What are the Benefits of Urban Green Space?

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Green Building & Sustainability Lunch and Learn Series
Seattle Department of Construction & Inspections
19 September 2019
Parks & Gardens

civic services
Friends of Seattle’s Olmsted Parks

book release in November 2019
Parks & Gardens

civic services

Green Stormwater Infrastructure
utility services
Grey Infrastructure

Drain, direct, dispatch

Green Infrastructure

Slow, spread, soak

Source: Low Impact Development: A Design Manual for Urban Areas, 2010
stormwater retention
green infrastructure tools & strategies

= mini parks?

credit: Seattle Public Utilities
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...
Parks & Gardens
Green Stormwater Infrastructure
Urban Forest

health & wellbeing services
The Urban Forest, Trees, & Green Space

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

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USDA Forest Service,
(U&CF Program + Pacific NW Research)
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Thanks!
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Sarah Krueger

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. 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.3
- A study found 7% higher rental rates for commercial offices having high quality landscapes.4
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.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.4

street trees boost market value of houses, providing tax revenue for communities
Green Cities: Good Health > 4,500 peer reviewed publications
Outside Our Doors
The benefits of cities where people and nature thrive.

design: milepost
co-author
co-author & printing:
The Nature Conservancy

KATHLEEN L. WOLF, PH.D.

also in Spanish! and Arabic!
Nearby nature experiences are important across the entire life cycle, from cradle to grave.

INFANTS

BIRTH WEIGHT
POTENTIAL ECONOMIC VALUE: $65.6M SAVINGS ON ANNUAL HEALTHCARE COSTS.
Birth weight influences long-term childhood health and development, and has been linked to some adult diseases. Low birth weight is associated with both short- and long-term health care costs, such as longer hospital stays and increased illness. Pregnant women who have more tree energy and green space near their homes generally have babies with healthier birth weight.

IMMUNE FUNCTION
ECONOMIC IMPACT: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND CHRONIC DISEASE ACROSS A LIFETIME.
We are most vulnerable in the early months of our lives, when the body and mind are growing and developing at an astonishing rate. The "hygiene hypothesis" suggests that early contact with outdoor microorganisms stimulates the development of a healthy immune system.

FAMILY DYNAMICS
ECONOMIC IMPACT: IMPROVED FAMILY DYNAMICS, PERHAPS REDUCING MENTAL HEALTH TREATMENT AND COUNSELING SERVICES.
An infant's parents and siblings adjust their lives after a baby's arrival, and these changes can bring stress and anxiety. Nature views and walks help reduce these conditions and improve interactions between people within the household.

Note: All economic values are in 2018 U.S. dollars, and are potential annual savings across the entire U.S.

CHILDREN & TEENS

OVERALL HEALTH AND WELL-BEING
POTENTIAL ECONOMIC VALUE: INCREASED PHYSICAL ACTIVITY, REDUCED ABSTINENCE LEADING TO A REDUCTION OF EMERGENCY DEPARTMENT VISITS, HOSPITALIZATIONS AND MISSED SCHOOL DAYS, AND REDUCED RISK OF ADULT SMOKING.
Positive activities in a child's surroundings can have both immediate and long-term health impacts. Nature has a positive influence; playing in nature helps children develop a love for the outdoors, as well as intellectual skills that improve health and life outcomes. Green spaces can also improve children's health and reduce stress levels.

ADHD
POTENTIAL ECONOMIC VALUE: ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD) IN THE U.S. Nature exposures in a potential alternative treatment; studies show that activity within nature or green spaces, such as playing or just sitting in nature, can reduce symptoms.

FUTURE FINANCIAL SUCCESS
POTENTIAL ECONOMIC VALUE: $1.26 BILLION INCREASE IN HIGH SCHOOL GRADUATES' LIFELONG INCOME.
School performance often mirrors personal well-being and success. Having green views from classrooms and nature improves students' ability to direct attention and feel less stress. Green high school campus landscapes are linked to higher graduation rates.

ADULTS

DEPRESSION AND STRESS
POTENTIAL ECONOMIC VALUE: REDUCED FRUSTRATION, MENTAL DISTRESS AND DEPRESSION DISORDERS, AND IMPROVES BODY IMAGE, SELF-ESTEEM AND LIFE SATISFACTION.
Many highly skilled lifestyles take their toll. Nature experiences reduce stress. Nearly 1 in 10 adults suffer from depression each year in the U.S., and mental, behavioral, and neurocognitive disorders are a leading cause of disability. Nature experiences support mental health and mindfulness for improved mental health, mood, and life function. Improved mental health and fewer depression treatment costs, and improved worker productivity.

CARDIOVASCULAR DISEASE
POTENTIAL ECONOMIC VALUE: REDUCED RISK OF CARDIOVASCULAR DISEASE.
Cardiovascular Disease is the leading cause of premature death in the U.S. People show slight reduction of CVD if their neighborhoods have greater nature coverage (particularly tree canopy), however it is worth noting the majority of scientists focused on men.

