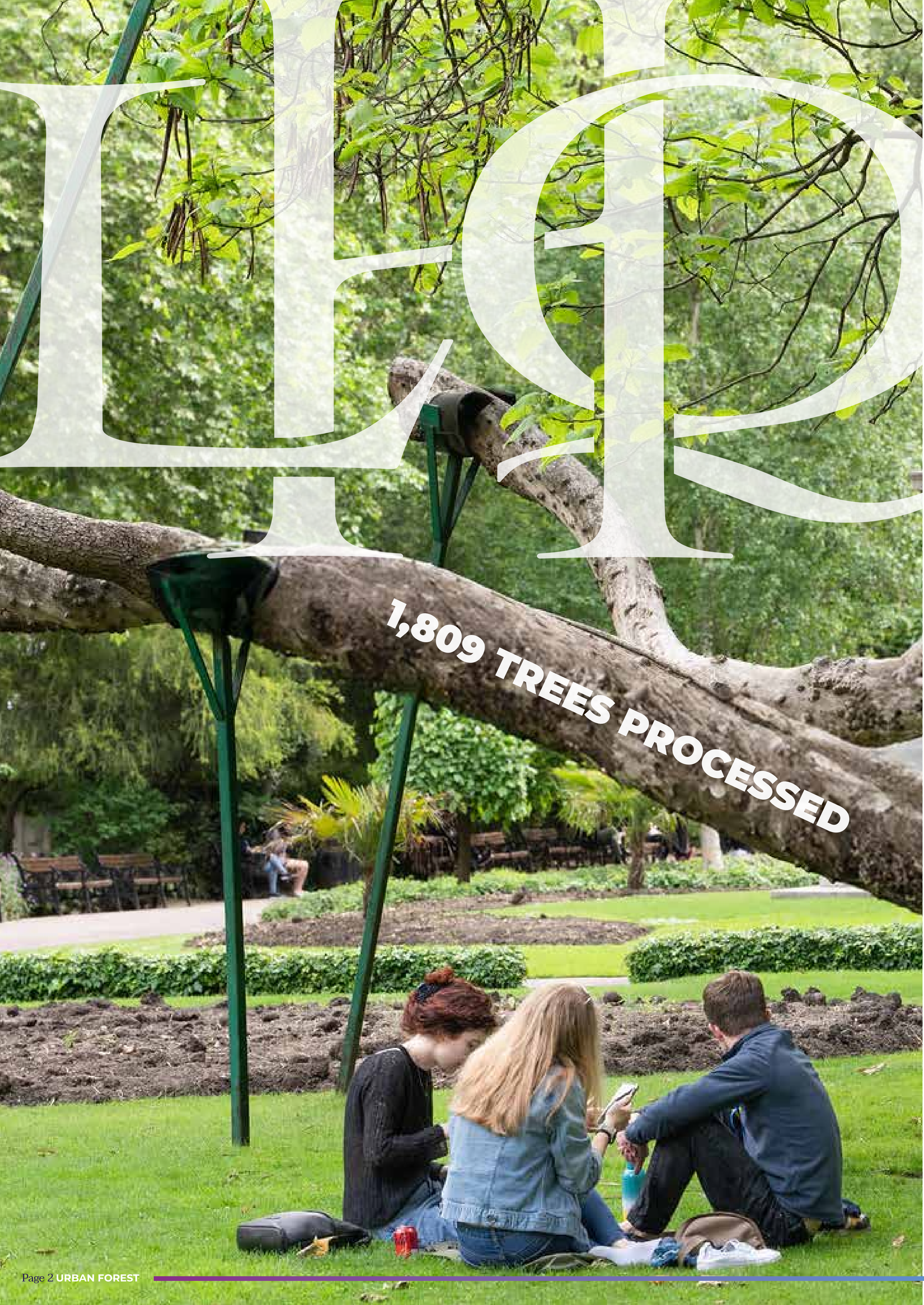
LONDON HERITAGE QUARTER

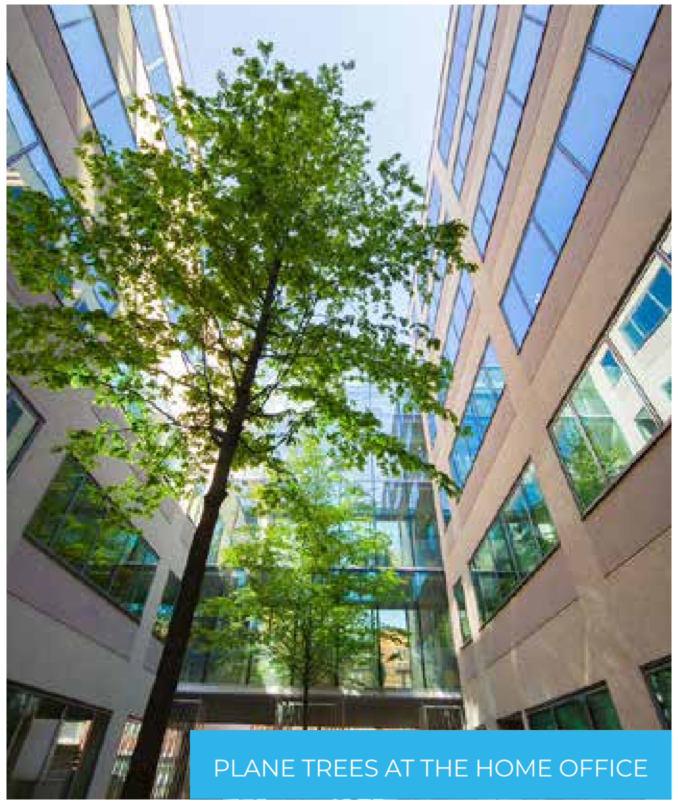
URBAN FOREST

Treeconomics



ALL ABOUT TREES

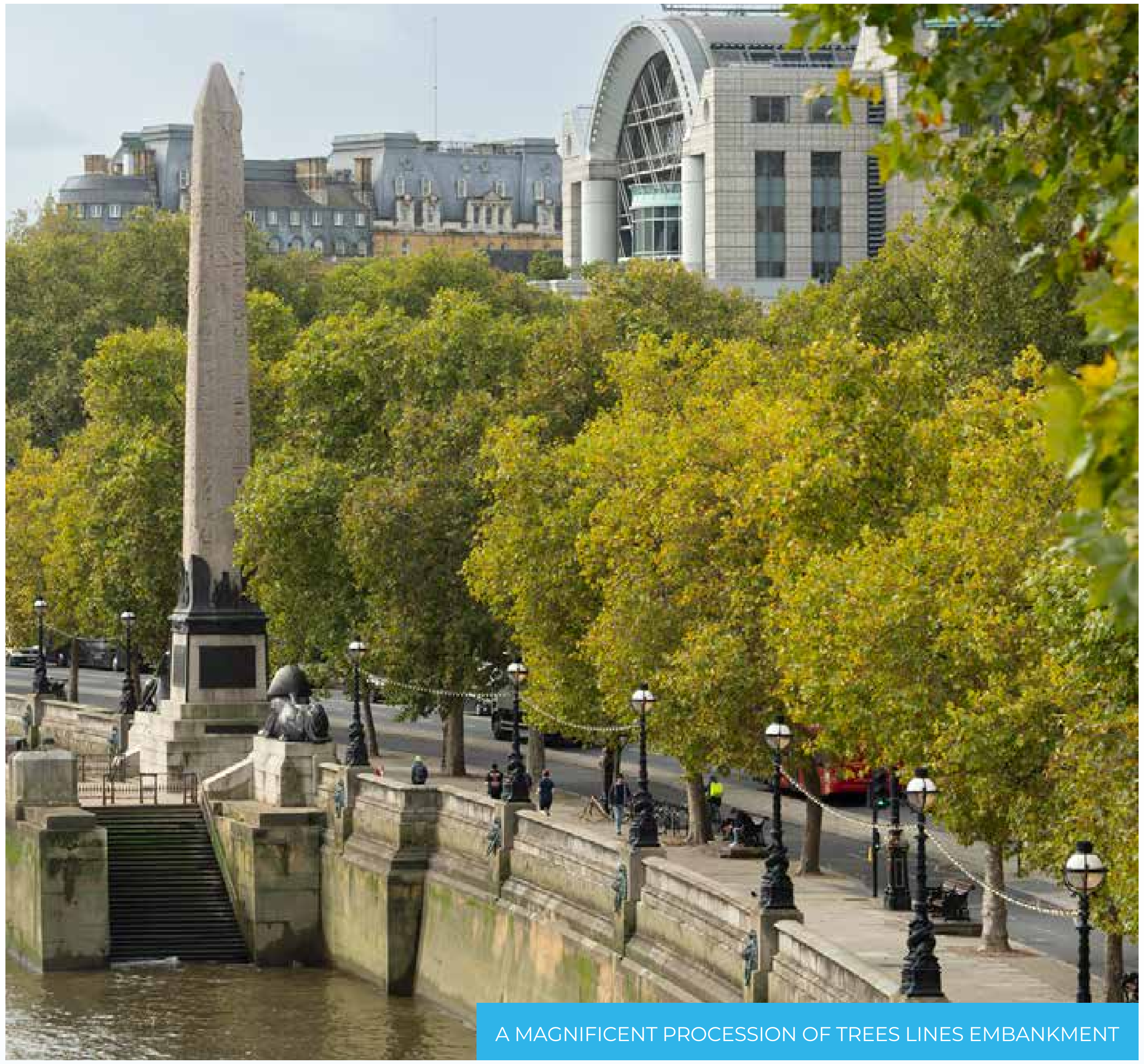
The trees in the parks, gardens, and streets of the London Heritage Quarter (LHQ) serve as valuable assets. They provide a wealth of benefits, offering resilience against climate change, protecting urban communities against the extremes of the urban heat island effect and temperature increases, and providing homes and forage for wildlife.


