

From Green Infrastructure to Place Making:



How Trees Can Make Our Cities More Resilient and Welcoming

Cecil Konijnendijk, professor, Faculty of Forestry
@CecilUforia

Outline

- No resilient and healthy city without trees and green space
- An urban forest under siege
- Making it work: mobilising the 10 C's



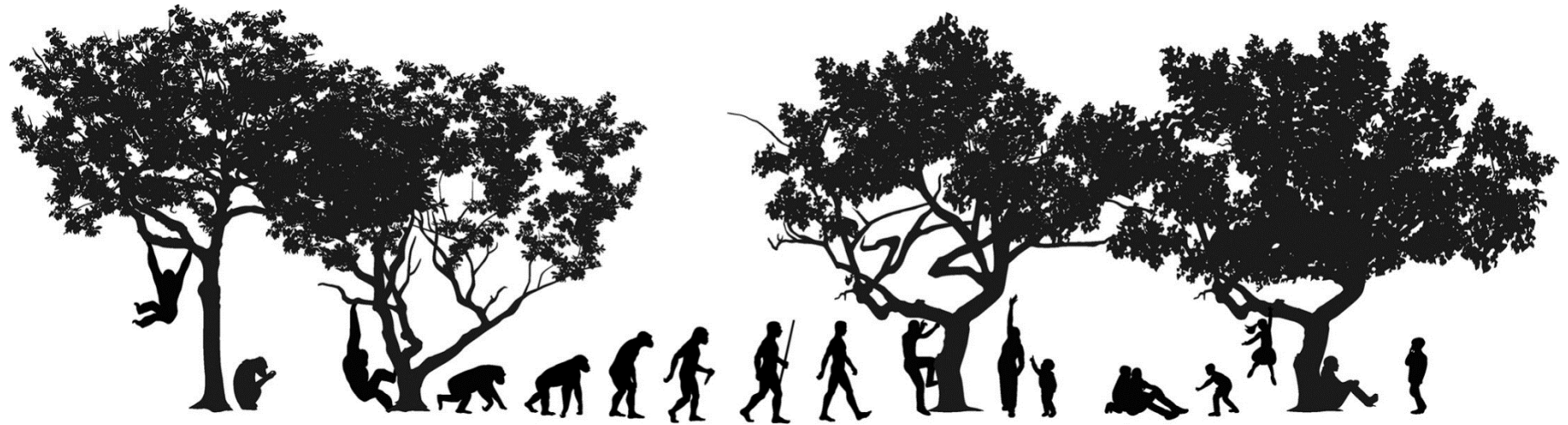
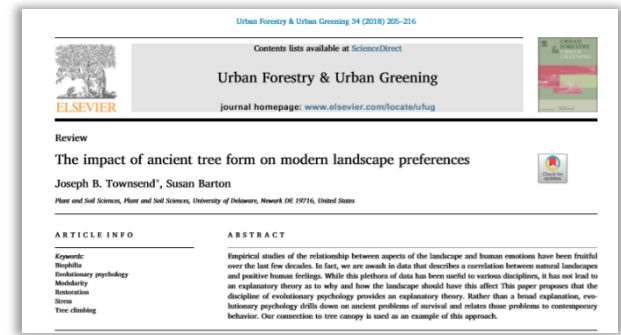


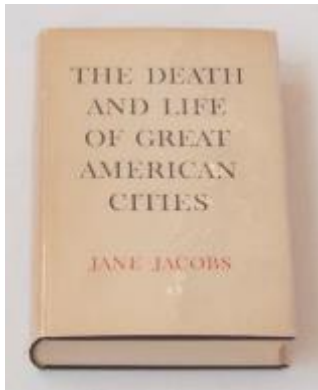
Illustration by Cathy Bedenbaugh, in Townsend and Barton (2018)



Phil Stanziola - New York World-Telegram and the Sun Newspaper Photograph Collection, Library of Congress, Reproduction Number: LC-USZ-62-137838. Domain, <https://commons.wikimedia.org/w/index.php?curid=14636401>

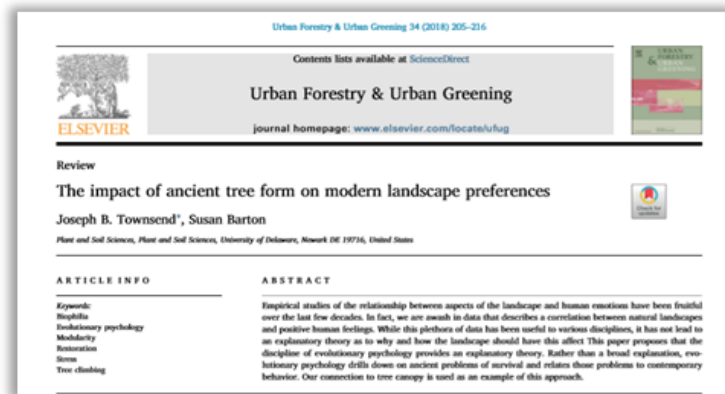


Cities are an immense laboratory of trial and error, failure and success, in city building and city design –
Jane Jacobs (1961)



Highlights

- Evidence suggests that tree form has an emotional **resonance** for modern humans.
- Evolutionary psychology is helpful in explaining the origins of this affect.
- For most of primate history, tree canopy has represented habitat and safety.
- We still carry neural circuits that evaluate tree canopy.
- Aspects of contemporary aesthetics are based on ancient canopy preference.





THE
ARGUMENTS
FOR PROTECTION
SERIES

The importance of
forest protected areas
to drinking water



Running**Pure**

A research report by the World Bank / WWF Alliance for Forest Conservation and Sustainable Use



Exhausted worker in Dubai, 2015
photo: Kamran Jebreili



Yoshifumi Miyazaki

THE JAPANESE ART OF

shinrin yoku

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EXPERIENCE NATURE IN A NEW WAY



THE JAPANESE
ART AND SCIENCE OF
SHINRIN-YOKU

FOREST BATHING

HOW TREES CAN HELP YOU FIND
HEALTH AND HAPPINESS

DR. QING LI

CHAIRMAN OF THE
JAPANESE SOCIETY FOR
FOREST MEDICINE

Urban Forestry

The art, science, and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society

(Helms 1998, based on Miller 1997)



DO NOT DISTURB

The purple trap in this tree is for
emerald ash borer detection.

For more information:
emeraldashborer.wi.gov

1-800-462-

TRAP ID#: T 020-



Wisconsin Department of
Trade and Consumer Protection

United States Department of

THE EMERALD ASH BORER IS HERE! Now What?



A workshop for municipal, First Nation, commercial
and environmental decision makers and managers of
urban and natural forests threatened by EAB



March 28, 2017

Workshop 8:30 am – 5:00 pm
(sign-in begins at 7:30 am)

Public Open House 6:30 pm-9:00 pm

Bora Laskin Theatre
Lakehead University
Thunder Bay, Ontario

Know Your Enemy!

THE EMERALD ASH BORER



Join The Garden Geeks of Facebook

When Things Become Really Bad...

