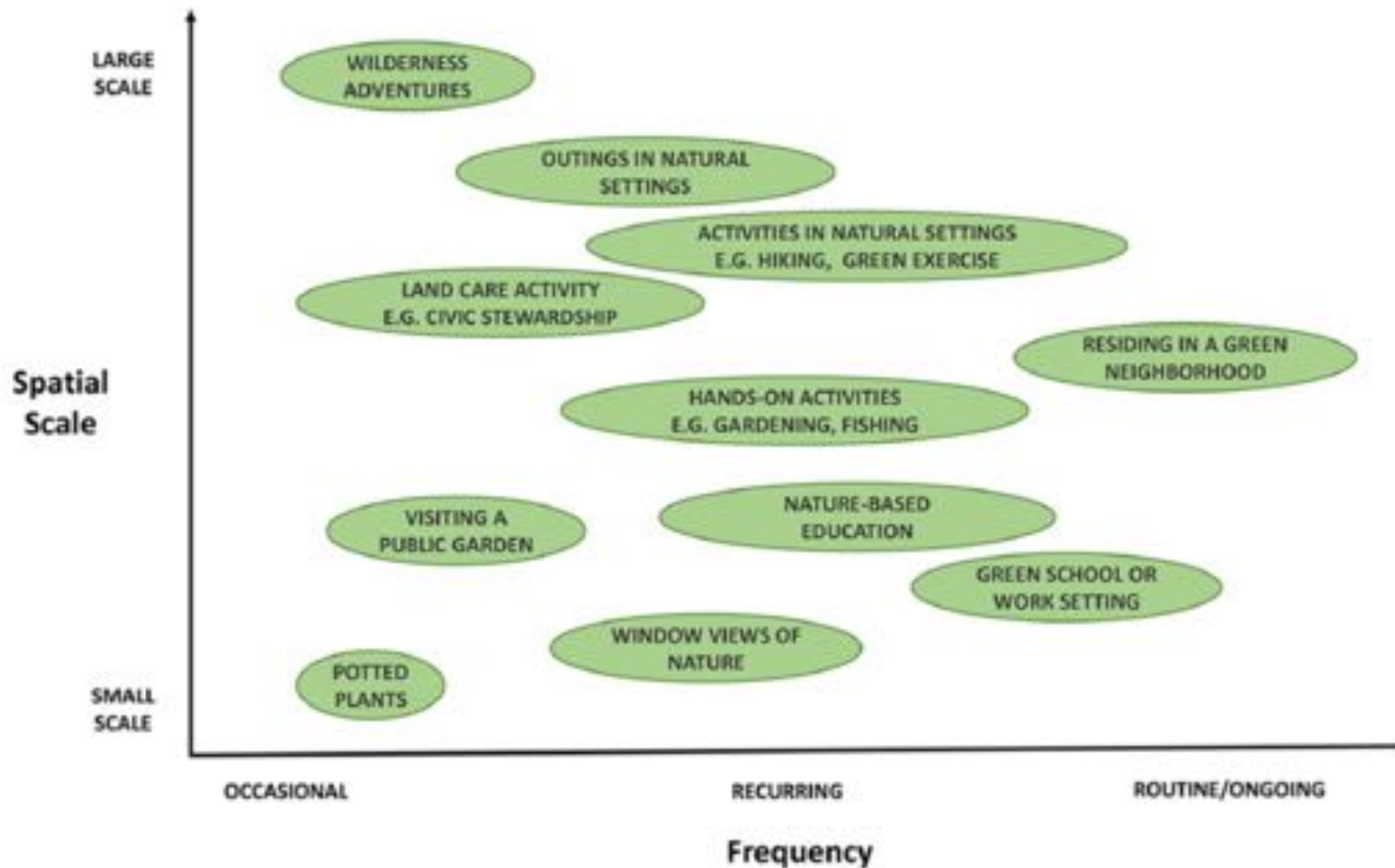


Community



credit: Ignacio Bunster-Ossa

Garden



Frumkin et al. 2017. Nature Contact and Human Health: A Research Agenda. Environmental Health Perspectives

