Urgent Biophilia:
The Need for Nature in Our Lives

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School of Environmental & Forest Sciences

Land and Water Summit

Albuquerque, New Mexico

February 25, 2021

Anna and Elena Balbusso, NY Times

constant busyness

attempted multi-tasking

‘out of balance’

credit: iStockphoto

Peter Titmuss / Universal Images Group via Getty Images

credit: UFCW

credit: Westend61/Getty Images

credit: Johnson and Johnson

Climate & Extreme Events

derecho

wildfire/bushfire

extreme heat

flooding

hurricane/typhoon

solastalgia: emotional or existential distress from environmental change

I have been crying for trees ever since the storm. It's just heartbreaking!
Bex Hurn, Eulogy for Trees

Mental health

'A high-risk perfect storm': loneliness and financial despair take toll on US mental health

Lockdowns have caused uncertainty, isolation, grief and economic despair, leading to a sharp rise in calls to helplines

Nina Lakhani

Fri 24 Apr 2020
07.00 EDT

The Guardian

▲ 'In the first wave people were anxious, but now in the second wave people are feeling depressed and isolated, especially very poor people and those in violent situations.' Photograph: Justin Paget/Getty Images

CDC Details COVID-19's Massive Mental Health Impact

— Young adults, people of color, essential workers, and adult caregivers particularly affected

by Elizabeth Hlavinka, Staff Writer, MedPage Today
August 14, 2020

Urgent . . . Biophilia

urgent: done or arranged in response to a pressing or critical situation

biophilia: human tendency to interact or be closely associated with other forms of life, a desire or tendency to commune with nature

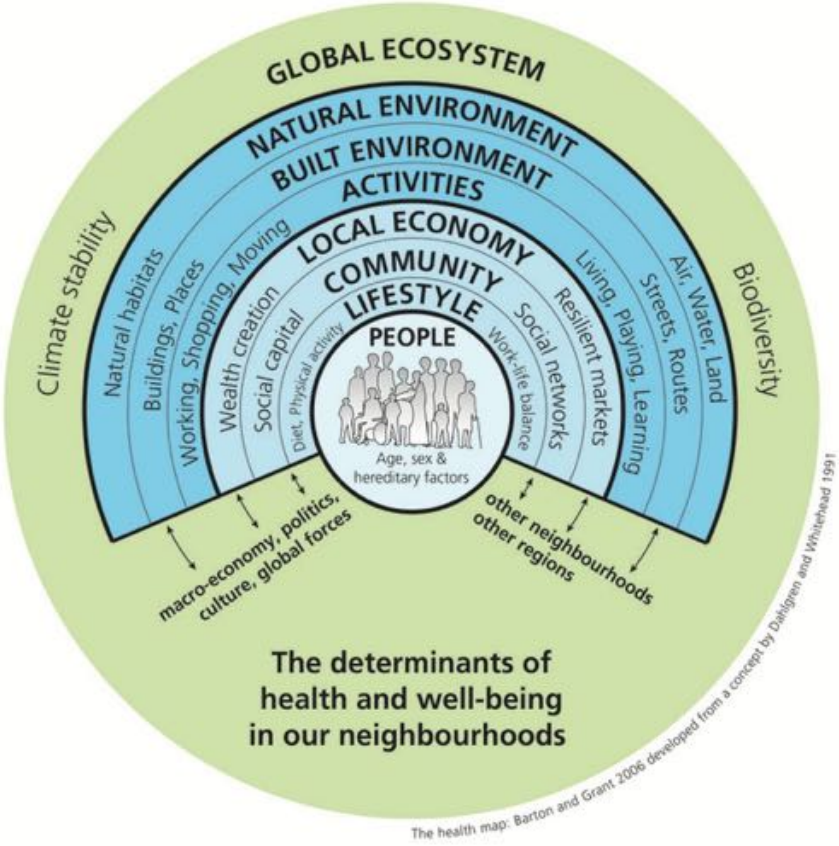
Mental Health

Social Determinants of Health

Health is…

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

(World Health Organization, 1946)



General Wellness

credit: Kew Royal Botanic Gardens

Therapy & Treatment

credit: yourlifechoices.com.au

Urban Trees & Green Space for Mental Health

general wellness:

school performance

stress reduction

attention restoration

creativity

job burnout prevention

therapy:

attention deficit

emotional therapy

depression reduction

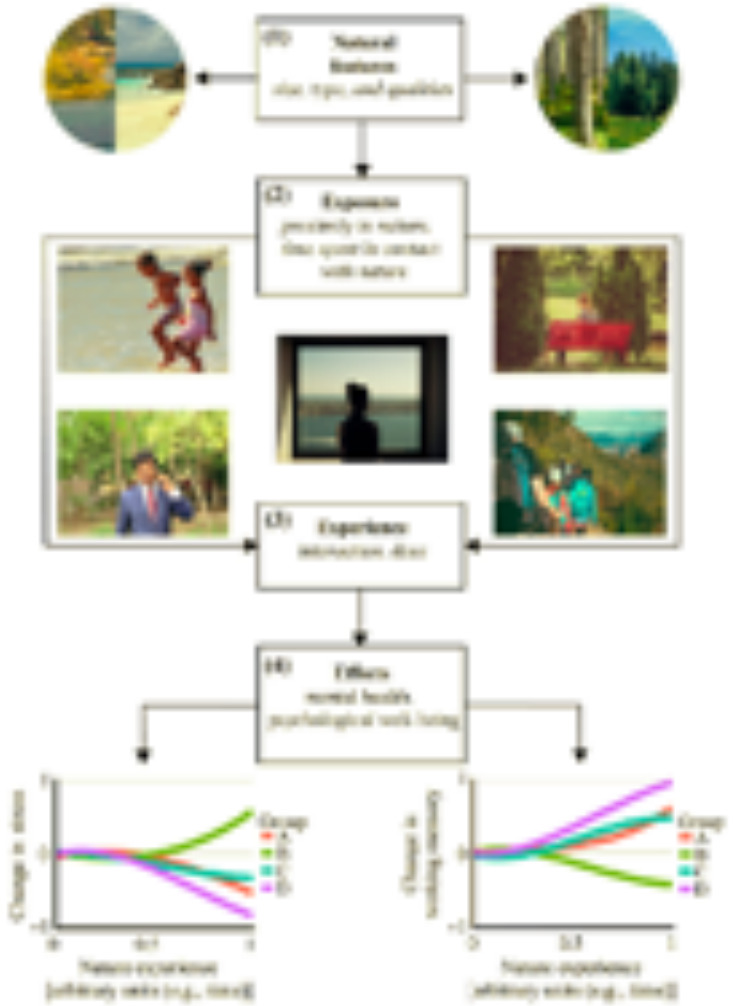
dementia & cognitive disorders

special situations

Nature & Mental Health

experiences & pathways to psychological benefit

Bratman et al. 2019. *Science Advances*



Biodiversity & Mental Health

vegetation cover &
afternoon bird abundance

Results:

- lower prevalence of depression, anxiety & stress:
  - less depression – more than 20% cover
  - less anxiety – more than 30% cover
  - less stress – more than 20% cover

Cox et al. 2017. BioScience 67, 147-155

Attention Restoration Theory

- directed attention
- cognitive fatigue
- outcomes? frustration, impulsive, aggression

Rachel & Stephen Kaplan, University of MI

ART Design Elements

- being away
- ‘soft’ fascination
- extent
- compatibility

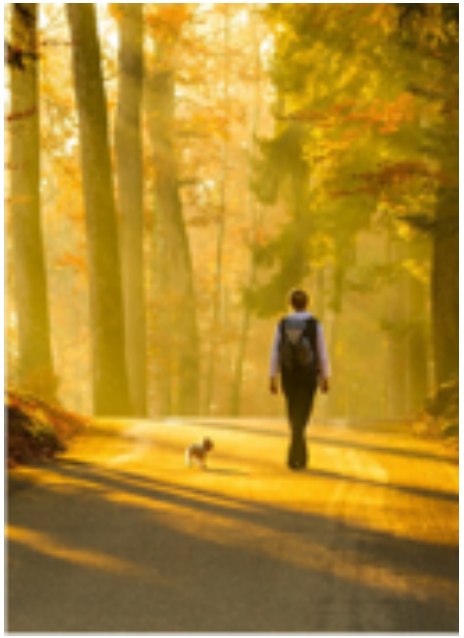
Rachel & Stephen Kaplan, University of MI

How Walking in Nature Changes the Brain

rumination: Maladaptive self-referential thoughts, heightened risk for depression and other mental illnesses

90-min walk in a natural setting *decreased*

- self-reported rumination
- neural activity in the subgenual prefrontal cortex
- no reduced effects from built environment walks



Look4ward.com

Bratman et al. 2015. *Proceedings of the National Academy of Sciences of the USA*

Co-Design for Co-Benefits

Co-Design for Co-Benefits

co-design: having or fulfilling several goals, purposes, or functions

co-benefits: the positive effects that policy or projects aimed at one objective might have on other objectives, including environmental, social and health, synergies

Low Impact Development in a High Desert Climate

Green Stormwater Infrastructure Practices and Case Studies

Seattle, Washington
reknowned wet climate :: 38 in annual precip

credit: Cliff Mass

credit: Prescott Valley Growers Landscaping

most studies done in temperate areas . . .

how to bring this work in dry climates?