- **Calamities:** an event causing great and often sudden **damage** or **distress**; a disaster
- In urban forestry: a **major loss** of urban forest **canopy** over a **short period of time**

340

A. Elmes et al. / ISPRS Journal of Photogrammetry and Remote Sensing 128 (2017) 338–353

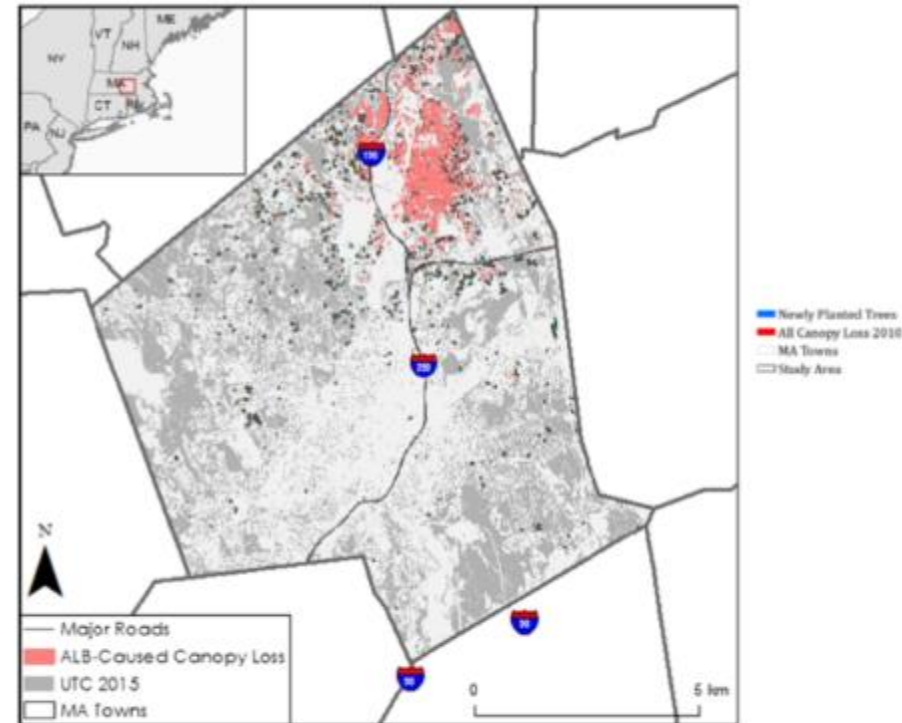


Fig. 1. Study area map, showing 2008–2010 Urban Tree Canopy (UTC) loss areas, created by Hostetler et al. (2013).

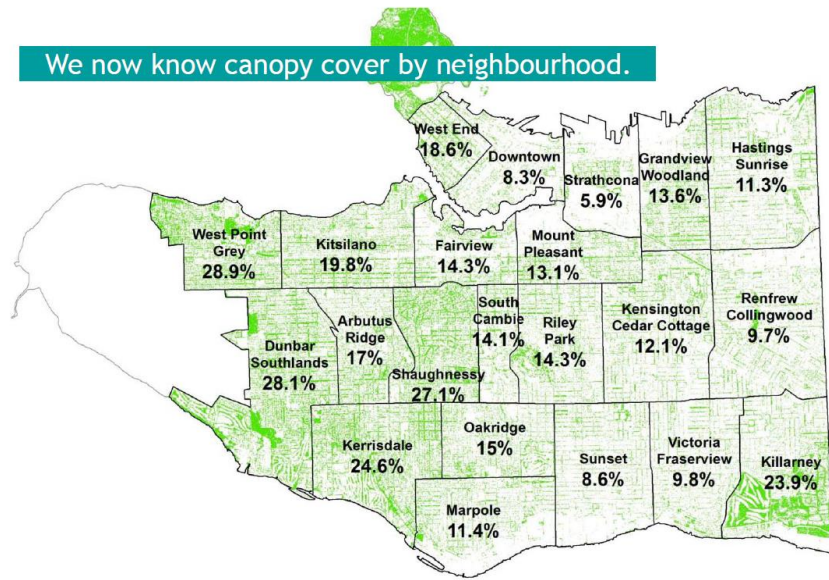


Regional Municipality of Wood Buffalo / Wikimedia Commons

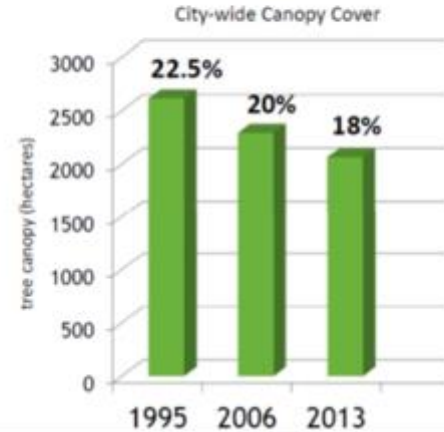


NASA Earth Observatory image by Joshua Stevens, using Landsat data from the U.S. Geological Survey

We now know canopy cover by neighbourhood.



However, our canopy cover has been declining over the past two decades. Why is this of concern?



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[Read more Auto Reviews](#)

OUR RESULTS

\$13 MILLION
Auto Defect

Of all nature's flora and fauna, trees seem to be among the very safest. After all, trees cannot sting or bite us. They can't lay eggs in our floorboards, or peck and scratch at our vulnerable flesh. They can't enter a cut to give us an infection, and they can't bite down on our ankles and drag us beneath the surface of the ocean. They seem harmlessly anchored deep in the ground, still and serene for all time. However, while it's true that trees are perfectly safe in the vast majority of instances, it is possible for trees to collapse or lose limbs, and to injure or even kill in the process. It may be a bizarre accident which can only be attributed to natural forces – or it may be a matter of negligent maintenance involving [premises liability](#). In this blog post, our [Philadelphia personal injury attorneys](#) will take a look at some of the statistics and stories behind tree fall accidents across America.

THERE ARE OVER 250 BILLION TREES IN AMERICA TODAY

While pollution and deforestation are serious and valid environmental concerns, it remains that the United States is home to billions upon billions of trees. As a matter of fact, in spite of a dramatically increased population, there are actually more trees in America today than there were some 100 years ago. FAO, or the Food and Agriculture Organization, reports the following:

"Forest growth nationally has exceeded harvest since the 1940s. By 1997, forest growth exceeded harvest by 42% and the volume of forest growth was 380% greater than it had been in 1920."

With approximately 250 billion trees spreading their leafy arms from coast to coast (not even counting trees which are smaller than one inch in diameter),



Jehane Samaha
MSc student

Urban Tree Selection Study

- ✱ What tree selection criteria do various professional groups prioritize?
- ✱ What trees will be excellent to plant in future cities?
- ✱ Online **survey**: temperate North America.
- ✱ **Case study** interviews: Philadelphia area.



