

AIRPORT
EXPANSION
CONSULTATION

PREFERRED MASTERPLAN

JUNE 2019

Heathrow



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Introduction



1

1 Introduction

1.1 Introduction

1.1.1 Heathrow is the UK's only hub airport and the UK's biggest port by value for trade with countries outside the EU. It currently serves 200 destinations in 80 countries, connecting the UK to the world and the world to the UK.

1.1.2 Heathrow's existing two runways are operating at capacity. The Government announced policy support for the Heathrow Northwest Runway Scheme in 2016, and subsequently produced a draft Airports National Policy Statement (ANPS). Following a successful parliamentary vote, the ANPS was designated in 2018.

1.1.3 Among other things, the ANPS sets out the general policies and requirements against which any application brought forward to deliver a northwest runway scheme at Heathrow will be decided.

1.1.4 We expect to submit our application for a Development Consent Order (DCO) in 2020. If granted, the DCO would contain the required permissions for building and operating an expanded Heathrow (the Project). For more information, please see the document *How do we obtain approval to expand Heathrow?*.

1.2 Purpose

1.2.1 This document describes the physical aspects of the Preferred Masterplan for the expansion of Heathrow Airport and explains what has influenced its selection. It is intended to provide clear and concise information about the Project.

1.2.2 The Preferred Masterplan forms part of the suite of documents which comprises the Airport Expansion Consultation. This is our statutory consultation which provides an opportunity for local communities and other stakeholders to help refine our plans ahead of submitting our DCO application.

1.2.3 This document should be read in conjunction with other documents describing the process by which we arrived at the Preferred Masterplan (*Updated Scheme Development Report*), other aspects of our proposals (*Future Runway Operations, Early Growth* and *Construction Proposals* documents) their environmental consequences (*Preliminary Environmental Information Report* and *Preliminary Transport Information Report*) and our strategies to maximise benefits and minimise impacts (*Proposals for Mitigation and Compensation*, *Economic Development Framework* and *Surface Access Proposals*). All documents that form part of this consultation are listed in Figure 1.2.1.

1.2.4 Chapter 2 of this Masterplan document describes the airport and its surroundings today (our starting point for the Project), Chapters 3 and 4 explain how consultation and engagement, the ANPS and our own requirements have shaped our proposals. Chapter 5 provides an overview of the Preferred Masterplan and Chapters 6 and 7 describe what is proposed in more detail. Chapter 8 describes the indicative phasing for the Preferred Masterplan.

1.3 Feedback

1.3.1 We are grateful for feedback provided at previous consultations and have considered these responses in developing our proposals (refer to Figure 1.3.1). We now ask for your views on our preferred proposals, so that we can further improve our project before we apply for planning consent next year. You can provide feedback:

- Online using the feedback form on our website aec.heathrowconsultation.com;
- Complete a feedback form, available at events or on request calling 0800 307 7996;
- Email us at feedback@heathrowconsultation.com; or,
- Write to us at Freepost LHR AIRPORT EXPANSION CONSULTATION.

1.3.2 We have set out our proposals in a number of documents covering different topics and different levels of detail. All of these are available on our website, at Document Inspection Locations and at consultation events.

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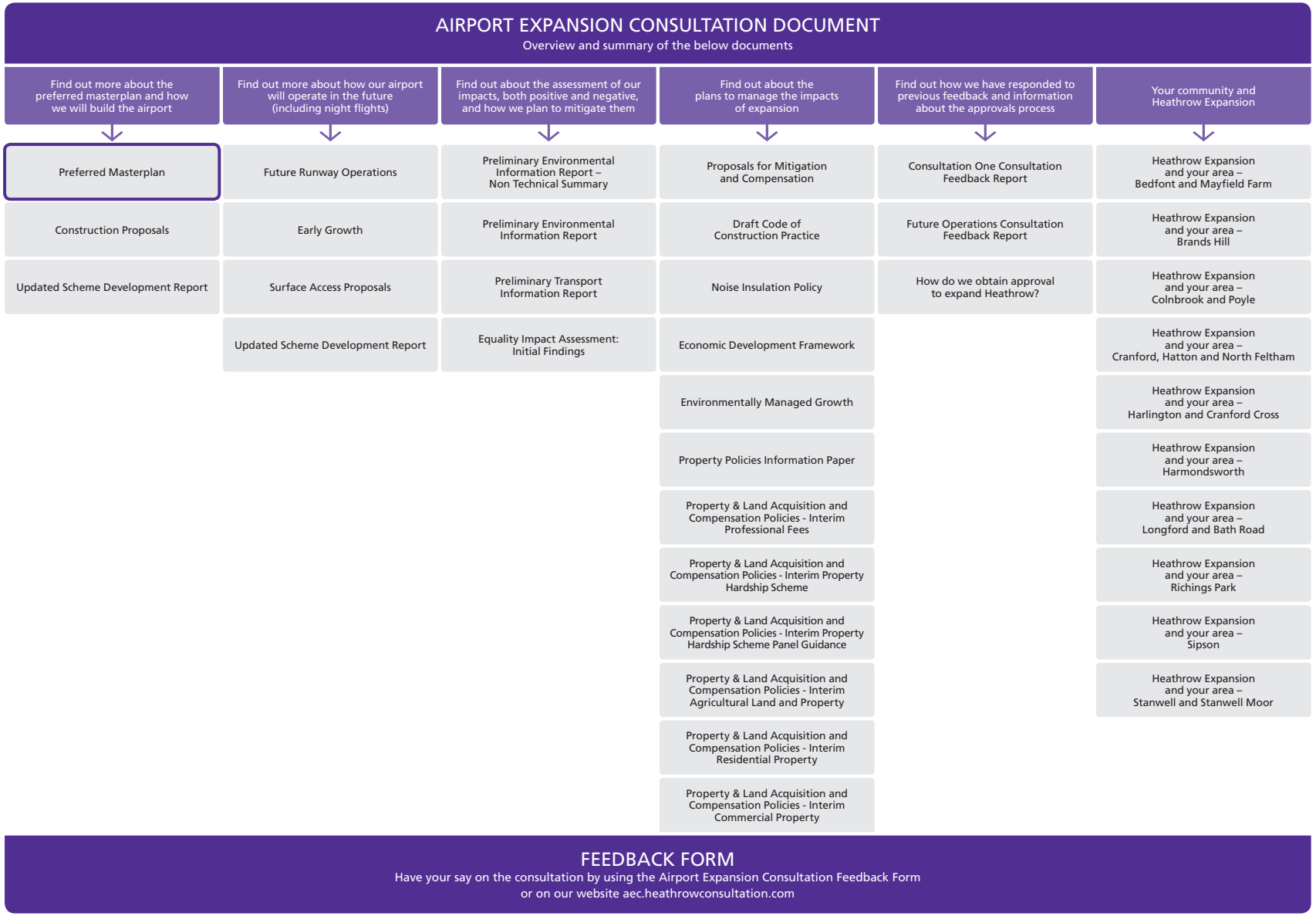


Figure 1.2.1: Map of all consultation documents

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Early Engagement

In developing the options that were set out in this consultation, we worked with a number of stakeholders to understand key technical opportunities and constraints.

