universität freiburg

Urban Trees and Forestry

Biotic and Abiotic Challenges of Urban Trees and Forests

23.09.2024

Yasin Korkmaz
Chair of Pathology of Trees

Green Cities

1

Kildeparken – Aalborg/Denmark

High Line – Manhattan, New York/USA

2

3

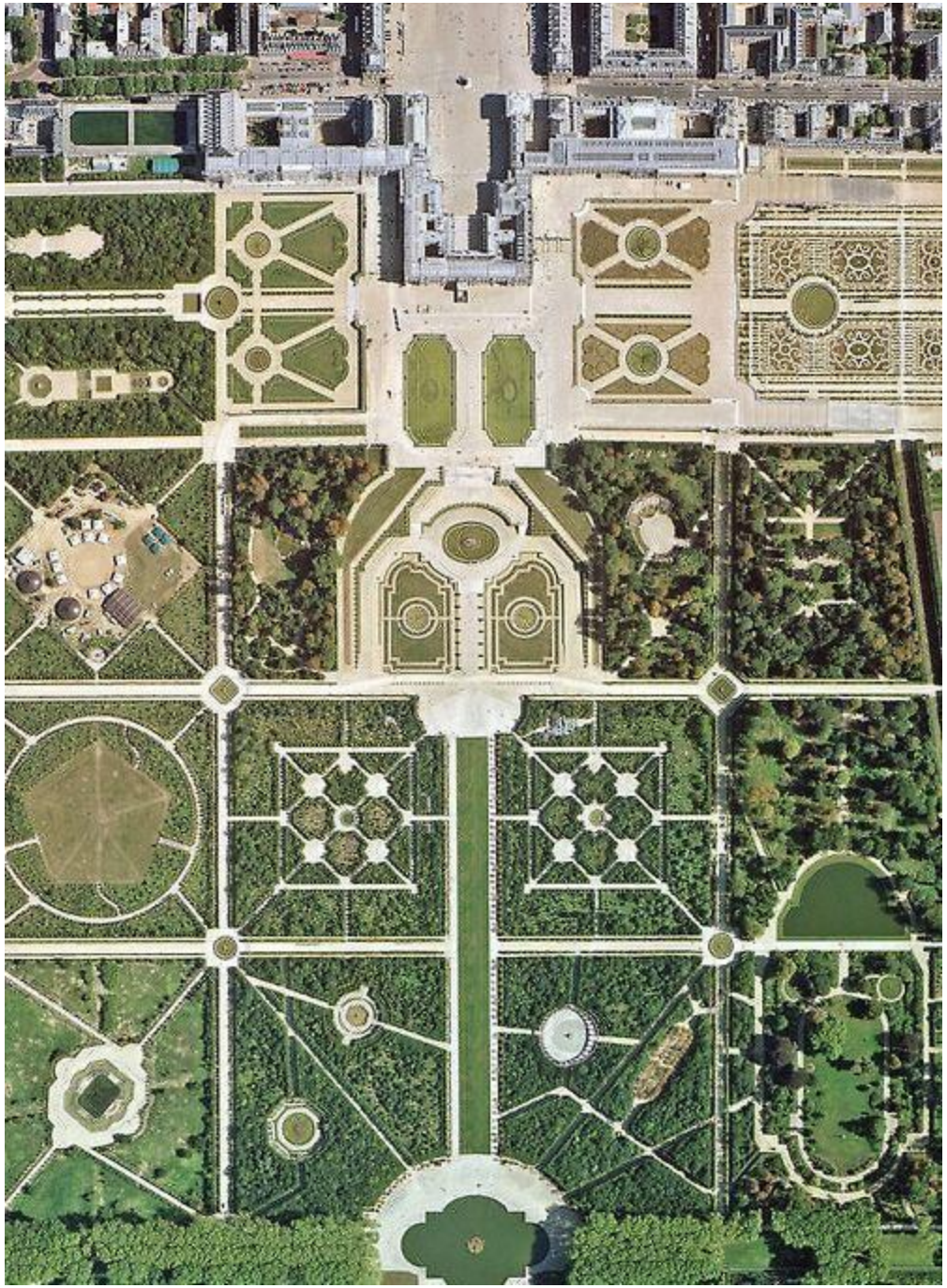
Puerta de Atocha – Madrid/Spain

Atatürk Arboretumu – Istanbul/Türkiye

4

5

The KII, Düsseldorf, Germany

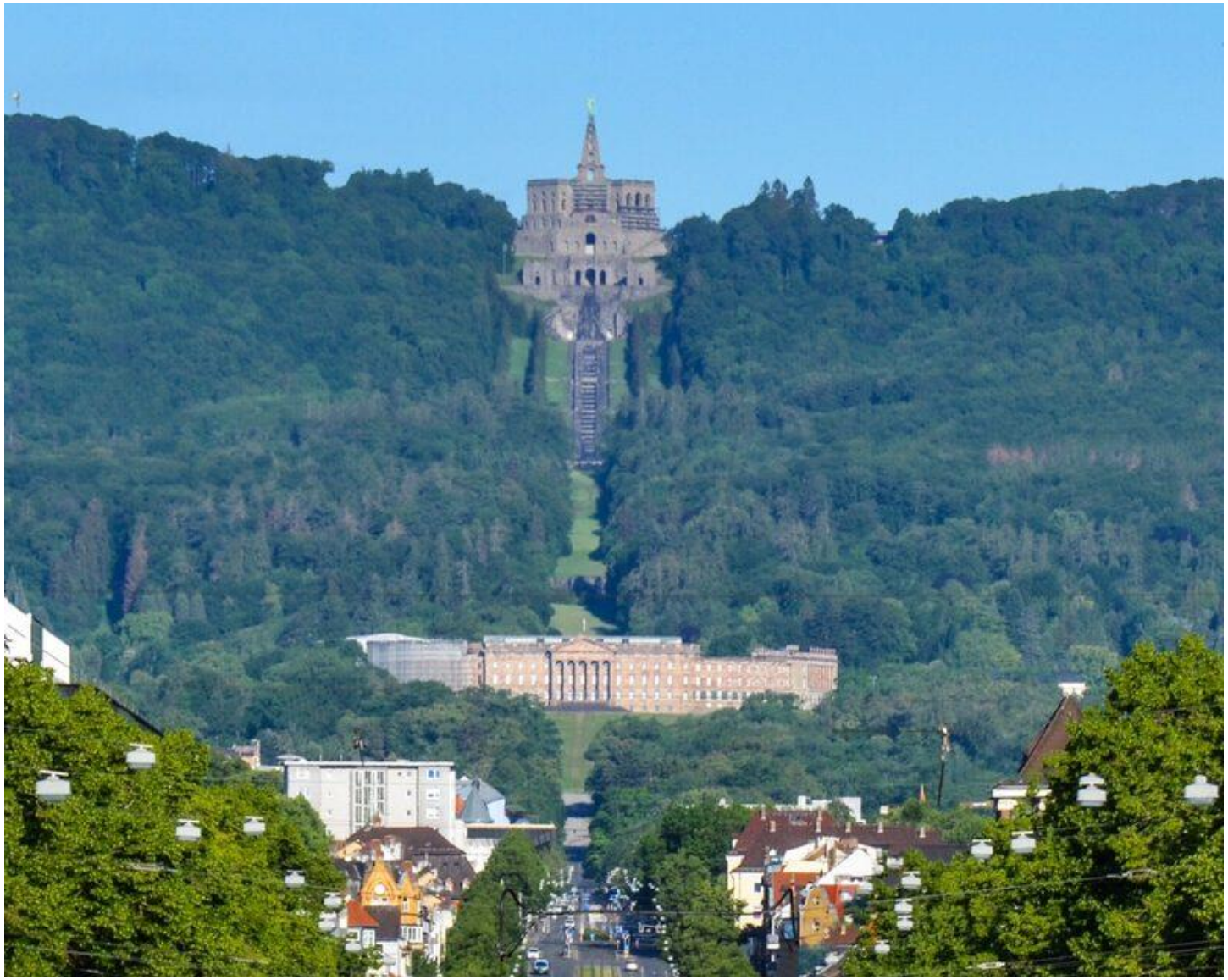


Versailles gardens – Paris/France

6

Berlin Tempelhof park – Berlin/Germany

7



8

Kassel wilhelmshöhe – Kassel/Germany

Gardens by the bay - Tanjong Rhu/Singapore

9

Singapore

10

Southern Ridges - Singapore

11

12

Namba Parks, Osaka, Japan

13

Awaji Yumebutai, Hyogo, Japan

14

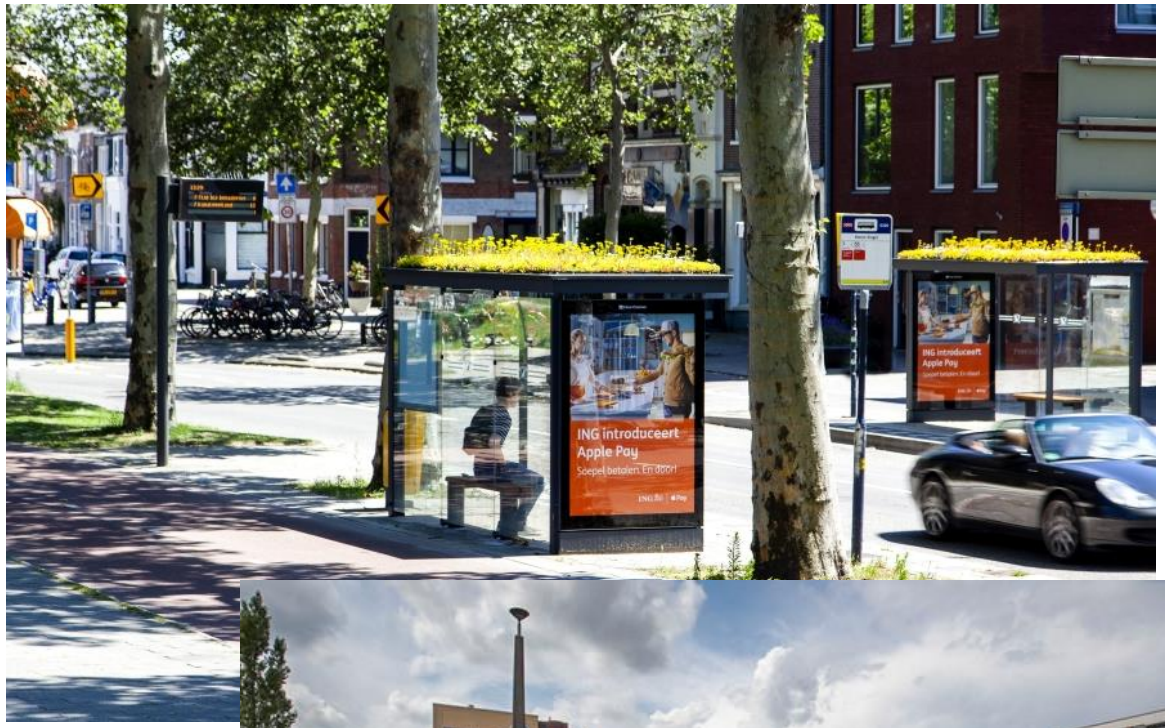
ACROS Building, Fukuoka, Japan

Sapporo - Hokkaido, Japan

15

16

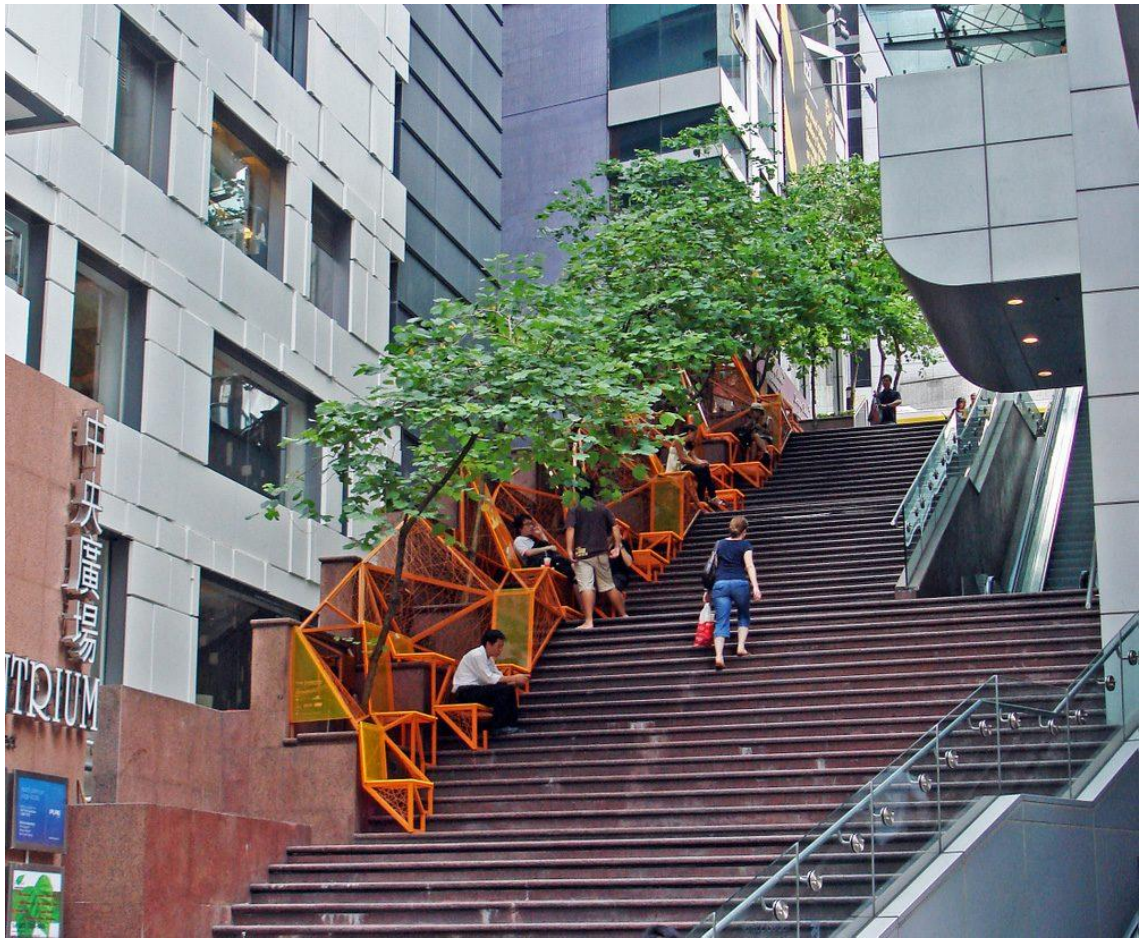
Cheonggyecheon – Seoul/South Korea



- Introduced 12 plant-topped ‘Living Roof´
- Aim to replace 479 bus shelters.

