

# Royal Borough of Windsor & Maidenhead Sustainability SPD

## Consultation Version

September 2023

Bioregional & Edgars on behalf of Royal Borough of Windsor & Maidenhead



EDGARS

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## Executive Summary

In June 2019, the Royal Borough of Windsor & Maidenhead (RBWM) declared an environment and climate emergency. This declaration enshrined the target of net zero carbon emissions in the borough by 2050, in line with the Government policy.

Following this declaration, the Council researched and prepared the Environment and Climate Strategy 2020-2025. This strategy sets out the Council's vision and five-year action plan for embarking on meeting the challenge of climate change. The strategy focuses on how we as a borough can significantly reduce our carbon emissions and key themes including Circular Economy, Energy, Natural Environment and Transport.

Actions to address climate change and reduce carbon emissions need to be taken across every sector. This planning guidance is one of the key actions identified in the strategy and is required to help shape development in the direction of net zero carbon, protect and enhance the natural environment, drive carbon reductions in the borough and deliver wider climate change mitigation and adaptation.

Applicants and developers, planning officers, planning committees and other decision makers will be expected to take the SPD into account when designing or making decisions on any form of new development in the borough.

The SPD adds value to the Borough Local Plan (BLP) by:

- Providing transparent, holistic guidance for applicants with more detail about policy requirements and expectations.
- Requiring applicants to consistently submit information to demonstrate compliance with policy.
- Helping officers and Councillors assess the environmental credentials of developments and make decisions.
- Encouraging developers to go further than current policy to demonstrate excellence in sustainable development, and providing guidance on how this could be done.

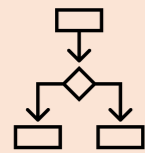
This SPD is being prepared by the Council in collaboration with industry experts, Councillors, and the local community and draws on industry expertise, examples of best practice and case studies to shape the content of the SPD.

In formulating the SPD, a process of scoping engagement has taken place through consultations with Council Officers, Councillors and the community.

This SPD will undergo a four-week consultation in Autumn 2023 before the Council makes a decision on its adoption. It is expected that the SPD will be adopted in early 2024.

## Overview of Sustainability Requirements

### Energy and Carbon



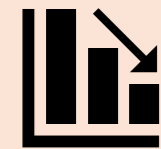
Apply the Energy Hierarchy to any new development and adopt a fabric first approach (See Section 3.2)



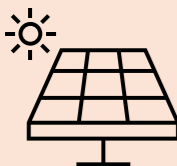
Maximise passive design measures such as building form, orientation, passive solar design, natural ventilation, increased insulation, and air tightness. (See Section 3.3).



All new buildings to have a zero or low carbon heat supply e.g. no fossil fuel boilers wherever possible.



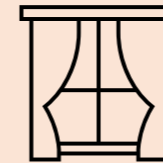
New development is expected to be able to exceed Building Regulations and achieve a minimum 35% reduction in carbon emissions over Part L 2021 and aim for 50% reduction.



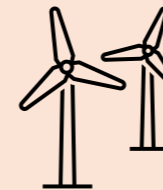
Consider the opportunities for different types of on-site renewable energy (See Section 3.5.1)



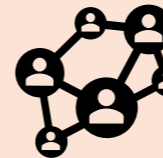
Describe how the design has incorporated measures to reduce carbon emissions and provide calculations in a Sustainability and Energy Statement.



Apply retrofit measures to improve existing buildings including improved windows, draughtproofing and a more efficient and preferably low carbon heat source



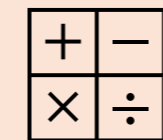
New development is expected to be able meet a minimum of 12% of total energy supply through on-site renewables.



Consider grid capacity and site wide approaches for energy sharing and storage (e.g. heat networks battery storage, demand-side-response-strategies) (see sections 3.5.2 and 3.5.3)



Provide new development with a three-phase power supply to make it easier to install heat pumps, photovoltaic panels and electric car-charging systems



Offset residual carbon where feasible and viable by calculating and making provision for carbon offset payments (see Section 3.6.1)



Implement a recognised quality regime such as such as [Passivhaus](#), [NEF/GHA Assured Performance Process](#), or [Home Quality Mark for dwellings](#) or [BREEAM Excellent or Outstanding for non-residential](#) to ensure the as-built performance for energy use and carbon emissions, and meets the as-designed performance

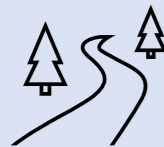
### Climate Adaptation



Apply the cooling hierarchy to minimise overheating risk (See Section 4.2.1)



Undertake an overheating assessment using Building Regulations Approved Document Part O for dwellings, CIBSE TM52 (non-residential) or TM59 (residential) (See Section 4.2)



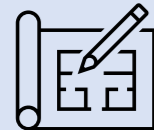
Integrate green and blue infrastructure into the development to provide multiple benefits, including counteracting heat gain (See Section 4.3)



Apply the Sustainable Drainage System hierarchy (See Section 4.4) and prepare a drainage strategy for new buildings and hardstandings which reduce permeable areas



Design to be resilient to flood risk including all sources of flooding and allowance for climate change (See Section 4.4)

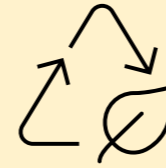


Undertake a Flood Risk Assessment where the development lies within Flood zones 2 & 3 or is of 1 hectare or more.

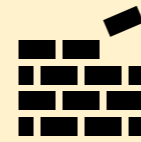


Design in water saving measures (See Section 4.5) Achieve a minimum water efficiency of 110 litres/person/day for residential dwellings.

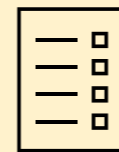
### Sustainable Materials and Construction



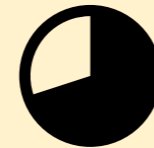
Apply the waste hierarchy and reduce the number of new resources used in construction and operation where possible (See Section 5.2.1)



Undertake a pre-demolition audit to assess existing buildings and their potential for reuse or adaptation (See Section 5.2)



Applications for large scale (major) development to provide Construction Environmental Management Plans including Site Waste Management Plans



Achieve a waste recovery rate of least 70% (See Section 5.2)



Select sustainable, responsibly sourced materials with Low Global Warming Potential (GWP), low embodied carbon and avoid volatile organic compounds (VOCs) and forever chemicals where possible (See Section 5.4)



Applications for large scale (major) development to provide an embodied carbon assessment (RIBA Stages A1-A5 or similar methodology) (See Section 5.5)



Integrate into the design suitable and appropriate facilities for the storage, segregation and removal of waste and recyclable material in accordance with the Council's Waste Management Planning Advice Note.

## Biodiversity



Consider whether the site includes or is near to any habitats, species or protected sites (See Section 6.2.2). Existing buildings, ponds, rivers and streams, trees, hedges and grassland can be important habitats for protected species.



Undertake an ecological survey to assess the development's impact on habitats and species and identify opportunities for biodiversity enhancement (See Section 6.2)



Undertake a Biodiversity Net Gain (BNG) Assessment using the DEFRA Metric and submit this with your planning application. Achieve a minimum 10% net gain and aim to exceed this. (See Section 6.2)



Larger developments which include new green space should provide details of long-term management and maintenance (See Section 6.2.2)



Include opportunities for food growing, such as food gardens and edible landscaping in smaller developments and orchard, community garden and allotment provision on larger sites and allocations (See Section 6.2.3)

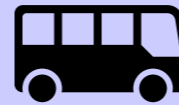
## Sustainable Transport



Design to prioritise walking, cycling and public transport and provide coherent, direct, safe and attractive connections to existing or planned infrastructure (See Section 7.4)



Provide attractive, accessible, safe and secure cycle parking in accordance with local standards (See Section 7.5)



Major development and those which will have significant transport implications will be required to conduct a Transport Assessment and provide a Travel Plan to promote sustainable active travel (See Section 7.2)



Provide development with high-speed internet (such as fibre to the premises) to facilitate future adaptation and home working.



Provide EV charging facilities equivalent to 1 charging space per home (or 1 per parking space if lesser) and at least 20% of parking spaces for other development (See Section 7.3)



## 1. Introduction

### 1.1. Purpose of this SPD

- 1 The purpose of the SPD is to provide more detailed advice and guidance on the implementation of Local Plan policies by providing technical guidance on sustainable design and construction, biodiversity enhancement and sustainable transport.
- 2 The SPD supports local and national commitments to mitigate and adapt to climate change, and policies within the adopted BLP 2013-2033 (adopted 2022). It will replace and update the Sustainable Design and Construction SPD 2009.
- 3 The BLP was in its later stages of preparation when the borough declared a climate emergency in June 2019. The plan evolved and was strengthened to focus on the role of placemaking and tackling climate change before adoption in February 2022. This SPD has been prepared in support of these objectives and strategic policies and provides further guidance on the detailed policies contained with the BLP.
- 4 A glossary of terms and acronyms is provided in Appendix 2.

### 1.2. Scope and Status of this SPD

- 5 This SPD sets out measures to design and construct new development to improve its environmental performance and reduce its environmental impact, including mitigating and adapting to climate change. The SPD aims to contribute towards attaining the Council's commitment to delivering carbon reduction and improving biodiversity. The true benefits of sustainable design and construction go well beyond simply cutting carbon emissions as there are also wide reaching social and economic benefits associated with sustainable design and construction.
- 6 This SPD relates to new development in the borough including:
  - All residential development encompassing new housing units, residential institutions and buildings, conversions, redevelopment and intensifications of existing buildings and householder improvements (e.g. extensions & curtilage developments);
  - Non-residential development encompassing new commercial buildings, employment and/or retail development; and also education, recreation, infrastructure and other forms of non-residential development.
- 7 This document is borough wide guidance that is being prepared as a supplementary planning document (SPD) under Regulation 14 of the Town & Country Planning Regulations (Local Plan) 2012, as amended.
- 8 Applicants and developers, planning officers, planning committees and other decision makers will be expected to take the SPD into account when designing or making decisions on any form of new development in the borough.

### 1.3. Structure of the SPD and how to use it

9 This SPD is divided into the following chapters:

- Chapter 2: [Policy Context](#)
- Chapter 3: [Energy and Carbon](#)
- Chapter 4: [Climate Adaptation](#)
- Chapter 5: [Sustainable materials and construction](#)
- Chapter 6: [Biodiversity](#)
- Chapter 7: [Transport](#)
- Appendices – provide further detailed topic-based guidance and a more detailed [Sustainability and Energy Statement Checklist](#); to assist applicants in demonstrating how proposals comply with planning policies and guidance.

10 Each topic-based chapter provides a summary of relevant national and local planning policy, before outlining how applicants can integrate sustainable principles or measures into the proposed development and provides examples of what new development needs to achieve.

- Purple boxes denote what the Council's requirements are and correlate to the Energy and Sustainability checklist. This checklist should be used for all applications in the preparation of planning applications, and to demonstrate where in the applications' documents this information is contained.

- Gold boxes denote recommended standards or measures that would strengthen proposals by demonstrating good or exemplary performance.

Please note this colour-coding does not apply to tables, where the borough's brand colours are used simply to denote the different levels of information present in different columns.

At the end of each chapter a list of external resources that are thought to be useful in the preparation of compliant proposals are provided.

## 2. Policy Context

### 2.1. National Policy

- 11 The Climate Change Act 2008 (2050 Target Amendment) contains a statutory target of securing a reduction in carbon dioxide levels of 100% below 1990 levels by 2050. Furthermore, this legislation requires Government to set legally binding carbon budgets for each five-year period to 2050, of which those legislated to date run until 2037 through the sixth carbon budget.
- 12 Section 182 of the Planning Act 2008 introduced a duty on local planning authorities to include policies that make a contribution to both climate change mitigation and adaptation in their plans. This sets a clear legal framework for the role of planning and local planning policy in responding to climate change.
- 13 The Planning and Energy Act 2008 allows local authorities to set energy efficiency standards that exceed the energy efficiency requirements of Buildings Regulations, providing that they are consistent with national policies and technical standards.
- 14 The Environment Act 2021 introduces the requirement that development proposals will need to achieve a 10% net gain in biodiversity through on site measures, or through the purchase of biodiversity credits to contribute to the recovery and ongoing conservation of the natural environment. This will come into force from November 2023 for larger developments requiring planning permission under the Town and Country Planning Act 1990 and on smaller sites from April 2024.
- 15 The National Planning Policy Framework 2023 (NPPF) sets out the Government's planning policies for England and enshrines the overarching presumption in favour of sustainable development. which includes making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution and mitigating and adapting to climate change.
- 16 The NPPF makes it clear that planning must address climate change. New development should be planned for in ways that minimise vulnerability and improve resilience, help the reduction of greenhouse gas emissions and support renewable and low carbon energy and associated infrastructure.
- 17 Planning Practice Guidance (PPG) also provides clarity on the interpretation of the NPPF. The PPG supports integrated solutions for adaptation and mitigation measures that support sustainable development.
- 18 The National Design Guide 2021 states that well-designed places integrate existing and incorporate new natural features into a multifunctional network that supports quality of place, biodiversity and water management, and addresses climate change mitigation and resilience.

- 19 Through the emerging Levelling Up and Regeneration Bill the Government has indicated support to Local Authorities who innovate and lead in mitigating and adapting to climate change. An update to the NPPF is expected to further strengthen national policy to mitigate for climate change.

### 2.2. Local Plan

- 20 The Borough Local Plan (BLP) 2013-2033 was adopted in February 2022. The BLP sets out the vision and objectives that will underpin development in the borough and manage development and infrastructure to meet the environmental, social and economic opportunities and challenges facing the area to 2033.
- 21 The BLP contains relevant overarching objectives including Sustainable Transport (Objective 7), Environmental Protection (Objective 9) and Climate Change and Biodiversity (Objective 11).
- 22 A key strategic policy, which this SPD supports, is **SP2 'Climate Change'**, which requires that all development proposals demonstrate how they have been designed to incorporate measures to adapt and mitigate climate change. This includes factors such as: building orientation, solar shading, thermal mass, heating and ventilation, green and blue infrastructure and sustainable drainage.
- 23 These topics are expanded upon within this SPD, and supporting information is also provided to further assist implementation of the following BLP Policies:
- **QP1 'Sustainability and Placemaking'** – contributing to the provision of social, natural, transport and utility infrastructure to support sustainable, healthy and active communities.
  - **QP2 'Green and Blue Infrastructure'** – securing enhancement and enlargement of the borough's existing green and blue infrastructure network to secure a multitude of benefits ranging from environmental to recreation, health and wellbeing.
  - **QP3 'Character and Design of New Development'** – achieving sustainable high-quality design through measures including sustainable design and construction, promoting sustainable travel, maximising blue and green infrastructure, adaptability and promoting waste and recycling.
  - **NR1 'Managing Flood Risk and Waterways'** – ensuring that the impacts of climate change over the lifetime of the development is included and future flood risk is taken into account through the design of sustainable drainage systems and flood prevention measures.



- **NR2 'Nature Conservation and Biodiversity'** – achieving enhancement and protection of natural habitats and species.
  - **NR3 'Trees, Woodlands and Hedgerows'** – ensuring trees, woodlands (including Ancient Woodlands sites and wood pasture) and hedgerows will be maintained, protected and enhanced.
  - **NR5 'Renewable Energy'** – supporting the production of renewable energy and minimising the adverse impact of schemes on the local social and natural environment.
  - **IF1 'Infrastructure and Developer Contributions'** – the provision of, and/or financial contributions to, supporting infrastructure that delivers against the objectives of the Local Plan.
  - **IF2 'Sustainable Transport'** – ensuring sustainable locations of development and an assessment of sustainable transport criteria.
  - **IF4 'Open Space'** – supporting the provision of open space and leisure opportunities, including allotments.
- 24 Throughout the chapters in this SPD, the relevant Local Plan policies are identified and expanded upon to guide the reader in demonstrating compliance with the policy criteria.
- 25 This SPD should be read alongside other relevant SPDs and guidance in the borough, which at the time of writing includes:
- **Borough Wide Design Guide Adopted 2020** – includes brief guidance on solar design, climate change and cycle storage. This will be expanded where needed by this Sustainability SPD.
  - **Planning obligations and developer contributions SPD Adopted 2014** - includes guidance on provision of or contributions towards biodiversity, transport, open space/allotments, landscaping, air quality. This guidance will be expanded by this Sustainability SPD in relation to achieving biodiversity 10% net gain, and reductions in buildings' carbon emissions.
  - **Allocated Site and specific area SPDs** - includes: Cookham Village Design Statement, Datchet Design Guide, Thames Basin Heaths SPA, West Street Opportunity Area and South West Maidenhead Development Framework. This SPD sits alongside these other SPDs.
  - **RBWM Parking Strategy 2004** - This guidance includes lifestyle standards which to be read alongside this SPD.

### 2.3. SPD Relationship to RBWM Environment & Climate Strategy

- 26 Following the declaration of a climate emergency, RBWM adopted the Environment and Climate Strategy 2020-2025 which sets out the vision and five-year action plan to embark on mitigating against climate change. The key themes and objectives of Climate Strategy, how they relate to BLP policies and how they are address by the SPD is shown in the table opposite.

### 3. Energy & Carbon

#### 3.1. Energy & Carbon Context

##### 3.1.1 National and International Carbon Commitments

- 27 The Climate Change Act 2008 (as amended) sets the national target for net zero carbon emissions by 2050 with legally binding carbon budgets every five years (the most recently set of which limits national emissions to 965MtCO<sub>2</sub>e in the period 2032-2037).
- 28 The reduction of carbon emissions from buildings is a key strand to the Climate Change Committee's (CCC) strategy in driving emission reductions. To meet these targets, it is necessary to improve energy efficiency in existing buildings, switch to low carbon heating in existing and new buildings, implement stringent energy efficiency standards for new buildings and ensure that buildings are designed for a changing climate.
- 29 To date, national improvements to energy efficiency in buildings continue to fall behind the necessary level, hence the importance of driving emission reductions at a local level through local planning policies to drive carbon reductions ahead of national regulation.
- 30 The Planning and Compulsory Purchase Act 2004 (Section 19) mandates that a local authority's local development plan (as a whole) includes policies that contribute to the mitigation of and adaptation to climate change, whilst the Planning and Energy Act (2008) allows local authorities to set their own energy efficiency targets above national standards.
- 31 The NPPF requires local authorities to prepare planning policies and plans which address climate change mitigation and adaptation. Chapter 14 of the NPPF states that the planning system should contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience, encourage the reuse of existing resources and support renewable and low carbon energy and infrastructure.
- 32 The UK Government's Heat and Buildings Strategy (2021) aimed to set out the transition to low carbon buildings, starting with ensuring high efficiency levels and updating guidance throughout the next decade. The guidance included:
- Future Homes Standard which will introduce a 75-80% reduction in carbon emissions (above current standards) from new homes achieved by high building fabric standards and low carbon heating from 2025;
  - Future Building Standard applies the guidance to non-residential buildings;
  - Consultation on halting any new gas connections to homes from 2025, in favour of low carbon heat strategies;
  - The Heat and Buildings Strategy also sets out how energy performance standards should be achieved using the Building Regulations Part L update (now in force).

Environment and Climate Strategy Adopted 17 December 2020: Themes and objectives	How does the SPD help deliver the Climate Strategy?	Borough Local Plan Policies relevant
<p><b>Circular Economy:</b></p> <p>More sustainable resource use, increasing domestic recycling rates and supporting less resource-intensive lifestyles.</p> <p>Increase recycling rate from 44% to 50% by 2025.</p>	<p>Provides guidance on Sustainable Construction including the use of more sustainable and recycled construction materials and the reuse and retrofit of existing buildings.</p> <p>Provides guidance on providing opportunities to for local food production and allotments on larger development sites.</p>	<p>SP2 Climate Change</p> <p>QP2 Green and Blue Infrastructure</p> <p>QP3 Character and Design of New Development</p> <p>IF4 Open Space</p>
<p><b>Energy:</b></p> <p>Reducing consumption and decarbonising our supply of energy. Increase renewable capacity ten-fold by 2025.</p>	<p>Provides guidance to incentivise building and refurbishment to provide net zero carbon emission buildings and reduce water demand in line with Thames Water recommendations.</p> <p>Provides guidance on renewable energy requirements for new builds.</p>	<p>SP2 Climate Change</p> <p>QP3 Character and Design of New Development</p>
<p><b>Natural Environment:</b></p> <p>Supporting biodiversity, health and wellbeing Minimum 10% biodiversity net gain for land designated for development.</p>	<p>Provides guidance to deliver a minimum 10% biodiversity net gain through the planning system.</p> <p>Provide guidance on sustainable drainage within the Green Blue Infrastructure network.</p>	<p>QP1 Sustainability and Placemaking</p> <p>QP2 Green and Blue Infrastructure</p> <p>NR2 Nature Conservation and Biodiversity</p>
<p><b>Transport:</b></p> <p>Reduce the need for carbon intensive travel by encouraging walking and cycling, as well as investing in zero emission vehicle infrastructure.</p>	<p>Provides guidance on the requirements for Electric Vehicle (EV) Charging points within new developments.</p>	<p>QP3 Character and Design of New Development</p> <p>IF2 Sustainable Transport</p>

33 It should be noted that this section relates to operational carbon emissions; embodied carbon emissions are covered in Section 5 of the document.

### 3.1.2 RBWM Carbon Commitments

34 In recognition that 67% of the borough's emissions are as a result of energy consumption in buildings, one of the four key themes of the **RBWM Environment and Climate Strategy 2020-2025** is energy. Analysis supporting the RBWM Environment and Climate Strategy states that the district's net zero carbon commitments will not be met unless energy consumption is reduced, energy supplies are decarbonised, and levels of local renewable energy generation are increased.

35 Therefore, the Royal Borough of Windsor and Maidenhead's Environment and Climate Strategy action plan sets a requirement for this SPD to outline low carbon measures that applicants can implement into development to drive the number of zero carbon developments in the borough.

36 Applicants are requested to follow the energy hierarchy in preparation of their Sustainability and Energy Statement (as required by **RBWM's Local Validation checklist**) which accompanies planning applications for new residential dwellings, or non-residential floorspace over 100sqm.

37 Proposals' **Sustainability and Energy Statement** should include:

- Detailed **energy assessment**.
- Details of how potential **overheating** and reliance on air conditioning will be reduced.
- Confirmation of three phase **power supply provision**.
- Details of **Electric Vehicle charging provision**.
- Confirmation of **high-speed internet connection**.
- Details of how use of **mains water** will be minimised.

Local Plan Policy Links

*(This section outlines local planning policy which relates to Energy and Carbon to assist applicants with complying with the relevant policies)*

Local Plan Policy	Applicable to:	Relevant Requirements:
SP2 Climate Change	All scales of development	Demonstration that the development has been designed to: <ul style="list-style-type: none"> <li>• maximise opportunities for natural heating and ventilation</li> <li>• maximise resistance and resilience to climate change</li> </ul>
	Outline, Full, Reserved Matters, Householder, Section 73, and Listed Building Consent	
QP3 Character and Design of New Development	All new build development	Demonstration that the development is climate resilient through: <ul style="list-style-type: none"> <li>• Minimising energy demand</li> <li>• Maximising energy efficiency</li> <li>• Minimises waste</li> </ul>
	Full, Reserved Matters, Householder, Section 73, and Listed Building Consent	
NR5 Renewable Energy	All development	Demonstration that renewable energy generation schemes will: <ul style="list-style-type: none"> <li>• Minimise adverse impacts to landscape, wildlife, heritage assets and amenity</li> <li>• Be of an appropriate scale to its location</li> <li>• Integrate with existing or proposed developments</li> <li>• Be the Best Practical Environment Option (BPEO)</li> </ul>
	Outline, Full, Reserved Matters, Householder, Section 73	
	Listed Building Consent (where applicable)	
IF1 Infrastructure and Developer Contributions	All development	Applications must: <ul style="list-style-type: none"> <li>• Deliver infrastructure that supports the overall spatial strategy of the borough through financial contributions or on-site provision.</li> </ul>
	Except: householder and development >100sqm	
	Outline, Full, Reserved Matters and Section 73	

Supplementary Planning Guidance:

This SPD supplements the Borough Wide Design Guide Principle 7.4 Solar Design and Climate Change.

### 3.2. Energy Hierarchy

38 **Applicants should submit a Sustainability and Energy Statement** (as required by RBWM's **Local Validation checklist** for new residential dwellings, and non-residential floorspace over 100sqm) which responds to the following guidance and provides a justification for their proposed approach, appropriate to the size and scope of the development.

39 Applicants should follow the energy hierarchy in preparation of their Sustainability and Energy Statement. The energy hierarchy is a sequence of steps that should be used to demonstrate how energy consumption has been minimised using the most effective and long-lasting measures before resorting to less effective or less long-lived measures. This is measured using modelling of the building's energy use and carbon emissions at each step, and reductions are based on regulated energy use. The steps of the energy hierarchy, often referred to as the **Be Lean, Be Clean and Be Green stages**, are as follows (and shown in Figure 1):

**1. Reduce energy demand and use energy efficiently (Be Lean)**

Including energy efficient building fabric and building services, thereby reducing energy demand.

**2. Supply energy efficiently and energy networks (Be Clean)**

Including connection to existing heat and energy networks in the vicinity; providing a single point of connection and space / capability for future connection to local planned networks; and creation of site-wide networks and communal energy strategies with centralised generation of energy.

**3. Renewable energy (Be Green)**

Including: on-site generation of renewable energy; on-site storage of renewable energy and/or heat generated, thereby reducing the amount of electricity and/or gas that must be bought from the grid; and procurement of electricity from suppliers who have certified renewable sources for generation of energy.

40 The above stages of the energy hierarchy are provided in further detail in the next sections (3.3 to 3.5).

41 To achieve net zero regulated carbon, residential regulated carbon emissions that cannot be mitigated on site (having exhausted all viable opportunities to mitigate regulated carbon emissions on-site by following the energy hierarchy) are offset via a financial contribution to RBWM Council's carbon offset fund. As set out in Section 3.6.1., unregulated emissions are also to be calculated and offset.

42 Applicants are generally expected to demonstrate **meaningful percentage reductions over the Part L baseline**. Applicants are encouraged to apply the Greater London Authority Energy Assessment.

This guidance targets a minimum 35% on-site improvement over Part L 2021, and applicants are strongly encouraged to go beyond this to achieve the benchmark improvement of 50% on-site improvement over the Part L 2021 baseline. Where these targets are used, applicants can demonstrate that the application goes beyond standard practice minima.

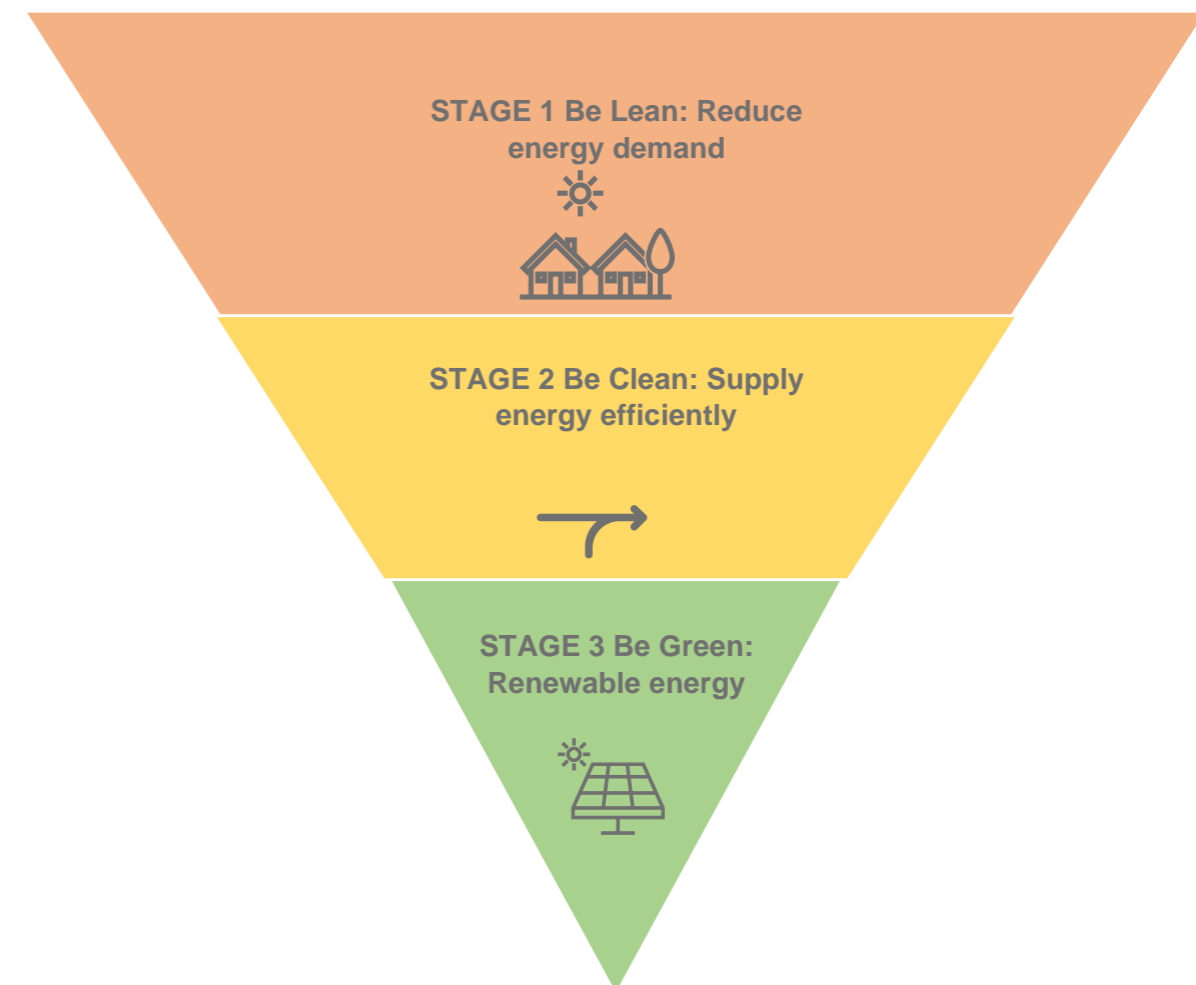


Figure 1: The energy hierarchy



## REQUIREMENT:

### Application evidence for energy and carbon calculations

for new residential dwellings, and non-residential floorspace over 100sqm

- ✓ The Council requires that applicants submit a Sustainability and Energy Statement containing, as a minimum:
  - a. calculation of the energy demand and carbon dioxide emissions covered by Building Regulations using the energy hierarchy;
  - b. Calculation of the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (see paragraph 5.22) at each stage of the energy hierarchy;
  - c. calculation of the estimated annual energy costs to the occupants of the development;
  - d. proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services (including heat recovery solutions);
  - e. proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies. There is an expectation that developments maximise renewable energy generation regardless of whether minimum standards are met through other measures, as such there is an expectation that 12% of the total energy demand will be met by on-site renewables, unless this is demonstrated to be unfeasible;
  - f. proposals for the storage and use or export of excess energy arising from renewable energy technologies; and
  - g. once on-site reductions have been maximised, the remainder of carbon emissions (i.e.: the carbon shortfall) should be met via a carbon offset payment where viable in order to meet net zero carbon. The Council requires all applicants to demonstrate how net zero carbon will be achieved by the proposed development.

- 43 Applicants are also encouraged to apply the **Greater London Authority energy efficiency targets** for the Be Lean stage: a 10% improvement on Building Regulations Part L baseline for residential developments, and a 15% improvement for non-residential.

## GOOD PRACTICE

### Benchmarks for on-site energy and carbon improvements vs Part L 2021

- 35% regulated carbon reduction on TER (general expectation)
- 50% regulated carbon reduction on TER (good practice)
- 63% regulated carbon reduction on TER (Future Homes Standard)
- Regulated carbon reduction on TER through efficiency measures
  - 10% (new residential)
  - 15% (new non-residential).

- 44 Applicants are also encouraged to use the **Energy Use Intensity (EUI) metric** to set targets for energy consumption, to demonstrate how through design measures this has been reduced, and to show a real commitment to reducing the energy consumption of buildings users. Energy Use Intensity is the **total annual energy consumption of a building**, with no distinction made between 'regulated' and 'unregulated' energy (unlike Building Regulations metrics). As it is measured in **kWh/m<sup>2</sup>/year**, it can be estimated at design stage and is displayed on energy bills so building users will be able to easily verify how the building is performing. It relies only on how the building performs, rather than taking into account the carbon factor of the grid. LETI<sup>1</sup> argues that it should be the metric used across planning and design decisions because of this. Please also refer to LETI's Climate Emergency Design Guide for further guidance on energy efficiency measures and reducing carbon emissions.

## BEST PRACTICE

### Exemplary energy benchmarks and calculation methods

- Calculate 'Energy Use Intensity' (EUI) using CIBSE TM54 or Passivhaus PHPP
- Aim to hit [LETI/RIBA](#) targets using those calculations
  - 35kWh/m<sup>2</sup>/year EUI (residential)
  - 60-70kWh/m<sup>2</sup>/year EUI (schools)
  - 55-75kWh/m<sup>2</sup>/year EUI (offices)

Proposals that adopt this EUI approach and demonstrate achievement at or close to optimal targets laid out by LETI or RIBA **will be looked upon favourably** and this climate benefit will be given weight in planning decisions.

### 3.3 Reduce Energy Demand (Be Lean)

45 **Applicants should firstly consider passive heat demand reduction** before looking at the active systems used to deliver the heat. Passive measures include improving the building envelope, minimising infiltration of outdoor air, using a simple building form and optimising solar gain.