1

Airport Expansion Consultation One (January 2018)

Building on the Airports Commission's recommendations, we worked to develop further options for the expansion of the airport. This consultation was an opportunity for you to give feedback on these options, and this engagement was a critical part of informing our expansion plans.

The feedback we received has helped us deliver all of our commitments to expand in a sustainable way, while increasing opportunities for people and businesses across our local communities.

We Engaged

Between our consultations, we have engaged with our communities and stakeholders to develop our proposals. The Community Engagement Board has been a key part of this engagement to ensure local communities can effectively contribute to the development of our proposals.

2

Airport Expansion Consultation (June 2019)

This consultation is based on the Preferred Masterplan, which comprises the draft proposals that we intend to include in our DCO. It includes detailed information on all aspects of expansion, including the likely environmental effects and the ways we intend to reduce them.

Further Engagement

After this consultation, we will refine our proposals based on the feedback we receive. We will continue to engage with our communities in advance of submitting our DCO application in 2020.

Figure 1.3.1: Consultation process

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Heathrow Today

2

2 Heathrow Today

2.1. Existing Heathrow

2.1.1 Heathrow is the UK's only hub airport. Hub airports combine direct passengers, transfer passengers and freight to enable long-haul aircraft to fly to destinations all over the world that cannot be served by 'point to point' airports which rely on local demand alone. Hub airports differ markedly from airports such as Gatwick, Stansted or Luton, which offer 'point to point' services and do not offer the combinations of long-haul and short-haul services that allow significant volumes of transfers. Today, Heathrow serves over 200 routes to more than 80 countries.

2.1.2 The current airport footprint totals approximately 1,200 hectares. Its principal land uses are shown in Figure 2.1.2. Heathrow is the busiest airport in the UK with approximately 650 arrivals and 650 departures every day. In 2018, the airport handled approximately 80 million passengers, and, in the year starting 1 April 2018, 476,000 Air Transport Movements (ATMs).

2.1.3 Heathrow is currently limited to no more than 480,000 ATMs per year as a condition of the 2002 Terminal 5 planning permission. As a result, Heathrow has effectively been operating at 98% of its permitted runway throughput since 2005.

2.1.4 Four terminals serve circa 80 million passengers per annum with supporting apron and baggage handling facilities. The airport has invested over £14 bn in the last 16 years to improve passenger facilities, with the new Terminal 5 opening in 2008 and the new Terminal 2 opening in 2014.

2.1.5 The terminals are supported by efficient road access from the M25 and M4 road network, good local road access and the airport's own landside perimeter road network. There are rail, London Underground, coach and bus stations in all terminal areas.

2.1.6 Large areas of the perimeter are used for passenger and colleague car parking, with frequent bus services linking these areas to the front door of the terminals.

