Our proposal for a new Bristol Tree Replacement Standard

The Bristol Tree Replacement Standard (BTRS), which was adopted nearly a decade ago in 2013, provides a mechanism for calculating the number of replacements for any trees that are removed for developments. It was ground-breaking in its time as it typically required more than 1:1 replacement.

The presumption should always be that trees should be retained. The application of BTRS should only ever be a last resort. It should not be the default choice, which it seems to have become.

The starting point for any decision on whether to remove trees (or any other green asset) is the Mitigation Hierarchy[1] which states, firstly, avoid; then, if that is not possible, minimise; then, if that is not possible, restore; and, as a last resort, compensate (the purpose or BTRS). Core Policy BCS9 adopts this approach and states that:

> *Individual green assets should be retained wherever possible and integrated into new developments.*

However, with the emergence of a new Local Plan for Bristol, we believe that the time has come for BTRS to be revised to reflect our changing understanding of the vital importance of trees to the city in the years since the last version of the Local Plan was adopted in 2014.

In addition, Bristol has adopted Climate and Ecological Emergency Declarations so a new BTRS will be an important part of implementing these declarations. Nationally, the new Environment Act 2021 (EA 2021) is coming into force late next year.

Our proposal provides a mechanism for complying with the new legal requirement for 10% Biodiversity Net Gain (BNG) which will be mandatory when EA 2021 takes effect.

Background

Under current policy - BCS9 and DM17 - trees lost to development must be replaced using this table:

Trunk Diameter of tree lost to development (cm measured at 1.5 m)	Number of replacement trees
<15	0-1
15-19.9	1
20-29.9	2
30-39.9	3
40-49.9	4
50-59.9	5
60-69.9	6
70-79.9	7
80+	8

Table 1 The Current BTRS replacement tree table

However, when the balance of EA 2021 takes effect late in 2023, the current version of BTRS

[1] https://nationalzoo.si.edu/ccs/mitigation-hierarchy

will not, in most cases, be sufficient to achieve the 10% BNG that will be required for nearly all developments. Section 90A will be added to the Town and Country Planning Act 1990 and will set out the level of biodiversity net gain required (Schedule 14 of EA 2021).

The Local Government Association says of BNG that it:

> *…delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development. Biodiversity net gain can be achieved on-site, off-site or through a combination of on-site and off-site measures.*[2]

GOV.UK says of the Biodiversity Metric that:

> *where a development has an impact on biodiversity, it will ensure that the development is delivered in a way which helps to restore any biodiversity loss and seeks to deliver thriving natural spaces for local communities.*[3]

This aligns perfectly with Bristol's recent declarations of climate and ecological emergencies and with the aspirations of the Ecological Emergency Action Plan,[4] which recognises that a BNG of 10% net gain will become mandatory for housing and development and acknowledges that:

These strategies [the Local Nature Recovery Strategies] *will guide smooth and effective delivery of Biodiversity Net...*

Our proposed new BTRS model

We propose that the Bristol Tree Replacement Standard be amended to reflect the requirements of the EA 2021 and BNG 3.1 and that the BTRS table (Table 1) be replaced with Table 2 below:

BNG 3.1 - Table 7-2[5]				BTRS Obligation
Category	**DBH (cm)**	**RPAr (m)**	**Area (ha)**	**Replacement Trees Required**
Small	<=30	3.6	0.0041	2
Medium	>30 to <=90	10.8	0.0366	10
Large	>90	15.6	0.0765	21

Table 2 The proposed new BTRS tree replacement table

[2] https://www.local.gov.uk/pas/topics/environment/biodiversity-net-gain.
[3] https://www.gov.uk/government/news/biodiversity-30-metric-launched-in-new-sustainable-development-toolkit.
[4] https://www.bristol.gov.uk/documents/20182/5572361/Ecological_Emergency_Action_Plan.pdf/2e98b357-5e7c-d926-3a52-bf602e01d44c?t=1630497102530.
[5] DBH = Diameter at Breast Height. RPAr = Root Protection Area radius. Area = the calculated BNG habitat area.

The Replacement Trees Required number is based on the habitat area of each of the three BNG 3.1 tree categories (Table 7-2 below) divided by the area habitat of one 30-year old BNG 3.1 Small tree (Table 3 below) plus 10% net gain. This is rounded up to the nearest whole number since you can't plant a fraction of a tree.

