

URBANE WÄLDER, LEIPZIG 22nd – 23rd October 2018

The Benefits of Urban Forests

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International Committee European Forum of Urban
Forestry



Summary...

- Trees in Cities
- Current Urban Issues
- The Emergence of Urban Forestry
- The Benefits of Urban Forestry
- The Importance of Delivery
- The Benefits of an Urban Forest approach in action...

Change is now the norm...

- Let's plant a thought. We live in a time when it seems as if almost anything could happen...
- Technology, ecosystems, politics, economies, our everyday habits; change is ubiquitous...
- Some change is positive, some less so. Mutability is something we are learning to live and work with...

But thinking of positive change...

- Humans have had a long, deep, cultural relationship with their trees, their woodlands and their landscapes - a relationship that transcends national cultures, and which sits as an equal alongside our scientific, economic, ecological and spiritual relationships...
- Urban Forestry has, arguably, done much to start re-kindling this relationship, as it is an optimistic scenario that is always looking forward to the future, and strives for our urban futures to be happy, healthy, creative and successful...

Trees in Cities...





Amsterdam



Berlin



Guangzhou

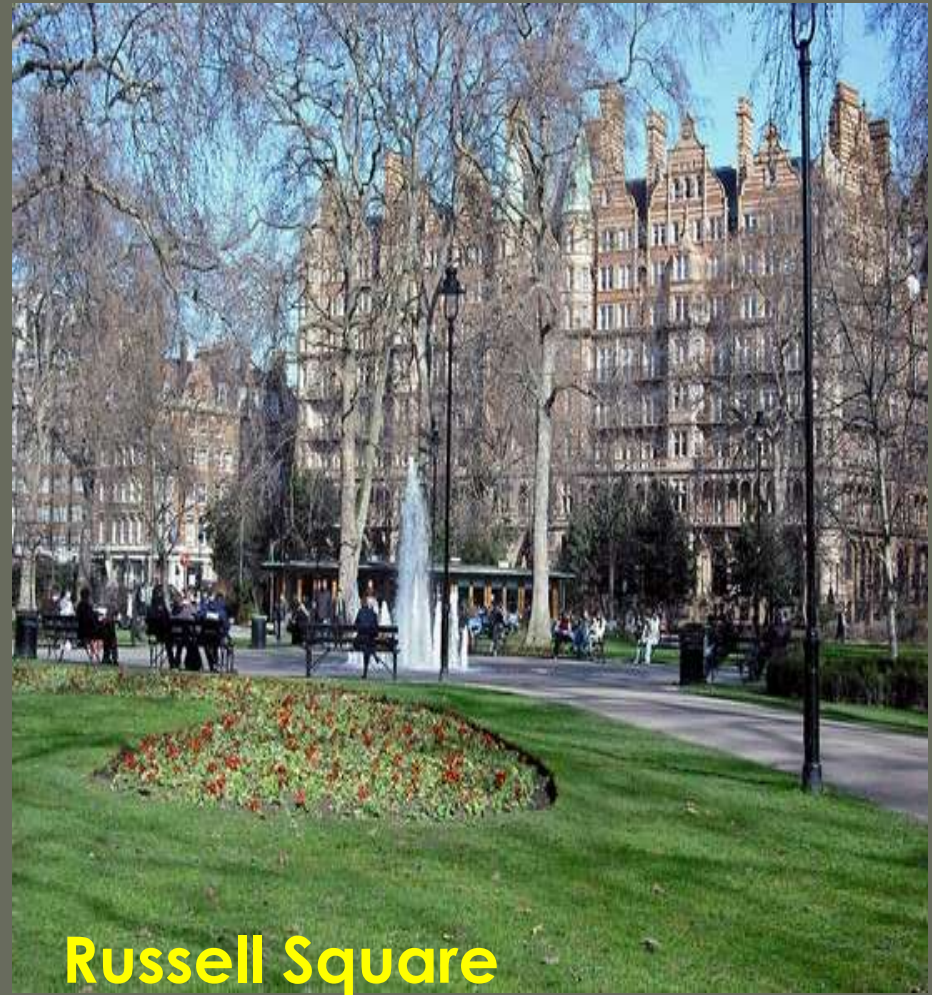


Leipzig

Pall Mall



London Squares – *rus in urbe*

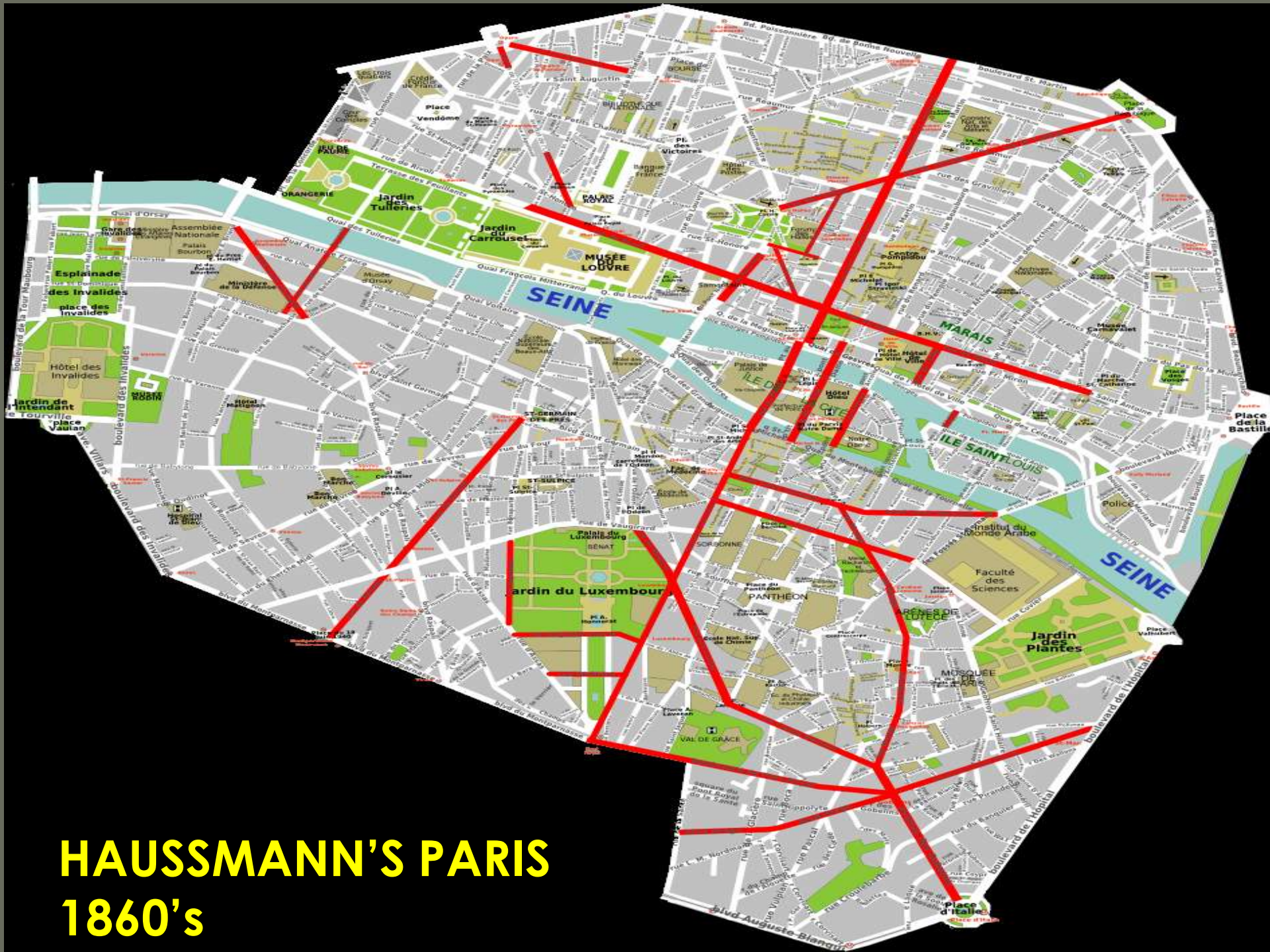


Key dates...

- 1800 – idea of ‘trees in the city’ getting acceptable
- 1817 – General Paving Act
- 1820 – more than 40 squares in London
- 1851 - Britain an urban population for the first time
- 1853 - Street trees planted in Chelsea
- 1855 – Parliament passed the Metropolis Management Act, which created the Metropolitan Board of Works
- Many new streets created / improved to relieve traffic congestion, including Northumberland Avenue, The Embankment, etc...
- End of the 19th century, street trees ‘almost routine’.



PARIS 1615



HAUSSMANN'S PARIS
1860's



Paris

c.19th [Quaker] Industrial Philanthropists...