# 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!







## Baltimore: Public Works Museum















credit: Leann Andrews, University of Washington

Images taken in the Community of Claverito, Iquitos, Peru

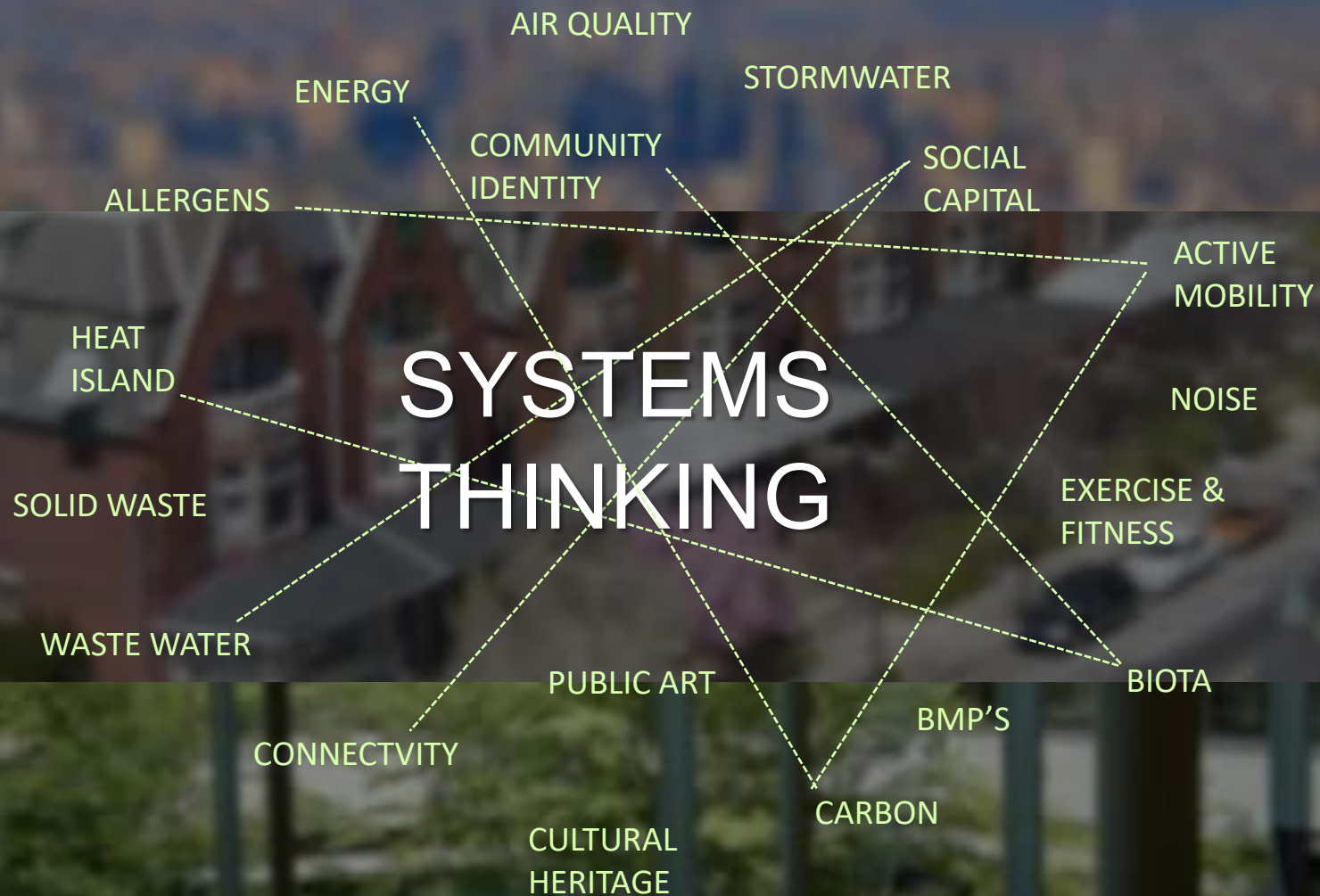


# sustainable city

ecological function,  
green infrastructure, &  
'revealed' processes

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

# SYSTEMS THINKING



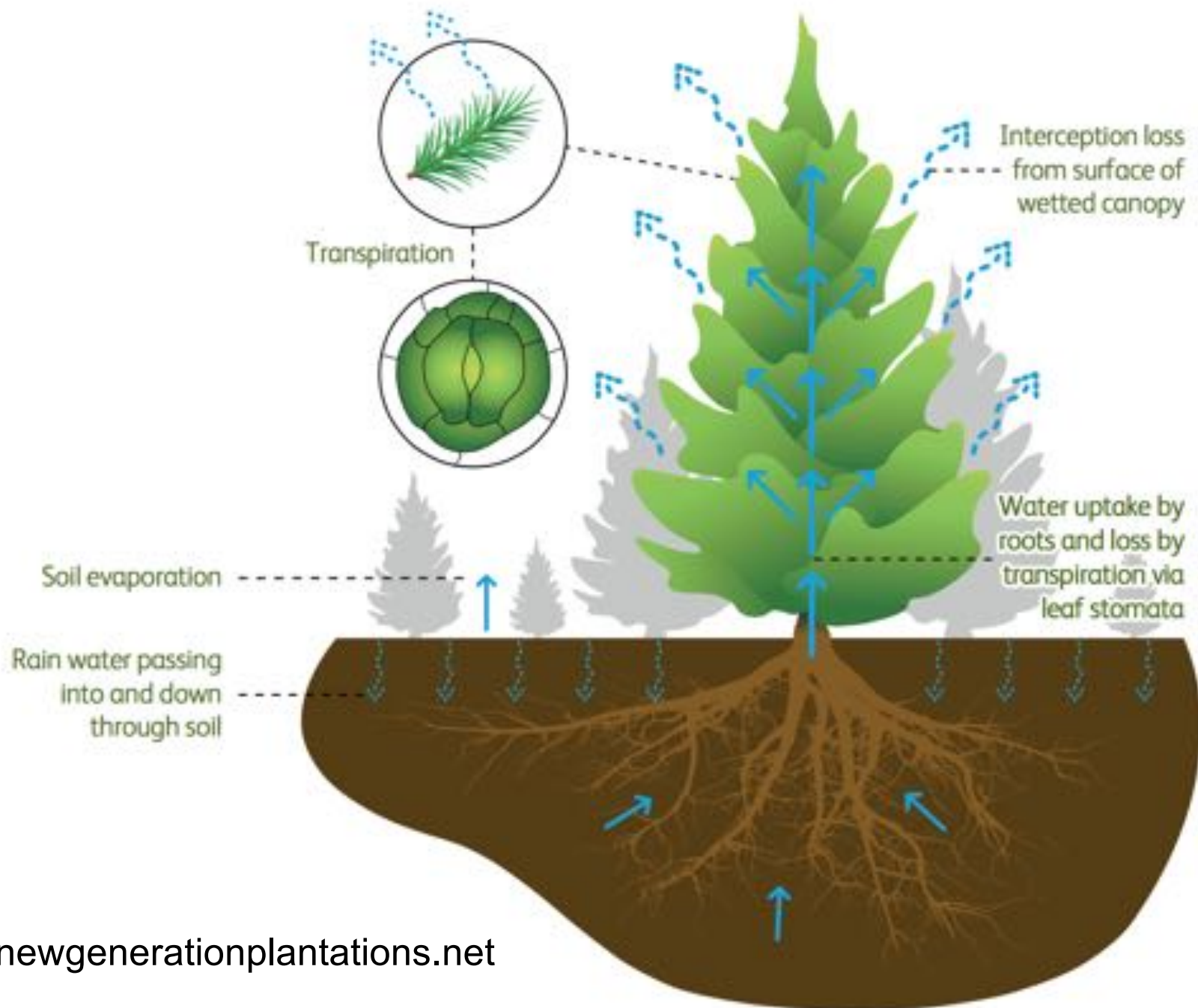
credit: American Planning Association





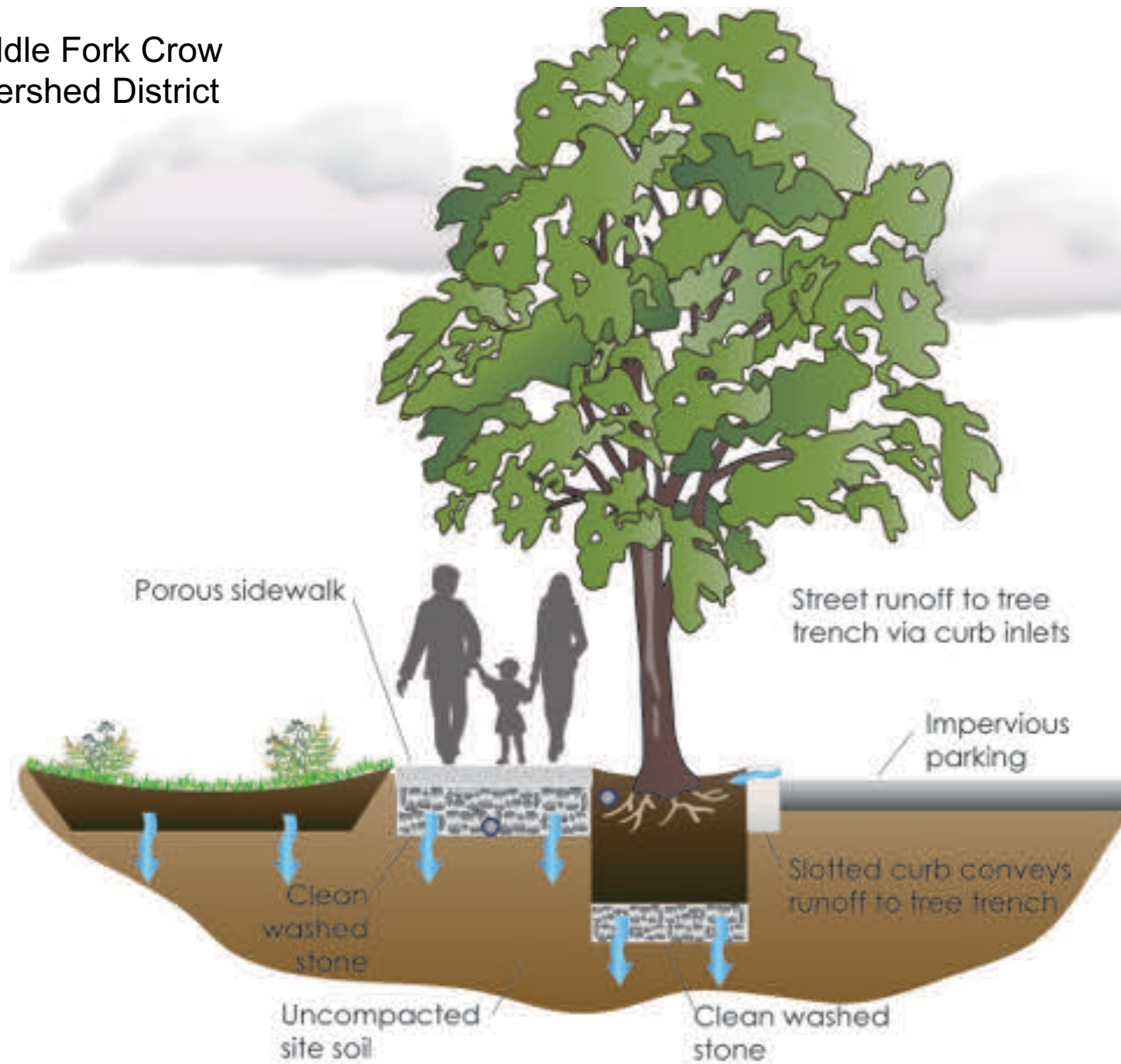
# Green Infrastructure

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



credit: [newgenerationplantations.net](http://newgenerationplantations.net)