The reasoning for our proposal is set out below:

1. Applying the Biodiversity Metric to Urban trees

The most recent Biodiversity Metric (BNG 3.1) published by Natural England, defines trees in urban spaces as Urban tree habitats. The guidance states that:

> *the term 'Urban tree' applies to all trees in urban situations. Urban trees may be situated within public land, private land, institutional land and land used for transport functions.*

Table 7-1 divides Urban tree habitats into three categories:

TABLE 7-1: Urban tree definitions

Urban tree categories	
Individual trees	Young trees over 75mm in diameter measured at 1.5m from ground level and individual semi-mature and mature trees of significant stature and size that dominate their surroundings, whose canopies are not touching but that are near other Urban trees.
Perimeter blocks	Groups or stands of trees within and around boundaries of land, former field boundary trees incorporated into developments, individual trees whose canopies overlap continuously.
Linear blocks	Lines of trees along urban streets, highways, railways and canals whose canopies overlap continuously.
Note: it is important these categories are applied in an urban environment only. For example, a line of trees along a canal or road would not mean automatic classification as a linear block of Urban trees, as these features may also fit the definition of a 'line of trees' within the linear module of the metric. The surveyor should take into account the degree of 'urbanisation' of habitats around the tree and assign the best fit for the particular situation.	

2. Calculating Urban tree habitat

Urban tree baseline habitat area is measured in hectares and is based on the Root Protection Area[6] (RPA) of each tree impacted by a proposed development. RPA is used instead of tree canopy because it is considered to be the best proxy for tree biomass.

In most cases, RPA is obtained from an Arboricultural Impact Assessment (AIA), which complies with **British Standard 5837 2012 - Trees in relation to design, demolition and construction** (BS:5837).

Where no AIA is available, Table 7-2 is used:

[6] RPA **area = π × r2** where **r** is 12 x the tree's DBH for a single stemmed tree. For multi-stemmed trees, the DBH of the largest stem in the cluster should be used to determine **r**.
GOV.UK advice is that **r** should be at least 15 times larger than DBH - https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions.
The Woodland Trust also recommends that **r** be set to 15 x DBH for ancient and veteran trees - https://www.woodlandtrust.org.uk/blog/2021/04/root-protection-areas.

TABLE 7-2: Urban tree size classes and their area equivalent

Size class	Diameter at breast height (cm)	Metric RPA radius (m)	Metric area equivalent (ha)
Small	≤ 30cm	3.6m	0.0041 ha
Medium	> 30 to ≤ 90cm	10.8m	0.0366 ha
Large	> 90cm	15.6m	0.0764 ha

Note that the tree's size will still need to be ascertained, and that any tree with a stem diameter (DBH) 75mm or more and of whatever quality (even a dead tree, which offers its own habitat benefits) is included. Under BTRS, trees with a DBH smaller than 150 mm are excluded, as are BS:5837 category "U" trees.

The guidance also makes it clear that, given the important ecosystem services value provided by trees, where possible like-for-like compensation is the preferred approach, so that lost Urban trees are replaced by Urban trees rather than by other types of urban habitat.[7]

3. Replacing lost trees

To calculate the number of trees required to replace Urban tree habitat being lost, table 7-2 above is used on this basis:

> *Size classes for newly planted trees should be classified by projected size at 30 years from planting.*

We have used the median DBH sizes for new stock trees as set out in **BS 3936-1: Nursery Stock Specification for trees and shrubs** as the basis for calculating the eventual size of a newly planted trees after 30 years and assumed that a tree adds 2.54 cm (1") to its girth annually.

This results in a predicted stock tree size after 30 years' growth. This is then assigned to one of the three Urban tree categories set out in table 7-2: Small, Medium or Large. In all cases save for Semi-mature tree stock, the eventual size of stock trees after 30 years falls within the BNG 3.1 size category **Small**, which has a habitat area of **0.0041 hectares**. This value is then used to calculate how many new trees will be required to replace trees lost to the development, plus a 10% biodiversity net gain. This gives a compensation size per replacement tree of 0.0045 ha.

Table 3 below shows the basis of our calculation:

[7] Paragraph 7.8 – Trading Rules.