17

Bee Bus Stop– Leicester, The UK



Cascade - Hong Kong

18

Parkcycle – Baku/Azerbaijan

19

Dubai – The Sustainable City

20

Basel – Mandatory green roofs

https://youtu.be/tLAoRObhvY4?si=e2psim5jtO4cOcmi

22

Guiyang, China

“economically sustainable, socially harmonious, environmentally friendly and resource-conserving”

China’s Tianjin Eco-City

23

http://thelowline.org/about/project/

Lowline - New York City

Saudi Arabia - The Line

End of the Line? Saudi Arabia 'forced to scale back' plans for desert megacity

Crown prince's pet project was sold as a 105-mile-long city of the future, but finances may have led to a rethink

The Mukaab, Saudi Arabia

https://youtu.be/IANyFzFM4R0?si=n09sBGpONPrOiNGp

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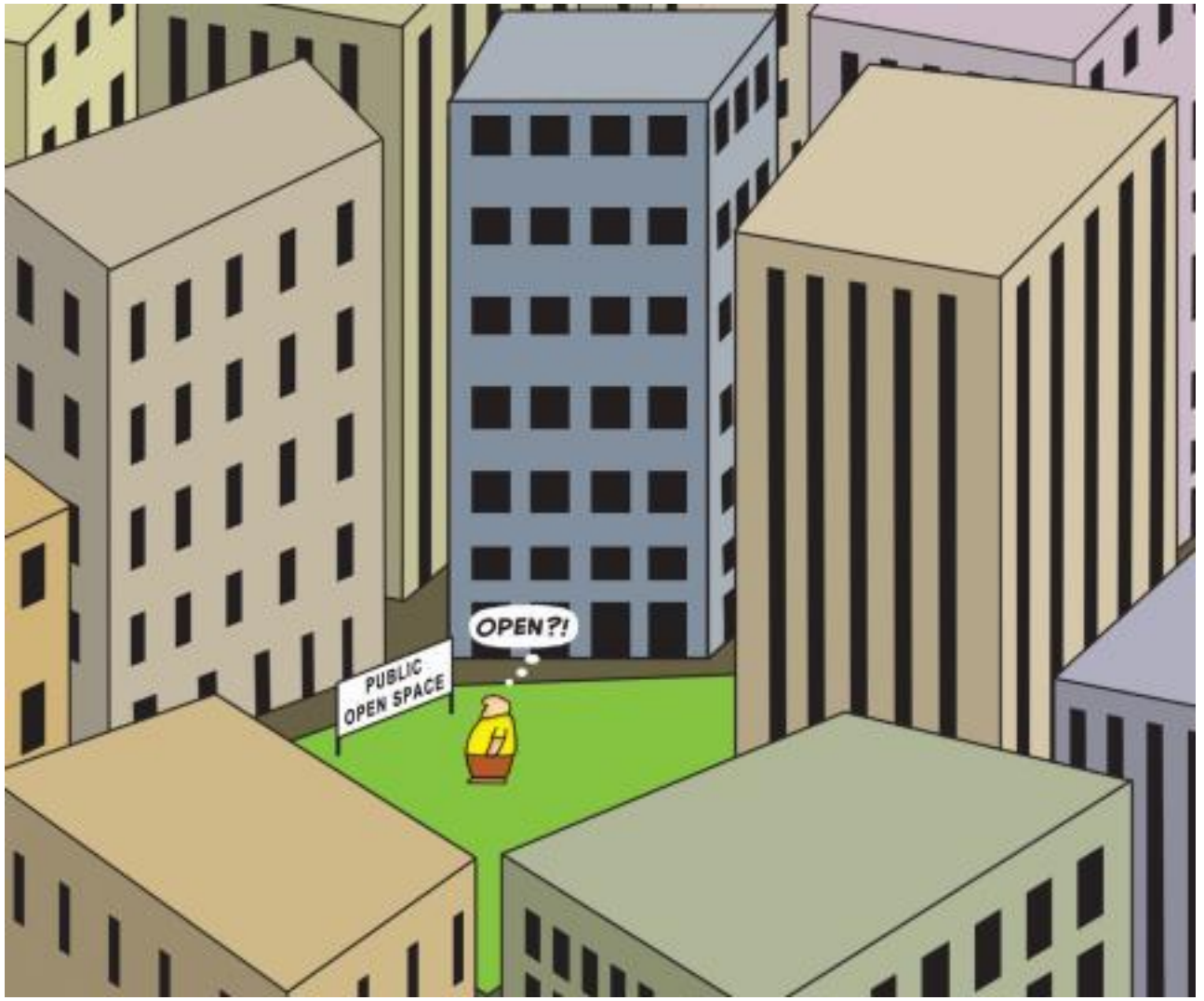
Urbanization



Facts on urbanization

•Over half the world's population lives in cities for the first time.

•By 2050, two-thirds of humanity is projected to live in urban areas.

•Half of Asia's population will be urban by 2025; Africa will reach 50% urbanization by 2035.

•Asia has 13 megacities, Latin America 4, and Africa, Europe, and Northern America each have 2.

•Megacities accounted for 9.9% of the urban population in 2011, rising to 13.6% by 2025.

•Cities generate around 75% of global CO2 emissions and are highly vulnerable to climate change.

•The urban heat island effect makes cities warmer than rural areas.

•Climate change impacts in cities include flooding, heat stress, extreme weather, droughts, water scarcity, and increased air pollution.

•Landslides, flooding, or extreme temperatures can damage city infrastructure, causing power outages and disruptions to water, traffic, hospitals, and homes.

•Poorer populations are most at risk and unable to cope with climate change, with rising vulnerability and exposure increasing the danger for urban dwellers.

•Greenness in European cities has increased by 38% in the last 25 years, while globally it grew by 12% (EC JRC, 2018).

•44% of Europe's urban population lives within 300 meters of a public park.

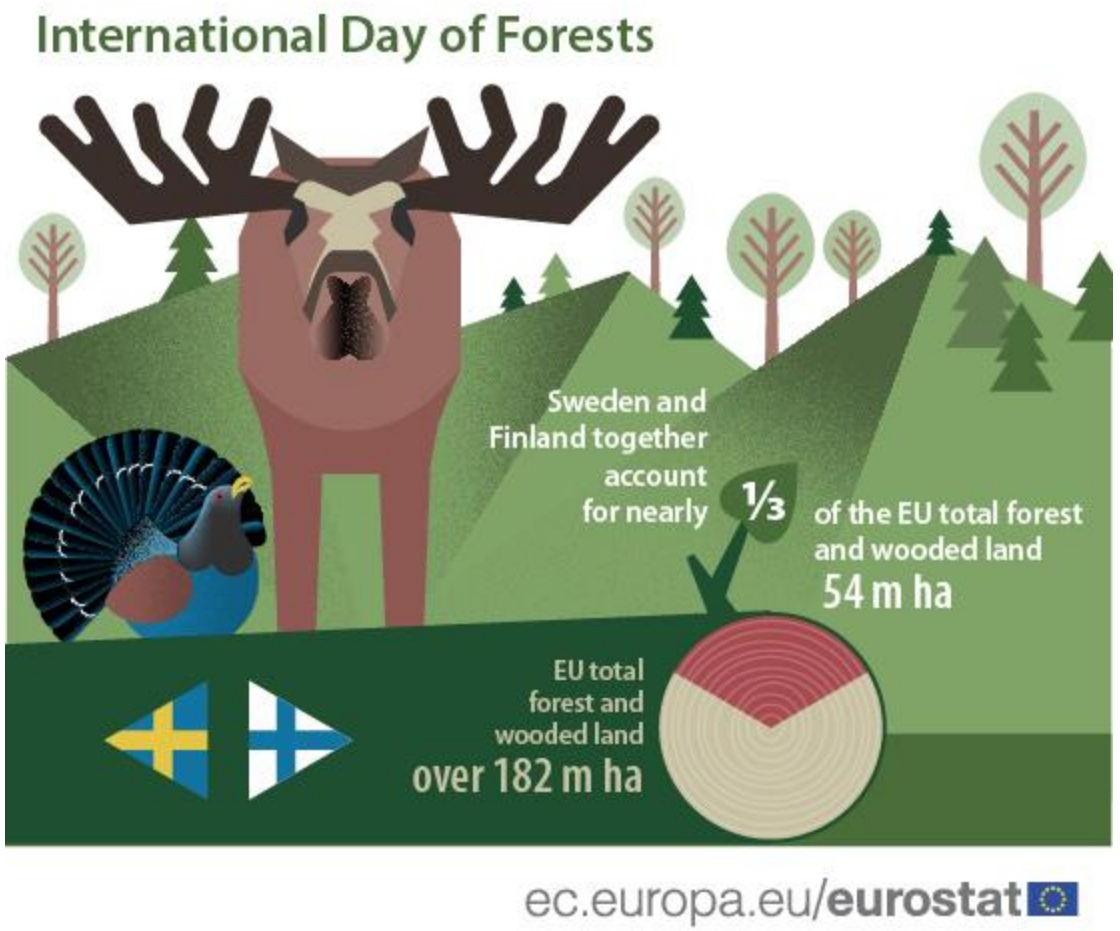
•Cáceres, Spain, has the highest proportion of green space (96%), while Trnava, Slovakia, has the lowest (7%).

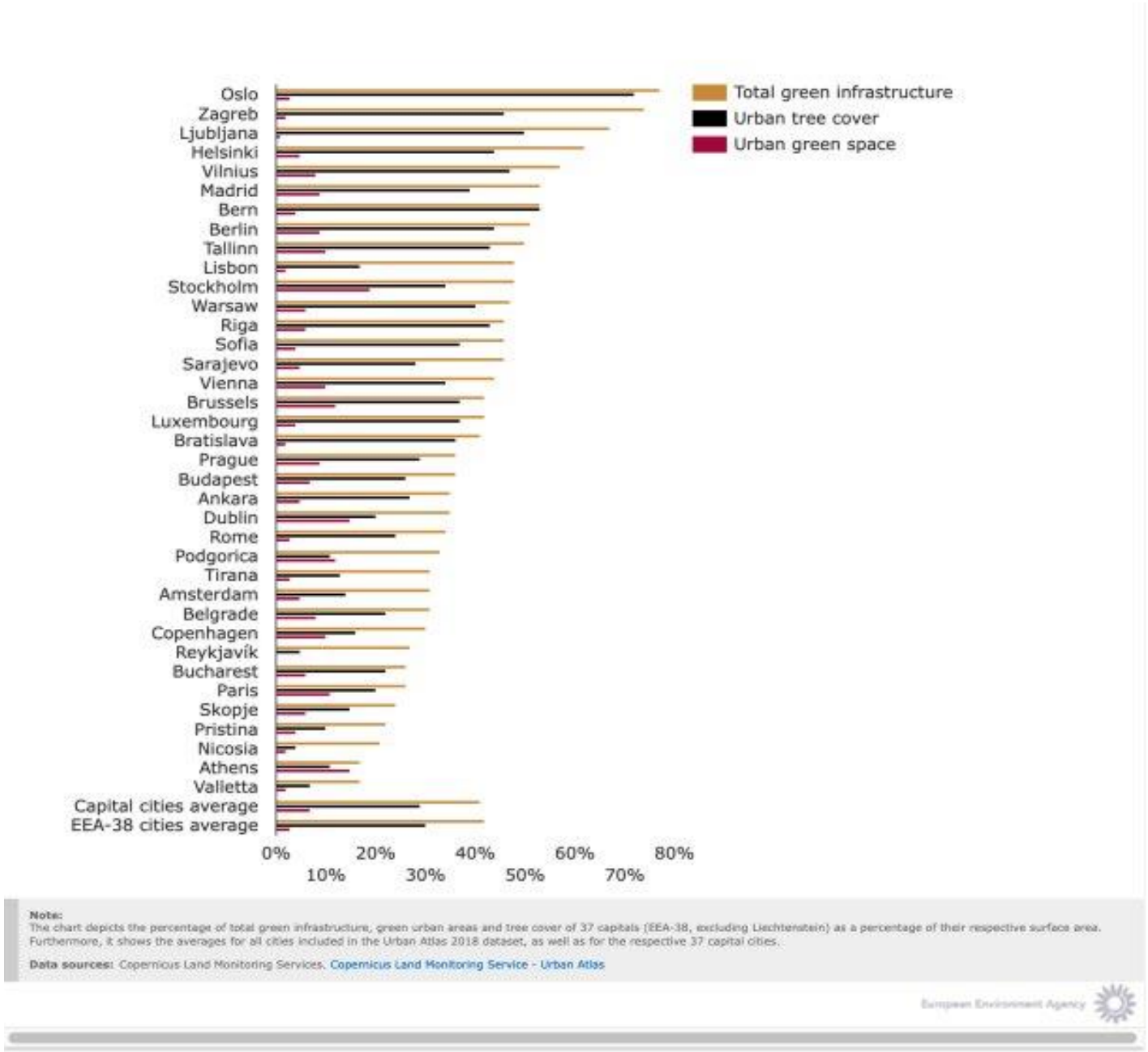
•Publicly accessible green areas make up just 3% of the total city area on average, but cities like Geneva, The Hague, and Pamplona have over 15%.

•Cities in Finland and Norway have the highest tree cover, while Cyprus, Iceland, and Malta have the lowest.

- Finland (71%) and Sweden (67%) have the highest forest coverage by land area, followed by Slovenia (64%), Estonia (58%), and Latvia (56%).

- The least forested countries are the Netherlands (8%), Malta (11%), and Denmark (16%).



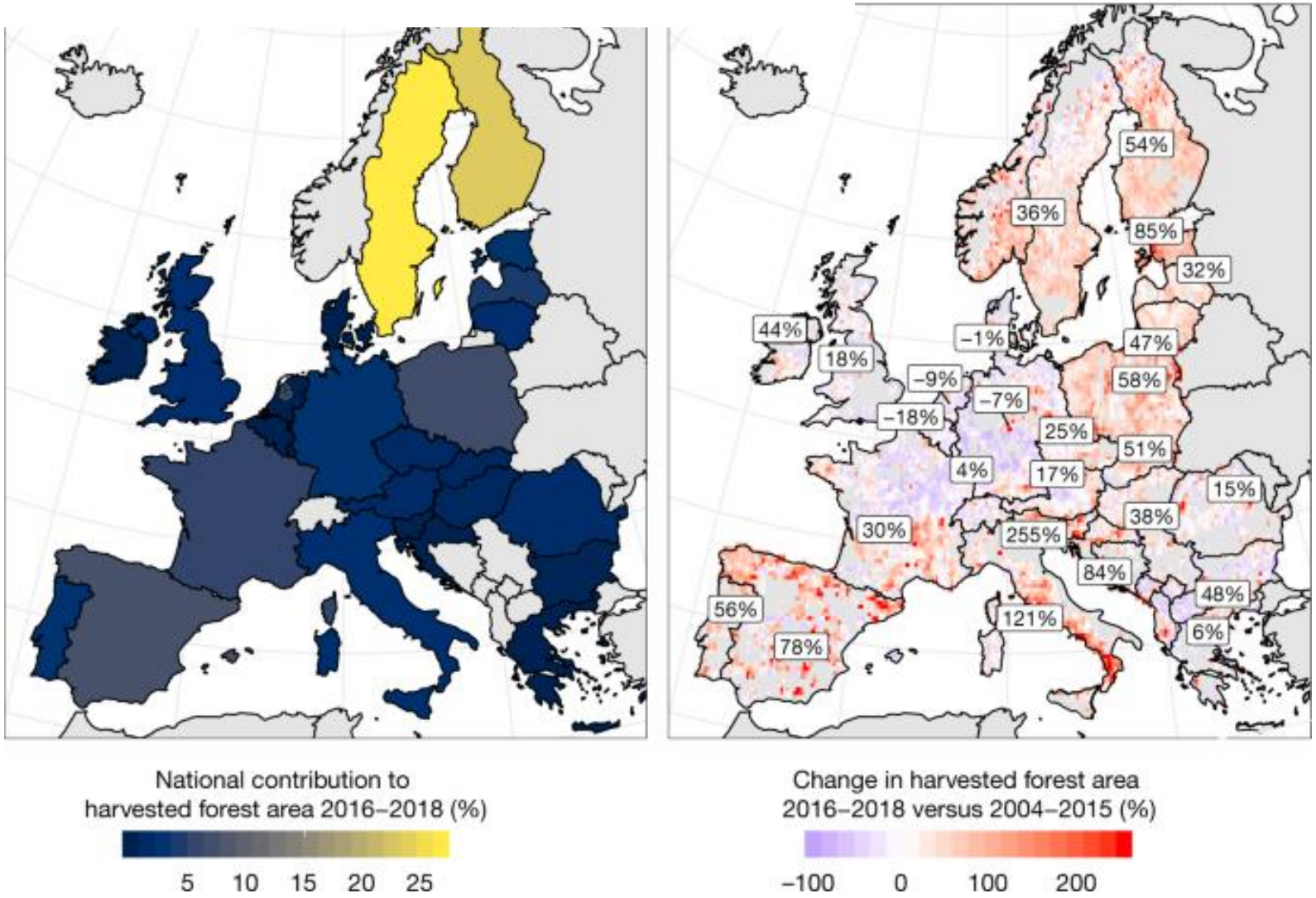


According to European Environment Agency, How green are European capital cities?

1) Oslo 77%
2) Zagreb 74%
3) Ljubljana 67%
4) Helsinki 62%
5) Vilnius 57%

Abrupt increase in harvested forest area over Europe after 2015

Guido Ceccherini ✉, Gregory Duveiller, Giacomo Grassi, Guido Lemoine, Valerio Avitabile, Roberto Pilli & Alessandro Cescatti



ECO-INNOVATION

3 million trees and roof-top gardens: European cities make green pledge

The Biblioteca degli Alberi 'Trees Library' park in Milan - Copyright Claudio Furlan/LaPresse via AP

- Milan aims to plant three million trees by 2030.
- The city is using nature-based solutions to enhance resilience and protect citizens from climate impacts.
- Plans include refreshing neighborhoods with green areas and wate, and regenerating the urban environment sustainably.

Image: PCA-Stream / Time Out

How Paris plans to become Europe's greenest city by 2030

From sweeping car bans to vast urban forests, the French capital is transforming itself for Parisians and the planet

- By 2026, Mayor Hidalgo has pledged to plant over 170,000 trees in Paris.
- By 2030, 50% of the city will be covered by planted areas.
- Building codes have been relaxed to make it easier for residents to plant trees in their neighborhoods.
- Hidalgo emphasized that integrating nature into urban life is key to "building the city around the individual."