46 Proven standards such as Passivhaus demonstrate how passive measures are incorporated into building design and provide a tested and implementable pathway to achieving good passive design. Applicants are encouraged to consider such standards.

47 The Council recommends that applicants consider implementing a recognised quality regime (such as [Passivhaus](#), [NEF/GHA Assured Performance Process](#), or [Home Quality Mark](#)) that ensures the finished building performs similarly to what the designs had aimed for (with regards to energy use, carbon emissions, indoor air quality, overheating risk). Applications using such quality assurance regimes will be looked on favourably, and where measures are proposed, compliance may be secured by condition.

48 Applicants could consider undertaking a [BREEAM](#) assessment for non-residential new build or refurbishment applications and are encouraged to target a rating of Excellent or Outstanding.

#### 3.3.1 Building Form and Orientation

49 The **orientation of a building can impact its thermal performance due to the amount of sunlight entering the building**. The space heating demand of a building can increase purely based on the orientation of the building, where a flat with most of the glazing on a north-facing facade requiring significantly more space heating over an annual period than a flat with most of the glazing facing South, due to reduced levels of sunlight.

50 Therefore, building orientation can also impact the thermal comfort of occupants, overheating risk and internal light levels.

51 A building's **form factor** is the **ratio of internal floor area to external surface area**; therefore a detached house would have a higher form factor than a mid-floor flat in an apartment block. The higher the form factor the less efficient the dwelling would be due to exposure to outdoor conditions affecting the energy efficiency of the dwelling, requiring higher levels of energy consumption and increased fabric efficiency to meet required thermal performance.

52 **Applicants should provide information on the proposed passive design measures** and building form and orientation in their Sustainability and Energy Statement.

#### 3.3.2 Passive Solar Design

53 Passive solar design is **working with the sun's energy for the heating and cooling** of dwellings and non-residential spaces by utilizing **exposure to the sun in winter** and **protection from the sun in summer**. This includes glazing on South facades with external shading

devices installed as an obstacle to the angle of the summer sun while allowing low-angle winter sun to pass. The aim is to get the best balance by reducing the need for space heating in winter, while avoiding the need for active cooling and fans in the summer so that that the winter

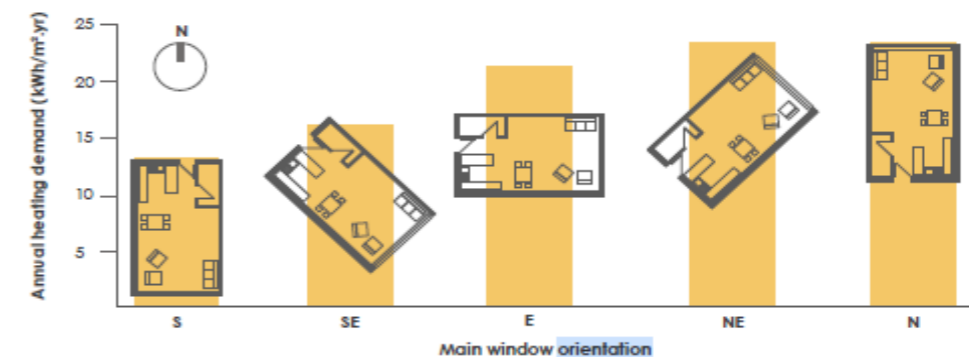







Figure 2:

- Top: Diagram of how a home's energy use for heating gets worse, the further the window is oriented away from south. Please note the yellow bars represent energy use for space heating, not sunlight coverage. Credit: LETI Climate Emergency Design Guide.
- Bottom: Diagram illustrating how buildings with simpler shapes (and adjoining walls with neighbouring homes) are inherently more thermally efficient than standalone buildings or ones with complex shapes. Credit: LETI Climate Emergency Design Guide.

Type	Form factor	Efficiency
 Bungalow house	3.0	Least efficient
 Detached house	2.5	
 Semi-detached house	2.1	
 Mid-terrace house	1.7	
 End mid-floor apartment	0.8	Most efficient

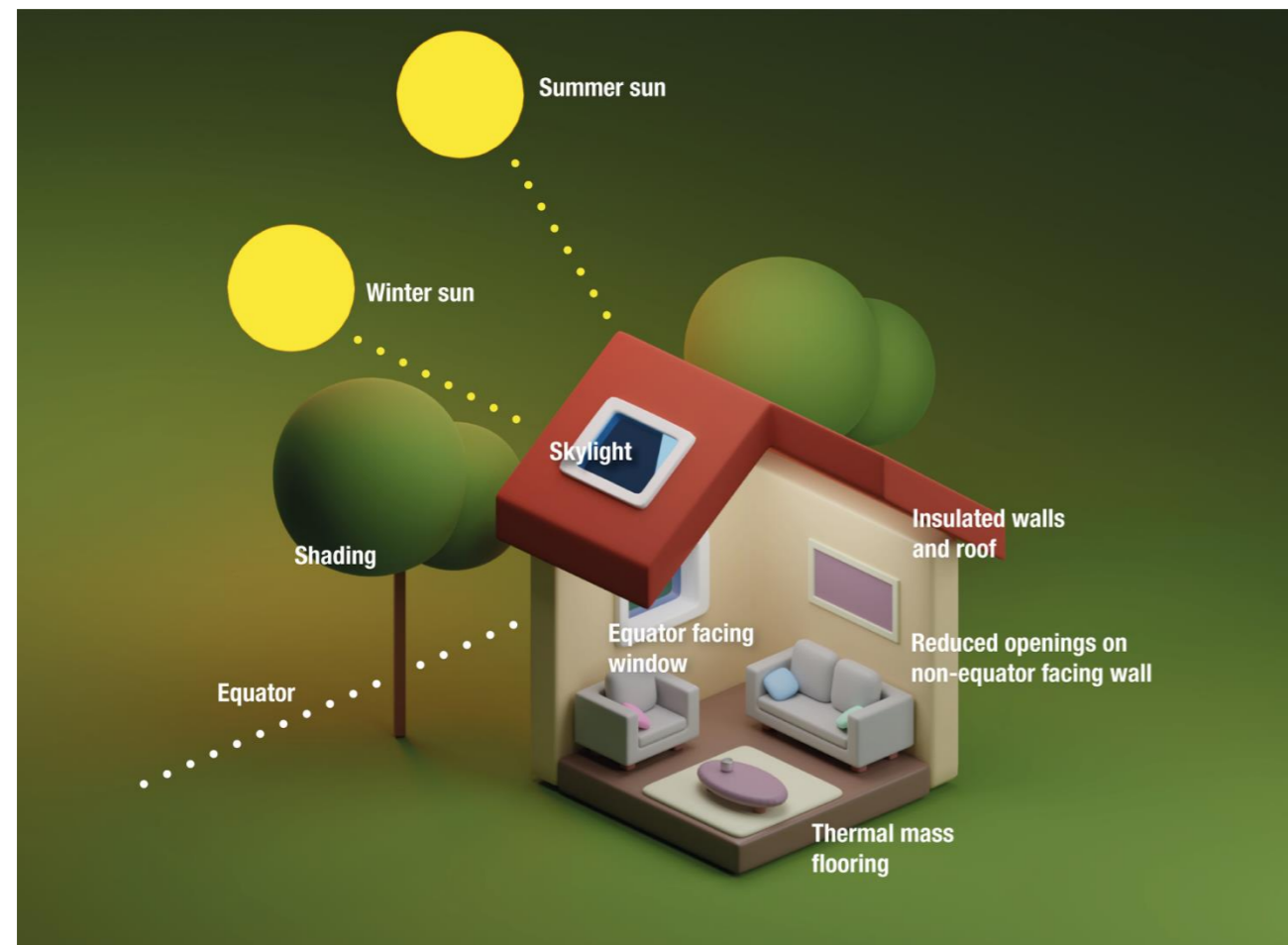
efficiency gains are not cancelled out.

54 Applicants should demonstrate that the **balance between achieving sufficient internal daylight levels and mitigating overheating** have been achieved **by glazing size and location**. The optimum wall-to-(external) window ratio is approximately 1:5 for South, East and West orientations and 1:5 - 2:5 for North facing glazing.

55 Demonstration of daylight and sunlight levels can be achieved using the [BRE Right to Light Guidance](#) and showing that the recommendations will be achieved in all dwellings and occupied spaces.

- 56 The **g-value of glazing** is the **solar heat energy that can pass through the window**. A lower G-value number indicates that less energy is allowed to pass through. Lower G-values of glazing can help facades that could benefit from reduced levels of solar gain and should also be appropriate to the building type (e.g.: residential glazing could be 0.5 and glazing for a school could target 0.4). The proposed g-value should be confirmed by the applicant.
- 57 **Internal shading** can include the installation of blinds at a base build level for commercial spaces and dwellings (especially high-rise dwellings exposed to long periods of sunlight, without shading from buildings or trees). Applicants should confirm where internal shading is required and how this will be indicated to future tenants.
- 58 Principle 7.4 of the Borough Wide Design Guide includes further guidance on passive solar design.
- 59 For information on external shading, please also see [Climate Adaptation section](#).

Passive Solar Design



### 3.3.3 Natural Ventilation

- 60 Applicants should demonstrate that a natural ventilation strategy has been followed where appropriate. **Windows should be openable** to allow for purge ventilation, with **noise and air**

**pollution concerns considered** during ventilation strategy design. **Single aspect homes should be avoided.**

- 61 Ventilation design should also consider the unwanted accumulation of moisture in order to prevent damp and mould, especially in kitchen and bathroom spaces where extract ventilation should be adequately sized and appropriately located. The proposed natural ventilation strategies can be demonstrated to the Council as part of an overheating analysis.

### 3.3.4 'Fabric first' Approaches

- 62 A fabric first approach is maximising the performance of the building fabric during design, before building services are considered, in order to reduce carbon emissions, ongoing maintenance and operational energy efficiency. 'Fabric first' could include improving the thermal mass, insulation, airtightness, incorporating both natural ventilation and mechanical ventilation with heat recovery, whilst considering solar gain, glazing ratio and shading devices. In a fabric first approach, these are pursued *before* looking at heating/cooling systems and renewable energy.
- 63 Within the Sustainability and Energy Statement, **applicants should demonstrate how the fabric first approach has been followed.**
- 64 Energy modelling should be carried out using adopted modelling software: SAP for residential models; and SBEM for non-residential. For residential, the total Part L Fabric Energy Efficiency Standard (FEES) should be calculated and reported. However, the use of more accurate energy modelling methodologies such as TM54 or PHPP will be looked on favourably.
- 65 Regardless of energy modelling method, applicants should demonstrate appropriate insulation (U-values of all elements) and airtightness. The proposed values should be laid out alongside those of the Building Regulations notional building, showing where improvements are made.

## BEST PRACTICE

### Fabric energy efficiency benchmarks

#### Good practice:

- Demonstrate a 10% reduction on the Building Regulations Part L TFEE (residential)
- Demonstrate a Part L FEE of  $\leq 20 \text{ kWh/m}^2/\text{year}$  (residential only)
- Demonstrate a carbon emissions saving of  $\geq 15\%$  from fabric improvements compared to Part L 2021 Target Emission Rate for the building (non-residential)

#### Exemplary:

- Calculate space heat demand using TM54 or PHPP
- Aim to hit targets using those calculations, such as:
- $15 \text{ kWh/m}^2/\text{year}$  space heat demand (LETI target, all building types)
- Other  $\text{kWh/m}^2/\text{year}$  space heat demand targets by building type, to be developed via the industry-led [UK Net Zero Carbon Buildings Standard](#).



66 **Building Regulations Part L 2021** mandates the maximum u-values for building components for dwellings (Volume 1), including existing and new dwellings, and Buildings Other Than

## BEST PRACTICE

### Air tightness benchmarks

#### Basic expected limit:

- <5 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa

#### Good practice:

- <3 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa

#### Exemplary:

- <1 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa

The above benchmarks are primarily set in relation to residential development, but many other types of development will also be able to achieve these e.g. offices and schools. Performance towards the exemplary level will trigger a need for mechanical ventilation to ensure air quality.

Dwellings (Volume 2). Guidance within Part L 2021 is a useful starting point to consider the properties of buildings' components, insulation and thermal bridging.

67 **Insulation continuity must be achieved** across elements of the building to ensure gaps do not lead to heat loss and potentially condensation and mould.

68 **Thermal bridging** occurs when areas of a building have significantly higher heat transfer than adjacent/surrounding areas (e.g. due to the conductivity of materials or reduced levels of insulation). Building fabric should be **designed and installed to minimise thermal bridging**.

### 3.3.5 Thermal Mass

69 **Materials that absorb heat** when surrounding temperatures are higher and then **give this heat back when the surroundings are cooler**, are said to have higher levels of thermal mass. This property enables the material to store heat.

70 Materials such as concrete, bricks, tiles and stone have high thermal mass. Using these in the right amount in the right location can help maintain comfortable year-round indoor temperatures, absorbing the sun's heat and releasing it in the evenings when air temperature falls. Stabilising internal environments this way **can reduce usage of heating and cooling** systems; however, the **materials must be exposed within the space** to efficiently function.

71 Applicants should demonstrate how thermal mass has been considered within their proposals.

### 3.3.6 Air Tightness

72 **Air permeability tests should be carried out on all new dwellings and non-domestic buildings**, this helps to identify and reduce unwanted heat loss that occurs through air infiltration into a building.

73 The **Building Regulations Part F 2021** (as per Future Homes Standard guidance) defines highly airtight dwellings as those with either:

- A designed air permeability of <5 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa
- An as-built air permeability of <3 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa

74 More ambitiously, Passivhaus certification requires air tightness of <1 m<sup>3</sup>/hr/m<sup>2</sup>@50Pa.

75 **Applicants must provide the targeted design air permeability** within their Sustainability and Energy Statement.

### 3.3.7 Guidance on Retrofit, Including in Heritage Situations

76 RBWM planning policy applies to both retrofit applications and new building proposals in the same way.

77 The **RBWM Climate and Environment Strategy action plan for 2020-2025** includes an action to incentivise developers to refurbish existing buildings to zero carbon homes standard and reduce water demand in line with Thames Water recommendations. Therefore, applicants should demonstrate how retrofit proposals are targeting zero carbon in their Sustainability and Energy Statement.

78 Retrofit can be broken down into the level of intervention, including; very low cost or free quick wins; low cost and technically easy measures, high cost and technically difficult measures and deep retrofit requiring technical expertise. Therefore, the measures can range between:

- **energy and water saving measures during operation** including reducing wasted energy and water leaks.
- **building fabric interventions** including glazing replacement, installation of secondary glazing, improved levels of insulation (cavity wall/ceiling insulation/raft roof/loft/floor), chimney improvements and increased levels of draughtproofing
- **building services upgrades** such as replacement gas boilers, radiator replacements, heat pumps, underfloor heating, installation of solar thermal or a PV array, mechanical ventilation with heat recovery and wastewater heat recovery systems.

79 Please also see the [Passivhaus Trust's retrofit guidance and Retrofit Primer \(2022\)](#) for detailed guidance on retrofit strategies.

80 Full planning permission or listed building consent may be required from the local planning authority for these works to take place.

### 3.3.8 Reducing Reliance on Fossil Fuels and Gas Boilers

- 81 The trajectory to zero carbon buildings is based on the future of heat being delivered with all new buildings being built fossil-fuel free. LETI argues that in order to achieve this, the timeline for this shift should be 2020-2025. This same view has been expressed by the Committee on Climate Change with regards to the role that new buildings will need to play in order to be compatible with the UK's legislated net zero carbon targets.
- 82 Therefore, for **all new development proposals with an expected completion date from 2025**, the Council will generally not consider any proposals with fossil gas boilers to be acceptable as this would constitute insufficient mitigation of climate change.

### 3.3.9 Efficient Low Carbon Electric Space Heating

- 83 **Heat pumps** can provide space heating, cooling and domestic hot water.
- 84 Air source heat pumps (ASHP) use refrigerant fluid to absorb heat from the outside air, and as the refrigerant liquid boils, the gas is then compressed and condenses onto heat exchanger coils. **ASHPs typically have an efficiency of 250-400%** (dependent on system set up, size and application), but can be up to 500% for the most efficient available on the market at the time of writing this SPD. This is far higher than an efficient gas boiler (typically 80-90% efficient). Heat pumps also rely on electricity and therefore provide flexibility for the future, should systems need to be changed out, and also fit into decarbonisation strategies as the national grid continues to decarbonise.
- 85 **Water source heat pumps** (WSHP) and **ground source heat pumps** (GSHP) operate in a similar way, taking heat from surrounding land and bodies of water. The efficiency of the available systems is less variable than those for the currently available ASHP.
- 86 Please note, **direct electric space heating strategies are preferably avoided**, due to potential for higher energy bill costs to occupants (especially for hot water), and lower efficiencies of these systems, in addition to reduced flexibility for future adaptation of systems without deep retrofit which is costly and disruptive to occupants.

### 3.3.10 Domestic Hot Water

- 87 Applicants should **demonstrate how domestic hot water will be generated and distributed** around the buildings. Following the energy hierarchy, communal systems should be considered as part of the Be Clean stage, for example where a communal energy centre with heat pumps is proposed, this system could also supply domestic hot water via a low temperature water distribution loop, with hot water boosted at the dwelling/building. Heat sharing loops like this also provide opportunities to recycle heat that is rejected from any part of the building that has active cooling.
- 88 Where other options are not feasible, applicants may propose direct electric hot water heaters in commercial buildings where the hot water demand may be very low (for example, in an office where it may be required for a single hand washing basin tap).
- 89 In accordance with the UK Health and Safety Executive, domestic hot water must be heated to and stored at a temperature of >60 degrees (amongst other storage and control measures) in

order to **prevent risk of exposure to Legionnaire's disease** in residential and non-residential buildings. Where hot water is not stored, this requirement does not apply.

### 3.3.11 Heat Recovery

- 90 **Mechanical ventilation with heat recovery** (MVHR) uses a heat exchanger to recover heat from 'used' or extract air to pre-heat 'fresh' air to be supplied to the dwelling. MVHR is more heat-efficient than natural ventilation and should be considered **where noise, air pollution or security concerns may prevent occupants from open windows**. It should also be used in buildings where the proposed airtightness triggers a need for mechanical ventilation. Applicants should demonstrate that where mechanical ventilation proposed it is adequate for the building. Where MVHR is proposed, it should be designed into new buildings from the beginning, as the system should be present in every room in order to balance the ventilation requirements.
- 91 LETI recommends a 90% ventilation heat recovery may be needed in order to achieve the domestic hot water and space heating performance recommended in its Climate Emergency Design Guide <sup>ii</sup>.
- 92 **Wastewater heat recovery** operates in a similar way to mechanical ventilation heat recovery, with heat from wastewater (e.g.: used shower or bath water) being used to pre-heat water entering a boiler/water tank in order to reduce demand to heat water to a set temperature. Installation could reduce the energy required per shower use by up to 55% <sup>i</sup>. Recognised to be a simple and effective way to reduce energy demand for domestic hot water, Applicants should consider this option, especially in buildings predicted to have high hot water demands (for example: hotels).

## 3.4 Supplying Energy Efficiently and Using Energy Networks (Be Clean)

- 93 Step 2 of the energy hierarchy is the connection to existing and proposed future heat networks. Connecting to heat networks and the creation of networks within buildings on site should be reviewed before the options for renewable energy technologies are considered.

### 3.4.1 Heat Networks

- 94 District heat networks enable development of a sustainable and flexible supply of energy on a city-wide or regional scale, **allowing for efficient use of local waste heat** and opening up opportunities for reducing primary energy demand. In urban areas with high heat demand, sharing heat demands and strategies can increase energy efficiency and balance demand with mixed-use developments. Heat networks can offer a solution to decarbonisation as they are technology agnostic and can be replaced with lower carbon technologies in the future. This switches the heat source for all connected buildings rapidly, rather than individual retrofit.



95 **Applicants should demonstrate if there are any local existing or planned heat networks within 500m of the proposed site and provide commentary on the feasibility of connection** (with supporting evidence from network operators where appropriate). Local sources of waste heat should also be considered. Where future connection is feasible, the ability to connect should be provided for developments.

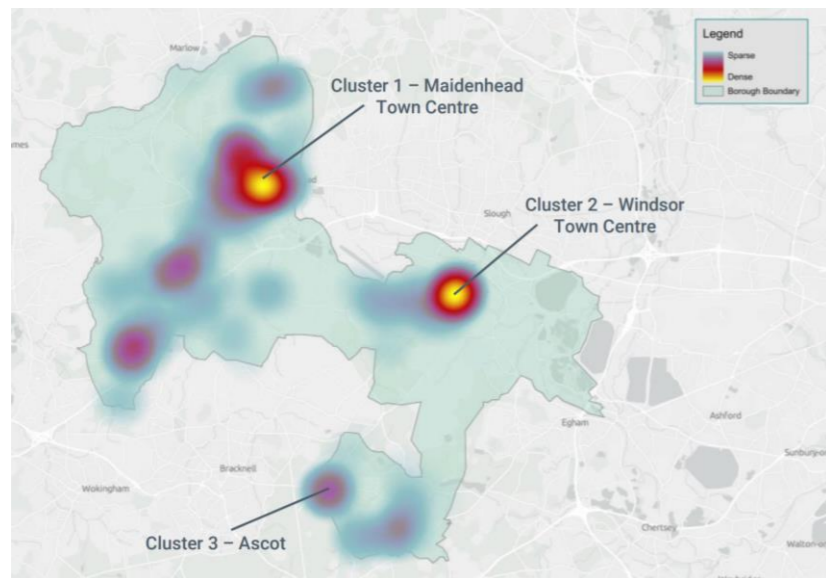


Figure 3: Borough heat demand map

### 3.5 Renewable Energy (Be Green)

- 96 Step 3 of the energy hierarchy is the incorporation of low carbon and renewable energy technologies.
- 97 **The Council expects that a minimum of 12% of the total energy demand of a building is provided through on-site renewable energy generation** but encourages applicants to maximise the generation according to the site's capability.
- 98 On larger developments, where centralised generation of renewable energy is proposed, the applicant is required to demonstrate what proportion of the site's total energy demand is generated from on-site renewable and low-carbon sources, and where this energy is proposed to be used.
- 99 Applicants are encouraged to demonstrate a higher percentage of the total demand is met by renewable energy.

#### 3.5.1 Feasibility and Suitability of Technologies

100 **Within the Sustainability and Energy Statement, the Council require that applicants undertake a feasibility assessment of renewable energy technologies** to demonstrate which technologies are suitable for the type, form, use and context of the proposed development.

- 101 It is widely accepted that heat pumps (including ASHP/GSHP/WSHPs) are renewable, due to the fact that they produce more units of heat than they consume in electricity to run. Also, as the grid continues to decarbonise, the carbon of the electricity used by the heat pumps will also fall<sup>viii</sup>.
- 102 **Opportunities for incorporating photovoltaic panels (PV) should be maximised** including horizontal and vertical arrays. Applicants should provide details of the proposed array including the area (m<sup>2</sup>) of the PV array, the number of panels, the panel wattage and efficiency, estimated energy generation per annum (kWh per annum), and an estimation of the carbon emissions that could be offset with the introduction of this technology. The optimum installation would be East-West facing at a 0-30 degree angle of inclination (or horizontal to the roof). This allows the maximum density of solar panel area to be fit in the available roof area, in order to capture maximum solar energy.



PV panels on Braywick Nature Centre

103 **Bio-solar roofs** (where PV panels are installed on top of green roofs) are welcomed as they incorporate the biodiversity benefits of a green roof combined with the generation of energy. In addition, the green roofs can reduce the temperature of flat roofs and therefore improve the



efficiency of the PV array (since PV panels have an optimum operating temperature and can overheat during the summer). Designs must ensure the planting does not shade the panels.



Bio-solar roof on Braywick Nature Centre

### 3.5.2 Grid Capacity Constraints

- 107 **Early discussion with the District Network Operator** may need to take place, as in some locations the **local electrical grid may have limited capacity** for exports (excess energy exported to grid when you aren't using the energy you're producing).
- 108 The need to export energy generated on site **can be solved with local energy storage**. This could include battery storage for electrical energy, or in the case of surplus heat energy, thermal stores could be used. Using energy storage can allow consumers to meet peak demand with stored energy or could reduce operational energy costs during times of the day when energy costs peak.
- 109 To facilitate this, **the Council requires that new buildings will be supplied via a three-phase power supply unless this is not viable**.
- 110 A three-phase system makes it more straightforward to install heat pumps, photovoltaic panels and electric car-charging systems, as the electrical demand is spread across the three-phases. Installing a three-phase supply allows homes to be future-proofed and supports future adaptability of buildings.

- 104 A **solar thermal** collector gathers energy from sunlight (similarly PV panels), however rather than generating electricity it generates heat. This heat is used to contribute to meeting domestic **hot water** demand but can also contribute a small amount to space heat via central heating.
- 105 Creating heat from direct combustion of **biomass** may be appropriate in some locations, usually where there are local sources of agricultural, forestry or industrial biomass waste suitable for burning. The carbon impact of **transporting** the biomass fuel must be taken into account when specifying this technology, as must the localised impact on **air quality** from transport and combustion. Applicants proposing such systems must demonstrate that the impacts are acceptable.
- 106 Following selection of the low/zero carbon technology, applicants should provide details of the proposed systems including the proposed set-up and efficiencies.

### 3.5.3 Site-Wide Energy Approaches

- 111 Applicants are encouraged to consider energy sharing strategies (including local grids; heat recycling; energy clubs via smart meters and Time of Use tariffs) to further reduce operational energy demand and carbon emissions.
- 112 As above, a site-wide strategy could incorporate forms of energy storage such as electrical batteries or heat batteries. Also as previously noted, heat sharing loops across larger sites or neighbourhoods can present opportunities for heat recycling from waste heat sources in or near the site.
- 113 Applicants are also encouraged to **consider demand side response**, which is the flexibility of the energy system to **reduce or increase energy consumption during a period of time** to respond to energy price changes or energy availability on the grid. Buildings or sites that can modify their energy use in real time through the use of demand response (including storage systems) will be able to reduce occupants' energy bills and LETI argues that in the future it would be expected that these systems are incorporated in every new building. Please see figure 4.

### 3.6 Towards Net Zero Carbon

- 114 Consideration of net zero carbon ambitions must be the responsibility of all members of the design team throughout the design and construction process in order to work towards the net zero target. Applicants are also encouraged to consider procuring electricity from providers using renewable energy sources.
- 115 Full maximisation of all energy hierarchy improvements would result in a net zero carbon development. All residential development applications (excluding residential extensions) and non-residential development over 100sqm should therefore be net zero carbon, unless it is demonstrated it is not feasible or not viable. After the energy hierarchy has been applied to the fullest feasible extent, this is to be achieved via carbon offsetting, the approach for which is described as follows.

#### 3.6.1 Carbon Offsetting

- 116 Achieving net zero carbon for new developments typically involves (after applying the energy hierarchy) a need for **developers to contribute a cash-in-lieu payment to the local planning authority's carbon offset fund**. This payment is based on the carbon price set by the local planning authority, multiplied by the carbon emissions of the development.
- 117 Applicants are required to contribute to the Council's carbon offset fund where they have demonstrated that net zero carbon cannot be achieved through the proposed design of the development, unless it is demonstrated that this would undermine the viability of the development.
- 118 The Council has initially set the price of carbon offsets at **£252 per tonne over a 30-year lifetime** of the development (however, this price is subject to change). The Council requires applicants to calculate their expected carbon emissions, and can contribute to the carbon offset fund accordingly:

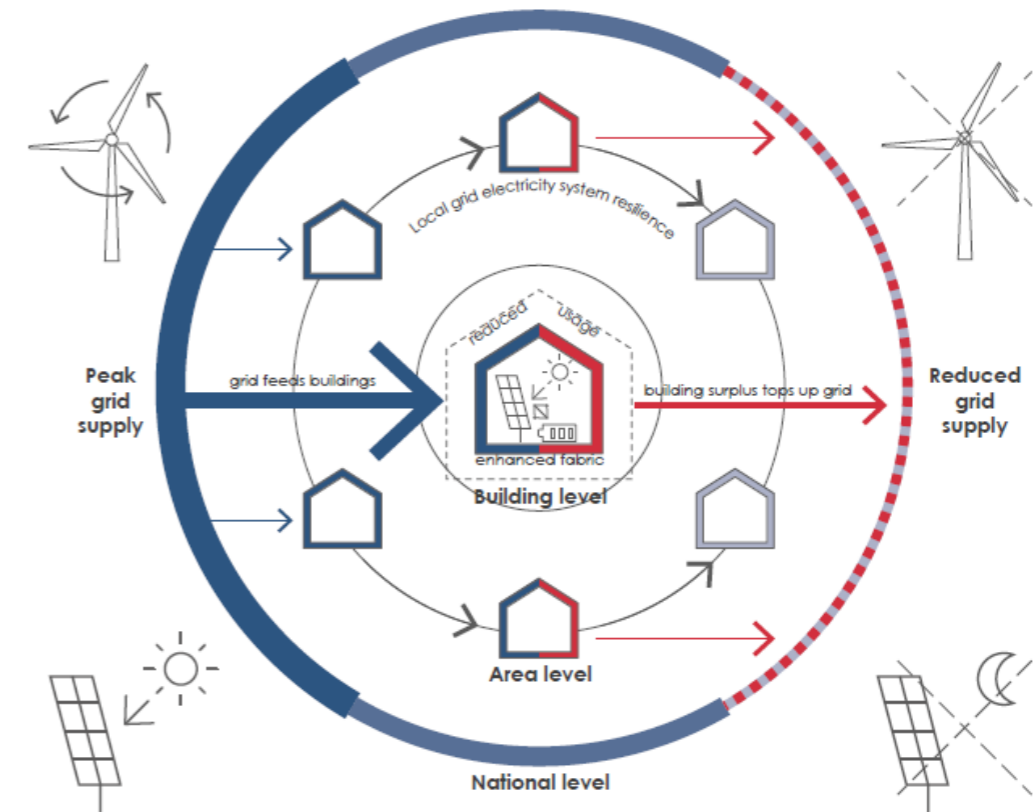


Figure 4: Demand side response at the local and national level (Credit: LETI, Climate Emergency Design Guide)

a. **Residential:** Total contribution = Building Emissions Contribution)

1. **Building Emissions Contribution** is the offset of both regulated and unregulated emissions from the use of the building, which should be calculated with the latest available version of SAP. Using the Tonnes CO<sub>2</sub> savings offset on the summary tab of the Greater London Authority Carbon Reporting Spreadsheet x £252 per tonne x 30 years.

b. **Non-residential:** Tonnes CO<sub>2</sub> savings offset on the summary tab of the Greater London Authority Carbon Reporting Spreadsheet x £252 per tonne x 30 years. This calculation should be made with the carbon factors of the latest version of SBEM.

- 119 The carbon offset contribution is collected through the Section 106 process, and these funds are ring-fenced to be spent on carbon-reduction projects.

### 3.7 Post Occupancy Evaluation (POE)

- 120 **POE is the process of collecting data** on energy consumption, building usage, maintenance requirements and costs, and feedback from building occupants, on the performance of the building in use. Together these can be used to inform future improvements.

- 121 The **BSRIA Soft Landings process** is for a gradual handover of a new or refurbished building, with a period of professional aftercare by the project team and client. Based on 6 phases, the process should be carried out from inception through to aftercare, which includes POE.
- 122 Applicants are encouraged to consider a post occupancy evaluation and major developments are encouraged to consider a soft landings approach.

### 3.8 Useful External Guidance on Energy and Carbon

- BSRIA Soft Landings process <https://www.bsria.com/uk/consultancy/project-improvement/soft-landings/>
- Building Regulations [Approved Document Part L: Conservation of fuel and power](#) (2021) <sup>ii</sup>
- LETI [Climate Emergency Design Guide](#)
- LETI One-pager on [Net Zero Carbon](#) <sup>iii</sup>
- LETI Climate Emergency [Retrofit Guide](#) <sup>iv</sup>
- RIBA 2030 [Climate Challenge](#) <sup>v</sup>
- Greater London Authority [Energy Assessment Guidance](#) <sup>vi</sup>
- Greater London Authority (GLA) [Carbon Offset Funds Guidance](#) (July 2022) <sup>vii</sup>
- Greater London Authority Carbon Emissions Reporting Spreadsheet <sup>viii</sup>
- UKGBC [Net Zero Carbon Buildings: A Framework Definition](#) (April 2019)
- UKGBC [Unlocking the Delivery of Net Zero Carbon Buildings](#) (November 2020) <sup>ix</sup>
- UKGBC [Renewable Energy Procurement & Carbon Offsetting Guidance for Net Zero Carbon Buildings](#) (March 2021) <sup>x</sup>
- UKGBC [Whole Life Carbon Roadmap: A Pathway to Net Zero](#) (November 2021) <sup>xi</sup>
- Historic England guidance on retrofit ([energy efficiency](#) and [renewable energy](#)) <sup>xii xiii</sup>
- CIBSE [TM54 method for accurately modelling operational energy performance](#) <sup>xiv</sup>
- PHPP (Passivhaus energy modelling method) [Technical Guidance](#) <sup>xv</sup>/ [Passivhaus Rules of Thumb](#) <sup>xvi</sup>/ [other Passivhaus resources](#) <sup>xvii</sup>



## 4. Climate Adaptation

### 4.1. Climate Adaptation Context

- 123 A rapid increase in climate adaptation measures will be required to ensure communities become resilient to increasingly severe impacts from shifting weather patterns. It is highly likely that the UK will experience increased overheating and flood risk, alongside heightened unpredictability and intensity of extreme weather events, which therefore requires careful planning to mitigate the effects of such occurrences. Widespread preparedness and resilience will reduce negative social, environmental and economic consequences.
- 124 The **UK Climate Projections** (2018), published by the Met Office, are the latest projections of changes to the UK climate in the future. The projections primarily find that winters will become warmer and wetter, summers will become hotter and drier, whilst the frequency of extreme weather events will rise.
- 125 Housing development is a key area of growth that climate adaptation must be at the heart of, particularly in reducing overheating risk and the risk of flooding. A large proportion of the UK's housing stock was built before 1950, and as such poses a significant challenge for adaptation measures to ensure that the risks of a changing climate do not adversely affect the populations of those living in older homes. Furthermore, the changing climate is having a significant effect on the natural environment, and adaptation measures are now crucial to create resilience in our ecosystem.