PLANE TREES AT THE HOME OFFICE

LHQ commissioned Treeconomics to assess the financial and multifunctional benefits of the trees across the LHQ area through an i-Tree Eco study.

1,809 trees were processed with data gathered via private surveys and from supplied public and private inventories.

Air pollution, amenity, carbon storage and sequestration benefits of trees have been calculated as well as replacement costs. These values are accompanied by metrics on tree species and canopy cover.

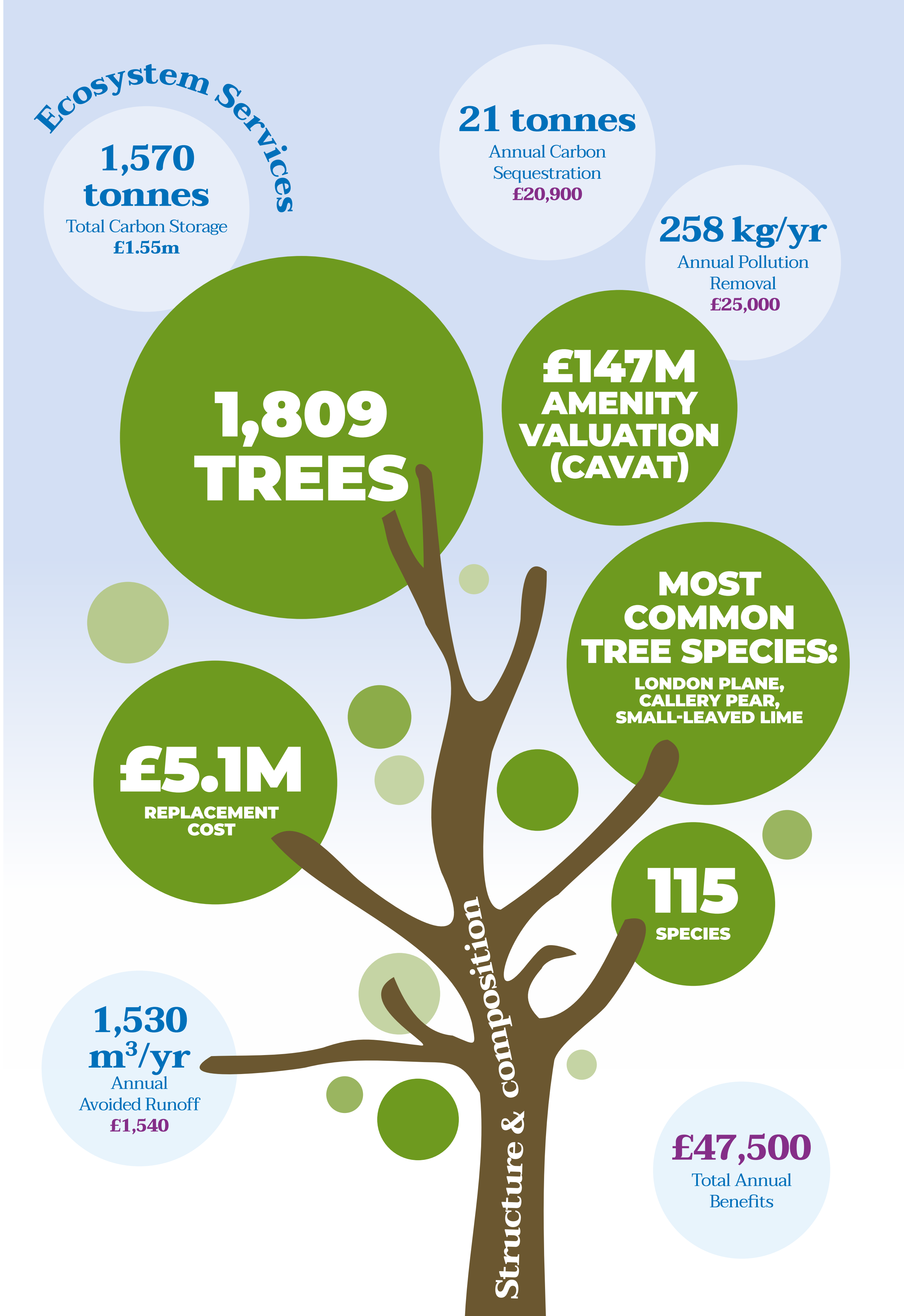


A MAGNIFICENT PROCESSION OF TREES LINES EMBANKMENT

KEY FINDINGS

Existing trees divert up to 1,530 cubic metres of storm water runoff away from the local sewer system every year, easing the pressure on the sewage network.

The trees remove a total of 258kg of pollutants each year and store 1,570 tonnes of carbon, sequestering 21 tonnes a year. The total structural value of the trees (the current cost to replace all the trees if they were lost) currently stands at £5.1 million. The Capital Asset Valuation for Amenity Trees (CAVAT) value – a value of trees to the local population, accounting for the level of public access and population density – stands at £147 million.



These are total figures for London Heritage Quarter, including Victoria, Victoria Westminster, Northbank and Whitehall BIDs.

COMMON SPECIES

Within the study area, trees belonging to 115 species and 70 genera were identified. The top 10 most common trees are listed below.

The urban forest in LHQ relies heavily on London plane – this species currently dominates the treescape. This is a result of the history of the area; these trees are a huge part of LHQ's character and heritage. Callery pear is the second most common species, while Small-leaved lime ranks third.

Top 10 Most Common Tree Species