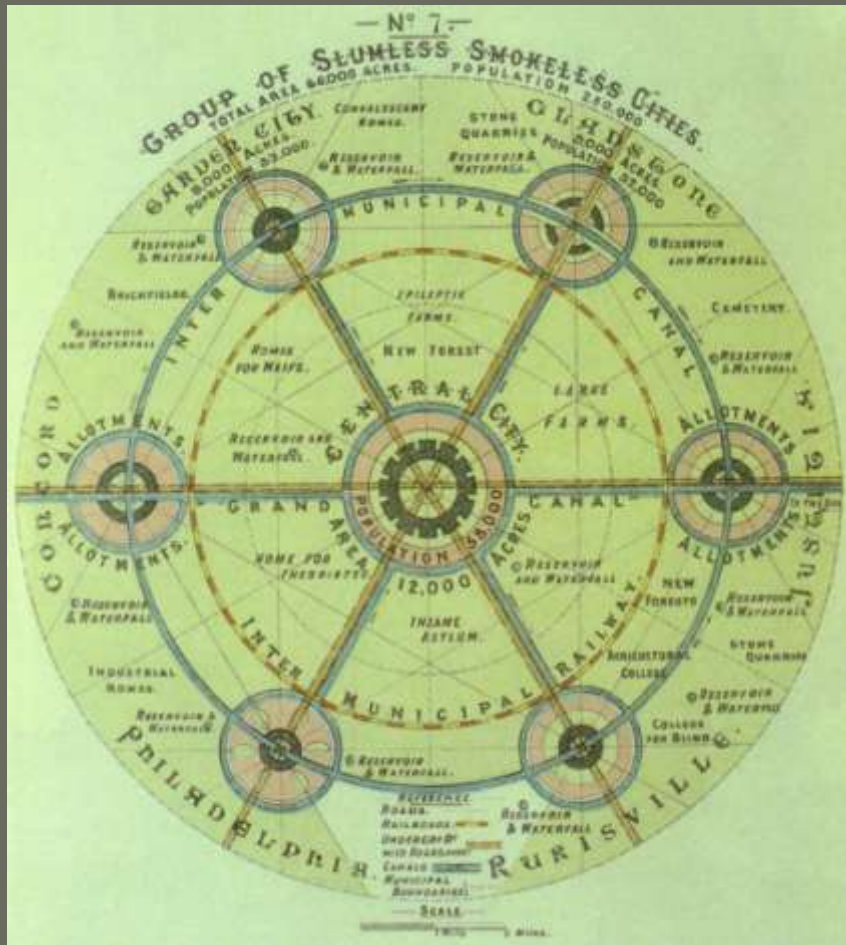
- Cadbury - Bournville
- Lever – Port Sunlight
- Owen – New Lanark
- Iron-mad Wilkinson – Broseley/Ironbridge
- Abraham Darby I – Coalbrookdale/Ironbridge
- Abraham Darby II – Coalbrookdale/Ironbridge
- Abraham Darby III – Coalbrookdale/Ironbridge
- etc...

...The presence of trees is pleasant to the eye, refreshes the workers and improves the health of the district.

Robert Owen, New Lanark 1816.

- September 1901: The City of the Future Conference, Birmingham.
- Chaired by George Bournville
- First such conference in the world...

Letchworth Garden City 1903



Inter-war developments...

- Trees on suburban estates...
 - Acacia Avenue
 - Hawthorn Road
 - Cherry Tree Avenue
 - Lime Grove
 - etc...

Telford – the Forest City...



- The Development Corporation acknowledged that the 'urban forest' was structural, and not merely an adjunct to development...
- Over 6.5 million trees planted
- 138 tree species / cultivars
- 17% tree cover [England average 10.8%]
- KPMG acknowledged that Telford's 'designed green environment' contributed to its 'Rising Star' status.

Current Urban Issues...



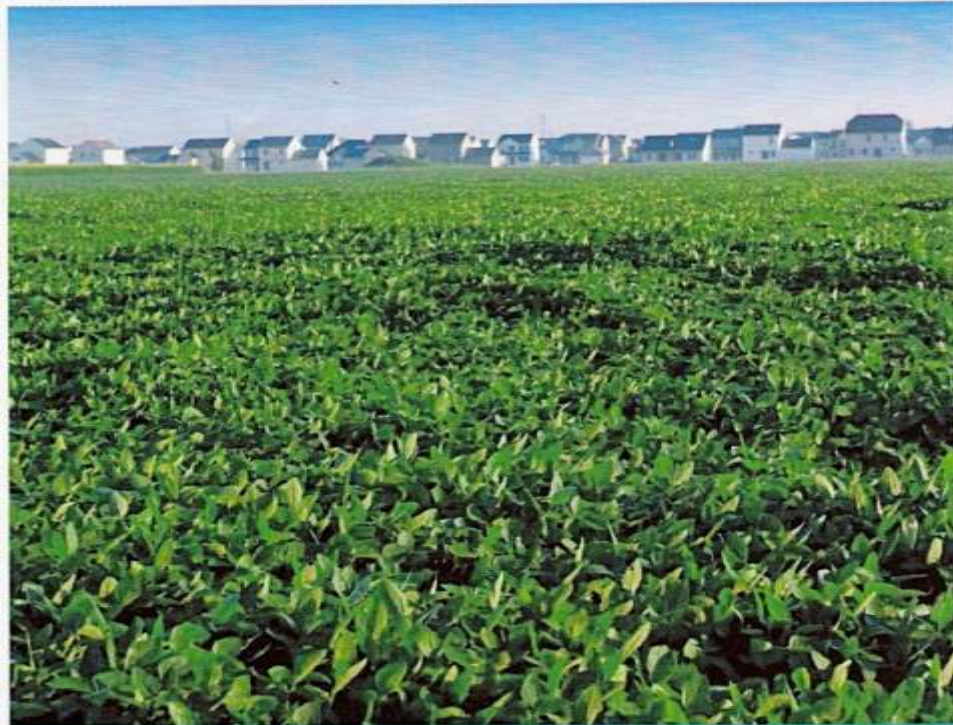
Urbanism across Europe...



Urban sprawl in Europe

The ignored challenge

ISSN 1725-9177



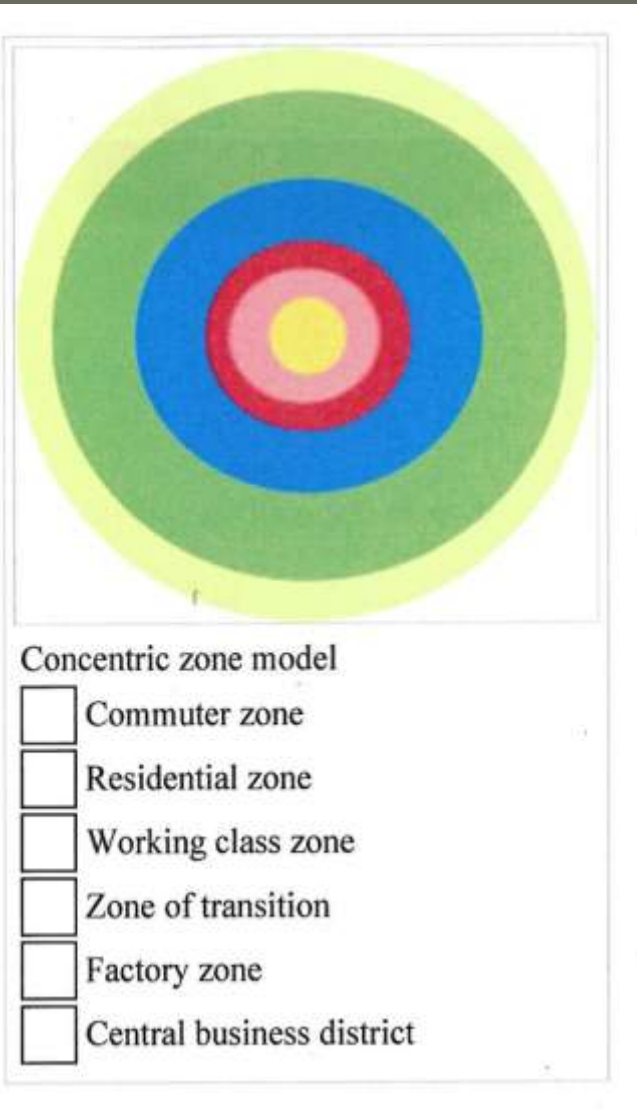
- Mainland European population falling
- Growing affluence
- More space / privacy wanted
- New car registrations more than 4 X the registration of births
- More space for new development is required **NOW...**

The Sprawling City...



- Low residential density
- Unlimited outward extensions
- Spatial segregation of different types of land use
- Leapfrog development
- No centralised ownership or planning
- Transport dominated by private cars
- Fragmented governance
- Variety in fiscal capacity of government
- Commercial strip development
- Difficulty in providing started homes, etc.
- Most trees in private ownership

The Compact City...