#### 4.1.1 national Climate Adaptation Commitments/Goals

- 126 Under the **Climate Change Act 2008**, **National Adaptation Programmes** are required to drive adaptive approaches to building resilience to climate change and are based on national **Climate Change Risk Assessments** (latest version in 2022). The acknowledged risks which actions should mitigate for are flooding risk to communities, business and infrastructure; risk to health and well-being from high temperatures; shortage of public water supply; risks to natural ecosystems; and risk to food production.
- 127 The CCC acknowledges the benefits of thinking holistically about buildings, land use and the natural environment and how they can contribute towards reducing carbon emissions whilst ensuring improved resilience to the UK's changing climate.

- 128 As noted in the previous section, The **Planning and Compulsory Purchase Act 2004** (Section 19) mandates that a local authority local development plan (as a whole) includes policies that contribute to the mitigation of and adaptation to climate change.
- 129 The **National Planning Policy Framework 2023** (NPPF) requires local authorities to prepare planning policies and plans which address climate change mitigation and adaptation. Chapter 14 of the NPPF states that the planning system should minimise vulnerability and improve resilience, taking full account for long-term flood risk, water supply, biodiversity and landscapes and the risk over overheating from rising temperatures. The NPPF also includes a framework for mitigating and adapting to flood risk by taking into account all sources of flood risk and the current and future impacts of climate change.
- 130 The **Environment Act** will strengthen the protection of existing environments and drive the delivery of multifaceted environmental benefits which will help to mitigate for the effects of climate change. The provision of green infrastructure is seen as a focus to deliver pleasant environments, improved biodiversity, improve health and well-being, assist with water management and contribute to cooling and overheating.

#### 4.1.2 RBWM Climate Adaptation Commitments

- 131 **RBWM's Environment and Climate Strategy 2020-2025** aims primarily to mitigate climate change rather than solely focusing on adaptation to its effects, but nonetheless acknowledges that adaptation is required. Through the action plan, adaptation measures cover reducing water demand and conserving and enhancing the borough's biodiversity.
- 132 **The Borough Local Plan Policy SP2 Climate Change requires development to maximise resistance and resilience to climate change.**



## Local Plan Policy Links

**Local plan policy links** (this section outlines local planning policy which relates to Climate Adaption to assist applicants with complying with the relevant policies.)

Local Plan Policy	Applicable to	Relevant Requirements
SP2 Climate Change	All scales of development.	Applications should demonstrate that the development has been designed to: <ul style="list-style-type: none"> <li>• Incorporate measures to adapt to and mitigate climate change</li> <li>• Maximise opportunities for natural heating and ventilation</li> <li>• Maximise resistance and resilience to climate change</li> <li>• Utilise and include green and blue infrastructure</li> <li>• Minimise impact of surface water runoff and incorporate mitigation and resilience measures from flooding</li> </ul>
	Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	
QP2 Green and Blue Infrastructure	All new build development	Applications should demonstrate: <ul style="list-style-type: none"> <li>• Incorporation of green and blue infrastructure on ground and upper levels</li> <li>• Provision of, or improvement of blue infrastructure</li> </ul>
	Outline, Full, Reserved Matters and Section 73	
QP3 Character and Design of New Development	All new build development	Demonstration that the development is climate resilient through the incorporation of green and blue infrastructure
	Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	
NR1 Managing Flood Risk and Waterways	All development	Applications should: <ul style="list-style-type: none"> <li>• Include an assessment on the impact of climate change using appropriate climate change allowances over the lifetime of the development</li> <li>• Incorporate Sustainable Drainage Systems</li> <li>• Reduce flood risk within and beyond the site</li> <li>• Be constructed with adequate flood resilience measures suitable for the lifetime of the development</li> </ul>
	Outline, Full, Reserved Matters, and Section 73	
IF1 Infrastructure and Developer Contributions	All development	Applications should: <ul style="list-style-type: none"> <li>• Deliver infrastructure that supports the overall spatial strategy of the borough through financial contributions or on site provision.</li> </ul>
	Except: householder and development >100sqm  Outline, Full, Reserved Matters and Section 73	

## 4.2. Overheating and the Cooling Hierarchy

- 133 As new buildings become increasingly energy efficient, it is crucial that the risk of overheating is simultaneously considered to ensure that such new buildings are not susceptible to overheating nor reliant on active cooling measures (such as air conditioning). Mitigating this risk is a key element in fulfilling the Policy SP2 requirement for resistance and resilience to climate change.
- 134 An overheating strategy that follows the cooling hierarchy, as set out below, should be utilised so that future buildings can both be operational net zero and fully resilient to current and future climate risks. Within the **Sustainability and Energy Statement**, applicants should demonstrate how the cooling hierarchy has been followed.

### REQUIREMENT

#### Application evidence for overheating within Sustainability and Energy Statement

*for new residential dwellings, and non-residential floorspace over 100sqm*

- ✓ Complete an overheating strategy to demonstrate how:
  - the cooling hierarchy has been implemented;
  - there is no excessive reliance on active cooling measures; and
  - green infrastructure measures are holistically integrated to mitigate overheating risk.

### BEST PRACTICE

#### Overheating evidence

- Complete either a CIBSE TM52 (non-residential) or TM59 (residential) overheating assessment using TM49 weather files; and
- Demonstrate that a recognised quality regime will be used to ensure the as-built performance indoor air quality and overheating risk meets the as-designed performance (e.g. Home Quality Mark).

### 4.2.1 Applying the Cooling Hierarchy

- 135 The overheating strategy should be considered and implemented at the earliest possible stage. Overheating should be addressed holistically with the operational energy approach since some measures have multiple purposes, such as mechanical ventilation heat recovery units. The hierarchy, in six stages, is outlined as follows.

Cooling hierarchy element	Application
<b>1. Minimise internal heat generation through energy efficient design</b>	<ul style="list-style-type: none"> <li>• An operationally energy efficient building will have low energy demand and subsequently will generate less active heat internally. This results in <b>less internal temperature fluctuation and increased comfort</b>.</li> <li>• A building with an airtight envelope is less prone to external heat influences and can therefore maintain internal temperatures more efficiently without active cooling measures.</li> </ul>
<b>2. Reduce the amount of heat entering a building in summer through orientation, shading, albedo (reflection), fenestration, and insulation</b>	<ul style="list-style-type: none"> <li>• Brise-soleils or awnings are useful measures for external protection from solar gain – <b>most suited to South facing surfaces</b>.</li> <li>• Vertical shading is suitable for <b>East or West facing windows</b>.</li> <li>• <b>External shutters</b> give maximum protection for windows but restrict daylight intake.</li> <li>• Energy efficient thermal insulation – primarily to walls and lofts/roofs – assist solar gain reduction through the building structure.</li> <li>• Light-coloured roofs will reflect more sunlight away from the buildings. Green roofs and solar PV panels will also provide <b>sunlight protection</b>.</li> <li>• Trees provide natural shading whilst also increasing the biodiversity of the site. External roof overhang shading can protect upper floors from excessive solar gain where they exceed the height of trees.</li> </ul>

**3. Manage the heat within the building through exposed internal thermal mass and high ceilings**

- Thermal mass typically consists **of concrete, stone or masonry in floors and walls**.
- The inclusion of solid thermal mass **creates a buffer zone** by taking up heat during the day and releasing it as the air cools; this levels out peaks and troughs throughout the heating cycle.
- It is important to include an appropriate amount of thermal mass. Excessive thermal mass will reduce a building's heating reaction time and result in slow heating, whereas too little results in the opposite.
- For lightweight timber-frame construction, traditional thermal mass options are less suitable. **Phase change materials** provide an option for thermal mass in such lightweight buildings. Wax in the materials melts and solidifies as they heat and cool, absorbing and releasing heat as necessary. Such materials can be an alternative to plasterboard for walls.
- During summer months, **thermal mass should not receive direct sunlight for the entire day** to avoid excessive internal heat retention throughout the evening.

**4. Passive ventilation**

- **Passive ventilation measures should be prioritised** since they do not require electricity generation.
- Window opening and purge ventilation are the key measures here, which should be supported by careful design that provides **multiple cross-ventilation opportunities** where possible.
- It is important to note that **daytime ventilation is only beneficial if the outdoor air temperature is less than the internal building temperature**. Clearly, this is more common at night, during which external cool air is able to replace internal warm air.

**5. Mechanical ventilation**

- Where security and noise are issues for window opening, mechanical ventilation units may be required to appropriately reduce overheating risks.
- Mechanical ventilation is able to **feed fresh air into internal spaces and remove latent heat**. Units can however be costly and increase energy demand.
- A key consideration is to achieve high levels of air change rate sufficient for purge ventilation, whilst having **minimal or no impact on the residents** in terms of noise and size of unit.
- Mechanical ventilation units with **heat recovery** can address overheating risk and energy efficiency simultaneously – [see more](#).

**6. Active cooling systems (ensuring they are the lowest carbon options)**

- As a last resort, once all other options in the hierarchy have been maximised, active cooling systems may be necessary to create a comfortable internal environment for occupants.
- Active cooling is more likely to be acceptable in the case of tall flat blocks where natural and urban shading measures are not able influence mid-upper floors and with fewer exposed facades for heat loss.
- **Noise impacts should be mitigated** for residents and heat exhaustion from the involved unit should be carefully considered so that adjacent units are not adversely impacted– **heat output from one unit will increase local air temperature** albeit at a small scale.
- Ongoing maintenance costs should not be ignored.
- Refrigerants used in active cooling systems are able to make notable contributions to climate change impacts. **The global warming potential (GWP) of most refrigerants are higher than that of CO<sub>2</sub>** by multiple factors – the GWP of R32 is 675 times that of CO<sub>2</sub>. Refrigerants with the lowest feasible GWP should therefore be prioritised.

## 4.3. Green and Blue Infrastructure

### REQUIREMENT

#### Application evidence for green infrastructure

for new residential dwellings, and non-residential floorspace over 100sqm

- ✓ In a Sustainability and Energy Statement, applicants are expected to demonstrate how the following have been achieved:
  - a. Appropriate material selection to mitigate urban heat island impacts
  - b. Innovative design to enable green roofs and solar PV
  - c. Integration of trees and green spaces into development to:
    - increase biodiversity;
    - reduce overheating; and
    - promote outdoor recreation.

#### 4.3.1 Urban Heat Island Effect

- 136 The urban heat island effect (UHI) occurs due to the removal of natural vegetation surfaces and construction of high-density pavements, roads and buildings. The subsequent large increase in thermal mass and darker-coloured surfaces results in significant heat absorption and retention, leading to higher temperatures in urban areas than less dense, more vegetated areas – the difference can be up to 9°C in some cases.
- 137 **Applicants should demonstrate how they have incorporated measures to combat UHI** (whether by reducing UHI in existing urban fabric, or by avoiding the creation of UHI). This is part of fulfilling the Policy SP2 requirement for resistance and resilience to climate change and can be a key function of the green and blue infrastructure required by Policies QP2 and QP3.
- 138 Mitigation measures to **combat UHI** consist of:
- **Increased abundance of foliage and vegetation**
  - **More bodies of open water for enhanced evaporative cooling**
  - **Use of more reflective materials on hard surfaces**
- 139 The role of materials in minimising the UHI effect can be significant, as roofs and pavements account for ~60% of urban surfaces and absorb in excess of 80% of the solar radiation received.
- 140 **'Cool materials'** can reduce this effect due to increased albedo, meaning that the surface can better reflect sunlight and emit heat from the building. Cool materials will therefore reduce overheating risks within the building and the wider urban area. For example:

- White and reflective roofs are up to 4 times more effective than dark roofs.
- It is helpful to avoid dark, low reflectance surfaces adjacent to glazing.

141 New development in high-density urban areas has an opportunity to significantly reduce the level of heat absorbed and retained on-site, and importantly ensure it does not worsen existing urban heat island areas. Reducing the urban heat island effect should be addressed alongside biodiversity and ecology policy requirements, due to the role that increased vegetation can play.

#### 4.3.2 Green Roofs to Mitigate Heat Gain

- 142 Green roofs containing vegetation, and sometimes water features, provide multiple benefits to a development. Water runoff reduction, evaporative cooling, increased biodiversity and reduced solar gain on the building surface are all key features.
- 143 Similar to a rooftop garden, green roofs can reduce heat islands through the provision of shade, removing heat from surrounding air and reducing roof surface temperature. Compared to standard roofs, **green roofs can be over 4°C cooler at the surface**, whilst modelling simulations have shown indoor temperature reductions from green roofs of up to 3°C.
- 144 **Green roofs can be combined with solar panels** to make 'biosolar roofs'. Although green roofs may reduce roof space for solar panels, this may be outweighed by efficacy gains of the panels due to the green roofs' mitigation of extreme temperatures. Panel efficiency is highest at a set operating temperature, and thus increases when paired with green roofs, as the panels are less likely to exceed this temperature. Panels should be placed at least 75cm above vegetation.
- 145 As policy requirements become more stringent for operational energy, overheating and biodiversity, a crucial balance on new development will need to be struck between:
- **Installing sufficient on-site rooftop solar PV** for a net zero energy/carbon balance
  - **Mitigating overheating risk with reflective, white roofs**
  - **Integrating green roofs with other requirements**

#### 4.3.3 Trees for Shading

- 146 Increased abundance of trees is a measure to address both climate adaptation and biodiversity, resulting in co-benefits. Shading from trees provides enhanced thermal comfort at street level and helps reduce health impacts of increased temperatures, which are exacerbated in urban areas. This is supplemented by the evapotranspiration ability of trees, providing a cooling effect.
- 147 Studies have found street air temperature with higher tree cover density to be 1.3°C lower than streets with lower densities. This benefit is even greater during summer months, **where average air temperature under street trees can be up to 3.3°C cooler than open pavement streets**.
- 148 Where trees are planted, it is vital that the underlying soil is appropriately assessed to determine that the quality and volume of soil is sufficient for predicted tree growth. Without soil assessments, trees are at risk of inhibited growth, impeding pavement surfaces and can die prematurely.



#### 4.3.4 Green Spaces for Residents to Use

149 The further important benefit of green spaces in developments is the widespread improvement to various elements of health and wellbeing:

- **Physical and mental health**
- **Reduce morbidity and mortality in urban areas**
- **Improved relaxation and reduced stress levels**
- **Increased social activity**
- **Lower air pollution and exposure to excessive heat and noise**

150 With [82.9% of residents in England living in urban areas](#), access to green space is a key issue for the majority of the population. As the previous section outlines, measures to increase trees and vegetation within urban and rural environments delivers significant benefits to the climate, biodiversity and society. Green areas provided for natural drainage (see 'SuDS) can double up as green open space for public or communal recreation and relaxation in drier periods.

#### 4.4. Flood Risk Reduction, Blue Infrastructure and Sustainable Drainage Systems

##### 4.4.1 Suds Hierarchy

151 **Applicants should demonstrate that they have implemented a sustainable drainage regime** in their development. Sustainable Drainage Systems (SuDS) promote the prioritisation of natural drainage solutions to control rainwater run-off, which is particularly important in urban areas where impermeable surfaces dominate landscapes.

152 The **Sustainable Drainage System hierarchy** varies between sources, but generally consists of the following stages that should be prioritised in order:

1. **Rainwater storage for later use**
2. **Infiltration through porous surfaces**
3. **Rainwater attenuation in ponds or open water (gradual release)**
4. **Rainwater attenuation in storage tanks (gradual release)**
5. **Rainwater discharge to watercourse**
6. **Rainwater discharge to surface water sewer or drain**
7. **Rainwater discharge to combined sewer**

153 Implementing SuDS provides opportunities to combine drainage solutions with provision for recreation and amenity. Rain gardens and swales can be integrated with walking routes, gardens and seating areas, whilst permeable paving can be used for sporting activities and integrated into children's play spaces to reduce waterlogging risks.

154 SuDS measures are inherently holistic by improving additional elements of new development beyond drainage:

- **Improved water quality and reduced flow of pollutants in rivers**

## REQUIREMENT

### Application evidence for flood risk and SuDS

The Council requires that applicants:

- ✓ Check and submit the appropriate level of Flood Risk Assessment if the development site falls within Flood Zones 2 and 3 (and also in Flood Zone 1 on sites of 1 hectare or more in size and in other circumstances as set out in the NPPF).
  - To find out information on flood zones applicants can visit: <https://check-long-term-flood-risk.service.gov.uk/map>
- ✓ Submit a surface water drainage scheme, which complies with the SuDS hierarchy, when there is a reduction of the permeable areas on a site through building footprints, or hardstanding.

- **Enhanced wildlife habitat provision**
- **Assists urban heat island effect mitigation.**

155 A range of measures can be integrated into the surrounding landscape to address the SuDS hierarchy ambitiously:

- **Green roofs:** planted vegetation on rooftops to limit rainwater runoff to the ground due to increased absorption from plants.
- **Permeable paving:** enables rainwater to infiltrate through pavements, subsequently reducing rainwater build-up at ground level.
- **Rain gardens:** shallow depressions with plants to increase water absorption and reduce or slow runoff.
- **Swales:** planted vegetation placed in shallow channels to slow down rainwater runoff.
- **Retention ponds:** store and gradually release rainwater to mitigate downstream flood risk.
- **Attenuation tanks:** water collection saved for re-use.

##### 4.4.2 Flood Resilience Measures in Buildings

156 Although SuDS (as above) will reduce flood risk at a local level, flood events are inevitable in some cases – especially with heavier rainfall due to climate change in coming decades - and should be appropriately prepared for. Therefore, to fulfil Policy SP2 requirements for



maximisation of climate change resilience and incorporation of flood resilience, **applicants should integrate additional design measures to increase resilience against such risks:**

- **Elevation:** raise the foundation of the building above the flood level.
- **Waterproofing:** waterproof sealants and membranes help prevent water infiltration to inside the building
- **Building materials:** use low permeability, flood-resistant materials to reduce damages but this must be balanced with embodied carbon implications.
- **Electrical systems:** ensure that electrical systems are placed above the anticipated flood line.
- **No increase to impermeable areas** as a result of development

## 4.5. Water Efficiency

### 4.5.1 Mains Water Usage Target Benchmarks by Building Typology

#### REQUIREMENT

##### Application evidence for water efficiency

- ✓ The Council requires that for new development, development should minimise the use of mains water by:

- Incorporating water saving measures and equipment

Designing residential development to meet a target of no more than 110 litres/person/day (105L internal + 5L external)

157 At a national policy scale, **Building Regulations Part G** limits water consumption to **125 litres/person/day**. However, the relevant planning body holds powers to limit water consumption to **110 litres/person/day** (including a 5 litres/person/day external water use allowance). The South-East is categorised as being in serious water stress<sup>1</sup> therefore measures to reduce water usage and conserve existing water resources are essential. Applicants are expected to demonstrate this.

158 A water-efficient development is likely to:

- **Install and operate a water management system** to closely monitor water usage throughout the building.

- **Install a leak detection system** to ensure no water is wasted.
- **Install technology to assess efficiencies.**
- **Use rainwater and greywater harvesting techniques** for the reuse of water.

159 **External water usage in garden spaces** can account for 50% of overall site water usage, particularly in hot and dry weather during summer months, which strongly suggests that outdoor water usage reductions should also be pursued. The key measure here is to reduce water demand and create water-efficient outdoor spaces. This can be achieved by using healthy composted soil consisting of mulch and bark, which can reduce evaporation rates by 75%. Selecting drought-resistant species will also assist reductions in outdoor water usage and increase resilience to future local climates. Outdoor spaces can also be a suitable use for greywater reused from the building.

160 The wider point when considering reduced water usage, indoors and outdoors, is that it mitigates local drought risks and subsequent water restrictions. Therefore, any reduced water usage not only reduces bill costs but also increases local resilience to climate risks, such as overheating, supply outages, and over-abstraction from local water sources which has subsequent impacts on wildlife.

161 Throughout the occupancy of the building, [guidance from Thames Water](#) for householders can be utilised to ensure water usage targets are achieved in practice.

### 4.5.2 Metering, Leak Detection/Avoidance and Solenoid Valves to Reduce Water Waste

162 Applicants should include sub-metering to all separate residence and/or separate users in a building. Water metering is essential to ensure that usage is accurately monitored, for the purposes of billing and to identify usage reduction solutions. Meter devices are typically placed at the connection point between the supply network and end-use location.

163 Metering can form part of strategies for leak detection and avoidance. These are of utmost importance as a large proportion of mains water is lost to leaks and much of this happens on-plot. Detection helps avoid water wastage and excessive operational costs for water utilities, whilst mitigating damage risks to the property. **Reliable leak detection and avoidance should be part of applicants' water efficiency efforts, especially at major developments.**

164 The recent development of **smart water metering systems** has increased the ease of metering system operations, through real-time consumption data and automatic leak detection. This helps consumers better understand what water they are using and thus identify ways to reduce this. Solenoid valves are a useful method to control water flow as they can open and close rapidly in response to electrical signals and can be easily integrated into smart systems to avoid wastage.

### 4.5.3 Rainwater and Greywater Recycling

165 **Applicants are strongly encouraged to show that they have considered water recycling** and where possible incorporated these into their development as part of their efforts towards exemplary water efficiency targets beyond the required minimum.

<sup>1</sup> Environment Agency Water Stressed Areas Final Classification 2021

- 166 Rainwater harvesting is the collection of runoff water from impermeable surfaces of the building. This is primarily used for non-drinking purposes such as toilet flushing, irrigation and laundry.
- 167 Payback time to install rainwater harvesting measures on existing buildings is likely to be between 10 – 15 years. Additional filters can be installed to provide drinking water, yet this comes at an added cost and increased payback period.
- 168 Greywater recycling is the reuse of wastewater from internal building water usage but excluding sewage and kitchen sink water. **Approximately 1/3 of water usage becomes greywater** and can subsequently be recycled to be reused for toilet flushing, which itself accounts for 30% of building water usage.
- 169 Greywater reuse can therefore represent a tool for a step change in water efficiency enabling the development to reach towards more ambitious water targets compatible with future climate as laid out by the [RIBA Climate Challenge](#).
- 170 Wastewater heat recovery (WWHR) is a useful technology to further improve the circularity of the whole-building efficiency. Water used for baths, showers and sinks is often significantly hotter than incoming water supply, which represents a major heat supply opportunity that should not be wasted. A heat exchanger can extract heat from the outgoing greywater and transfer the heat for space heating and domestic hot water usage, which will reduce hot water energy consumption. It is noted that this however is an energy efficiency measure rather than a water efficiency measure.

#### 4.6. Useful External Guidance on Climate Adaptation

- HM Govt [long term flood risk checker](#) for flood risk from all sources – option to search by postcode or view a full map
- LETI [Climate Emergency Design Guide](#)
- LETI Climate Emergency [Retrofit Guide](#)
- RIBA [Climate Challenge](#)
- Good Homes Alliance [Overheating Risk Tool](#)
- [Part O](#) Building Regulations (Overheating assessment – new part of building regulations implemented from June 2022)

## BEST PRACTICE

### Recommended water efficiency measures

- Adoption of RIBA Climate Challenge 2030 water usage targets
- Leak detection and avoidance systems
- Rainwater and Greywater reuse systems

- CIBSE [TM52](#) The limits of thermal comfort: avoiding overheating (2013) [for use in non-residential buildings]
- CIBSE [TM59](#) Design methodology for the assessment of overheating risk in homes (2017)
- [Thames Water Developer Services](#)
- Met Office UK Climate Projections 2018 [User Interface](#)
- National Trust Climate Adaptation [Guidance](#)
- National Trust [Climate Hazard Map](#)
- Historic England [Overheating and Historic Buildings](#)
- Historic England [Climate Change Adaptation Report](#)

## 5. Sustainable Materials and Construction

### 5.1. Sustainable Construction Context

171 It is estimated that **the built environment is directly responsible for 25% of UK carbon emissions, and of that 25% approximately a quarter is embodied emissions of buildings and other infrastructure.** The built environment sector must urgently address its responsibility in countering the climate emergency and collaboratively work to accelerate decarbonisation in the design, construction and operation of our homes and buildings.

#### 5.1.1 National Relevant Commitments/Goals

172 The **Climate Change Act 2008** (as amended) sets the national target for net zero carbon emissions by 2050. The 2050 target implicitly requires that sustainable materials and embodied carbon are accounted for, including carbon emissions attributed from the manufacture, distribution and installation of products and materials. A full definition of the term embodied carbon is provided in Section 5.4.1 below.

173 The CCC recommends the substitution of high-embodied carbon materials with low embodied carbon materials, in addition to the use of recycled materials, and for the introduction of a mandatory whole-life carbon standard for buildings and infrastructure.

174 The value of embodied carbon within existing buildings is also recognised through statutory bodies such as Historic England, who acknowledge that the reuse of existing buildings can radically reduce the overall carbon emissions compared with a new building. Additionally, retrofitting to address energy efficiency should also make use of sustainable materials and construction methods to limit embodied carbon.

175 The purpose of the planning system is to achieve sustainable development through meeting the needs of the present without compromising the ability of future generations to meet their own needs. This also extends to the use of mineral resources.

176 The NPPF 2023 through Chapter 14 states that the planning system should support the transition to a low carbon future through encouragement of the reuse of existing resources, including the conversion of existing buildings, and through Chapter 17 supports the use of secondary or recycled materials.

177 Furthermore, recent industry-led [Part Z proposals](#) have the intention of amending Building Regulations to introduce new requirements on whole-life carbon reporting by 2023 and minimum standards by 2027. Whilst not yet national policy, this demonstrates the direction of travel in respect of quantifying and managing embodied carbon in the near future.

178 Historic England's research report '[Heritage Counts Re-use and Recycle to Reduce Carbon research](#)' identifies the role of existing buildings to ensure sustainable materials and construction are pursued, rather than a sole focus on new builds. **The UK will not be able to achieve the 2050 net zero target without appropriate policies in place for existing**

**buildings**, which primarily must include retention over demolition of existing buildings due to the high amount of embodied carbon that would result from a building replacement.

#### 5.1.2 RBWM Sustainable Construction/Materials Commitments

179 One of the four strategic themes of the **RBWM Environment and Climate Strategy 2020-2025** is the circular economy, recognising that significant carbon reductions are possible when consumption and waste is reduced, and materials are recycled.

180 Through the **Environment and Climate Strategy 2020-2025** and actions leading from it, the borough has set the target of being net zero carbon by 2050.

#### Local Plan policy links

<i>This section outlines local planning policy which relates to Sustainable Materials and Construction to assist applicants with complying with the relevant policies.</i>		
Local Plan Policy	Applicable to	Relevant Requirements
SP2 Climate Change	All development	Adaptation measures need to be built into developments to ensure the sustainable development of housing, businesses and the economy of the Royal Borough.
	Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	
QP3 Character and Design of New Development	All new build development	Demonstration that the development is climate resilient through: <ul style="list-style-type: none"> <li>• Minimising energy demand</li> <li>• Maximising energy efficiency</li> <li>• Minimises waste</li> </ul>
	Outline, Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	

## 5.2. Reuse And Recycling of Materials, And Keeping Existing Buildings in Use Via Retrofit

### 5.2.1 Waste Hierarchy

- 181 As per policy **Local Plan Policy QP3**, the minimisation of waste is an integral criterion of the high-quality sustainable design that is expected of all new development. To inform decision-making on waste and re-use of materials, the waste hierarchy is a useful tool, set out below in order of preference. **Applicants should demonstrate that they have used materials in line with the waste hierarchy, as follows.**
1. **Reduce:** minimise the use of virgin raw materials and associated generation of waste
  2. **Re-use (on-site first):** re-use materials wherever suitable on-site and prepare materials for future re-use.
  3. **Recycle (on-site first):** although recycling uses additional energy, it is preferable to other forms of disposal as it enables the content of the material to be re-used.
  4. **Recover:** where re-using or recycling materials is not possible, energy can be recovered from materials through processes such as incineration, anaerobic digestion, gasification and pyrolysis.
  5. **Disposal:** as a last resort, where no opportunities for the above stages remain, materials are to be disposed of in landfill resulting in the end of a material's lifecycle.
- 182 In summary, all opportunities should be maximised to mitigate materials usage and wastage, followed by re-use and recycling of materials wherever possible. If your site contains existing structures, the waste hierarchy implies that designs should firstly seek to retain these to reduce waste generation and the need for new materials. See 'circular economy' section below and Appendix 5 for technical guidance on pre-demolition audits.
- ### 5.2.2 Circular Economy and Potential for Recycling/Reuse on Site
- 183 'Circular economy' means keeping resources in use for as long as possible in their most valuable form. This is not just about 'recycling' but ensuring that **every step from design to 'end of life' has the goal in mind to keep resources circulating in a valuable form for as long as possible.** For example, at the design and construction stage for a new building, this may include constructing in a way that enables it to **eventually be disassembled** and its components directly reused economically, instead of having to be demolished into mixed fragments that cannot (physically, technically or financially) be separated into useful resources.
- 184 For a site involving existing buildings, it would involve making every effort to:
- i. Preferably keep the existing building in use in the redesign
  - ii. Next, pursue partial retention of functioning parts in situ or in their original form,
  - iii. If that is not possible then reusing their materials in another form.
- 185 Direct reuse in a 'high value' form is preferable to 'downcycling'. For example, if an existing building has marble slabs, these are a 'higher value form', whereas crushing them for aggregate infill would count as 'downcycling'.

## REQUIREMENT

### Application evidence for construction waste and circular economy

- ✓ All applicants are required to follow the waste hierarchy for design and construction decisions.
- ✓ Major development to submit:
  - Circular Economy Statement that follows UKGBC guidance
  - Pre-demolition/pre-development audit
  - Site Waste Management Plan
  - Construction Environmental Management Plan
  - Evidence that a waste recovery rate of  $\geq 70\%$  is achieved

- 186 To appropriately follow circular economy principles, the re-use of materials from any necessary demolition on-site must be entirely maximised. The recovery and re-use of such materials mitigates the need for new materials to be produced, whilst reducing material build-up in landfill. The following materials in particular should be salvaged as far as possible:

- Bricks
- Wood
- Asphalt
- Metals
- Glass
- Plastics

## REQUIREMENT

### Application evidence for operational waste management

The Council requires that applicants will:

- ✓ Demonstrate that the development is designed for in-use waste management according to the RBWM Waste Management Planning Advice Note.



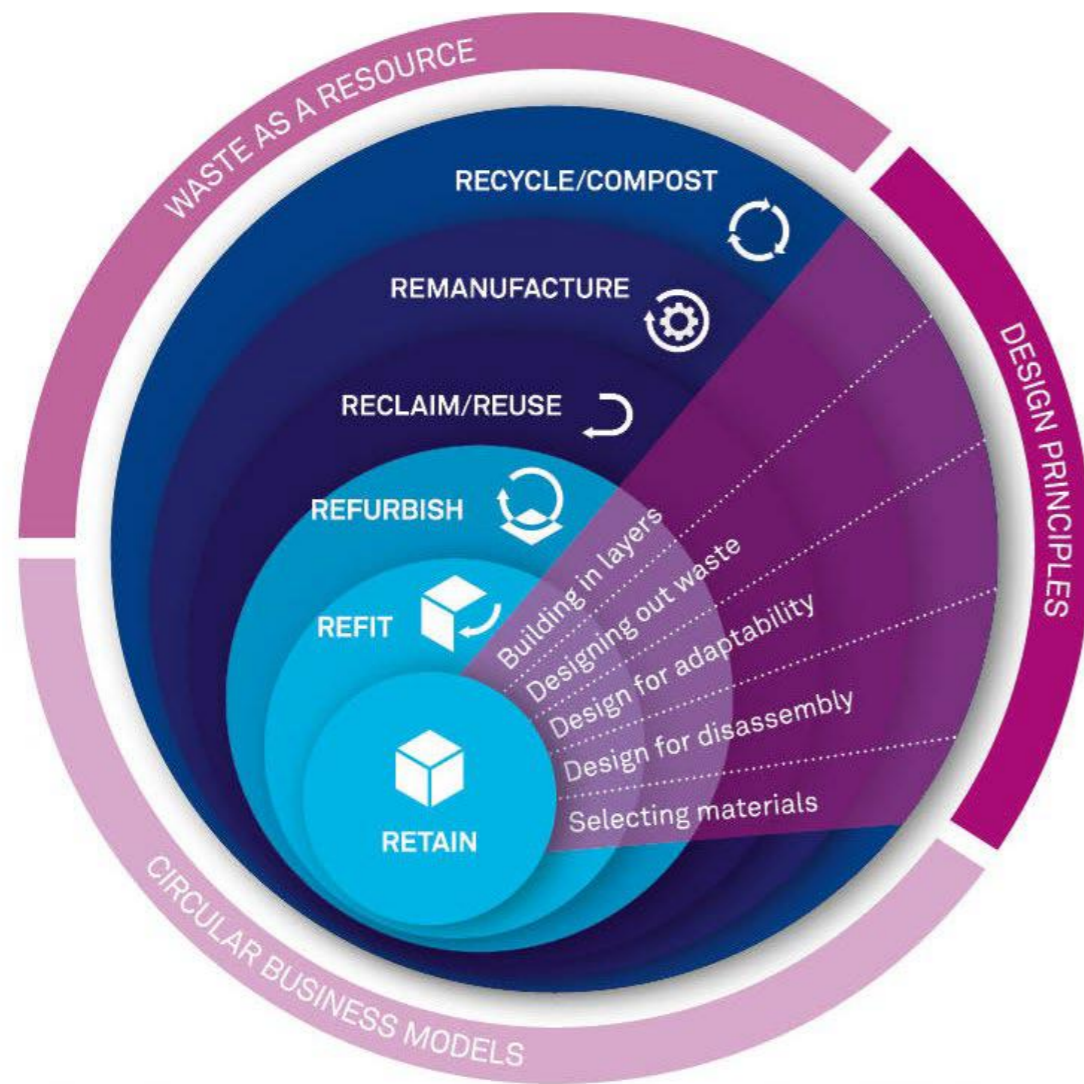


Figure 5: Building Revolutions (Dave Cheshire, 2016)

2. **Design buildings for optimisation**

- a. Longevity
- b. Flexibility
- c. Adaptability
- d. Assembly, disassembly and recoverability

3. **Use standardisation**

- a. Standardised, modular elements in buildings are created with less waste and are easier to re-use

4. **Products as a service**

- a. Create payment systems where materials are treated as a service

5. **Minimise impact and waste**

- a. Use low impact materials
- b. Use recycled content or secondary materials
- c. Design out waste
- d. Reduce construction impacts

**5.2.3 Sustainable Waste Management in Construction and Operation**

- 189 **Construction environmental management plans** and **site waste management plans** are required for major development and for BREEAM assessments. Collectively, the plans should ensure that negative impacts to the environment from construction and the use of materials within the site are avoided as far as possible.
- 190 Waste management throughout the construction phase is likely to have a larger impact than during the operation of the development, however operational waste management for occupiers should remain a primary consideration. The **RBWM Waste Management Planning Advice Note** sets out existing expectations and requirements that new development is subject to in order to address operational waste management.
- 191 Particularly for development sites where demolition is deemed necessary, it is expected that the developer will set out how waste recovery (minimum 70%) is achieved.