Benefits of Urban Trees

https://youtu.be/zarll9bx6FI?si=MS8p8bQMU8cvIYJe

URBAN FORESTRY

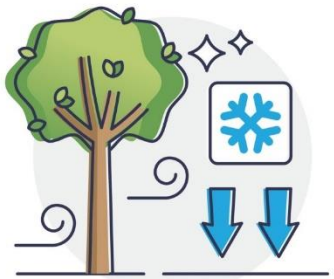
COOLS THE AIR

REGULATES WATER FLOW
AND IMPROVES WATER QUALITY

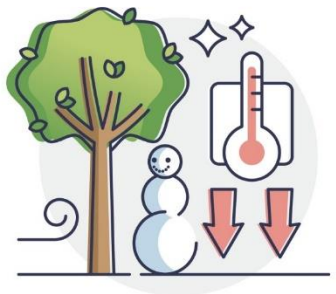
FILTERS FOR URBAN
POLLUTANTS

MITIGATE
CLIMATE CHANGE

IMPROVES PHYSICAL AND
MENTAL HEALTH



REDUCES AIR
CONDITIONING NEEDS



SAVES ENERGY USED
FOR HEATING

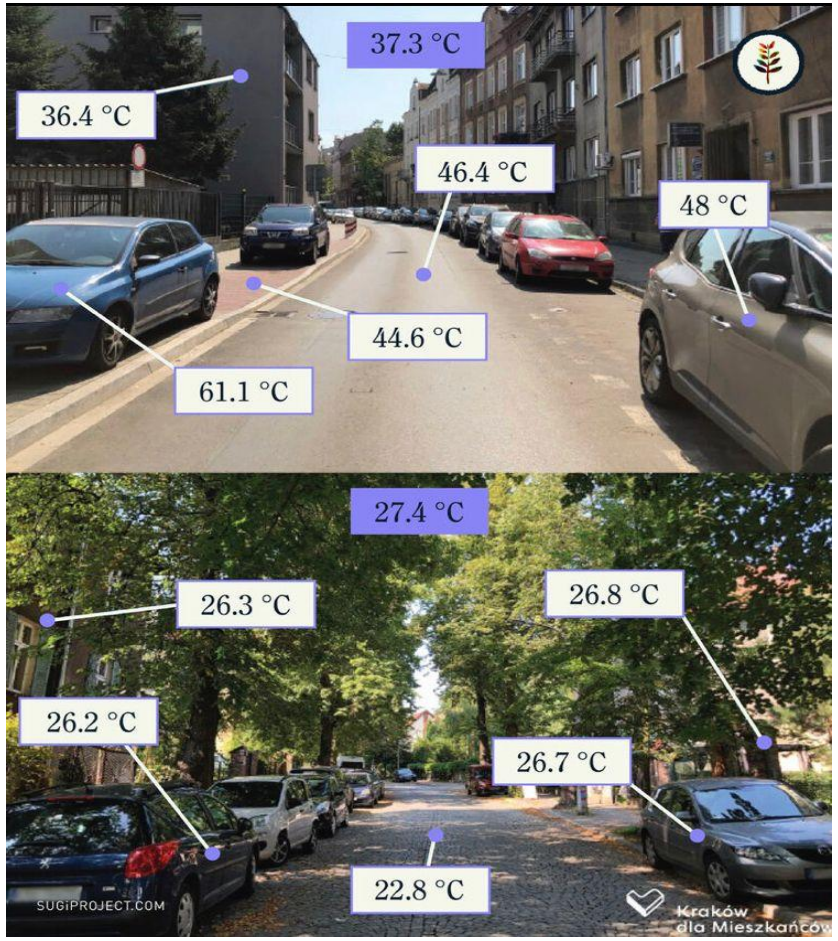
INCREASES URBAN
BIODIVERSITY

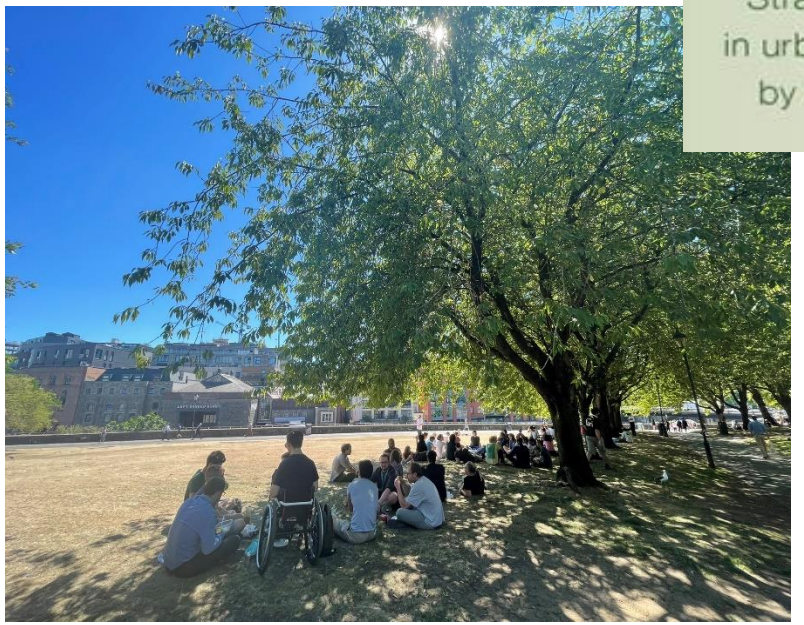
INCREASES PROPERTY
VALUE

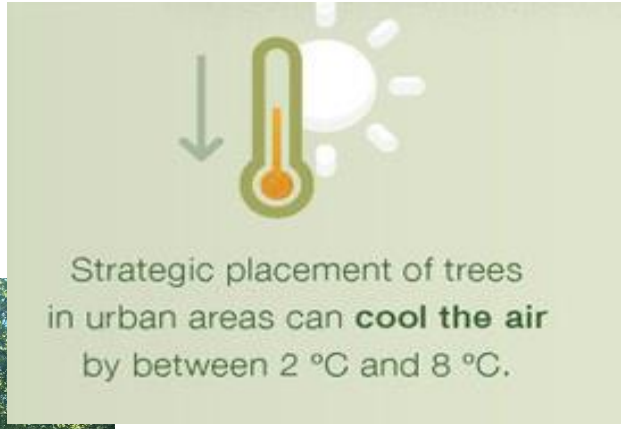
Cool outdoor temperature

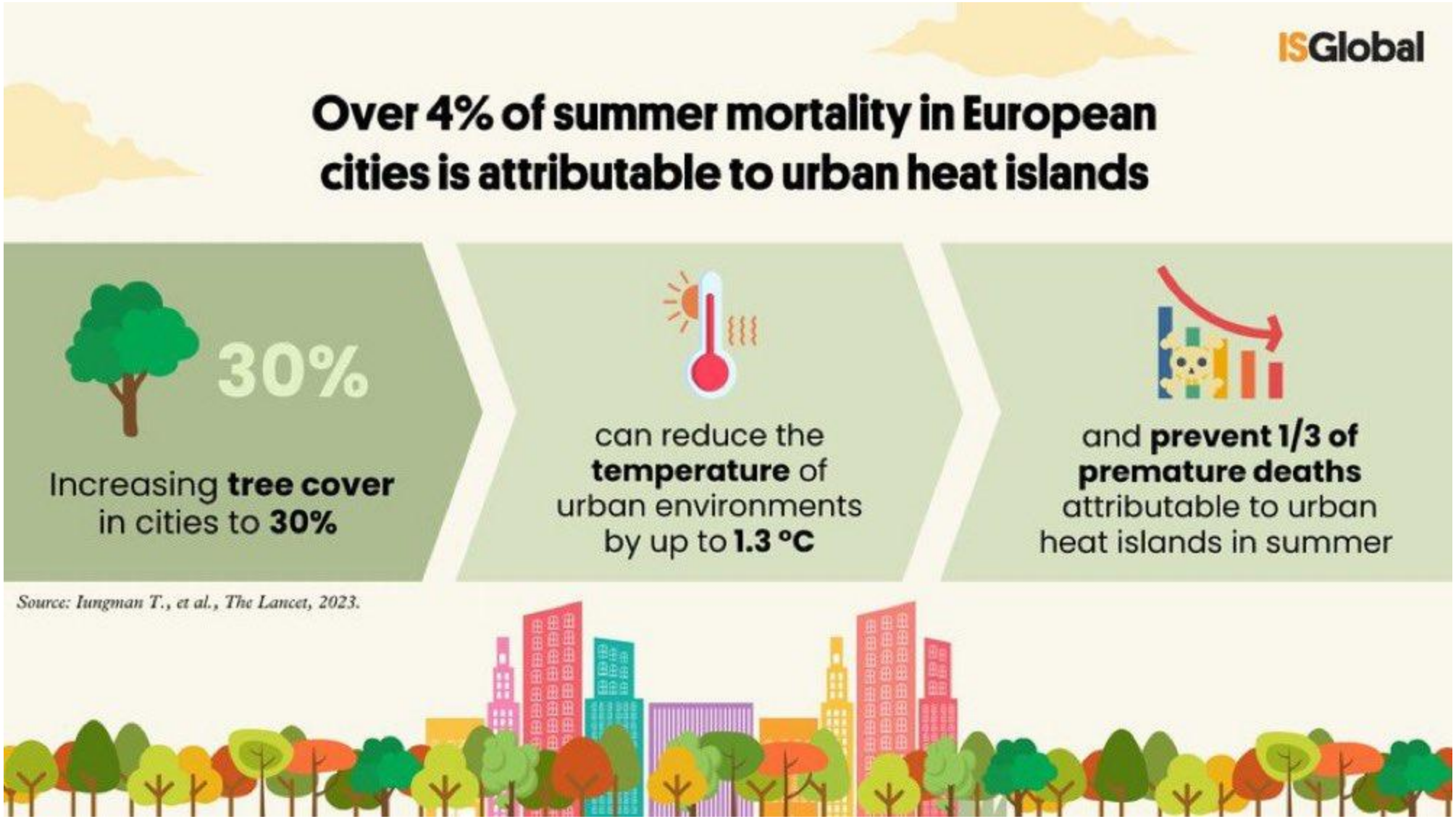
- Trees help cities become more resilient to increasingly severe and frequent heat waves caused by climate change.

- Through evaporation, trees can lower urban temperatures by up to 8°C and offer natural shade.





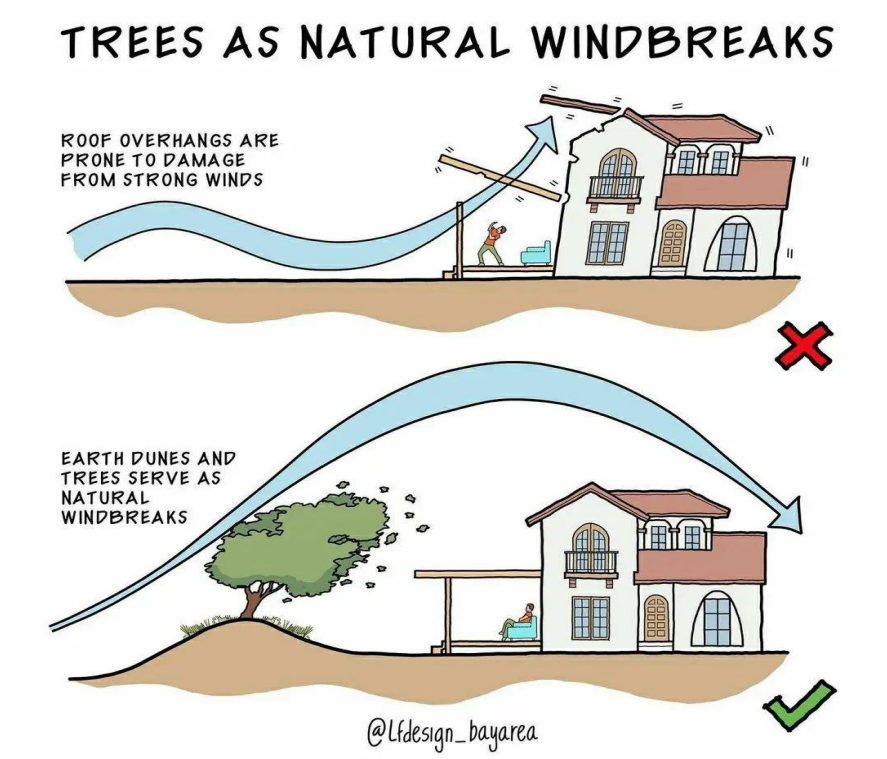


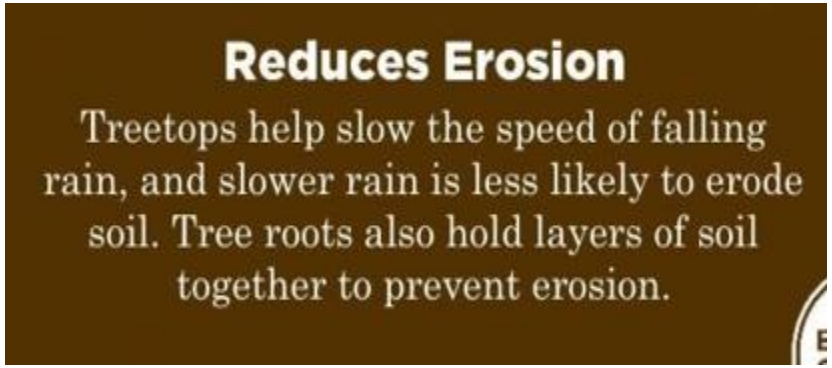


hubs.li/Q01zQ_qp0

Build urban resilience

- Trees and forests make cities more sustainable, healthier, resilient, and livable.
- With climate change increasing extreme weather events like floods, trees in coastal cities can help prevent flooding.
- Trees also mitigate other natural hazards, such as soil erosion and mudslides.

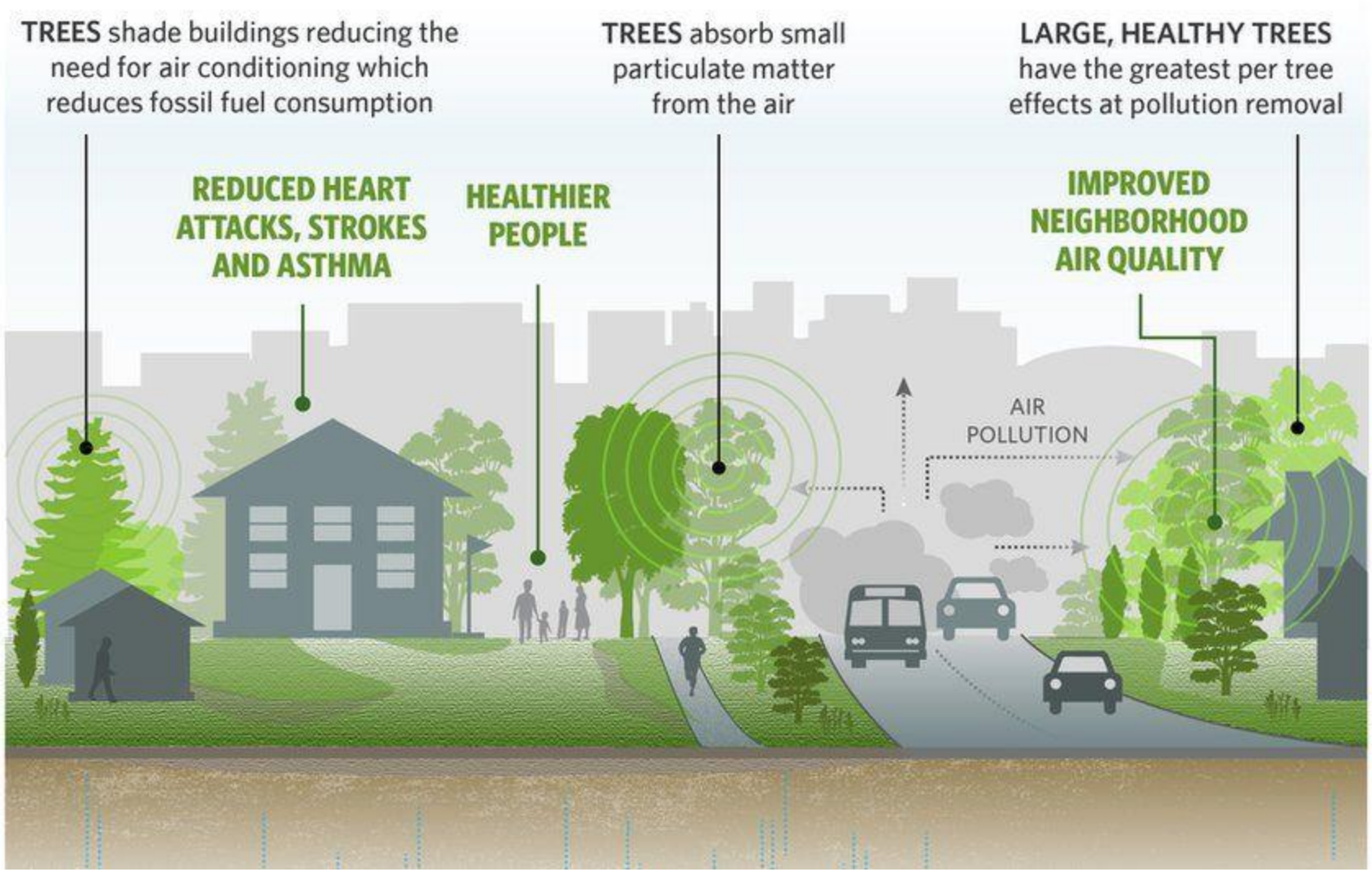




Contribute to cleaner air

- Trees absorb pollutants and filter fine particulates, helping to clean city air.