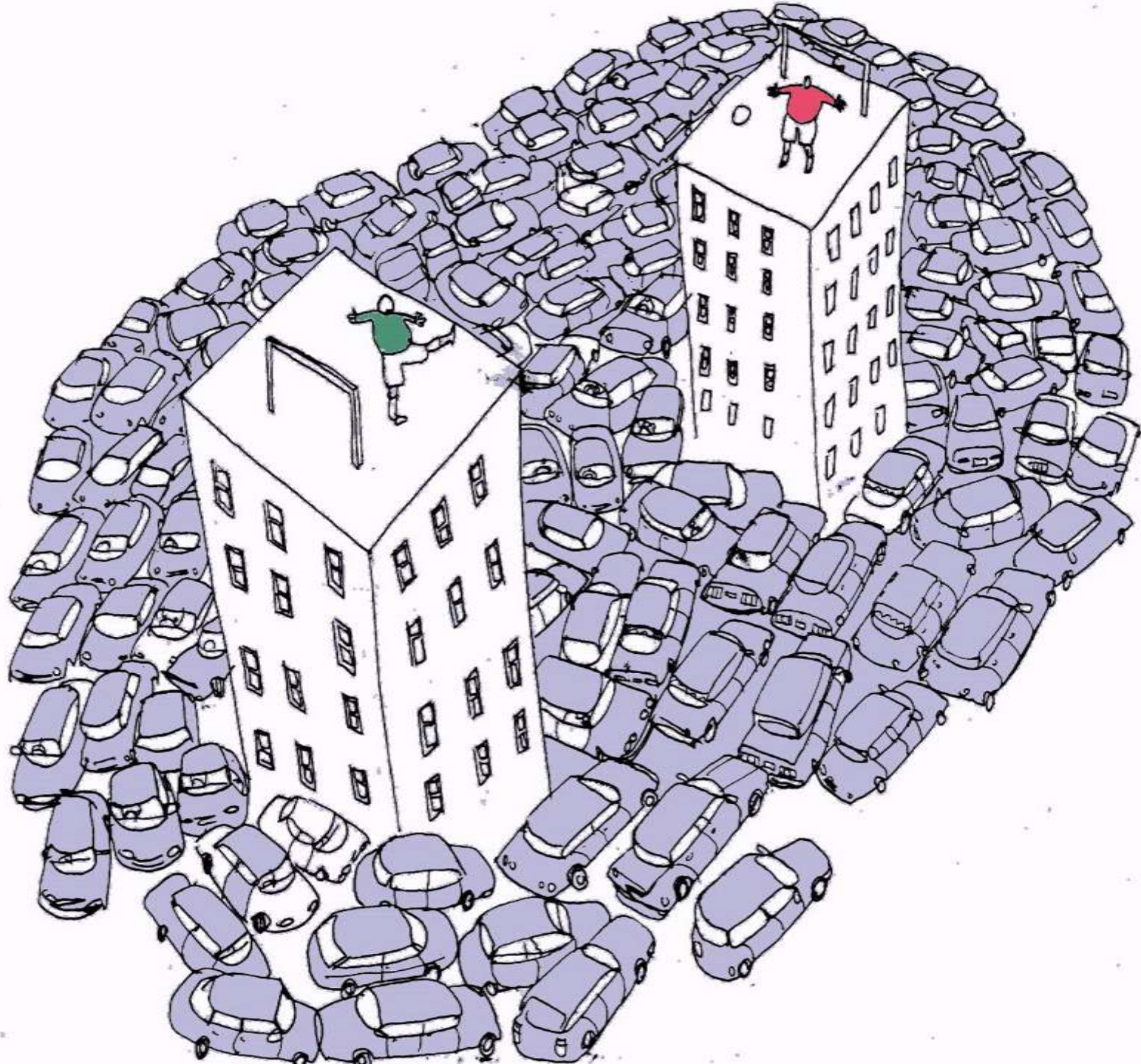
- High residential + employment densities
- Mixture of land uses
- Fine grain of land uses
- Increased social + economic interactions
- Contiguous development
- Contained urban development
- Urban Infrastructure
- Multimodal Transportation
- High degrees of accessibility, street connectivity, impervious surfaces
- **Low open space ratio**
- Unitary Control of Planning
- Fiscal capacity to finance urban facilities + infrastructure

The Compact City Paradox...

- For a city to be **sustainable**, functions and population must be concentrated at higher densities, **but...**
- a city must be **worth living in...**

What makes a liveable city in the 21st century?...

- Energy
- Food
- Water
- Transport
- Jobs / Development
- Retail
- Telecommunications
- Public services
- Emergency Services
- Health
- Finance



What makes a really liveable city?

- It includes, but is not limited to...
 - Access to daylight and sunlight
 - Potential for good health and well-being
 - The opportunity to walk unimpeded
 - A sense of personal safety
 - Ready access to art, music, culture...
 - The availability of fresh food + clean water
 - Proximity to friends
 - **Ready access to trees, woods and parks**

The Challenges facing our Cities...

- **Globalisation...**

- Great economic + social change
- Industrial educated economy
- Global competition
- Accelerating social + geographical mobility

- **Social Exclusion...**

- Growing exclusion
- Unemployment / Poverty
- Especially vulnerable groups / plurality
- Segregated Cities

- **Urban Governance...**

- Increasing demands on cities
- A need for new urban management approaches
- Challenge of local democracy

- **Urban Environment...**

- Environmental + sustainability problems
- Climate [weather]change
- Challenges to lifestyles + mobility
- Cultural heritage assets
- Loss of Biodiversity
- Impact upon the 'Natural World'
- Be **Resilient** – did we miss our chance of just being Sustainable...?

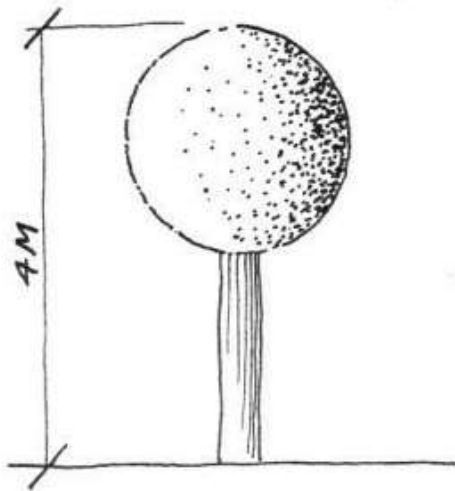
The benefits of Urban Forestry - beginnings in Europe

- Originated in the USA in the 1960's and 70's
- European version of Urban Forestry secured under COST Action E12 *Urban Forests and Trees* : 1997-2002
- EU recognise Urban Forestry as a 'Specific Scientific Domain'
- 1998 : European Forum of Urban Forestry was launched in Wuppertal.
- 2012 : EFUF held in Leipzig
- 2019 : EFUF being held in Köln 22nd – 25th May

But there is still much work to do...



THE TREE, as seen by...



THE PLANNER...



THE PARKS DEPT...



THE PUBLISHER...



THE HIGHWAYS DEPT...



THE DEVELOPER...



THE LANDSCAPE DESIGNER.



TREE

So what is Urban Forestry...an oxymoron?... NO!

- Although the words 'forest' and 'forestry' are now generally understood to be connected with trees, this used not to be the case. It can be argued that the word '**forest**' stems from the Latin word '**foris**', which means '**out of doors**'.*
- Thus the urban forest is really the '**urban out of doors**', and includes **all** urban green space in and around our towns and cities.

*Alexander Porteous (1928) The Forest in Folklore and Mythology.

Benefits of the Urban Forest...

- Economic
- Financial
- Environmental
- Social, Health & Well-being

Economic...

- Urban trees can increase property values by 7 – 18%
- the larger they grow, the value grows proportionally;
- They can assist in creating a 'destination of choice' for investment, as well as for tourists / visitors;
- They can improve the environmental performance of buildings by reducing heating and cooling costs;
- Sites with mature trees can be worth more as development sites;

Economic continued...

- Trees can create a positive perception of place for potential property buyers/investors;
- Urban trees improve the health of local populations, reducing health costs.

Financial...



London's Urban Forest - Key Statistics				Total
Number of Trees	Inner London	1,587,000		8,421,000
	Outer London	6,834,000		
Tree Cover	Inner London	13%		14%
	Outer London	14%		
Canopy Cover	Inner London	18%		21%
	Outer London	21%		
Most Common Species	Inner London	Birch, Lime, Apple		
	Outer London	Sycamore, Oak, Hawthorn		
Pollution Removal (per annum)	Inner London	561 tonnes	£58 million	£126.1 Million
	Outer London	1680 tonnes	£68.1 million	
Stormwater Alleviation (per annum)	Inner London	705,000m³	£568,935	£2.8 Million
	Outer London	2,709,000m³	£2.2 million	
Carbon Storage (whole value)	Inner London	499,000 tonnes	£30.9 million	£146.9 Million
	Outer London	1,868,000 tonnes	£116 million	
Carbon Sequestration (per annum)	Inner London	15,900 tonnes	£987,000	£4.79 Million
	Outer London	61,300 tonnes	£3.8 million	
Building Energy Savings (per annum)	Inner London	£223,000		£260,600.00
	Outer London	£37,600		
Building Avoided Carbon Emissions (per annum)	Inner London	£23,600		£54,600
	Outer London	£31,000		
Replacement Cost (whole value)	Inner London	£1.35 Billion		£6.12 Billion
	Outer London	£4.77 Billion		
Amenity Value (CAVAT) (whole value)	Inner London	£17.6 Billion		£43.3 Billion
	Outer London	£25.7 Billion		
TOTAL ANNUAL BENEFITS	Inner London	£59.54 Million		£132.7 Million
	Outer London	£73.16 Million		

Environmental – addressing climate change...

- Urban trees reduce the urban heat island effect through evapotranspiration;
- They provide shade, thus making buildings & streets cooler and more people-friendly in summer [up to 8°C] – and more retail friendly too;
- They assist in removing dust & particles from the air;

Environmental continued...

