Trees & Nearby Nature: essential for place-making and vital, prosperous cities

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Place Making and Prosperous Cities Seminar
Manchester City Training Academy
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credit: American Planning Association
Trees as Place-Makers
urban forestry and urban greening
‘metro nature’

economic values to communities
property values
Economic Value of Metro Nature
Methods Challenges

Forest Products
= market goods
excludable
identifiable ownership
expenses-revenues
= profits

Trees/Green in Cities
= public goods
non-excludable
multiple “owners”
expenses-returns?
-profits?
## Yard & Street Trees

### Value Increase Condition

<table>
<thead>
<tr>
<th>Increase</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>mature yard trees (greater than 9-inch dbh)</td>
</tr>
<tr>
<td>3%</td>
<td>larger street trees (up to 100’ away)</td>
</tr>
<tr>
<td>3-5%</td>
<td>trees in front yard landscaping</td>
</tr>
<tr>
<td>6-9%</td>
<td>good tree cover in a neighborhood</td>
</tr>
<tr>
<td>10-15%</td>
<td>mature trees in high-income neighborhoods</td>
</tr>
</tbody>
</table>

**multiple studies:**

Green Cities: Good Health > Local Economics
<table>
<thead>
<tr>
<th>Value</th>
<th>Increase</th>
<th>Condition</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>10%</td>
<td>inner city home located within 1/4 mile of a park</td>
</tr>
<tr>
<td></td>
<td>17%</td>
<td>home near cleaned-up vacant lot</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>home adjacent to or fronting a passive park area</td>
</tr>
<tr>
<td></td>
<td>32%</td>
<td>residential development adjacent to greenbelts</td>
</tr>
</tbody>
</table>
Local Government Benefits

*Civic Investment – Public Goods like schools, emergency response, roads*

- street trees average positive effect on house values
- added up across Portland, Oregon
- yields a total value of $1.35 billion
- potentially increasing annual property tax revenues $15.3 million

Donovan & Butry. 2010. *Landscape and Urban Planning*
urban forestry and urban greening
‘metro nature’

economic values to communities
retail centers
Trees & Shopper Environments Research

- Research Questions -
  trees and visual quality?
  trees and consumer behavior?
  trees and product pricing?

- Methods -
  mail out/in surveys
  national or local sample
  residents/nearby city residents

partners: U of Washington, NGOs, business organizations
funded by USDA Forest Service
Image Categories (sorted by ratings)

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

Pocket Parks
mean 3.72
(highest)

Full Canopy
mean 3.63
Enclosed Sidewalk 3.32

Intermittent Trees 2.78
No Trees
mean 1.65 (lowest)
(high - 3.72)
1. Place Perceptions
   - Place Character
   - Interaction with Merchants
   - Quality of Products

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%
social science of consumer behavior

‘atmospherics’
retail & place marketing

“Companies stage an experience when they engage customers in a memorable way.”
summary

urban forests = human habitat

studies of trees in business districts
perception, preference & behavior
design & place messaging/identity
customer relationships
urban forestry and urban greening
‘metro nature’

economic values to communities
human health & wellness
WHO health definition

*a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity* (1946)

science & evidence re: environment role of ‘metro nature’?
not a panacea, but important!
Determinants of Health
evidence about human wellness & ‘nearby nature’
Green Cities: Good Health
www.greenhealth.washington.edu

Sponsors:
USDA Forest Service, U&CF Program
University of Washington
NGO partners

thanks!
to U of WA students:
Katrina Flora
Mary Ann Rozance
Sarah Krueger

research review & 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.\(^14\)

- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.\(^34\)

- 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.\(^34\)
urban nature & health benefits across the life cycle
Urban Forests and Newborns
the urban natural environment and 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; similar studies in Lithuania, Vancouver B.C., Munich, Tel Aviv Israel, Spain
Change in % Population on ADHD Treatments
2001 - 2010

America’s State of Mind, Medco Health Solutions, Inc
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*
Trees & Crime Reduction

- trees in the public right of way are associated with lower crime rates
  - smaller, view-obstructing trees are associated with increased crime
  - larger trees are associated with reduced crime

Donovan & Prestemon. 2012. *Environment and Behavior*
10% increase in tree canopy
~ 12% decrease in crime

Improving Depression

20 adults with major depression walk in a park setting and an urban setting

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

cognitive and affective improvements after walking in a nature setting

Berman et al. 2012. *Journal of Affective Disorders*
Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

- Shorter stays
- Less pain
- Fewer minor complications
- Better emotional well-being
Massachusetts General Hospital

credit: Frank Oudeman
Economic Valuation of Health Outcomes

• What are the benefits?
• Who experiences nature and gets benefits?
• What is the green condition or situation that provides benefits?
• Scale of value question (i.e., community, province/state, nation)
• What are the costs/income gained/lost associated with these benefits?
Potential Annual Cost Savings and Increased Income Associated with Human Health and Well-being Benefits Derived from Metro Nature

<table>
<thead>
<tr>
<th>Benefit (geographic scope)</th>
<th>Minimum ($)</th>
<th>Maximum ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn Health (U.S.)</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Attention Deficit Hyperactivity Disorder (U.S.)</td>
<td>383.5</td>
<td>1,917.7</td>
</tr>
<tr>
<td>Schools (U.S.)</td>
<td>20.4</td>
<td>1,262.9</td>
</tr>
<tr>
<td>Crime (U.S.)</td>
<td>340.6</td>
<td>899.4</td>
</tr>
<tr>
<td>Cardiovascular Disease (U.K., U.S.)</td>
<td>1,220.0</td>
<td>1,220.0</td>
</tr>
<tr>
<td>Alzheimer’s Disease (U.S.)</td>
<td>724.6</td>
<td>1,449.2</td>
</tr>
<tr>
<td>Totals</td>
<td>2,694.4</td>
<td>6,754.5</td>
</tr>
</tbody>
</table>

Millions of U.S. Dollars (2012)

Conclusions

• Nearby trees & nature in cities & towns is essential!
• Economic benefits – property value & retail behavior
• Nature supports disease prevention & health promotion for people of all ages
• Evidence? Green Cities: Good Health
• Many more studies underway . . . .
Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples' perceptions and behaviors regarding nature in cities

Nature and Consumer Environments
Research about how the urban forest influences business district visitors.

Trees and Transportation
Studies of the value of having quality landscapes in urban roadsides.

Civic Ecology
Studies of human behaviors and benefits when people are active in the environment.

Policy and Planning
Integrating urban greening science with community change.

Green Cities: Good Health
Human health & well-being research

Urban Forestry and Human Benefits
More resources, studies and links...

Projects Director
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