The Oxfordshire Flora Group is part of the Ashmolean Natural History Society of Oxfordshire, working with local and national organisations. It has produced a Rare Plants Register.

The Oxfordshire Flora Group monitor 28 no. plant species which are rare or threatened in Oxfordshire, counting and mapping their occurrences. Seven of these species are on the UK Biodiversity list. They also put in place appropriate site maintenance programmes and record all information about each plant producing reports at suitable intervals.

Apium graveolens	Wild Celery
Aristolochia clematitis	Birthwort
Blysmus compressus	Flat-sedge
Carex filiformis	Downy-fruited Sedge
Carex vulpine	True Fox-sedge
Cynoglossum germanicum	Green Hound's-tongue
Epipactis leptochila	Narrow-lipped Helleborine
Fallopia dumetorum	Copse-bindweed
Filago pyramidata	Broad-leaved Cudweed
Galium tricornutum	Corn Cleavers
Gentianella anglica	Early Gentian
Helosciadium repens	Creeping Marshwort
Himantoglossum hircinum	Lizard Orchid
Hypopitys monotropa	Yellow Bird's-nest
Lythrum hyssopifolia	Grass-poly
Microthlaspi perfoliatum	Cotswold Penny-cress
Neotinea ustulate	Burnt Orchid
Oenanthe silaifolia	Narrow-leaved Water-dropwort
Ophrys insectifera	Fly Orchid
Platanthera bifolia	Lesser Butterfly-orchid
Platanthera chlorantha	Greater Butterfly-orchid
Pulsatilla vulgaris	Pasqueflower
Ranunculus hederaceus	Ivy-leaved Crowfoot
Salvia pratensis	Meadow Clary
Sium latifolium	Greater Water-parsnip
Tephroseris integrifolia	Field Fleawort
Veronica praecox	Breckland Speedwell
Viola stagnina	Fen Violet

Where possible, options will be explored to introduce a selection of these species into the proposed planting scheme for the biodiversity roof mixes and rain gardens.

A broad palette of tree species brings a strong character and structure to the development, with a range of predominantly native and some non-native species. These offer food, shelter and nesting opportunities for wildlife together with a rich blend of seasonal colours and attractive forms. All trees will be planted in soft landscaped beds and are proposed in semi mature sizes to ensure good impact at planting.

The tree selection has been influenced by a visual analysis of species already doing well throughout ARC Oxford, together with trees resistant to known pests and diseases and principles set out in the Oxford Urban Forest Strategy 2021. The aim is for increased species diversity with new trees forming part of a potential wider campus, species-rich 'Urban Arboretum' to aid resilience to disease and impacts of climate change. Native species have been prioritised to provide improved habitats and a higher biodiversity value.

Site boundaries

- Planted with native Field Maple, Silver Birch, Common Alder and Wild Cherry
- Some Small-leaved Lime trees as it appears to be thriving on the campus already
- Aim is to further strengthen and thicken the existing tree lines and groups
- Oak has been avoided due to processionary moth
- A variety of disease-resistant Elm (Ulmus 'Vada') is proposed in small groups on plot frontage, continuing the theme of recently planted disease-resistant Elm trees in nearby Florence Park

Car park

- Native Silver Birch in rear car park contribute to shady woodland character
- Turkish Hazel are selected for their excellent disease resistance and drought tolerance
- Retention of two large existing Pine trees in new planted beds

John Smith Drive frontage

- New tree planting thickens the existing tree lines and groups
- Small groups of disease-resistant Elm and native Cherry and Lime
- Liquidambar and Zelkova trees form individual features selected for their anticipated resilience to climate change and their glorious autumn colouring