- They slow the rate at which precipitation reaches the ground [by up to 36%, which can help to reduce the effects of flash flooding]
- Good tree-pit design can absorb 25mm rainfall.
- They help reduce wind speeds;
- Trees help to reduce traffic noise by absorbing & deflecting sound;
- They increase biodiversity and 'nature in the city'
- Can help prevent cancers

Social, Health & Well-being...

- Trees help to create a sense of place & local identity;
- They increase pride in the local area;
- They create focal points & landmarks
- They have a positive impact on people's physical & mental health;
- They have a positive impact on crime reduction.

RISK FACTORS

- Stress
- Loneliness
- Physical inactivity
- Urban living



Loneliness by Irina Souiki



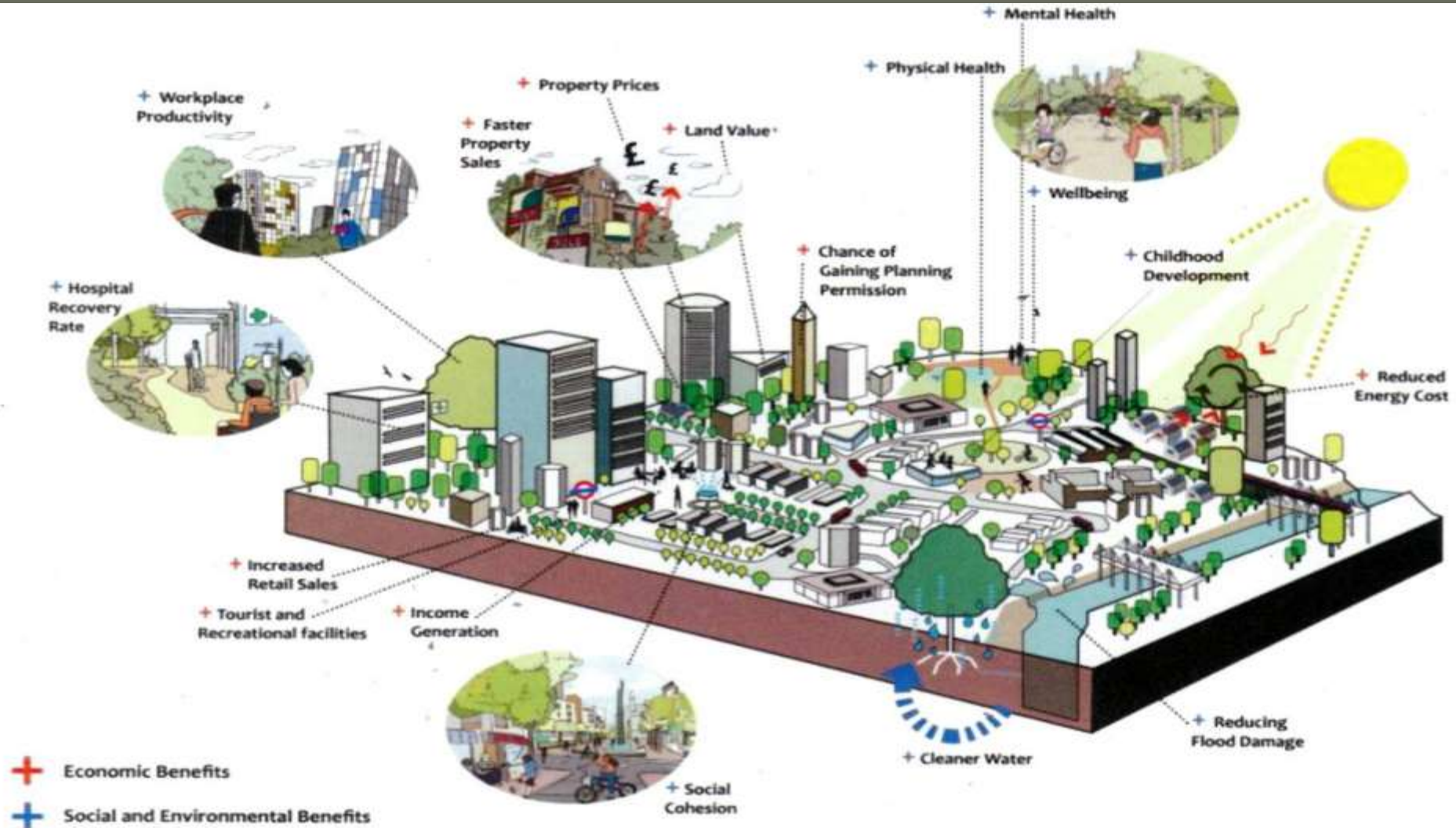
People from the countryside cope better with stress



Human Health Issues in the City...

- Stress/mental health & NCD's
- Unipolar Depressive Disorders
- Lower respiratory infections
- Ischaemic heart disease
- Cerebrovascular disease
- Prematurity & low birth weights
- Birth asphyxia & birth trauma
- Neonatal infections
- Hearing loss
- Diabetes
- Cancers [especially from diesel fumes]

The benefits of the urban forest...

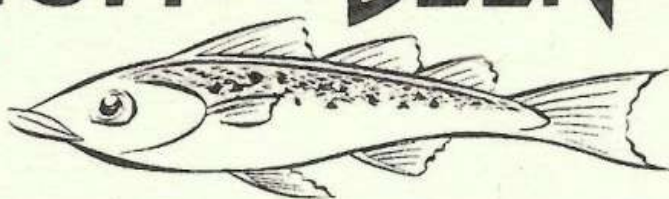
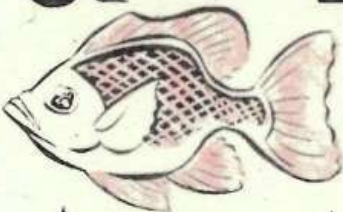
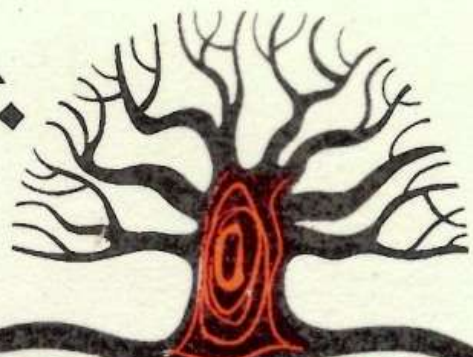


- **“Without data, you’re just another person with an opinion”** W. Edwards Deming.

Increasingly sophisticated research into urban forestry shows us that urban trees influence our lives and the places where we live, love and work in many ways by:

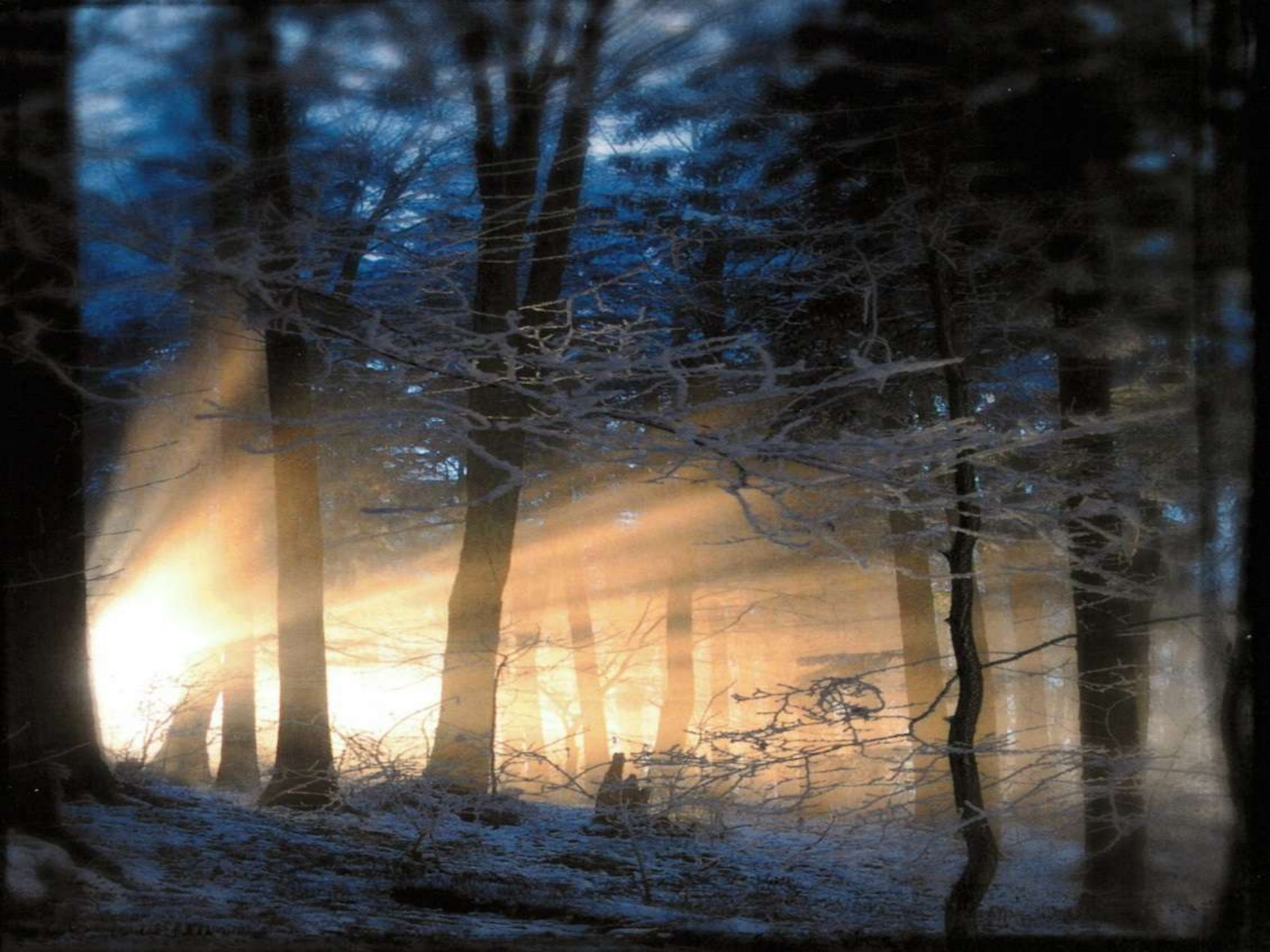
- Improving our health & well-being
- Improving learning
- Increasing property values
- Providing focal points to improve social cohesion
- Improving air quality
- Offsetting carbon emissions
- Promoting biodiversity and nature in the city
- Limiting the risk of flooding
- Cooling our towns & cities
- Promoting inward investment & job creation
- Making us drive more safely

