



## Designing with trees

**Chair: Joe Stenson**, Group Head of Urban Design at Barratt Developments plc

### The plant expert's perspective – choosing species for multiple benefits in a changing climate

**Peter Thurman**, Principal, The Thurman Consultancy

### The landscape design perspective for healthy places and healthy streets

**Lee Heykoop**, Landscape Manager, Sustainability and Design Implementation, Homes England

### Case Study 1: Placemaking with trees

**Ryan Murphy**, Director, Bradley Murphy Design

### Case study 2: Green space connectivity, guided by trees – trees as signposting for green space entrances and connectivity

**Marion Preez**, Director, Landscape Architect, Urban Pioneers

#### Partners:

**Urban Design Group, Landscape Institute, RIBA**

#### QUESTIONS, COMMENTS AND REFERENCES BY TOPIC

We have done our best to put comments in the right place! The most useful elements are the many references attendees have provided, otherwise all to be read in conjunction with the recording and the presentations

#### Requests from TDAG

- I have just been asked which tree strategies I could recommend or who is really good at developing tree strategies - any suggestions, please email me. [sue.jamesriba@gmail.com](mailto:sue.jamesriba@gmail.com)
- Ideas for 2025 seminars – again email me with suggestions. Thanks
  - What I would like to hear more of is how we move our focus to what already exists in the ground and how we can grow those trees well into maturity, starting with how one plans / prepares / improves the planned or existing planting site.

#### Presentations

Together the presenters gave us a very full picture of designing with trees. The questions came thick and fast and so there are collated below under topics rather than trying to apportion them to any one presentation.

## Tree species

This was a big subject and generated a number of questions and comments.

Referring to the TDAG species guide (*Tree Species Selection for Green Infrastructure*), it outlines choices for various issues that were raised such as:

Railways – tree selector ‘transport corridor’

Fruit – tree selector ‘ornamental qualities, plus in ‘issues’ for the negative’ aspects

Tree width – tree selector ‘size’ and ‘crown’ shape

Water – tree selector ‘environmental tolerance’

Thorns – check in ‘issues’

Allergens – check in ‘issues’

Wind – while not covered by the guide, criteria search ‘coastal’ provides more robust tree species

- Andy Hirons has done some work for the Woodland Trust on trees and biodiversity value - it is quite complex but would be useful if we could add to the TDAG tree species guide
- When designing new developments do you consider species that might be associated with a space like in the previous iteration of a landscape?
- Are you planning ahead for future climates in your choices?
- Is there a list of trees suitable for highways/street tree planting available?
  - <https://www.tdag.org.uk/tree-species-selection-for-green-infrastructure.html>
  - Also highly recommend the book *The essential tree selection guide* by Henrik Sjoman and Arit Anderson (NB. This is based on the TDAG guidance. Henrik is a co-author for both)
- I think provenance is just as important as species selection
- Gleditsia have been planted a lot in some Bristol streets but they look great
  - Yes, and not all have thorns!
  - We planted *Gleditsia triacanthos* "Skyline" in Scotland on an exposed site but found that it isn't doing that well. Leaves appear quite late into the year
- Would you suggest then not to design with fruit trees?  
I've worked in a couple of project recently that to achieve the 10% BNG net gain, the ecology consultant suggested to choose between a variety of local fruit trees. What do you think of this suggestion?
- What's your opinion on *Paulownia tomentosa*
  - Beautiful and well-behaved in the UK
- Are silver birch, London plane and lime still being specified in urban areas?
  - Yes - I am a planting officer in London and have had to push back on several landscape architects for specifying 80% *Betula*
- **Natives v. Aliens**  
Given the need for diversification, what's your view on exploring non-native species for highway planting and street trees?
  - Non-native species have to be on the urban tree agenda
  - How would you convey this need to government institutions such as Highways England who seem to be totally against non-natives?