Species	Tree Count	% of Population	Total Annual Benefits £	CAVAT Value £
London Plane	849	46.93%	36,808	120,719,441
Callery Pear	101	5.58%	353	463,251
Small-leaved Lime	50	2.76%	306	1,179,447
Common Hornbeam	41	2.27%	359	403,338
Silver Birch	31	1.71%	279	261,821
Black Locust	29	1.60%	438	648,948
Sweet Cherry	28	1.55%	155	258,453
Italian Alder	22	1.22%	339	651,648
Indian Bean tree	22	1.22%	459	2,711,460
Oriental Plane	20	1.11%	956	4,451,128

TREES ARE VALUABLE CARBON SINKS

CARBON STORAGE

Trees take in carbon dioxide during photosynthesis; the carbon captured in this process is stored within the plant in a number of different ways, whilst the oxygen is released. As trees grow they store more carbon by holding it in their tissue, but as trees die and decompose they release much of this carbon back into the atmosphere.

Approximately 50% of wood by dry weight is comprised of carbon, and tree stems and roots can store it for decades or centuries as woody matter whilst the tree lives, or even for millennia if it is formed into coal. Trees are therefore an excellent natural way to reduce the amount of carbon dioxide in the atmosphere, and positively influence climate change. Maintaining a healthy, growing tree population will ensure that more carbon is stored than released.

Below is a snapshot of where the 1,570 tonnes of carbon were stored within the trees in LHQ when the survey was undertaken in 2024. This value will change over time as carbon is sequestered each year (currently 21 tonnes each year) and added to the trees' bulk.

AN OAK TREE BESIDE CHARING CROSS STATION

TREES ABSORB AIR POLLUTANTS THROUGH THEIR LEAVES

CLEANER AIR

Poor air quality is a particular problem in many urban areas and along road networks. The problems caused by poor air quality are well known, ranging from human health impacts to building damage.