Site Boundary
Campus Boundary

NTS

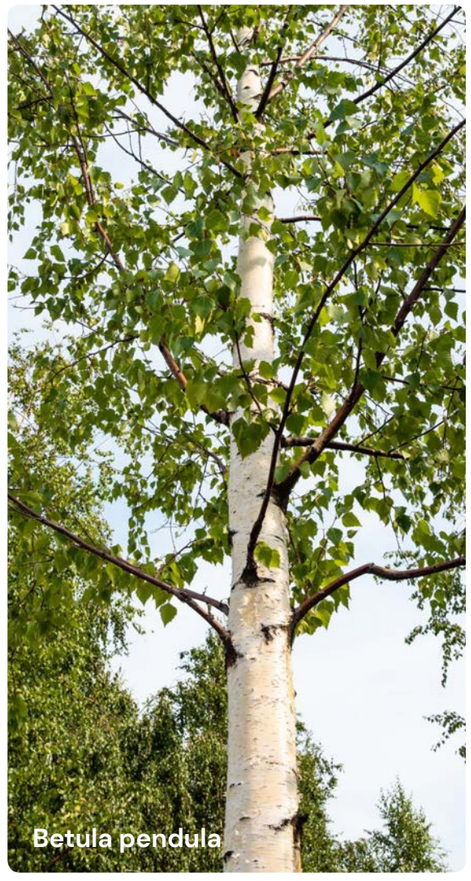
0 5 10 20 40

Existing trees		
Field Maple	*Acer campestre*	
Common Alder	*Alnus glutinosa*	
Silver Birch	*Betula pendula*	
Turkish hazel	*Corylus colurna*	
Wild cherry	*Prunus avium*	
Higan cherry	*Prunus subhirtella'Autumnalis'*	
Sweetgum	*Liquidamber styraciflua*	
Small-leaved Lime	*Tilia cordata*	
Elm	*Ulmus 'Vada'*	
Japanese Zelkova	*Zelkova serrata*	


Acer campestre


Alnus glutinosa


Tilia cordata


Betula pendula

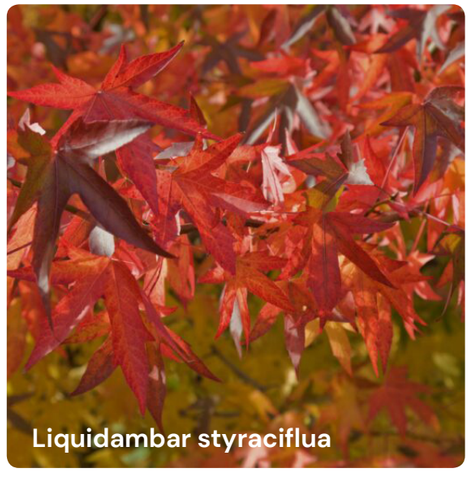

Liquidambar styraciflua


Acer campestre


Alnus glutinosa

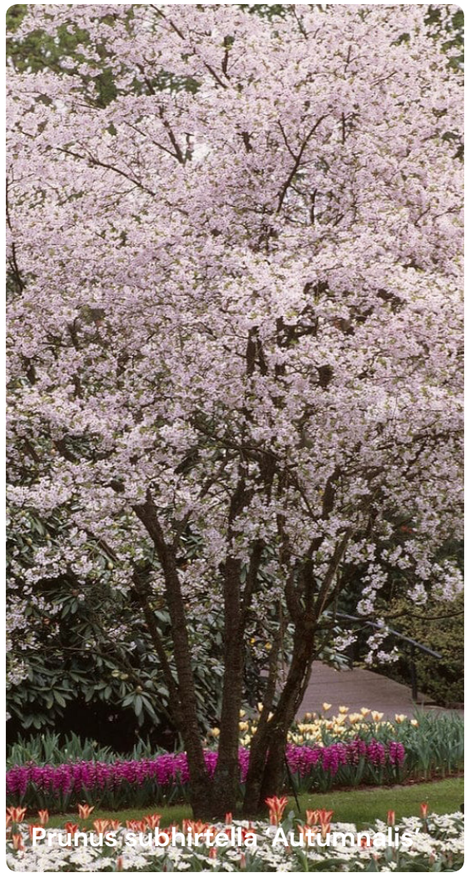

Tilia cordata


Betula pendula

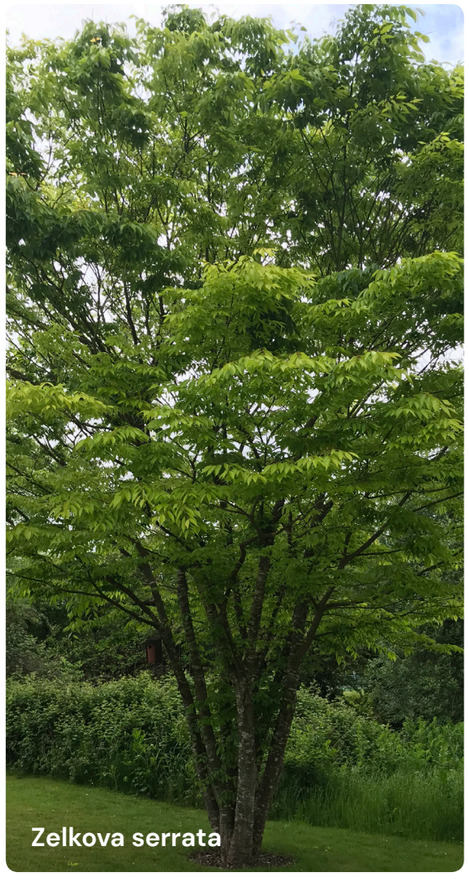

Liquidambar styraciflua


Prunus avium


Corylus colurna


Prunus subhirtella 'Autumnalis'