- Increasing urban tree cover improves air quality and reduces air pollution-related illnesses and deaths.


TREES shade buildings reducing the need for air conditioning which reduces fossil fuel consumption
REDUCED HEART ATTACKS, STROKES AND ASTHMA
HEALTHIER PEOPLE
TREES absorb small particulate matter from the air
AIR POLLUTION
LARGE, HEALTHY TREES have the greatest per tree effects at pollution removal
IMPROVED NEIGHBORHOOD AIR QUALITY

Mitigate the effects of climate change

- A typical tree absorbs about 21 kg of CO2 annually, while mature trees (over 100 years old) sequester up to 150 kg of CO2 annually.

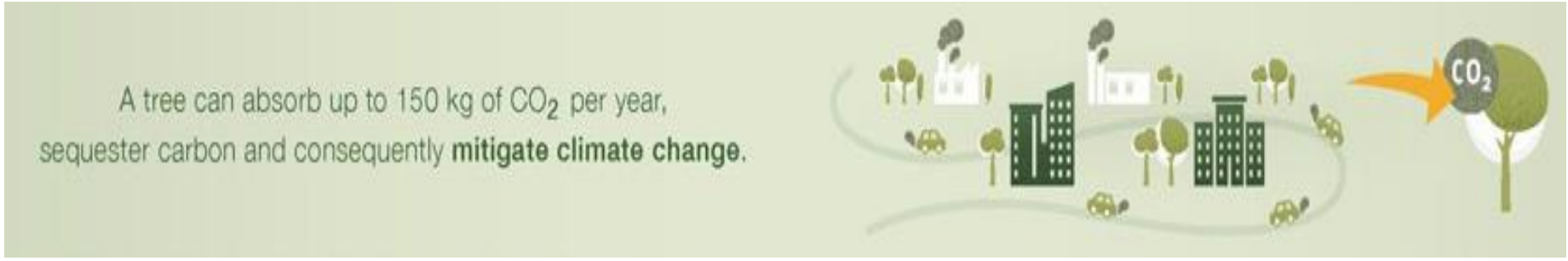
- Strategically planting trees around buildings can lead to significant energy savings.

Carbon Sequestration by Urban Trees

Silvano Fares, Elena Paoletti, Carlo Calfapietra, Teis N. Mikkelsen, Roeland Samson & Didier Le Thiec

Urban Trees for Carbon Sequestration

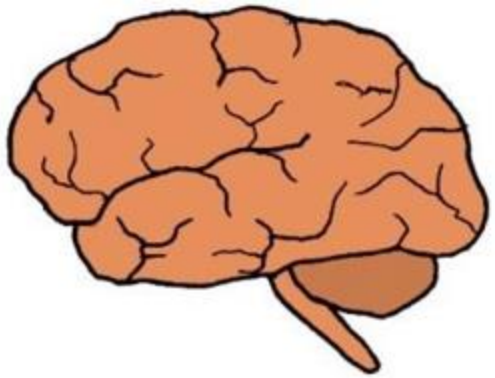
B. C. Scharenbroch



Improve human health and well-being

- Green urban spaces positively impact citizens' physical and mental health.

- They promote physical activity, foster social inclusion, and contribute to more sustainable communities.



Improves Public Health

Forests and other green spaces promote mental and physical health. They help people relax and reduce stress, promote social cohesion, encourage physical activity, and reduce exposure to air pollutants, noise, and excessive heat.

Research | Open Access | Published: 30 March 2023

Neighbourhood socio-economic disadvantage and loneliness: the contribution of green space quantity and quality

Tara Jamalishahni ✉, Gavin Turrell, Sarah Foster, Melanie Davern & Karen Villanueva

BMC Public Health **23**, Article number: 598 (2023) | Cite this article

- Disadvantaged neighborhoods experience significantly higher levels of loneliness.
- These areas typically have less green space and lower-quality green space.
- Loneliness stems from fewer social relationships or a mismatch between perceived and desired social connections.

Green space and mortality in European cities: a health impact assessment study

Evelise Pereira Barboza, Marta Cirach, Sasha Khomenko, Tamara Iungman, Natalie Mueller, Jose Barrera-Gómez, David Rojas-Rueda, Michelle Kondo, Mark Nieuwenhuijsen

Urban Green Space and Its Impact on Human Health

by Michelle C. Kondo [1,*], Jaime M. Fluehr [2], Thomas McKeon [2] and Charles C. Branas [3]

[1] USDA Forest Service, Northern Research Station, Philadelphia, PA 19103, USA
[2] Urban Health Lab, University of Pennsylvania, Philadelphia, PA 19104, USA
[3] Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY 10027, USA
[*] Author to whom correspondence should be addressed.

The association between green space and cause-specific mortality in urban New Zealand: an ecological analysis of green space utility

Elizabeth Richardson, Jamie Pearce, Richard Mitchell, Peter Day & Simon Kingham

BMC Public Health **10**, Article number: 240 (2010) | Cite this article

Create economic benefits

- Urban forestry generates economic benefits as a cost-effective nature-based solution with high investment returns.
- Researchers estimate a return of USD 2.25 for every USD invested in tree planting.
- Integrating trees into landscape planning can significantly increase property values.

URBAN TREES: WORTH MORE THAN THEY COST

G M Moore
Research Associate, Burnley College, University of Melbourne, 500 Yarra Boulevard, Richmond Victoria 3021

Benefits and costs of street trees in Lisbon, Portugal

A.L. Soares [a,*], F.C. Rego [a], E.G. McPherson [b], J.R. Simpson [b], P.J. Peper [b], Q. Xiao [b]

[a] *Center for Applied Ecology "Prof. Baeta Neves", High Institute of Agronomy, Technical University of Lisbon, Tapada da Ajuda, 1349-017 Lisbon, Portugal*
[b] *Center for Urban Forest Research, USDA Forest Service, Pacific Southwest Research Station, Davis, CA, USA*

Table 2
Predominant street tree species in Lisbon.

Species	% of total tree numbers	Total tree numbers
Celtis australis L.	16.1	6629
Tilia L.	15.9	6573
Jacaranda mimosifolia D. Don	10.3	4233
Platanus L.	8.6	3560
Acer negundo L.	6.9	2831
Tipuana tipu (Benth.) Kuntze	4.6	1906
Fraxinus angustifolia Vahl.	2.8	1177
Ligustrum lucidum Aiton fil.	2.8	1177
Koelreuteria paniculata Laxm.	2.4	981
Populus × *canadensis* Moench	2.3	953
Cercis siliquastrum L.	2.1	883
Populus nigra L.	2.0	813
Brachychiton populneum (Schott & Endl.) R. Br.	1.9	784
Populus alba L.	1.8	755
Aesculus hippocastanum L.	1.7	685
Celtis occidentalis L.	1.6	672
Melia azedarach L.	1.4	590
Robinia pseudoacacia L.	1.4	590
Prunus cerasifera Ehrh.	1.3	520
Grevillea robusta A. Cunn. Ex R. Br.	1.0	433
Aesculus × *carnea* Hayne	1.0	422
Catalpa bignonioides Walt.	1.0	421
Prunus avium L.	1.0	421
Other street trees	7.8	3238
Citywide total	100	41,247

Table 3
Annual management costs of all trees.

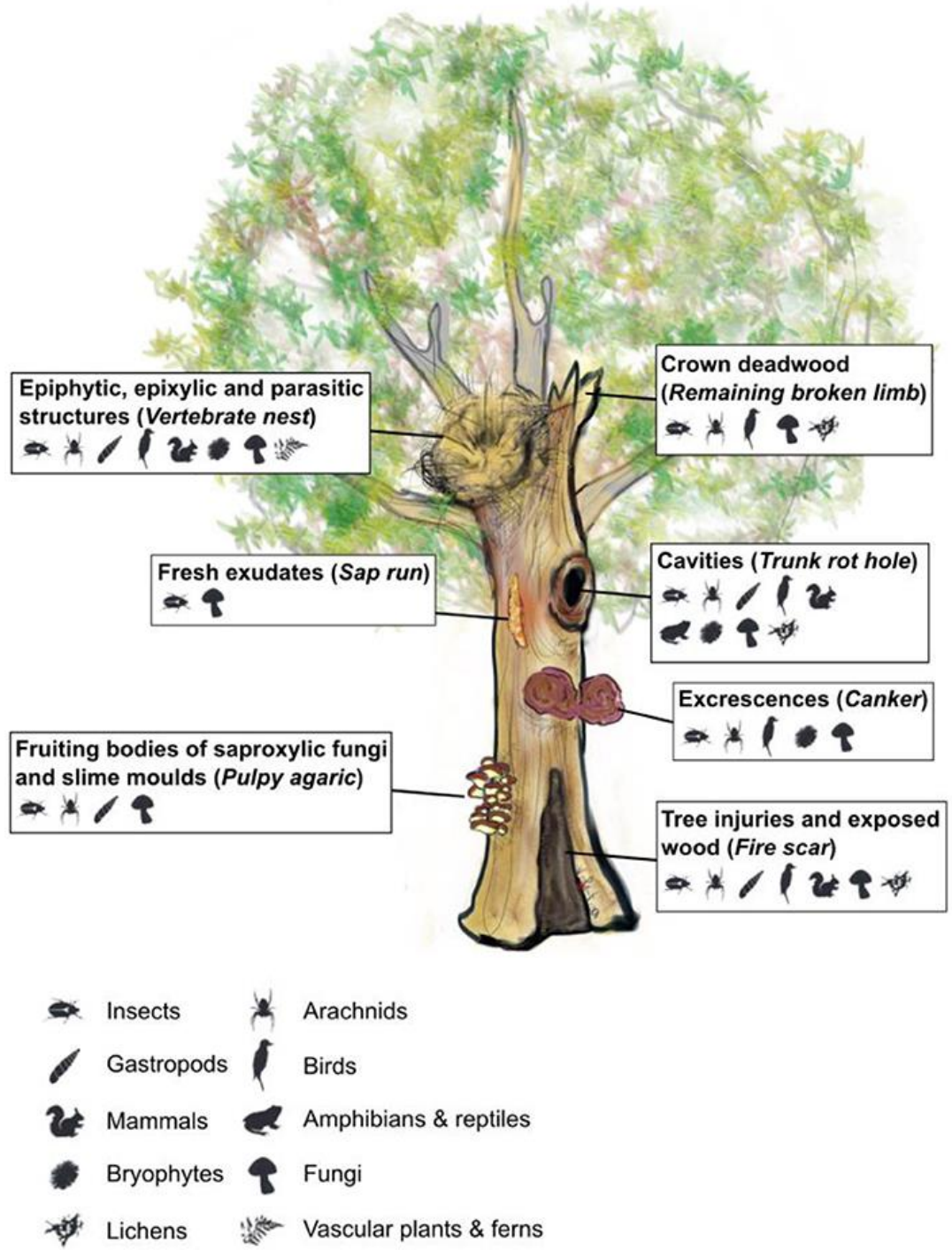
Costs	Total ($)	$/tree
Tree management (TM)	1,216,723	29.50
Administration (*A*)	409,600	9.93
Other costs (*O*)	256,000	6.20
Total costs	1,882,323	45.64

Table 4
Benefits, costs, and net benefits of Lisbon's street trees.

	Lisbon	
	Total ($)	Value/tree ($)
Benefits		
Energy	254,185	6.16
CO_2	13,701	0.33
Air quality	222,738	5.40
Stormwater	1,973,613	47.85
Property value	5,968,542	144.70
Total	8,432,779	204.45
Costs		
Total	1,882,323	45.64
Net benefit	6,550,456	159.00
Benefit–cost ratio	4.48	
Total trees	41,247	

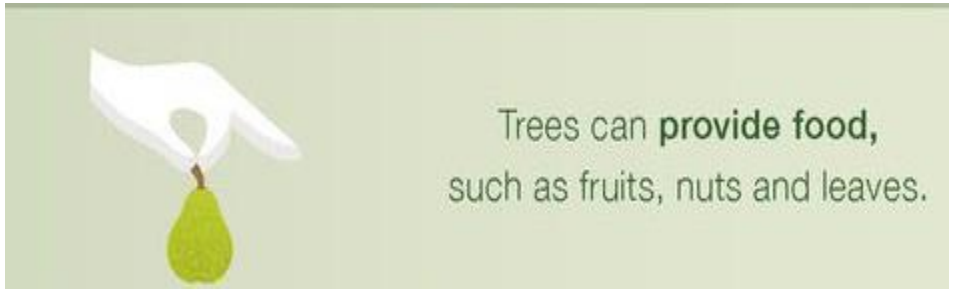
Foster biodiversity

- Trees in urban environments encourage biodiversity by providing essential habitats, food, and protection for various flora and fauna.


Epiphytic, epixylic and parasitic structures (*Vertebrate nest*)
Crown deadwood (*Remaining broken limb*)
Fresh exudates (*Sap run*)
Cavities (*Trunk rot hole*)
Excrescences (*Canker*)
Fruiting bodies of saproxylic fungi and slime moulds (*Pulpy agaric*)
Tree injuries and exposed wood (*Fire scar*)
Insects
Arachnids
Gastropods
Birds
Mammals
Amphibians & reptiles
Bryophytes
Fungi
Lichens
Vascular plants & ferns

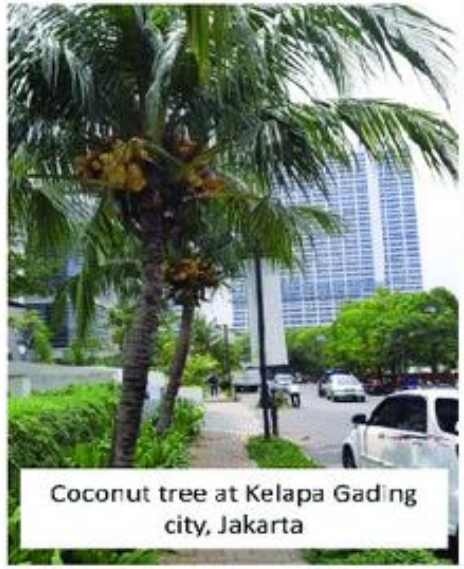
Contribute to food security

- Trees in the city contribute to food security by providing free, easily accessible food, including fruits, nuts, mushrooms, honey, and medicinal plants.