CRIME & SAFETY
POTENTIAL ECONOMIC VALUE: REDUCED RISK OF CRIME AND PROPERTY OWNERSHIP.
Personal safety and security are important conditions for patterns of crime and property owners. In neighborhoods—community gardens, forest canopy, and landscaped travel paths — are associated with reduced personal and property crimes.

OLDER ADULTS

MOBILITY & QUALITY OF LIFE
POTENTIAL ECONOMIC VALUE: $1.7-3.6B SAVINGS ON HEALTH CARE COSTS FROM FALLS PER YEAR.
One in three older adults falls each year, giving rise to injury, illness, and reduced mobility. Residents fall within older care facilities are particularly sensitive to physical situations. Being out in nature maintains personal mobility, leading to reduced falls and reduced need for medications. Further, those who are socially isolated are more likely to be lonely, so gardening and nature walking activities that promote social interactions support positive lifestyles and quality of life.

HYPERTENSION
POTENTIAL ECONOMIC VALUE: $1.3-3.0B SAVINGS ON TREATMENT COSTS ANNUALLY.
Hypertension, or high blood pressure, is one of the five most expensive conditions impacting older adults. Views of nature, particularly forests, and ‘stress busters’ (natural settings) decrease blood pressure.

COGNITIVE DISORDERS
POTENTIAL ECONOMIC VALUE: $2.0-2.2B ANNUAL SAVINGS ON MEDICAL SERVICES, NOT COUNTING THE VALUE OF HOME CAREGIVER SERVICES.
Almost one in five older adults experiences mental and cognitive disorders, with age being the greatest risk factor. In 2016, about 13% of people aged 65 or older were affected with Alzheimer's disease. Those with dementia have three times as many hospital stays per year as their counterparts. Encounters with nature improve symptoms related to cognitive disorders, such as aggression, depression, and reduced mobility.

Contributing analysts:
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Parks & Gardens
civic services

Green Stormwater Infrastructure
utility services

Urban Forest
health & wellbeing services
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’

Bloomfield et al. 2016 Perspectives in Public Health

put aside the Hygiene Hypothesis
intestinal microbiome development

Arrieta et al. 2014. Frontiers in Immunology
Trees & Physical Activity

- school children in cities grades 6 to 8
- relationship of tree cover to outside-of-school physical activity
- **5% increase in treed area cover = 5% increase in free-time physical activity**

public health officials
moderate activity
recommendations

parks, active living, active transit
EAB Tree Loss & Public Health

1990 to 2007, 1,296 counties in 15 states infected areas vs. no bugs
15,000 more deaths from cardiovascular disease
6,000 more deaths from lower respiratory disease
controlled for demographic, human mortality, and forest health data at the county level

Toledo, Ohio in 2006, pre EAB

2009, EAB in neighborhood

photo credits: Dan Herms, Ohio State U
Improving Depression

20 adults with major depression walk in a park setting and a built setting

- 50-minute walks one week apart
- before-after testing:
  - Mood: Positive and Negative Affect (PANAS)
  - Cognition: Backward Digit Span (BDS)

Berman et al. 2012. *Journal of Affective Disorders*

cognitive & affective improvements after walking in a nature setting
Canopy Cover & Stress

Images of canopy cover varied 0-60%.

Tree cover shows an inverse relationship with depressive symptoms in elderly residents living in U.S. nursing homes

Matthew H.E.M. Browning, Kangjae Lee, Kathleen L. Wolf
City Trees & Human Health

newborn & infant health
increased physical activity for kids
student therapy
overall adult health
social cohesion
respiratory & cardiovascular health
reduced depression
elder care improvements
Story: Nature for Human Health Benefits Across the Life Cycle
Parks & Gardens  
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health & wellbeing services
mobility hierarchies

e.g. road networks
Let's get personal . . .

“The tree which moves some to tears of joy is in the eyes of others only a green thing that stands in the way. Some see nature all ridicule and deformity . . . and some scarce see nature at all. But to the eyes of the man of imagination, nature is imagination itself.”

WILLIAM BLAKE

It’s time to get rid of those nuisance trees!

Have some problem trees in your yard? Hire the best pros in Magnolia and have them removed!

Trees are beautiful—but they can also be trouble, shedding seeds, butting up against buildings and fences, and blocking natural light. Whatever your reason, tree removal may be the right move. And it may be more affordable than you think! Here’s what your neighbors spend to remove their nuisance trees:

Small: $125 to $450
Medium: $175 to $800
Large: $400 to $1,000+

Your neighbors in Magnolia trust Angie’s List to connect them with qualified pros for their home projects. Check it out to find their favorites—and get deals on everything from gutter cleaning to kitchen remodels.

Say goodbye to those trouble trees!
www.naturewithin.info