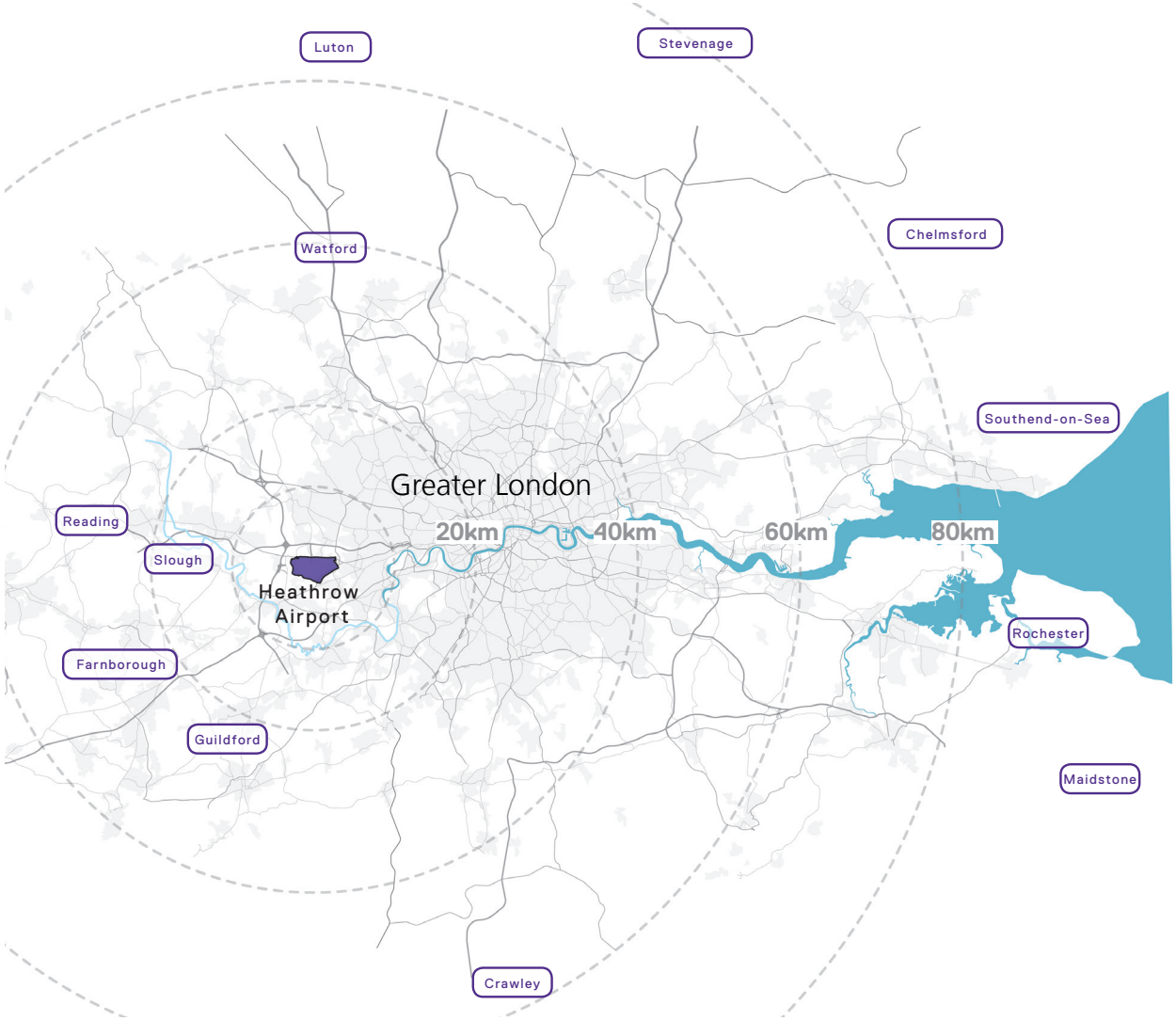


Figure 2.1.1 Regional location map of Heathrow airport

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2.1.7 Heathrow is the UK's biggest port by value. One third of the UK's long-haul export goods (by value) travelled through Heathrow in 2018. Approximately 1.7 million tonnes per annum of cargo are handled through significant cargo infrastructure located to the south of the airport. Outside the airport boundary, a high number of freight and logistics businesses are located nearby, which support and enable the movement of such large volumes freight.

2.1.8 Heathrow has one of the largest aircraft maintenance facilities in Europe to support the operation of the two major home-based airlines, British Airways and Virgin Atlantic. This is located on the eastern side of the airport.

2.1.9 There is Airport Supporting Development (ASD) that is essential to the safe and efficient operation of the airport, such as ground support equipment, airside fire stations, snow removal and aircraft de-icing equipment, aircraft fuel storage, and heating and cooling facilities, among others.

2.1.10 Additionally, a number of hotels support the airport's operation – a few hotels are located adjacent to terminals, but many are located a short bus ride away around the airport perimeter. Offices for airport colleagues are located in close proximity to the terminals, cargo and maintenance facilities.

2.1.11 The airport is a crucial part of the UK's national infrastructure and an economic driver of the local and regional economy. The airport site employs approximately 76,000 people in a range of jobs directly related to the operation of the airport, including airline employees, security, passenger services and maintenance. Approximately 38,000 further jobs are supported off-airport, mainly in the surrounding area, in the airport's supply chain and as a result of spending in the area.

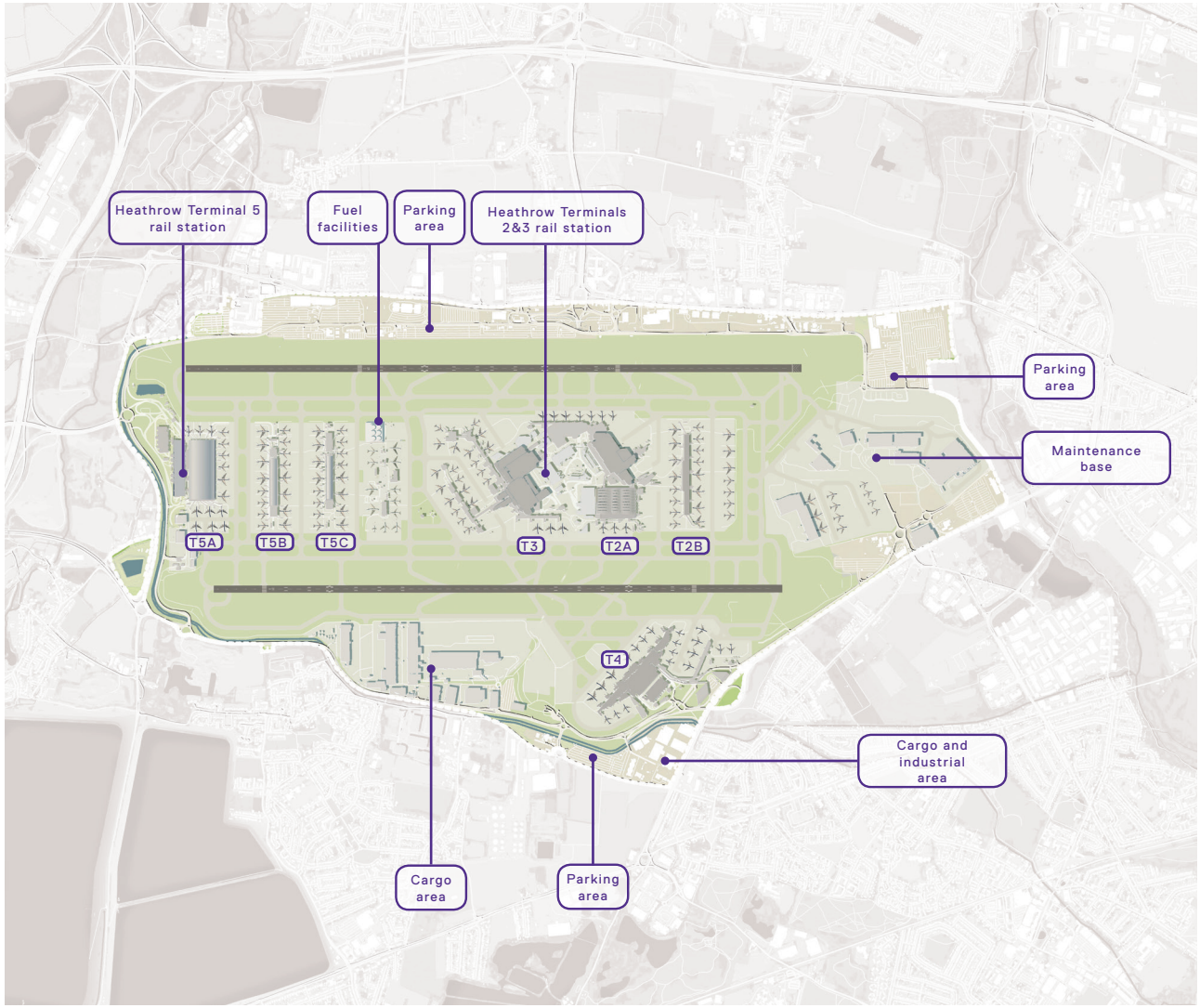


Figure 2.1.2: Heathrow today (the airport)

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View from control tower looking west



View of Harmondsworth Moor



View of M4 spur



View of the airfield



View of The Queen Mother Reservoir



View of Duke of Northumberland's River

Figure 2.1.3: Existing views of the airport

Figure 2.2.1: Existing views around the airport

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2.2. Around the Airport

2.2.1 Heathrow sits on the western edge of Greater London and is surrounded by a number of settlements, a dense network of motorways and roads, a number of rivers and water courses, open spaces and other features. Figure 2.2.2 shows some of the principal existing features around the existing airport.