- 'NATIVES VERSUS ALIENS': the relevance of the debate to urban forest management in Britain:  
<https://setmanadelsboscosurbans.wordpress.com/wp-content/uploads/2015/04/natives-versus-aliens.pdf>
- "Future native" <https://reforestingscotland.org/a-forest-for-the-future/>
- Pollen as allergen is something of a neglected issue for some
  - I think Trees in Hard Landscapes provides some basic information on planting to avoid pollen allergen
    - It does...also wind direction etc...but there are some many allergens out there apart from trees - so a discussion in itself!
    - The Allergy-Fighting Garden by Thomas Leo Ogren
- 1. Start with 30 odd native species, take away the species which aren't appropriate for planting (fruiting, suckering, weak limbs etc.),  
2. then take away the remaining species which aren't being negatively impacted by pests and disease.  
3. remove remaining species which can't tolerate pollution/heat/drought/flooding  
You should be left with very few options, then it is time to suggest future proof species.
- Corsican Pines do pretty well but you'd best see what works at the site currently and work from there
- Acer platanoides 'Crimson King' seems to do well as does Coastal redwood
- I don't quite understand why fastigiated tree species are planted in places where there would be enough space for "normal" trees with larger root systems and crowns. Many of the fustigated breeds fall apart when they reach a size of 8m and higher. So they are rather prone to fail without getting very old. Also, in my experience, they are not that attractive to birds in terms of nesting.
  - I agree about when there is space. Not ALL fastigiate forms break apart
  - It's not just the breaking apart of fastigiate trees but their propensity to lose this upright growth and spread outwards. Maintenance can then become a problem.

### **Edible landscapes**

We (Barratts) encourage the implementation of edible landscapes where appropriate, Peter's examples showing discarded windfall fruit causing slip hazards on a footpath is probably a good example of what not to do. Fruit Orchards or within public open spaces should be encouraged.

### **Trees and urban microclimates**

Urban areas have different microclimates from a tree's perspective; different rainfall, temperature and wind conditions

### **Tree species and water demand**

- When I worked on new build developments, we had several clients that would only accept trees that were listed as low water demand, which severely limited the trees we could plant around new housing.
- I seem to remember a note in NHBC guidance saying, that if the tree isn't listed you can assume a medium water demand... I used that to help expand tree palette beyond the usual and very restrictive list

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Held on 29<sup>th</sup> October 2024. Questions, comments and references

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- Water demand' (WD) was a term in the NHBC guidance, coined by Giles Biddle, which he defined as follows:  
"The ability of vegetation to cause drying of a clay subsoil"
- Desiccation is defined as "the level of soil drying typically associated with subsidence damage". Desiccation does not mean that the soil is completely desiccated and there is no moisture remaining in the soil. There may still be plenty of moisture in the soil, but the soil has dried enough that subsidence can occur.

NB. This area needs further research and robust evidence.

### Trees and wind

- Is there a good source for guidance on trees that tolerate windy conditions
- Book by Henrik Sjomann and Arit Andersen has criteria for this.
  - The Sjomann Anderson guide is based on the TDAG species guide as Henrik was an author for both

### Trees and noise

Forest Research are producing a First Steps in trees and noise

### Carbon sequestration

Peter, how can tundra possibly be sequestering more carbon than woodland? I accept entirely that there may be a lot of carbon embedded in tundra but how is it sequestering any more

- Yes, I get that, but is it still sequestering? And how? If you plant trees then at least you can see the carbon in the form of wood. And I know that the rate of sequestration falls as the new woodland matures but it seems to me there's a lot of confusion around the topic.
- <https://www.resilience.org/stories/2020-02-13/the-irreversible-emissions-of-a-permafrost-tipping-point/>
- Yes, that's all about keeping the methane contained. We need to capture more carbon without releasing the stuff that's currently embedded.
- So peat is effectively pure carbon  
Dartmoor is a really good carbon sink because of this, the carbon is locked up within the peat bogs in anoxic conditions preventing its decay which locks in so much more carbon than a tree can
- Short summers and long, cold winters stunt the decomposition of organic matter. Plant remains, which as a result of continuous freezing and thawing of the soil, can remain trapped in a layer of permafrost for several thousand years. This is why tundra is a carbon sink, trapping carbon dioxide and keeping it from returning to the atmosphere.

