We Need City Trees!

Economic Benefits of Urban Trees

Dr. Kathleen Wolf
College of Forest Resources, University of Washington
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www.cfr.washington.edu/research.envmind
City Trees & Forests 
Benefits Categories

- environmental
- economic
- psychological
- social
- physical self

Global Urbanization
1900 - 14% of humanity lived in urban areas, 2000 - 47%
ALPHA: Awaji Landscape Planning & Horticulture Academy, University of Hyogo

Japan compact cities
public & non-motorized transportation

gas price & behavior change?
dynamic street life

dynamic civic buildings

Kyoto train station
civic forests

sacred forests
native species & cultural stewardship
forests of contemplation
forest symbols
U.S. Urbanization

- time series modeling - past to future
- > 80% U.S. population lives in urbanized areas - future?


Nowak, J. Forestry, Dec. 2005

U.S. Urban Land Cover (2020)
U.S. Urban Land Cover (2030)

U.S. Urban Land Cover (2040)
Small Changes, yet Big Change
Maintain the Big Picture
- trees are not only: hazard, risk, costs

City Trees & Forests
Planning & Investment:
- what?
- how?
- why?
City Trees & Forests

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Not just beauty . . .
environment, economics, social benefits
City Trees & Nature Environmental Services

- Air pollutants reduction
- Nitrogen, phosphorus and sediment interception
- Carbon emissions reduction & sequestration
- Urban heat-island cooling
- Reduced “bad” ozone
- Stormwater runoff reduction
- Wildlife habitat

Wildlife Habitat

- including birds!
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City Trees & Nature
Community Economics

- Residential real estate values - 3-7% with trees in yard
- Residential real estate values - 5-20%, proximity to natural open space
- Commercial property rental rates - 7%
- Heating and cooling costs reductions
- Less frequent pavement replacement
- Improved consumer environments in business districts - 9-12% product spending

Research Question:
What is the response of consumers/shoppers to trees in CBD streetscapes?

Measures:
Visual preference
Place perceptions
Patronage behavior
Product pricing

research program, U of Washington
Wolf & collaborators, funded by US Forest Service
Image Categories (sorted by ratings) 
(cities of 10-20 K population)

Pocket Parks
mean 3.72
(highest)

Full Canopy
mean 3.63

Scale: 1=not at all,
5=like very much,
26 images

Enclosed Sidewalk
3.32

Intermittent Trees
2.78
No Trees mean 1.65 (lowest)
(high - 3.72)

1. Place Perceptions
   • Amenity and Comfort
   • Interaction with Merchants
   • Quality of Products
   • Maintenance and Upkeep

2. Patronage Behavior
   • travel time, travel distance
   • duration & frequency of visits
   • willingness to pay for parking

3. Product Pricing
   • higher willingness to pay for all types of goods
   • higher in districts with trees - 9-12%
typical retail street in urban Japan
Namba Parks, Osaka
view from nearby hotel

interior retail space
ground level
small plazas, retail entry

passive nature experiences
Namba Parks: retail success & nature experience benefits

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City Trees & Nature
Human Health & Well-Being

- Improved surgery and illness recovery
- Higher job satisfaction and reduced absenteeism
- Lower crime rates in well landscape areas
- Stress & anxiety reduction in urban lifestyles
- Reduced violence and more constructive conflict resolution in domestic conflict
- Reduced ADHD symptoms
- Improved social ties in neighborhoods


Workplace Nature Views

- **Well-being**
  - desk workers without view of nature reported 23% more ailments in prior 6 months

- **Job Satisfaction**
  - less frustrated and more patient
  - higher overall job satisfaction and enthusiasm
Plants in Workplace

- **Productivity**
  - 12% quicker reaction on computer tasks
  - Reports of being more attentive

- **Less Stress**
  - Lower systolic blood pressure

**directed attention**
we all deserve a corner office!

bottom-line $$ benefits of small city parks

Roger Ulrich. Texas A &M. Studies on nature and medical recovery

Wellness & Healing

- Surgery Recovery
  - shorter post-operative stays
  - less use of potent pain drugs, better attitude

- Lifestyle Recovery
  - attentional fatigue restored
  - relationships and career coping

Healing Gardens - institutional design -

U of WA Hospitals Surgery Pavilion

Roadside Landscape & Traffic Stress Response

■ Roadside Features - Driving Simulations
  – Forest, golf course, strip mall

■ Physiological Response
  – E.g. heart beat, blood pressure

■ Results
  – Nature scenes - return to baseline faster, less response to new stressors
  – Immunization effect

Americans travel 2.3 billion miles per day on urban freeways & highways
- http://www.treeclimbing.jp/

- physically disabled & tree climbing!
recreational tree climbing (& tree therapy)
Social Benefits

- studies at the University of Illinois, Landscape and Human Health Laboratory

Dr. Frances Kuo
Research Director

http://www.lhhl.uiuc.edu/
Nearby Nature is necessary “human habitat”

source: UrbanPhoto

lower levels of fear
less violent & aggressive behavior
more self-discipline for girls
reduced ADHD symptoms
better neighbor relationships
better coping with life’s challenges
fewer reported crimes
Nearby Nature
- not distant places

engineered nature & forests
high rise nature!
Green Roof - Chicago City Hall

high-rise nature, preferred views

Tokyo Metropolitan Assembly Hall

- Ecos, Sept-Oct 2004
Parking Structure - Kobe, Japan
Namba Parks, Osaka
view from nearby hotel

High Line Railway - W Manhattan
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public health & human habitat

Physical Inactivity & Obesity

majority of Americans not active enough
goal-30 minutes per day of moderate activity
to reduce risk factors for chronic diseases
(heart, stroke, cancer, diabetes)
significant costs to national health services

310-580,000 deaths per year
$100 billion medical costs (1995)
9.4% of all U.S. medical costs
Obesity Trends* Among U.S. Adults

1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults

1986

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

1987

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults

1988

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

1989

(*BMI $\geq 30$, or ~ 30 lbs overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults

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2000

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Obesity Trends* Among U.S. Adults

2001

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults

2002

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

2003

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

No Data      <10%        10%–14%       15%–19%      20%–24%     ≥25%

Source: Behavioral Risk Factor Surveillance System, CDC.

Obesity Trends* Among U.S. Adults

2004

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Doubling of adult obesity rate since 1980.

No Data      <10%        10%–14%       15%–19%      20%–24%     ≥25%

Source: Behavioral Risk Factor Surveillance System, CDC.
Fat for Life?
Six Million Kids Are Seriously Overweight. What Families Can Do.
By Geoffrey Cowley & Sharon Begley

CANINE CONSTITUTIONAL.
A walk in the park. Deep snow. It's always harder to drag the kids along then the dog. Usually gets up early? Tackle the walk in the morning.
make room for pedestrians

walkable places = health & happiness
Nature, Human Health & Walkable Neighborhoods

- Environments: Neighborhood Streets (Tokyo)
  - tree-lined
  - parks

- Outcomes: Elderly People & Walking
  - less illness
  - lower mortality rate


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good human habitat & safe, economically vital cities
Science & Community Change:
Tech Transfer, Urban Forestry & Local Government Policy

Kathleen Wolf, Ph.D.
Univ of Washington, Seattle
kwolf@u.washington.edu