Trees Do It All!

Liveable Cities & Human Health

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Global Urbanization
1900 - 14% of humanity lived in urban areas, 2000 - 47%
Japan
compact cities

dynamic
street life
public & non-motorized transportation

civic forests
sacred forests

native species & cultural stewardship
forest symbols
Canada Urbanization

The Urbanization of Canada
This is the percentage of the total Canadian population that resides in urban areas.

Small Changes, yet Big Change
Prevent Hazards & Damage

- healthy trees are safer trees
Trees & Livable Cities
Planning & Investment:

- what?
- how?
- why?

Not just beauty . . .
environment, economics, social benefits

“malleable mental accounting”
Cheema & Soman, 2006, J of Consumer Psych
Trees & Livable Cities

Benefits Categories

- environmental
- economic
- psychological
- social
- physical self

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!
Trees & Livable Cities

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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
   - most measures higher with trees

3. Product Pricing
   - higher willingness to pay for all types of goods
   - higher in districts with trees - 9-12%

典型零售街道：日本
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
Trees & Livable Cities

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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
Nearby Nature is necessary “human habitat”

source: UrbanPhoto

Nearby Nature
- not distant places
Trees & Livable Cities

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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

Lohr et al. 1996. J. of Environmental Horticulture
we all deserve a corner office!

bottom-line $$ benefits

Green Roof - Chicago City Hall

high-rise nature, preferred views
Tokyo Metropolitan Assembly Hall

Nashville, mixed use bldg  roof gardens/ecosystems
Parking Structure - Kobe, Japan

engineered nature & forests

social & market values?
Namba Parks, Osaka
view from nearby hotel

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

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

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
Effects of gardening to frontal cortex

Elders & Horticulture Therapy

TOYODA Masahiro, SUGIHARA Shiho, KAKIGI Tatsuya
University of Hyogo
Awaji Landscape Planning & Horticulture Academy

1)兵庫県立大学自然環境科学研究所
   ／兵庫県立住吉高岡高等学校
2)兵庫県立高岡総合リハビリテーションセンター
方法
実験1:
課題①: 2種の土を混ぜる
課題②: 土を鉢に入れる
課題③: 花を鉢に植える

図. 各課題の手順（数字は秒）

課題①
課題②
課題③

方法
実験2:
課題④: 左右の腕を体の前で弧を描くように動かす

課題①
課題④（対照課題）
フォルダ装着位置は、額の正中位で且つ眉から1cm上とした

写真引用 福田正人、三鷹隆彦、近赤外線スペクトロスコピーNIRSによる統合失調症と感情障害の診断、
Trees & Livable Cities

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Social Benefits

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

Dr. Frances Kuo
Research Director

http://www.lhhl.uiuc.edu/

Chicago Public Housing with & without green spaces

Wm. Sullivan & F. Kuo
University of Illinois
lower levels of fear
less violent & aggressive behavior
fewer reported crimes
more self-discipline for girls
reduced ADHD symptoms
better neighbor relationships
better coping with life’s challenges

http://www.treeclimbing.jp/
• physically disabled & tree climbing!
recreational tree climbing (& tree therapy)

Trees & Livable Cities

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public health & human habitat
**Physical Inactivity & Obesity**

- Majority of N. 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

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**Obesity Trends* Among U.S. Adults 1985**

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

- No Data
- <10%
- 10%–14%
Obesity Trends* Among U.S. Adults
2004
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Doubling of adult obesity rate since 1980.

Source: Behavioral Risk Factor Surveillance System, CDC.

Age & Disease - Canadians (1993)

- cardiovascular disease
  leading cause of death, men & women
- age 45-64 - 7,207 men/2,599 women
dead from heart disease
- age > 65 - 32,245 men/35,347 women
dead from heart and stroke disease

25% of these deaths were the direct result of sedentary living
Fat for Life?
Six Million Kids Are Seriously Overweight. What Families Can Do.
By Geoffrey Cowley & Sharon Begley

Canine Constitutional
A brisk walk in the park keeps Maxie in shape between dog shows. Maxie's owner, Columbus resident Carlo Mazza, pegs up well to give her German shepherd an easy regular workout. They typically log 3 miles in Riverside Park.
make room for pedestrians

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

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

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

Streets are inadequate:

dangerous & unattractive

Streets are inadequate

no room for people
Complete the Streets!
cars/pedestrians/bikes

Home Zones (Dutch “woonerf”)
streets and nature in everyday life
Home Zones

- traffic calming
- green streets
- festival planning
- play spaces
- multi-modal transport

Urban Forestry/Nature Programs

Involve the People!

- physical activity
- passive experience benefits
- social ties
- learning for sustainability
from grassroots to power

a movement for social & environmental change

stewardship of city nature
ecological restoration

youth in meaningful community activity

green infrastructure & natural systems

- people recognize needs
- see opportunities
- assist with planning
- active in management
- over large spaces
High Line Railway - W Manhattan
Community Gardens & Orchards

- ecosystem services
- urban agriculture = food
- build community
Vertical Gardens - NY Times

Community Gardens as Parks

- good food & good design
School Yard

Parks & People Foundation
Baltimore, Maryland

asphalt to green
visions of landscape recovery
first phase - reading circle

nature recovery & schools
nature recovery & schools

planning skills & efficacy
Our ability to perceive quality in nature begins, as in art, with the pretty. It expands through successive stages of the beautiful, to values as yet uncaptured by language.

Aldo Leopold

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good human habitat & liveable cities