### Utilities and services

This was another big area of discussion.

If you are building a location from scratch, or part of a team who are doing so, do you ask them to plan buried services to be well away from tree planting to allow trees to grow as big as possible? Also if you are collating buried services, are you allowing enough space for future expansion easily?

- NUAR – National Underground Asset Register  
<https://www.gov.uk/government/news/os-named-future-operator-of-national-underground-asset-register>
- The Government have recently announced that OS will be taking the National Underground Asset Register (NUAR) forward into 2025
- Integrating trees and lighting? when in the process do lighting designers get involved as trees and us are not usually good bed fellows 😊 canopy width for instance is hugely important from my perspective as we have to place a column at least 5m from a canopy edge. Do tree people have any knowledge of these restrictions that lighting guys encounter and how can we better work together? I am a huge advocate of trees as my research around infrared light and how trees deliver that to us in an incredible way is truly remarkable so we need more trees but I still have to get lights onto the street too. How do you guys approach this, do you work closely with your lighting people?
  - For me the issues around planning lighting, is that even when I've said to designers that they need to keep lights away from trees, they keep putting them by the trees. Then I have to say that we can't put up bat boxes to tick a box in bream, as there is too much light pollution,
  - Worth you pointing street lighting engineers towards the British Standard for street lighting (BS 5489) - it mentions a lot about designing around trees and even using trees as part of their lighting scheme by lighting the tree and so showing where a bend is etc
    - Absolutely Gavin, I am fully aware of the BS but often trees are sited before we even get to start a design. if we can't meet the BS and LPA spec then the site doesn't get approved so trees are a little more moveable but as I said, its compromise ultimately.
    - I would say that it wouldn't be the case with myself. I have met British Standards and LPA compliance, but I always ask about bat/bird/bee box positions before I design but also its a two-way street as we need to achieve compliance so sometimes, we simply can't move lights and the trees therefore will need to move. collaboration is key I feel, I shouldn't be one or the other, we both have to prevail
    - There are definitely conflicts around some of the recommendations of lighting engineers and the detrimental impact on nocturnal biodiversity if you're going to light up the tree, as well as increase maintenance on the trees as they adjust their growing patterns around lighting.
  - In Trees in Hard Landscapes, we say that there needs to be integration and collaboration between all elements of infrastructure...putting trees alongside lighting as a critical element...but isn't this the challenge with a whole range of professionals and those delivering who need to work together?
    - Absolutely however in my experience the conversation doesn't happen. We are often asked to just work around the trees but with the tighter layouts from developers this becomes troublesome to fit them in and still meet British Standards. How can we bring our two specialisms closer together as I certainly want to ensure enough

trees make it into design. Can we also think of putting them in back gardens? In my infrared research trees deliver infrared to our mitochondria and therefore are essential for health (see research from Glen Jeffrey and Robert Fosbury etc at UCL. Honestly more trees are needed for health but we still have to light the roads (well for now anyway).

- Also the question from the start for Ryan too, in terms of the critical infrastructure - did they add in lots of room to allow future expansion in the existing buried services runs and allow as much room as possible for trees to grow to their ultimate height and spread, not curtailed by the tree pit sizes?
- Non-adopted means greater control of utility runs, doesn't it?
- NJUG is being reviewed. Volume 4: Street Works UK Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2): <https://streetworks.org.uk/resources/publications/>