credit: Middle Fork Crow  
River Watershed District

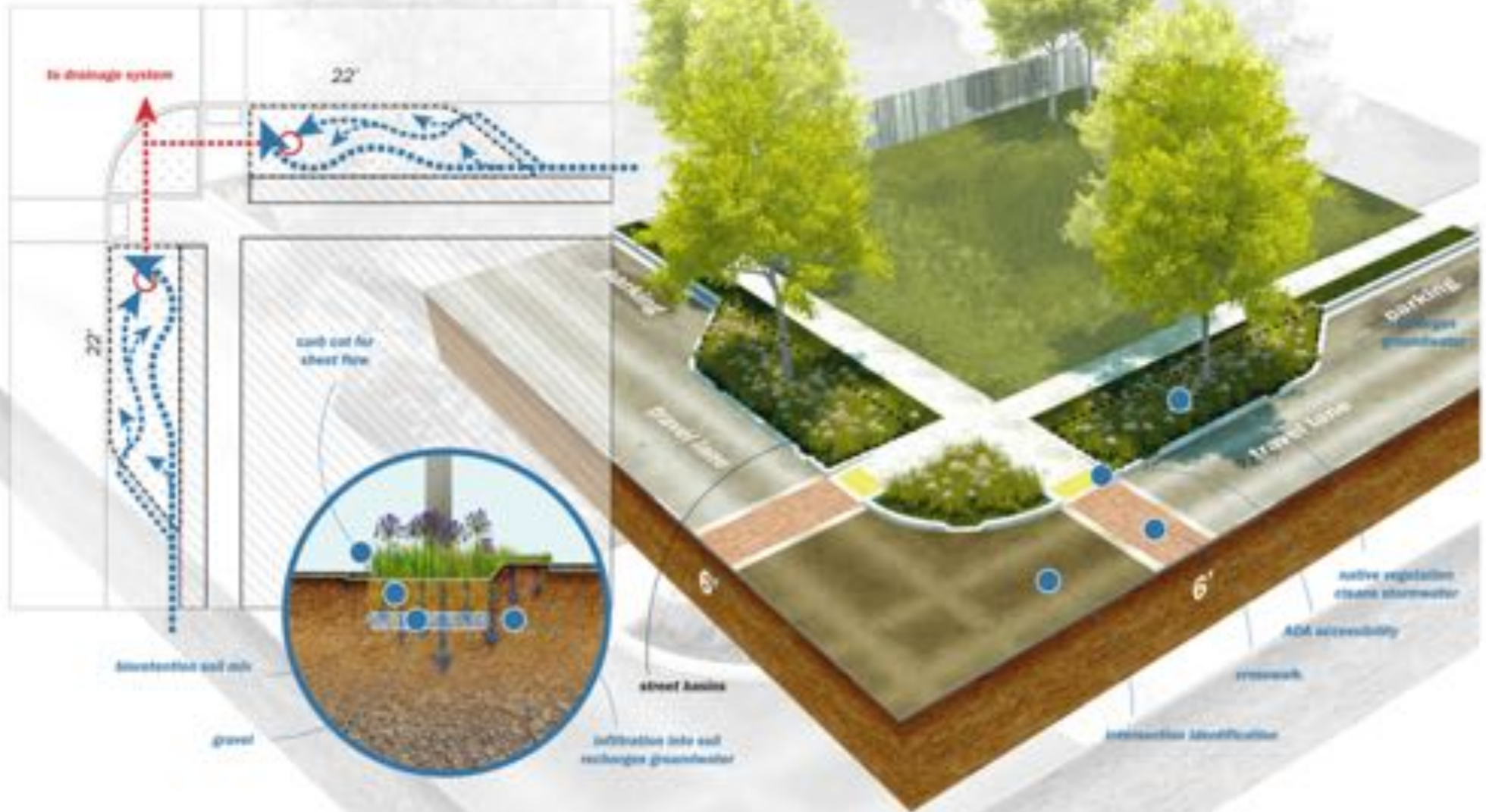




## BEST MANAGEMENT PRACTICES

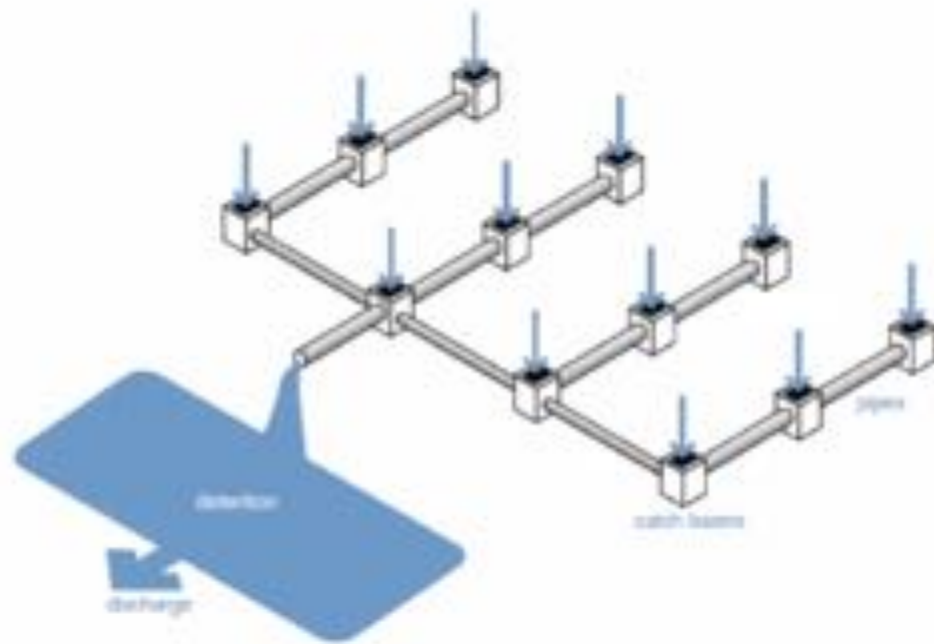
### CORNER STREET BASIN

Approx. 450 sqft.