187 Various guides are available to assist developers enhance the circularity of a development, such as Construction Industry Research and Information Association (CIRIA) [Reclaimed and Recycled Materials Handbook](#) and the Institution of Civil Engineers Demolition Protocol.

188 The UK Green Building Council [guidance](#) on the circular economy of construction sets out some useful principles to be addressed throughout various phases:

1. **Maximise re-use:**

- a. Re-use the existing asset
- b. Recover materials and products on-site or from another site
- c. Share materials for onward re-use

## BEST PRACTICE

### Waste diversion recommended targets

[Greater London Authority Circular Economy Guidance](#) contains 5 key targets to demonstrate the extent to which circular economy has been pursued. In London, only major projects referable to the Mayor are *required* to respond to these targets, but the guidance has also been applied to proposals below that threshold. The targets are as follows:

- **Demolition waste:** Minimum of 95% diverted from landfill for reuse, recycling or recovery.
- **Excavation waste:** Minimum of 95% diverted from landfill for reuse.
- **Construction waste:** Minimum of 95% diverted from landfill for reuse, recycling or recovery.
- **Municipal waste:** Minimum 65% recycling rate by 2030.
- **Recycled content of materials:** Minimum 20% of the building material elements to be comprised of recycled or reused content.

## BEST PRACTICE

### Best practice material wastage rates

Similarly to setting targets for recycled content % targets, all development should set targets to limit material wastage. According to [WRAP guidance](#), best practice targets should be:

- **Waste generation** (tonnes/£100k)
  - a. Residential new build: 6
  - b. Other new build: 5
  - c. Residential refurbishment: 4
  - d. Other refurbishment: 3
- **Waste recovery** (%)
  - a. Construction: 70-80%
  - b. Refurbishment/strip-out: 70-80%
  - c. Demolition: 80-90%
  - d. Excavation (non-hazardous): 100%.

### 5.3. Sustainable Material Selection and Sourcing

- 192 The selection of sustainable materials should take place as early as possible to ensure that decisions made are integral to building design. Generally, sustainable products such as timber should be prioritised over traditional building materials such as metals and cement, which emit large amounts of greenhouse gases throughout their extraction, manufacturing and processing.
- 193 There is a wide range of environmental impacts associated with material production, use and waste including, but not exclusively: greenhouse gas emissions, air pollution, habitat loss and deforestation, minerals extraction and water wastage and pollution. When selecting construction materials, developers should consider how they will reduce environmental impacts and limit carbon emissions.
- 194 Where an organisation does not have a company-wide procurement plan, a sustainable procurement plan can be created and implemented for refurbishment and new development projects. This can be applied to all involved in specification and procurement during the project and provide a framework for responsible and local sourcing of products and materials.

#### 5.3.1 Local Sourcing

- 195 Local sourcing, particularly of re-used materials, can provide multiple social, environmental and economic benefits. Within the UK, where material production is not prominent, there is a gap in the market for re-usable materials to be the focus of construction materials. Supporting such business locally addresses both circularity of materials and reduces associated impacts from sourcing materials out of the local area.
- 196 However, the relationship between sustainability and sourcing is not simply a matter of distance from the source. The operational ability, adaptability to future conditions, durability and longevity of a material are all important elements to consider alongside sourcing locally. For example, if comparing a stronger Scandinavian timber against a weaker UK timber, the negative impact of additional travel distance of the Scandinavian timber may be outweighed by requiring less of the material to form a building foundation, or a greater durability allowing the building to delay the need for replacement. If one material can be re-used following the lifespan of the existing building, then that is also an additional benefit over a locally sourced material that may not be re-usable.
- 197 The Council urges applicants to check and consider the **Environmental Product Declarations** (if available) to make informed decisions on the choice of construction materials as part of the design process.

#### 5.3.2 Responsible Sourcing

- 198 Responsible sourcing is procurement/sourcing materials where it can be proven with third-party auditable certification that the raw material has been legally harvested and traded, taking into account the supply chain impacts that have occurred before the material is used on site.
- 199 In the UK, it is not always easy to locally source all building materials, and this has led to the argument that responsible sourcing should be prioritised over locally sourcing materials in certain cases, where there are recognised certifications for products.

#### REQUIREMENT:

#### Application evidence for sustainable material selection

*for new residential dwellings, and non-residential floorspace over 100sqm*

In a Sustainability and Energy Statement, the Council requires that applicants will:

- ✓ Demonstrate how the balance between local and responsible material sourcing has been addressed
- ✓ Obtain certification for products where available (e.g. Aluminium Stewardship Initiative)
- ✓ Ensure recycled content is at least 25% and aim for 50%

- 200 Although the sustainable selection of a material should always be the primary decision, these sustainable sourcing frameworks and certifications can be of great use to reduce the carbon impact if more unsustainable materials are selected. Guidance and frameworks on local and responsible sourcing are found in Appendix 4.

#### 5.3.3 Recycled Content Of Total Construction Material

- 201 A straightforward way to determine sustainable material selection is to achieve a certain percentage of recycled content. **Best practice should achieve at least 25% and aim for 50%**. The Council strongly encourages applicants to demonstrate their ambition for recycled content in line with this best practice.

#### 5.3.4 Global Warming Potential (GWP) of Materials

- 202 The Global Warming Potential (GWP) of materials is an important consideration, particularly with operational materials such as insulation and refrigerants. GWP was developed to allow the different global warming impacts of different gases to be compared.
- 203 The GWP of insulation in particular should be carefully considered, as benefits from insulation properties relating to energy efficiency could be outweighed by high embodied carbon impacts due to high GWP in some cases.
- 204 The majority of closed-cell spray foams and rigid foam products have high GWPs (up to 3,400), particularly when compared to cellulose, sheep's wool and straw-based materials (which can have negative GWP as some of these natural materials also sequester carbon as they are growing).



### 5.3.5 Reducing Material Waste Through Efficient Procurement

- 205 The construction industry is the leading contributor to the UK's total waste, with construction, demolition and excavation accounting for 62% in 2018, according to [DEFRA](#). This represents the significant impact the industry has and reveals the need for materials circularity to be improved.
- 206 Construction waste involves the waste that arises during the construction of a development and surplus materials due to inaccurate estimations or over-ordering.
- 207 Wastage rates from construction materials can be reduced where suppliers offer buyback schemes, which means that any excess materials or wastage can be taken back by the supplier. The supplier is then able to resell the product or efficiently recycle it, instead of the developer sending the material for waste disposal in landfill. This means that the resource is not lost, which can also result in financial savings for the developer if there are excess materials that would otherwise cost more due to disposal fees.
- 208 Material efficiency plays an important role in reducing material wastage, as material mismanagement (e.g. purchasing more materials than required) will inevitably cause increased construction waste. An effective materials efficiency strategy must appropriately consider the impact of each material and ensure that exact amounts are specified, whilst specifying efficient designs to reduce the amount of material required in the first instance.

### 5.3.6 Healthy Materials Selection

- 209 Material selection is also highly relevant throughout the operation of the building to ensure the health of occupants is not heavily influenced by poor material selection.
- 210 **Volatile organic compounds (VOCs)** are typically present from building materials, furnishings and paints. VOCs often have negative effects on occupant health, for example due to eye and respiratory irritation, and nausea. '**Forever chemicals**' can also pose a danger to occupant health, which are commonly found in non-stick crockery, food packaging and waterproof clothing.
- 211 All development should consider material selection to ensure the content of VOCs within buildings will be mitigated. The exception to this would be development rarely expected to be occupied by people or animals, such as certain infrastructure-related buildings. Special attention should be paid to this topic for development likely to have particularly sensitive occupants such as children, the elderly or those with pre-existing health conditions.

## 5.4. Embodied Carbon and Life Cycle Analysis

### 5.4.1 What is Embodied Carbon?

- 212 Embodied carbon means emissions associated with the materials and construction process of a development, measured in kgCO<sub>2</sub>e. For example, carbon emissions associated with the energy use or manufacturing process of extracting and producing a product, transporting it to the site, assembling it into a building, both when the new building is created and when it is refurbished or maintained. Embodied carbon is usually measured against **Gross Internal Area (GIA)** (kilogrammes of carbon per m<sup>2</sup>), as defined under [NRM 2](#) produced by RICS. In [the RICS Code of](#)

[Measuring Practice](#), the GIA is the area of a building measured to the internal face of the perimeter walls at each floor level.

- 213 The industry standard method to account for a building's embodied carbon is the [RICS Whole Life Carbon Assessment for the Built Environment](#). This is based on the relevant British Standard BS/EN 15978. The RICS method defines the various different parts of the building that should be assessed, and divides the stages of a building's life into several stages or 'modules':
- **A1 – A5:** All stages up to completion of the building. This is also known as '**upfront carbon**'.
  - **B1 – B5:** The building's in-use lifespan. (Sometimes also includes B6 and B7, which relate to operational energy use and operational water use respectively).
  - **C1 – C4:** End of life of the building and disposal of its waste materials.

### BEST PRACTICE

- Aim for LETI or RIBA Climate Challenge embodied carbon targets
- Follow guidance in the LETI Embodied Carbon Primer

### REQUIREMENT

#### Application evidence for embodied carbon

*for new residential dwellings, and non-residential floorspace over 100sqm*

The Council requires that:

- ✓ Applicants will demonstrate that embodied carbon of construction has been considered and reduced where possible in an **Energy and Sustainability Statement**

The Council expects that:

- ✓ **Major development** will complete an embodied carbon assessment for RICS stages A1 – A5 (or similar methodology)

- 214 The largest contributor to embodied energy is through stages A1-A5. Carbon emitted through these stages occurs 'today' and therefore will certainly affect the local and national carbon budgets as previously noted in relation to the **Climate Change Act and Paris Agreement**.
- 215 Heavy embodied carbon impacts tend to arise from:



- Concrete and cement production
- Steel production
- Metal extraction and refinement (e.g. aluminium and copper)
- Plastic and glass production
- Transportation with long distances between source and site

216 Material selection is of the utmost importance to reduce embodied carbon and should be considered at the earliest possible stage to ensure supply chain availability and integration into building design. Resources such as the **Materials Pyramid** can be particularly useful to understand the embodied carbon impact of particular materials and ensure sustainable material selection. All proposals should consider the use of such resources to appropriately account for embodied carbon, even if a full embodied carbon assessment is not required.

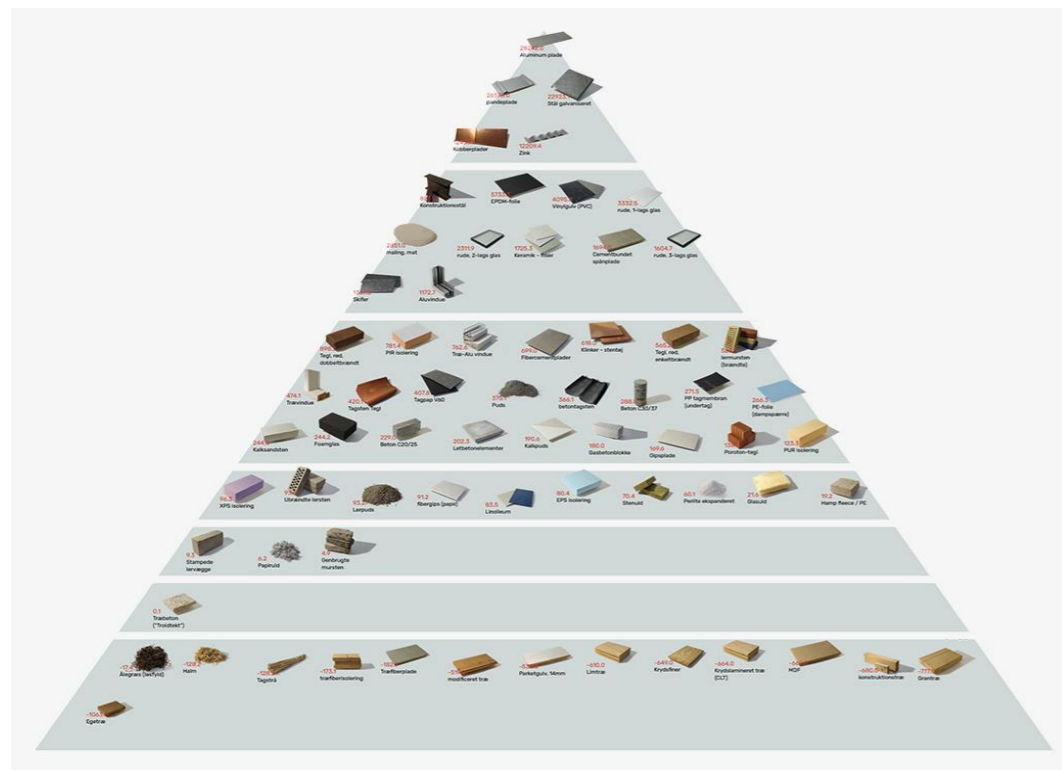


Figure 6: The Construction Materials Pyramid. CINARK,. <https://www.materialepyramiden.dk/>

- Low-carbon operational water use
- Design for future deconstruction and reuse
- Design an efficient building shape and form
- Incorporate carbon sequestering materials
- Design for durability and flexibility
- Address embodied and operational carbon reductions together
- Determine expected building lifespan
- Source materials locally
- Minimise waste
- Efficient and lightweight construction
- Follow circular economy principles

Embodied Carbon Process	Emissions Source
Raw material extraction	Extraction of raw materials uses energy and commonly result in carbon dioxide emissions, particularly for timber, metals and minerals. Mining and refinement add to emissions.
Manufacturing and processing	CO <sub>2</sub> produced during this process often requires heavy machinery that operates at high temperatures and subsequently emit large quantities of CO <sub>2</sub> .
Transportation	Material transportation from source to construction sites can often involve long distances, which is often through carbon intensive transport methods.
Construction and assembly	The majority of these emissions arise from on-site energy use from machinery to assemble the building.
Maintenance and operation	In-use maintenance of structures and systems, involving consumption for heating, lighting and cooling.
Demolition and disposal	Embodied carbon emissions are heightened throughout this process if building materials are simply demolished, incinerated, or placed in landfill to decompose. Reuse of materials should be prioritised.

#### 5.4.2 Guidance on Embodied Carbon Assessments

217 Throughout the design process, principles should be set and retained to address operational and embodied carbon emissions simultaneously. Such principles could consist of those set out in the **Greater London Authority Whole Life-Cycle Carbon Assessments guidance** (likely to be most relevant to major developments), which are noted below:

- Reusing and retrofitting existing built structures
- Utilising repurposed or recycled materials
- Choosing low-carbon materials (e.g. timber, lime or low-carbon production)
- Fabric first approach to holistically reduce embodied and operational carbon

218 To achieve 'high quality and sustainable design', schemes should demonstrate how embodied carbon reductions have been pursued at the design stage. Reduction measures should be specifically considered according to the setting and type of development, but the principles and measures in the list above should be used as a starting point to develop a detailed strategy.

219 Applicants are encouraged to communicate with the Council at the pre-application stage to discuss how embodied carbon reductions are being addressed. An initial embodied carbon assessment at an early stage would be useful to undertake to gain an initial understanding of where embodied carbon reductions could be made, prior to increased certainty at the detailed design stage.

Procurement strategies should be set at an early stage alongside the initial identification of reduction opportunities.

220 Technical guidance on how to complete embodied carbon assessments, and a range of benchmarks figures to aim for within this assessment, are found in Appendix 7: Technical .

### 5.4.3 What if I Can't Do Calculations?

221 It is acceptable that at a smaller scale or where not enough detail is available on designs, that assumptions are used for calculations or 'typical' estimations used instead. For example, **LETI small housing 'Archetype' contains a suggested embodied carbon target of <math><500 \text{ kgCO}\_2/\text{m}^2</math> or a 40% reduction in embodied carbon** (see image on the right for LETI's typical 'small scale housing' embodied carbon breakdown).

222 LETI also provides targets for offices, schools and medium-large scale housing (in the **Embodied Carbon Primer**), however it is recommended that applicants refer to above guidance for these building archetypes.

223 Please also refer to Appendix 3: 'How to measure embodied carbon' and Appendix 4: 'LCA Tools' from the **LETI Embodied Carbon Primer**. Appendix 6 'Rules of thumb' provides further useful guidance for key building components (e.g. how to use fewer materials, how to reduce waste, adaptability, disassembly, and case studies), these being substructure, superstructure, façade, building services, internal finishes, fixtures & fittings, the site, and external works.

224 As an alternative to embodied carbon calculations (for example this could be acceptable in non-major developments), basic actions and narrative that could be demonstrated are:

- **Reused materials**
- **Cement replacement, cement products with clinker replacement, or less cement**
- **Using recycled aggregate**
- **Using renewable materials e.g. certified sustainably sourced timber or other plant-based materials**
- **Sourcing steel from producers that use electric arc furnaces rather than coal-fired**
- **Replacing high-carbon materials with lower-carbon ones (see [Materials Pyramid](#))**
- **Using products with EPD or from the [BRE Green Guide to Specification](#)**

225 Following existing established processes and the principles set out in BREEAM and HQM credits for materials and waste, even if formal certification is not sought, can help project teams and Planning Officers/Councillors to recognise efforts that have been made and where progress has been made.

### Embodied carbon

Focus on reducing embodied carbon for the largest uses:

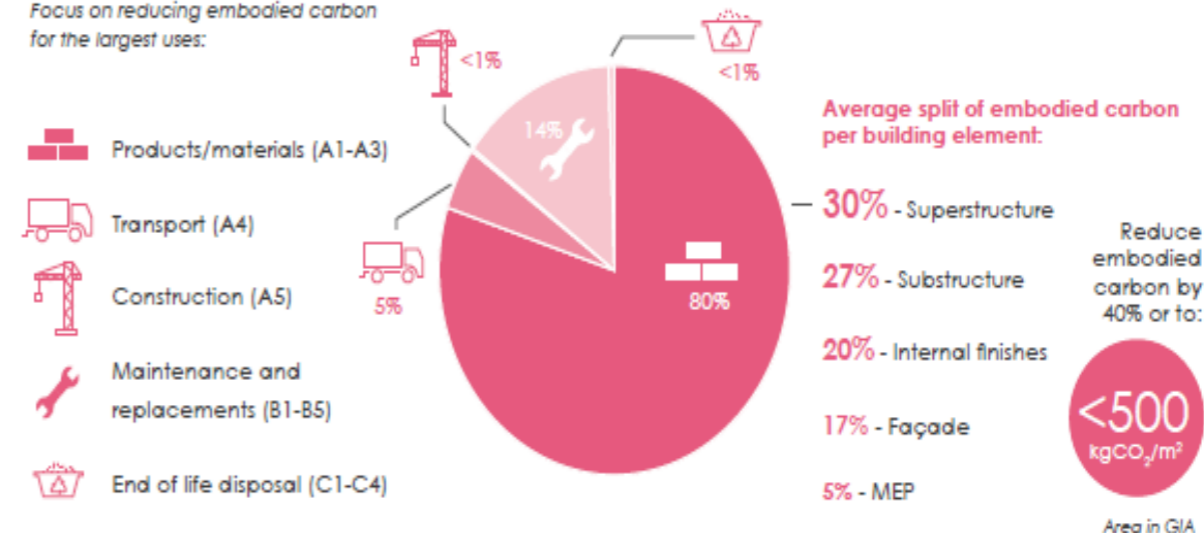


Figure 7: Embodied carbon elemental breakdown ([LETI Embodied Carbon Primer](#))

### 5.5. Useful External Guidance on Sustainable Materials and Construction

- [LETI Embodied Carbon Primer](#) (December 2020)

(Please note that the Embodied Carbon Primer includes some very useful guidance within the Appendices, including how to define the design and construction team scopes for a whole life carbon assessment; how to measure embodied carbon; LCA tools; guidance for low carbon procurement priorities; rules of thumb; designing for manufacture and assembly.

- [LETI Climate Emergency Design Guide](#) (2020)
- [LETI Retrofit Guide](#)
- [RICS Whole Life Carbon Assessment for the Built Environment](#) (2017)
- [CINARK Construction Materials Pyramid](#)
- [BRE Green Guide to Specification](#)
- [BRE Green Book Live](#)
- [BRE Pre-Redevelopment Audit Code of Practice](#)
- [IStruct - How to calculate embodied carbon](#) / [IStruct - The Structural Carbon Tool Version 2](#)
- [RBWM Waste Management Advice Note](#)

## 6. Biodiversity

### 6.1. Biodiversity Context

- 226 Biodiversity means the diversity of all life: animals, plants, fungi, microbes and genetic variety. Species richness (number of different species) and abundance (amount of each type of species) are both key to the biodiversity value of a place.
- 227 Biodiversity is vital to sustainability, as varied species and habitats fill a wide range of essential roles and niches which enable each other to thrive. The more varied species present, the wider the range of resources they can use and strengths they bring. A less biodiverse ecosystem tends to be less resilient against shocks such as drought, heat, disease, or pests – risks that are growing with climate change. Biodiversity thus represents the ‘toolkit’ our ecosystem has to adapt to climate change and other shocks.
- 228 This makes biodiversity crucial not just for the intrinsic value of nature, but also for the functioning of human systems. For example, if a disease wipes out a certain species of insect that normally pollinates our food crops, we will need other species to step in and play that role. Or if birds protect our crops from pests, we must ensure their survival.
- 229 The variety of life on earth and in the local area provides a wide range of ecosystem services ranging from food, biofuels and oxygen to carbon sequestration, microclimate regulation via shade and humidity, managing flood and erosion, creating soil from waste, and providing the green spaces we need for recreation and mental health. These functions depend on many different species acting in symbiosis.
- 230 Yet, across the world and the UK, humanity has been altering ecosystems, reducing the diversity of our crops and livestock, and reducing the area where wildlife can thrive. 75% of the world’s land has now been significantly altered by human activity<sup>xviii</sup> and 75% of food comes from only 12 plants and 5 animal species<sup>xix</sup>.
- 231 In the UK<sup>xx</sup>, 41% of monitored species are in decline (since 1970, species underwent an average 13% decline in abundance and 5% decline in distribution). Key causes are intensified agriculture, climate change, and increasing built use of land. Planning proposals and decisions clearly have a role to play in reversing this decline.

#### 6.1.1 National Biodiversity Commitments

- 232 The Climate Change Act 2008 (amended 2019) requires the Government to enact legislation to limit carbon emissions to net zero by 2050. This requires both mitigation through the reduction of carbon emissions as discussed earlier, and through adaptation measures which includes reference to nature recovery and biodiversity.
- 233 The Environment Act 2021 is the national legislative framework for environmental protection and covers the protection of nature and biodiversity, water and air quality and waste. The Act mandates a general duty to conserve and enhance biodiversity.
- 234 The Environment Act 2021 requires that developments deliver a 10% biodiversity net gain, which would be secured for a minimum of 30 years. Alongside the mandated 10%

biodiversity net gain enshrined in the Act, further measures are included to protect and enhance the natural environment including Local Nature Recovery Strategies.

- 235 The Environmental Targets (Biodiversity) (England) Regulations 2023 and The Environmental Targets (Woodland and Trees Outside Woodland) (England) Regulations 2023 set targets to halt the decline in species populations and boost nature recovery by increasing tree cover and woodlands. Furthermore, the Government’s Environmental Implementation Plan (January 2023) also provides interim targets for the creation of habitats outside of protected sites and for tree canopy and woodland cover.
- 236 The National Planning Policy Framework (NPPF) Chapter 15 requires planning policy and decisions to conserve and enhance the natural environment and protect statutory designated habitats (e.g. Sites of Special Scientific Interest). This duty will be strengthened via implementation of the Environment Act 2021 and future versions of national planning policy.

#### 6.1.2 Local Biodiversity Context and Commitments

- 237 The Royal Borough of Windsor and Maidenhead is home to a range of different types of habitats and species. Over 80% of the borough is designated Green Belt<sup>xxi</sup>, and nearly 10% of the borough is covered by an ecological designation<sup>xxii</sup>.
- 238 The Local Plan (2022) was supported by RBWM’s Green and Blue Infrastructure Study (2019) which provides useful baseline mapping of key landscape features, many of which have importance for biodiversity such as hydrology, woodland, parks and gardens, and sites designated for biodiversity protection.
- 239 **RBWM Environment and Climate Strategy 2020-25**<sup>xxiii</sup> also prioritises biodiversity. One of four strategic themes, the ‘natural environment’ theme’s aim is to achieve “Cleaner air, higher water quality and increased biodiversity”. It has three objectives:
- “Protect and enhance our natural environment”,
  - “Green our towns and urban areas”, and
  - “Increase awareness of biodiversity”.
- 240 To deliver these objectives, the RBWM Environment and Climate Strategy commits the Council to make supplementary planning guidance to support delivery of biodiversity net gain, and extension and enhancement of green and blue infrastructure to support Local Plan policies. This SPD is part of that commitment. Also, as per the Environment Act the Council will develop a Local Nature Recovery Strategy and Nature Recovery Network, and via the Biodiversity Action Plan will target habitats for conservation / enhancement.
- 241 The Environment and Climate Strategy also confirms other ways the Council will pursue its goals, of which the most relevant to biodiversity in development are:
- Use planning policy and decisions to bring forward urban green infrastructure
  - Seek to realise the natural environment’s ability to sequester carbon dioxide through tree planting, tree management and soil preservation



- Use the knowledge and passion in local community nature organisations to help raise awareness and tackle biodiversity loss
  - Fund the Strategy’s implementation partly by developer contributions to be secured through planning (Section 106 and Community Infrastructure Levy).
- 242 **RBWM Biodiversity Action Plan (BAP)**<sup>xxiv</sup> has been developed to help deliver on commitments made in the Environment & Climate Strategy. Adopted in December 2022, the BAP was developed by the Council in 2022 in collaboration with the regional Wildlife Trust, other local conservation groups, and the Council’s Rural Forum.
- 243 The BAP establishes priorities for protecting and enhancing biodiversity within the borough. It sets a baseline, objectives and targets within a five-year period. It covers the period 2022 – 2026, but also shares longer-term targets with other bodies, e.g. “30% of land for nature by 2030” (set by central government and endorsed by BBOWT).
- 244 The BAP also echoes RBWM’s aforementioned Environment & Climate Strategy with its intent to increase carbon sequestration via major projects affecting the natural environment, noting that funding will be sought for this, which may include payments from developers via Section 106 (S106) or the Community Infrastructure Levy (CIL).
- 245 The BAP provides the following key information, which should be taken into account in applicants’ response to the requirements of Policy NR2:
- **List the designated nature conservation sites** in the local area including Ramsar sites, SACs, SPAs, SSSIs, LNRs and LWS. No maps are contained within the BAP itself, but one has been created for this SPD (see map at Appendix 8: Summary of RBWM Biodiversity Action Plan ).
  - **Baselines for the habitat types** most important within the borough: Woodland, grassland, cultivated or disturbed land, and water. For each, this baseline notes the prevalence, subtypes, condition, species, threats, and conservation priorities.
  - **A set of six ‘Habitat Action Plans’ (HAPs):** [Woodland](#), [Grassland](#), [Waterways](#), [Standing Water](#), [Urban](#), and Farmland. Each of these contains actions structured by the three strands that run throughout the BAP: 1. Data collection, 2. Actions for direct benefit to biodiversity, and 3. actions on engagement or partnerships.
  - **Case studies for each type of identified key habitat** exemplifying the type of interventions that can make positive change.
  - **Notes that ‘Biodiversity Opportunity Areas’ (BOA) have been mapped separately.** These are not designations that constrain activities but denote where conservation efforts can be most effective.
  - **A set of quantitative and qualitative objectives with specific target years,** some of which have relevance to development applications.
- 246 **The Biodiversity Opportunity Areas** referred to by the BAP are mapped by the Thames Valley Environmental Records Centre on a Berkshire-wide level. The BAP itself does not provide these maps but they are available from the TVERC website. See also **Appendix 8: Summary of RBWM Biodiversity Action Plan of this SPD.**
- 247 Local habitat mapping by conservation volunteer groups is also available and may be helpful for developers to refer to.
- For example, the **Wild Maidenhead Phase 1 Habitat Survey** provides more granular detail on specific sites and species in Maidenhead. This survey is useful to understand specific wildlife species that are present and need interventions, some of which could be delivered with development. The full report comes with helpful mapping, reproduced at **Appendix 8: Summary of RBWM Biodiversity Action Plan of this SPD.**
  - Other ‘wilds’ groups are also producing mapping; see ‘external guidance’ at the end of this chapter.
- 248 **PLEASE NOTE: All of the above are outlined more fully in Appendix 8:** Summary of RBWM Biodiversity Action Plan **of this SPD.** This Appendix is designed to help developers navigate the content of the BAP, BOA mapping, other relevant local habitat mapping and local conservation priorities that should be taken into account in the preparation of development proposals. It does this by giving a more detailed snapshot of the key priorities for different types of habitat and location, including with visual maps that are not provided within the BAP itself.



**This section outlines local planning policy which relates to Biodiversity to assist applicants with complying with the relevant policies.**

Local Plan Policy	Applicable to	Relevant Requirements
SP2 Climate Change	All scales of development. Outline, Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	Applications should demonstrate that the development has been designed to: <ul style="list-style-type: none"> <li>Utilise and include green and blue infrastructure to maximise resistance and resilience to climate change</li> </ul>
QP1 Sustainability and Placemaking Change	Larger developments: 10 or more residential units or 1,000 sq. m of floorspace or 1 ha in area) Outline, Full, Reserved Matters and Section 73	Large developments are expected to: <ul style="list-style-type: none"> <li>Provide attractive public spaces</li> <li>Create places that foster healthy lifestyles</li> <li>Foster biodiversity and enhancement of green infrastructure</li> </ul>
QP2 Green and Blue Infrastructure	All new build development Outline, Full, Reserved Matters and Section 73	Applications should demonstrate that their proposals fulfil the following: <ul style="list-style-type: none"> <li>Green and blue infrastructure to maintain, enhance and enlarge the borough's existing green and blue infrastructure</li> <li>Incorporation of green and blue infrastructure on ground and upper levels</li> <li>Provision of, or improvement of blue infrastructure</li> </ul>
QP3 Character and Design of New Development	All new build development Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	Applications should demonstrate: <ul style="list-style-type: none"> <li>Protection of trees and vegetation</li> <li>Integration of comprehensive blue and green infrastructure</li> </ul>
NR2 Nature Conservation and Biodiversity	All developments Full, Outline, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	Applications should demonstrate that: <ul style="list-style-type: none"> <li>Proposals result in a net gain for biodiversity (using the appropriate metric)</li> <li>Designated sites of international and national importance, will be maintained, protected and enhanced.</li> <li>Protected species and habitats will be safeguarded from harm or loss and should be enhanced where possible.</li> <li>Proposals maintain, protect and enhance existing biodiversity</li> <li>Proposals avoid impacts on habitats and species of principle importance</li> <li>Proposals either individually or cumulatively do not have a detrimental impact on sites of local importance,</li> <li>Proposals do not compromise the implementation of national, regional or local biodiversity action plans</li> <li>The mitigation hierarchy has been employed to avoid, mitigate and as the last report compensate for adverse biodiversity impacts</li> <li>Proposals take the opportunity to enhance connectivity to other habitats. Applications should be accompanied by an appropriate level of ecological reporting</li> </ul>
NR3 Trees, Woodlands and Hedgerows	All developments Full, Outline, Reserved Matters, Householder, Section 73	Applications should demonstrate: <ul style="list-style-type: none"> <li>Protection of trees</li> </ul>
IF1 Infrastructure and Developer Contributions	All development Except: householder and development >100sqm Outline, Full, Reserved Matters and Section 73	Applications should: <ul style="list-style-type: none"> <li>Deliver infrastructure that supports the overall spatial strategy of the borough through financial contributions or on site provision.</li> </ul>
IF4 Open Space	Large residential development of 10 or more dwellings Outline, Full, Reserved Matters and Section 73	Applications should: <ul style="list-style-type: none"> <li>Provide new open space in accordance with Local Plan standards</li> </ul>
EP3 Artificial Light Pollution	All developments Full, Outline, Reserved Matters, Householder, Section 73	Applications should: <ul style="list-style-type: none"> <li>seek to avoid generating artificial light pollution where possible and development proposals for new outdoor lighting schemes that are likely to have a detrimental impact on biodiversity</li> </ul>

Supplementary Planning Guidance:

This SPD supplements the Borough Planning Obligations and Development Contributions SPD

Local plan policy links

## 6.2. Biodiversity Net Gain and Building-Level Considerations

### 6.2.1 Biodiversity Net Gain (BNG)

249 Biodiversity net gain expresses the balance between habitat loss and habitat creation before and after development. A **minimum 10% net gain is required in all development (excluding exemptions)** by the Environment Act 2021. This supports net gain required by plan Policy NR2.