2.2.2 The area required for expansion includes, amongst other things areas of Metropolitan Green Belt, homes, businesses, utilities infrastructure, heritage assets and environmentally sensitive habitats and natural features.

2.2.3 Our proposals have been developed with a comprehensive understanding of this context and its constraints, and every effort has been made to limit the impacts of expansion and take opportunities to mitigate the effects arising from the expansion of the airport.

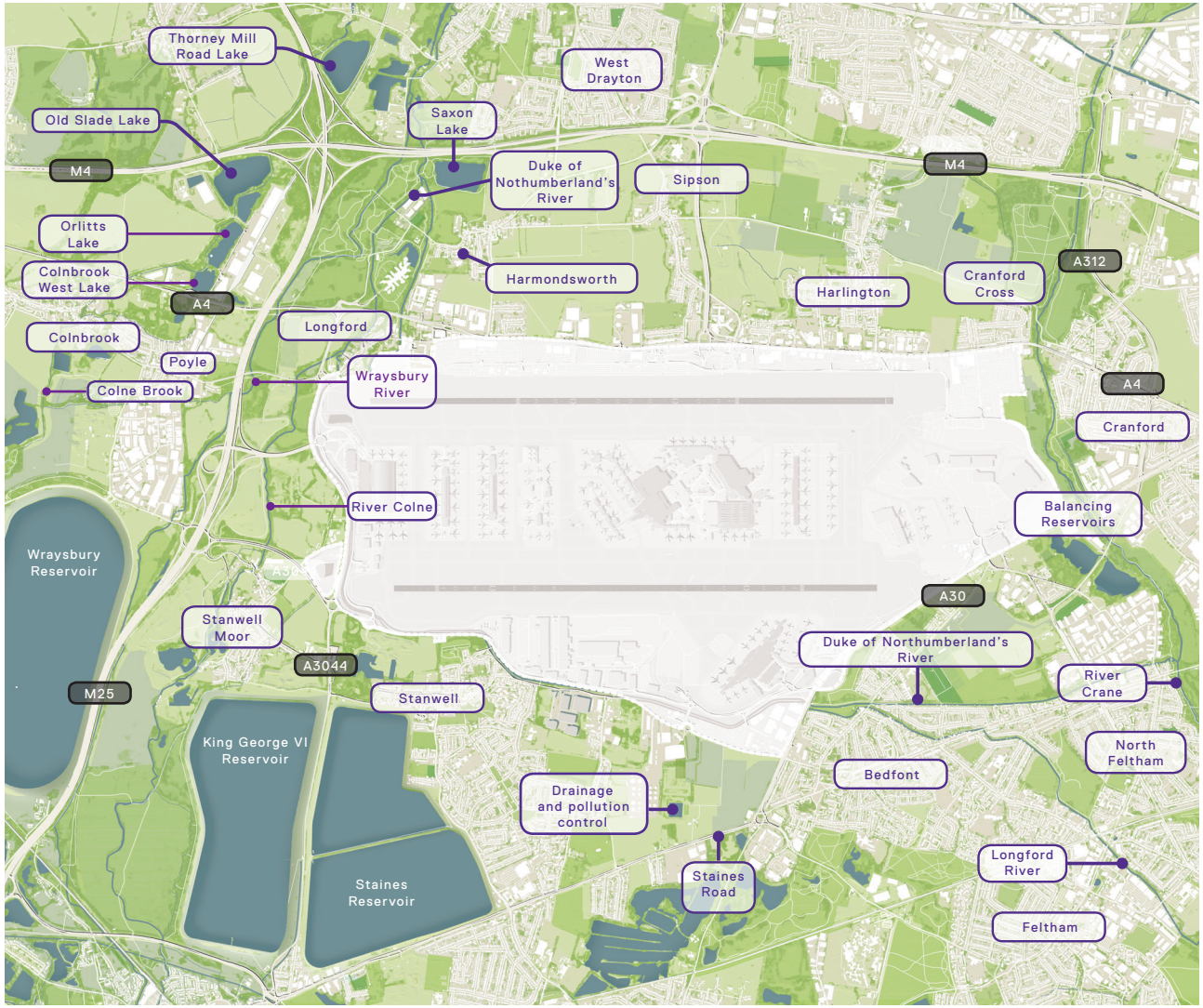


Figure 2.2.2: Around the airport

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Influences

3

3.0 Influences

3.1 Introduction

3.1.1 This chapter provides an overview of the key influences that have informed the development of the Preferred Masterplan.

3.2 Airports National Policy Statement

3.2.1 The Preferred Masterplan has been informed by the ANPS. This establishes the principle of expansion, prescribes certain aspects of the design and capacity of the Project and sets out policy criteria and targets for surface access and environmental matters that the Project must meet.

3.2.2 Paragraph 1.15 of the ANPS states that the Northwest Runway should be at least 3,500m in length and the scheme should enable at least 260,000 additional air transport movements per annum. It specifically requires the applicant to secure the upgrading or enhancing of road, rail or other transport networks or services which are physically required to enable the Northwest Runway to operate (ANPS paragraph 5.19). It also requires the re-provision of some displaced facilities, such as the existing Immigration Removal Centres, as part of the proposals (Section 5 of the ANPS) and includes policy requirements for a broad range of environmental aspects associated with the Project, including air quality, noise, carbon emissions, water and ecological mitigation, and historic environments.