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





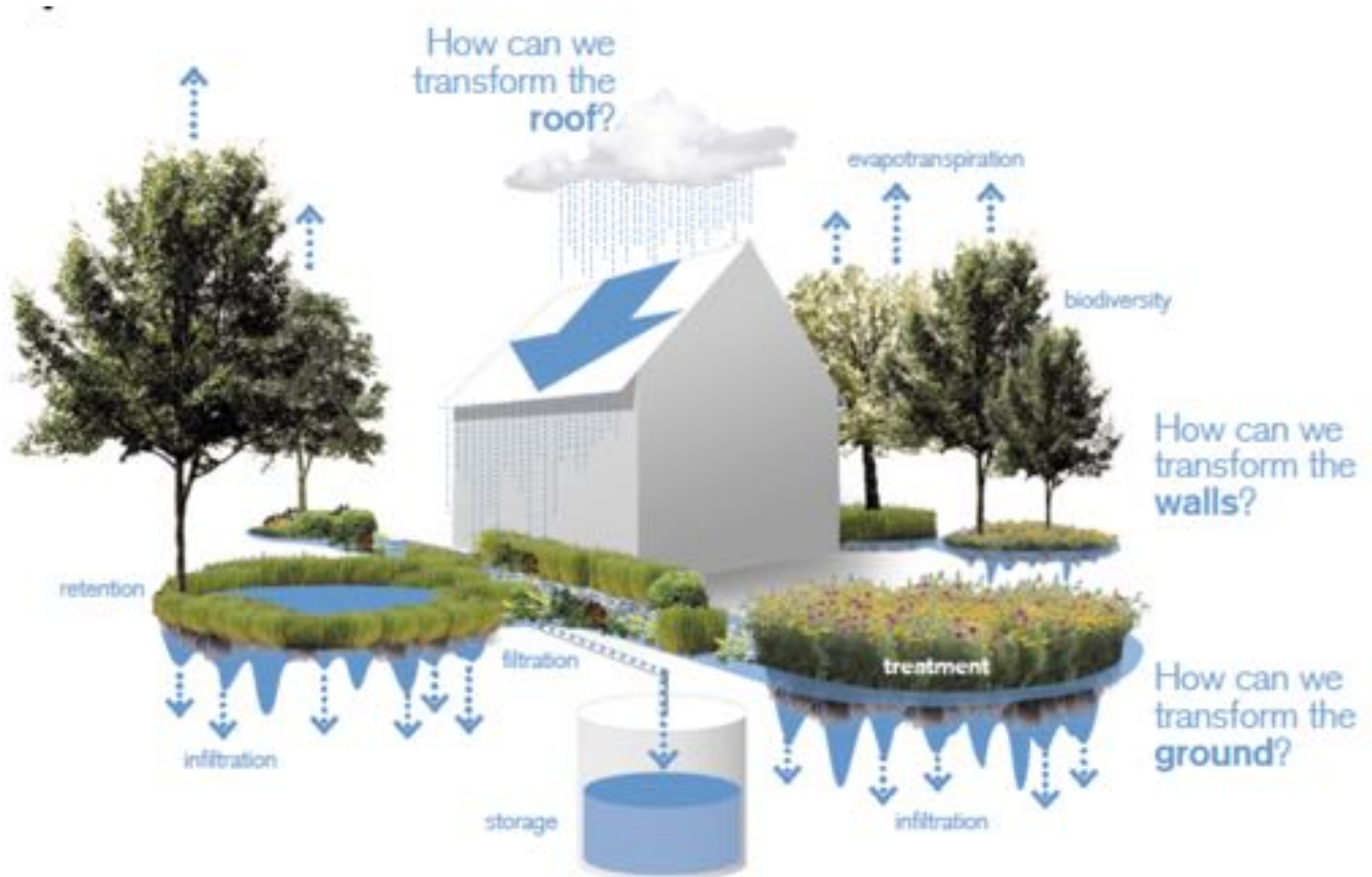
GSI Tool	
Bioretention	
Rain Gardens	
Stormwater Cisterns	
Dispersion	
Dry Well/ Infiltration Trench	
Biofiltration	

GSI Tool	
Permeable Paving	
Green Roofs	
Depaving	 <small>Photo Courtesy of Sustainable Seattle</small>
Tree Canopy	
Compost & Mulch	

green  
infrastructure  
tools &  
strategies

= mini parks?