### Tree strategies

- At the 21/5/2024 TDAG webinar, Jim Smith asked how we might get trees to be considered as 'critical infrastructure'. Does anyone know why DEFRA decided - in 2019 - that the imposition of a statutory obligation on local authorities to produce a Tree and Woodland Strategy would be an "excessive burden"?
- In Sheffield, citizens successfully campaigned for a city tree strategy with appropriate, adequate sub-strategies. Once the Forestry Commission had published its 'Sheffield Tree Felling Investigation Report' (on the 18/7/2019), effectively forcing Sheffield CC to change its ways, the Council was ready to publish its first city tree strategy. That provided resolutions that are acceptable to all stakeholders.  
<https://ianswalkonthewildside.wordpress.com/2022/05/20/sheffields-fig-forest/comment-page-1/#comment-6541>
- DEFRA Consultation outcome (15/10/2019):summary of responses and government response  
(6.4 Government response to questions 12-13 [tree strategies]):  
<https://www.gov.uk/government/consultations/tree-and-woodlands-introducing-measures-for-felling-street-trees/outcome/summary-of-responses-and-government-response>

### Highways and street tree planting technical drawings

This has been delayed but is now moving forward and should be completed early in the new year.

- The 'Supplementary Technical Guidance for Highway Tree Management' is expected to support the HE 'Streets for A Healthy Life' document and supersede Forestry Commission operations note 51 (published as a result of the Sheffield investigation in to the felling of 17,500 street trees).
- Recommended tree root protectors if the tree is adjacent to the highway, please?
  - Root barriers don't always work. Give them room so they don't need protection?
  - That isn't always possible if a planning requirement is to put them, trees, adjacent to the highway. As a highways officer I have to make sure any

trees thrive and survive but I have to make sure the roots do not cause issues with the adopted highway

- We, Highways, don't always have the room

### **Trees and railways**

LNER has a guidance for tree species near railway, distance, species etc

Network Rail's Biodiversity Strategy

<https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjtuVok5rOJAxVzW0EAHdqrA2QQFnoECAgQAQ&url=https%3A%2F%2Fwww.networkrail.co.uk%2Fwp-content%2Fuploads%2F2020%2F12%2FNetwork-Rail-Biodiversity-Action-Plan.pdf&usq=AOvVaw3pEZcpuH CTavhV3dg4Hk &opi=89978449>

Any advice for managing trees/vegetation in large, complex organisations (such as Network Rail where I work). Despite having biodiversity and vegetation management strategies there remains a disconnect between development projects and operations/maintenance within the organisation. As an organisation we lack a unified vision and the technical capabilities to manage vegetation effectively. How can we bridge this gap?

### **Urbanism and trees**

The built environment has formed itself around pre-existing countryside trees and hedge lines in the suburbs at least.

### **New developments**

- When designing developments, how do you move developers and residents away from the idea of flat grass lawns with a few select trees, which offer little in the way of biodiversity, climate resilience, water retention, etc.? Lawns are low on maintenance, but not future-proofed - what would you recommend instead
- Barratts have an initiative devised with the RSPB for each of our new development's show home gardens to be defined as 'Wildlife friendly' with specific planting specifications to encourage a biodiverse environment within the private garden space.  
Customers are given the opportunity to replicate the wildlife friendly gardens and are encouraged to do so as part of the wider landscape strategy for the site.

We can only influence, not control the customer's preferences for hard or soft landscape in their own curtilage once they've taken control of their own plot.

- Have you designed in dark sky corridors through those areas? as I would imagine that there would be a lot of light pollution coming from the housing and streets
- I've seen schemes that have been designed to be one way, and the end users change things like adding in security lighting in the back gardens, which have changed it all :)
- Is the level of tree cover in the high-density areas of Alconbury the same as the medium/low density areas? from experience it often seems that the high density doesn't benefit in the same ways from the green infrastructure
- The local authority Tree Officer should be communicating with the developer to make sure the proposed planting is appropriate. If that's not happening, it is most likely because the local authority doesn't have a tree officer or there just aren't enough tree officers employed to handle the workload.

### **Community tree nurseries**

Please would all developers include community tree nursery areas, e.g. alongside allotments? (Waiting for a plot to be delivered near me - had it written into planning permission.)

