Public Health and Green Infrastructure
achieving co-design for co-benefits

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Outline

Sanitary to Sustainable City

Nature & Human Health

Green Stormwater Infrastructure for Health (examples & principles)
sanitary city

efficient and hygienic
supply & removal
of materials and services
natural systems disconnect
Industrial Age – city squalor

Filthy Cities!
Outline

Sanitary to Sustainable City

Nature & Human Health

Green Stormwater Infrastructure
(examples & principles)
sustainable city

ecological function, green infrastructure, & ‘revealed’ processes

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

systems solutions
ecology that works
testing innovations
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 Stormwater Infrastructure :: Hermosillo, Mexico (6 inch rainfall)
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
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
St Francis Early Success Project - 2010
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
Clear Creek Basin, 2 acre stormwater detention lake, 17 acres of greenspace & parks amenities
Outline

Sanitary to Sustainable City

Nature & Human Health

Green Stormwater Infrastructure for Health (examples & principles)
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)
Social 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
Green Cities: Good Health

www.greenhealth.washington.edu

Sponsors:
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University of Washington
NGO partners

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Research Reviews & Summaries
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.\(^1\)\(^2\) 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.\(^9\)

- A study found 7% higher rental rates for commercial offices having high quality landscapes.\(^5\)\(^4\)

- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.\(^3\)\(^4\)

- 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.\(^3\)\(^4\)
Green Cities: Good Health
database of >4,200 peer reviewed publications
Story: Human Health Benefits Across the Life Cycle
Urban Forests and Newborns

the natural environment may affect pregnancy outcomes . . .

10% increase in tree-canopy cover within 50m of a house

= lower number of low weight births (1.42 per 1000 births)

*Donovan et al., Health & Place 2011; Hystad et al., Env Health Perspectives 2014*
Healthy Microbiome

- control obesity & asthma
- boost immune function
- improve mental health

need contact with ‘Old Friends”

put aside the Hygiene Hypothesis
~10 to 100 trillion microbes in healthy gastrointestinal (GI) tract

intestinal microbiome development

Arrieta et al. 2014. Frontiers in Immunology
Design for Nature
Contact
ADHD and nature contact

- 96 children aged 7-12 diagnosed ADD or ADHD
- Parents gave postactivity attentional functioning ratings (PAAF) –

- 4 measures:
  - Can’t stay focused on unappealing tasks (homework or chores)
  - Can’t complete tasks
  - Can’t listen and follow directions
  - Easily distracted

Faber Taylor. 2001. Environment & Behavior
ADHD and nature contact

- 17 children aged 7-12 with diagnosed ADHD
- 20-minute guided walks
  - Park
  - Neighborhood
  - Downtown
- Pre-walk puzzles
- Post-walk cognitive test

Faber Taylor & Kuo. 2009. *Journal of Attention Disorders*
Walking Programs

children
elders
families
Walking Meetings

creativity, energy, communication, health
Parks Prescription

Date: __________________________
Dr: ______________________________
Name: ____________________________
I recommend:
☐ Walking  ☐ Other: ________________
_____________________ minutes a day
_____________________ days per week
* Health Canada suggests moderate activity of 30 minutes per day | 5 days a week

Benefits of daily activity
• Improve overall physical and mental health
• Maintain a healthy weight
• Reduce the risk of diabetes and other chronic conditions
• Lower cholesterol levels
• Manage stress and anxiety

Signature: ________________________

[Image of a prescription for parks activities]
Parks Prescription

1. Get a prescription for ParksRx from your healthcare provider.
2. Visit www.REACHforbetterhealth.com
3. Enter your zip code
4. Click

Pick your park

Exercise in the park and share outcomes with your healthcare provider.

PARKS Rx
Your Prescription For Better Health

This information is provided for educational purposes and is not to be considered medical advice.

www.REACHforbetterhealth.com/ParksRx
Made possible with funding from the Centers for Disease Control and Prevention.
Green Streets for Walkability

evidence of lower frustration and higher meditation when moving into the greener streets

Experience the restorative powers of nature and join us for Strolls for Well-Being, a free 10-week program offered at Bloedel Reserve. If not already a member, participants are given a temporary membership to

**DAY-USE STROLLS:**
Since introducing the Strolls for Well-Being program in 2014, hundreds of people have benefited from the healing effects of nature.
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
The medicine of being in the forest

We are the leading global voice for forest bathing and forest therapy

Santa Rosa, California
Outline

Sanitary to Sustainable City

Nature & Human Health

Green Stormwater Infrastructure for Health (examples & principles)
Design Ideas

enhance aesthetics & appeal
create great places
encourage health behaviors & outcomes
stormwater management
place making: vertical + horizontal surfaces

design concept
Winslow, Bainbridge Island, Washington
retail district green stormwater infrastructure
management for co-benefits - retail
design concept

bring people in!
design concept
orient seating to nature!
design concept

enable biodiversity & soft fascination
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
Summary

sanitary to sustainable cities
green infrastructure solutions
nature in cities & human health
co-design for co-benefits
improved human habitat
nature experiences are essential!
Outside Our Doors
The benefits of cities where people and nature thrive.

design: milepost

co-author: US Forest Service

co-author & printing: The Nature Conservancy
spatial linkages: the city becomes a park

TKF Foundation :: Nature Sacred initiative