PHILADELPHIA URBAN FOREST
PHOTO CREDIT: METROPOLIS

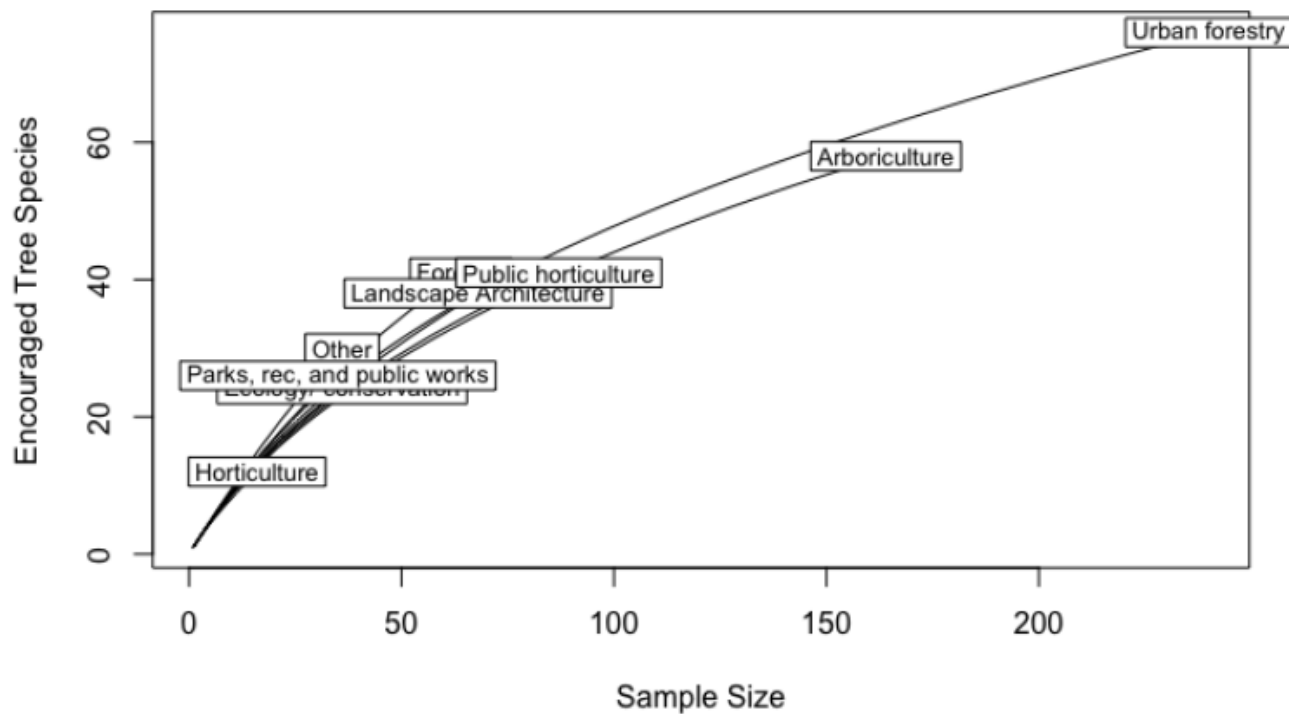
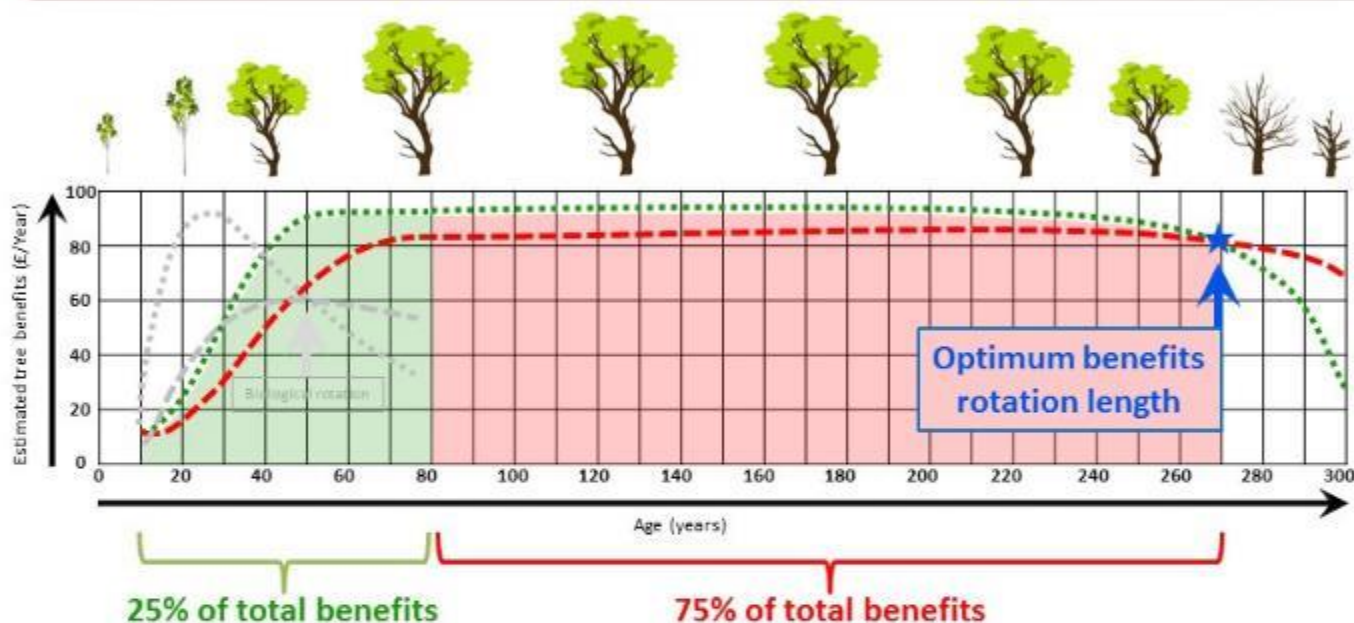


Figure 12: Rarefaction curves for the palettes of encouraged tree species identified by each professional field.

Optimised urban tree benefits rotation length



This is a simplistic diagrammatic representation prepared for the Sheffield Trees Action Group seminar held on 21/01/17 showing one approach to estimating the optimum rotation length for urban trees based on the financial benefits they provide. It is a conceptualisation based on estimated figures to demonstrate the principle, and the reality of individual circumstances may vary considerably from this simplistic view. For these reasons, it should be referenced with caution and applied intelligently, taking full account of the individual circumstances of each situation.