Industrial Age – city squalor

Filthy Cities!

credit: BlendSpace

credit: blogs.isb.bj.edu.cn

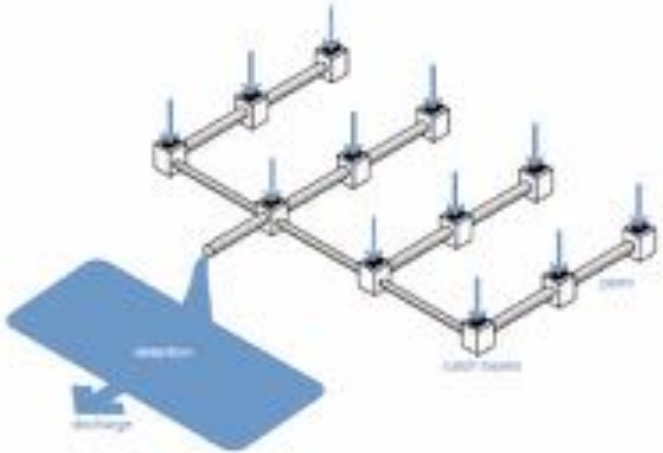
sanitary city

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

08/04/2005

Baltimore: Public Works Museum
STORM DRAIN

Grey Infrastructure



Drain, direct, dispatch

Green Infrastructure

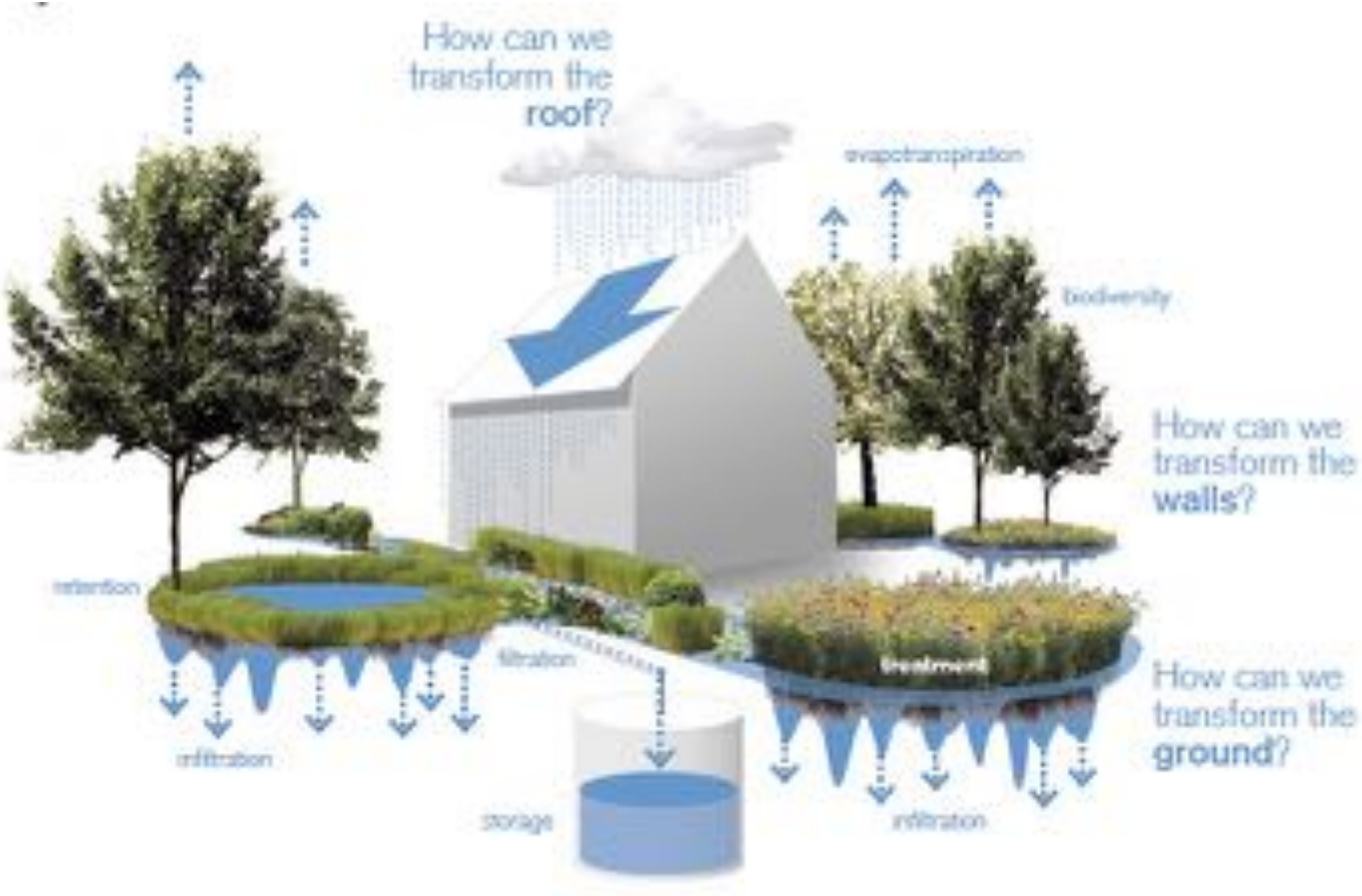