Exploring Fruit Tree Species as Multifunctional Greenery: A Case of Its Distribution in Indonesian Cities

Edi Santosa [1,*], Anas Dinurrohman Susila [1], Winarso Drajad Widodo [1], Nizar Nasrullah [2], Ismi Puji Ruwaida [3] and Rismita Sari [4]



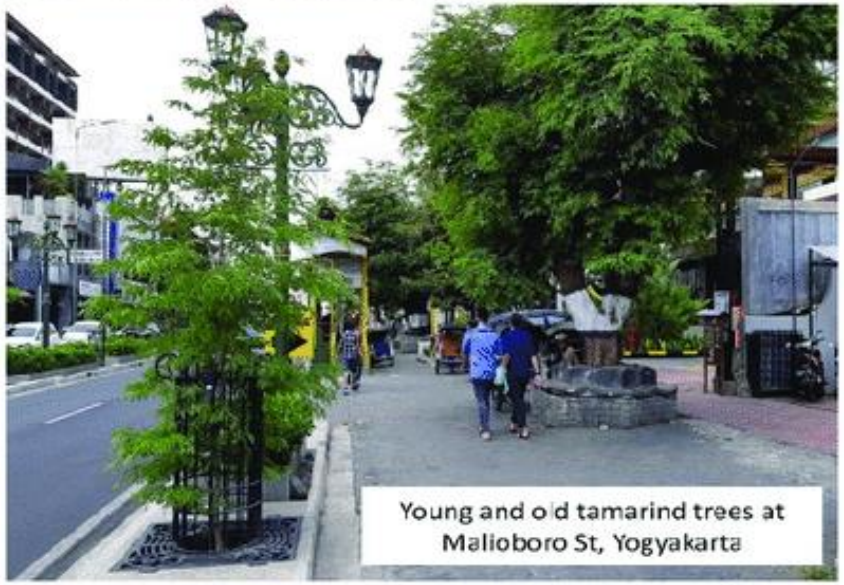
Coconut tree at Kelapa Gading city, Jakarta

Breadfruit (background) and dates tree (foreground) at Gatot Subroto St, Jakarta

Oil palm trees (left side) at Thamrin St, Jakarta

Breadfruit tree at Surabaya

Date tree at Buduran city, Surabaya



Young and old tamarind trees at Malioboro St, Yogyakarta

Buffers Noise

- Greenspace helps mitigate noise in urban areas.
- Planting "noise buffers" of trees and shrubs can reduce noise by 5 to 10 decibels for every 30 meters of woodland width.
- This reduction can make sharp tones appear approximately 50% less intense to the human ear.

Holly spp.

Arborvitae spp.

Cypress spp.

Pittosporum spp.

Organic Material

Organic fertilizer

abc 7 NEWS

Stuck with a fallen tree? This Bay Area company wants to turn it into furniture

By Liz Kreutz via

Wednesday, January 18, 2023 3:51AM

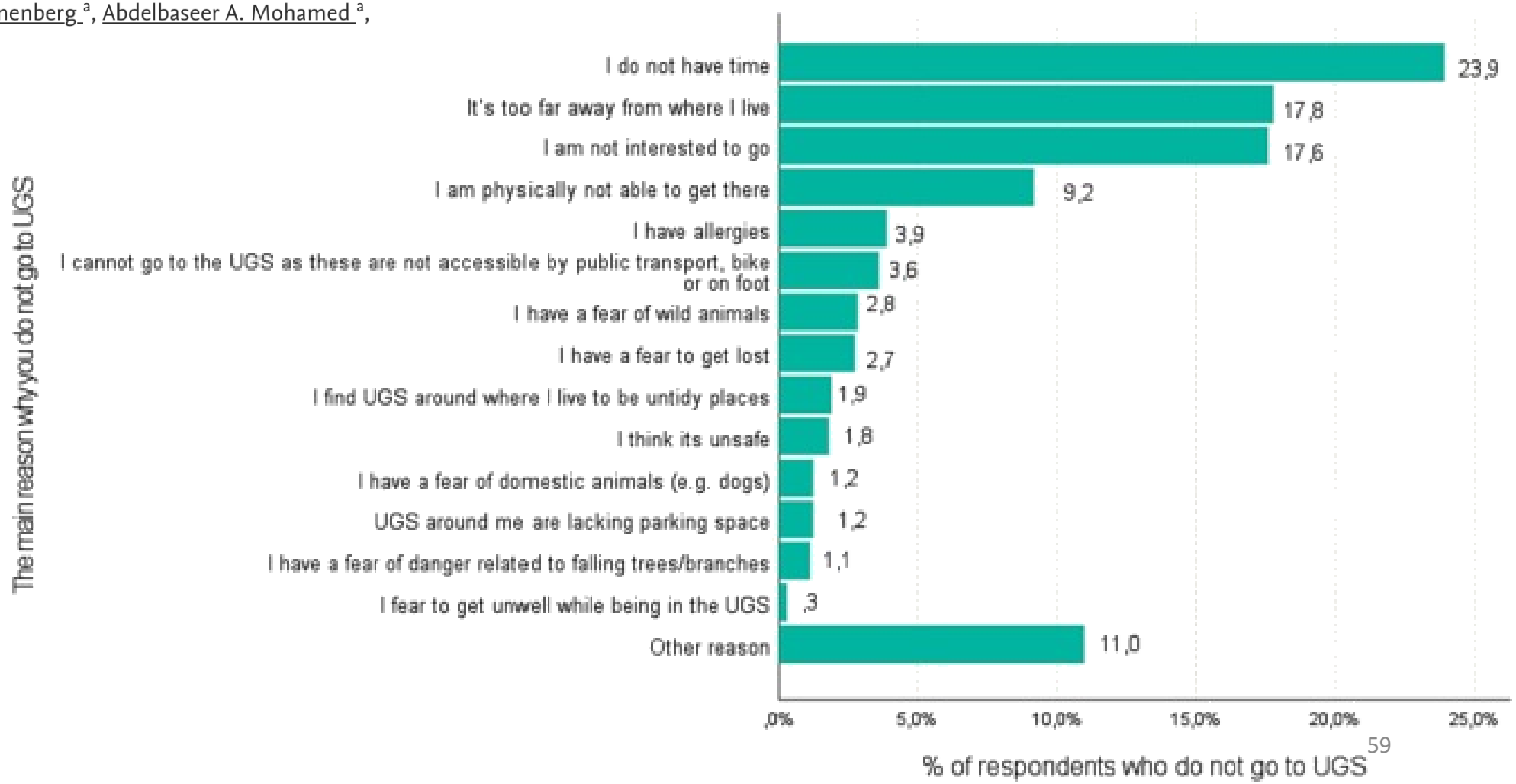
- Humans breathe about 9.5 nly 23% by mass.
- We extract just over a thir kg of oxygen per year.
- This is roughly equivalent

Who does not use urban green spaces and why?

Who does not use urban green spaces and why? Insights from a comparative study of thirty-three European countries

Edyta Łaszkiewicz [a], Jakub Kronenberg [a], Abdelbaseer A. Mohamed [a], Dennis Roitsch [b c], Rik De Vreese [b]

Show more



Social Inequality

- In Europe, lower-income urban neighborhoods typically have less green space than higher-income areas.
- In German cities, neighborhoods with low average income, educational attainment, and high unemployment have smaller green spaces than wealthier, more educated, and employed neighborhoods (Wüstemann and Kalisch, 2016; Schüle et al., 2017).
- Germany's children from lower socio-economic backgrounds have less access to urban green space than those from wealthier families (Rehling et al., 2021).

You build a new beach for the ‘people’, but the ones with no cars, the poor ones, the black and brown ones?...how are they going get to the parks and beaches? Public bus.

The evaluation of the 3-30-300 green space rule and mental health

Mark J. Nieuwenhuijsen [a b c], Payam Dadvand [a b c], Sandra Márquez [a b c], Xavier Bartoll [d e], Evelise Pereira Barboza [a b c], Marta Cirach [a b c], Carme Borrell [b c d e], Wilma L. Zijlema [a b c]

The 3-30-300 Rule for Urban Forestry and Greener Cities

By Cecil Konijnendijk

- Green spaces in lower socio-economic neighborhoods are often of lower quality, reducing their motivation (Csomós et al., 2020; de Vries et al., 2020; Vierikko et al., 2020).

- In socio-economically disadvantaged neighborhoods of Helsinki, Berlin, Bucharest, and Lisbon, urban parks have less diverse facilities and vegetation compared to wealthier areas (Vierikko et al., 2020).

- In the Netherlands, green areas in poorer neighborhoods are less aesthetically pleasing than those in wealthier neighborhoods.

1. Macks Street play area, Bermondsey

2. Bellingham Play Park, Lewisham

3. Grove Park Library Garden, Lewisham

https://londonplay.org.uk/our_news/where-is-londons-saddest-playground/

Gender

- Gender affects green space usage, with studies from Sweden indicating that women value green areas more than men.

- However, women often feel less safe in some green spaces, which can deter them from using them (Fredman et al., 2019; Ode Sang et al., 2020).

Housing Market

- The housing market influences green space distribution in central and eastern European cities.
- Properties in areas with more green space are typically more expensive, leading to neighborhood gentrification (Kronenberg et al., 2020).
- This trend is observed in Poland (Trojanek et al., 2018) and in Debrecen, Hungary, where new upscale neighborhoods have more green spacethano older, lower-income housing estates (Csomós et al., 2020).

Who Benefits from Public Green Space?

The High Line in New York City shows that the answer can be the wealthy, who flock to live nearby, driving up property values and driving out long-term, low-income residents

By Mallory Richards on September 19, 2020

"Creating green spaces or infrastructures can have socially negative effects. The paradox is that improving a depressed area with green infrastructure can make it attractive to the middle and upper classes, leading to higher rents. As a result, original residents may be forced to leave their neighborhood, a phenomenon known as 'green gentrification.'"


RIP
DEUTSCHE
WOHNEN
KEINE
PROFITE
auf
MEINER
MIETE!!


Now that the neighborhood is nice, why do I have to move?


PRICE $7.99
THE NEW YORKER
AUG. 31, 2015
TOMINE


CUIDADO
QUE NOS ECHAN
DEL BARRIO
WE'RE NOT
MOVING OUT


GENTRIFICATION IN PROGRESS

Open Access Article

Gentrification through Green Regeneration? Analyzing the Interaction between Inner-City Green Space Development and Neighborhood Change in the Context of Regrowth: The Case of Lene-Voigt-Park in Leipzig, Eastern Germany

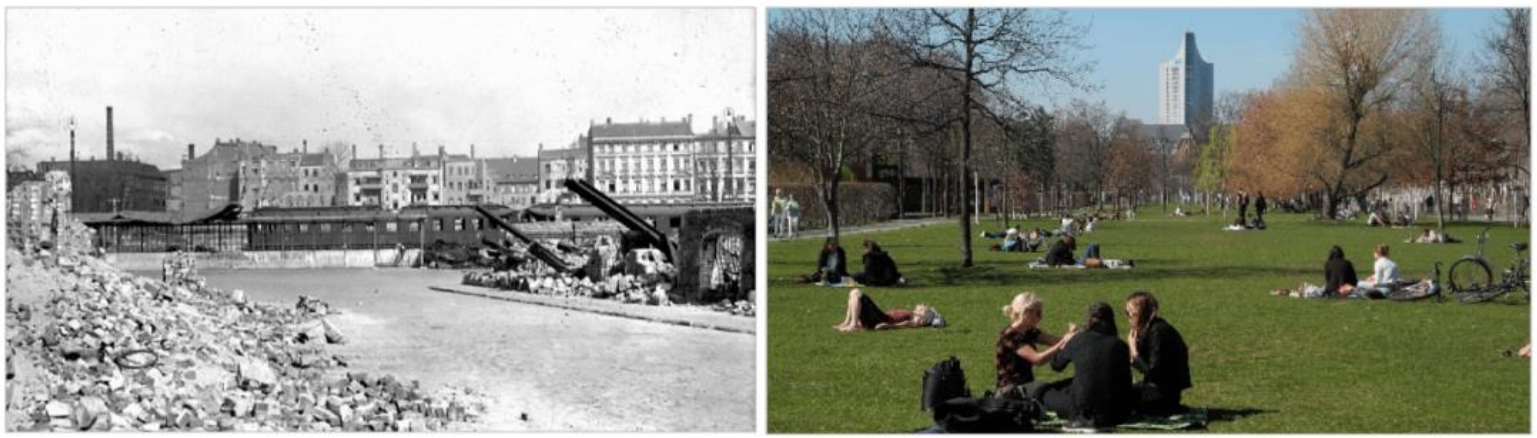
by Lena Ali [1,*], Annegret Haase [2] and Stefan Heiland [1]

[1] TU Berlin, Department of Landscape Planning and Development, 10623 Berlin, Germany

[2] Helmholtz Centre for Environmental Research-UFZ, Department of Urban and Environmental Sociology, 04318 Leipzig, Germany

* Author to whom correspondence should be addressed.

Figure 2. (**a**) The railway industrial area in Reudnitz [72] has been transformed into (**b**) the Lene-Voigt-Park (LVP) (Photo: Annegret Haase).



(a) (b)

- Between 2000 and 2018, the average age of residents decreased from 41 to 37 years, and the unemployment rate fell from 14.3% to 4.8%.

- Factors attracting students to the area include:
  - Previously, moderate rents and the park served as a social hub.
  - As students move in, they bring their friends, leading to community changes.

- According to Capital magazine, the marketing period for apartments in Reudnitz-Thonberg has shortened, with listings often online for only a few days.

- Newly renovated and newly built apartments are driving up average prices in the district.

Central Park: Greatest urban park in the world. They started building it when there wasn't even a city past 57th St. They kicked out farmers and, tenant squatters, sheep herders out of muddy fields and filth. They moved some trees. And people protested the loss of goddam *'countryside.'* But if one man hadn't been able to SEE AHEAD of what we'd need, this city would be unlivable today, wouldn't it? Yes, it would. People don't even know Fred Olmsted's name but should thank him daily. I do. (Motherless Brooklyn)

Immigration/ Ethnicity

- Communities with high proportions of immigrants and ethnic minorities often have less access to high-quality green and blue spaces compared to those with fewer immigrants and minorities (WHO, 2017a; De Sousa Silva et al., 2018).

- In Oslo, immigrants have less access to green areas for outdoor recreation (Suárez et al., 2020).

- In Helsinki, immigrants live farther from blue spaces than non-immigrant residents (Viinikka et al., 2018).

- In Berlin, immigrants are more likely to reside in higher-density neighborhoods with limited green space access (Kabisch and Haase, 2014).

Aging and Disability

Accessibility in Public Open Spaces for People with Disability: A Case of Patan, Nepal

Sebi Nakarmi & Sudha Shrestha

Urban Parks as Perceived by City Residents with Mobility Difficulties: A Qualitative Study with In-Depth Interviews

Magdalena Wojnowska-Heciak,* Marzena Suchocka,* Magdalena Błaszczyk, and Magdalena Muszyńska

Too Old for Recreation? How Friendly Are Urban Parks for Elderly People?

by Diana Andreea Onose, Ioan Cristian Iojă, Mihai Răzvan Nițǎ, Gabriel Ovidiu Vânău * and Ana Maria Popa

Falling branches and trees

The epidemiology of injuries related to falling trees and tree branches

Teagan L Way [1], Zsolt J Balogh [1 2]

Affiliations + expand

PMID: 35068037 PMCID: PMC9303233 DOI: 10.1111/ans.17481

Preventing death and serious injury from falling trees and branches.