Annex A: Heathrow Northwest Runway scheme boundary map



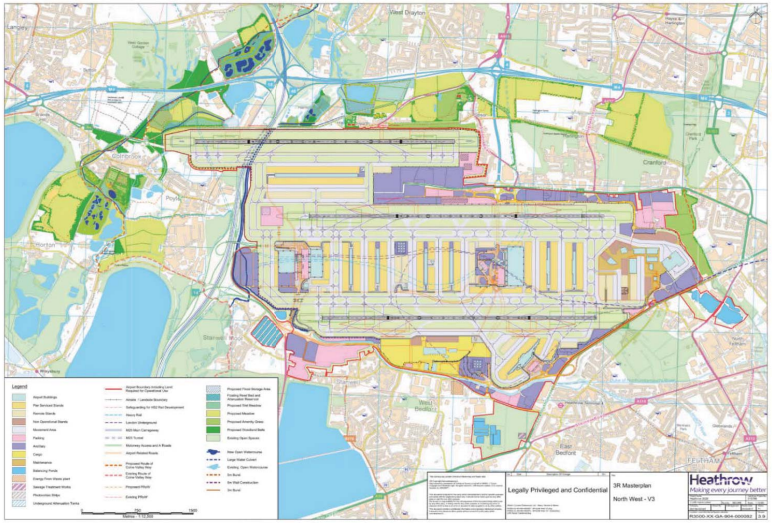
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Figure 3.2.1: Annex A - *Airports National Policy Statement* document

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Annex B: Illustrative Heathrow Northwest Runway scheme masterplan



NB: This map is for illustrative purposes and is a masterplan of the Heathrow Northwest Runway scheme as submitted by Heathrow Airport to the Airports Commission. It should not be considered as a detailed site plan; the full detail and design of the scheme will be considered as part of Heathrow Airport's development consent application.

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Figure 3.2.2: Annex B - *Airports National Policy Statement* document

3.2.3 The ANPS applies to schemes at Heathrow in the area shown illustratively within the boundary map in Annex A reproduced in Figure 3.1.1 (see ANPS paragraph 4.3). It is made clear, however, with reference to the illustrative layout drawings in Annex B reproduced in Figure 3.1.2, that this does not limit variations resulting in the final scheme for which development consent is sought (see ANPS paragraph 4.11).

3.2.4 As later sections of this document explain, careful consideration has been given to the requirements set out in the ANPS in our proposals, which have guided the composition and layout of the Preferred Masterplan.

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3.3 Other Planning Policy

3.3.1 Heathrow is located predominantly within the London Borough of Hillingdon, but is in close proximity to eight other local planning authorities (LPAs): South Buckinghamshire District Council, Slough Borough Council, Royal Borough of Windsor and Maidenhead, Runnymede Borough Council, Spelthorne Borough Council, London Borough of Hounslow, London Borough of Richmond upon Thames, and London Borough of Ealing (see Figure 3.3.1).

3.3.2 Boroughs within London have their local planning policies supplemented by London-wide policies, with the main policy document being *The London Plan 2016*. Heathrow and the immediate vicinity have been identified in this plan as an Opportunity Area (OA), defined as previously developed (brownfield) land "with significant capacity to accommodate new housing, commercial and other development linked to existing or potential improvements to public transport accessibility". OAs are intended to be London's main growth areas.

3.3.3 The London Plan is under review, with the draft London Plan (2017) proposing 13,000 new homes and 11,000 new jobs in the OA in the event that the new runway goes ahead. The new plan also indicates that the targets for homes and jobs would be reviewed if expansion of the airport proceeds.

3.3.4 Each local authority produces a Local Plan which is represented on maps commonly known as 'policies maps', highlighting the current and emerging planning constraints in the local area. In the Heathrow context, these maps show that a great deal of land near the airport – which is not currently developed – is designated as Metropolitan Green Belt, or has environmental, housing development or employment designations (refer to Appendices A and B of this document).

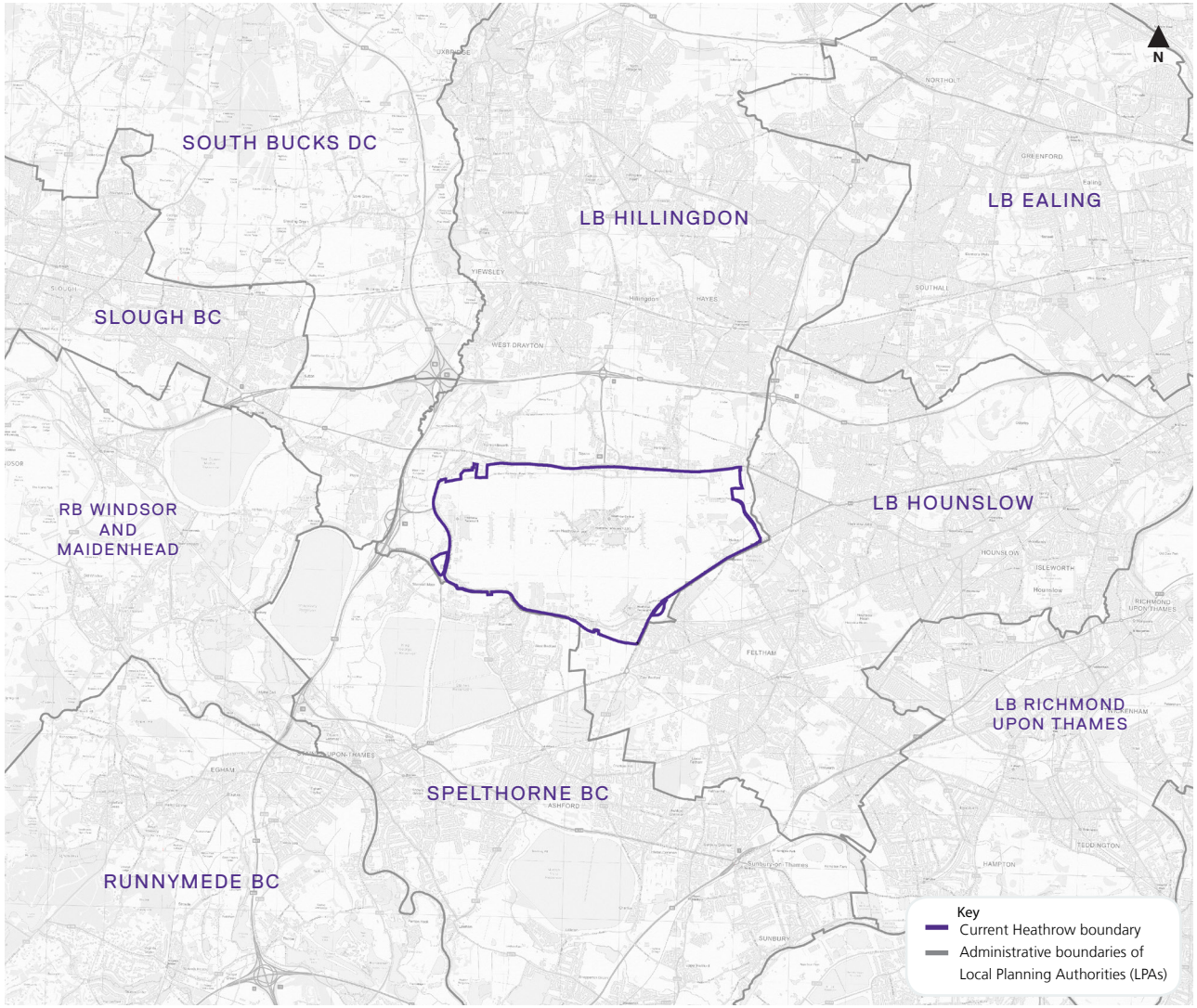


Figure 3.3.1: Administrative boundaries of Local Planning Authorities

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3.3.5 However, these Local Plans, together with the London Plan, do not set policy for nationally significant infrastructure such as a new runway. While local policy designations will continue to be important, the principal policies relating to any new runway at Heathrow will be those set out in the Government's ANPS, and Local Plans may need to be updated to reflect national policy and respond to the Project.