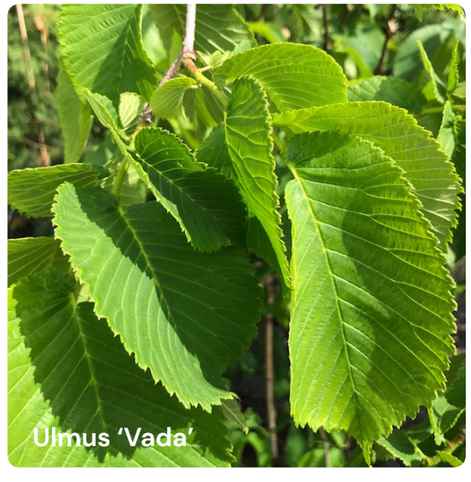

Ulmus 'Vada'


Zelkova serrata


Prunus avium


Corylus colurna


Prunus subhirtella 'Autumnalis'


Ulmus 'Vada'


Zelkova serrata

Elm trees were once common in Oxford which boasted some fine specimens. All were lost to Dutch Elm Disease in the 1970s.

There is an opportunity to connect with local community projects which are bringing Elm trees back to Oxford. A partnership between Oxford City Council and 'Oxford Communities for Zero Carbon' local conservation group has brought disease-resistant varieties of Elm tree back to Florence Park, located approximately 1km north-west of ARC Oxford. Here a new tree avenue of six new disease-resistant Elm trees was planting in November 2021.

The tree strategy for Plot 4200 focuses on the introduction of a diverse range of tree species which will form part of a species-rich urban arboretum at ARC Oxford, ensuring a more resilient landscape able to cope better with changing climate conditions. On Plot 4200, this range of species includes a disease-resistant variety of Elm, Ulmus 'Vada', with five semi-mature trees proposed on the eastern boundary fronting onto John Smith Drive. Ulmus 'Vada' is a medium-size tree, reaching 10-12m height and with very good resistance to Dutch Elm Disease.


PLANTING OF DISEASE RESISTANT ELMS


REPLANTING OF HISTORIC ELMS


FLORENCE PARK ELM TREES

Tree Canopy Cover Assessment

Methodology

Oxford City Council Technical Advice Note (TAN) 9 requires a tree canopy assessment to take place.
The projected canopy cover for the site over 10, 20, 25 and 30 years should be calculated for the site with and without development, taking into account tree growth, tree age and tree life expectancy on advice from the arboriculturalist.

The methodology set out in TAN 9 is as follows:

1. Calculate total area of existing baseline tree canopy cover within the application site.

2. Calculate existing baseline tree canopy cover as % of total application site area.

3. Taking account of key site specific tree canopy cover dynamics (e.g. tree growth, tree age, tree life expectancy/ potential to contribute etc.) project forward over time to predict total tree canopy cover within the application site at baseline + 10, +20 and + 30 years for the following scenarios:
a. No development.
b. With development.

4. Calculate impact on existing tree canopy cover by subtracting area of tree canopy cover for no development scenario from area of tree canopy for with development scenario, both at baseline + 25 years.

The policy states that the Council requires no net loss of canopy cover after 25 years (developed site vs existing site), however, a positive canopy gain has been targeted.

Notes on tree canopy cover

The table refers to tree canopies as shown in Aspect Trees' 'Tree Survey' dated May 2023
Only trees (dia. >7.5cm) within the site red line have been considered
Trees included within the canopy measurement are those where the trunk sits on or is within the boundary
Canopy of included trees measured to the full extent, even if this extrudes beyond the boundary
Where there are overlapping canopies, this will just be measured as one canopy
Assumed the 1 no. cherry trees in poor condition and classified as Category 'U' by the arboriculturalist cannot be realistically retained as a living tree for 10 years or longer

Assumed growth rates

Assumed diameter spread increase of 1m Ø every 10 years for existing oaks
Assumed diameter spread increase of 1.5m Ø every 10 years for existing limes, pines, birch, cherries and whitebeam
Assumed canopy spread of 4m for the proposed trees at planting
Assumed diameter spread increase of 1.5m Ø every 10 years for the proposed trees
The percentage given is an approximate percentage of the canopy as a proportion of the plot area
Percentages are rounded up to two decimal places

Following on from the baseline assessment earlier in the report, the projected canopy cover for the site within the proposed development has been calculated. This has taken into consideration proposed tree removals, existing retained trees and proposed tree planting.