**ONLY WHEN THE LAST
TREE HAS DIED & THE
LAST RIVER HAS BEEN POISONED
& THE LAST FISH HAS BEEN CAUGHT
WILL WE REALISE THAT WE CAN-
NOT EAT MONEY.**



19TH CENTURY CREE INDIAN

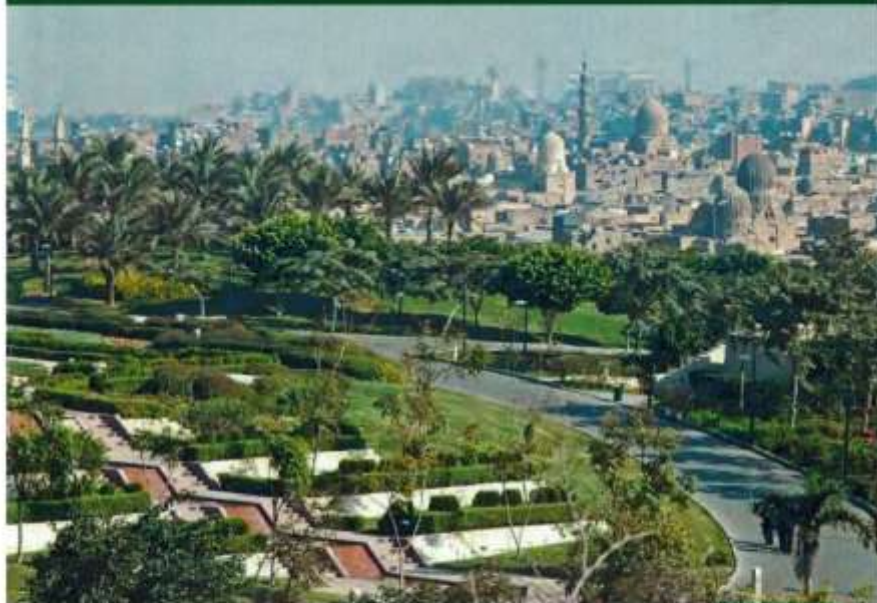
- **“Not everything that can be counted counts, and not everything that counts can be counted.”** Einstein





Food and Agriculture
Organization of the
United Nations

Guidelines on urban and peri-urban forestry



FAO
FORESTRY
PAPER

1987-2015

178



BENEFITS OF URBAN TREES



Strategic placement of trees
in urban areas can cool the air
by between 2 °C and 8 °C.



Large urban trees are excellent filters for
urban pollutants and fine particulates.



Mature trees regulate water flow
and improve water quality.

A tree can absorb up to 100 kg of CO₂ per year,
sequester carbon and consequently mitigate climate change.



Wood can be used
for cooking and heating.



Trees can provide food,
such as fruits, nuts and leaves.

Spending time near trees
improves physical and
mental health by increasing
energy level and speed of
recovery, while decreasing
blood pressure and stress.



Trees properly placed around
buildings can reduce air conditioning
needs by 30% and save energy used for
heating by 20-60%.



Trees provide habitat, food
and protection to plants
and animals, increasing
urban biodiversity.



Landscaping, especially with trees,
can increase property
values by 20%.

World urban population is growing fast...



...planting trees today
is essential for
future generations!

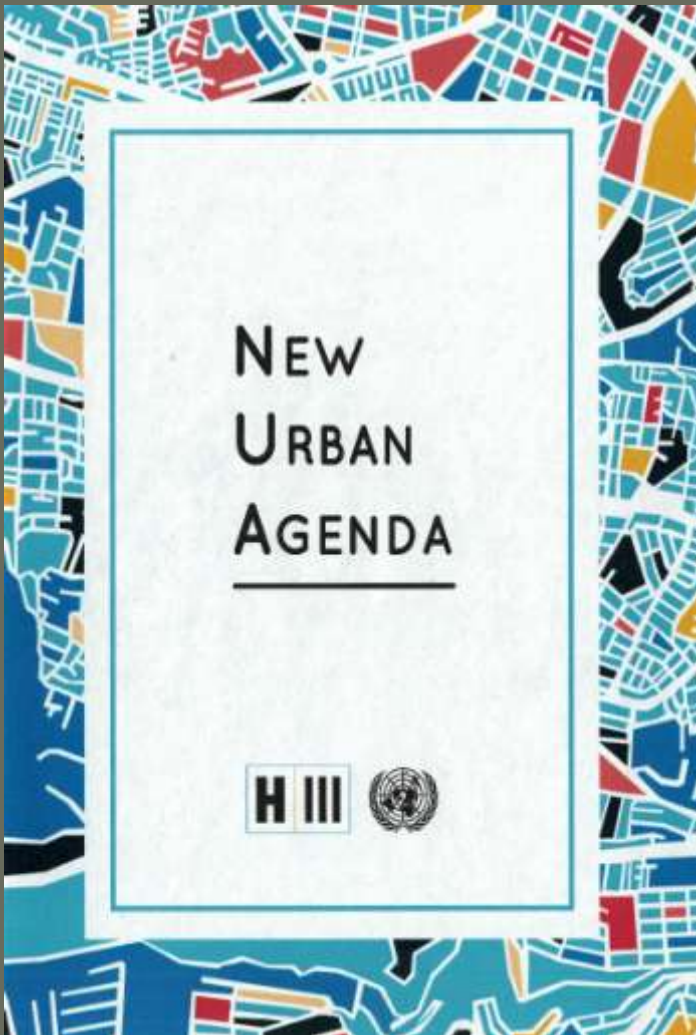


Food and Agriculture Organization
of the United Nations

fao.org/forestry/urbanforestry



The Importance of Delivery - the UN's New Urban Agenda



- Promotes a shared vision of :
 - Sustainable and inclusive urban prosperity
 - Opportunities for all
 - Environmentally sustainable and resilient urban development.
- **Urban Forestry can help to deliver this...**

Tree Pests + Diseases : Already in the UK..

- Acute Oak Decline
- Asian Longhorn Beetle
- Bleeding Canker (Horse Chestnuts)
- Canker Stain of Plane
- Chalara Dieback of Ash
- Dothistroma needle Blight [Red Band Needle Blight]
- Dutch Elm Disease
- Great Spruce Bark Beetle
- Horse Chestnut Leaf Minor
- Oak Pinhole Borer
- Oak Processionary Moth
- Phytophthora [at least 4 of them]
- Pine Tree Lapet Moth

More on the way??..

- Citrus Longhorn Beetle
- Eight-Toothed European Spruce Bark Beetle
- Emerald Ash Borer
- Pinewood Nematode
- Bronze Birch Borer
- etc.....???



THE EMBANKMENT : LONDON







PARLIAMENT SQUARE





RECOMBINANT ECOLOGY...

- A relatively new field of ecology that acknowledges that, like it or not, non-indigenous flora and fauna do and will have roles and functions in the natural processes of our emerging future landscapes, particularly our urban landscapes.

Criteria for the acceptable use of non-indigenous tree species...

- The introduced species must...
 - be adapted to the site conditions & climate
 - be able to create humus
 - be ecologically integrated into the indigenous flora & fauna
 - be able to regenerate naturally
 - not introduce disease to other species
 - not be susceptible to any abnormal risk of being attached by disease
 - be able to be managed on an uneven-aged basis.
- **If it ticks all the above, plant it!**
- Prof. Dr. H J Otto. Head of Silviculture, Lower Saxony.

Species Selection for Green Infrastructure



A Guide for Specifiers



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Draft Version 29.06.2017

www.tdag.org

280 tree species...pros & cons



Acer campestre (Field maple)

[Back to Contents](#)

[Contents page](#)

[Species Listing for 'A'](#)

[Back to Tree Selector](#)

[Mature Size](#)

[Environmental Tolerance](#)

[Grown Form](#)

[Ornamental Qualities](#)

[Crown Density](#)

[Use Potential](#)

Use-potential



Tree size and crown characteristics



15-25m

Mature height is typically <15 m but exceptionally may reach 20m.