3.3.6 Local Plans show extensive areas of Green Belt around Heathrow and the presence of the Colne Valley Regional Park west of Heathrow. The Green Belt is fragmented by development and by road and rail infrastructure and often does not accord with a received notion of 'countryside'. Nevertheless, it remains largely open land free from development, and is not untypical for the inner edge of the Metropolitan Green Belt. The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. Development in the Green Belt is normally considered inappropriate and policy requires 'very special circumstances' to be demonstrated to justify development.

3.3.7 In view of the potential implications for the Green Belt we are undertaking a study to look at the form and function of the Green Belt around Heathrow and consider the extent to which the land which may be affected by the Project currently fulfils the purposes of Green Belt as set out in national policy. This study has fed into the development of the Preferred Masterplan.

3.3.8 We will seek to identify opportunities to use new landscaping and environmental mitigation measures to help manage and mitigate impacts on the Green Belt. We will also refine our analysis of impacts on the Green Belt as we develop the Project in greater detail and in response to consultation feedback.

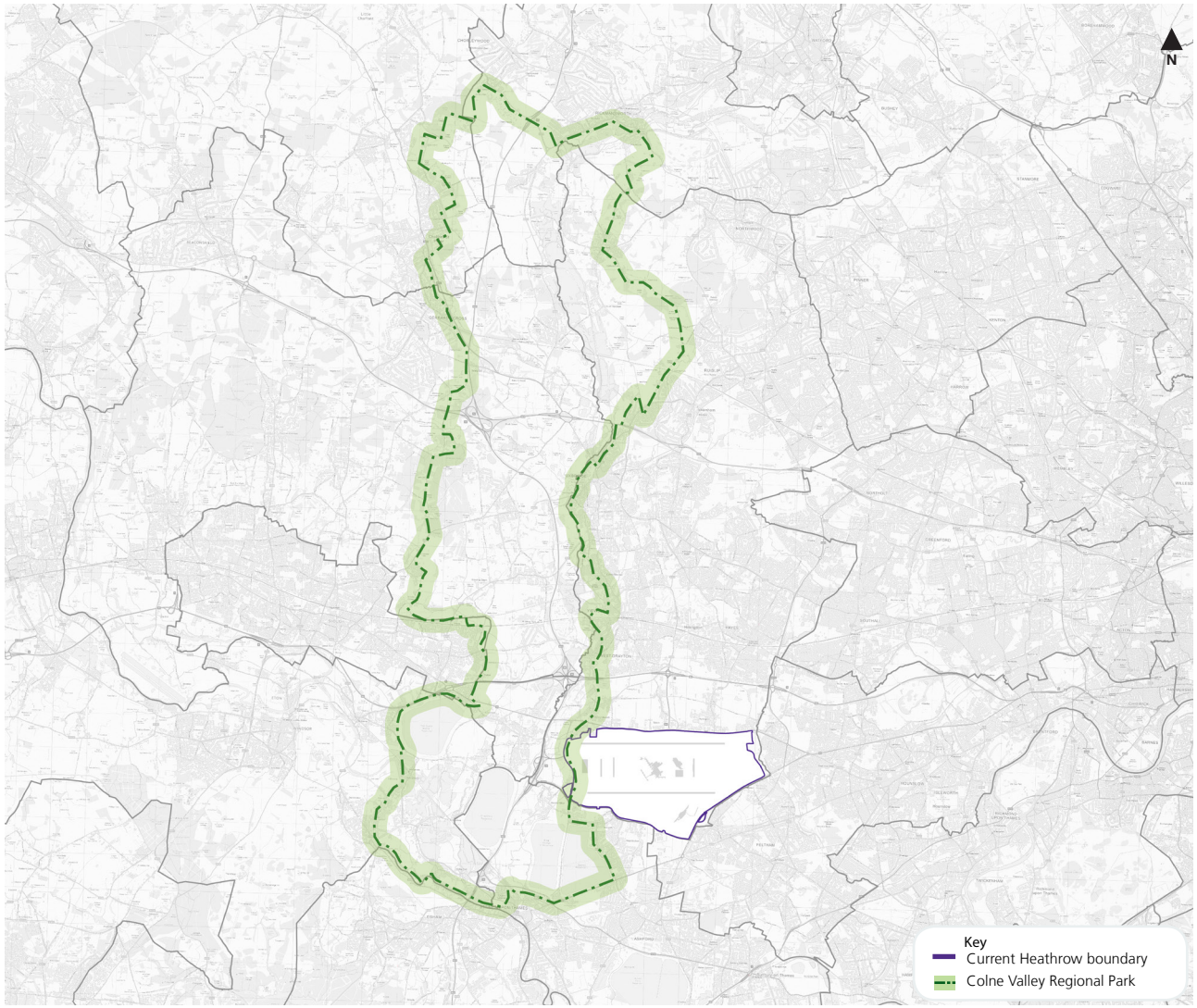


Figure 3.3.2: Colne Valley Regional Park

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3.3.9 Our DCO application will set out our reasoning and justification of the 'very special circumstances' required to justify development in the Green Belt.

3.3.10 Local authorities in close proximity to the airport may need to review their Local Plan policies, including Metropolitan Green Belt policies (recognising that any changes will need to demonstrate that exceptional circumstances have been considered), to meet their own population and housing growth requirements.

3.3.11 Sections of Metropolitan Green Belt land surrounding Heathrow have also been designated as Nature Conservation Sites of Metropolitan or Borough Importance, Linear Parks, Sites of Special Scientific Interest (SSSIs), Special Protection Areas and Ramsar Sites. Additionally, there are areas of flood plain associated with the Rivers Colne and Crane, and certain villages and settlements close to the airport are designated as Conservation Areas and accommodate a number of listed buildings and other heritage assets.