Andrew Brookes

La Trobe University, Bendigo

LIABILITY FOR DEATH OR INJURY CAUSED BY FALLING TREES OR BRANCHES: A REVIEW OF THE PRESENT POSITION UNDER ENGLISH LAW IN RELATION TO TREE SAFETY INSPECTION

Julian Forbes-Laird

Pages 233-241 | Published online: 27 Mar 2012

Allergy

Allergenic fungal spores in the air of urban parks

Idalia Kasprzyk · Agnieszka Grinn-Gofroń · Agata Ćwik · Katarzyna Kluska · Paloma Cariñanos · Tomasz Wójcik

Allergenic risk assessment of urban parks: Towards a standard index

Chiara Suanno [a], Iris Aloisi [a], Luigi Parrotta [a], Delia Fernández-González [b c], Stefano Del Duca [a]

Show more

The effect of residential urban greenness on allergic respiratory diseases in youth: A narrative review

Giuliana Ferrante[a], Federica Asta[b], Giovanna Cilluffo[c]*, Manuela De Sario[b], Paola Michelozzi[b] and Stefania La Grutta[c]

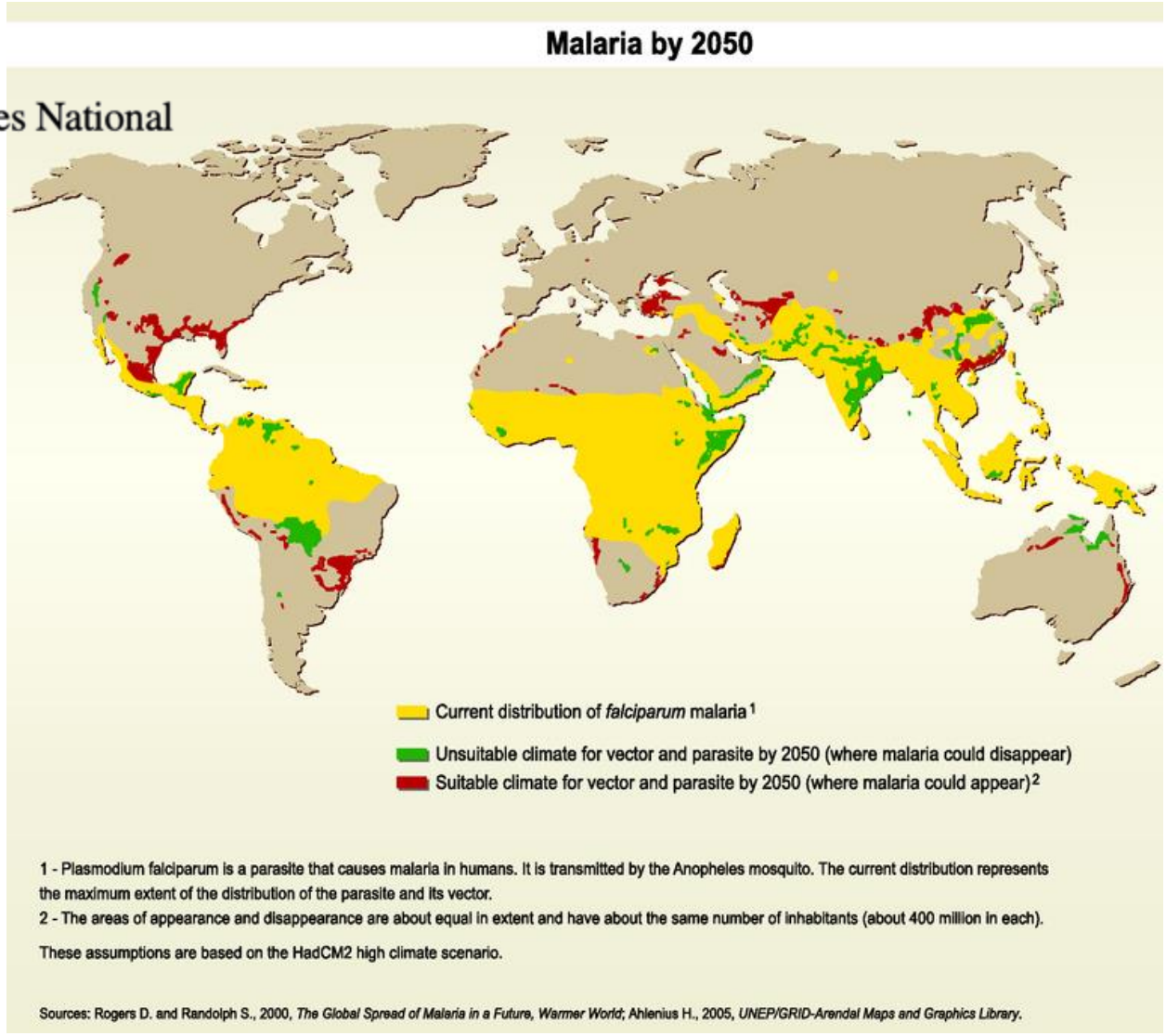
Vector-borne diseases

Vector-borne diseases, climate change and healthy urban living: Next steps

K Mathieu[1] and M Karmali[1,*]

What is the Risk for Exposure to Vector-Borne Pathogens in United States National Parks?

LARS EISEN,[1] DAVID WONG,[2] VICTORIA SHELUS,[3,4] and REBECCA J. EISEN[5]



Darkness

PARK IN THE DARK: HOW THE PARK BECOMES SCARY AT NIGHT AND WHAT WE CAN DO ABOUT IT

by Kristen Kaufman, Sana Sherif, Mira Shetty, Morad Sovari, Sonakshi Srivastava (MSc/MPhil in Nature, Society and Environmental Governance)

"In the evening, I don't walk in the park": The interplay between street lighting and greenery in perceived safety

Johan Rahm[1] · Catharina Sternudd[1] · Maria Johansson[1]

Survey shines a light on safety fears in Glasgow parks after dark

18th November 2022

Legends of ghostly hauntings echo in Ohio hills

bobbing along de-
lroad tracks... the
young girl pressed
window pane... the
a man walking the
a crumbling iron

e only a few of the
sightings of ghosts
state parks, as told
lists with the Ohio
nt of Natural Re-
ivision of Parks and

egends of ghostly
have risen from the
utheast Ohio.
ost of Moonville" is
y popular tale told
all deserted town in
ate Forest. Today,
mains of Moonville
railroad trestle and

0 years ago Moon-
one of many small
outheast Ohio which
ound a booming iron
furnace industry.

"There was a railroad track that ran through the town," said Ron Mills. "Each night a railroad man would stand along the tracks with his lantern to signal the train. One morning the man was found lying bloodless along the tracks. There were no clues to his death."

Since the mysterious death, Mills reports that on certain foggy nights passersby have seen a lantern eerily bobbing along the deserted railroad track.

There are many legends that surround the old iron furnace era of southeast Ohio. One of these persistent legends involves the old remains of the iron furnace at Lake Hope State Park.

According to Larry Henry, the furnace had to be guarded day and night for fear someone would fall into the furnace's hot, bubbling contents. A watchman was posted to walk the ledge of the furnace.

"One stormy night around 8 p.m. as the watchman walked along the furnace's edge with his lantern, lightning struck and he fell into the hot molten iron," said Henry.

The iron furnace has since closed and the town is gone. The crumbling old furnace now sits along the lake at Lake Hope State Park.

Yet, Henry reports that under similar stormy conditions, hikers have reported seeing the glow of a lantern and the outline of a man walking about the furnace ledge.

In Hocking Hills State Park there survives an old legend about "Old Man Rowe" — a refugee of the Civil War era who sought refuge in Old Man's Cave. The hermit was rumored to have hidden gold inside the cave.

"When Old Man Rowe died his body seemed to disappear," said Nancy Stranahan. "The hermit's corpse and bones were never found inside the rock cave — and neither was his gold."

According to Stranahan, the ghost of Old Man Rowe can still be seen roaming the hills of the park and his shadow can be seen lurking inside the rock cave.

Hikers following the Sprucevale Trail in Beaver Creek State Park in Northeast Ohio will find the site of a long-abandoned ghost town.

During the mid-1800s, Sprucevale was once a prospering village with a post office, general store, woolen mill, blacksmith shop and 17 houses. Today all that remains are the three walls of Hambelton's stone grist mill and the legend that surrounds the mill.

"For almost a century the ghost of Esther Hale, a Quaker preacher dedicated to getting people to follow her down the path to salvation, has haunted the old grist mill," said Nancy Hollenbeck. "Her spirit is believed to linger near her old home and each year her ghost is said to appear dressed in white. She is seen writing her old Quaker religious message on the wall of the old mill. She then leads the way into the mill and disappears."

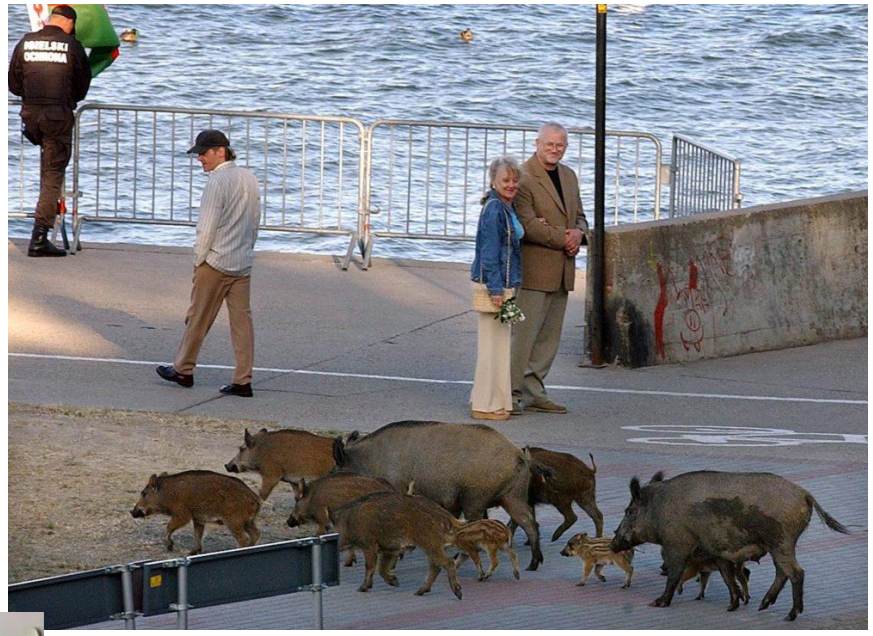
Perhaps the youngest of Ohio state park ghosts is reported to haunt the Pleasant Valley area surrounding Malabar Farm State Park in Northcentral Ohio — Ceely Rose.

Near the main entrance of Louis Bromfield's Malabar home stands a white frame house. The now vacant home, owned by the Rose family, was the site of a very mysterious

Urban Wildlife

Public perceptions and attitudes toward urban wildlife encounters – A decade of change

Sayantani M. Basak [a], Md. Sarwar Hossain [b], Declan T. O'Mahony [c], Henryk Okarma [d], Elżbieta Widera [a], Izabela A. Wierzbowska [a]



The Effects of Urbanization on Fear in Wildlife

Sarah Spier
University of Nebraska-Lincoln

Joseph J. Fontaine
University of Nebraska-Lincoln, jfontaine2@unl.edu

The evolutionary consequences of human–wildlife conflict in cities

Christopher J. Schell, [1] Lauren A. Stanton, [2,3] Julie K. Young, [4] Lisa M. Angeloni, [5] Joanna E. Lambert, [6] Stewart W. Breck, [7,8] and Maureen H. Murray [9]

Tourism

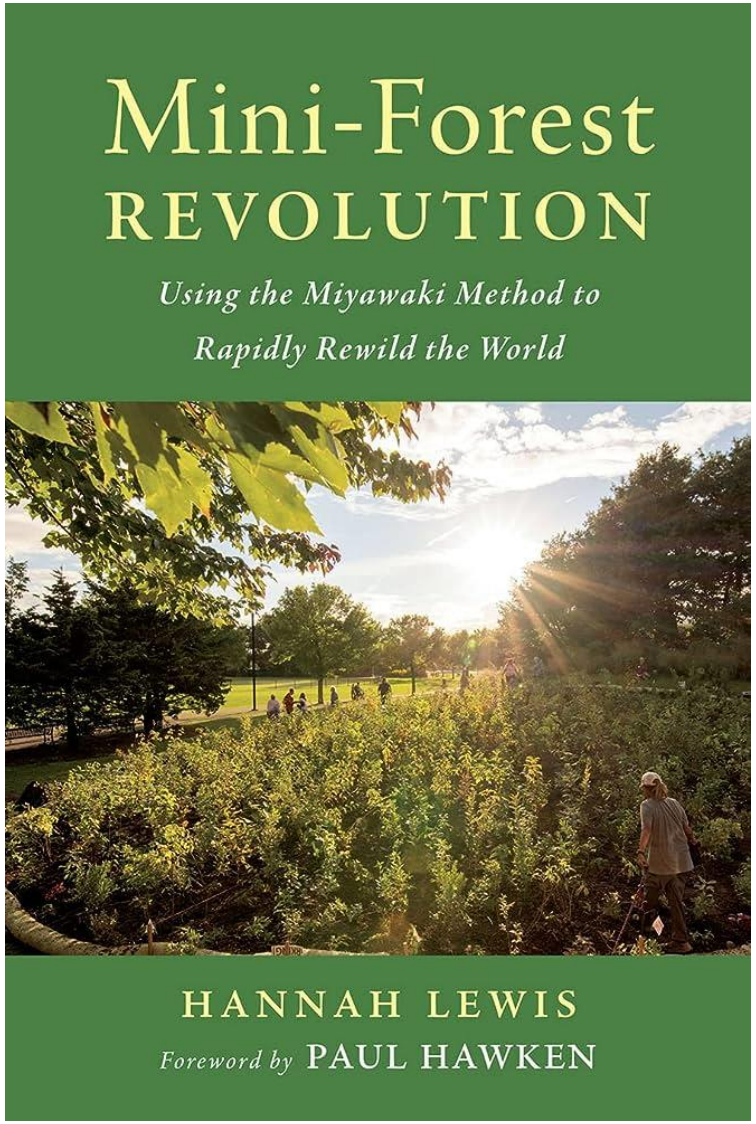
Town shuts down road to keep out ‘poorly behaved’ tourists and influencers

Residents are fighting back after visitors ‘damaged roads, trampled gardens and defecated on private property’

Vermont is shutting down one of its roads for three weeks due to a surge in tourists and influencers seeking fall content.

"Leafers" are a group of disrespectful, loud tourists who invade Quahog, Rhode Island every fall to watch the leaves change colors. — @Family Guy

Technologic and effective plantation alternatives



Original Paper | Published: 17 June 2010

Effectiveness of the Miyawaki method in Mediterranean forest restoration programs

Bartolomeo Schirone, Antonello Salis & Federico Vessella

Landscape and Ecological Engineering **7**, 81–92 (2011) | Cite this article

3430 Accesses | **18** Citations | **82** Altmetric | Metrics

Restoration of native forests from Japan to Malaysia

Akira Miyawaki

Chapter

296 Accesses | **9** Citations | **15** Altmetric

Part of the Tasks for vegetation science book series (TAVS,volume 30)

AN OVERVIEW OF MIYAWAKI FOREST CONCEPT: THE IMPLEMENTATION, PROS AND CONS

Taras Koziupa

Faculty of Electrical Power Engineering and Automatics, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

Miyawaki Method

- Japanese botanist and plant ecology expert specializing in seeds and natural forests.
- Miyawaki concluded that natural Japanese temperate forests should be composed of deciduous trees, not conifers.
- Deciduous trees have survived around temples and tombs, protected by religious and cultural practices.
- Conifers, introduced species, became dominant in forests but were naturally present only at high altitudes and extreme environments.
- Conifers were planted for centuries to produce timber and have since acclimatized.

Prof Akira Miyawaki

- Planting trees (only native species) as close as possible.
- Plants support each other in growing and block sunlight from reaching the ground to prevent the growth of weeds.
- Miyawaki’s Method of tree plantation is 30 times denser, and plant growth is ten times faster than usual.

https://www.youtube.com/watch?v=y9c_Zlmqcgw


OCTOBRE 2017
AVRIL 2020
URBAN FORESTS


March 2021
Green Yatra
July 2022
Green Yatra
16 Month's Old Miyawaki Forest in an Old Dumping Yard, Navi Mumbai


PUKAAR FOUNDATION
July 2019
May 2020

Liquid Tree

- The device holds 600 liters of water and microalgae, which absorb CO2 and produce oxygen via photosynthesis.
- Microalgae are 10 to 50 times more effective at sequestering CO2 compared to regular trees, making them ideal for urban areas with limited space.
- The device has the CO2-binding capacity equivalent to two 10-year-old trees or 200 square meters of lawn.

AIR MONITORING

Could Liquid Trees Be a Game-Changer for Urban Air Pollution?

- The LIQUID 3 team aims to complement, not replace, forest or tree-planting efforts by utilizing the system in urban areas where tree planting isn't feasible.

- Unlike trees, which may struggle in heavily polluted environments, algae thrive and are unaffected by high pollution levels.

https://youtu.be/IErhEMR-e0k?si=Q63XEjhjJ9ghBmml

Mechanical Tree

- Mechanical tree” is 1,000 times more efficient at capturing carbon from the atmosphere than natural trees are.

- The MechanicalTree™ now stands 10 meters high on the Arizona State University campus in the U.S.