Slow, spread, soak

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

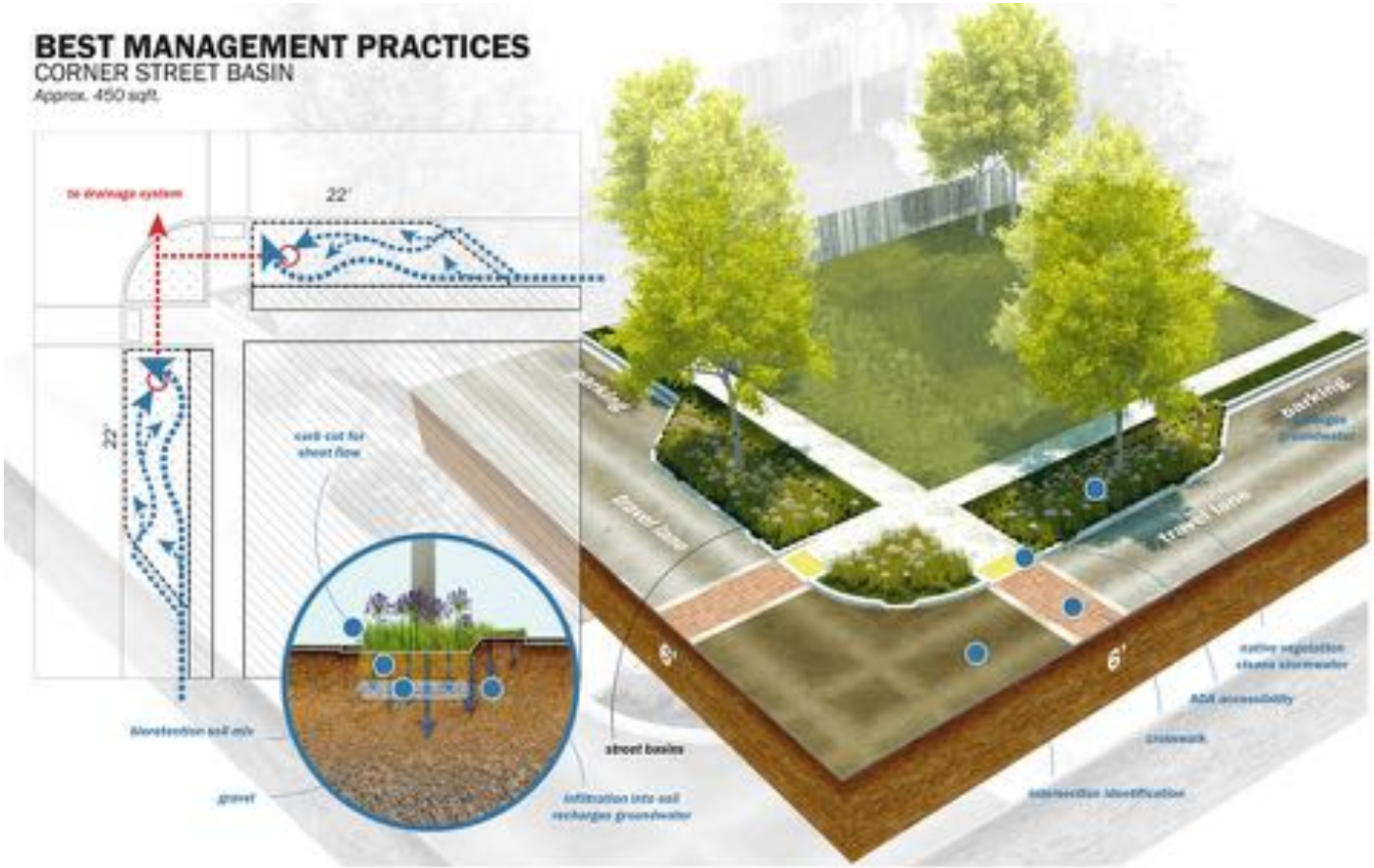
sustainable city

ecological function,
green infrastructure, &
‘revealed’ processes

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



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

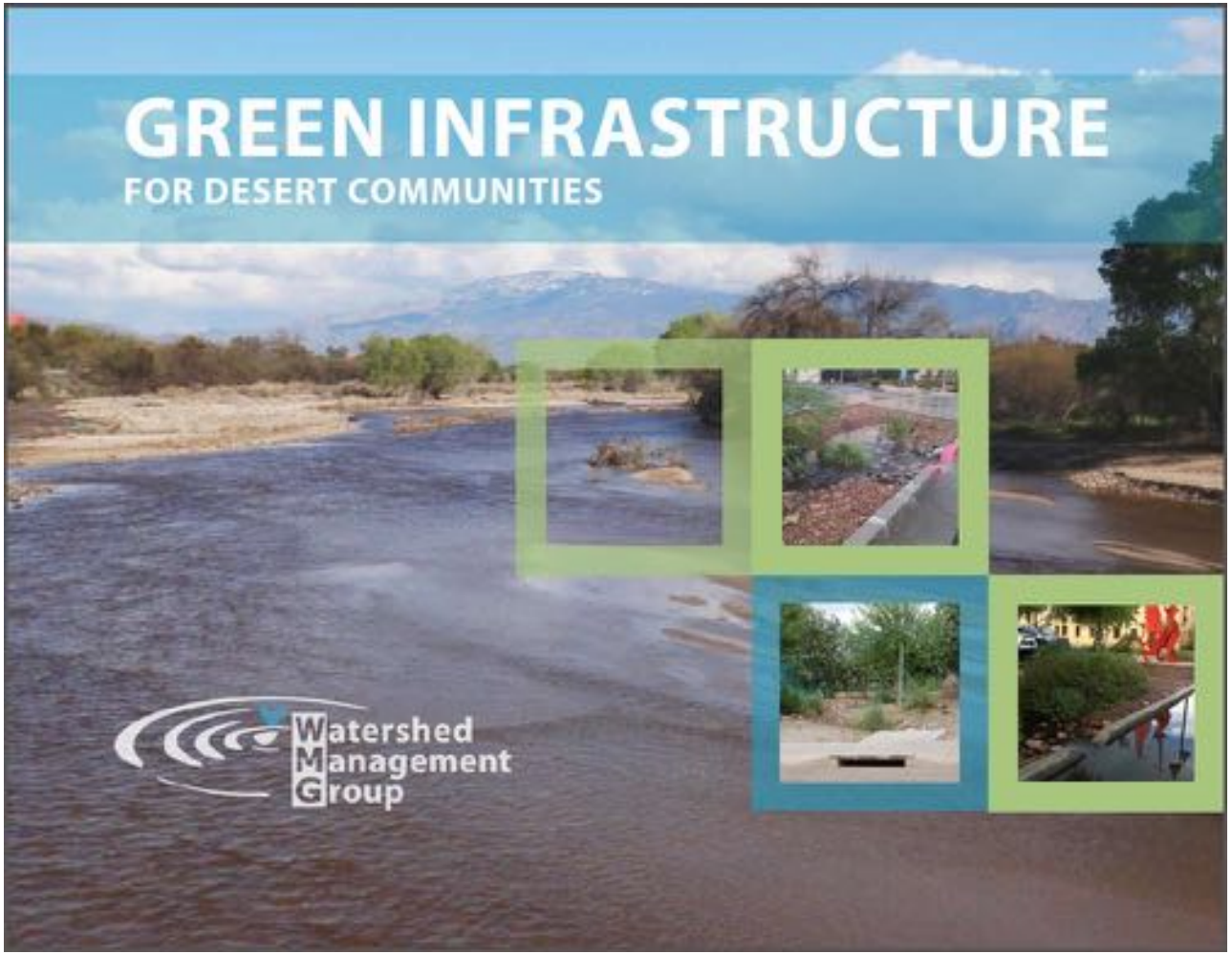