### **Planting success or failure rates, enforcement and monitoring/maintenance**

- We have had great success rates at Alconbury on the larger tree stock however that was largely due to ensuring the tree pit design, soil strategy and monitoring / aftercare.
- Seen so many dead trees in developments, really disheartening, esp. on sites where the council has allowed the plans to include the unnecessary removal of mature established trees for the work phase (nowhere near the planned building) and then planting lots of samplings where the majority have died. and the council hasn't followed up when the public has reported this
- And no performance management.
- How will they be monitored/enforced?
- Contact your local councillor and get enforcement from Planning on the case, once voting residents start moaning Cllrs take notice especially with elections coming up
- A new development in East Anglia had lots of new streets named after trees, then dead trees all down the roads
- Note: Fund4Trees has a research project on this topic and other research is underway.
- Any advice for managing trees/vegetation in large, complex organisations (such as Network Rail where I work). Despite having biodiversity and vegetation management strategies there remains a disconnect between development projects and operations/maintenance within the organisation. As an organisation we lack a unified vision and the technical capabilities to manage vegetation effectively. How can we bridge this gap?
- We recently had volunteers plant whips, but apparently, they all died. We now have more whips to plant. Any lessons @Marion Preez
- We have the same problem. Community members also don't like seeing whips fail...
- Did you find a solution to the end maintenance team ruining things? as I know people in Kingston who are running community group planting areas, having the same issue with council contractors
- Have a good relationship with Councillors and Cllrs take an interest?
- I think they have tried that. They have also tried complaining to the contractor, who promised to assign more horticulturally minded staff to the site, but they didn't find any change in the issues they have seen on site this year.



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- Also include contractors in community planting, if you can, so they're part of the community too. (Charm the bosses!)
- Recruit some Volunteer Tree Wardens! <https://treecouncil.org.uk/tree-wardens/>
- We have to challenge the expedience of planting trees if we have no plans or budget to support their establishment as such projects will inevitably fail to achieve their objectives
- ...and monitoring how they are being handled during the development too, as contractors always say they are following the BS guides, but what we see on site differs a lot from what they say in an email
- Also on completion, what kind of monitoring have been done for the trees, the water quality, biodiversity etc. to evidence what is working and what may need to be tweaked for the next time you do something similar?
- As Ryan stated in combination with BMD's monitoring - U&C do regular monitoring on all their strategic sites - BNG, trees, water and open spaces
- Joe - Question for you. Very interested in your 'managed verge' method. Would be very helpful to have further information of how to implement this, including how land ownership is divided and how maintenance is agreed?

## Soils

- DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites:  
<https://assets.publishing.service.gov.uk/media/5b2264ff40f0b634cfb50650/pb13298-code-of-practice-090910.pdf>

Many developers do nothing to protect soil in areas earmarked for tree planting. Due to inhospitable ground conditions (and inadequate tree protection), most trees deteriorate in condition and continue to struggle to make quality specimens – many die.

## Tree value

It is clear from all the case studies that there's a huge natural and cultural capital value to trees, and thinking about making people clear on the cost effectiveness. London tree officers have a valuation system to put a monetary value on trees to inform decision making, is there anything similar for new plantings and developments in existing treescapes elsewhere? also please be aware Natural England are working on green town and cities schemes so more information of design guides for green infrastructure is available and accreditation coming soon.

- Need to clarify your question - the LTOA guidance is CAVAT? In Trees, Planning and Development we demonstrate this in practice. Ideally, I suppose we would be able to put value of trees (present and future) - existing and new plantings in all decision making
- CAVAT for trees is useful, not sure if it has been used for new plantings ? Planning / landscape conditions for new developments only last for 5 years - maybe the new BNG requirements will help. ?? <https://www.ltoa.org.uk/resources/cavat>

### **NHBC guidance**

NHBC Ch 4.2 prevents us as designers from planting any worthy forest scale or large trees near buildings...or rather it specifies that the foundations have to be designed and constructed to cater for the future growth of such trees?