Forests of mechanical trees could be built to 'soak up carbon dioxide' and help stave off climate change, scientists claim

- **Arizona State University researchers have developed special mechanical trees**
- **These devices are vertical towers with rows of discs that capture carbon dioxide**
- **The carbon is pushed down into a closed environment where it can be stored**
- **The team behind the development plan to build three mechanical tree farms**

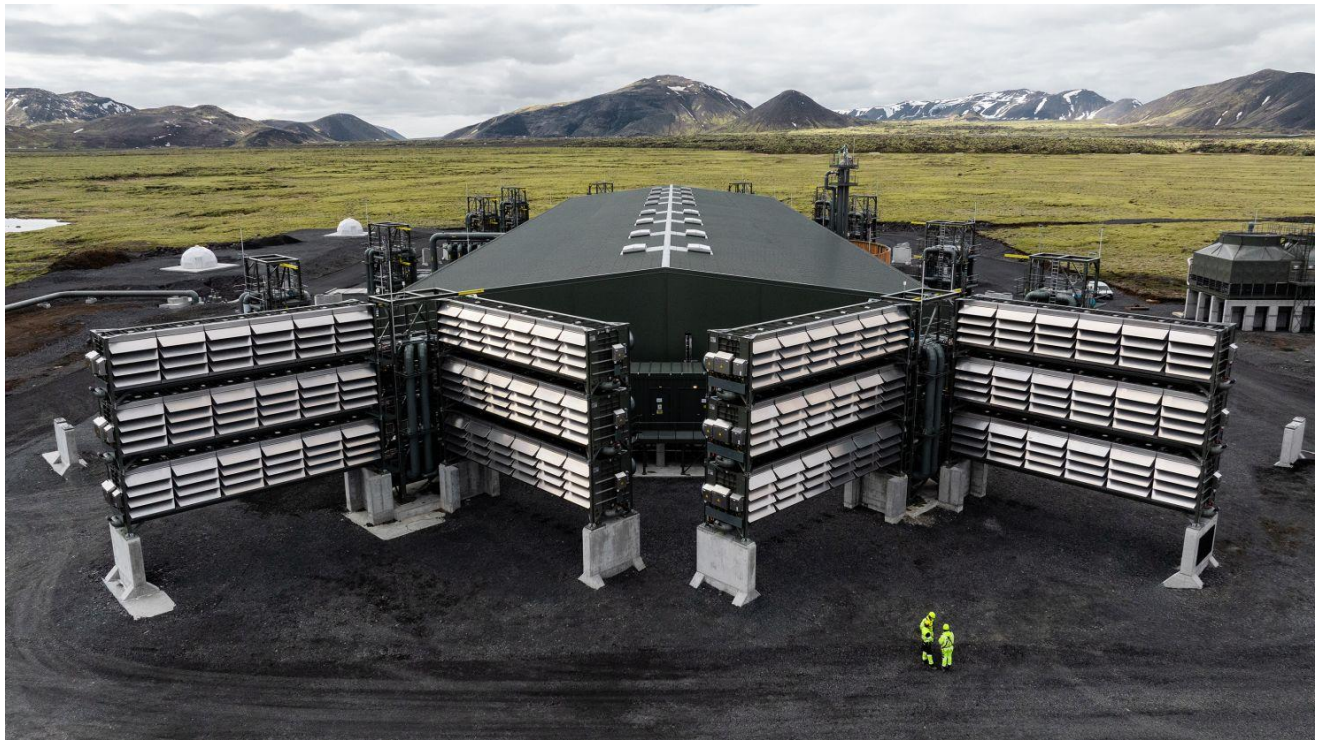
By RYAN MORRISON FOR MAILONLINE
PUBLISHED: 20:57 BST, 25 January 2022 | **UPDATED:** 21:13 BST, 25 January 2022

- The mechanical trees resemble giant stacks of vinyl records, each disk coated with CO2-trapping material.
- As air passes through, CO2 is captured by the disks.
- Once full, the disks sink into a barrel where steam releases the captured CO2 stored in the barrel.
- Plans are in place to scale the technology with direct air-capture carbon farms, capable of capturing around 1,000 tons of CO2 per day.

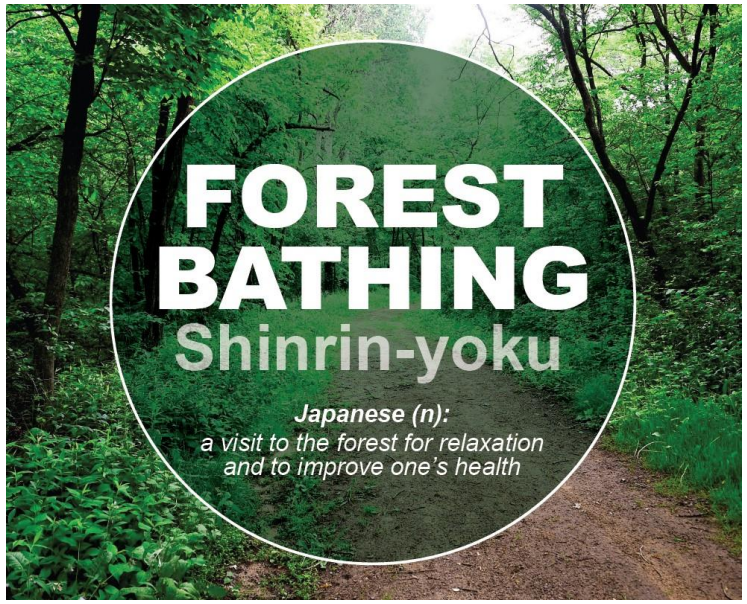
https://youtu.be/6AG0edLnG2U?si=grpbH_xTghn3Ag1H

Mammoth, the world’s largest vacuum

- Climeworks opened the world's largest direct air capture (DAC) plant, Mammoth, near Reykjavik, Iceland. It is designed to remove 36,000 tons of CO2 annually.
- DAC technology captures CO2 from the air and stores it underground, transforming it into stone (in partnership with Carbfix).
- DAC is seen as a potential solution for carbon removal, but it's criticized for being expensive and energy-intensive.
- Current costs are around $1,000 per ton of CO2, with the aim of reducing them to $100 by 2050.



NATUREACH



- The main goal of the project is to make nature accessible to all through specially designed virtual nature experiences.

- There are groups in society who, for various reasons, cannot get out into nature.

Urban Forestry

Editorial office
Bayerische Landesanstalt für Wald und Forstwirtschaft

Urban Forestry – A chance for forest management

The populace is moving into the cities at an increased pace and city parks and green areas offer a pleasant climate. Urban forestry provides an opportunity to express the importance of trees, forests and forestry to the general public.

Urban Forestry

C C Konijnendijk and T B Randrup, Danish Forest and Landscape Research Institute, Hoersholm, Denmark

- **Origin**: Developed in North America during the 1960s (Johnston, 1996).
- **Definition**: First comprehensively defined by Canadian professor Erik Jorgensen.
- **Concept**: Urban forestry is the art, science, and technology of managing trees and forest resources in community ecosystems.
- **Purpose**: Aims to provide psychological, sociological, aesthetic, economic, and environmental benefits.

In a European context, the following main characteristics of urban forestry were defined:

- **Integrative Approach**: Combines elements of urban green structures into a cohesive 'urban forest.‘
- **Strategic Planning**: Develop long-term policies and plans for various sectors and programs.
- **Goals:** Provides economic, environmental, and sociocultural benefits.
- **Multidisciplinary:** Involves natural and social science experts; aims to be interdisciplinary.
- **Participatory**: Emphasizes partnerships between all stakeholders.

FAO has adopted;

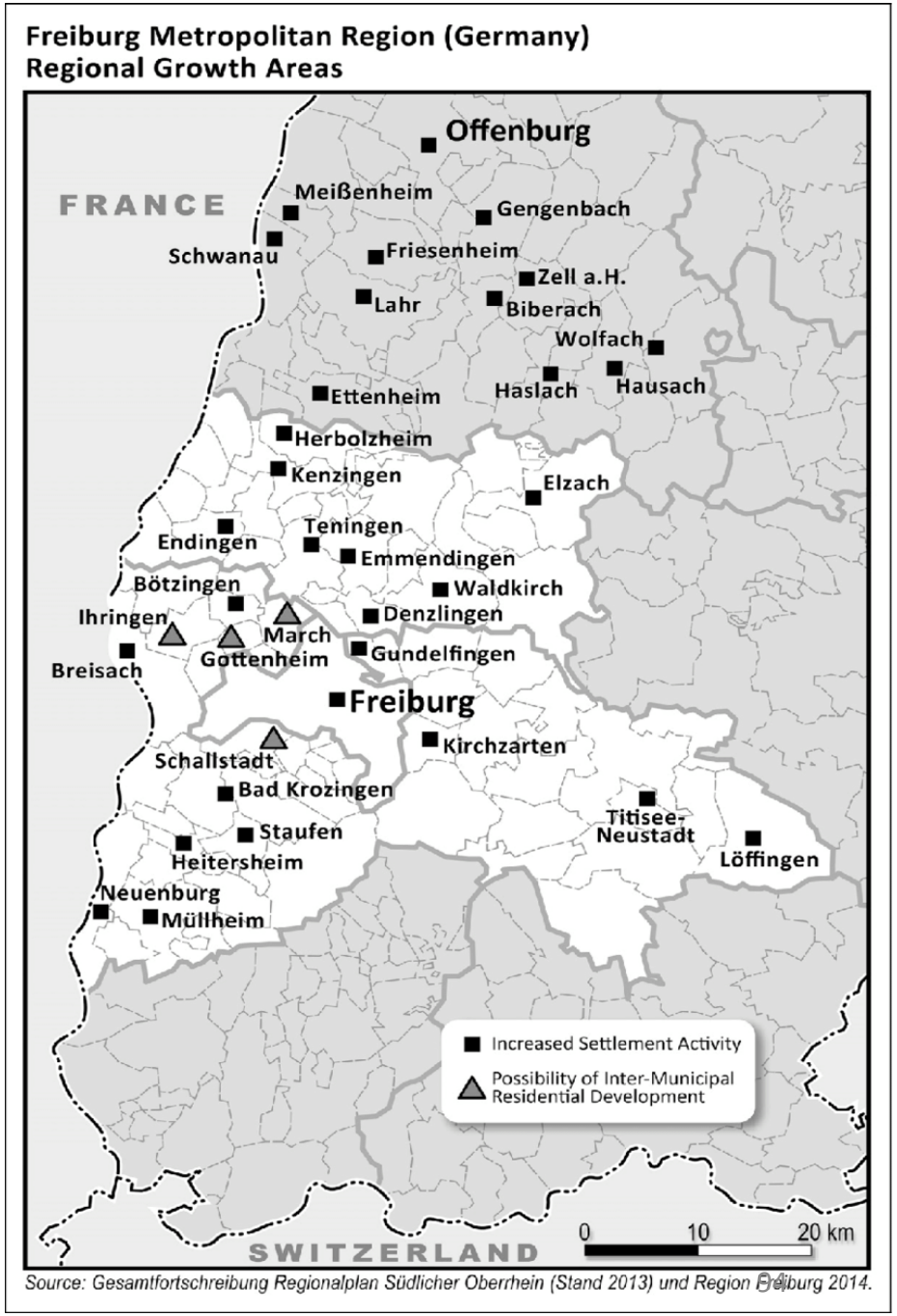
Term: ‘Urban and Peri-Urban Forestry’ (UPF)

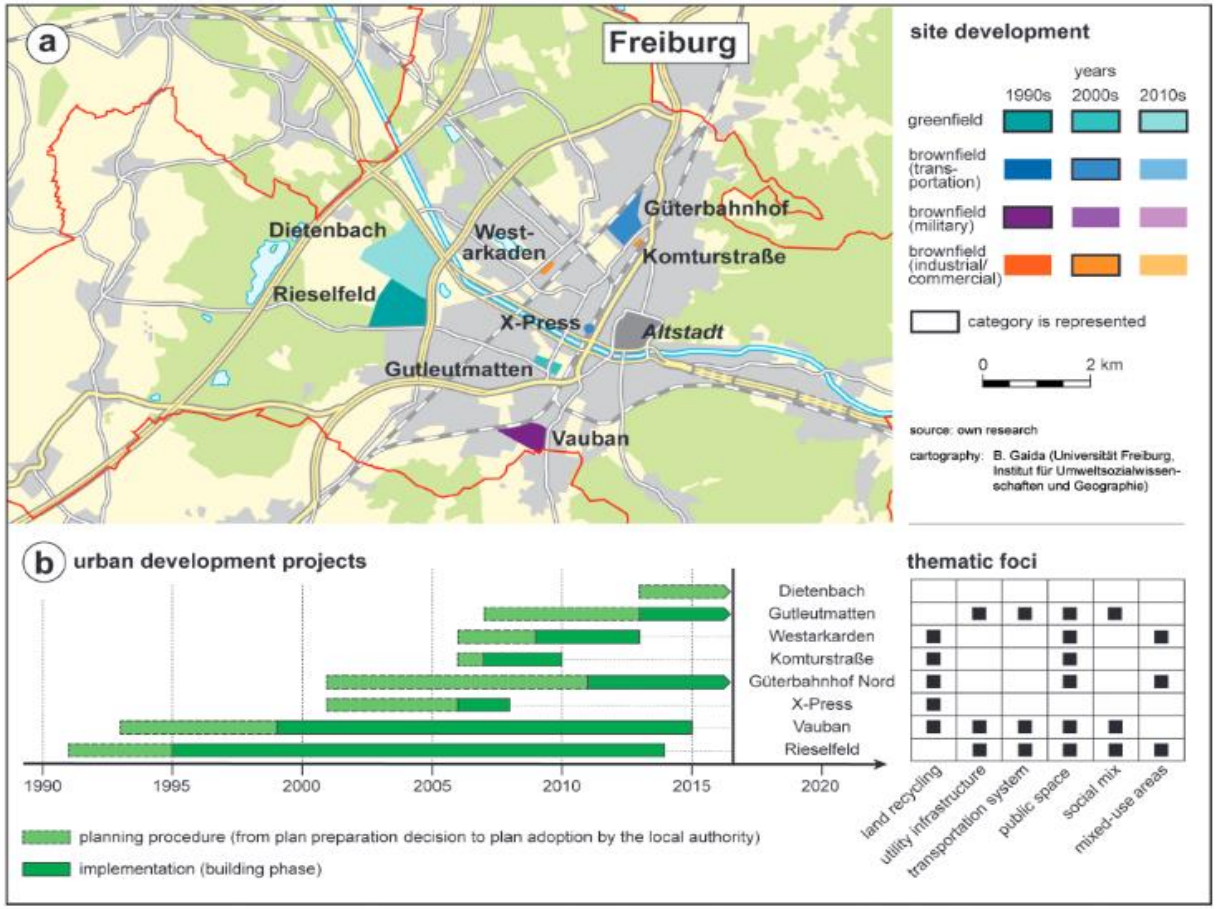
Scope: Includes urban and peri-urban forests, wooded lands, and trees in:

- Parks
- Gardens
- Tree-lined streets and squares
- Undeveloped areas
- Transport corridors
- River corridors

Freiburg

- **Location**: Southwest Germany, between the Black Forest and the Upper Rhine Valley.
- **Urban Structure**: One of 112 German urban districts divided into 42 districts (FRITZ, 2010).
- **Area:** 153.07 km²Population: 214,234 (including 30,000 students)
- **Reputation:** Known as a “Green City” (Freiburg Green City, 2010)
- **Focus:** Sustainable urban development and environmental protection.
- Transportation:
  - 30 km tramway network
  - 168 km city bus routes
  - Connected to the regional railway system
  - 70% of residents live within 500 m of a tram stop.



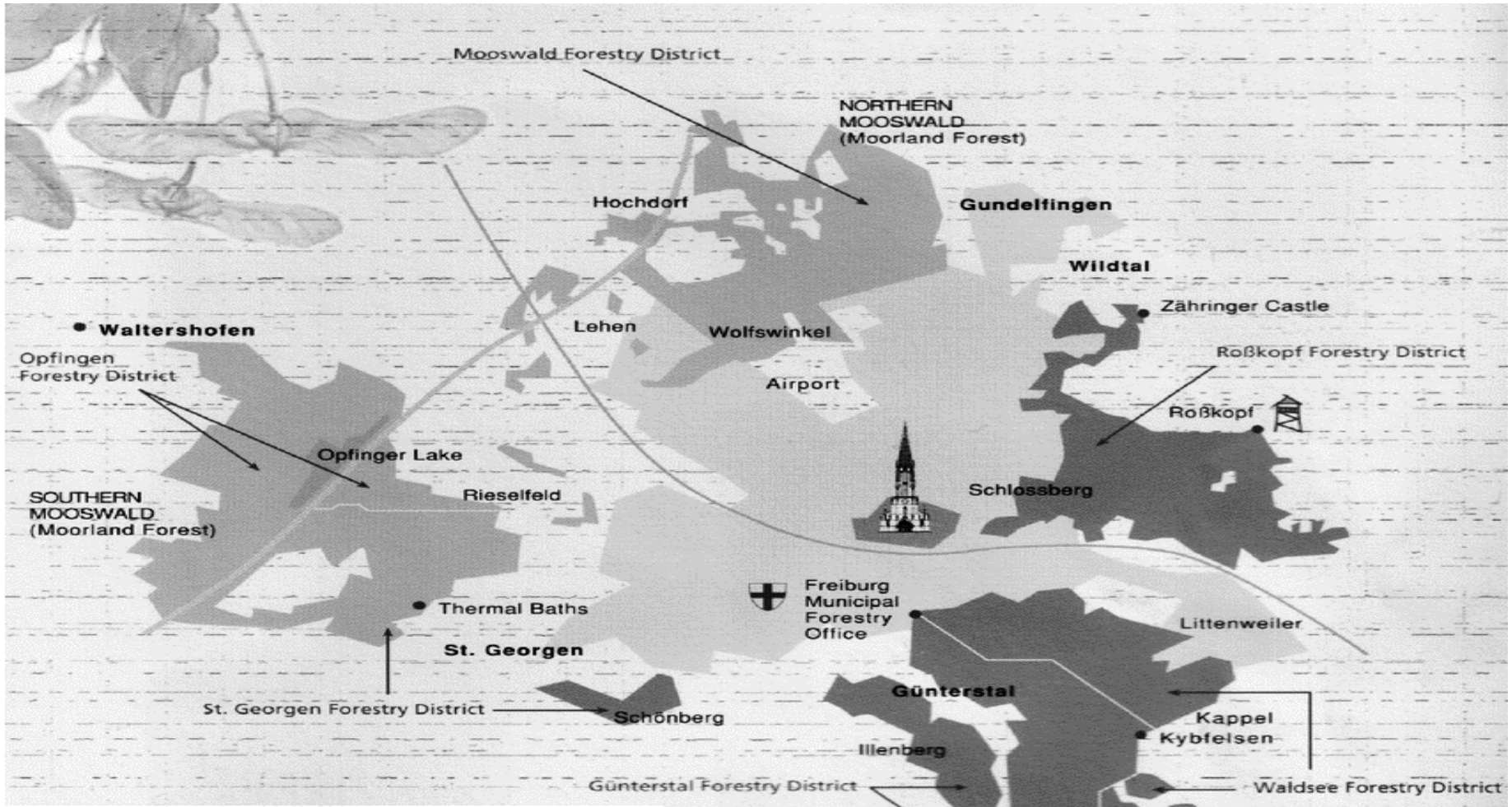


- Güterbahnhof Nord is a former freight rail station north of Freiburg.
- The development plan focused on a functional mix of commercial and residential space.
- The aim was to create a living space for diverse social groups, including students and seniors.
- The main motivation for the development was to respond to the increasing demand for urban development in the prospering city.