credit: georgetownclimate.org

stormwater retention

Stormwater Management

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


GREEN INFRASTRUCTURE
FOR DESERT COMMUNITIES
Watershed
Management
Group

barren lot
to community
pocket park

2 years

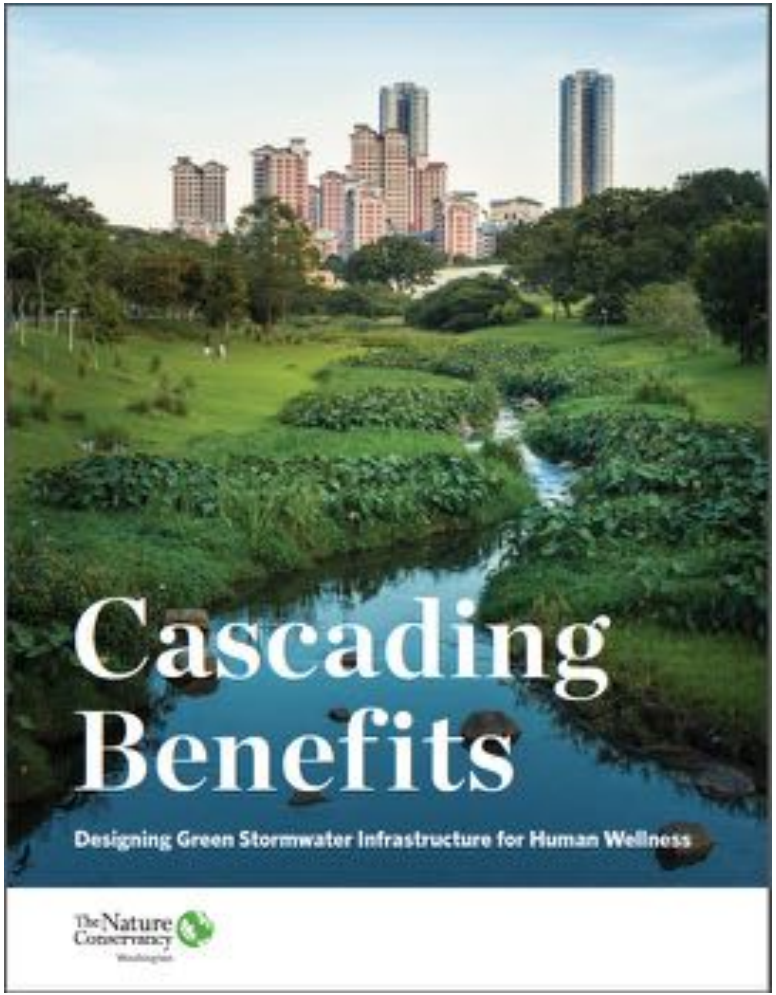
credit: Green Infrastructure for Desert Communities