- TDAG is working with the NHBC Foundation on this. Hopefully a first step towards reviewing and updating Ch.4.2 with the focus on improving foundation design
  - Sue - I think the key about the NHBC Foundation research is that TDAG is very much in the conversation
- NHBC doesn't 'prevent' anything. 0\_0 Three years ago, at the National Tree Officers Conference (2021), we were told that NHBC guidance is being revised and the new guidance is expected to include guidance on tree species selection and get improvements to the foundation depth calculator that is supposed to be used when building on clay soils.  
<https://ianswalkonthewildside.wordpress.com/2021/10/25/late-flowers-and-autumn-berries/#comment-6000>
- Vital point is how to integrate buildings and trees especially on shrinkable soils

### **Miyawaki**

Anyone tried any Miyawaki type approaches on any sites?

- Responses were mixed – some in favour and had good examples, some against.
- Testing the Miyawaki Method in Our Urban Greenspaces – Natural England
- Tiny Forest - Earthwatch Europe We have had some positive experience within North East Community Forest in terms of locating these in urban areas / green spaces and school grounds - where the community have been involved. Positive outcomes with tree wardens coming forward and children involved in citizen science. They have grown really well and become focus in some of the open spaces.
- There is a large amount of investment in soil amelioration prior to planting Miyawaki which is not normally considered as part of the costs compared to conventional planting. As they originated as a means of dealing with highly compromised soils in brownfield sites

### **Terminology**

- I feel more comfortable with 'living landscapes' compared to 'soft' - how do we create language that we can all agree on????
  - I don't mind the term soft landscaping, as on our sites, it differentiates between the areas where soil can breathe, and the areas which are covered in permeable or impermeable surfaces which are being classed as "green". as an ecologist, soft to me, allows for access to the soil etc. to invertebrates and other animals that rely on them.
- Tree establishment, not tree planting must be our mantra

### **General References**

A Trees and Woodland Strategy Toolkit for Local Authorities

<https://treecouncil.org.uk/what-we-do/science-and-research/tree-strategies/>

This TDAG guide has some handy tips for keeping existing trees on developments

<https://doi.org/10.25500/epapers.bham.00004109>

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Is there a link for the Barratts Redrow successful landscapes guide?

You can download it here: <https://we.tl/t-bPXtf7IFpm>

Or e-mail me @ [joe.stenson@barratplc.co.uk](mailto:joe.stenson@barratplc.co.uk) and I will e-mail a PDF copy

BS5837: 2012 – now under review

<https://web.archive.org/web/20210606094012/https://beta.bathnes.gov.uk/sites/default/files/2020-01/BS5837%202012%20Trees.pdf>

*Trees in Hard Landscapes* <https://www.tdag.org.uk/trees-in-hard-landscapes.html>

<https://ianswalkonthewildside.wordpress.com/2021/01/24/parakeets-back-on-their-nesting-site-at-graves-park/comment-page-1/#comment-5081>

<https://inews.co.uk/news/environment/revealed-suburban-trees-felled-rate-58-day-56159>

<https://web.archive.org/web/20200806190954/https://inews.co.uk/news/environment/revealed-suburban-trees-felled-rate-58-day-56159>

How to protect and manage the urban forest

<https://www.gov.uk/guidance/how-to-protect-and-manage-the-urban-forest>

Designated sites –

[www.naturalengland.org.uk/GreenInfrastructure/downloads/Design\\_Guide/Green\\_Infrastructure\\_Framework.pdf](http://www.naturalengland.org.uk/GreenInfrastructure/downloads/Design_Guide/Green_Infrastructure_Framework.pdf)

<https://www.urbanandcivic.com/media-library/case-studies/treeconomics-alconbury-weald/>

BNGECOS 44 (5.1)- Selling England by the pound

<https://www.ecos.org.uk/ecos-44-5-1-selling-england-by-the-pound/>

Our next TDAG online seminar, and the last for 2024, 20th November from 2-4pm GMT on 'When is tree protection not tree protection'.

Register here:

<https://bham-ac-uk.zoom.us/meeting/register/tZMudu6hpgjvE9UEw21sqT0tqJlWxMz5JOx8#/registration>

Sue James for the Trees and Design Action Group