250 **The DEFRA Biodiversity Metric** is the nationally recognised tool by which the minimum 10% biodiversity net gain requirement of the Environment Act 2021 will be measured. Applicants should use the current version available at the time of making a planning application. For more detail on how it works, please **see SPD Appendix 9: Using the DEFRA Metric for Biodiversity Net Gain**.

251 The DEFRA metric compares the pre-development and post-development presence of different types of planted habitat area and their condition. Net gain is achieved on site by expanding habitat area, creating more valuable habitat types, or improving the condition of existing habitat.

252 The amount, type and quality of habitat using the **DEFRA metric must be assessed by a 'competent person'**. Non-planted features (e.g. bird boxes) do not count in the DEFRA 4.0 metric.

253 As per the national approach, negative impacts to 'irreplaceable habitats' cannot be compensated with offsetting. Proposals should be designed not to harm them. Any such harm must be treated separately from the main BNG metric, but enhancements to them can count towards the net gain.

- Until Government legislates to **define irreplaceable habitat**, the Council will use the NPPF definition. As of the NPPF 2023 these are: ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.

254 RBWM will afford **positive weight to proposals that exceed the minimum 10% on site**, taking into account the scope for improvement from the pre-development site. Sites with very little pre-existing greenery will be able to achieve a much higher net gain, potentially several hundred %.

255 **Applicants must offset any deficit** as a last resort where the minimum 10% net gain cannot be achieved on site. Biodiversity offset credits are created for sale by land managers by creating or enhancing habitat on other land. These are expected to become regulated and mediated via Government schemes (Natural England), but meanwhile can be accessed via brokers.

- **Any offsetting should always be within the borough** and as close to site as possible.
- The Council is in the process of setting up a scheme to make this easier.

#### REQUIREMENT

Applicability for different applications: Biodiversity net gain  $\geq 10\%$



New development (excluding exemptions)



Proposed use: all



Application types: All (Full, outline, reserved matters, S73, Householder)



Proposal size threshold: All

#### REQUIREMENT

Application evidence for Biodiversity Net Gain

- ✓ Biodiversity net gain percentage as per DEFRA metric (conducted by 'competent person'), with calculations attached (with transparent separate treatment of 'irreplaceable habitat') and evidence of how this is secured for 30 years
- ✓ Designs showing on-site habitat (area, type and condition) pre-development and proposed post-development
- ✓ Narrative demonstrating unavailability of any losses or offsetting, where proposed. Offsetting should be within the borough.

256 **The BNG metric can be used for full and reserved matters applications and also for outline applications on an indicative and precautionary basis.** Government confirms that for outline applications or development permitted in phases, there will be a requirement to show how BNG will be achieved across the whole site on a phase-by-phase basis and it should be subject to a condition for approval of a biodiversity gain plan prior to each phase commencement<sup>xxv</sup>.

257 Applicants for all types and sizes of development, through their application documents, will be required to provide:

- **The baseline ecological conditions of the site**, as demonstrated through an ecological report (Preliminary Ecological Appraisal)
- **Illustrate the type and condition of habitat being delivered or enhanced** by the development, via sufficiently labelled site or landscape plans
- **Biodiversity net gain calculation showing that at least 10% net gain will be met** for the proposed development firstly through on-site measures, calculated through the most up to date version of DEFRA’s Biodiversity Metric with confirmation that this was performed by a suitably competent person as per the User Guide to the DEFRA Biodiversity Metric
- **Measures of how the proposed habitats will be secured for 30 years or more** (detailed management measures may be subject to a planning condition)
- Where there are on-site **losses and/or where biodiversity offsetting** is required to meet the 10% net gain, the applicant is required to **confirm that the offsetting will be delivered within the borough** and **demonstrate why this was necessary** with reference to the specific characteristics of the development site (for an indication of the explanation expected, see commentary alongside **Error! Reference source not found.**) and confirm that offsetting credits have not been used to ‘compensate’ any loss of irreplaceable habitat.

**6.2.2 Habitat Protection and Creation**

258 Retention of existing habitat is usually more beneficial than destroying and recreating it, due to the time lag in re-establishing the habitat and its community of species. **As per Policy NR2**, proposals should include ecological reports (per [BS42020](#)), alternative sites considered, and mitigation.

259 The Council expects applicants to identify how their site relates to habitats and habitat enhancement opportunities designated in the BAP, or any other ecological designation applicable to the site to ensure that appropriate measures for the conservation and enhancements of the borough’s habitats may best be best achieved in a holistic manner.

260 Steps that applicants should take in the pursuit of habitat protection should include:

- Check if the site overlaps with or is near any **protected sites** or **Biodiversity Opportunity Areas** (see Appendix 8: Summary of RBWM Biodiversity Action Plan and [resource links](#)). Development on protected sites will not generally be considered appropriate.
  - i. Development near protected sites may affect the protected site even without overlap. For example, consider increased footfall (people or dogs), light pollution, changes to water flows, air pollution, severance from wildlife corridors, predation of wildlife (domestic cats) or fertiliser/pesticide runoff.

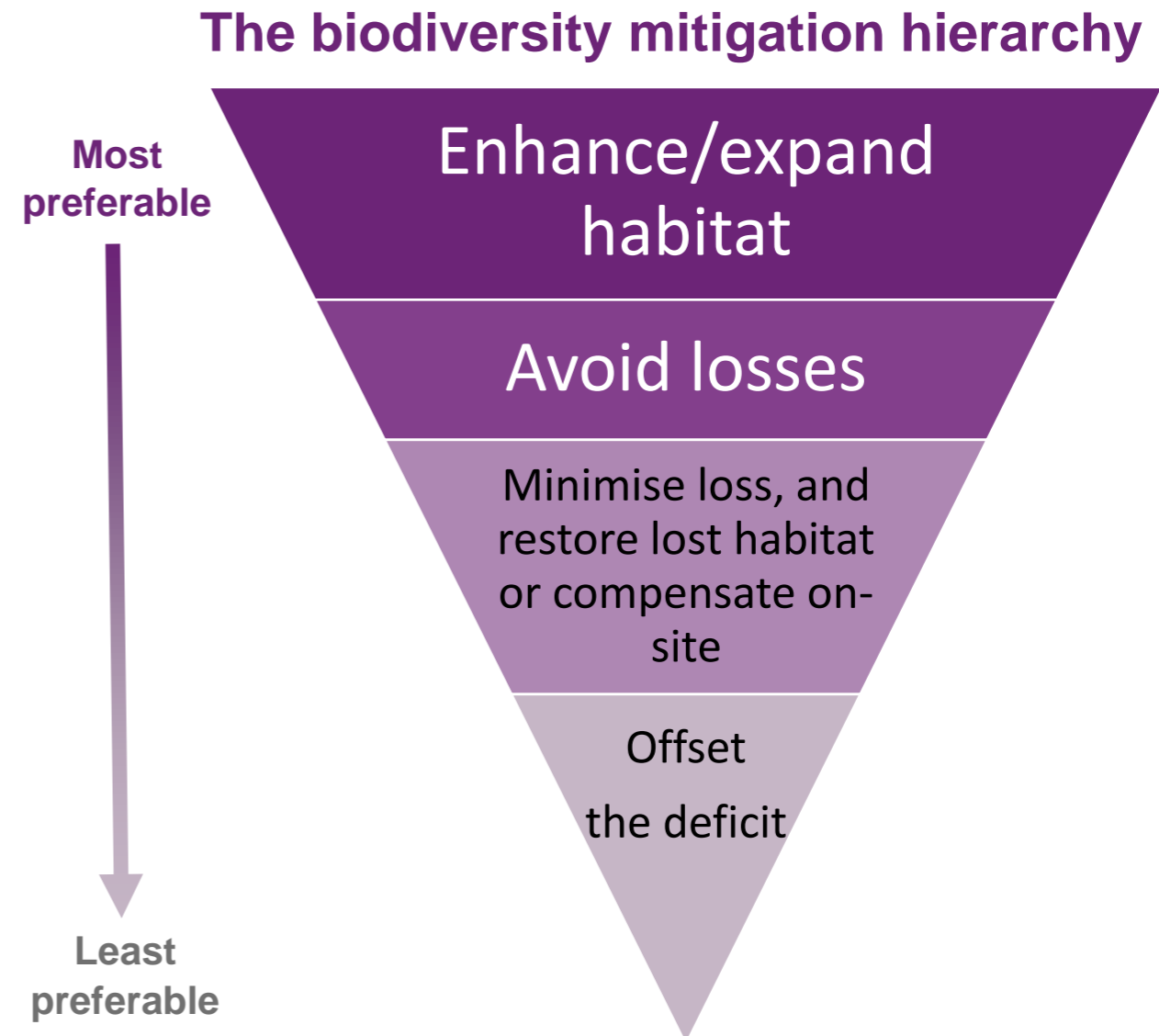


Figure 8: The Biodiversity Mitigation Hierarchy.

If your scheme involves loss and/or offsetting, for this to be accepted you should **demonstrate how you have striven to firstly pursue on-site mitigation**, for example by:

- Showing how you iterated your design to arrange your built features in ways to avoid loss and make room for more habitat
- Demonstrating any constraints that prevented the inclusion of more high-value habitat creation on site and explain how you have considered and ruled out space-saving measures such as green roofs, green walls, hedges, and so on.
- This information should be given in your design statement and signposted in the relevant part of this SPD’s checklist.

Central Government has committed to produce further guidance on how to demonstrate the need for biodiversity offset credits. Please refer to this when it becomes available.

- ii. Development within a certain distance of a protected site is required to conduct special assessments and may need to take special mitigation measures – e.g. providing alternative green space to reduce the likelihood of increased footfall to the protected site ('Suitable Accessible Natural Greenspace'). Requirements vary by the distance from the protected site (**'impact risk zones'**) and the size and type of development. Guidance on impact risk zones is [available](#) from DEFRA. Zones can be viewed by:
  1. Using GIS software to view DEFRA shapefiles alongside that guidance, or
  2. [DEFRA Magic Map](#) (no special software needed) – select 'Designations' > 'Land-based' > 'Statutory' > 'SSSI Impact Risk Zones' and zoom to 1km scale.
- Establish whether your site contains any **other valuable habitats that are not yet protected by a designation**, or any **notable species in need of protection**, considering:
  - i. **'Irreplaceable habitats'** as per NPPF or emerging government definition. The Council expects development to be laid out to avoid any loss or harm to these habitats.
  - ii. **'Priority Habitats'**: Habitat types defined by the Natural Environment and Rural Communities Act (2006) Section 41. The Council expects development to be located to minimise the loss or impact to priority habitats. Indicative priority habitat maps can be seen at DEFRA Magic Map but must be verified by on-site ecologist surveys.
  - iii. **Threats to key habitats or species noted in BAP baseline or objectives** (as outlined in Appendix 8: Summary of RBWM Biodiversity Action Plan )
  - iv. Applicants must check for any **Tree Preservation Orders (TPO)** in place. Works to TPO trees without prior permission is illegal, similarly for tress protected under Conservation Area controls. The Council expects that development will be laid out to avoid removal of any TPO trees, important trees, **Ancient Trees** or **Veteran Trees**, unless adequate justification and mitigation is provided. An arboriculturist can identify these.
    1. Existing mature trees and hedgerows support far more wildlife than young replacements. Mature trees and hedgerows can strongly support the identity, heritage, character and thus the desirability of a development, so should be treated as an opportunity rather than a constraint (e.g. retained hedgerows can form a framework for spatial layout). Where existing trees may be impacted by construction, they should be assessed by an arboriculturist as per [BS 5837](#).
    2. Where important trees are retained, applicants are encouraged to outline protection measures against damage in construction (including roots). An arboriculturist can devise suitable actions. Best practice is laid out in [BS 5837](#). If the site has significant or extensive trees, it may be appropriate to provide a full arboricultural method statement following BS5837.
  - v. The most recent records of **notable or vulnerable species** presence in specific locations are available from [TVERC](#). Ecological reports should include such information. If such species are present on site or nearby, or if the site contains types of habitat likely to host these (especially bats and birds), then the applicant should demonstrate that surveys have been conducted at the appropriate times of day/year

## REQUIREMENT

**Applicability for different applications: Checking for impacts to any designated protected site (SSSI, SPI, SAC, Ramsar, NNR, LNR), TPO tree or irreplaceable habitat, and demonstrating mitigation of impact**



New development and refurbishment of existing



Proposed use: all



Type: All (Full, outline, reserved matters, phased)



Proposal size threshold: All



QUICK LINKS WITHIN  
THIS DOCUMENT:

[Combined checklist](#)

[Energy and carbon](#)

[Climate adaptation](#)

[Sustainable construction](#)

[Biodiversity](#)

[Sustainable transport](#)


and mitigation measures proposed. As well as designs, these measures may need to include a construction schedule timed to avoid disturbance to nesting birds and bats.


261 Applicants will need to enhance or create new habitats as part of efforts to achieve the required  $\geq 10\%$  Biodiversity Net Gain, as well as protecting existing habitat. **Applications should deliver where possible the following best practices**, and positive weight will be afforded where more of the practices are fulfilled:


- **Creating wildlife corridors between existing habitats** on or off site. Your proposal should show how you have considered where your site sits in relation to the wider network of protected sites and Biodiversity Opportunity Areas (see mapping, Appendix 8: Summary of RBWM Biodiversity Action Plan ) and design your proposal to extend these or create stepping stones to help wildlife move between those safe havens. Larger sites are likely to have more scope for beneficial impact in this respect.
- **Creating a diversity of habitat on sites to support a diversity of species:** a patchwork of diverse and complementary habitats often support a wider array of species by providing a wider array of niches that species can occupy. ‘Edge’ areas such as woodland edge, pond edge or river margin often exemplify this pattern. Certain different habitats can complement each-others’ habitat value, such as grass meadows alongside woodland or hedgerow<sup>xxvi</sup>, or trees alongside waterways<sup>xxvii,xxviii</sup>.
- **Planting and management measures specifically chosen to support local wildlife species or habitats**, especially those known to be present in or near your site: [TVERC’s data search service](#) contains the most up to date records of species present, and the [RBWM Biodiversity Action Plan](#) describes measures desirable for specific habitat types including woodland, grassland, waterways, standing water, and (in future) farmland and particularly notable species associated with them. Where it is not known what species may be able to benefit your site, it is generally beneficial to include a range of landscape features that provide:
  - i. Nectar, pollen or fruit across as wide a period of the year as possible;
  - ii. Planting that can be maintained with minimal disturbance, especially wildflower meadows which only need to be cut once or twice a year (thus also saving maintenance costs as well as being nectar-rich)
  - iii. Wildlife access to water
  - iv. Maintenance of ‘dark’ areas at night time, i.e. avoiding light pollution to habitats.
- **Optimal tree and plant selection:** It is important that applicants consider the most appropriate planting in recognition of the site’s characteristics and conditions, taking into consideration access to water, sunlight, other environmental factors, and the selected plant’s anticipated size and shape at maturity and its maintenance needs. Please note that although woodland creation is generally positive, it is not always appropriate: trees should not be planted on peaty soils over 50cm deep or on organic soils under 50cm<sup>xxix</sup>.
- **Well-designed green roofs or walls:** These can provide precious habitat on sites where space is tight. Applicants may use these to fulfil **Policy QP2(2)** requirement for *all forms of development in intensifying urban areas* to provide “green and blue infrastructure at both ground floor and upper levels”, as well as towards the required 10% biodiversity net gain.


## BEST PRACTICE

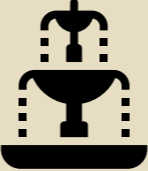
### Recommended contextual landscape design measures for biodiversity


- 

20% Biodiversity Net Gain
- 

Fill the missing link between existing nearby habitats and Biodiversity Opportunity Areas
- 

A diverse patchwork of complementary habitats and edges
- 

Planting that provides nectar, pollen or fruit across the year
- 

Access to water for wildlife
- 

Maintain dark skies

- i. Green roofs can be designed for low maintenance and can also be carefully combined with solar panels ('biosolar roofs'<sup>xxx</sup>) helping you to meet expectations for both Biodiversity Net Gain and carbon reductions.
- ii. Where green walls are proposed, the applicant is expected to demonstrate how these have been designed to avoid maintenance challenges.
- iii. Poorly designed green roofs may not provide wildlife benefits; some studies find they attract ground-nesting birds but can fail to provide water and food for chick survival. Applicants should provide sufficient detail on planting species and build-up.
- iv. Links to several free resources on optimal green roof design (for biodiversity and other considerations) are given at the end of this chapter.

- **Use of native species wherever possible:** Native plant species are more likely to have symbiotic relationships with our native wildlife and therefore support biodiversity recovery. Sourcing plants grown in the UK also reduces the risk of bringing in invasive pests and pathogens. Proposals are encouraged to allow natural dynamics, such as natural regeneration to occur, particularly where there is an appropriate native seed source nearby (e.g. ancient woodland or important hedgerows). However, there are some non-native species that can provide benefits such as drought tolerance, resistance to invasive diseases such as Dutch Elm disease, or filling a seasonal gap where native plants may not provide food for wildlife. Where any non-native planting species are proposed, proposals are encouraged to include narrative on the unique biodiversity or climate adaptation benefits of these.

262 **High-quality green and blue infrastructure** (as sought by **Policies QP1, QP2 and QP3**) ideally means **multi-functional**: providing a range of benefits to people and wildlife. See Chapter 4 (Climate Adaptation) for guidance on designing for benefits such as mitigation of flood or heat. Green features can also aid mental wellbeing (a phenomenon named 'biophilia'). Views onto green space help, but the effect is greater if people can engage fully e.g. via exercise, play, or gardening.

263 Wildlife benefits from refuges free from disturbance by people or pets. Larger sites could enclose some areas with wildlife-permeable barriers. The Council will apply positive weight to applications that demonstrate green space design that optimises multiple benefits for people and wildlife.

264 **Proposals could demonstrate generosity of green space provision** by including in the application a disclosure of performance against well-established benchmarks, such as:

- [Urban Greening Factor](#) – while developed for London, this tool is useful in any urban setting. It accounts for vertical green space (walls; hedges) as well as ground- and roof-level plants. The guidance comes with a score calculator. A score of 40% is very good in urban settings.
- [Garden Cities Design Guidance](#) – stipulates that green infrastructure forms 50% of total site area, of which at least half should be public. Although this guidance is aimed at developments aiming to achieve Garden City status, this target for green area provision is still a positive benchmark for any development to aim for.

## BEST PRACTICE

### Recommended measures for exemplary green space design to balance benefits between people and wildlife



Design green roofs with enough substrate to support invertebrates and ground-nesting birds



Design green walls & roofs to avoid maintenance challenges, e.g. ensure climbers won't grow into ventilation exhausts



Native planting to feed native wildlife – or non-natives that also do this or offer resistance to disease or drought



Low maintenance for reduced wildlife disturbance and cost



Some wildlife refuges that gently deter disturbance by people and pets, e.g. brambles, permeable fences, wet ditches

- [WELL Buildings Standard](#) – stipulates that 70% of accessible outdoor space (as viewed from above) to be planting or tree canopy cover. This is one target within the much wider WELL framework, a certification for design and operation of buildings for human wellbeing.
- [Natural England Green Infrastructure Standards Framework](#) may help you navigate the range of standards against which your scheme could aim for excellence.

265 **Various accreditations** may be beneficial to your scheme both in terms of demonstrating planning acceptability and in terms of community acceptability and marketing benefits to end users. For example:

- **BREEAM certification** is well-recognised and sought-after, especially in the commercial market. One of its many themes is Land Use and Ecology. Even if not aiming for a BREEAM rating, applicants may choose to demonstrate good practice in designing for biodiversity by fulfilling the criteria for BREEAM credits in the Land Use and Ecology theme. The credits vary by type of development project. In [non-residential new construction](#), the relevant credits include LE01 (site selection), LE02 (early ecologist involvement), LE03 (use of ecological insights to mitigate impacts), and LE04 (measurable ecological improvement).
- **Building with Nature standard**. This provides guidance and benchmarks, which if fulfilled make the development eligible for a Building with Nature award.

266 **Proposals should demonstrate provision for long-term maintenance of green space.** Given the financial and administrative burden on pressured local government finances, the applicant should not expect that the Council will adopt any private public green space provided at their development. Where public green space is included in a proposal, the application should include plans for the expected maintenance requirements and how this will be administrated and funded permanently. See the [RBWM Green and Blue Infrastructure Study](#) section 'Management and maintenance of green space' for an outline of several potential arrangements for management and funding, including their implications and potential pitfalls.

- From a biodiversity perspective, RBWM expects the proposal's narrative to include explanation of how the maintenance schedule will deliver ecological benefits, such as by minimising or eliminating the application of pesticides and fertilisers and wildlife disturbance through trimming or mowing, especially during bird nesting seasons.

## BEST PRACTICE

### Benchmarks for exemplary green space provision

**UGF**

score 0.4 or more (Urban Greening Factor)

**ANGSt**

Accessible Natural Greenspace Standard (capped walking distances to various sizes of natural space)



50%

green space across site area, of which half to be public



70%

planting or tree canopy across accessible outdoor space

See also [Natural England Green Infrastructure Standards Framework](#) for more potential benchmarks.



- The level of detail required in the proposal's plans for long-term green space management and maintenance should be commensurate with the scale of the development and the type of application (full, outline, reserved matters).
- Outline applications that propose public green space may include less detail on the exact maintenance measures that will be conducted but should demonstrate that funding arrangements have been provisionally well considered and that initial thought has occurred how the probable types of green space could be managed for wildlife benefits (e.g. general good practice for grassland, stream/river/pond borders, light pollution, etc).

### 6.2.3 Local Food Production

- 267 Green space for food production is an opportunity to deliver biodiversity enhancement as well as social benefits via community food production. The Local Plan (paragraph 6.10.2) definition of green infrastructure includes allotments, community gardens, orchards and urban farms, thus these contribute to the blue and green infrastructure provision required by **Policy QP2** and **QP3**.
- 268 The provision of allotments and other food growing provision is to be supported through developers' direct provision on site, and/or through developer contributions as stipulated through the Local Plan and [Developer Contributions SPD](#).
- Local Plan Appendix F lays out the open space standards that should be achieved, which include allotments of 0.2ha per 1,000 population, within a 400m walk from dwellings
  - Local Plan Appendix C also sets out requirements for food growing space provision at specified allocated sites. These requirements variously include allotments, community gardens, orchards, or a general capability for food production within green infrastructure. For some sites it is specified that this provision should make use existing high-quality farmland.
  - The Council has also set an intent to produce a Green and Blue Infrastructure SPD. When published, applicants should refer any further expectations around the provision of food growing space defined in that SPD.
- 269 Food gardens and less formal 'edible landscaping' can support biodiversity via food crop diversity, and by planting that supports wildlife without harming the crop for people. A good example is flowering herbs such as thyme, mint, rosemary or lavender, as insects feed on the pollen and nectar while people usually consume the leaves. Fruit trees or bushes can provide similar benefits.
- 270 Where proposals include food gardens or other edible landscape, detail will be welcomed on the type of plants proposed, and the management of the spaces to avoid harmful impacts on wildlife.
- 271 Food gardens can also contribute to recreation, reducing food miles (thus traffic and carbon emissions), and create opportunities to compost food waste. The UK's food waste is responsible for a significant amount of carbon emissions, potentially up to 5% of the UK's total emissions<sup>xxxi</sup>. Composting will not fully solve this (as CO<sub>2</sub> is emitted from compost) but the act of composting brings food waste into people's awareness and produces a valuable resource for further growing.
- Where gardens and kitchens are provided, RBWM encourages demonstration that provision is made for safe and convenient composting of garden waste and kitchen scraps. As a minimum, proposals must include suitable space for food waste storage to enable occupants

## REQUIREMENT

### Provision for long-term maintenance of green space

**All applications** are expected to demonstrate the following in relation to any proposed public or shared green space:

- Management arrangements for long-term maintenance
- Funding mechanisms for long-term maintenance
- How the maintenance schedule will deliver ecological benefits

**In outline applications**, a reduced level of detail is acceptable but full detail will need to be provided at the reserved matters stage.

to easily and conveniently make use of the borough's food waste collection. The [Council's waste management advice for new developments](#) denotes the minimum required volume for food waste storage (23L caddy for houses or individual flats; or for communal flats the requirement comprises 5% of the total anticipated waste volume, in bins of 140L).

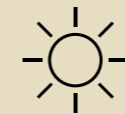
- Where communal compost facilities are proposed, please include them in the narrative to be provided on long-term management and maintenance of shared space as previously laid out.

272 At sites that contain high quality farmland (grades 1, 2 and 3a), RBWM will look positively on proposals whose layout strives to keep the high-grade land free from built development in favour of creating community gardens, orchards or allotments so that the qualities of these soils continue to benefit people. This is a requirement for some specified allocated sites; see BLP Appendix C.

## BEST PRACTICE



Reuse of high-grade agricultural land for community growing



Locate growing areas in the sunniest spots on site



Flowering herbs or flowering fruit trees, to support pollinators



Management plans that minimise fertiliser and pesticide



Provide space and management for food composting

### 6.3. Useful Guidance on Biodiversity and Relevant Measures

- **BBOWT Nature Recovery Network map.** Please note this is not a county-level Nature Recovery Network or Strategy as required via the Environment Act 2021 but is useful mapping by a leading conservation body that could inform decision-making until the formal NRN/NRS is developed. <https://www.bbowt.org.uk/nature-recovery-map>
- **British Standard BS42020.** Defines best practice for how to inform your development with appropriate ecological information to inform the actions you take for biodiversity. <https://knowledge.bsigroup.com/products/biodiversity-code-of-practice-for-planning-and-development/standard>
- **British Standard BS5837.** Defines best practice process to protect and work around trees in design, demolition and construction phases of development. <https://knowledge.bsigroup.com/products/trees-in-relation-to-design-demolition-and-construction-recommendations/standard>
- **Building With Nature** accreditation scheme <https://www.buildingwithnature.org.uk/>
- **Defra Biodiversity Metric 4.0** – The most recent version of the Defra BNG metric at the time of writing. Please check for more recent versions when producing your application. <https://nepubprod.appspot.com/publication/6049804846366720>
- **Defra Biodiversity Metric for Small Sites** – A simplified version of the Defra BNG metric for use on sites of ≤9 homes on a site of ≤1ha, or <5,000sqm of development, or sites <0.5ha. Please also check for more recent versions as this metric is periodically updated. <https://nepubprod.appspot.com/publication/6047259574927360>
- **Defra Magic Map.** An interactive map where you can check for designations such as SPAs, SSSIs, SACs, Ramsar sites, and Local Nature Reserves. See menu: Designations > Land-based. It also maps estimated habitat types (layer: Habitats & Species > Habitats) but these habitat maps are not always accurate at fine scale and will need to be verified via site visits or local records. <https://magic.defra.gov.uk/magicmap.aspx>
- **Green roof design guidance:** See <https://www.greenroofguide.co.uk/design/>, <https://www.greenspec.co.uk/building-design/green-roofs-2/> and <https://livingroofs.org/> .
- **Natural England database of designated sites** (LNRs, NNRs, Ramsar, SSSIs, SACs, SPAs), recording what state the habitat is in and conservation priorities. This could inform your design choices to be a good neighbour or actively steward any parts of the designated site within your redline. <https://designatedsites.naturalengland.org.uk/>
- **RBWM Biodiversity Action Plan** and attached Habitat Action Plans: <https://rbwmtogether.rbwm.gov.uk/biodiversity-action-plan-2>
- **Natural England protected site Impact Risk Zones.** The guidance document explains required assessment and mitigation depending on proximity to protected sites. Shapefiles are provided for use with GIS software or see also Defra Magic Map (linked above). <https://www.data.gov.uk/dataset/5ae2af0c-1363-4d40-9d1a-e5a1381449f8/ssi-impact-risk-zones-england>.
- **RBWM Community Infrastructure Levy** <https://www.rbwm.gov.uk/home/planning-and-building-control/planning-policy/community-infrastructure-levy/cil-charging-schedule>
- **RBWM Green and Blue Infrastructure Study 2019.** <https://rbwm.objective.co.uk/file/5512067>
- **RBWM Local Nature Recovery Strategy** and **Berkshire Nature Recovery Network** – These are in development as of early 2023. Please check the websites of the Council and [Berkshire Local Nature Partnership](#) when developing your planning application.
- **RBWM Planning Obligation and Developer Contributions SPD** <https://www.rbwm.gov.uk/home/planning/planning-policy/planning-guidance/adopted-supplementary-planning-documents-spd/planning-obligation-and-developer-contributions-spd>
- **Rivers Trust (2020) riparian shade map.** Indicates water bodies that could benefit from more shade. <https://data.catchmentbasedapproach.org/maps/therivertrust::riparian-shade-england/explore?location=51.499779%2C-0.614951%2C14.06>
- **Wild Maidenhead Phase 1 Habitat Survey** <https://www.wildmaidenhead.org.uk/phase-1-habitat-survey> **Wilds groups** (Cookham, Windsor, Ascot, Eton Wick, Datchet, SL6) – like Wild Maidenhead, some of these groups are collecting records of wildlife in their respective areas <https://rbwmtogether.rbwm.gov.uk/the-wilds-of-the-royal-borough-of-windsor-and-maidenhead>
- **Thames Valley Environmental Records Centre.** A useful source of data for species, habitats, wildlife & geological sites and ecological networks.
  - a. A dedicated page is given as a gateway to information for landowners and land managers <https://www.tverc.org/cms/content/landowners-and-land-managers>
  - b. TVERC's Data Search Service can be used to formally confirm whether your site overlaps with any Biodiversity Opportunity Areas and access the latest Protected Species and Habitats and Designated Site information to help you devise evidence-based positive actions for biodiversity at your proposed development. [TVERC Data | Thames Valley Environmental Records Centre](#)
- **Urban Greening Factor** - guidance on calculation and benchmarks. <https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/urban-greening-factor-ugf-guidance>



## 7. Sustainable Transport

### 7.1. Sustainable Transport Context

273 Transport is now the sector responsible for the largest share of the UK's carbon emissions, even despite the sharp drop in 2020<sup>xxxii</sup>. Of transport emissions, the vast majority are from cars (~60%), followed by vans (~17%) and HGVs (~17%). Buses and rail together account for only 5%. Unlike other sectors such as manufacturing and electricity supply, the transport sector had not been achieving much of a downward trend in emissions in the decade prior to 2020. After the short sharp drop during the 2020 pandemic, transport emissions in 2021 already began to rebound; the Committee on Climate Change states that without further intervention it is "likely that overall road traffic will [be] close to pre pandemic levels from 2022".

274 It is therefore vital that development proposals and planning decisions work actively to mitigate these trends both in terms of reducing the amount of driving, and increasing the proportion of vehicles that have zero emissions, in order to support the national transition to net zero carbon. This is an essential element of design to mitigate climate change as required by local plan policy SP2.

#### 7.1.1 National Transport Commitments/Goals Relevant to Planning

275 The **Climate Change Act 2008** (as amended) sets the national target for net zero carbon emissions by 2050, and five-yearly carbon budgets of which those up to 2037 have so far been legislated. **Steep reductions to carbon emissions from surface transport are a key necessary contributor** to meeting these targets, as shown in the CCC analysis attached to the carbon budgets. From the 101 megatonnes in 2021, it must drop to 32 megatonnes by 2035.

276 The CCC's analysis reveals a **range of necessary changes to achieve the required carbon reductions in the transport sector**, relating to the take up of low carbon technologies, and a behavioural shift to reduce travel demand and shift journeys to non-car modes of transport. In this sector, the pathway to achieve the UK's carbon targets includes:

- Reducing transport carbon to near-zero at source rather than offsetting
- Electric vehicles to make up 35% of cars and vans on the road by 2030, rising to 65% in 2035 and 87% by 2040
- On-street public EV charge points to reach 140,000-270,000 by 2030 and 250,000- 480,000 by 2040 (up from 18,000 as of 2022)
- Rapid EV charge points to reach 8-15,000 by 2030 (up from 3,000 as of 2022)
- Grid reinforcement so EV charging can reach 92tWh by 2040 (up from ~1tWh in 2022)
- Reduce car distance driven by 6% by 2030 and 17% by 2050

- Van mileage to be reduced by 3% from 2030 onwards
- To enable the reduction in car and van mileage, a range of other changes are needed to support other modes' popularity in comparison to private vehicles, including:
  - More remote work (as 36% of car miles are currently commuting/business trips)
  - Walking & cycling to take >5% of modal share away from driving, by 2030
  - Public transport to take 2-4% of modal share away from driving, by 2030
  - Road investment decisions to be contingent on analysis showing how this contributes to the UK's net zero carbon transition<sup>xxxiii</sup>.