credit: Seattle  
Public Utilities



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



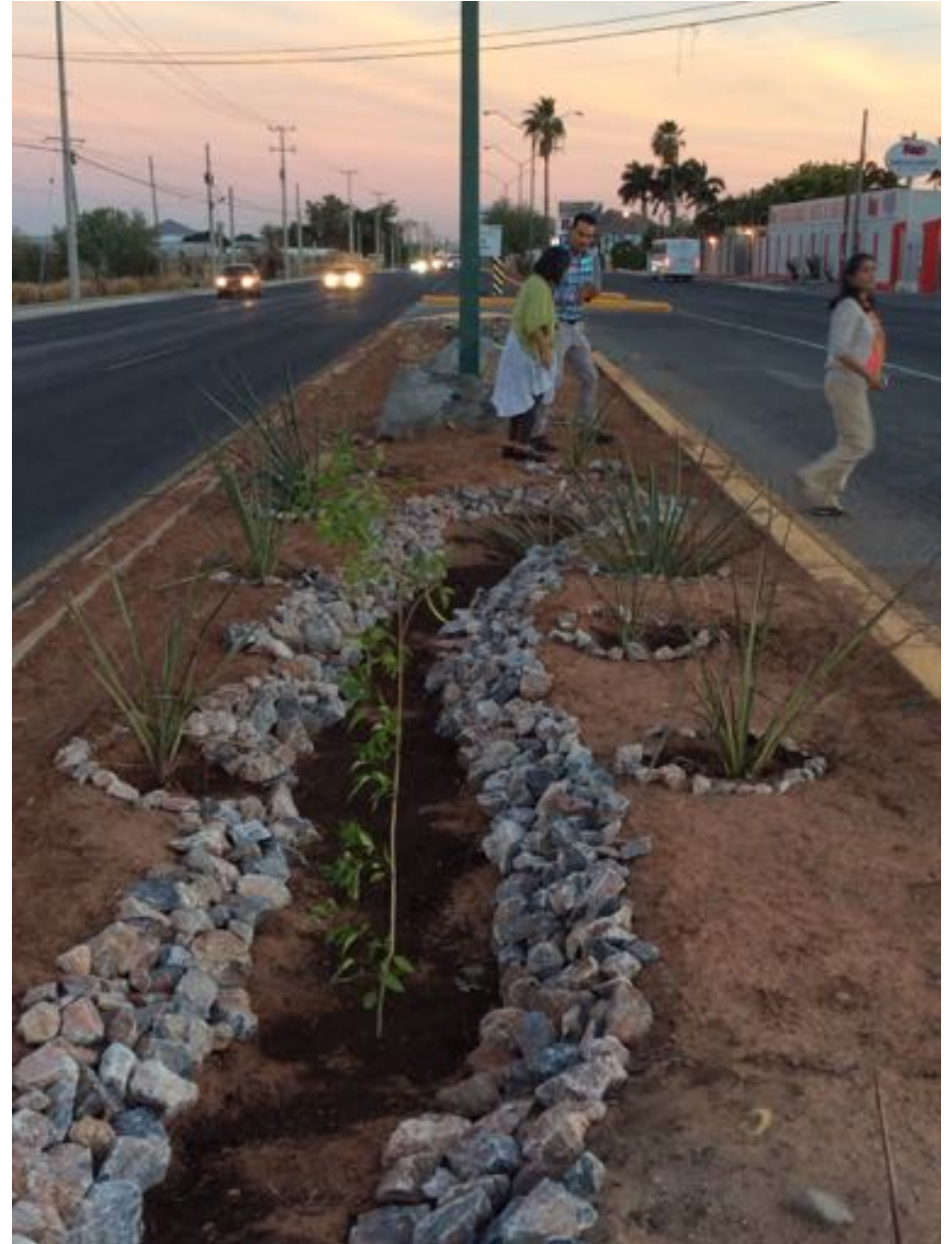


credit: Cliff Mass





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





# GREEN INFRASTRUCTURE

## FOR DESERT COMMUNITIES





# 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**



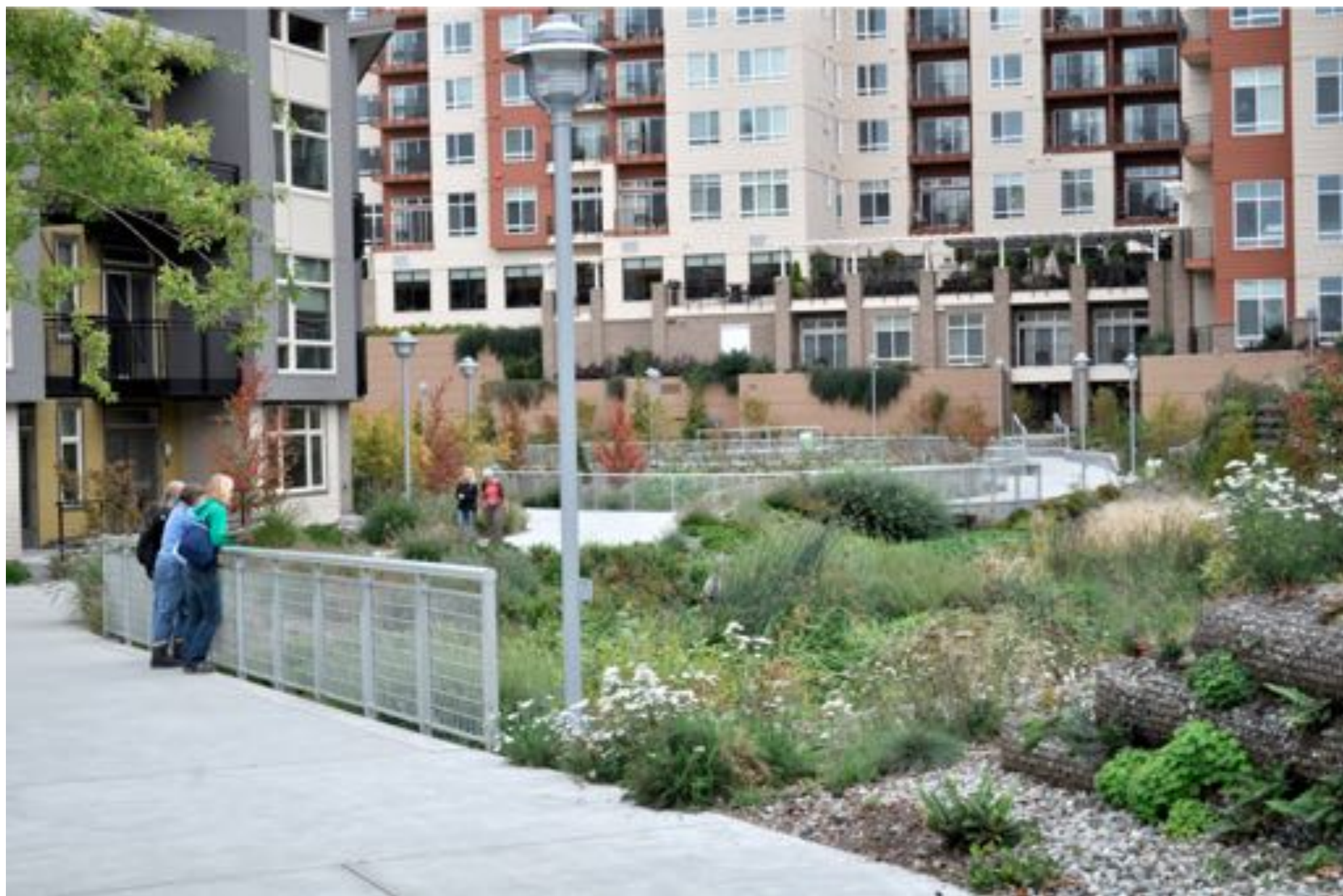


# Stormwater Management



**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**

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**neighborhood  
social cohesion**

**environmental  
education &  
social learning**





University of Texas Medical School, Austin  
SITES Landscape Architect, Heather Venhaus