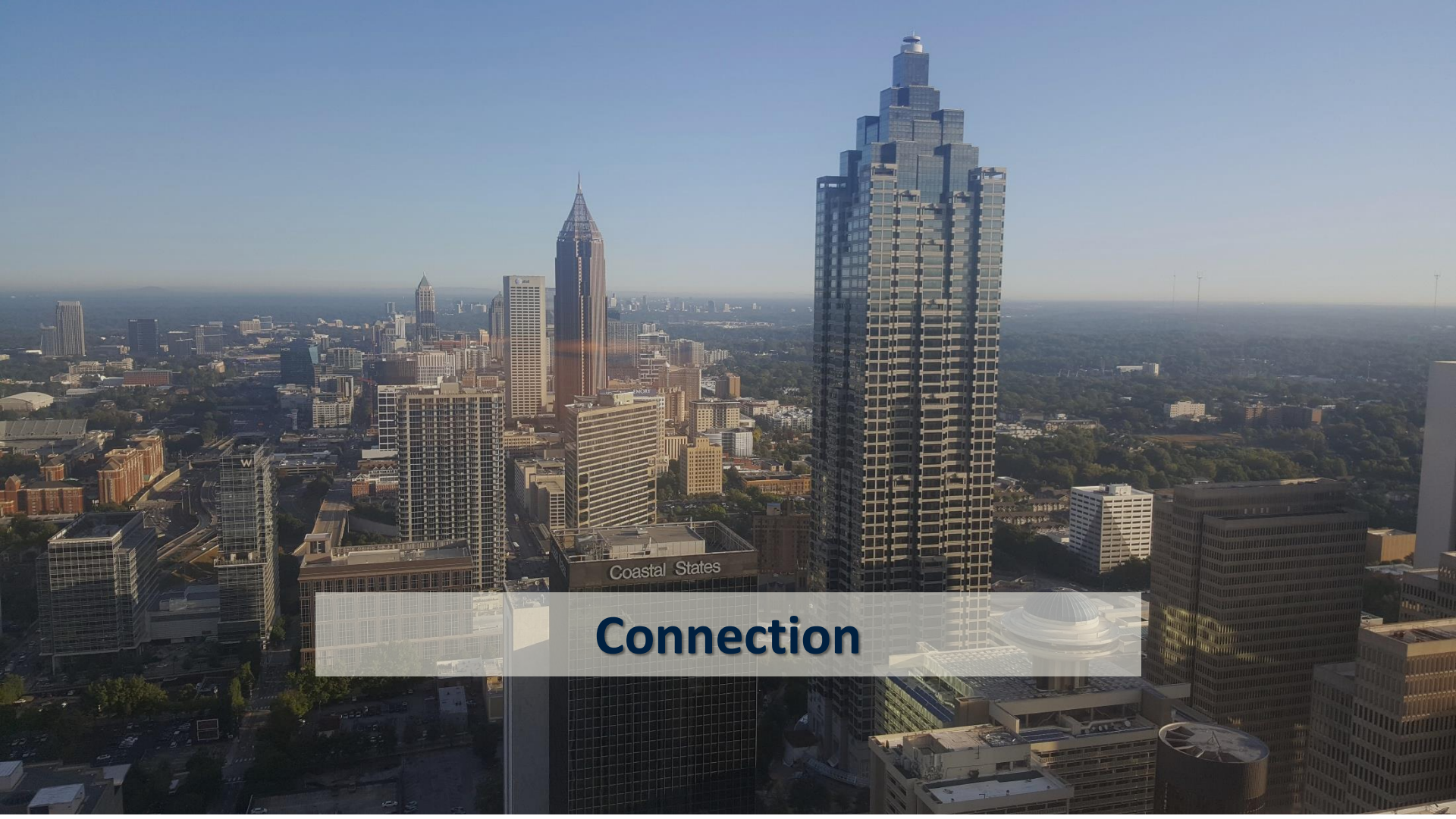
From conventional forest management theory for optimising timber volume production, the most efficient point to fell and replant is where the current annual increment and mean annual increment curves cross (both in grey). This is called the biological rotation and is at about 51 years in this example. Extrapolating this principle to urban trees, and considering the delivery of tree benefits rather than timber volume, the current annual tree benefits curve (green dots) crosses the mean annual tree benefits curve (red dashes) around 270 years of age (blue arrow). Felling at around 80 years of age delivers about 25% of the potential benefits (green shading) that leaving the trees to their full optimised benefits rotation could deliver. Put another way, up to 75% of the potential benefits those trees could deliver (red shading) are sacrificed through premature removal.

Making It Work – with 10 C's



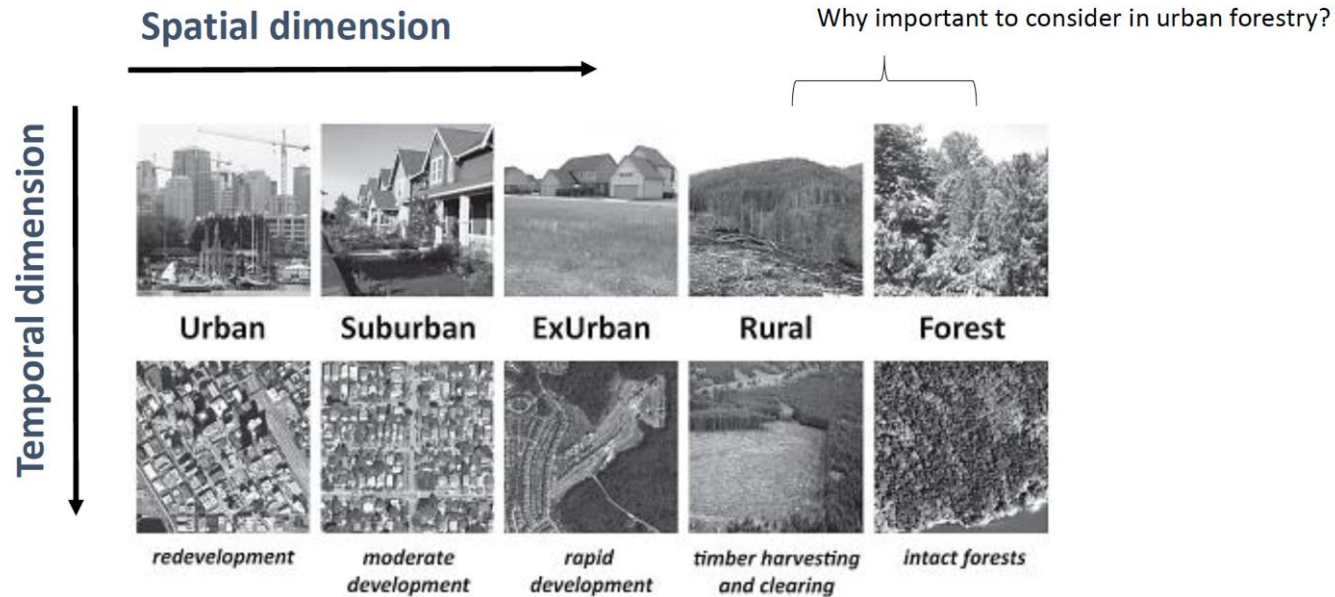
- Connection
- Collaboration
- Community
- Communication
- Clarity
- Competence
- Creativity
- Courage
- Champions
- Cash