277 The transition to electrified vehicles has been reflected in **updated Building Regulations Part S in June 2022** which now requires development that provides car parking to meet the new minimum requirements for EV charging provision. This lays out requirements for near-universal provision of electric vehicle charging at residential developments where there is parking provided and sets a parking threshold above which new non-residential development must provide electric vehicle charging. A brief summary of the requirements of the new Part S is given in Appendix 10 of this SPD.

278 **Sustainable transport is a central tenet of the NPPF 2023**, and through Chapter 9 of the framework, promotes sustainable locations and opportunities for sustainable modes of transport through plan making and planning decisions.

#### 7.1.2 RBWM Transport Context and Commitments

279 One of the four strategic themes of the **RBWM Environment and Climate Strategy 2020-2025** is transport, recognising that significant carbon reductions are possible when carbon intensive travel is minimised, active travel is encouraged and the infrastructure for low carbon vehicles is provided.

280 **Paragraph 2.9 of the Council's Environment and Climate Strategy 2020-2025** states that 33% of total emissions in the borough come from transport. Using the same BEIS dataset, this would suggest that the residents of the borough are more reliant on cars than in other LPAs within Berkshire. The only Council area in Berkshire with a higher percentage of total emissions coming from transport is West Berkshire at 38%.

281 The borough's **Local Transport Plan (2012)** which is currently being updated and the borough's **Cycling and Walking Infrastructure Action Plan (2022)** will help to deliver the Environment and Climate Strategy 2020-2025, in addition to this supplementary planning document.

282 To support home-working and flexibility for future adaptation of homes, the Council expects applicants to demonstrate that all new homes are supplied with high-speed internet connection to facilitate home working.

## Local Plan Policy Links

*This section outlines local planning policy which relates to Transport, to assist applicants with identifying and complying with the relevant policies.*

Local Plan Policy	Applicable to	Relevant Requirements [paraphrased]
SP2 Climate Change	All scales of development.	<ul style="list-style-type: none"> <li>✓ Applications will demonstrate that mitigation and adaptation measures have been built into all new development to ensure sustainable development. The following measures shall be incorporated [of which relevant to transport]:</li> <li>✓ Use of planting to provide street shading</li> <li>✓ Minimise the impact of surface water runoff in the design of drainage, where possible incorporate mitigation and resilience measures for any increases in river flooding levels due to climate change</li> </ul>
	Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	
QP1 Sustainability and Placemaking	Larger developments: 10 or more residential units or 1,000 sq. m of floorspace or 1 ha in area)	<p>Larger developments are expected to demonstrate that:</p> <ul style="list-style-type: none"> <li>• The provision of social, natural, transport and utility infrastructure to support communities</li> <li>• Promote walkable neighbourhoods</li> <li>• Attractive public spaces that encourage walking and cycling</li> <li>• Foster healthy lifestyles</li> </ul>
	Outline, Full, Reserved Matters and Section 73	
QP3 Character and Design of New Development	All new build development	<p>Applications should demonstrate that:</p> <ul style="list-style-type: none"> <li>• Proposal provides a layout that is well connected, permeable and legible and encourages walking and cycling</li> <li>• Proposal delivers easy and safe access and movement for pedestrians, cyclists, cars and service vehicles maximising the use of sustainable transport where possible</li> <li>• Proposal creates a safe, accessible place where crime and disorder do not undermine quality of life; meeting the expectation for attractive legible places with strong active frontages</li> <li>• Proposal incorporates interesting frontages and design details to provide visual interest at pedestrian level</li> <li>• Proposal is designed to minimise the visual impact of traffic and parking</li> <li>• Is accessible to all and is capable of adapting to future needs</li> </ul>
	Full, Reserved Matters, Householder, Section 73, Householder and Listed Building Consent	
IF1 Infrastructure and Developer Contributions	All development	<p>Applications must:</p> <ul style="list-style-type: none"> <li>• Deliver infrastructure that supports the overall spatial strategy of the borough through financial contributions or on site provision.</li> </ul>
	Except: householder and development >100sqm	
IF2 Sustainable Transport	All new development	<p>Proposals that create a safe and comfortable environment for pedestrians and cyclists, and improve access by public transport, will be supported. Applications should demonstrate that:</p> <ul style="list-style-type: none"> <li>• Proposals support the policies and objectives of the Transport Strategy set out in the Local Transport Plan or successor document</li> <li>• Proposals are located to minimise and manage travel demand, especially to minimise number/ distance of vehicle trips and parking demand</li> <li>• Proposals improve access by foot, cycle and public transport</li> <li>• Proposals facilitate better integration and interchange between transport modes</li> <li>• Flows are optimised to reduce congestion, pollution and noise</li> <li>• Parking provision (cycle and vehicle) is as per the 2004 Parking strategy or Parking SPD when adopted, or relevant Neighbourhood Plans</li> </ul> <p>Transport Assessments and Statements and Travel Plans will be required to be prepared and submitted alongside development proposals, including residential schemes, in accordance with Department for Transport guidance and local authority requirements.</p>
	Outline, Full, Reserved Matters and Section 73	

### Supplementary Planning Guidance:

This SPD supplements the Borough Parking SPD

## 7.2. General Requirements Around Sustainable Transport

- 283 As a unitary authority, the Royal Borough of Windsor and Maidenhead has responsibility for all local authority functions within its area, including transport planning. This differs from most other local authorities, which have a two-tier system with transport a county-level matter.
- 284 The key document that forms a framework for all of the Council's sustainable transport goals is the Local Transport Plan (LTP). The Local Transport Plan extant at the time of writing this SPD is the LTP 2012-2026, but this is expected to be replaced imminently as there has been a recent early consultation on an update to this.
- 285 The Council requires that where a development will have significant transport implications, a proportionate **Transport Assessment** is submitted. The Transport Assessment should demonstrate how the development will connect to a wider range of public transport as well as active travel modes, including how it will support measures and targets contained in the [Bus Service Improvement Strategy](#)<sup>xxxiv</sup> as well as the borough's Local Transport Strategy/Local Transport Plan. This should include sustainable transport promotion measures during occupant handover and operation, as well as design measures.
- 286 In accordance with the NPPF, the Council will secure **Travel Plans** through the planning process from **all developments that generate significant amounts of movement**. In particular, the Local Transport Plan 2012-26 notes that **major residential development** will be required to develop and implement travel plans for sustainable travel patterns.
- 287 National guidance notes that the threshold for 'significant amounts of movement' depends on context; e.g. the presence of local roads close to capacity, and public transport accessibility. In the borough, the Developer Contributions SPD states the development size thresholds that require a Travel Plan. For the Transport Assessment requirement, the local plan (Policy IF2) does not set any specific minimum thresholds or limit this to specific types of development.
- 288 Transport Assessments, Transport Statements and Travel Plans should be prepared in line with the relevant [guidance](#) from the Department for Transport or other relevant ministry. The relevant guidance at the time of composing this SPD is from the Department for Levelling Up, Housing and Communities in concert with the Ministry of Housing, Communities and Local Government<sup>xxxv</sup>. This explains the type of information to be included in each type of transport document and explains the logic by which local transport authorities like the Council should determine the threshold for when such documents are needed in a development proposal.
- 289 For major new developments, applicants will be required to make use of the Council's traffic model to show the impacts on the highway network.
- 290 New development is expected to mitigate its impacts on transport networks. Developer-led transport improvements, including to public transport services, must be in accordance with the Council's transport strategies. Where development has a wider impact on transport networks, contributions to the relevant strategy area and implementation programme will be sought.
- 291 **Note that it should not be assumed that the Council will adopt any public space** including transport infrastructure created by development. Applicants should provide information about how any provided transport infrastructure and operational measures will be maintained in the long term, such as how this will be funded and who will administer this.

### REQUIREMENT: Transport Assessments / Statements

- ✓ Assesses the potential transport impacts of developments and proposes mitigation measures, usually through design measures and developer contributions, rather than management measures.
- ✓ Transport Assessments are more thorough; Transport Statements are lighter-touch and are used where the development's impact is lower.
- ✓ Should be prepared in line with relevant national [guidance](#).

#### Applicability by application type



All development proposals with significant transport implications.

### REQUIREMENT: Travel Plans

- ✓ A package of measures that seek to reduce the number of car journeys to / from a particular development or organisation and encourage people to adopt more sustainable travel patterns.
- ✓ Can include 'hard' and 'soft' measures, usually operational.
- ✓ Can be personalised to reflect the specific needs of your actual or anticipated residents or non-residential occupant organisations.
- ✓ Should be prepared in line with relevant national [guidance](#).

#### Applicability by application type, as per Local Transport Plan 2012



All developments that generate significant amounts of movement, including but not limited to major residential development. For thresholds, see Developer Contributions SPD.



### 7.3. Provision for Electric Vehicle Charging

292 As noted in 'National context', the widespread rollout of convenient electric vehicle charging is a completely essential component to support the UK's legally binding carbon targets. In addition to local plan expectations on this topic, recent national regulation has also been introduced in relation to this vital topic and is therefore summarised in this SPD.

#### 7.3.1 EV Charging Requirements in Building Regulations

293 In 2022, Building Regulations introduced a new Part S which sets requirements for provision of electric vehicle charging at all residential development that has associated parking, and at all non-residential development whose parking provision meets a certain threshold. Part S sets requirements not only for **new development** but also for **major renovations (residential or non-residential)** and **dwellings created by change of use**.

294 Through Part S, there is a legal requirement to provide electric vehicle charging at all residential development that has associated parking spaces, and all non-residential that has more than 10 associated parking spaces, subject to certain caveats and conditions around the type of parking, heritage settings and cost constraints.

295 Appendix 10: of provides a brief summary of the new Part S requirements (the [full Part S document is available here](#)).

#### 7.3.2 Going Beyond the Building Regulations Minima for EV Charging

296 The Council's existing position is that EV charging provision should be part of **any new development that provides parking spaces (residential or non-residential)** as follows:

- Provision of EV charging points on at least 20% of the parking spaces (whether new spaces, or spaces re-provided in the case of major refurbishment and change of use).
- Provision of ducting, cabling, and capacity within the Mechanical and Engineering Services for the remaining 80% of spaces (to enable future installation of charge points in those spaces).


297 This local standard described above does not differ by use classes or type of parking, unlike Building Regulations Part S which has lower requirements for covered car parking, non-residential parking, and excludes on-street parking. As a result, there are some cases where the local standard is higher than Part S requirements, and other cases where the reverse is true.


298 Where the local minimum standard described above differs from that of Part S due to the type of development or the type of parking, the Council expects the development proposal to apply whichever standard is higher for that type of parking or development. This expectation applies to **all developments that have associated parking or create on-street parking**.

- In **mixed-use development**, Part S must firstly be met and then the provision should be extended to meet the local standard across any parts of the parking for which Part S provision did not fulfil the local standard, in proportion to the amount of parking per use class.
- Some worked examples to illustrate the above are given in Appendix 10: Applying Local and National Electric Vehicle Charging Requirements.


## REQUIREMENT

### RBWM expected minimum EV charging provision at new parking

 **20%** new parking spaces to have charge points


 **80%** remainder new spaces: cabling, ducting, MEP capacity


### Applicability by application type

 All development that creates or re-provides parking

 Proposed use: All.

- ✓ Where there is a difference between RBWM local standard and Part S requirement (due to the type of development or type of parking), apply whichever is the higher standard
- ✓ In mixed use, where there is a difference between RBWM standard and Part S requirements for different uses, apply the higher standards proportionally to the amount of parking provided for each use type

 Application types: All (Full, outline, reserved matters, phased)

 Proposal size threshold: All

299 Percentage **provisions should be rounded up to the nearest whole number**; e.g. if the local 20% / 80% standard is applied,  $\geq 1$  charge point is required even if there are fewer than 5 spaces.

300 **Where proposals affect existing on-street parking**, the Council may seek developer contributions to enable rollout of on-street electric vehicle chargers towards the local standard.

301 While the new national regulation (Part S) sets certain required standards for type and extent of electric vehicle charging to be delivered through development, this provision can now be considered the 'new minimum' rather than exemplar. Part S also does not set any requirements for on street or rapid EV charging, which can deliver a key boost to EV use in the right locations.

302 RBWM therefore considers that **exemplary sustainable development would include EV charging provision that goes beyond the minimum requirements set by Part S**. Such provision demonstrated in proposals would be afforded material weight in favour of the proposal. Potential enhanced provision could include the following standards:

- **Rapid charge points:** inclusion of charge points that are rapid ( $\geq 43\text{kW}$ ) or ultra-rapid ( $\geq 100\text{kWh}$ ) at strategic locations, such as short-stay parking or communal parking areas.
- **On-street parking charge points:** provision for electric charging in public streets for developments affecting or creating on-street parking arrangements (ideally with effort made to improve the current price disparity compared to at-home charging<sup>xxxvi</sup>).
- **Provision of active charge points within covered car parking**, rather than falling back on the 'cabling-only' standard permitted for covered car parking by Part S.
- **Provision of a greater ratio of charge points to parking spaces**, especially in non-residential parking (as Part S only requires one charge point if there more than 10 non-residential spaces, without increasing this in proportion to a higher number of spaces). As noted above, compliance with the local 20% provision already supports this principle.
- **Provision of electric car club vehicles with allocated charge points.** Car club provision is generally encouraged as a way to reduce the total number of cars that need to be manufactured and make efficient use of land by enabling occupants to make necessary car journeys without needing separate parking space for every home. An electric car club can also acclimatise users to electric vehicles thus addressing concerns such as range anxiety through a positive experience of the car club vehicle, thus potentially emboldening those people to choose an electric car sooner than they otherwise might have.

303 Please note, however, that while enhanced provision of electric vehicle charging is encouraged as part of the approach to fulfilling local plan policy expectations around high quality sustainable design that is adaptable to future use, it **should not be considered a way to bypass the equally important need to design to reduce the need to drive and to provide for longer journeys by non-car modes**, such as public transport and cycling. Provision of electric vehicle charging (whether basic or enhanced) **should not be seen as a justification to provide more than the minimum necessary amount of parking**, as this would undermine the convenience of non-car modes of transport in comparison to cars.

## BEST PRACTICE

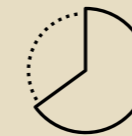
### Enhanced electric vehicle provision: Ways to impress and excel



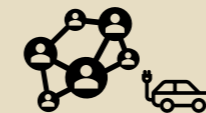
Rapid chargers ( $\geq 43\text{kW}$  supply) at short-stay parking



On-street chargers if proposal effects on-street parking



Chargers to spaces ratio higher than the minimum



Provision of electric car clubs with rapid charge points

#### 7.4. Creating an Ideal Environment for Cycling, Walking and Other Active Travel

- 304 As noted above, it is important for applicants and officers to remember that **non-car models are inherently more sustainable than either conventional or electric vehicle use**. This is because non-car modes use less material and energy for both vehicles and infrastructure, per person-mile travelled, in addition to the other benefits of active travel such as exercise and air quality improvements.
- 305 Beyond these environmental and physical health benefits, the use of walking, cycling and public transport comes with psychological and social benefits. They bring an increased likelihood of chance social interactions on a daily basis that can help reduce the risk of social isolation and later-life loneliness which is thought to be an elevated risk in many neighbourhoods of the borough<sup>xxxvii</sup>. They may also support independence for those members of our ageing population who no longer feel confident to drive. Furthermore, good connection to public transport helps with saleability of homes and commercial premises (noting that development that provides more spaces to pedestrians and cycles and less space to cars can see greater success, contrary to common anxieties<sup>xxxviii</sup>).
- 306 **Reducing the need to drive is key**. As a first step, the Council require that all new homes have a high-speed internet connection to facilitate home working.
- 307 **Density, mixes, and design of streets and layouts**: An essential element of truly high quality sustainable design is to create suitable densities, layouts and mix of uses that enables the vast majority of needs to be met without a car and instead within a short walk, cycle or public transport trip – ideally *more conveniently* than by accessing these by car. It is also important to design walking and cycling routes to be not only safe and convenient, but also attractive and comfortable. Some helpful concepts and guidance to refer to in devising and explaining proposals is as follows:
- **15-minute neighbourhoods**: this concept refers to the practice of ensuring that urban development is suitably located, sufficiently dense and contains a sufficient mix of uses to meet people’s daily needs by foot or bike. This is key to the definition of a sustainable location, as beyond this distance it is most likely that people will drive instead. The concept has 4 pillars: Proximity, diversity, density and ubiquity<sup>xxxix</sup>. [Guidance](#) is available from the TCPA<sup>xl</sup> among others.
    - **Residential** proposals could contribute towards this context by choosing a site ≤15 minutes’ walk/cycle to a key set of neighbourhood facilities. Major residential proposals should include such facilities on-site unless it is shown that these are already present nearby and will be directly connected by foot/bike.
    - **Non-residential** proposals may demonstrate that the proposed use improves the mix of daily facilities and services needed by local households within the 15-minute radius. Non-residential development that will draw commuters or visitors overwhelmingly by car will generally be discouraged unless demonstrated that the proposed use is necessary and is not compatible with being sited closer to residential areas or public transport.
  - Generally, lower densities are an obstacle because they fit fewer homes in the 15-minute radius to facilities and extend the distance that must be travelled between plots.
  - If you cannot achieve a 15-minute neighbourhood, it will still be beneficial to demonstrate a 20-minute neighbourhood and/or connection to the key ‘bundle of facilities’ by regular, frequent public transport instead. When considering 15-minute neighbourhoods, designs should **take into account the actual walking or cycling time by the proposed routes**, not just the distance as the crow flies. [Free online ‘isochrone’ tools](#)<sup>xli</sup> can map the area walkable/cyclable from a specific point.
- **Borough Wide Design Guide 2020** should be used to guide **all development**. Section 6: explains how layouts should be designed to encourage walking, cycling and public transport in preference to the private car for local journeys.
- 308 For **development affecting public realm or highways in in heritage settings**, please refer to Historic England “[Streets for All](#)” guidance (as referenced in the Borough Wide Design Guide). To demonstrate high quality sustainable design, the Council strongly encourages proposals in such settings to include narrative and visual aids to show how they work towards the goals set out in that Historic England guidance (summarised in). Proposals in such settings can be strengthened by adding narrative showing how it has taken inspiration from this advice to deliver reduced car use and increased active travel.
- 309 **Connecting to wider sustainable transport networks for onward travel is key**. All development proposals are expected to show what measures are being taken to connect to existing or planned walking and cycling networks, and public transport through reference to the following Council documents:
- Active travel routes, and their planned extensions or improvements identified in the [Local Cycling and Walking Infrastructure Plan](#)<sup>xlii</sup>. Protection and improvement to rights of way as laid out in the [Public Rights of Way Management and Improvement Plan](#)<sup>xliii</sup>.
  - Maps of the bus routes, stops, and a range of targets relating to infrastructure and other provision around buses within the [Bus Service Improvement Strategy 2021](#)<sup>xliv</sup>.



- [The Local Transport Plan 2012-26](#) (LTP) contains a detailed range of information on active and public transport networks and factors affecting their success. It sets priorities for the maintenance and improvement to these networks, and a range of objectives to achieve. Note the 2012 LTP will soon be replaced by an updated LTP that had a recent consultation. A summary of key points include:

- i. The Council will seek to ensure that new development is in sustainable locations within urban areas that are well serviced by public transport, cycling and walking networks to provide realistic alternatives to the private car; improvements to existing transport networks will be sought through the planning process to mitigate the impacts of any new development
  - a. For major new developments, applicants will be required to make use of the Council's traffic model to show what the impacts will be on the highway network.
  - b. New development will be expected to mitigate its impacts on transport networks. Developer-led transport improvements, including public transport service improvements, must be in accordance with the Council's transport strategies. Where development has a wider impact on transport networks, contributions toward the relevant strategy area and implementation programme will be sought.
- ii. Developer contributions will be sought to support bus services and active travel infrastructure where appropriate.
- iii. Improved interchange between transport modes is a priority, particularly within town centre locations and at rail stations
- iv. Improved timely and accessible information is a priority for public transport and walking/cycling. This may range from wayfinding maps and signs, through to printed leaflets, or new technologies where this aids the user (such as real-time information displays at bus stops, online interactive maps and journey planners).
- v. Climate-resilient design and location of transport infrastructure is a priority; the Council will keep criteria under review in line with national guidance
- vi. The reduction of vehicle crime and cycle theft is a priority; the Council will seek to 'design out crime' with appropriate improvements via new developments

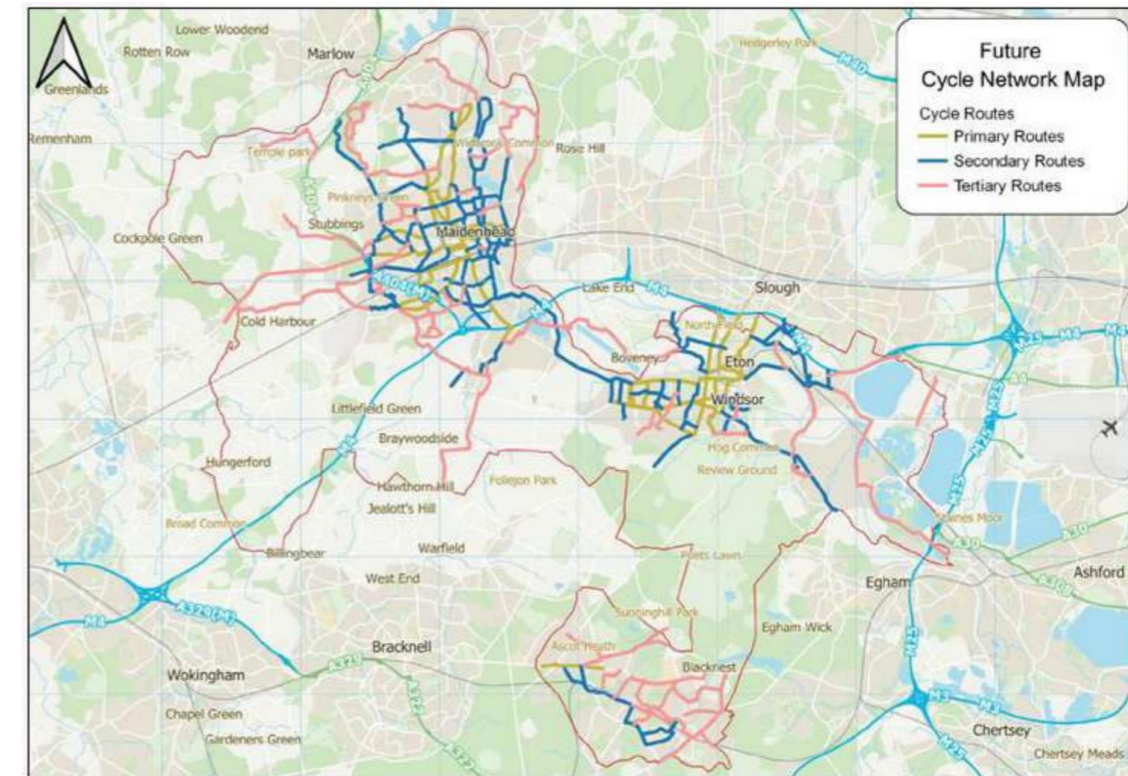


Figure 9: Future cycle network map. From RBWM [Local Cycling & Walking Infrastructure Plan](#) (2022).

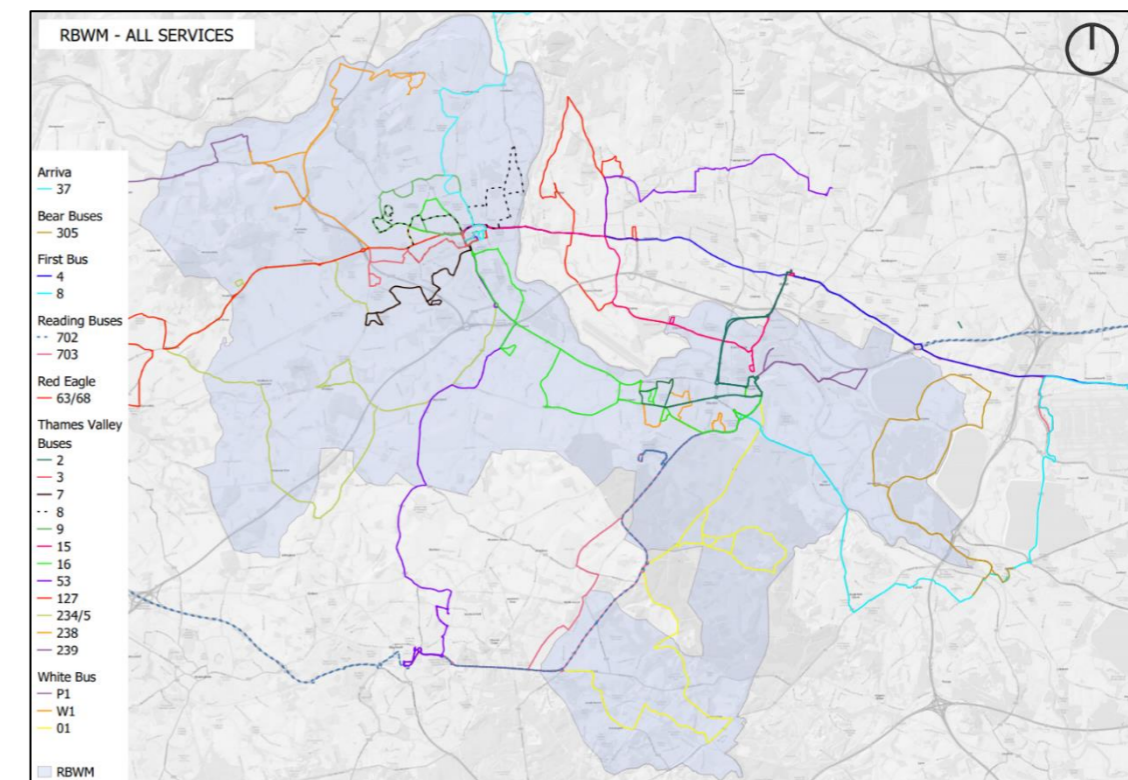


Figure 10: All bus services in RBWM area. From Bus Service Improvement Plan (2021).

310 Where it is relevant, the Council requires that applicants identify how the proposal reserves the necessary space for planned extensions or improvements to walking, cycling or public transport infrastructure. Relevance will be determined by the site's adjacency to or overlap with a proposed or existing route. The level of detail expected in proposals will be proportionate to the scale of development proposed.

311 To evidence that cycling route provision is well designed to inclusively suit a range of users and contribute to an environment that could attract modal shift away from cars,



developments should include plans and narrative (in your design and access statement and/or transport assessment/statement) explaining how the designs have followed the principles and/or standards set out by the following national guidance including Gear Change, LTN 1/20, Manual for Streets and Active Travel England Standing Advice Note: Active Travel and Sustainable Development (2023). These are summarised in Appendix 11: Summary of national guidance on active travel infrastructure provision.

312 Details of development layout or street design that provides “priority to pedestrians and cyclists” should be accompanied by visuals and narrative to explain how it does this with reference to the guidance points noted above. Some potential features could include, where appropriate:

- ‘Low traffic neighbourhoods’ created by filtered permeability features at their entrance and exits that allows foot and cycle travellers to pass but limits car traffic to one entrance/exit or even keeps car traffic and parking to the outside of the neighbourhood. This prevents rat-running and makes streets safe for neighbourly activities such as children’s informal outdoor play.
- Cycle routes and foot pavements that continue on a level table across side roads without having to give way to the side roads; this may be supported by give-way markings on the side road and a continuous foot/cycle lane surface colour making it clear that the traffic exiting the side road is a ‘guest’ in the foot-and-cycle users’ area rather than vice versa
- Traffic calming measures such as speed bumps or raised tables, ideally with slim gaps allowing cycles to pass without hindrance
- Avoiding roundabouts, offering foot/cycle traffic an alternative more direct route away from roundabouts, or using Dutch-style roundabouts that allow cyclists a separate and protected route
- Where underpasses or overpasses are needed, aim to keep foot/cycle routes at grade and have the motor traffic follow the raised or lowered route
- Designing any on-street car parking at an angle to avoid the risk of ‘dooring’ cyclists or wheelchair users.

Figure 11: Public rights of way. From [RBWM Green & Blue Infrastructure Study](#).

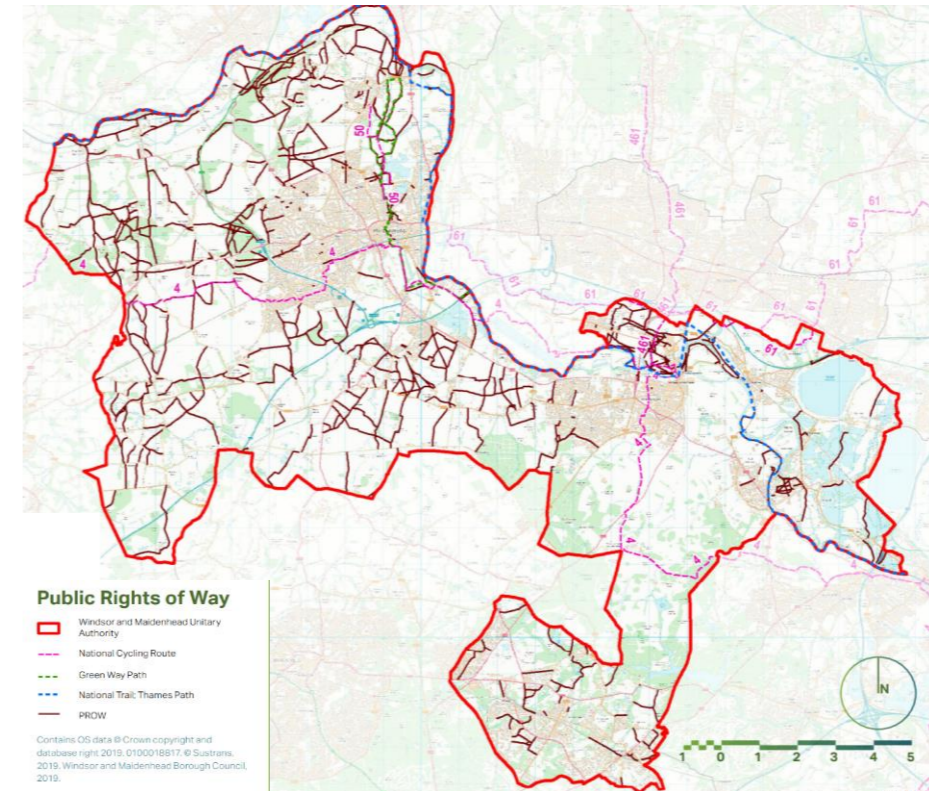


Figure 12: Principles in design of effective active travel. From [Dft., Gear Change](#).