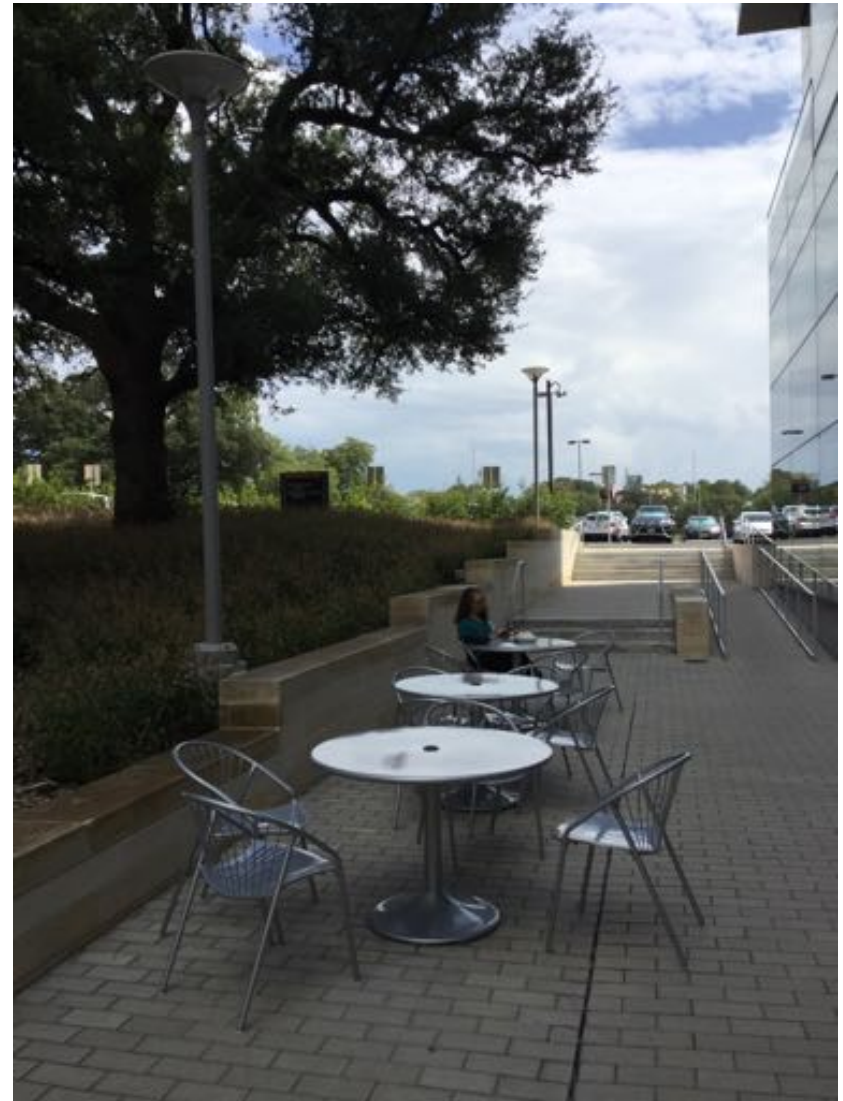


stormwater management  
human health & well being









patient & medical staff interactions

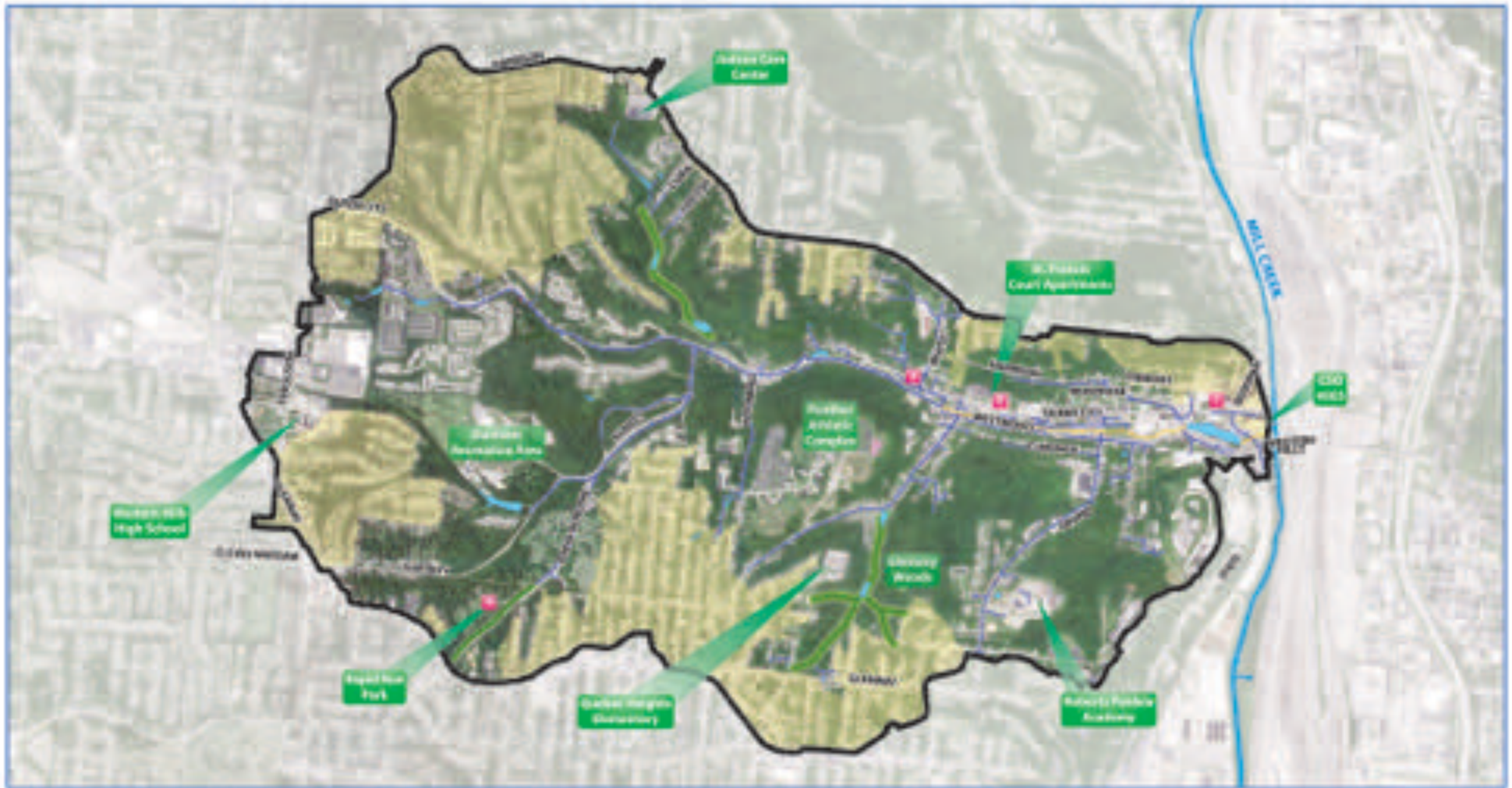


patient & medical staff interactions



# PROPOSED SOLUTIONS IN THE LICK RUN WATERSHED

Cincinnati USA



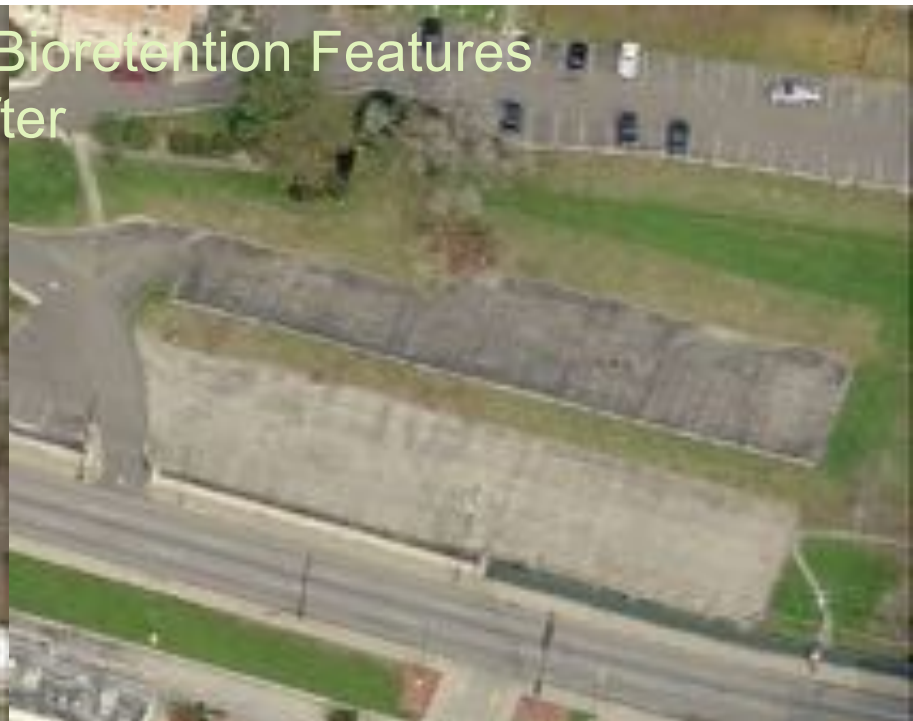
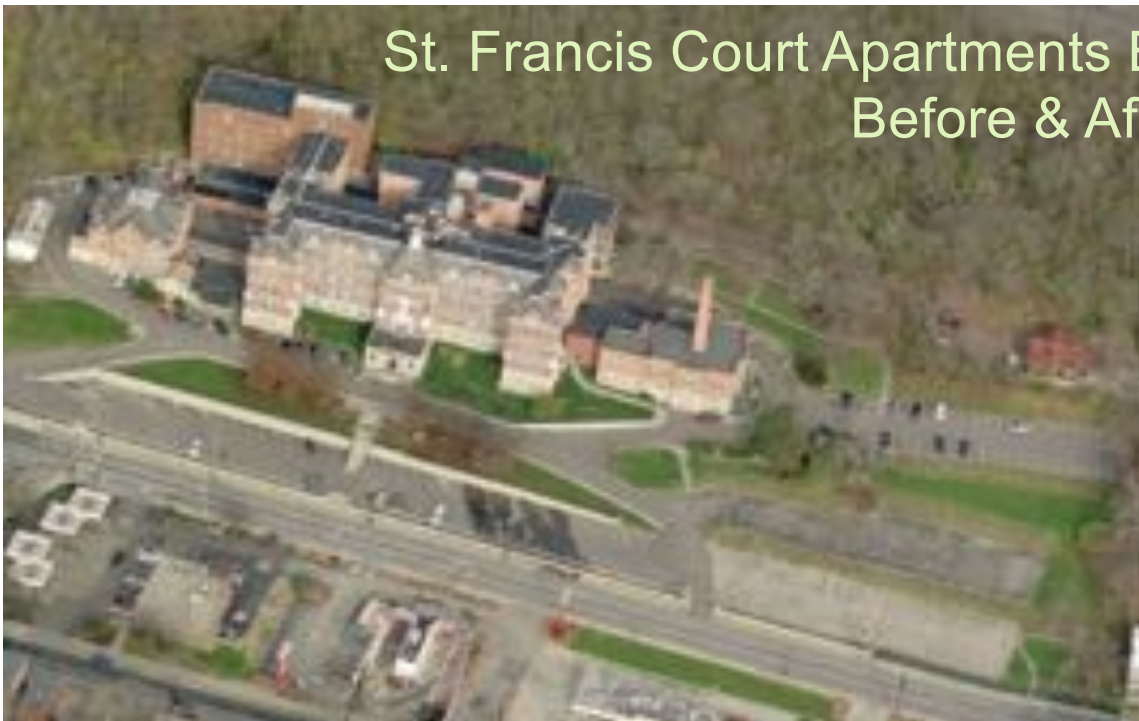