Natural crown form is typically globular. Some cultivars provide alternative forms.



Forms a dense crown.

Example of planting

Acer campestre tree Westonbirt.jpg



Natural habitat



Occurs naturally in most of continental Europe (except Nordic countries) and parts of western Asia and north Africa. Can be found as an understorey tree, woodland edge species as well as an open grown tree on lower hillsides, plains, steppes (margins) and riverbanks. It commonly grows as a shrub in thickets. Prefers neutral to alkaline soils.

Environmental Tolerance



Moderately tolerant to shade.



Moderately tolerant to drought.



Moderately sensitive to waterlogging.

Ornamental qualities



LATE SPRING

Light green flowers borne in upright clusters in late spring. Fairly inconspicuous.



LATE SUMMER

Samara fruits maturing in late summer.



Deciduous broadleaf tree. Simple, five-lobed leaves that turn a golden colour in autumn.



Single stemmed or as a multi-stemmed shrub with a grey-brown corky bark, vertically fissured on mature stems.

Issues to be aware of



Few problems associated with the species.

Notable varieties

Natural form

'Elsrijk'.

Narrow crown

'Baronne', 'Green column'.

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Visual interest

Acer campestre leaves Westonbirt.jpg



© Image provider, used with permission

Effective Urban Forestry ...1

- Increase the quantity of trees in order to increase the filtering capacity;
- Healthy trees that are growing well have the biggest effect – therefore ensure good growing conditions;
- Make sure that trees are able to grow to maturity;
- Select tree species that will adapt well to city surroundings & which preferably need little maintenance;
- Make sure there is sufficient species variation in order to efficiently capture the full cocktail of pollution;

Effective Urban Forestry...2

- Use conifers [preferably evergreens] for the effective capture of particulates throughout the year;
- Alternatively, use deciduous trees with coarse, hairy leaves for capturing particulates;
- Use deciduous trees with flat, broad leaves for the effective absorption of NO_2 & ozone;
- Don't use any species of tree that is sensitive to air pollution;
- Limit the use of trees which release a lot of VOC's & minimise large scale planting of these in order not to stimulate the production of summer smog.



The best way of foretelling the future is to create it...we have to design resilient communities that are 'ready for anything'...

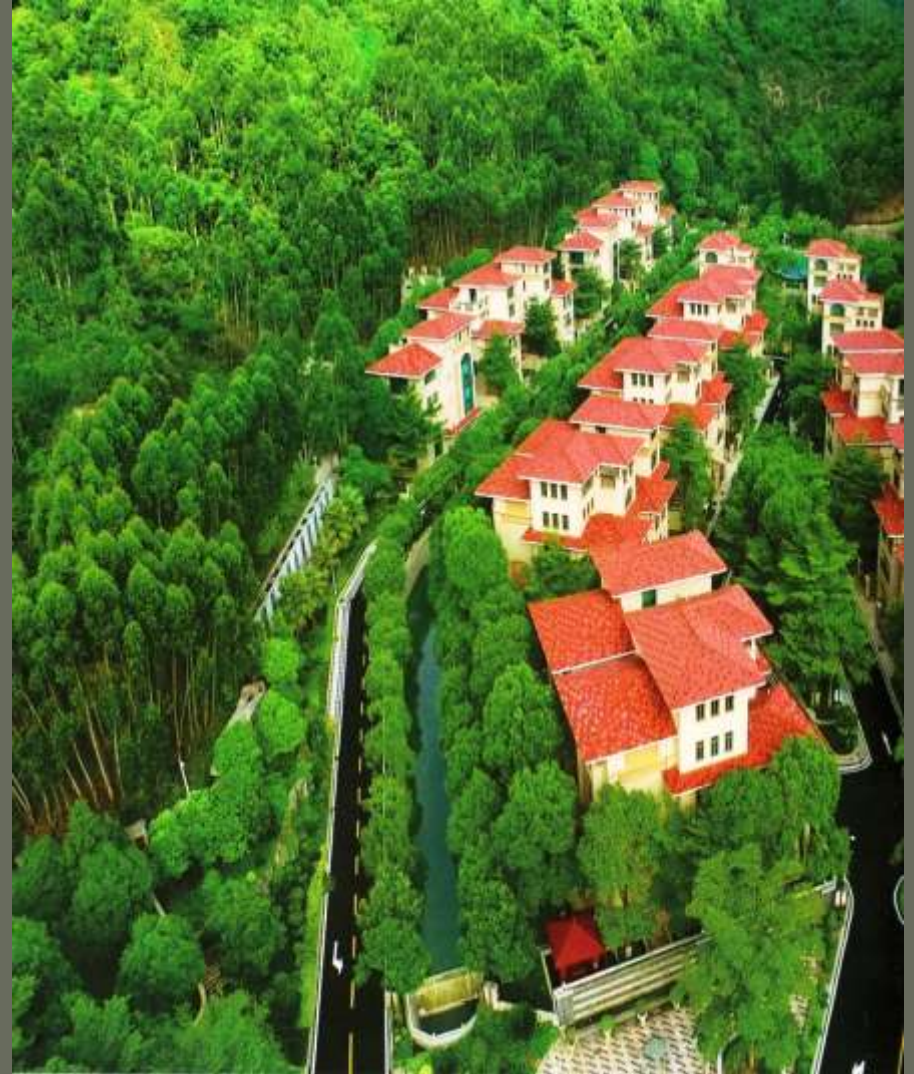
- **The Benefits of an Urban Forestry approach in action...**

Canary Wharf, London





Zhuhai



MALMÖ's URBAN FOREST...

- Over 60,000 trees have been planted throughout the city;
- It is a resilient urban forest – having one of the most varied populations of tree species in northern Europe;
- Voted European City of Trees in 2009



MALMÖ ARENA

Sparbanken Syd

Swedish Match

INGENIÖRS BYG

G.S.