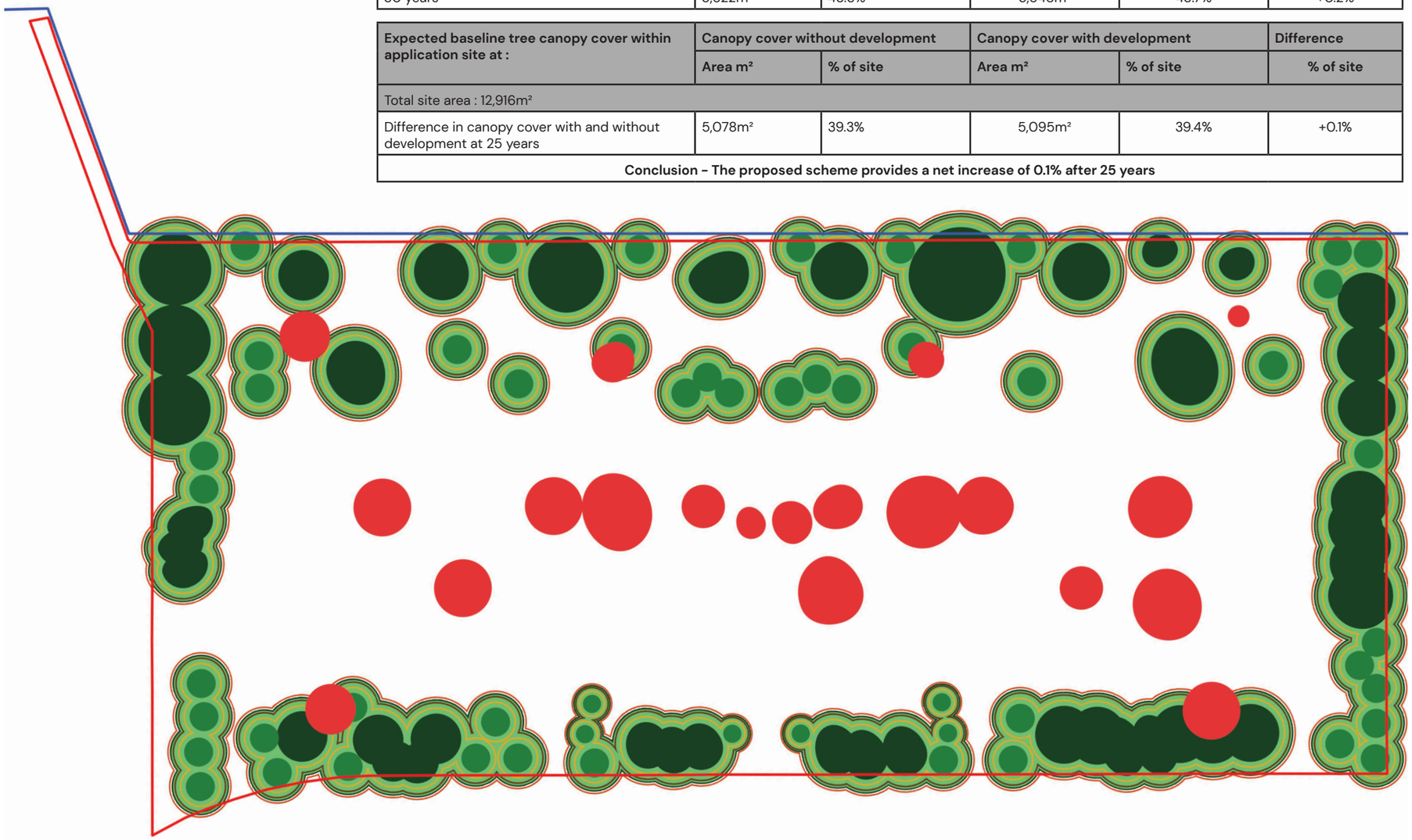
The results show a tree canopy cover uplift at 25 years, with 17m² canopy cover increase within the development. This provides a tree canopy cover of 39.4% of the site area, which is a 0.1% canopy cover increase of the developed site over the site without development.