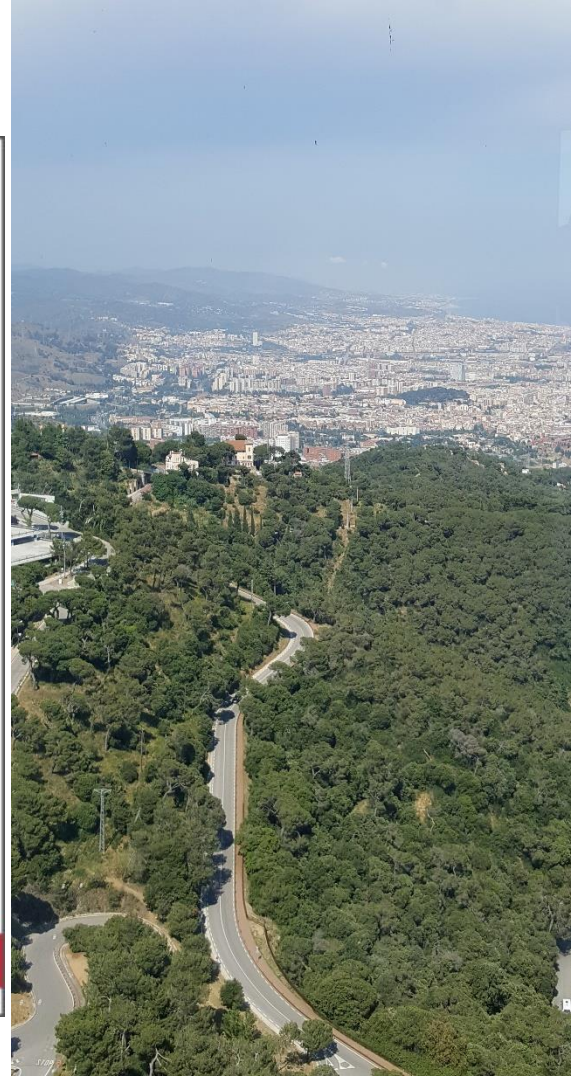


Connection

Urban Forests along the Urbanisation Gradient



Source: Alberti and Hutyrá 2012









Collaboration

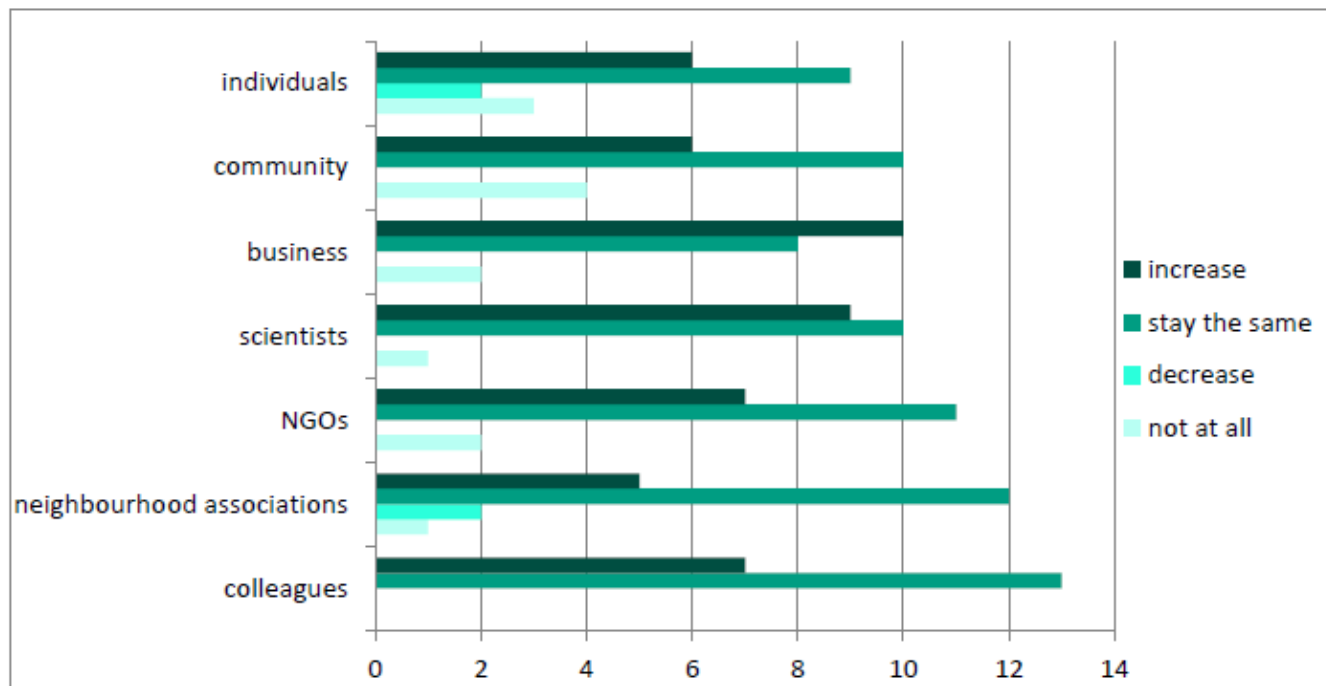
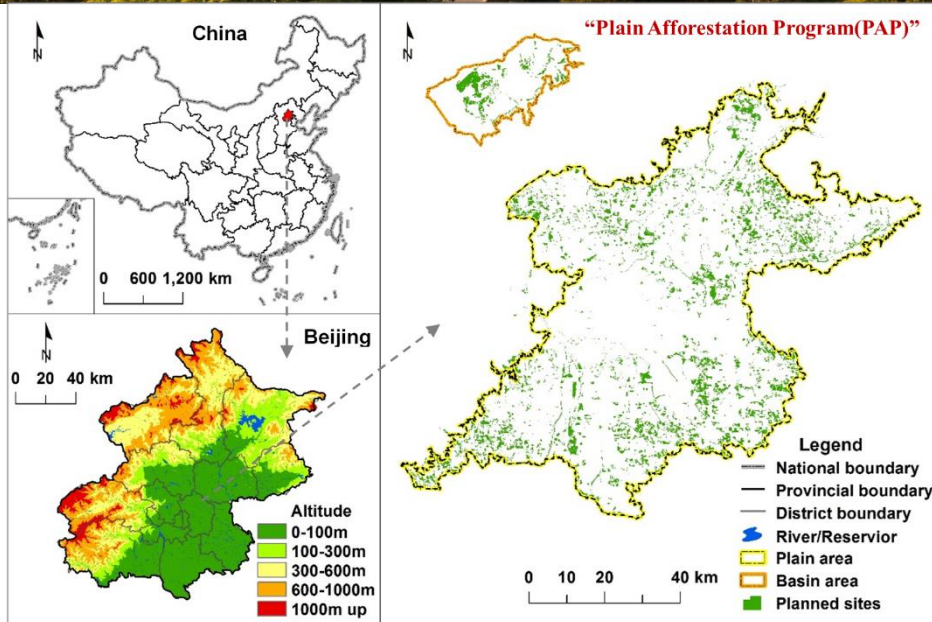


Figure 6.2 Views by city officials (N=20) on future involvement of stakeholders as gauged by of the following question in the questionnaire 'Who should be involved to what intensity in the future?'