# St Francis Early Success Project - 2010





## St. Francis Court Apartments Bioretention Features Before & After



2009: Two levels of unused parking lots



2012: Two bioinfiltration basins with walking path













Spring 2011, Ponding after rain event



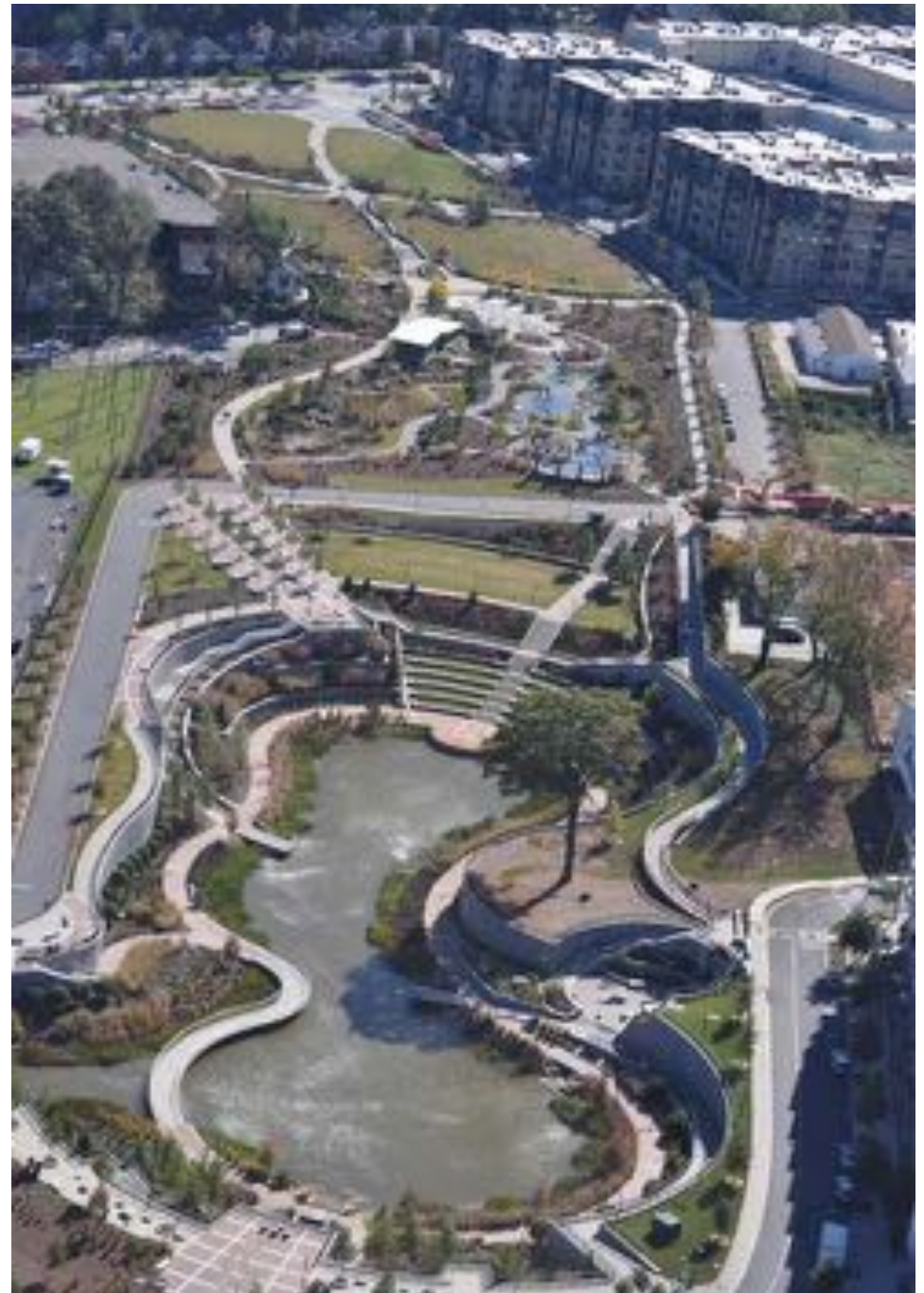


Summer 2011, One year after installation



# Historic 4th Ward Park - Master Plan

August 2009





# 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





# Metro Nature & Human Health

NEARBY NATURE INCLUDES A VARIETY OF SPACES AND PLACES

URBAN FOREST CANOPY



BIOPHILIC DESIGN



PARKS AND GARDENS



GREEN STORMWATER INFRASTRUCTURE



IMAGE BY MIG / SVR

# Green Cities: Good Health

[www.greenhealth.washington.edu](http://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



# Green Cities: Good Health



INTRODUCTION RESOURCES FUTURE RESEARCH REFERENCES

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

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.<sup>1,2</sup> Then, it shows how nonmarket valuations can support local decision-making.

### 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.<sup>9</sup>
- A study found 7% higher rental rates for commercial offices having high quality landscapes.<sup>14</sup>
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.<sup>34</sup>
- 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.<sup>34</sup>