public road right of way

10 ish years

credit: Brad Lancaster, Harvesting Rainwater.com

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



co-author:

co-author & printing:

The Nature Conservancy

sponsors:

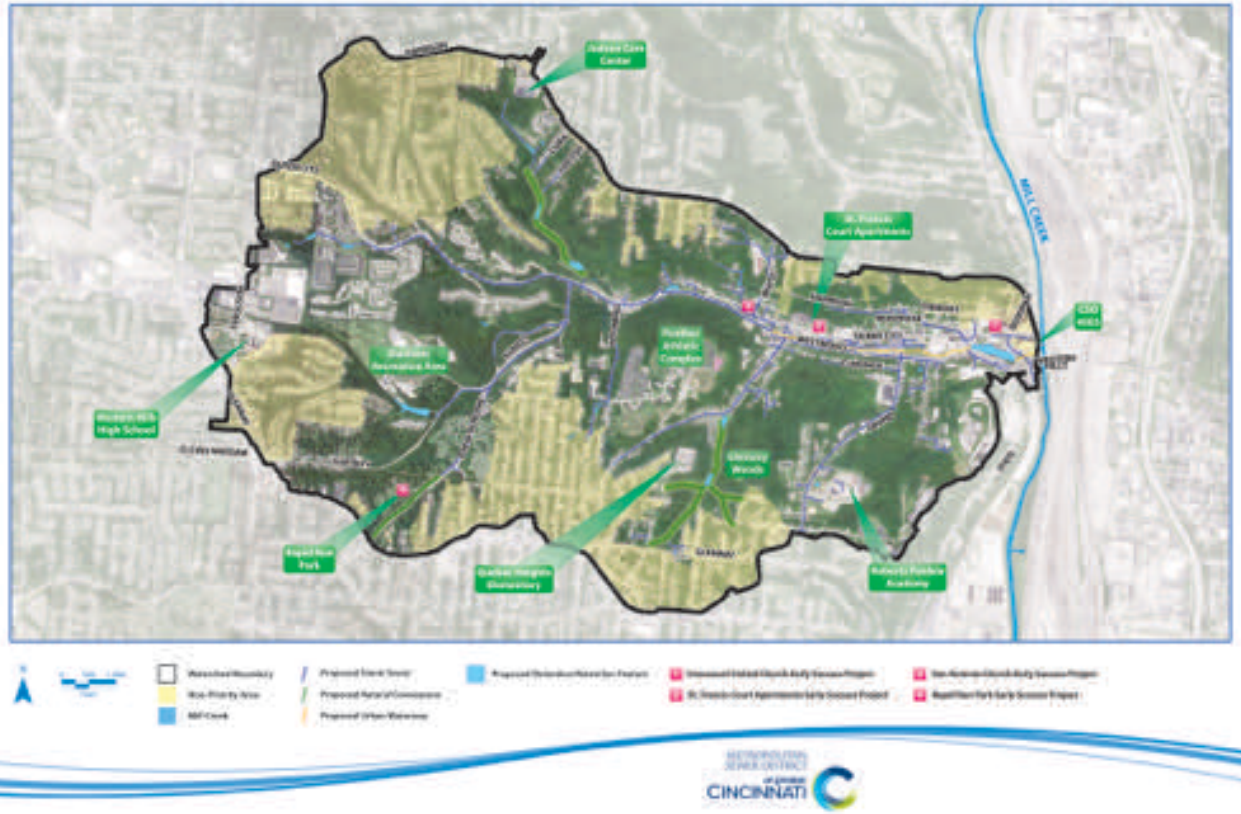
Willamette Partnership

Oregon Public Health Institute

The Green Infrastructure Leadership Exchange

Design Approaches

PROPOSED SOLUTIONS IN THE LICK RUN WATERSHED



urban watershed planning

green stormwater infrastructure

credit: Dave Gamstetter

Legend
St Francis Court
Apartments
Elder Housing

St. Francis Court Apartments Bioretention Features Before & After

2009: Two levels of unused parking lots