Project: Assessment of large-scale urban afforestation

Na (Alice) Yao
Visiting PhD Student



Large-scale Urban Afforestation Program →

- Planning
- Strategic implementation
- Short-term benefits

1. Central governmental agency for the project

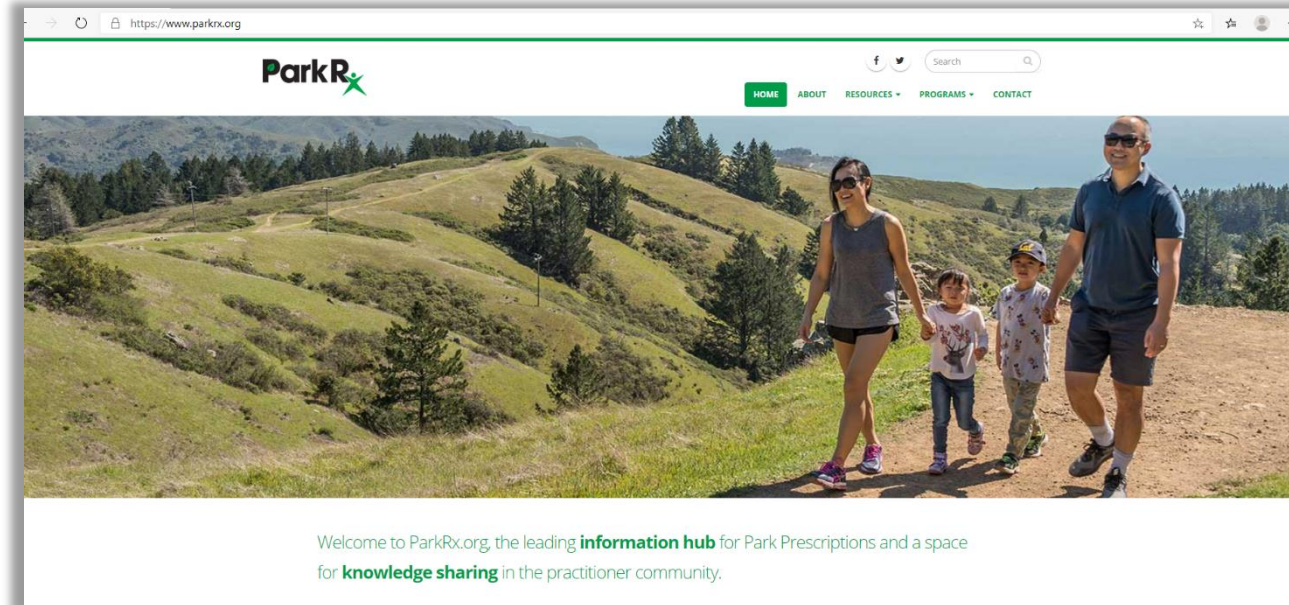
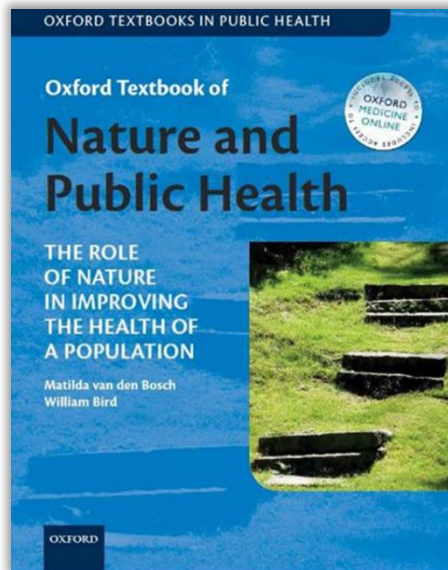
• Lateral

- **Forestry and Parks Bureau; (Lead)**
- Finance Bureau; (*Support*)
- Commission of Development and Reform; (*Support*)
- Commission of Science and Technology; (*Support*)
- Land and Resources Bureau; (*Support*)
- Water Authority; (*Support*)
- Public Security Bureau; (*Coordinate*)
- Agriculture Bureau; (*Coordinate*)
- Environmental Protection Bureau; (*Coordinate*)
- Commission of City planning; (*Coordinate*)
- Commission of Rural Affairs; (*Coordinate*)
- Supervision Bureau; (*Supervise*)
- Audit Bureau; (*Supervise*)

• Vertical

• Top-down four-layer governmental system







Community

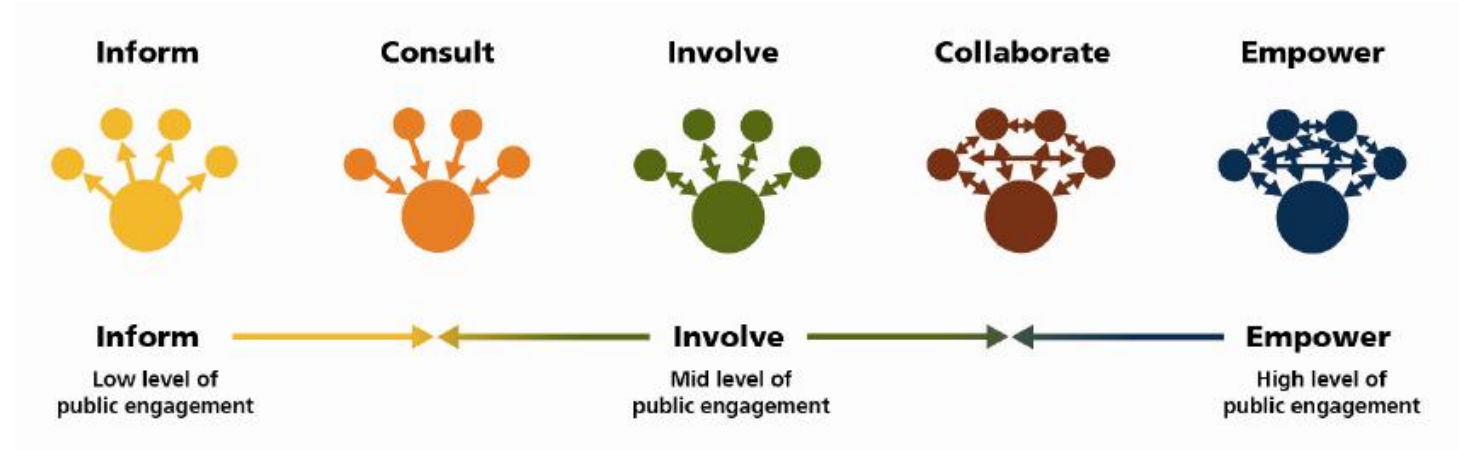


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<http://www.mediacoop.ca/sites/mediacoop.ca/files2/mc/musquem2.jpg>