Trees significantly contribute to improving air quality by directly removing pollutants from the air, absorbing them through the leaf surfaces (1), by intercepting particulate matter e.g., smoke, pollen, aerosols created in the atmosphere, and dusts), and by reducing air temperature. (2)

By removing pollution from the atmosphere, trees reduce the risks of respiratory disease and asthma, amongst other benefits, thereby contributing to reduced health care costs. Tree cover, air pollution concentrations and leaf area are the main factors influencing pollution filtration and increasing tree planting has been shown to make further improvements in air quality. (3)

258 KG/YR

Annual Pollution Removal
Nitrogen Dioxide, Sulphur Dioxide, Particulate Matter (PM2.5)

AVOIDED SURFACE RUNOFF

Surface run-off threatens people, transport, property, and can contribute to pollution in streams, wetlands, rivers, lakes, and oceans. Surface water flooding is a concern in the LHQ area – a high-density built environment.

During precipitation events, a portion of the precipitation will be intercepted by vegetation; precipitation that reaches the ground and does not infiltrate into the soil becomes surface run-off.

Within an urban area like LHQ, the large extent of impervious surfaces increases the amount of run-off, however, trees are effective at reducing this. Trees intercept precipitation, whilst their root systems promote infiltration and water storage in the soil. Interception slows down rainwater reaching the ground, and some water will be evaporated off without ever touching the ground.

CANOPY COVER

Canopy cover is a basic, two-dimensional metric defined as the area of leaves, branches, and stems of vegetation covering the ground when viewed from above.

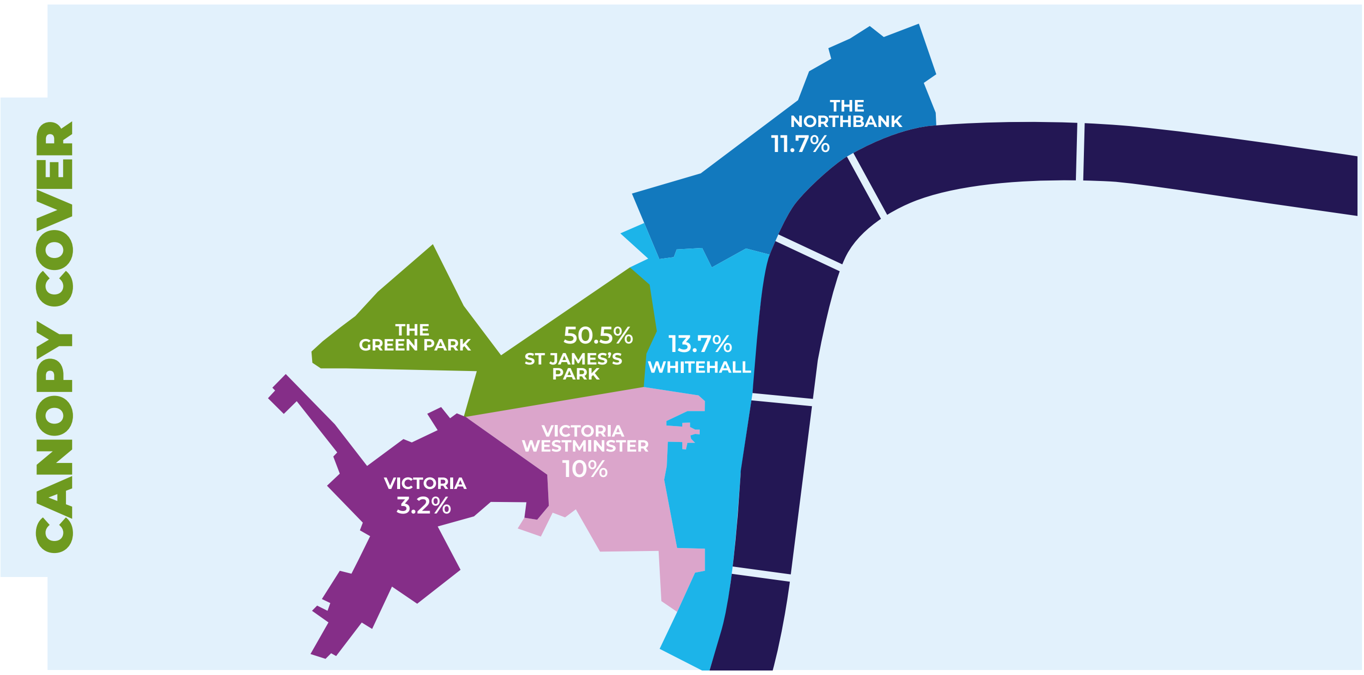
It can be used to gain a basic understanding of the ecosystem services provided by the urban forest, and can be used as a simple, repeatable method of assessing the growth of the urban forest over time.