Assumed growth rates

- Assumed diameter spread increase of 1.5m Ø every 10 years for all existing trees
- Assumed canopy spread of 4m for the proposed clear-stemmed trees at planting
- Assumed diameter spread increase of 1.5m Ø every 10 years for the proposed clear-stemmed trees
- The percentage given is an approximate percentage of the canopy as a proportion of the plot area
- Percentages are rounded up to one decimal place
- Assumed canopy spread of 2.5m for the proposed multi-stemmed trees at planting
- Assumed diameter spread increase of 1.0m Ø every 10 years for the proposed multi-stemmed trees

Expected baseline tree canopy cover within application site at :	Canopy cover without development		Canopy cover with development		Difference
	Area m²	% of site	Area m²	% of site	% of site
Total site area : 12,916m²					
At planting	2,631m²	20.4%	2,409m²	18.7%	-1.7%
10 years	3,548m²	27.5%	3,461m²	26.8%	-0.7%
20 years	4,547m²	35.2%	4,544m²	35.2%	-0.0%
25 Years	5,078m²	39.3%	5,095m²	39.4%	+0.1%
30 years	5,622m²	43.5%	5,648m²	43.7%	+0.2%

Expected baseline tree canopy cover within application site at :	Canopy cover without development		Canopy cover with development		Difference
	Area m²	% of site	Area m²	% of site	% of site
Total site area : 12,916m²					
Difference in canopy cover with and without development at 25 years	5,078m²	39.3%	5,095m²	39.4%	+0.1%
Conclusion - The proposed scheme provides a net increase of 0.1% after 25 years					



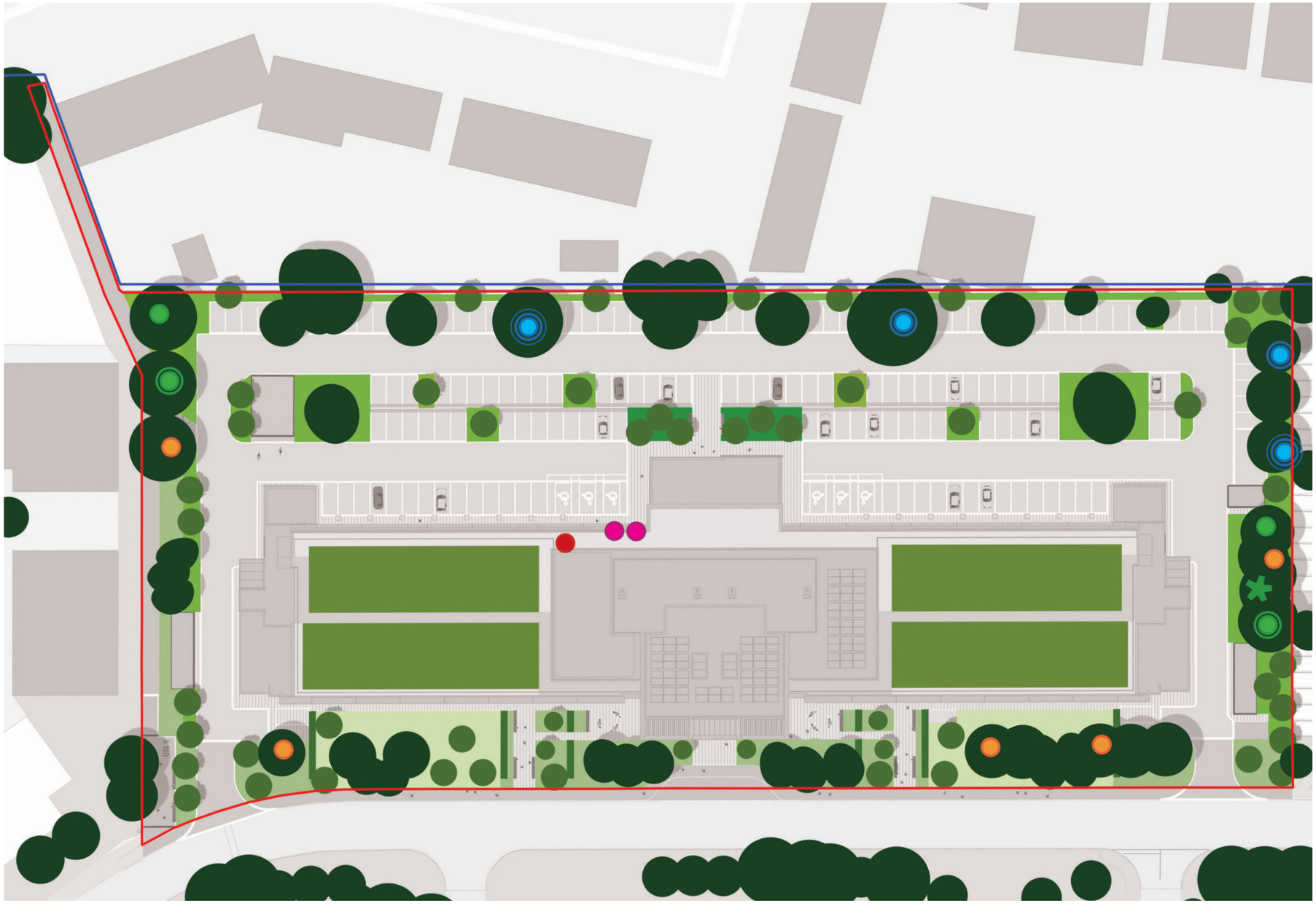
Site Boundary
Campus Boundary
Existing retained trees - canopy at Year 0
Proposed trees - canopy at Year 0
Existing and proposed tree canopies at Year 25
Existing trees removed to facilitate development