3.3.12 To enable more collaborative and consistent planning for the benefits and impacts Heathrow brings to the sub-region, a number of local authorities, county councils and Local Enterprise Partnerships have formed the Heathrow Strategic Planning Group (HSPG). The group has agreed a number of shared goals, aimed at helping to secure high quality and sustainable development. We are engaging constructively with HSPG on our emerging plans for expansion, notwithstanding the different positions some members may have on a third runway.

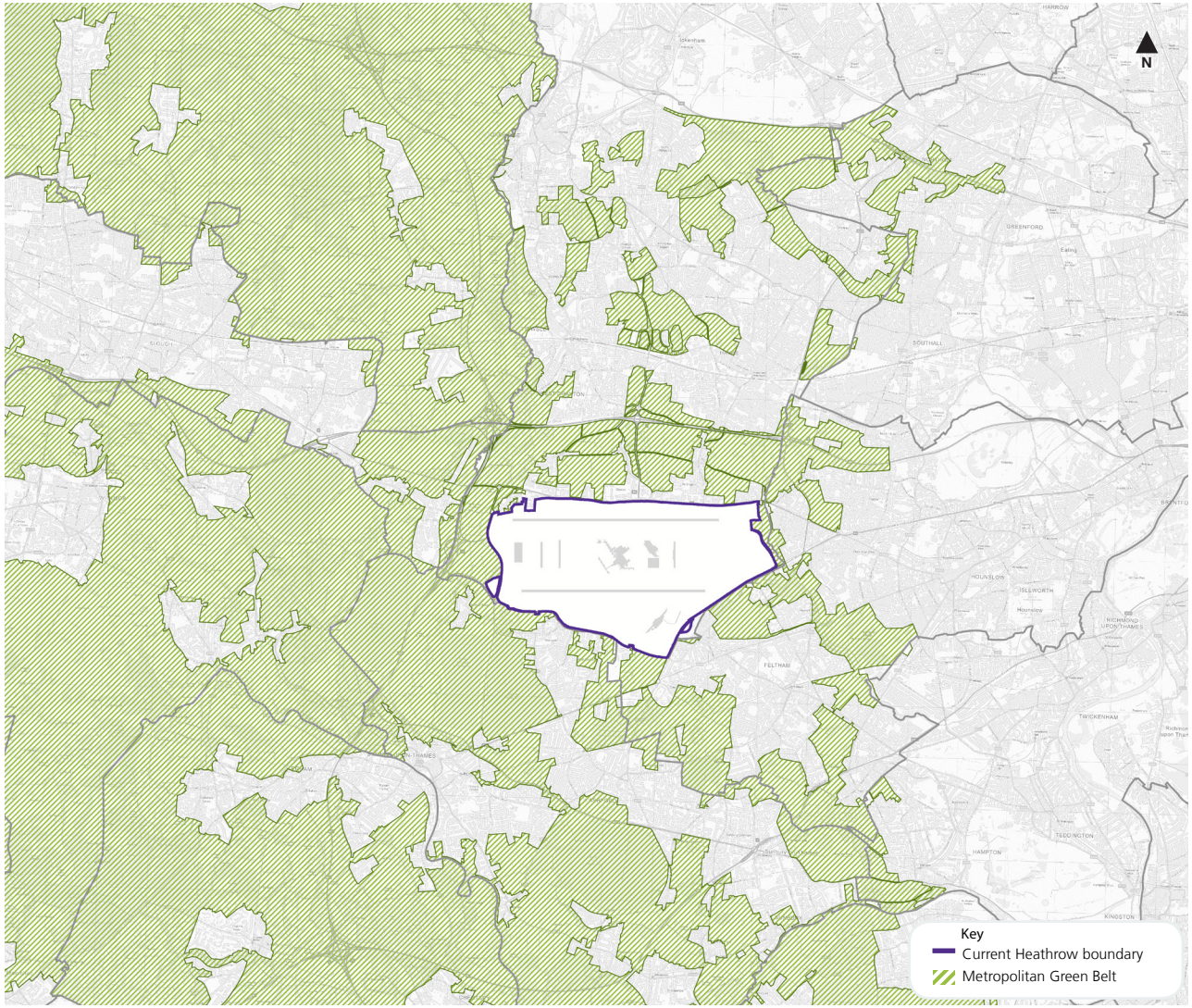


Figure 3.3.3: Existing Green Belt

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Figure 3.4.1: Heathrow 2.0 document

3.4 Heathrow 2.0: Our plan for sustainable growth

3.4.1 The Preferred Masterplan has been prepared within the context of Heathrow's strategy for sustainable growth: Heathrow 2.0. This strategy sets out a series of goals that will guide the future of Heathrow as an expanded airport, and will also guide us in the years leading up to opening a new northwest runway. It is based upon four pillars:

- A Great Place to Work is about helping our people fulfil their potential;
- A Great Place to Live is about working better with our neighbours to improve their quality of life;
- A Thriving Sustainable Economy focuses on creating opportunities for business (including SMEs and sustainable business) to deliver a stronger future for the UK; and,
- A World Worth Travelling is all about working with our industry and regulator to deliver fair and sustainable air travel for future generations to enjoy.

3.4.2 Heathrow 2.0 is also a robust and realistic plan for attempting to decouple aviation growth from climate change at Heathrow and delivering our aspiration to make growth from our new runway carbon neutral.

3.4.3 More detail on all of these ambitions can be found in the document *Heathrow 2.0: Our plan for sustainable growt*h. This document is available at heathrowconsultation.com.

3.5 Relationship with Other Projects

3.5.1 Where appropriate, the Preferred Masterplan has been prepared to take account of other projects that we are aware may be taking place before or on similar time scales to the Project.

Airspace Change

3.5.2 Any changes to the design of the airspace around Heathrow (i.e. flight paths) cannot be consented under the DCO. Required changes to airspace design resulting from the Project will be consented via submission, by Heathrow, of an Airspace Change Proposal to the Civil Aviation Authority (CAA) in accordance with the Airspace Change Process (ACP). Airspace changes therefore do not form part of the proposals for which Development Consent is sought and consequently are not described in this document.

Western and Southern Rail

3.5.3 Network Rail is promoting the Western Rail Link (or Heathrow Rail Link) project independently from Heathrow's proposals for a third runway. Proposals for a Western Rail Link would be subject to a standalone DCO, separate from Heathrow's DCO.

3.5.4 Heathrow's plans for expansion have been designed to be compatible with, although independent from, a future Western Rail Link.