2012: Two bioinfiltration basins with walking path

Rally's

Rally's

Spring, Ponding after rain event

Summer, One year after installation

Cloudburst Management Plan

Copenhagen

credit:https://oppla.eu/casestudy/18017

Cloudburst Management Plan

Copenhagen

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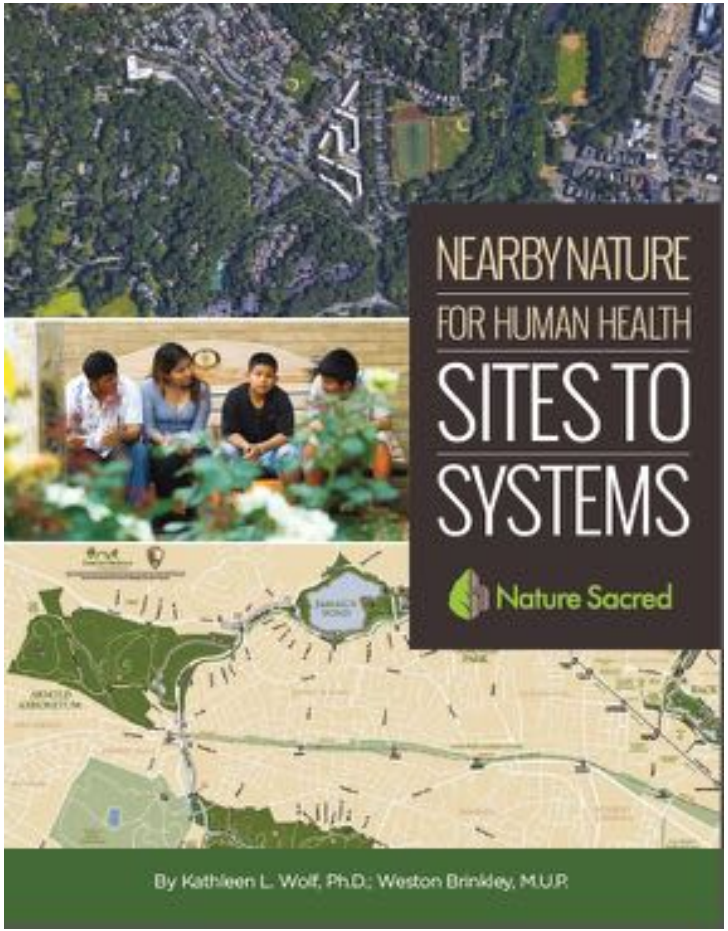


spatial linkages: the city becomes a park

TKF Foundation :: Nature Sacred initiative

green infrastructure tools & strategies

= mini parks?

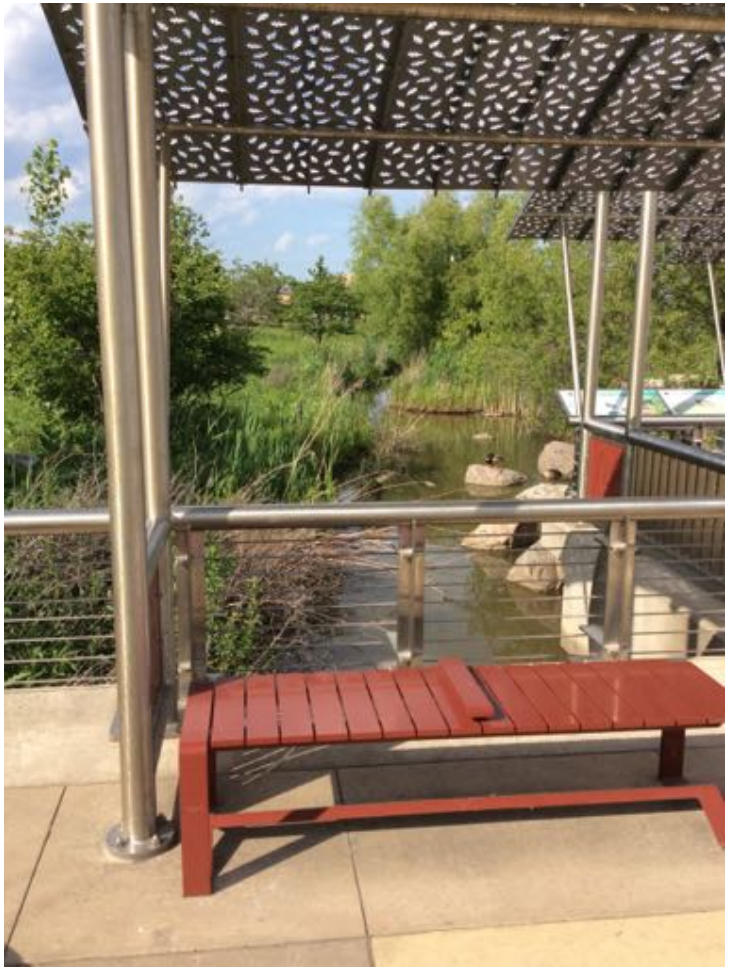
credit: Seattle Public Utilities

design concept

place making:
vertical +
horizontal
surfaces

design concept

bring people in!