In such an intensely urban area like LHQ, canopy is expected to be lower. High buildings may reduce the capacity for street trees and the lack of residential areas with private gardens is reduced, which is often a linchpin for high canopy cover in urban environments.

This is expected but also demonstrates how vital dedicated green spaces are for maintaining canopy cover and the related benefits trees provide.

In this graphic we include the estimated canopy cover for St. James's Park and The Green Park given their proximity to LHQ as highly valued and accessible green spaces. Unsurprisingly they have the highest canopy cover by a significant margin compared to the BIDs. LHQ relies mainly on concentrated groups of trees for canopy such as Embankment or squares and green spaces.

According to a 2024 GLA Methodology Report – Tree Canopy and Green Cover Mapping, canopy cover for Greater London is estimated to be 19.6%, and for Westminster it is approximately 21.4%. (4) The relatively low level of canopy cover across LHQ is a call to action to increase tree planting where practicable and protect trees already in situ.



THE URBAN FOREST

A valuable natural asset.

This booklet has highlighted the significant contribution of the urban forest, reinforcing its value in terms of amenity, biodiversity, and ecosystem services.

LHQ does not own trees, however the information nonetheless enhances our understanding of the values, benefits, and features of the urban forest and will be used to raise awareness among BID stakeholders and the wider community about its benefits. It will guide discussions on green infrastructure with both public and private tree owners, covering topics such as tree diversity to increase resilience, and strategies for new and replacement planting to support an aging tree population.

The findings also strengthen the case for continued LHQ investment in placemaking and sustainability projects, such as The Arc and Strand West projects whose concept design proposals include new street trees to create healthy and climate-resilient spaces.

What you can do now:

- Download our **LHQ Hub App** for information about the urban forest.
- Look out for street trees where you live and work especially in hot weather; keep these watering tips from **Trees for Streets** in mind.
- Look up tree-related organisations, such as **The Tree Council** and **Trees and Design Action Group**. TDAG group provides useful tree-related guides and information for planners, architects and urban designers as well as for the public.

STREET TREES SOFTEN OUR URBAN LANDSCAPE

Acknowledgments

We would like to thank the private residents and landholders for facilitating surveying, and all those who provided tree inventories, including The Royal Parks, Westminster City Council, Transport for London, and the Greater London Authority, amongst others without whom this project would not have been possible.

References

1. Escobedo, F., Nowak, D (2009). Spatial heterogeneity and air pollution removal by an urban forest. Landscape and Urban Planning, 2009 Vol. 90 (3-4) pp. 102-110.

2. As well as reducing ozone levels, some tree species also emit the volatile organic compounds (VOCs) that lead to ozone production in the atmosphere. The i-Tree Eco software accounts for both reduction and production of VOCs within its algorithms, and the overall effect of the trees is to reduce ozone through evaporative cooling, however this is not valued in this report as there is no UK Social Damage Cost for this pollutant.

3. Hirabayashi, S., (2012). i-Tree Eco Precipitation Interception Model Descriptions.

4. GLA Methodology Report – Tree Canopy and Green Cover Mapping (2024).

Methodology and Valuations

Data was processed using i-Tree Eco version 6.1.51. Inventory data was collated in 2024 and standardised. Given the requirements of i-Tree and the format of the data provided, some data manipulation was required. Where data was incomplete, assumptions were made. Many trees were recorded within the study to capture the total benefit that trees provide. However, a proportion of trees could not be measured.

Replacement cost: Council of Tree and Landscape Appraisers Methodology from the Royal Institute of Chartered Surveyors. Amenity valuation (CAVAT): Capital Asset Valuation for Amenity Trees (CAVAT) is a method developed in the UK to provide a value for the public amenity that trees provide. Carbon storage and carbon sequestration values are calculated based on figures jointly published by the Department for Energy Security and Net Zero, and the Department for Business, Energy & Industrial Strategy, at a sum of £269 per metric tonne of CO2e. Pollution removal: This value is calculated based on the UK social damage costs; £62.06 per kg (nitrogen dioxide), £17.118 per kg (sulphur dioxide), £463.823 per kg (particulate matter less than 2.5 microns). Avoided runoff: The value is based on an average volumetric sewerage charge of £1.0017 per cubic metre from Thames Water.

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