c̓əsnaʔəm
the city before the city



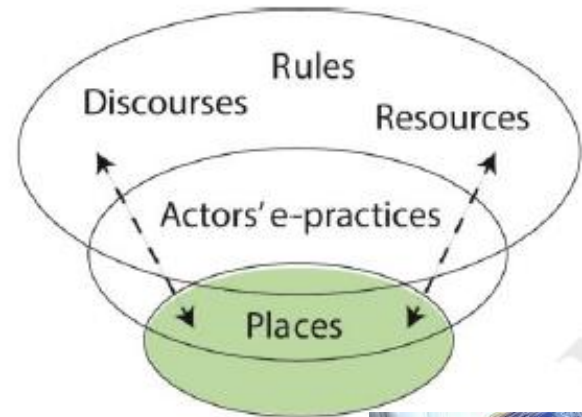
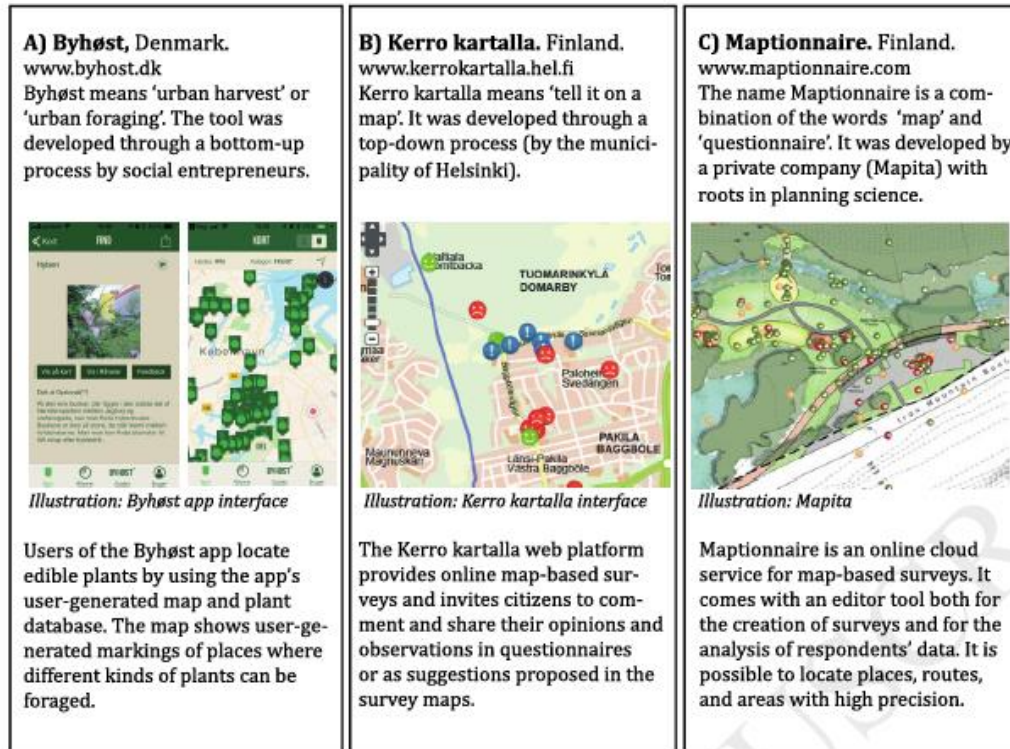


Figure 1. Overview of the three case studies of place-based e-tools (based on interviews and information from the e-tools' web-sites).

An aerial photograph of a university campus. In the foreground, there is a green lawn with several white tents and tables set up, possibly for an event. A small blue pond is visible in the lower right. A large parking lot with many cars is in the middle ground. The campus is surrounded by dense green trees. In the background, a city skyline is visible under a clear blue sky, with a prominent white cable-stayed bridge on the right.

Communication



**GREENEST
CITY 2020**

TREE



TREES KEEP US HEALTHY. FOLLOW



GET MOVING

Inspect trees and shrubs from the bottom up and look for specific problems such as brittle or dead branches, soft or decaying wood, small holes in trunk, or shallow pits in the bark and weak or off-color foliage.



Help your trees stay healthy by releasing nutrients and increasing their resistance to disease, in stressful weather.

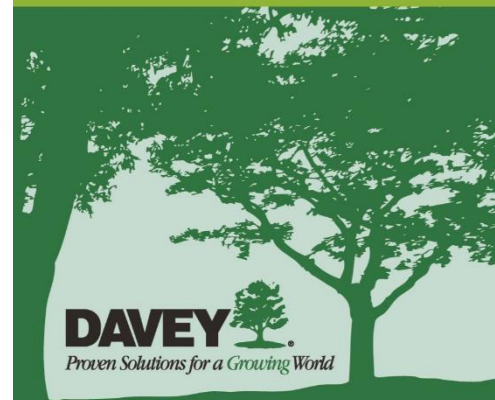
WE NEED MORE TREES TO HANG THE HAMMOCKS

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HOLLAND

Loesje

the American Cancer Society, a reliable means of protection from the effects of the sun's ultraviolet (UV) rays. As important as a hat or sunglasses.



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E D CES

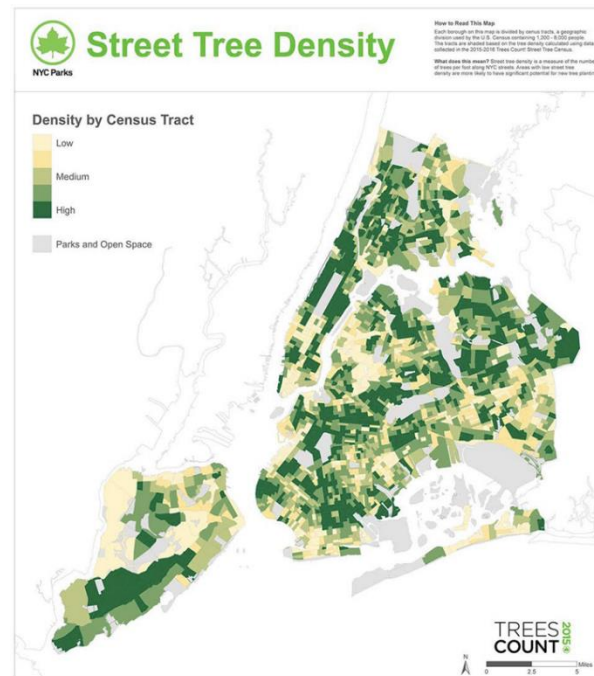


SCHEDULE REGULAR CHECK-UPS

and planning for your trees' future. Schedule a check-up with a certified arborist to ensure the best care for your trees.

Notice something that worries you? Schedule a check-up with a certified arborist to ensure the best care for your trees.

YOU'RE ONE IN A MILLION
We did it! One million trees for New York City!





Clarity

URBAN FOREST STRATEGY

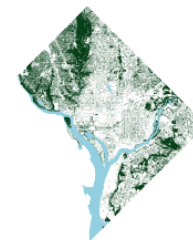
2018 UPDATE



Strengths of Using Canopy Targets



- Simple and powerful narrative / discourse – attractive to e.g. politicians
- Easy to communicate and understand
- Provides common narrative and sense of direction in complex governance situation
- Measurable indicator of success
- Assemble public support and generate action and involvement (e.g. also from business)
- Highlighting the urgency of loss
- Linked to several key ecosystem services – see the iTree approach
- Allows for benchmarking



Current Tree Canopy
38%

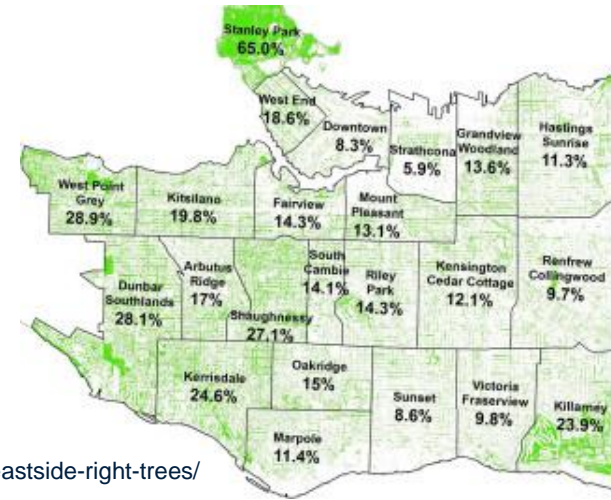


Potential Tree Canopy
55%

Pitfalls when Using Canopy Targets



- Cities and local conditions are very different
- Mostly suitable for some ecosystem services (see e.g. i-Tree)
- Public – private; access
- Quite two-dimensional – how about the ‘on the ground’ experience?
- Quantity over quality – resilience, diversity, functionality
- It’s not only about trees
- Issue of uneven distribution of canopy
- Methodology





AMERICAN FORESTS
- SINCE 1875 -



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ABOUT US

OUR WORK

GET INVOLVED

BLOG



The reason for that is simple: research no longer supports a universal 40 percent tree canopy recommendation, and neither does American Forests.