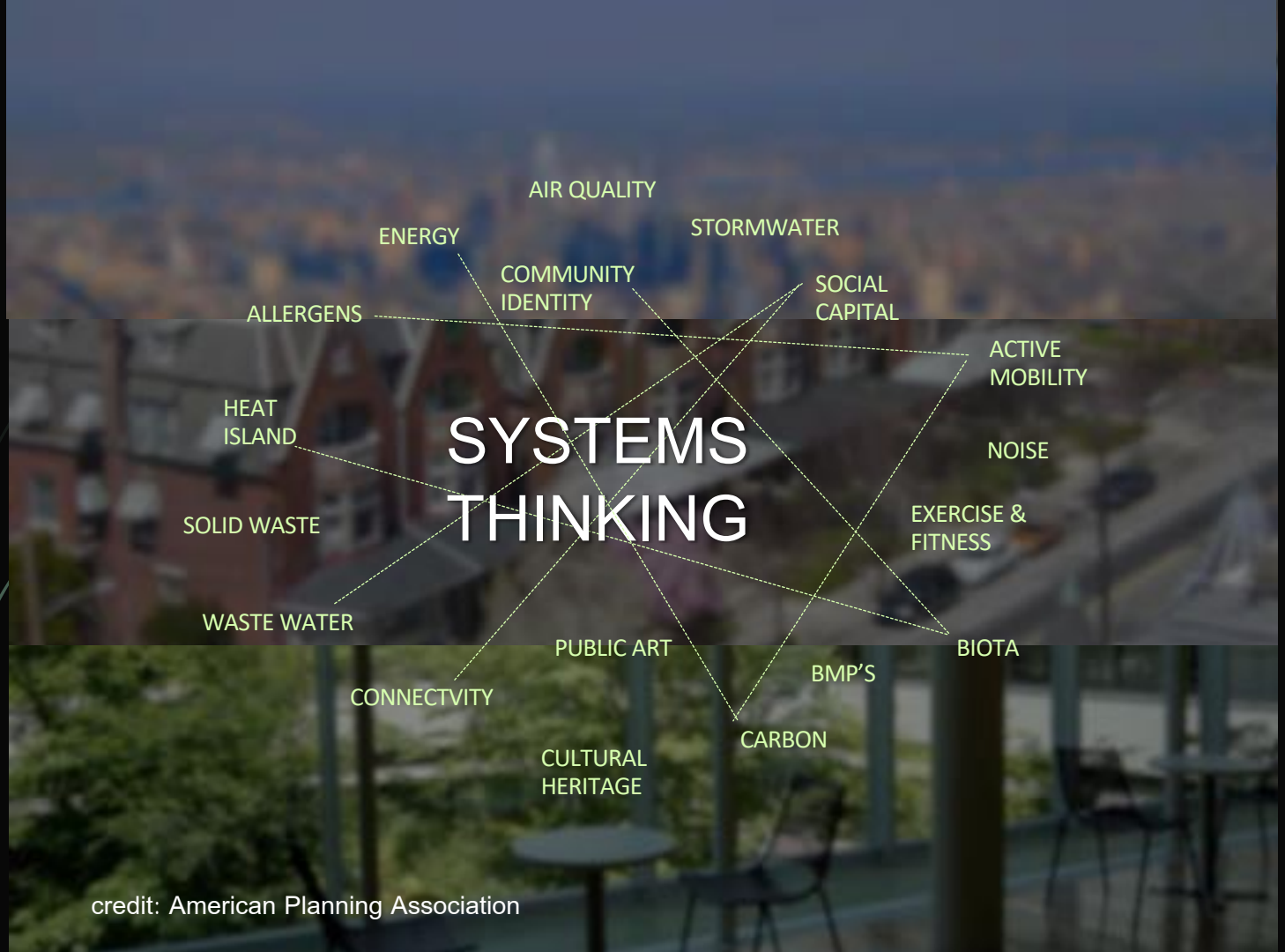


design concept

orient seating to nature!

design concept

enable biodiversity & soft fascination



credit: American Planning Association

Urgent! Biophilia!

Conclusions

- **nature for health, mental health focus**
- **sanitary to sustainable cities**
- **green stormwater infrastructure in community**
- **co-design for co-benefits**
- **optimize public capital investments for ecosystem and human services**