## 7.5. Useful External Guidance on Sustainable Transport

- **Local Transport Plan 2012 – 2026** [https://www.rbwm.gov.uk/sites/default/files/2020-04/transport\\_local\\_transport\\_plan\\_part1\\_2012\\_07\\_24.pdf](https://www.rbwm.gov.uk/sites/default/files/2020-04/transport_local_transport_plan_part1_2012_07_24.pdf)
- **Borough-wide Design Guide SPD 2020** – outlines key measures that should be taken to improve quality of place and within that, measures for walking and cycling. Includes some visual examples of good practice. <https://www.rbwm.gov.uk/home/planning/planning-policy/planning-guidance/adopted-supplementary-planning-documents-spds/borough-wide-design-guide-spd>
- **Local Walking & Cycling Infrastructure Plan 2022** – contains maps of walking and cycling routes (existing and planned) and proposed improvements and extensions to these. [https://www.rbwm.gov.uk/sites/default/files/2022-09/transport\\_local\\_cycling\\_and\\_walking\\_infrastructure\\_plan\\_0.pdf](https://www.rbwm.gov.uk/sites/default/files/2022-09/transport_local_cycling_and_walking_infrastructure_plan_0.pdf)
- **Bus Service Improvement Strategy 2021** [https://www.rbwm.gov.uk/sites/default/files/2021-11/rbwm\\_bus\\_service\\_improvement\\_strategy\\_november\\_2021.pdf](https://www.rbwm.gov.uk/sites/default/files/2021-11/rbwm_bus_service_improvement_strategy_november_2021.pdf)
- **Planning obligation and Developer Contributions SPD** - lays out the contributions to sustainable transport (among other topics) and the thresholds (differentiated by development type) above which a travel plan is required. <https://www.rbwm.gov.uk/home/planning/planning-policy/planning-guidance/adopted-supplementary-planning-documents-spd/planning-obligation-and-developer-contributions-spd>
- **RBWM Parking Strategy 2004**. Lays out expected standards and principles for provision of car parking and cycle parking. Note: this is expected to be replaced soon by the Parking SPD. <https://www.rbwm.gov.uk/home/planning/planning-policy/non-development-plan/design/parking-strategy>
- **RBWM Parking SPD**: Not yet available, but when adopted this is expected to replace the Parking Strategy 2004 noted above.
- **National guidance on Travel Plans, Transport Assessments and Statements**. Explains what kind of information should be provided in each of these documents, and when each type of document is likely to be required as part of a development proposal. <https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements>
- **Department for Transport “Gear Change: A bold vision for cycling and walking”**. Sets out the case, vision and action principles for design and decision-making to enable more walking and cycling. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf)
- **Department for Transport LTN 1/20** – national design guidance for routing and detailing of cycle infrastructure. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf)
- **Manual for Streets** – a publication by two government departments offering guidance on how and why to design streets to achieve better quality places. <https://www.gov.uk/government/publications/manual-for-streets>
- **National Cycle Network map** by Sustrans and Ordnance Survey. <https://www.sustrans.org.uk/national-cycle-network> and <https://explore.osmaps.com/?lat=51.500044&lon=-0.776445&zoom=10.3443&style=Standard&type=2d&overlays=os-ncn-layer>
- **Town and Country Planning Association** – Collection of guidance on why and how to create 15-20 minute neighbourhoods. <https://www.tcpa.org.uk/collection/the-20-minute-neighbourhood/>
- **Living Streets (2022) Walking for Everyone**. The sections ‘Creating better places for everyone to walk and wheel’ and ‘Supporting everyone to walk and wheel’ include guidance on how to make development layouts and street design more truly inclusive for all abilities, including by noting the obstacles that tend to arise in existing streets and current development practice without intervention. <https://www.livingstreets.org.uk/media/7085/walking-for-everyone-web-version.pdf>
- **Living Streets (2018) The Pedestrian Pound**. This piece of research demonstrated how areas can benefit economically by giving more space to pedestrians and cyclists and less to cars, contrary to retailers’ common anxieties. <https://www.livingstreets.org.uk/media/3890/pedestrian-pound-2018.pdf>
- **Secured by Design and accompanying manuals** – Design manuals that support pursuit of the national police-led initiative and certification system ‘Secured by Design’. This guidance is applicable to an entire development but may prove particularly useful in enhancing the security of cycle parking and storage. Separate manuals are available for different uses including residential, schools, commercial developments, hospitals and self-build. Secured by Design initiative also offers a database of approved products to enhance security. <https://www.securedbydesign.com/guidance/design-guides>
- **Design and Masterplanning Guide, Garden City Standards for the 21<sup>st</sup> Century**: Town and Country Planning Association. This notes a target of 50-60% of trips to be made by non-car means, in any settlement aiming for Garden Community status. [https://www.tcpa.org.uk/wp-content/uploads/2021/11/TCPA\\_GC\\_PG\\_Guide\\_3\\_Design\\_and\\_Masterplanning\\_Dec\\_2017.pdf](https://www.tcpa.org.uk/wp-content/uploads/2021/11/TCPA_GC_PG_Guide_3_Design_and_Masterplanning_Dec_2017.pdf)
- **TravelTime isochrone generator** (map of area that can be walked or cycled within a certain time from a specified map point). <https://app.traveltime.com/>

## Appendix 1: Sustainability Checklist to be Completed and Submitted with All Applications

Theme	Checklist question	Relevant to development type	Relevant to scale	Relevant to application type	Application validation document checklist item	How and where in your application pack is the evidence that this item has been fulfilled? (Document name, page number, brief narrative on how fulfilled or how/why not fulfilled)
Energy & carbon	Have you demonstrated that the energy hierarchy has been followed and the carbon emissions have been reported for each stage of the hierarchy through the Sustainability and Energy Statement?  Have you targeted a minimum of 35% reduction of carbon emissions against Building Regulations Part L 2021?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters, S73	Sustainability and Energy Statement and Carbon Reporting Spreadsheet	
Energy & carbon	Have you demonstrated a fabric-first approach and passive design measures have been incorporated?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement and Carbon Reporting Spreadsheet	
Energy & carbon	Have you demonstrated that zero or low carbon heat supply has been incorporated?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement	
Energy & carbon	Have you demonstrated that at least 12% of a building's energy demand can be delivered through on-site renewable energy generation?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Full, Reserved Matters and S73	Sustainability and Energy Statement and Carbon Reporting Spreadsheet	
Energy & carbon	Have you calculated any carbon offset payments that are required, using the Council's carbon offset price?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Full, Reserved Matters and S73	Sustainability and Energy Statement and Carbon Reporting Spreadsheet	
Energy & carbon	Where developments include refurbishment of existing buildings, have you demonstrated how retrofitting proposals have targeted net zero carbon?	All	All	Outline, Full, Reserved Matters, S73, Householder and LBC	Sustainability and Energy Statement Or Design and Access Statement	



Theme	Checklist question	Relevant to development type	Relevant to scale	Relevant to application type	Application validation document checklist item	How and where in your application pack is the evidence that this item has been fulfilled? (Document name, page number, brief narrative on how fulfilled or how/why not fulfilled)
Energy & carbon	Have you demonstrated that the development will be supplied with a three-phase power supply?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement	
Energy & Carbon	Have you demonstrated that the development will be supplied with high-speed internet?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement	
Energy & carbon	Has the proposed development been designed to achieve the adequate air tightness?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Full, Reserved Matters and S73	Sustainability and Energy Statement	
Energy & carbon	Have you demonstrated that innovative solutions for energy sharing and storage including site-wide approaches (e.g. battery storage, demand-side-response-strategies) are proposed?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement	
Energy & Carbon	Have you demonstrated that a recognised quality regime will be used to ensure the as-built performance for energy use and carbon emissions, and meets the as-designed performance?  Note: compliance testing will be required via conditions. Applicants are requested to outline which quality assurance regime they seek to use, dependent on the modelling conducted at design stage.	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Sustainability and Energy Statement	
Climate adaptation	Have you demonstrated how the proposal is resilient to overheating risks (current and future?)	All	All	Outline, Full, Reserved Matters, S73, Householder and LBC	Design and Access Statement	



Theme	Checklist question	Relevant to development type	Relevant to scale	Relevant to application type	Application validation document checklist item	How and where in your application pack is the evidence that this item has been fulfilled? (Document name, page number, brief narrative on how fulfilled or how/why not fulfilled)
Climate adaptation	Can you demonstrate that the cooling hierarchy has been implemented through the design of the development?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Design and Access Statement	
Climate adaptation	Have you incorporated green and blue infrastructure into the development, including green roofs?	All	All	Outline, Full, Reserved Matters, S73 and Householder	Proposed site plan and Design and Access Statement	
Climate adaptation	Where the development lies within Flood zones 2 & 3, or is Flood Zone 1 on sites of 1 hectare, have you prepared a Flood Risk Assessment?	All	All	Outline, Full, Reserved Matters, S73 and Householder	Flood Risk Assessment	
Climate Adaptation	Where you are proposing a reduction on permeable areas, or hardstanding in the development, have you demonstrated that the SuDS hierarchy has been employed?	All	All	Full, Reserved Matters, S73 and Householder	Design and Access Statement or Drainage Strategy	
Climate Adaptation	Have you demonstrated that water saving measures and equipment have been incorporated into the design of the development?	All	All	Full, Reserved Matters, S73 and Householder	Design and Access Statement	
Climate Adaptation	Have you demonstrated that water usage is targeted to 110 litres per person/per day?	All new residential dwellings	All	Full, Reserved Matters and S73	Design and Access Statement	
Sustainable construction	Where your development involves demolition, have you prepared a pre-demolition audit?	All	All	Outline, Full, Reserved Matters, S73, Householder and LBC	Design Statement	
Sustainable construction	Have you demonstrated that the waste hierarchy has been followed and that waste has been minimised in construction and operation where possible?	All	All	Outline, Full, Reserved Matters, S73, Householder and LBC	Design Statement	
Sustainable construction	Have you provided: circular economy statement, pre-development audit, site waste plan and construction environmental waste management plan?	Larger developments: 10 or more residential units or 1,000 sq. m of floorspace or 1 ha in area)	Major	Full, Reserved Matters and S73	Construction Environmental Management Plan and, or including site waste management plan	
Sustainable construction	Have you demonstrated that local, responsible and lower carbon material sourcing have been considered a priority?	All new residential development, and non-residential development Excludes householder applications, and applications	Minor and Major	Outline, Full, Reserved Matters and S73	Energy and Sustainability Statement	

Theme	Checklist question	Relevant to development type	Relevant to scale	Relevant to application type	Application validation document checklist item	How and where in your application pack is the evidence that this item has been fulfilled? (Document name, page number, brief narrative on how fulfilled or how/why not fulfilled)
		for non-residential floorspace under 100sqm.				
Sustainable construction	Have you demonstrated that the recycled content of materials has been considered (minimum 25% with target of 50%)?	All new residential development, and non-residential development  Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Full, Reserved Matters, S73	Energy and Sustainability Statement	
Sustainable construction	Have you demonstrated that embodied carbon has been considered and reduced where possible?	All new residential development, and non-residential development  Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Full, Reserved Matters, S73	Energy and Sustainability Statement	
Sustainable construction	Have you included an embodied carbon assessment?	Larger developments: 10 or more residential units or 1,000 sq. m of floorspace or 1 ha in area)	Major	Full, Reserved Matters and S73	Embodied Carbon Assessment	
Biodiversity	Have you provided a compliant ecological assessment?	All	All	Outline, Full, Reserved Matters, S73 and Householder	Ecological Appraisal	
Biodiversity	Have you demonstrated that the development achieves a minimum of 10% biodiversity net gain through the provision of green and blue infrastructure?	All	All*	Outline, Full, Reserved Matters, S73 and Householder	*DEFRA Biodiversity Metric* based upon existing and proposed site plans	
Biodiversity	Does the development site contain or lie close to any irreplaceable habitat, statutory designated areas, protected species or within 500m of a watercourse? Or within a designated area under the local Biodiversity Action Plan?  If yes: Have you demonstrated that the development has maintained, protected and enhanced protected species and valued habitats?	All	All	Outline, Full, Reserved Matters, S73 and Householder	Ecological Survey	

Theme	Checklist question	Relevant to development type	Relevant to scale	Relevant to application type	Application validation document checklist item	How and where in your application pack is the evidence that this item has been fulfilled? (Document name, page number, brief narrative on how fulfilled or how/why not fulfilled)
Biodiversity	Does the development provide publicly available green space?  If yes: Have you shown how the long-term maintenance of this green space will be funded and delivered without Council adoption?	All new residential development, and non-residential development  Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and Major	Outline, Full, Reserved Matters and S73	Design and Access Statement	
Biodiversity	Where new dwellings are being provided, have you calculated the requirement of food growing space provision, and or developer contributions?	All new residential dwellings. Excludes householder applications, and applications for non-residential floorspace	Minor and Major	Outline, Full, Reserved Matters and S73	Design and Access Statement Or for financial contribution: Section 106	
Sustainable Transport	Where development will have significant transport implications, have you prepared a Transport Assessment and subsequently a Travel Plan (if required)?	All new residential development, and non-residential development Excludes householder applications, and applications for non-residential floorspace under 100sqm.	Minor and major	Outline, Full, Reserved Matters and S73	Transport Statement or Assessment	
Sustainable transport	Have you demonstrated that EV charging facilities are provided to satisfy local and national requirements (whichever is greater)?	All new residential development and non-residential development, that creates or re-provides parking. Excludes householder applications.	Minor and Major	Outline, Full, Reserved Matters and S73	Proposed Site Plans and Design and Access Statement	
Sustainable transport	Have you demonstrated how the design of the development supports and encourages active travel through the provision of walking, cycling and wheeling networks, and or connections to public transport?	Larger developments: 10 or more residential units or 1,000 sq. m of floorspace or 1 ha in area)	Major	Outline, Full, Reserved Matters and S73	Design and Access Statement And/or Transport Statement	

## Appendix 2: Glossary and Acronyms

<b>Air tightness</b>	A measure of how much (or how little) air leakage a building experiences, due to its fabric. Measured in air changes per hour at a pressure of 50 pascals, sometimes abbreviated to 'ACH@50PA'.
<b>BAP</b>	Biodiversity Action Plan
<b>BBOWT</b>	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust
<b>BNG</b>	Biodiversity net gain. Refers to the measure of the habitat value of a site before and after development.
<b>BREEAM</b>	Building Research Establishment Environmental Assessment Method. A rating system reflecting the extent to which a building exceeds basic performance in a range of sustainability criteria.
<b>Brise-soleil</b>	A shading solution that reduces heat gain from direct sunlight, usually protruding out from the outer surface of a building.
<b>Building Regulations Approved Document Part L</b>	Conservation of fuel and power: Approved Document L is the part of Building Regulations that sets minimum standards for energy-related carbon emissions and efficiency of buildings.
<b>CCC</b>	Climate Change Committee
<b>CCRA</b>	Climate Change Risk Assessment
<b>CIBSE</b>	Chartered Institute of Building Services Engineers
<b>Circular economy</b>	An economy in which resources are kept in use for as long as possible in a 'higher value' state.
<b>Embodied carbon</b>	Carbon that was emitted in the production, transport and assembly of materials that make up a building or product.
<b>Energy Use Intensity (EUI)</b>	A measure of how much energy a building uses per square metre of internal floor space. Measured in kWh/m <sup>2</sup> /year. Refers to <i>total</i> energy use, not divided into 'regulated' or 'unregulated' (see other glossary items here) unless otherwise stated.
<b>Energy modelling</b>	Methodologies to assess the energy performance of a building based on its characteristics. Various methodologies are available, but these vary in accuracy. See 'PHPP', 'SAP', 'SBEM' and 'TM54' in this glossary.
<b>GDP</b>	Gross Domestic Product
<b>GIA</b>	Gross Internal Area. A measure of total floor space in a building.
<b>GLA</b>	Greater London Authority. A public body (and overarching planning authority for the 32 no. London Boroughs) which developed carbon-related planning policy for London, and guidance on how to report against those policies on energy use, operational carbon and embodied carbon. This guidance has been adopted by some local authorities outside London.
<b>HAP</b>	Habitat Action Plan. A plan relating to a specific type of habitat, which sits within the wider BAP (Biodiversity Action Plan, as above).
<b>Home Quality Mark (HQM)</b>	A rating system and environmental certification framework devised by the BRE (see BREEAM, above) to assess the quality of homes across a range of criteria thought important to occupants.
<b>Irreplaceable habitat</b>	As defined by the NPPF: Ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.
<b>LETI</b>	Low Energy Transformation Initiative, formerly 'London Energy Transformation Initiative' but has branched out to the rest of the UK Established in 2017, this is a voluntary group of over 1,000 built environment professionals working to transition the built environment to net zero carbon by creating guidance and targets.
<b>Low carbon energy</b>	Energy generated from low carbon sources. This includes renewable energy*, nuclear energy, and recycled heat. It does not include conventional gas. *Biomass is sometimes excluded due to concerns over the carbon emissions of deforestation.
<b>MVHR</b>	Mechanical Ventilation with Heat Recovery. This recovers heat from outgoing air, to warm up the fresh incoming air.



<b>NABERS</b>	National Australian Built Environment Rating System. An approach developed in Australia to assess building energy performance, which is starting to be voluntarily adopted in the UK (currently only for offices) thanks to its effectiveness in delivering improved energy efficiency.
<b>NAP</b>	National Adaptation Plan
<b>NIA</b>	Net Internal Area. A measure of useable floor space in a building. NIA excludes floor areas occupied by internal walls, skirting boards, permanent plant/equipment, lifts, stairwells, and similar.
<b>NPPF</b>	National Planning Policy Framework.
<b>Operational carbon &amp; energy</b>	Energy use and carbon emissions caused by the operation of a building. Operational carbon is almost entirely due to energy use, but can have other smaller causes, such as leaked refrigerant gases from air conditioning.
<b>PHPP</b>	Passivhaus Planning Package. A methodology to accurately predict the energy demands of a building. This is used in the process of designing and delivering buildings that can satisfy the standards required for Passivhaus certification but can be used for any building without pursuing certification.
<b>Performance gap</b>	The difference between the predicted operational energy use of a building, and the actual amount of energy that it uses.
<b>Primary energy</b>	A measure of a building's energy use that takes into account the inefficiencies and losses involved in generating and distributing that energy before it gets to the building, as well as the efficiency rating of the building's equipment.
<b>RBWM E&amp;CS</b>	Royal Borough of Windsor and Maidenhead Energy and Climate Strategy (December 2020).
<b>RBWM ISPS</b>	Royal Borough of Windsor and Maidenhead Interim Sustainability Position Statement (March 2021).
<b>Ramsar site</b>	A conservation designation afforded to certain wetlands of international importance. Over 170 countries are signatories to the Ramsar convention.
<b>REGO</b>	Renewable Energy Guarantees of Origin. The regulators (Ofgem's) term for electricity that has been generated by renewable sources.
<b>Regulated energy</b>	Energy uses in a building that are covered by Building Regulations (see above). Includes only 'fixed' energy uses, such as space heat, hot water, fixed lighting, fans and pumps.
<b>Renewable energy</b>	Any energy that is generated from rapidly renewable sources. Including wind, solar, hydro, tidal, geothermal, ambient heat in the air, and some forms of biomass.
<b>RIBA</b>	Royal Institute of British Architects
<b>RIBA Climate Challenge</b>	Targets for buildings to support climate change adaptation (water efficiency) and mitigation (reduction of embodied carbon and operational energy use). Set by RIBA (above).

## Appendix 3: Overheating Risk Mitigation Guidance

### Toolkits and methods for reducing overheating risk, denoting which is appropriate by size and type of development:

- i. The publication of **Approved Document Part O: Overheating** now means that overheating measures are required under Building Regulations. Implementation of Part O began in June 2022 and applies to residential dwellings.
- ii. The newly introduced regulations intend to reduce excess solar gain in internal spaces and ensure that measures are implemented to easily remove excess indoor heat. Under Part O, spaces will now be assessed individually, which will help identify specific areas and rooms at enhanced risk of overheating.
- iii. Part O offers two options:
  - The Simplified Method
  - Dynamic Thermal Modelling
- iv. The Simplified Method aims to limit solar gains and maximise opportunities for natural ventilation, primarily through selecting appropriate sizes and designs of windows. Under this approach, the methodology restricts glazing on south, west and east walls and ensures that there is an appropriate amount of openable window area to remove excess heat.
- v. The alternative compliance approach is to use dynamic thermal modelling, which is based on the **CIBSE TM59 methodology**. Using inputs from TM59 and CIBSE 2020s Design Summer Year climate modelling, compliance can be demonstrated by showing that the internal temperature of a space does not surpass a set temperature limit throughout a specified number of hours. This approach benefits developers and occupants since it allows specific solutions to be identified in individual spaces, instead of adopting whole-house solutions.
- vi. Under Part O, as set out in the cooling hierarchy above, passive overheating measures must be prioritised and maximised prior to the consideration and potential implementation of mechanical ventilation and/or active cooling systems.
- vii. For non-residential buildings, adaptive thermal modelling through CIBSE TM52 should be used. The guidance determines accepted levels of internal temperature:
  - **Hours of exceedance:** the limit of hours where the operative temperature exceeds the threshold comfort temperature by 1K or more whilst the building is occupied and during a season that does not require heating (May – September).
  - **Daily weighted exceedance:** this refers to the level of overheating severity throughout one day, which is determined by overheating duration and rate of temperature increase.
- viii. For both TM52 and TM59, the **rural and semi-urban TM49 weather files** (Gatwick Airport data) would be most appropriate as this best represents the conditions found in RBWM. TM49 (*Design Summer Years for London*) is a useful guidance tool as it allows developers to account for difficulties building within an urban heat island context, whilst mitigating risks that will arise from an increasingly uncertain climatic future.
- ix. **Passivhaus standards** set a summer overheating criterion, requiring that internal temperatures do not exceed 25°C for more than 10% of the year. This is assessed using a plug-in for **Passive House Planning Package**, the Passivhaus software to model building energy performance. Passivhaus is however aware of the high dependency on modelling assumptions, which are particularly apparent with the uncertainty of future climate scenarios.
  - **Upper limit temperature:** this is the absolute maximum daily temperature of a room.

## Appendix 4: Water Efficiency Technical Guidance

- i. The evidence-based industry framework, **RIBA Climate Challenge**, gives an indication of what exemplary practice would be. Under the 2030 targets, water usage should be limited to:
  - **10 litres/person/day for new build offices**
  - **75 litres/person/day for domestic/residential**
  - **0.5m<sup>3</sup>/pupil/year for new build schools**
- ii. Water efficiency benchmarks for different types of scheme are also available as part of the wider BREEAM environmental scoring system, under the **BREEAM Wat 01 credit**. These represent a percentage reduction on the baseline water use for the respective building type. They are calculated using the BREEAM Wat 01 calculator which is a [free-to-use online tool](#) based on the litre usage or other water efficiency rating of your water fittings and appliances. This calculator and associated benchmarks are a useful means to benchmark and demonstrate the extent to which a development's water efficiency is exemplary, even if the development itself is not pursuing a BREEAM certification.

## Appendix 5: Guidance on Circular Economy In Development

### Pre-demolition/pre-redevelopment audits

- i. Any proposals for demolition of existing structures should, to be considered acceptable, include a strong justification explaining why it was not possible to retain and reuse/refurbish the existing structures and narrative on what steps were taken to explore scope for retention/refurbishment and avoidance of the need for demolition and disposal. Materials should only be passed off to other management/landfill as a last resort where it is clear that there is not suitable purpose for the material on-site or on an alternative site.
- ii. One generally expected first key step in this process would be site materials audits: Pre-demolition or pre-redevelopment.
- iii. Pre-demolition or pre-redevelopment audits are an assessment of your site to understand what materials already exist there and identifying the potential for these materials to possibly be reused. Where your site contains existing buildings or structures, these audits are strongly encouraged as a means to evidence that you have made efforts to fulfil the first two steps of the waste hierarchy rather than resorting immediately to demolition and disposal.
- iv. Best practice for pre-redevelopment audits (external guidance):
  - A pre-redevelopment audit is a tool to assessing whether existing buildings and structures on site can be fully or partially retained and refurbished as part of the proposals.
  - The audit should be carried out by an independent third-party as early as possible (ideally during RIBA stages 1 or 2) and should provide robust justifications for the potential to fully or partially refurbish or demolish the existing development.
  - The audit should include a description of existing buildings and structures, their age, key materials, and photos of internal and external aspects.
  - The pre-development audit should clearly demonstrate how the proposed approach has been based on the embodied carbon and resource decisions of the existing site, and robust justification for decisions (demonstrating that they are not based on purely economic basis).
  - See [BRE Code for Practice: Pre-redevelopment audits](#) (July 2017)
- v. Best practice for pre-demolition audits (external guidance):
  - Once the decision for partial or full demolition has been made, a pre-demolition audit can be used to provide detail on the materials on site in existing buildings and structures (including façade, foundations, etc). If carried out at an early RIBA design stage, this audit can help identify where materials can be re-used on site and can help towards achieving targets for re-use and

recycling both on and offsite (such as targets set in order to achieve credits towards a BREEAM certification).

- vi. The Council acknowledges that these audits are a step that can earn BREEAM credits for schemes working towards a BREEAM certification, and such will accept information on targeted BREEAM credits as demonstration that the applicant has implemented the material audit.

## Appendix 6: Responsible and Local Sourcing Guidance

- i. **LETI Climate Emergency Design Guide** focuses on the need to consider low-embodied carbon choices for key materials: concrete, timber/wood, bricks, structural steel, aluminium and glass. For example, the production of concrete with Ground Granulated Blast-furnace Slag over cement can result in 1/5 of the energy used and 1/15 of CO<sub>2</sub> emissions.
- ii. 100% of timber and timber-based products used for building materials but also all timber used on-site during construction (e.g. hoarding, pallets) should be sourced from sustainably managed sources and be legally sourced and harvested. This includes FSC and PEFC certified timber. This should also include timber-based products, such as timber composite decking.
- iii. Certification schemes are also available for major materials, such as **the CARES Sustainable Constructional Steel Scheme** and **Aluminium Stewardship Initiative**, which can demonstrate sustainable sourcing and processing.
- iv. **BES6001 Framework Standard for Responsible Sourcing** includes organisational management, supply chain management and sustainable development requirements. It focuses on individual products, not organisations/companies.
- v. Independently certified **Environmental Management Systems (EMS)** which assess key processes for extracting raw materials such as ISO14001 EMS certifications partially comply with BREEAM criteria, based on the extent to which they cover the supply chain processes involved BREEAM Guidance Note 18 provides detailed information on which EMS have been recognised by BREEAM and given a responsible sourcing weighting level by the BRE.

## Appendix 7: Technical Embodied Carbon Assessment Guidance

- i. The following construction elements should be examined, as set out under **NRM 2 (RICS)**: as part of an embodied carbon assessment:
  - **Substructure**
  - **Superstructure**
  - **Finishes**
  - **Fittings, furnishing and equipment**
  - **MEP services**
  - **Prefabricated buildings and building units**
  - **Work to existing building**
  - **External works**
- ii. The **LETI Embodied Carbon Primer** supplementary guidance document provides in depth analyses of primary construction materials (Appendix 8), such as timber, aluminium, glass, steel and bricks. In practice understanding of the use of these materials in the document can help applicants determine appropriate material selection.
- iii. For exemplary development, that aims to achieve net zero embodied carbon, the guidance document '**Passivhaus: a route to net zero embodied carbon**' sets out a high-level approach to accomplishing such a goal. This is particularly useful to understand how embodied carbon reductions can be employed alongside energy efficiency measures.
- iv. The **RICS Whole Life Carbon Assessment (1<sup>st</sup> edition, 2017)**, based on **RIBA Stages**, and the PAS 2080 framework (2016 Carbon management in infrastructure) are both well-respected methodologies that provide a strong basis to undertake an embodied carbon assessment.
- v. Well-tested specific approaches to calculate embodied carbon are:
  - **Calculation methodology should conform with BS 15978; 2011 Sustainability of construction works – assessment of environmental performance of buildings** [Note: the RICS Whole Life Carbon Assessment noted below is based on this Standard]
  - **RICS Professional Statement: Whole Life Carbon assessment for the built environment** as the methodology to calculate embodied carbon [noting that this is an interpretation of BS15978 mentioned above]
  - **ISO 14025: 2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.**
  - **Institution of Structural Engineers: How to calculate embodied carbon**
- vi. The following sources of data are preferable for reliable embodied carbon estimations due to largely reliable embodied carbon factors:



- **Environmental Product Declarations** for specific products you propose to use – these are certificates disclosing the embodied carbon (and other environmental impact factors) that are based on the specific conditions in which an individual product is produced. Not all products on the market have EPDs, but many products claiming ‘green’ credentials do have these to evidence their claims. You can use embodied carbon data from EPDs in combination with generic embodied carbon data for other products or materials from the databases noted below. EPDs should be third-party verified and confirm to RICS guidance.
  - **The University of Bath ICE database** – free-to-use; registration required.
  - **Built Environment Carbon Database** – currently in development (as of the time of writing this SPD, early 2023) led by RICS along with several other industry bodies.
- vii. Where specific carbon factors are not available, carbon factors can be manually generated using the **RICS Methodology to Calculate Embodied Carbon of Materials**. Associated assumptions and principles should also be addressed, which are set out in the Institution of Structural Engineers’ **How to Calculate Embodied Carbon for Construction Materials** guidance.
- viii. LETI guidance also lists out the actions for embodied carbon at each stage of the project, listing actions for the designer and for the life cycle assessment specialist at each RIBA Stage (see Appendix 0.2 of the **LETI Climate Emergency Design Guide**).

**Industry Benchmarks for Embodied Carbon Targets**

- ix. According to the UKGBC, 20% of built environment carbon emissions are due to embodied carbon from the construction and refurbishment of buildings. The UKGBC recommends that minimum standards or embodied carbon limits are set by 2025 for large buildings (>1000m<sup>2</sup>) in mature sectors (where benchmark level data exists) and that by 2027, these minimum standards for embodied carbon are applied to all sectors.
- x. As part of the pursuit of high quality and sustainable design, RBWM strongly encourages development proposals, especially major proposals, to show that they have worked towards and compared against embodied carbon industry benchmarks relevant to the development type and completion date as outlined below (LETI and/or RIBA).
- xi. Developed by building environment professionals and experts, the **RIBA 2030 Climate Challenge** sets voluntary targets for embodied carbon, operational energy and water consumption. Version 2 of their targets has been updated so that embodied carbon targets align with LETI, GLA and UKGBC guidance. RIBA states that the Climate Challenge “presents ambitious but achievable forward-facing performance outcomes that are in line with the Future Homes Standard and future regulation, set against business-as-usual compliance approaches”. In their guidance, buildings should adopt the 2025 guidance as a minimum where buildings are being designed today, since the targets are based upon

operational performance (as it is likely that buildings designed today will be completed closer to 2025).

- xii. **LETI Embodied Carbon Primer** (January 2020) set out to provide supplementary guidance to their Climate Emergency Design Guide, and provide voluntary recommended embodied carbon reduction targets, broken down into three building types, *which* LETI states will contribute to whole life net zero carbon design, when combined with achievement of energy use intensity (EUI) targets and supplied with 100% renewable energy.

<b>RIBA Climate Challenge Targets</b>				
		<b>Business as usual</b> (kgCO <sub>2</sub> e/m <sup>2</sup> )	<b>2025 target</b> (kgCO <sub>2</sub> e/m <sup>2</sup> )	<b>2030 target</b> (kgCO <sub>2</sub> e/m <sup>2</sup> )
<b>Residential</b>	Embodied carbon target (life cycle stages A1-A5, B1-B5, C1-C4, AND sequestration)	1200	<800	<625
<b>Commercial office</b>	Embodied carbon target (life cycle stages A1-A5, B1-B5, C1-C4, AND sequestration)	1400	<970	<750
<b>School</b>	Embodied carbon target (life cycle stages A1-A5, B1-B5, C1-C4, AND sequestration)	1000	<675	<540

LETI Embodied Carbon Targets					
	'Business as usual' (kgCO <sub>2</sub> e/m <sup>2</sup> )	2020 target or 40% reduction on baseline (kgCO <sub>2</sub> e/m <sup>2</sup> )		2030 target or 65% reduction on baseline (kgCO <sub>2</sub> e/m <sup>2</sup> )	Whole life net zero target (kgCO <sub>2</sub> e/m <sup>2</sup> )
Residential	Embodied carbon target (life cycle stages A1-A5, without sequestration)	800	500	300	0
	Embodied carbon target (with sequestration included)	N/A	400	200	-100
Commercial office	Embodied carbon target (life cycle stages A1-A5, without sequestration)	1000	600	350	0
	Embodied carbon target (with sequestration included)	N/A	500	250	-100
School	Embodied carbon target (life cycle stages A1-A5, without sequestration)	1000	600	350	0

	Embodied carbon target (with sequestration included)	N/A	500	250	-100
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- xiii. Targeting 'business as usual' or 2020 level targets does not demonstrate an ambitious approach to *operational* and embodied carbon and these targets should be exceeded unless clear and robust justification can be provided.
- xiv. It is important to understand the scope of the two targets. Looking the office targets as an example, the LETI target figure for 2030 is almost half of the target recommended by RIBA. This is because the LETI targets only cover upfront embodied carbon (stages A1-A5, with sequestration optionally included) whereas the RIBA targets also cover in-use and end of *life* embodied carbon (B1-B5 and C1-C4) as well as up-front embodied carbon (A1-A5). In addition, the RIBA 2030 Climate Challenge targets also include sequestration, whereas the LETI targets are set at two levels: with and without sequestration. This means accounting for carbon that was captured and stored by trees or other plants, where your building includes some timber or other plant-based material.
- xv. Although not set *out* over an indicative time period, the Greater London Authority has also set whole life carbon targets within their **Whole Life-Cycle Carbon Assessments London Plan Guidance (March 2022)**. These targets are used as part of determining planning permission approval/denial within the GLA for applications that are referred to the Mayor of London, but also used across London Boroughs as part of application reviews to demonstrate where applicants have seriously considered and have set appropriate ambitions for whole life carbon (i.e. they are not given the same weight as policy minimums).

## Appendix 8: Summary of RBWM Biodiversity Action Plan and Other Local Habitat Mapping

- i. As outlined in the [Biodiversity chapter](#), Applicants are expected to consider the existing and potential biodiversity value that their development could and should support, both in terms of:
  - a. The existing and potential biodiversity value of land within their site boundary,
  - b. How their site sits within the wider surrounding landscape network of existing and potential biodiversity assets.
    - In this case by 'biodiversity value' and 'biodiversity assets' we refer to the quantity and quality of habitats, any conservation designation status, and the presence of specific wildlife species in need of protection or support.
    - Extensive research and mapping has taken place within RBWM and Berkshire as a whole to establish what the existing biodiversity assets are in the local area (whether or not these have a conservation designation), the condition of these, and the range of potential opportunities that are possible and desirable to best support biodiversity recovery. These prior exercises and documentation include:
      - c. District-wide Biodiversity Action Plan (by the Council)
      - d. Berkshire Biodiversity Opportunity Areas (by Thames Valley Environmental Records Centre, TVERC)
      - e. Habitat mapping across Maidenhead (by Wild Maidenhead or other relevant local groups).
- ii. We here summarise the key insights from these in order to illustrate the kind of needs, issues, objectives and actions whose consideration or implementation would help to demonstrate that the applicant has earnestly considered and prioritised biodiversity benefits as part of their development proposals.