By Ian Leahy, *American Forests*, Director of Urban Forest Programs

One of the most frequent questions I receive, as American Forests' Director of Urban Forest Programs, comes from individuals developing tree canopy goals for their jurisdiction or region. They have come across numerous references to American Forests' recommended 40 percent tree canopy goal but cannot find a source citation to include in planning documents.

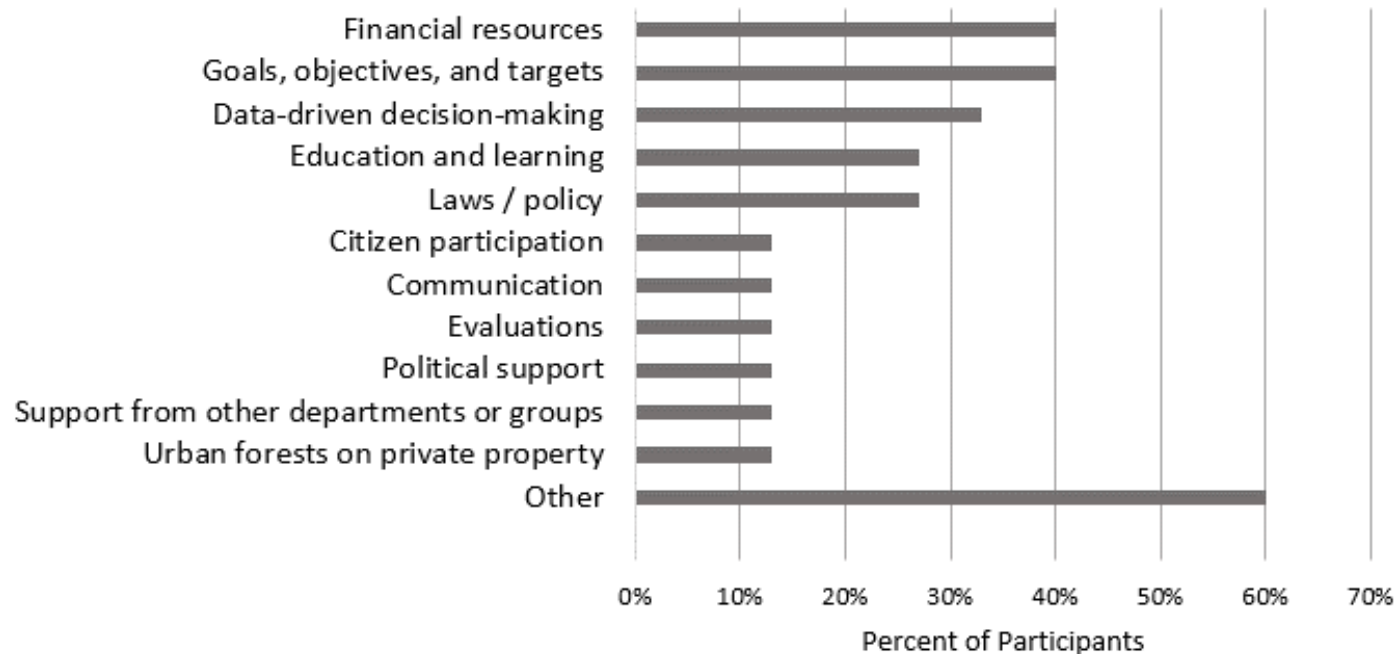
The reason for that is simple: research no longer supports a universal 40 percent tree canopy recommendation, and neither does American Forests.





Competence

Factors Prioritized by Participants



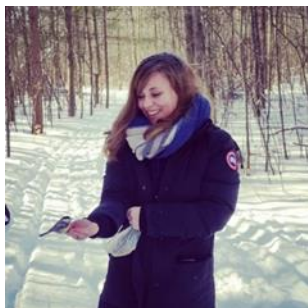
Perspectives and Controversies

The Internet of Nature: How taking nature online can shape urban ecosystems

Nadinè J Galle,¹ Sophie A Nitowski² and Francesco Pilla¹

THE
ANTHROPOCENE
REVIEW

The Anthropocene Review
1-9
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<http://www.smh.com.au/good-weekend/green-power-nycs-parks-commissioner-on-why-parks-are-essential-20160823-gqytqf.html>; Photo: Nathaniel Welch





Courage

...the happiness and fulfillment of citizens and residents is important to us. This can only be achieved through promoting physical, psychological and social well-being. At the heart of our vision is a society in which all enjoy a good quality of life, a healthy lifestyle and an attractive living environment.

...we will continue to ensure high quality services such as water, electricity, public transport, health, education, culture, sports and recreation.




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GATHERING*

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AUTUMN

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FROM TRANSPORT, HEALTH, EDUCATION, SKILLS AND BUSINESS TO
CULTURE, SPORT, HERITAGE, ENVIRONMENT AND COMMUNITY.



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TO INSPIRE MORE PEOPLE TO ENJOY LONDON'S GREAT OUTDOORS AND
HELP MAKE LONDON GREENER, HEALTHIER AND WILDER.

Sponge City

Landscape

Planning

Architecture



土人设计
TURENSCAPE



Building A Greenway: Puyangjia...



Yichang Yunhe Park



Quzhou Luning Park



A Resilient Landscape: Yanweizh...



Floating Connection: The Harbi...



Qian'an Sanlihe River Ecological...



Minghu Wetland Park



Qunli Stormwater Park: A Green...



Shanghai Houtan Park



Central Landscape of Zhonggua...



Tianjin Qiaoyuan Wetland Park



The Floating Gardens -- Yongni...






Cash





- 
- An aerial photograph of a city, likely Rio de Janeiro, showing a dense urban landscape with various buildings, including high-rise apartments and older structures with red-tiled roofs. In the background, there are prominent mountains under a clear blue sky with scattered white clouds. A semi-transparent white box is overlaid on the center of the image, containing a bulleted list.
- **The 11th 'C': Complexity. Urban forestry is complex and often dealing with wicked problems**
 - **The 10 C's can help – also in balancing long-term vision and short-term actions**
 - **A governance perspective is recommended**