ENTRE

ENTRE

ENTRE

EN

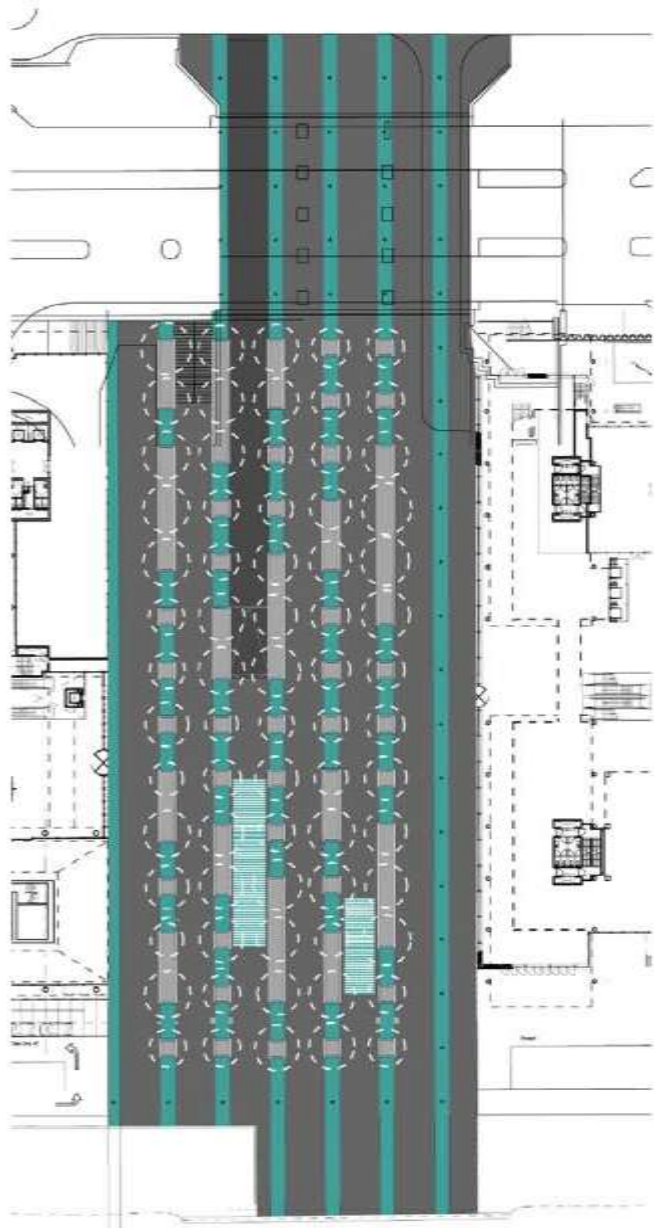
ENTRE

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ZUIDPLEIN AMSTERDAM

Hardszeen 'Bricano'
 Gneiss
 Boombakken van hardsteen en gneiss





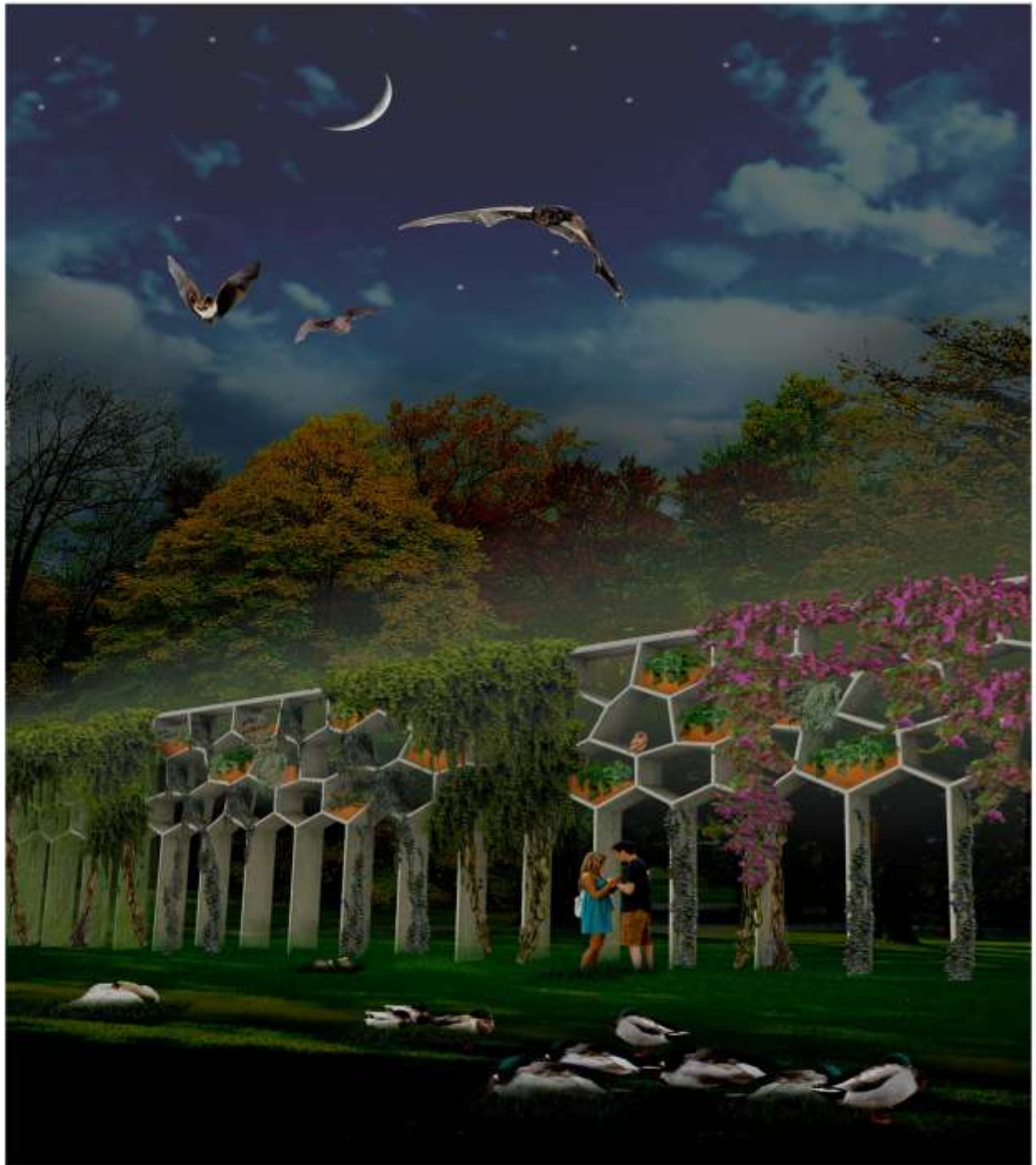


MÁXIMAPARK, UTRECHT













MADRID, SPAIN

madridspain

la m30 desaparece bajo
tierra

MADRID











cherry trees



Cherry tree line











The Northern Forest, UK



Our area is changing — we need to respond

With below average woodland cover, but above average ambition, the North of England is perfectly placed to leverage huge value from renewed investment in community forests.

A new Northern Forest

The Woodland Trust is working with the Community Forests in the north of England to develop plans for a new Northern Forest — stretching from Liverpool across to Hull, with the M62 as its spine.



25
years

Working with a wide range of partners, we will set out how a new Northern Forest will deliver major environmental and social benefits that complement the significant growth, investment and new infrastructure that is planned for the north of England. This will embrace the core cities of Liverpool, Manchester, Sheffield and Leeds, the cities of Chester and Hull and major towns across the north.

The Northern Forest will both accelerate the creation of new woodland and support sustainable management of existing woods right across the area. Many more trees, woods and forests will deliver a better environment for all by: improving air quality in our towns and cities; mitigating flood risk in key catchments; supporting the rural economy through tourism, recreation and timber production; connecting people with nature; and helping to deliver improvements to health and wellbeing through welcoming and accessible local green spaces.



50m
trees

13m
population



9%
in the next 20 years

650k
new homes planned for
the Northern Forest area



7.6%
woodland cover



UK average = 13%
EU average = 44%

>£75bn
infrastructure investment
planned over the next 25 years

The area has an abundance of transport infrastructure, with key gateways served by

2 & 7
ports airports

plus a new unified
transport body,
Transport for the North

1 million companies help
the area generate over

£304bn
(that's 18% of England's GDP)



'We will also draw upon the existing network of forests in and around our largest towns and cities under England's Community Forest programme'... DEFRA



HM Government

A Green Future: Our 25 Year Plan to Improve the Environment



25 Year Environment Plan

4. Focusing on woodland to maximise its many benefits

We will increase tree planting by creating new forests, and incentivising extra planting on private and the least productive agricultural land, where appropriate. This will support our ambition to plant 11m trees.

We will take the opportunities of other landscape scale interventions, including when scoping a Nature Recovery Network, to drive extensive woodland planting while enhancing our distinctive landscapes. We will also work with industry and support Grown in Britain to increase the amount of home grown timber used in England in construction, creating a conveyor belt of locked-in carbon in our homes and buildings. A wide range of economic and environmental benefits will flow from commercial afforestation to meet the growing demand for timber.

We will not focus solely on planting, however; we will also support increased protection of existing trees and forests. Pests and diseases threaten the wide range of benefits we derive from trees and plants. We want to make sure our trees can withstand future threats.

Beyond the economic benefits, the Government recognises the significant heritage value and irreplaceable character of ancient woodland and veteran trees. We are committed to ensuring stronger protection of our ancient woodlands, making sure they are sustainably managed to provide a wide range of social, environmental, societal and economic benefits.

1. Supporting the development of a new Northern Forest

We will support the planting of a forest that crosses the country in a belt of trees, using the M62 corridor as its spine. With £5.7 million of government funding, we will support the existing partnership of the Community Forests and the Woodland Trust to accelerate and further develop the Northern Forest. This will deliver accessible community woodland to a large swathe of England and at the same time help us to meet our statutory carbon budget requirements. This area has an increasing population, meaning that future generations will benefit from this new forest.



Looking up into the crown of an Ash tree (Photo Forestry Commission / Isobel Cameron)

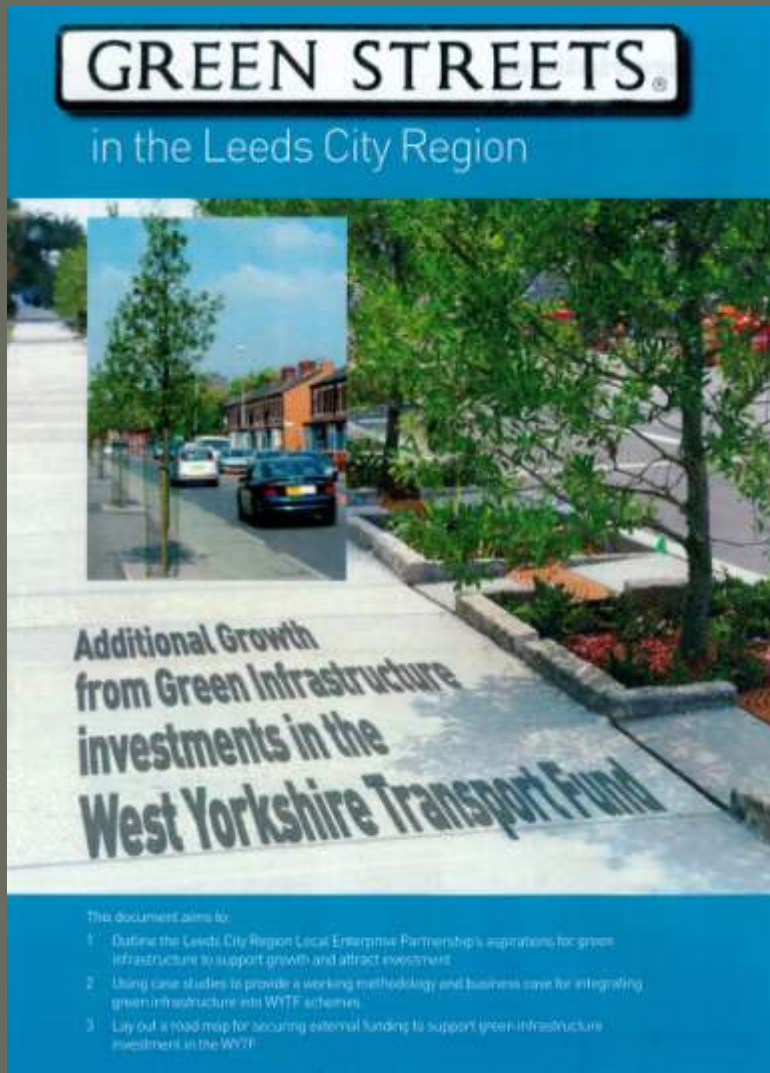
We will make sure that landowners, farmers and key forestry stakeholders help lead the work, and that it balances the various environmental, social and economic benefits of forestry. We will explore the best use of innovative forms of private sector finance, including philanthropic, social and commercial investment.