RSS Feed

Print

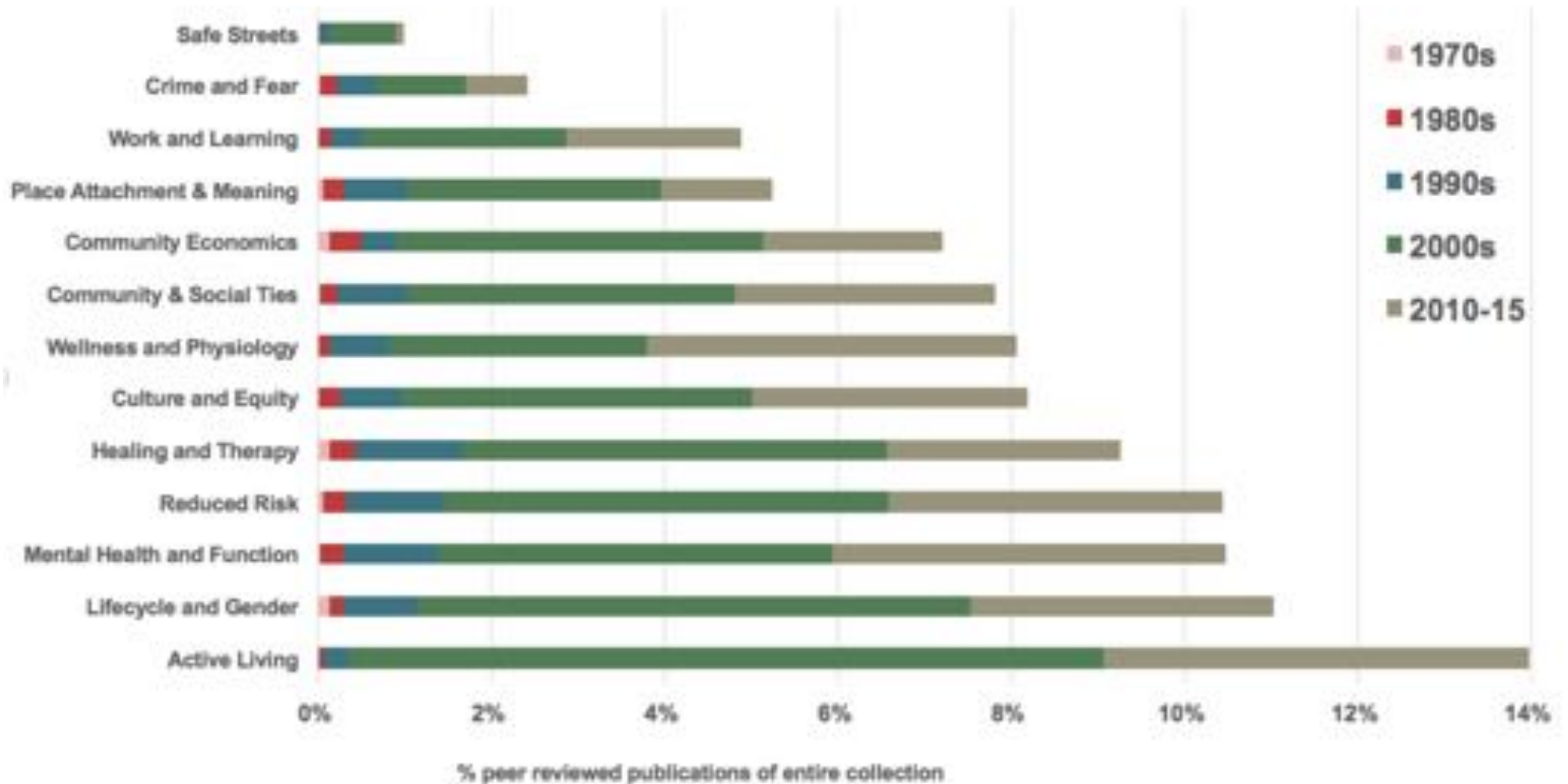


street trees boost market value of houses, providing tax revenue for communities

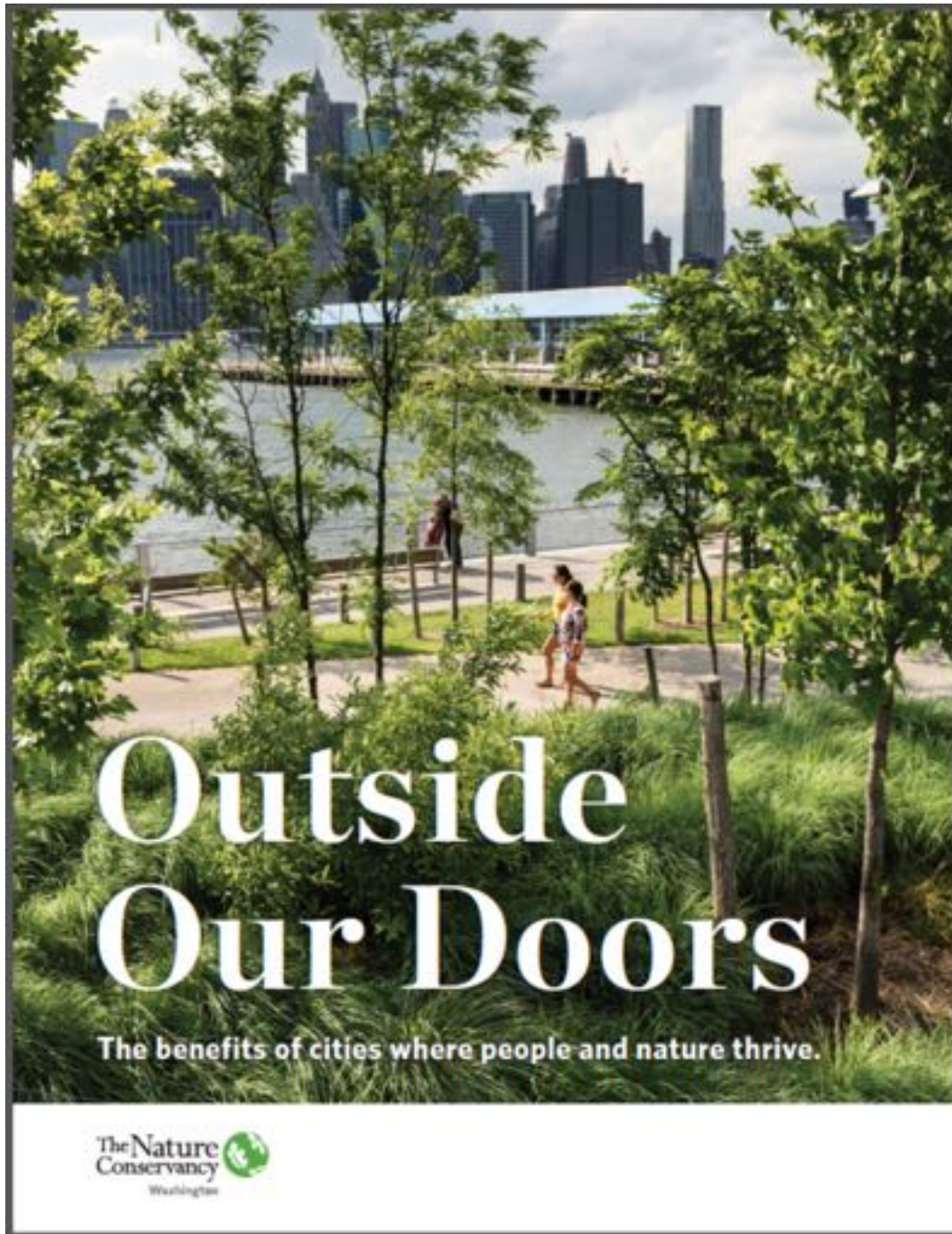


# Green Cities: Good Health

database of >4,200 peer reviewed publications







design:  milepost

co-author:  FOREST SERVICE  
U.S. DEPARTMENT OF AGRICULTURE

co-author & printing:  
The Nature Conservancy 

# Design Ideas



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





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!**





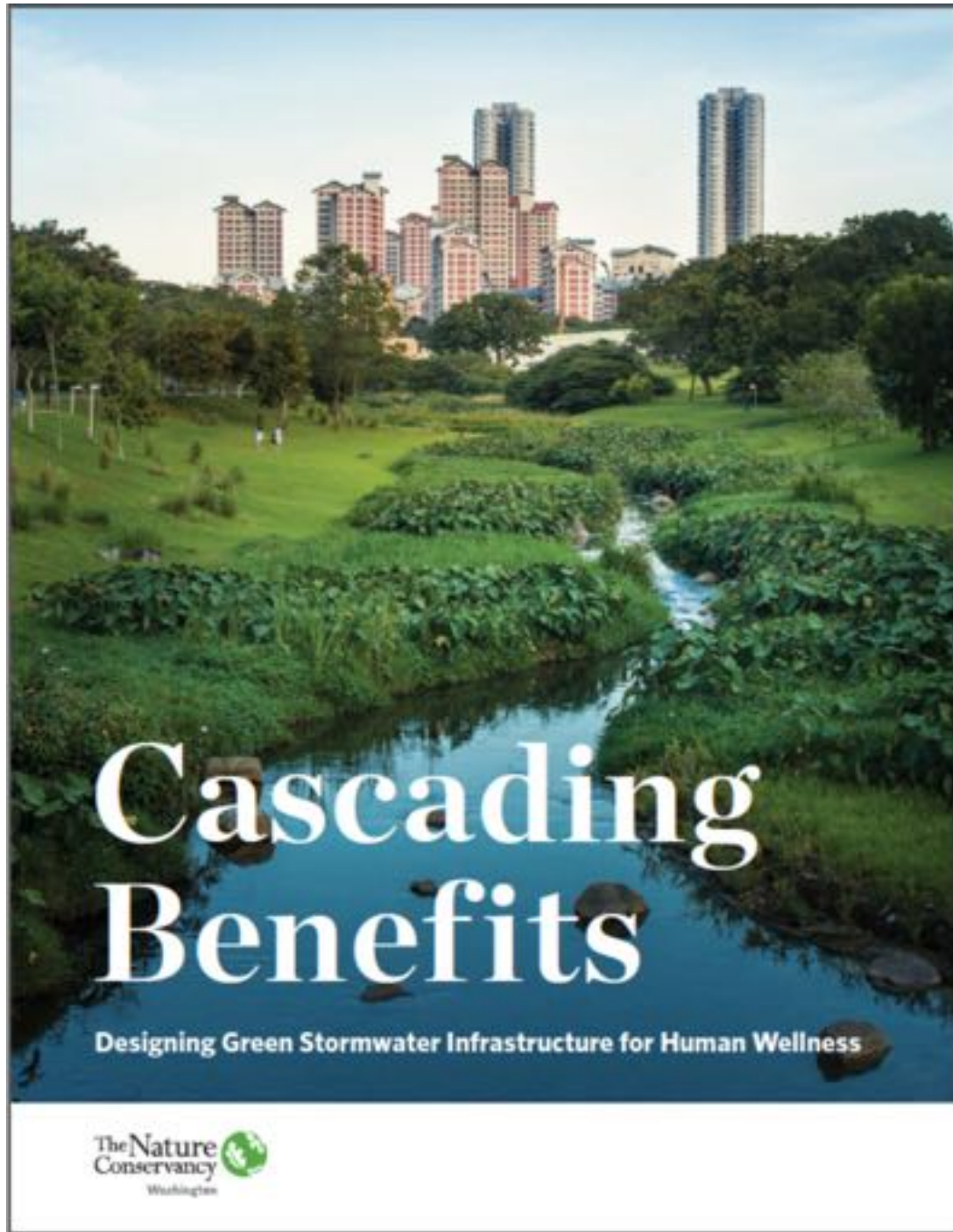
**design concept**



enable  
biodiversity &  
soft fascination







co-author:



co-author & printing:

The Nature  
Conservancy





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# Summary



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

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