Annual Tree Growth (cm)		Girth	DBH	Growth Period (yrs)	DBH after 30 years		
		2.54	0.8085	30	24.26		
Urban Tree Habitat size 30 years after planting							
Tree Size (BS 3936-1)	Planting DBH (cm)	Eventual DBH (cm)	RPA r (12 x DBH) (m)	RPA (sq m)	RPA (ha)	BNG 3.1 Size	BNG 3.1 RPA (ha)
Light Standard	2.23	26.49	3.18	31.73	0.0032	Small	0.0041
Standard	2.86	27.12	3.25	33.26	0.0033	Small	0.0041
Select Standard	3.50	27.76	3.33	34.85	0.0035	Small	0.0041
Heavy Standard	4.14	28.40	3.41	36.48	0.0036	Small	0.0041
Extra Heavy Standard	4.77	29.03	3.48	38.11	0.0038	Small	0.0041
Advanced Heavy Standard	5.41	29.67	3.56	39.81	0.0040	Small	0.0041
Semi-mature	6.84	31.10	3.73	43.74	0.0044	Medium	0.0366

Table 3 Annual stock tree growth predictions

4. The likely impact of this policy change

We have analysed tree data for 1,038 surveyed trees taken from a sample of AIAs submitted in support of previous planning applications. Most of the trees in this sample, 61%, fall within the BNG 3.1 Small range, 38% within the Medium range, with the balance, 1%, categorised as Large.

Table 4 below sets out the likely impact of the proposed changes to BTRS. It assumes that all these trees were removed (though that was not the case for all the planning applications we sampled):

BNG 3.1 Category	Tree Analysis		BTRS Impact		Habitat (ha)	
	Sample Tree Count	% Share	Current Policy	New Policy	Current Policy	New Policy
Small	628	61%	730	1,256	3.27	5.63
Medium	397	38%	1,628	3,970	7.29	17.78
Large	13	1%	104	273	0.47	1.22
Totals	1,038	100%	2,462	5,499	11.03	24.63

Table 4 Proposed BTRS impact analysis

The spreadsheet setting out the basis of our calculations can be downloaded here - RPA Table 7-2 Comparison.

Our proposed changes to BTRS (published in the Planning Obligations Supplementary Planning Document, page 20) are set out in Appendix 1.

Bristol Tree Forum
7 June 2022

Appendix 1

Our proposed changes to BTRS, set out in the Planning Obligations Supplementary Planning Document, page 20.

Trees - Policy Background

The justification for requiring obligations in respect of new or compensatory tree planting is set out in the Environment Act 2021, Policies BCS9 and BCS11 of the Council's Core Strategy and in DM 17 of the Council's Site Allocations and Development Management Policies.

Trigger for Obligation

Obligations in respect of trees will be required where there is an obligation under the Environment Act 2021 to compensate for the loss of biodiversity when Urban tree habitat is lost as a result of development.

Any offsite Urban tree habitat creation will take place in sites which are either on open ground or in areas of hard standing such as pavements.

Where planting will take place directly into open ground, the contribution will be lower than where the planting is in an area of hard standing. This is because of the need to plant trees located in areas of hard standing in an engineered tree pit.

All tree planting on public land will be undertaken by the council to ensure a consistent approach and level of quality, and to reduce the likelihood of new tree stock failing to survive.

Level of Contribution

The contribution covers the cost of providing the tree pit (where appropriate), purchasing, planting, protecting, establishing and initially maintaining the new tree. The level of contribution per tree is as follows[8]:

- Tree in open ground (no tree pit required) **£765.21**
- Tree in hard standing (tree pit required) **£3,318.88**

The 'open ground' figure will apply where a development results in the loss of Council-owned trees planted in open ground. In these cases, the Council will undertake replacement tree planting in the nearest appropriate area of public open space.

In all other cases, the level of offsite compensation required will be based on the nature (in open ground or in hard standing) of the specific site which will has been identified by the developer and is approved by the Council during the planning approval process. In the absence of any such agreement, the level of contribution will be for a tree in hard standing.

The calculation of the habitat required to compensate for loss of Urban trees is set out in Table 7-2 of the Biodiversity Metric (BNG), published from time to time by Natural England. This may

[8] These values should be updated to the current rates applicable at the time of adoption. The current indexed rates as of April 2022 are £1,041.6 & £4,517.89 respectively.

be updated as newer versions of BNG are published.

The following table will be used when calculating the level of contribution required by this obligation:

BNG 3.1 - Table 7-2[9]				BTRS Obligation
Category	**DBH (cm)**	**RPAr (m)**	**Area (ha)**	**Replacement Trees Required**
Small	<=30	3.6	0.0041	2
Medium	>30 to <=90	10.8	0.0366	10
Large	>90	15.6	0.0765	21

[9] DBH = Diameter at Breast Height. RPAr = Root Protection Area radius. Area = the calculated BNG habitat area.