### RBWM Biodiversity Action Plan

- iii. The BAP outlines that only 39% of RBWM's Local Wildlife Sites are in positive conservation management, which is behind the Berkshire average (64%).
- iv. The BAP lists the designated nature conservation sites in the local area. (see map at Figure 13: Statutory nature sites in the borough. Map credit: DEFRA (RBWM boundary colour & key added by Bioregional). We here outline the types:
  - Ramsar sites: Sites with statutory protection for their status as wetlands of international importance. The borough overlaps with one Ramsar site: South West London Waterbodies, which is also an SPA and SSSI.

- SACs: Special Area of Conservation. Sites with statutory protection for their international importance for biodiversity, designated nationally support of a European directive. The borough contains or overlaps with three SACs.
  - SPAs: Special Protection Areas. Sites with statutory protection for their international importance for the conservation specifically of birds, designated at European level. Two SPAs overlap with the borough.
  - SSSIs: Sites of Special Scientific Interest. A statutory protection nationally designated for wildlife, geology, or landform interest. RBWM BAP lists 11 SSSIs (several of which are part of wider international designations).
  - LNRs: Local nature reserves. A statutory designation made to protect places that have local-level wildlife or geological interest. The BAP lists 9 LNRS within the borough. Many of the LNRs overlap with SSSIs, SACs, Ramsar or SPAs.
  - LWS: Local Wildlife Sites. A non-statutory site of significant value for wildlife conservation. The BAP notes that the borough has 84 Local Wildlife Sites.
- v. **The BAP also comes with a set of six 'Habitat Action Plans' (HAPs):** [Woodland](#), [Grassland](#), [Waterways](#), [Standing Water](#), [Urban](#), and Farmland. Each of these contains actions structured by the three strands that run throughout the BAP:
    - Data collection actions
    - Actions bringing direct benefit to biodiversity/nature conservation
    - Actions on engagement, relationship-building or partnerships.
  - vi. **The BAP objectives with most potential relevance to development are:**
    - Save 30% of land 'for nature' by 2030
    - All new development to have 10% biodiversity net gain secured for ≥30 years
    - Assemble better data on habitat distribution by surveying to identify Priority Habitat and ancient or veteran trees
    - Assemble better data on species distribution via surveys (dormice, bats, water vole, kingfisher, invertebrates, amphibian, newts, water rail, and toads)
    - By 2025, bring at least 50% of Local Wildlife Sites into positive management
    - By 2025, create 20ha of biodiverse grassland through developments
    - By 2025, increase trees by 15,000, including 5ha of extensions to existing LWS woodland and Priority Habitat woodland, and planting by 50 landowners
    - By 2025, increase the length of hedgerow in the borough by 5km
    - Monitor all waterways quality in the borough for phosphate and nitrate
    - Increase carbon sequestration through nature-based projects
    - Manage and reduce invasive species (including removal from 5km of waterways by 2025, and work with landowners to identify and eradicate these).
    - Support water vole via 3km of improvements to degraded river habitat and improving marginal vegetation of 5 lakes or ponds by 2025.







- vii. **The baseline set by the Borough's Biodiversity Action Plan** notes that only 39% of RBWM's Local Wildlife Sites are in positive conservation management, which is behind the Berkshire average (64%). Further baseline details are summarised in the bullet points below. Applicants are encouraged to take these into account when getting to know the context and contents of their site, in order to identify the opportunities that exist for delivering habitat protection and creation via their landscape designs and management measures:
- Woodlands cover ~27% of land area in the borough, or 34% including wood pasture and scattered trees. This is very high compared to the UK average of 13%. Areas of ancient woodland in RBWM account for 6.2% of land in the borough, including in Windsor Forest and Great Park, and Bisham Woods among others
    - a. Particularly important species for RBWM's woodlands include: Noctule bat; dormouse; lesser spotted woodpecker; stag beetle; various butterflies including speckled wood butterfly and silver-washed fritillary; and native bluebell.
    - b. Threats to RBWM's woodland habitats are Fragmentation, poor management (e.g. fertiliser or herbicide usage); invasive species (e.g. rhododendron, laurel), drainage of wet woodland; deadwood removal; deer proliferation; harmful visitor activity (trampling, dog faeces, litter); pests/diseases (e.g. ash dieback, oak processionary moth); climate change; loss of traditional practices e.g. coppicing or pollarding.
  - Grassland makes up ~33% of the land area in the borough, but the majority of this is 'improved' grassland, a classification meaning it has been managed to produce more grass. This usually involves fertiliser, grass seed and soil PH adjustments, resulting in a low biodiversity compared to natural grassland that has not had such interventions.
    - c. RBWM's grassland includes some that has Priority Habitat status, including coastal/floodplain grazing marsh, lowland meadows and lowland dry acid grassland
    - d. RBWM's grassland homes several Priority Species including great crested newt, reptiles, small mammals and invertebrate species. Further key species associated with grassland types found in RBWM are glow worm, barn owl, adder, slow worm, grass snake, common lizard, pennyroyal, wild bees, moths, butterflies and wasps.
  - Threats to RBWM's grassland are Lack of management (scrub encroachment); over mowing; over-fertilising; overgrazing (mainly cattle and horses); development (habitat loss or fragmentation); air pollution (nitrogen deposition); and increased recreational use (leading to trampling and wildlife disturbance).
  - 'Cultivated and disturbed' land (excluding amenity grassland) accounts for ~22% of the land area in the borough. Most of this is arable land (cropland).
    - e. Important species associated with farmland types present in RBWM are Barn owl, skylark, yellowhammer, swallows, wild bees, beetles, butterflies and moths.
    - f. Threats to biodiversity in RBWM's farmland are Reduction of crop rotation (with grass leys and fallows), and regular recreation (horse riding).
  - Water (ponds, running water, reed beds) makes up 3.6% of the borough area.
    - g. Some of this, including rivers and reedbeds, are classified as Priority Habitat. Of particular note is that the borough contains 25 miles of the River Thames (one of the country's largest and most important rivers) as well as various other rivers, many of which are Thames tributaries. Also notable is the manmade Jubilee River which offers flood alleviation to 3,000 properties in Maidenhead, Windsor and Eton.
    - h. Key species associated with the waterways present in RBWM include Brown trout, water vole, kingfisher, loddon lily, and aquatic invertebrates.
    - i. Key species associated with standing water habitats present in RBWM include Toads, great crested newt, water rail, and aquatic invertebrates.
    - j. Threats to the biodiversity of RBWM's waterways are Pollution (nutrient runoff, leaching, sewerage); poor management (dredging, re-sectioning, neglect of banksides); nocturnal wildlife harm due to lighting from development; climate change; increased recreational use; inappropriate land drainage; invasive species (Himalayan balsam, New Zealand pygmy weed, American mink, signal crayfish); and man-made barriers.
    - k. Threats to the biodiversity of RBWM's standing water are Pollution (nutrient runoff, leaching), lack of management (siltation, excess vegetation, build up of plant material); invasive species; climate change; drainage and agricultural infilling; overstocking of fish; and increased recreational use.
- viii. Case studies of positive interventions are given for each type of habitat, which may provide inspiration for future actions by the Council, land managers or developers:
- Woodland corridor creation via planting at Ockwells & Thriftwood Park, Maidenhead
  - Grassland conservation grazing at Battlemead Common, Cookham
  - Farmland wildflower field margins at Paley Street Farm, White Waltham
  - Waterways invasive species control at Sutherland Grange, Windsor
  - Standing water – wet woodland pond creation at Allens Field, South Ascot
  - Urban swift nest boxes ("swift corridor") in Maidenhead, Marlow & Cookham.

**Biodiversity Opportunity Areas (TVERC)**

ix. The BAP notes the existence of Biodiversity Opportunity Areas but does not list or map them. Therefore we here provide a map of the BOAs created by TVERC<sup>xiv</sup> at a Berkshire level. BOAs are not designated sites that constrain activities but are thought to have potential importance for biodiversity. BOA mapping aims to identify where the main biodiversity hotspots are and thus where conservation efforts can be most effective, such as maintenance, restoration and creation of Priority Habitats.

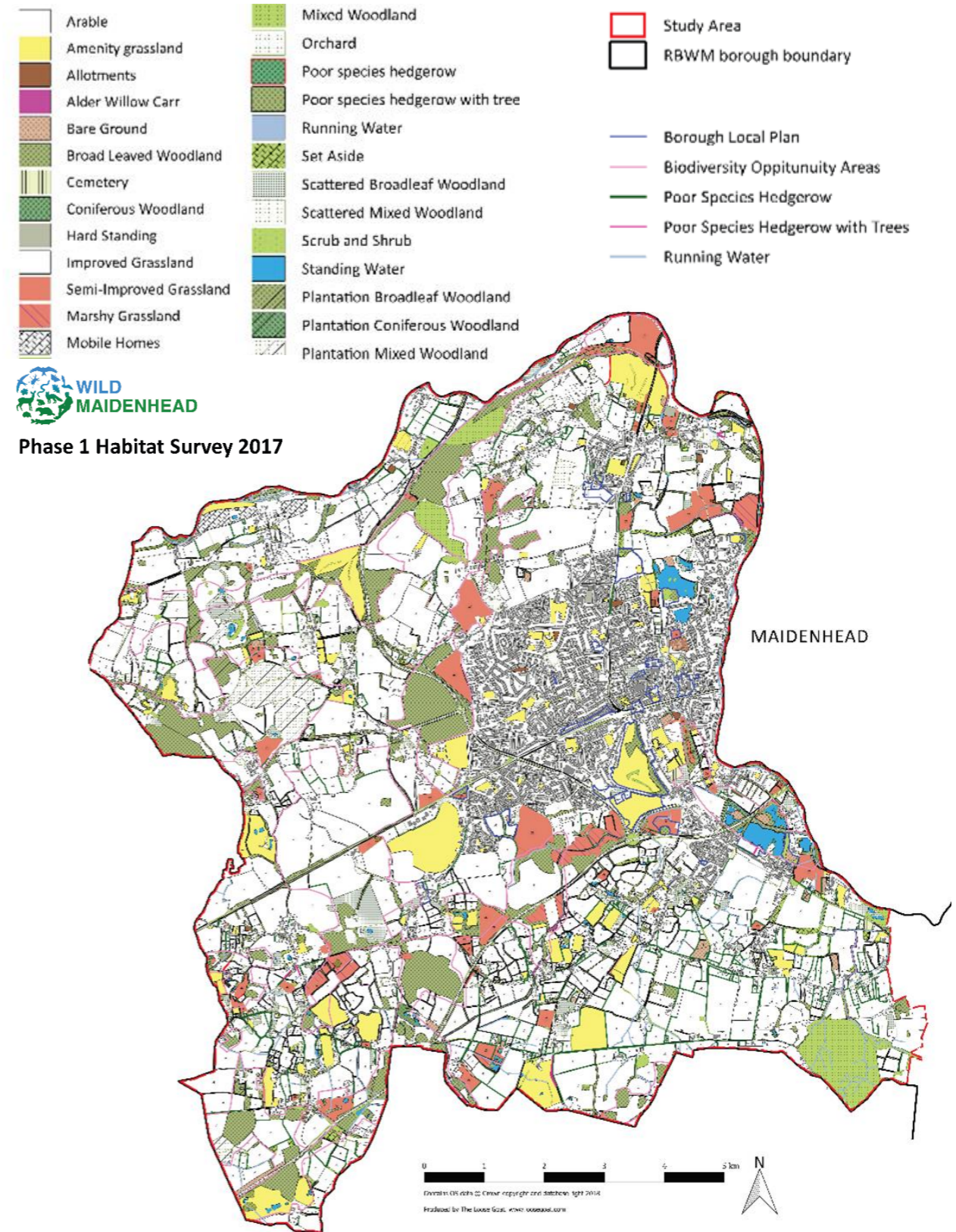
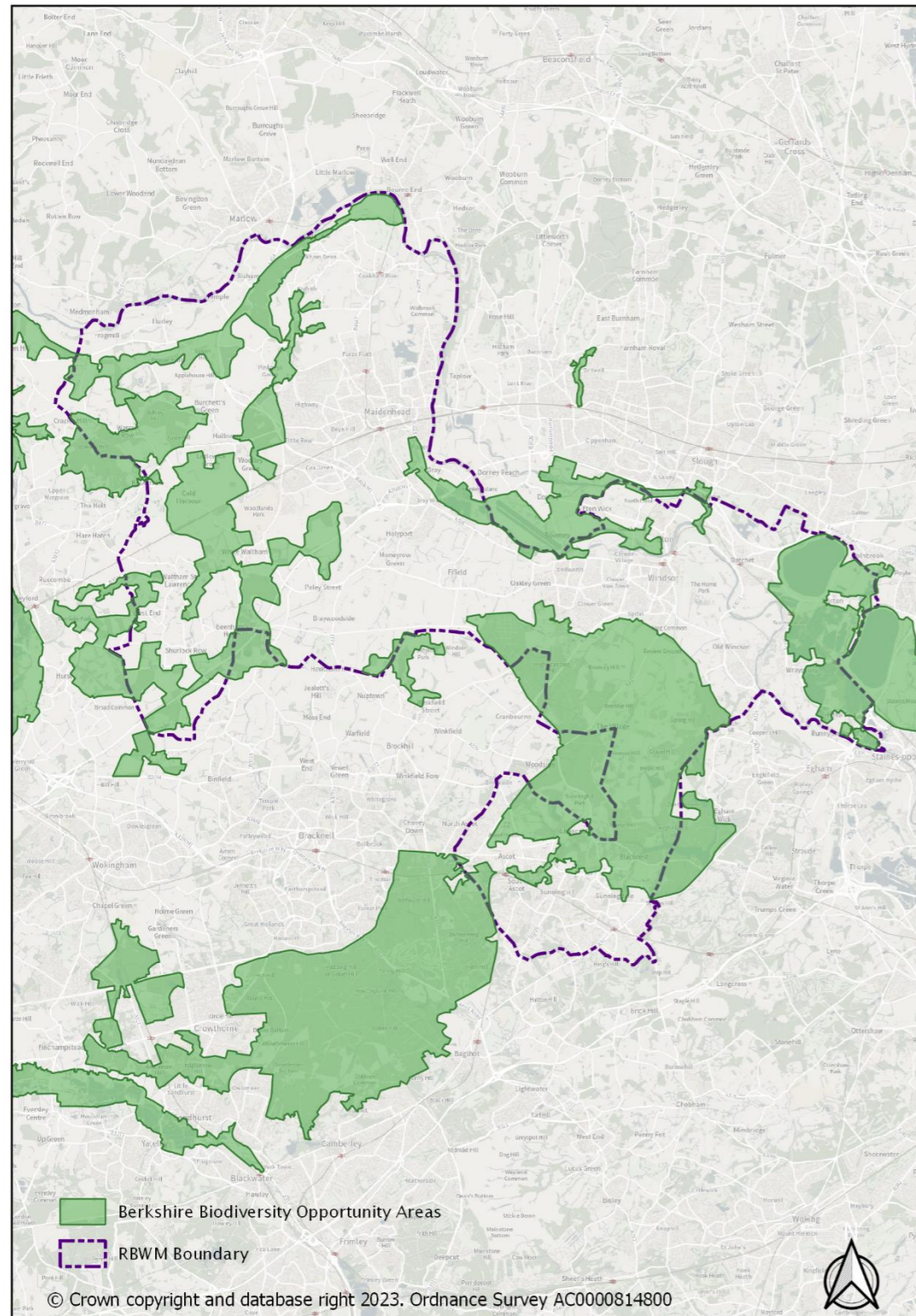


Figure 14: For full size map, please visit: <https://www.wildmaidenhead.org.uk/phase-1-habitat-survey>





### Wild Maidenhead Phase 1 Habitat Survey

- x. The Wild Maidenhead Phase 1 Habitat Survey provides more granular detail on specific sites and species in the Maidenhead area. This document is useful to understand specific wildlife species that are present, are experiencing threats, and could benefit from interventions some of which could be delivered with development (e.g. swift bricks, protection from artificial light, and protection from visitor disturbance). The full report comes with helpful mapping, reproduced here (Figure 14 **Error! Reference source not found.**).

TVERC Biodiversity Opportunity Areas in RBWM



## Appendix 9: Using the DEFRA Metric for Biodiversity Net Gain

- xi. **The DEFRA metric currently has two versions:**
- The full tool**
  - The ‘Small Sites’ tool.** This is a simplified version which can be used<sup>xlvi</sup> for the following:
    - Developments of 9 or fewer homes on sites of less than 1ha
    - Sites of 0.5ha where the number of homes is not known
    - Non-residential development on sites of 0.5ha
    - Non-residential development of less than 5,000 square metres.
    - But: the ‘small sites’ tool cannot currently be used where off-site measures will be needed, or if the site contains protected species, most Priority Habitat types, or certain other types of habitat that the Small Sites tool does not offer.
- xii. The DEFRA metric compares the pre-development and post-development presence of different types of planted habitat area and their condition. More valuable types of habitat earn more points, as do habitats in better condition. Applicants through the design of their development can deliver biodiversity net gain through the creation of larger habitat areas, creation of areas of more valuable habitat types, or enhancement of the condition of existing habitats.
- Non-planted measures such as bird boxes, bat bricks, insect hotels, do NOT count in the DEFRA 4.0 metric.
- xiii. The amount, type and quality of habitat entered into the **DEFRA BNG metric must be assessed by a ‘competent person’**. [Local government guidance](#)<sup>xlvii</sup> states this is generally understood to be a qualified ecologist for the ‘full metric’, but that the ‘Small Sites’ metric may not need a qualified ecologist but someone otherwise ‘competent’ in their ability to confidently identify the indicator species likely to occur in the location at the time of year the survey is undertaken. The DEFRA Metric User Guide<sup>xlviii</sup> does not specify a qualification required but notes that “Competency is aligned with ... BS 8683:2021” and that for a River Condition Assessment the assessor must be trained and accredited in the River Condition Assessment methodology.
- xiv. The Government has confirmed<sup>xlix</sup> that it will enact secondary legislation that will **exclude certain types of ‘irreplaceable habitat’ from the net gain calculation** as their loss cannot be offset. In accordance with this Government proposal, when calculating the BNG, the following rules apply to development applications in RBWM:
- any loss of irreplaceable habitats such as ancient woodland, ancient and veteran trees must be treated separately from the calculation of biodiversity net gain and cannot be compensated by biodiversity credits.
  - where retention and enhancement of these habits is proposed, these enhancements can contribute to an improved biodiversity score.
- xv. Government has committed to legislate to “set out a clear definition of irreplaceable habitat and list of habitat types to be considered irreplaceable” and “separate information requirements” relating to such habitats in planning proposals and decisions. Until this legislation is enacted, the Council will follow the **NPPF glossary definition of ‘irreplaceable habitat’**, which as of the NPPF 2023 is as follows: ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.
- xvi. Where the minimum 10% net gain cannot be achieved through the delivery of new or improved habitats on site, as a last resort, the applicant will need remedy the deficit through biodiversity offsetting. Biodiversity offset credits are created for sale by land owners or managers by creating or enhancing habitat on other land. These are expected to become regulated and mediated through Government schemes (Natural England), but meanwhile can be accessed via brokers.
- Where biodiversity offsetting is needed, the Council expects this to be delivered as close to the site as possible and always within the borough.
  - RBWM is in the process of setting up a Biodiversity Offsetting Scheme.
- xvii. The BNG metric can be used not only for full and reserved matters applications, but also for outline applications on an indicative and precautionary basis. Government confirms that for outline applications or development permitted in phases, there will be a requirement to set out how biodiversity gain will be achieved across the whole site on a phase-by-phase basis, and it should be subject to a condition requiring approval of a biodiversity gain plan prior to commencement of each phase<sup>l</sup>.
- xviii. Applicants for all types and sizes of development, through their application documents, will be required to provide:
- The baseline ecological conditions of the site, as demonstrated through an ecological report (Preliminary Ecological Appraisal)
  - Illustrate through site or landscape plans (which are sufficiently labelled) the type and condition of habitat being delivered or enhanced by the development.
  - Biodiversity net gain calculation showing that at least 10% net gain will be met for the proposed development firstly through on-site measures, calculated through the most up to date version of DEFRA’s Biodiversity Metric with confirmation that this was performed by a suitably competent person as per the User Guide to the DEFRA Biodiversity Metric.
  - Measures of how the proposed habitats will be secured for 30 years or more (detailed management measures may be subject to a planning condition).
  - Where there are on-site losses and/or where biodiversity offsetting is required to meet the 10% net gain, the applicant is required to demonstrate why this was necessary with reference to the specific characteristics of the development site (for an indication of the explanation expected, see commentary alongside **Error! Reference source not found.**) and confirm that offsetting credits have not been used to ‘compensate’ any loss of irreplaceable habitat.
  - Confirmation that any offsetting credits used are from within the borough area.

## Appendix 10: Applying Local and National Electric Vehicle Charging Requirements

### Summary of Building Regulations Part S

- i. We provide this summary to help the reader become familiar with the general gist of the newly introduced Part S of building regulations. However, please note the Council is not liable for any inaccuracies in the below and it is the responsibility of the developer to refer to the [full Part S document](#) and comply with its requirements.
- ii. Our brief summary of the key requirements of Part S 2022 is as follows:
  - a. **All residential development** (whether new, or through material change of use) that has one or more associated parking spaces must provide a number of charge points at a rate of at least one charge point per home, or one charge point per parking space if the number of parking spaces is less than the number of homes.
  - b. **Major residential renovation that has more than 10 associated parking spaces** must ensure that at least one parking space for the use of each dwelling has access to a charge point, and the remaining spaces must have cabling ready to support installation of charge points
  - c. **Non-residential development that has more than 10 parking spaces** (whether **new development or major renovation**) must provide at least one charge point and cabling suitable to supply charge points in at least 20% of the remaining space. The required number of charge points is not specified to increase with greater amounts of parking, unlike the cabling.
- iii. There are some caveats to the above, including but not limited to:
  - a. **An ‘associated parking space’ does not have to be an allocated one.** It means any parking space, within the site boundary of the building, that is for the use of or available to any occupant of or visitor to the building.
  - b. **On-street parking** on the public highway that does not belong to the owners to the building is excluded from the definition of ‘associated parking’, and therefore no requirements are set for this kind of parking.
    - However, in the case of on-street parking where the street is a new road proposed as part of the development, that street is under the ownership or control of the same developer at the point of depositing plans and therefore this becomes ‘associated parking’ to which the usual Part S requirements will apply in relation to all buildings that are associated with these spaces
  - c. **‘Covered car parking’** can comply by providing not the charge points but instead by providing cable routes to allow a certain proportion of the covered parking spaces to be fitted with electric charge points in future. The amount of spaces in the covered car parking that must have these cable routes depends on the type of project (residential, non-residential, new, refurbishment, change of use) and on the proportion of the required provision that has already been met in any parking that the project provides in a location other than a covered car park. Where there is a mix of covered and non-covered car parking, the development must firstly comply with the requirements for the non-covered car parking.
- iv. Developers may also find it helpful to refer to the [associated FAQ](#) provided with Part S.
  - d. **Cost caps and grid constraints:** The required provision has some flexibility in response to situations where there are electrical grid constraints, or developments in which the cost of connection to the grid would exceed £3600/charge point or where the cost of installing the charge points would represent over 7% of the total capital cost of renovation. The exact degree of flexibility varies by type of development (new, renovation, residential, non-residential) so it is essential to refer to the document to establish the exact applicability to your proposal, but the general logic flowing through Part S tends to mean that the development must then meet the requirements as far as possible within the relevant cost cap (and within the available incoming electrical supply at major renovations).
  - e. **Heritage settings:** Flexibility to adjust the level or location of provision, where the building or its setting have particular architectural or historic value, in collaboration with the local authority’s heritage officer.
  - f. Technical requirements are set for the type and quality of charge point (such as speed, socket type, display, and relevant British Standard).
- v. This SPD previously noted that there will be some cases where the Part S requirement will be higher than the local standard (20% of parking spaces to be provided with charging and the remaining 80% to have cabling) and other cases where the reverse is true. It was also stated that applicants should apply whichever standard is the higher in relation to the type of development proposed. Some examples are given here to illustrate this.
  - a. In residential development with 1-5 parking spaces per home, all outdoors and within the site boundary of the building, Part S requires 1 charge point per home. This fulfils the local charge point standard (20%), but the remaining spaces also need cabling to meet the local standard.

- b. In new covered car parking, Part S only requires cabling, not any charge points. This is lower than the local standard, therefore instead the local standard should be applied.
  - c. In development that creates on-street parking that does not belong to the building owners and is not under the control of the same developer at the point of depositing plans *or* is separated from the building by a public road, Part S sets no requirement and therefore the local standard applies.
  - d. In non-residential new development, the local standard always applies as it exceeds Part S.
- vi. In **mixed-use development**, Part S must firstly be met and then the provision should be extended to meet the local standard across any parts of the parking for which Part S compliance did not meet or exceed the local standard.
- **For example, if a mixed-use development provides 100 spaces**, of which 50 are for residential use at a ratio of 1 space per home and the other 50 for non-residential use,
    - Part S would require chargers to all 100% of the 50 residential parking spaces. This more than fulfils the RBWM local standard across the residential parking.
    - In the 50 non-residential spaces, Part S only requires 1 charger between them and cabling to 20% of the rest (10 spaces). Thus in the non-residential share of the parking, the RBWM standard is not met by Part S compliance. Therefore the non-residential parking should use the local 80%/20% standard, i.e. 10 spaces with chargers and 40 with cabling.



## Appendix 11: Summary of National Guidance on Active Travel Infrastructure Provision

- i. As noted in Chapter 7: Sustainable Transport, developers should, when designing cycling infrastructure, refer to national guidance on the quality and standards for this including LTN 1/20, Gear Change and Manual for Streets.
  - a. [‘Gear Change’](#)<sup>ii</sup>, Department for Transport – contents include:
    - ‘Do’ and ‘don’t’ principles in designing for active travel
    - Quashing key myths and negative biases around cycling
    - Setting priorities for development design and planning decisions with regards to improving infrastructure quality sufficiently to meaningfully boost active travel.
  - b. [LTN 1/20](#)<sup>iii</sup> – This gives detailed design guidance on:
    - planning for cycling
    - space for cycling within highways
    - transitions between carriageways, cycle lanes and cycle tracks
    - junctions and crossings
    - cycle parking and other equipment
    - planning and designing for commercial cycling
    - traffic signs and road markings
    - construction and maintenance.
  - c. [Manual for Streets](#) – this 2007 guidance compiled jointly by several Government departments emphasises the following key points:
    - Defining the 5 functions of ‘Streets’ distinct from ‘roads’: Place, movement, access, parking, and utilities/drainage/lighting). ‘Place’ is the most important.
    - Defining 7 key stages for the street design process from policy to implementation
    - Setting a ‘movement framework’ for a hierarchy of users starting with pedestrians and then cyclists
    - Improving the relationship between dwellings and streets, including geometry such as widths, heights and aesthetics
    - Principles to consider the differing needs of different users including children and disabled people, as well as cyclists, bus users and emergency vehicles.
    - Guidance on traffic signs, markings, street furniture, light, materials, maintenance.
  - d. [Active Travel England](#) Standing Advice Note: Active travel and sustainable development, 2023 guidance on:
    - How LPAs should proceed to assess an application where standing advice is offered
    - Active travel assessment considerations



Figure 15: Principles in design of effective active travel. From [Dft., Gear Change](#).

- Transport assessment and travel plans
  - Access to local amenities and public transport
  - Suitability for walking, wheeling and cycling
  - Street design
  - Safety at junctions and crossings
  - Cycle parking and facilities
- ii. We here provide a summary of key principles and messages flowing from these, which should form the basis for pursuing and assessing good design in provision for active travel in proposals:
    - a. **Routes for active travel should be coherently laid out** to allow people to reach their day-to-day destinations by active travel easily, along routes that connect, and are simple to navigate. Coherency also means being of consistently high quality, being laid out to provide active travel routes along desire lines between key locations and avoiding excessive variation quality of provision (for example, cycle routes should not suddenly disappear abandoning the user at busy intersections or roundabouts).

- **Coherency in RBWM** means the development proposal also shows how its walking and cycling routes are connected to wider networks and supports network improvements where needed. Please see the [Local Walking and Cycling Infrastructure Plan](#)<sup>liii</sup> for maps of these existing routes, planned route extensions, and some improvements that are needed such as barrier removal in specific locations. See also: [Public Rights of Way Management and Improvement Plan](#)<sup>liv</sup>.
- b. **Routes for active travel should be the most direct:** They should provide the shortest and fastest route from place to place; this includes providing facilities at junctions that minimise delay and the need to stop and providing clear wayfinding. These routes should be at least as direct – and preferably more direct – than those for cars and vans.
- c. **Routes for active travel should both be safe and feel safe.** Separation of modes is important for both pedestrians and cyclists. Pedestrians should always be first in the hierarchy of street users. Where foot and cycle traffic must share space, this should be clearly signposted and there should be sufficient width and visibility for users to avoid each other. Motor traffic volume and speed should be reduced wherever possible such as through filtered permeability (ensuring that the filtering does not obstruct larger bikes such as cargo bikes or disability-adapted cycles). Where motor speeds cannot be reduced to levels safe to share space, physically protected separate dedicated protected cycle lanes should be provided. Painted cycle lanes are insufficient. It should be shown how routes will remain usable at all times of day, considering that bike lights and handheld torches are not as powerful as car headlights and therefore the route should be free of potholes and obstructions and may need additional lighting provision compared to car routes.
- Innovative designs can still achieve high levels of safety; the Manual for Streets lays out six principles through which to ensure compliance with disabilities legislation when pursuing innovative designs, and notes that ‘safety-related issues need not dominate the overall assessment of the scheme at the expense of other [street quality] considerations’.
  - RBWM’s suggested range of safe infrastructure types is also outlined in the [Local Walking and Cycling Infrastructure Plan](#).
- d. **Routes for active travel should be comfortable:** Surfaces should be smooth and wide enough for the volume of users (considering the need to overtake and the desire to walk or cycle side by side). Foot and cycle routes should cater not only for proficient users but also to those who have different levels of cycling skill, confidence and physical fitness – such as children (who may need space to wobble), families (who may need to walk or cycle side by side), older and disabled people (who may need space for wider adapted cycles). Steep gradients, steep cambers, and proximity to high speed or high-volume traffic should be avoided (consider that noise and slipstream from fast-moving motor vehicles is at best unpleasant and at worst can unbalance cycles or

pedestrians). Much of the existing ‘National Cycle Network’ is of poor quality or condition and contains obstructions.

- e. **Routes for active travel should be attractive:** Cycling and walking provide a

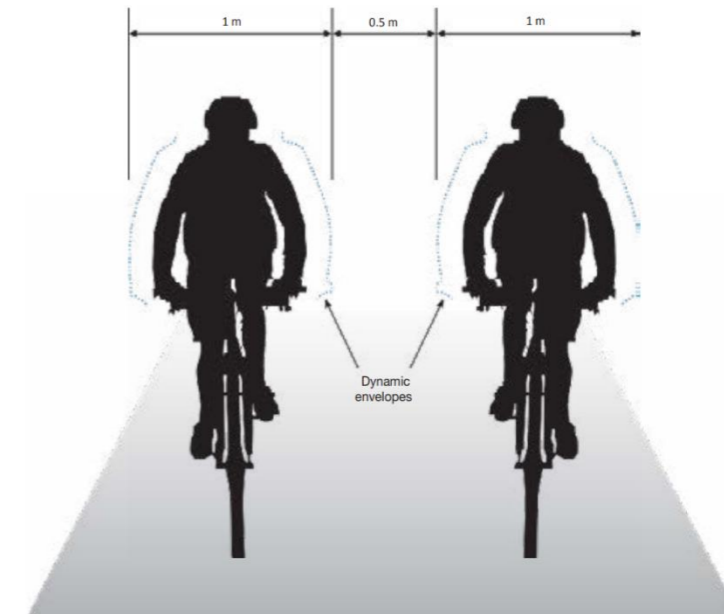


Figure 16: Illustration of the space needs of cyclists to ride side by side or overtake, considering the natural ‘wobble’ inherent in the motion of cycling as well as the width of the person and bike. From Department for Transport, LTN 1/20.

more sensory experience than driving as the traveller is directly exposed to their surroundings and the elements. The attractiveness of the environment makes a real difference to the daily decision whether to walk, cycle or drive. Routes should therefore be stimulating (e.g. with active frontages or attractive views), use high-quality materials, planting, and be kept free from litter or broken glass.

- iii. The SPD chapter on Sustainable Transport also notes the Heritage England “[Streets for All](#)” guidance on design to welcome active travel. We here summarise key points from the content of that guidance to offer the reader a preview of its relevance to the development in question (acknowledging that these are of primary relevance to **major** proposals). The goals laid out in the Historic England guidance are to achieve:
- a. An inclusive environment – including towards both visible and hidden disabilities
  - b. Public safety and ease of movement – including recognition that designs should be clear about which transport modes they promote, how this will affect the use and character of places and significance and appreciation of the historic environment, and how they manage any consequent risks that inevitably arise when modes share space

- c. A healthy environment to support wellbeing and cohesion – including air quality and stress reduction
  - d. A high-quality environment – that is attractive, stimulating, functional and durable
  - e. Economic benefit – seeking that designers of schemes make it clear what economic benefits they aim to achieve and measure performance before and after the works.
- iv. The guidance also offers more detailed advice on surfaces, street furniture, traffic management/calming, planting, lighting, and new equipment like kiosks, post boxes, parking ticket machines, cycle parking, waste bins, CCTV and advertising. Proposals in such settings can be strengthened by adding narrative showing how it has taken inspiration from this advice to deliver reduced car use and increased active travel.



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- <https://www.rbwm.gov.uk/home/planning>

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