NTS
0 5 10 20 40

In collaboration with the project ecologist Ecology Solutions, a biodiversity strategy has been developed with a variety of initiatives that aim to increase biodiversity across the site, providing improved resources for wildlife. This will be achieved through retention of existing trees, creation of a diverse range of new habitats and a long-term strategy for habitat management.

The key strategies include:

- Site clearance to include timing / phasing of tree and vegetation clearance to avoid the bird-nesting season and hedgehog winter hibernation period
- During the construction phase, precautionary measures to protect badgers with construction lighting restricted to ensure continued dark corridors across the site
- Retention of all boundary trees plus key trees to the internal site area
- Maximising the quantity of new tree planting with 49 no. proposed semi mature trees in a range of predominantly native species
- Provision of a variety of habitats that feature a rich mix of species including plants attractive to pollinators, foraging and commuting corridors, and food sources for small animals including hedgehogs and badgers
- 50% of the soft landscaped area on the plot is planted with species providing nectar sources
- A large area of biodiversity roof of Sedums and wildflowers combined with PV panels
- Installation of bird, bat and invertebrate boxes in line with the requirements of TAN 8, including 9 no. nest sites for building-dependent birds, 5 no. bat roost boxes and 5 no. invertebrate boxes, together with tree-mounted bird nest boxes for a range of small birds
- Employing the DEFRA metric calculation, the scheme achieves 70.35% Biodiversity Net Gain which exceeds Oxford City Council's requirement of a Biodiversity Net Gain of 5%. For more information, refer to Ecology Solution's BNG Metric
- A lighting strategy has been designed with the use of low-UV warm-white LED bulbs with directional, downward-facing and shielded lights which prevent light spill and ensure dark spaces along the plot boundaries.



Site Boundary
Campus Boundary
Bat Boxes
Tree-mounted Bird Box with 26mm diameter entrance hole
Tree-mounted Bird Box with 32mm diameter entrance hole
Building-mounted Swift Nest box
Building-mounted house Sparrow Terrace
Invertebrate habitat features - Clay and Reed
Invertebrate habitat features - Wood Concrete
Invertebrate habitat features - Lacewing Box
Existing Retained Trees
Proposed Trees
Amenity Lawn
Woodland Ground Cover Planting
Rain Garden Planting
NTS
0 5 10 20 40
Flowering Ground Cover Mix
Biodiversity roof: sedums and wildflowers

Macgregor Smith

A range of attenuation measures have been integrated into the site design to manage surface water run-off at source before it enters the drainage system.

A large proportion of available roof space has been allocated as Blue Roof with an attenuation cell layer integrated below areas of paving and biodiversity roof.
At ground level, additional storage is provided by underground attenuation tanking in conjunction with a lined permeable surface system of block paving extending over much of the car park area and vehicular routes of the site. Rain gardens on either side of the rear building entrance form shallow planted depressions helping to absorb, slow down and filter surface water.

Refer to Baynham Meikle's Drainage Strategy Report for more detailed information.