- Gutleutmatten is a housing project in Freiburg developed on former hobby gardens.
- The goal was to create approximately 500 new housing units for 1,200 to 1,300 inhabitants.
- The project focuses on the social dimension of sustainability.
- The construction plan included several elements of ecological sustainability, such as car-sharing parking spaces and rainwater infiltration areas.

https://www.researchgate.net/publication/333753751_Image_and_implementation_of_sustainable_urban_development_Showcase_projects_and_other_projects_in_Freiburg_Heidelberg_and_Tubingen_Germany

How many urban forest areas exist in Freiburg?



Urban forests of Freiburg
(7 districts):

Opfingen
Mooswald
Roßkopf
Waldsee
Günterstal
St.Georgen
Schauinsland

(PDF) A comparative perspective of urban forestry in Belgrade, Serbia and Freiburg, Germany (researchgate.net)

Urban woodland resources

Surroundings: Extensive forest and nature areas in a ring-like formation around the city.

Forest Coverage:
- Total Area: 6,421 ha
- Percentage of Municipal Area: 42%
- Forest Area per Inhabitant: ~325 m²

Urban Woodland Types:
- Mountain Forests:
  - Elevation: 300 to 1,284 m
  - Tree Species: Equal mix of *Fagus sylvatica*, *Picea abies*, and *Pseudotsuga menziesii*, with some broad-leaved trees.

- Lowland Forests:
  - Tree Species: Predominantly thermophilic deciduous trees such as *Quercus rubra* and *Populus* spp.

https://www.dreamstime.com/photos-images/freiburg-winter.html

- **Prioritized Functions:**
  - Protection
  - Recreation
  - Nature Conservation

- **Secondary Function:**
  - Production

- **Main Objective:**
  - To make the forest a freely accessible recreational resource

https://en.wikipedia.org/wiki/Freiburg_im_Breisgau

Ownership structure

City Ownership:
- 79.5% of urban woodlands
- 5110 ha of forests

Other Ownership:
- State: 786 ha
- Private Organizations: 525 ha
- Private Owners: 8% of forests, following professional advice from the City Forest Office

Management:
- City Forest Office, part of the Department for Environment, Education, and Sport, manages most urban woodlands.

Legal framework

- **National and State Laws:**
  - National Forest Law
  - State Forest Law of Baden-Württemberg
  - Nature Protection Law of Baden-Württemberg

- **Regional and EU Regulations:**
  - Various regional plans
  - EU Habitat Directive

These laws and policies guide the management of Freiburg's urban woodlands, with state and EU regulations influencing practices.

Participants in woodland management

- **Primary Management**:
  - City Forest Office: Leads the management of urban woodlands.

- **Secondary Management**:
  - State Forest Office in Freiburg: Plays a significant supporting role.

- **Influential Organizations:**
  - Nature Conservation and Ecological Organizations: Impact decision-making processes.
  - Research Institutions:
    - Forest Research Institute
    - Albert-Ludwigs University of Freiburg

- **Public Engagement:**
  - High public awareness and active involvement in presenting ideas.

Problems in urban forest management

Problems Related to Natural Resource Conservation in Freiburg:

- **Ecological Challenges:**
  - Insects and diseases
  - Invasive species
  - Issues with natural regeneration
  - Air pollution
  - Forest decline
  - Natural disasters (e.g., storms in 1990 and 1999, floods in 2021)

- **Social Use and Abuse:**
  - High recreational pressure
  - Conflicts between different types of recreation (e.g., hiking vs. camping)
  - Competing land uses (e.g., forestry vs. urban development)
  - Littering
  - Illegal overnight stays by the homeless

- **Policy, Planning, and Management Issues:**
  - Conflicts between forestry practices and conservation efforts
  - Low income from traditional forestry practices

Freiburg Green City

1975

Successful citizen resistance against the planned Wyhl nuclear power plant

1979

First solar apartment building in Freiburg

1986

Resolution of the municipal council to phase out nuclear energy;

Establishment of the Environmental protection department

Chernobyl disaster, 1986

1991

Resolution on waste management concept;

Introduction of the reusable packaging requirement

1992

Building standard: low-energy construction for municipal buildings;

1st energy self-sufficient solar house;

"Federal Capital for Nature and Environmental Protection" award

1994

Construction „Heliotrop“ as 1st plus energy house in the world

Foundation „Regio- Verkehrsverbund Freiburg“

1995

Construction Rieselfeld;

Western Rieselfeld becomes nature reserve

Since all four construction phases have been completed in 2012, 12500 people feel at home here

1996

Signing of Aalborg Charter;

Climate protection concept: Reduction of CO2 emissions by 25% by 2010

- An attractive, family-friendly district for currently 5,500 inhabitants. Car-free, with over 70 percent of households not owning a car

- All houses in Vauban are built to a low-energy consumption standard – maximum 65 kWh/m2/year (the average energy standard for new-build German homes is about 100 kWh/m2/year, 200 kWh/m2/year for older homes)

1998

Construction start of the "Quartier Vauban"

2004

Opening Solar Info Center

A technology and service center dealing with renewable energy and energy efficiency. 45 companies

2007

Update of climate protection concept: Reduction of CO2 emissions by 40% by 2030

2010

Start ECOfit-Program;

Start „Environmental Zone Freiburg“ (Umweltzone)

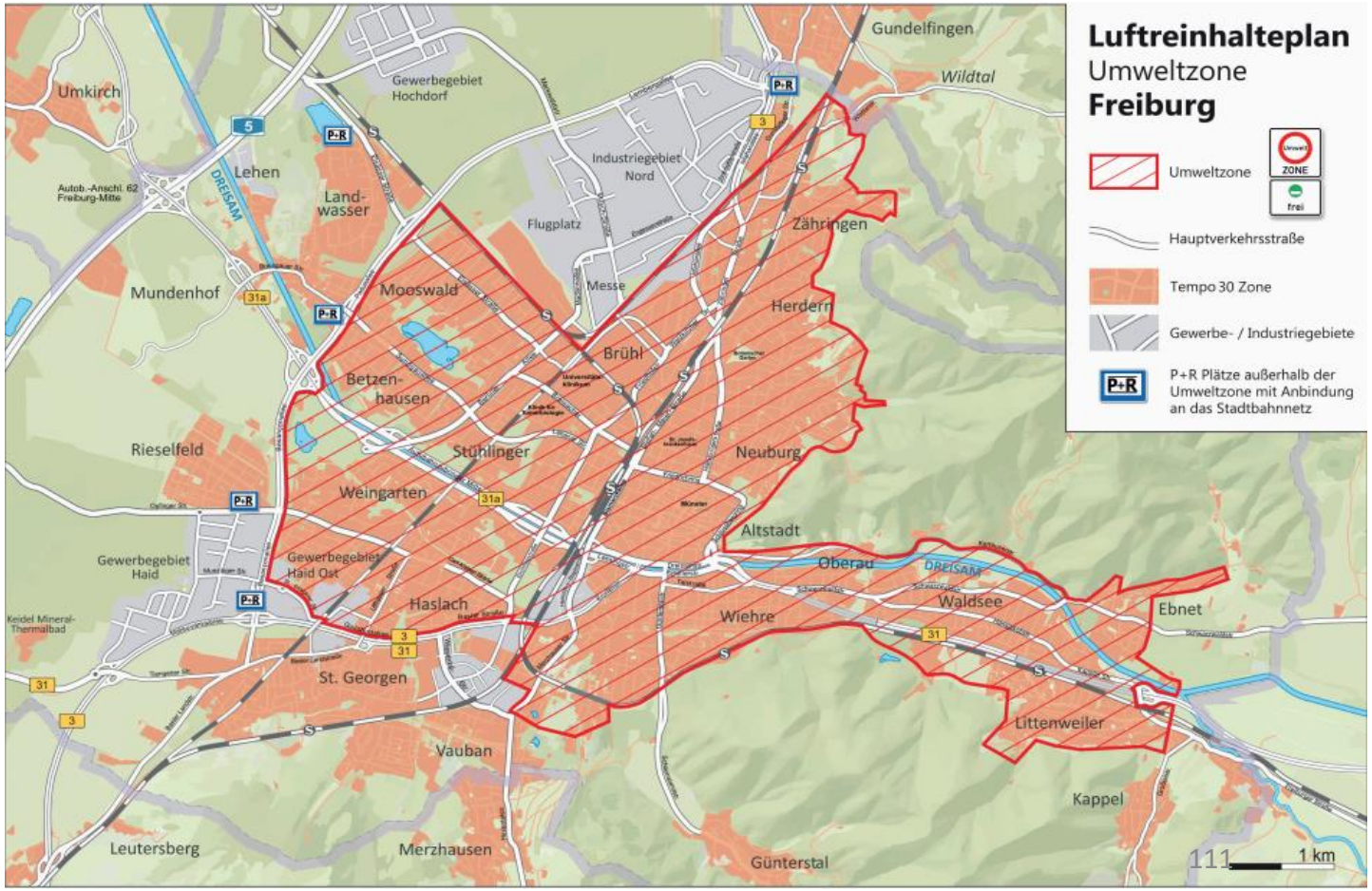
Driving in the low-emission zone without a green emissions sticker

Dear road user,

You have parked your vehicle within Freiburg's low-emission zone (Umweltzone), despite not having a green emissions sticker on display. Driving a vehicle without a green emissions sticker in Freiburg's sign-posted low-emission zone is prohibited and is punishable with a fine. A form giving you the opportunity to provide a statement will be sent to you by post.

Please observe the regulations for driving in the low-emission zone (see map) to avoid being charged again during future traffic inspections for using your vehicle in this area.

Without a green sticker, you can expect a fine of € 80



Deutscher Nachhaltigkeitspreis

Deutschlands nachhaltigste Großstadt 2012

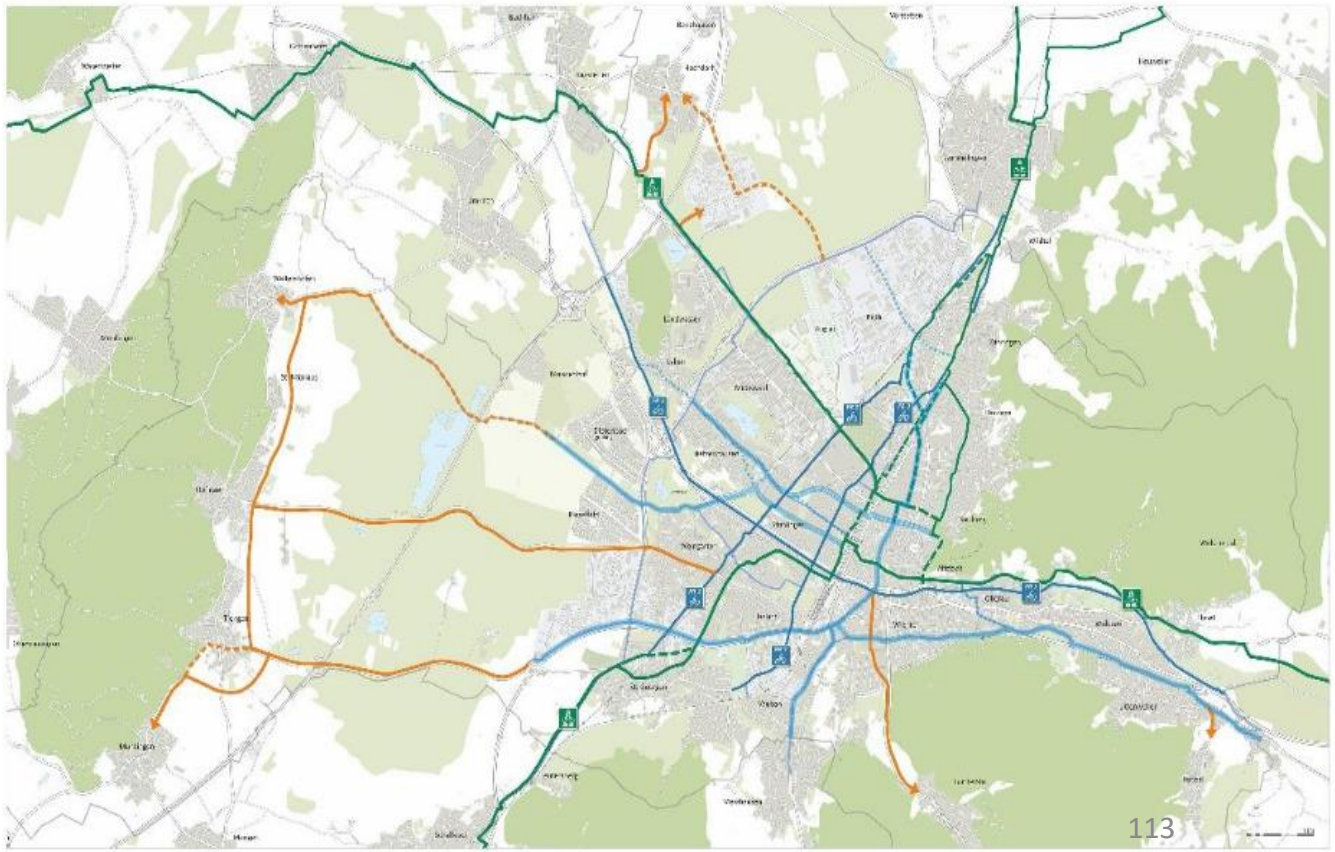
2012

Freiburg honored with the German Sustainability Award as Germany's most sustainable major city

2013

Cycling concept 2020 (Radverkehrskonzept);

Basic decision on adaptation to the consequences of climate change



2014

New climate protection target: 50% less CO2 by 2030, climate neutrality by 2050;

Start of the "Green Industry Park" initiative

2019

Citizen referendum on the new, climate-neutral District Dietenbach;

Update of climate protection concept: 60% CO2 reduction by 2030,

100% reduction by 2050;

Award for Freiburgs Climate Adaption Concept

(Klimaanpassungskonzept) at the Competition „Klimaaktive

Kommunen 2019“ (Climate-active Municipalities)

2021

Freiburg's Municipal Council decides on the climate protection campaign, with its 120-million-euro Future Fund;

Tightening of the climate protection goals according to which Freiburg wants to become climate-neutral by 2038.

City	Country	Years ahead of country	City Target	Country Target
Copenhagen	Denmark	25	2025	2050
Adelaide	Australia	25	2025	2050
Nottingham	UK	22	2028	2050
Mumbai	India	20	2050	2070
Liverpool	UK	20	2030	2050
Glasgow	UK	20	2030	2050
Edinburgh	UK	20	2030	2050
Bristol	UK	20	2030	2050
Sheffield	UK	20	2030	2050
Newcastle	UK	20	2030	2050
Birmingham, UK	UK	20	2030	2050
Brighton and Hove	UK	20	2030	2050
Zürich	Swizerland	20	2030	2050