Proposed Trees in the Northern Forest...

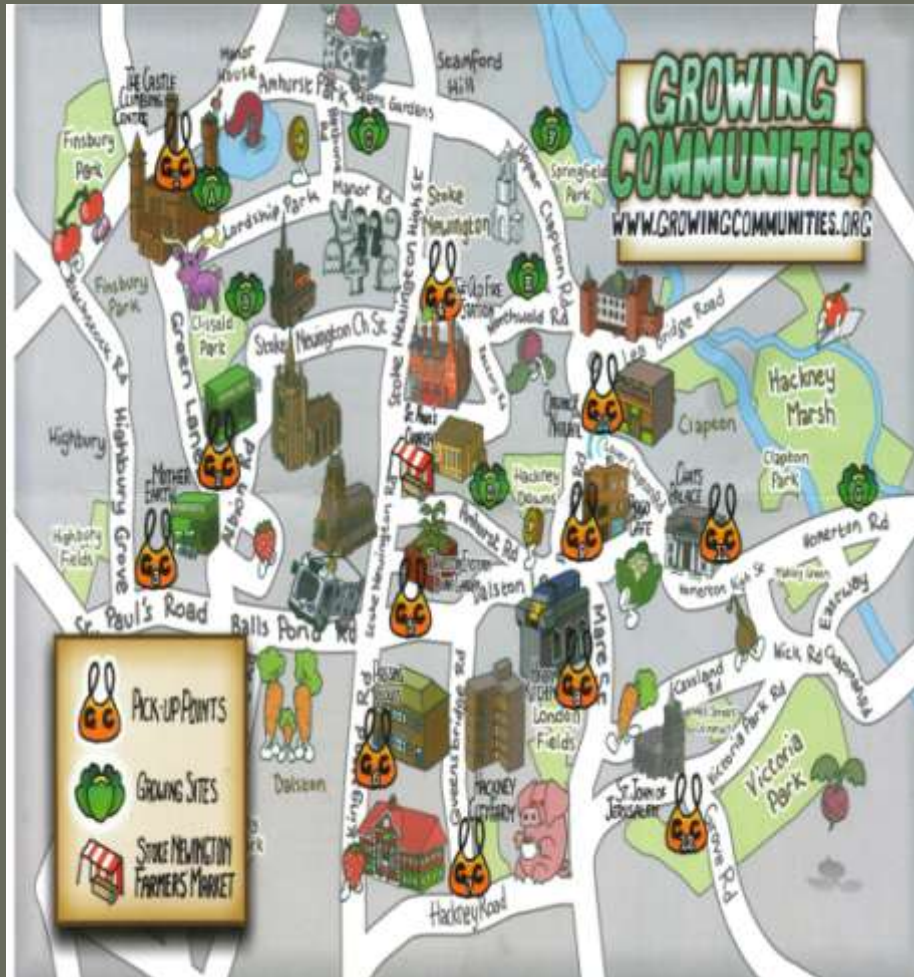
- Hills & Moorlands : 11.3 million
- Farmland & Lowland Areas (inc. Natural Flood Management) : 26.1 mill.
- **Urban Fringes : 5.3 million**
- **Towns & Cities : 7.3 million**

Green Streets will include...

- Street Trees [the right tree planted in the right place in the right way for the right reasons]
- Other Tree Planting
- Rain Gardens
- Green Roofs and Walls
- Urban Orchards
- Natural Habitats
- Green Ways



Orchards / Production...



Working with local people...



FIGS, DATES, LAUREL, AND MYRRH



Plants of the Bible and the Quran

LYTTON JOHN MUSSELMAN

Foreword by
GARRISON KEILLOR





The essence of the Green Streets approach...

- Go to the people, live with them, learn from them. Start with what they know; build with what they have.

But with the best leaders, when the work is done – the task accomplished, the people will say...

‘We have done this ourselves’

**To conclude...there are no more new frontiers
– we have got to make it here. Thus...**

- The Benefits delivered by an Urban Forestry approach demand that trees in the public realm receive much better trans-disciplinary design and structure planning so that the quality and resilience of our towns and cities is significantly improved by gaining more viable urban habitats than now exist...**



- We must plant more trees in and around our towns and cities to connect, define and green our Poly-Centric City Regions – the right tree, in the right place, for the right reasons – and not be afraid of geometry...



- This must be part of a belief in the value and importance of our plural city regions as a nucleus of our culture, together with a more radical approach to post-industrialism and natural processes – such as can be found in the concept of Urban Forestry...



As Urban Foresters, we need to remember that...

- The future is not some place we are going to, but one we are creating. The paths are not to be found but made, and the activity of making them changes both the maker and the destinations.

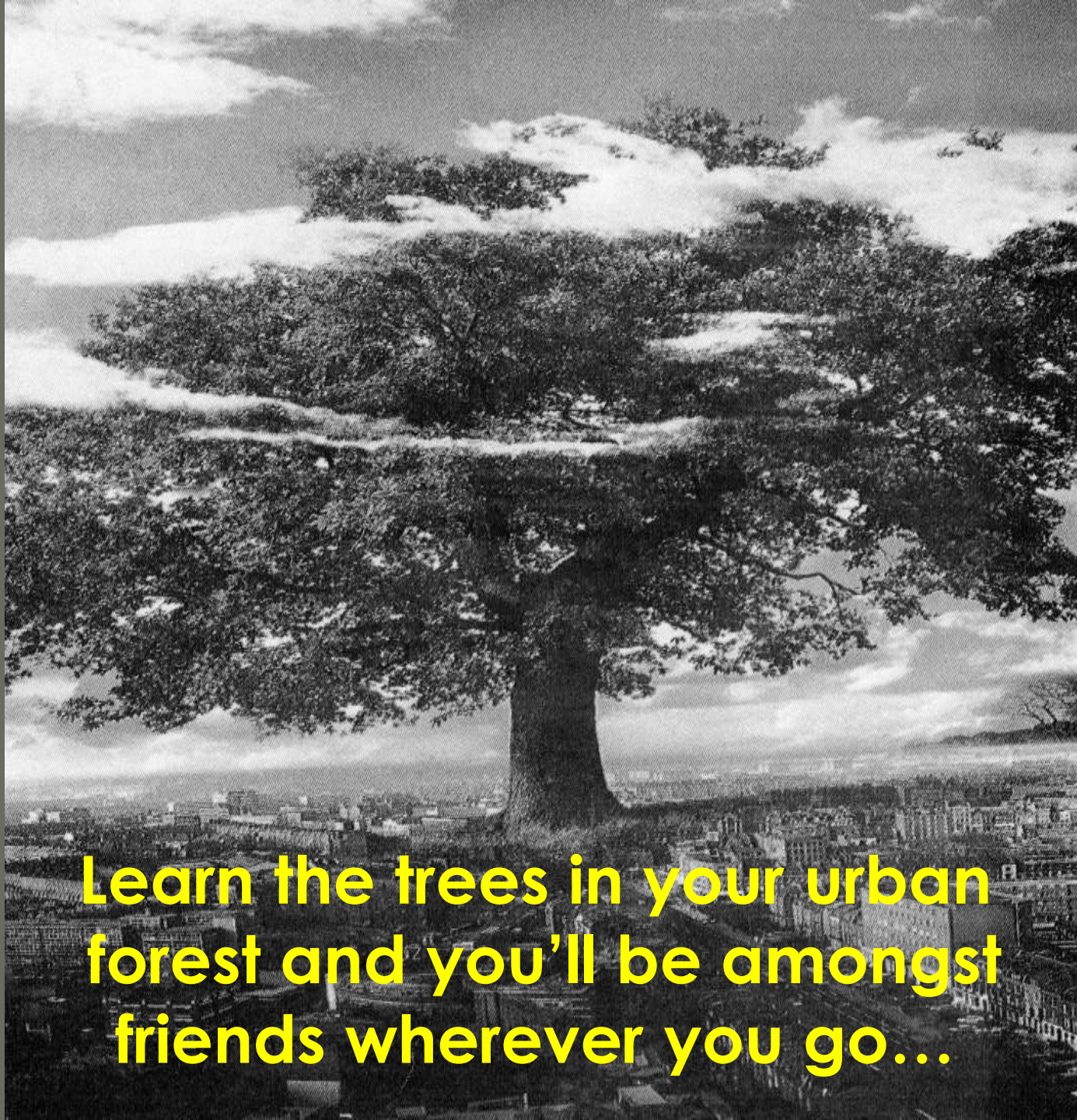
Very roughly after John Scharr





QUIET

TREES AT WORK



Learn the trees in your urban forest and you'll be amongst friends wherever you go...



Thank you for your attention.....