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3.5.5 A decision has yet to be made on whether proposals for a Southern Rail Link are to proceed. When it does proceed it would be subject to a standalone DCO. Similar to the approach taken in relation to the proposed Western Rail Link, Heathrow's plans for expansion have been designed to be compatible with, although independent of, a potential future Southern Rail Link.

Southampton to London Pipeline Project

3.5.7 Esso is promoting a DCO application to replace 90km of its 105km underground aviation pipeline that runs from the Fawley Refinery near Southampton to its West London terminal facility to the south of the airport, west of Mayfield Farm. We will work with the promoter of that project on any potential interfaces.

3.6 Consultation and Engagement

3.6.1 We are committed to delivering the expansion of the airport responsibly through open and transparent consultation. Listening to our communities has been, and will continue to be, a critical part of developing our plans and helps us to deliver on our commitments in a fair and transparent way.

3.6.2 Our Airspace Principles Consultation and our Airport Expansion Consultation One took place between January and March 2018 and presented options for the design principles to guide how we design our future airspace, options for physical elements required for the expansion of the airport, and approaches on key areas such as noise, air quality and carbon.

3.6.3 Our Airspace and Future Operations Consultation took place between January and March 2019. It sought feedback on local factors we should be aware of when designing future airspace for an expanded Heathrow and changes to our current runways, as well as options for future operations in areas such as night flights, runway alternation, and directional preference.

3.6.4 Feedback given during these consultations has helped us shape our proposals and improve our plans. Please refer to the *Consultation One Consultation Feedback Report* and *Future Operations Consultation Feedback Report* to find out more on how consultation feedback from Airport Expansion Consultation One and the Future Operations elements of our January 2019 Consultation has shaped our expansion proposals.

3.6.5 In addition to these consultations, a wide variety of targeted engagements have helped to inform the development of the Preferred Masterplan. These include a series of community design workshops with local communities close to the airport. At these workshops a mixed media approach using animations, display boards, postcards and a digital platform was used to develop a clearer understanding of the views of the local communities on the changes in their areas, and how we can address local issues.

3.6.6 The Heathrow Strategic Planning Group (HSPG) was established as a forum for local planning authorities to establish shared goals aimed at helping to secure high quality and sustainable development. Alongside the HSPG, there is a regular programme of engagement with individual local authorities and key stakeholders. Key stakeholders include, Highways England, Transport for London, Historic England, Natural England and the Environment Agency. Heathrow has also established working groups and regular engagement with the emergency services and appropriate Control Authorities and security agencies.

3.6.7 We have also actively engaged with the Heathrow Community Engagement Board (HCEB). The HCEB was set up to increase community and stakeholder participation in Heathrow's planning and decision-making processes.

3.6.8 As part of our current statutory Airport Expansion Consultation, we are seeking feedback on a range of areas including:

- The Preferred Masterplan for an expanded airport – the proposed physical layout for our future airport, including the new runway, which is described in this document;
- Our proposals for construction (please refer to the *Construction Proposals* document to find out more on this topic);

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- How we propose to operate our future airport, including runway operations, surface access, and proposals for additional flights to be introduced before the new runway is operational (please refer to the *Future Runway Operations, Early Growth* and *Surface Access Proposals* documents to find out more on these topics); and,

- Compensation and mitigation – how we propose to mitigate the impacts of our growth, including compensation, noise insulation and other measures to manage these effects (please refer to the *Proposals for Mitigation and Compensation* document to find out more on this topic).

3.6.9 This consultation will be an opportunity for local communities and the general public to have their say on these important topics and help shape our final application for our Development Consent Order, which we plan to submit in 2020.

3.6.10 Expansion is an important opportunity to build a long-term, sustainable legacy for our local communities. This consultation is a key milestone in the delivery of this critical national infrastructure project.

3.7 Strategic Brief

3.7.1 The development of the Preferred Masterplan has been guided by the requirements and direction of a number of major influences, including those contained in *Heathrow's Strategic Brief* document.

3.7.2 The Strategic Brief for Heathrow sets out the high-level aspirations for Heathrow's future as we develop future business plans and transition to become a three-runway airport. It acts as Heathrow's brief to colleagues and stakeholders on the nature and aspirations of the airport we wish to construct and operate, in order to realise our vision of giving passengers the best airport service in the world. It considers the requirements for an expanded Heathrow through the eyes of our five stakeholder groups: passengers, investors, airlines, colleagues and UK communities and environment.

3.7.3 The Strategic Brief sets the strategic direction for the programme, including operational aspects. It articulates the guiding principles for the programme: safe and secure, simple, affordable and financeable, adaptable, predictable, sustainable, connected and distinctive. These principles are considered in turn for the key operational functions of airfield and airspace, terminals, baggage, cargo, surface access, commercial and the 'Heathrow ecosystem', comprising Local Authorities, the supply chain, revenue generators and commercial partners.

3.7.4 These influences have helped to shape three main factors; demand forecasts, operational requirements and commercial imperatives.

3.7.5 More detail on all of these ambitions can be found in the Strategic Brief document. This document is available at heathrowconsultation.com.

3.7.6 The Preferred Masterplan is closely integrated with our operational proposals described in the *Future Runway Operations* document.



Figure 3.7.1: Strategic Brief document

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Towards Our Proposal



4

4 Towards Our Proposal

4.1 Introduction

4.1.1 As well as the influences documented in Chapter 3 there are a number of other inputs which are detailed in this chapter. A series of strategies and plans have been developed throughout the design process to date, aimed at guiding the development of key aspects of the Preferred Masterplan. These are summarised in Sections 4.5 - 4.9.

4.1.2 The four main stages of the Masterplan design process are summarised as follows:

Stage 1 – Strategic Definition: the purpose of this stage was to set the objectives for the Project and define the key inputs into the process. An example of these inputs is the Strategic Brief, which is described in Section 3.7. This stage has been completed.

Stage 2 – Component Options Development: the Masterplan is a complex interrelationship of operational and non-operational components. Some of these components are key to defining the shape of the Masterplan and the associated land requirement. The key components have been through a design development process which involved: creating a longlist of all options to be considered, ensuring that all aspects of the design have been explored; reducing the number of options under consideration by applying discontinuation rules which remove options that do not meet the requirements; and evaluating the remaining options. This stage of the process has been completed and the component options that were developed were consulted on in our Airport Expansion Consultation One. Our evaluation process took into account a range of considerations to ensure that properly informed and balanced judgements were reached in selecting our preferred masterplan. Evaluation criteria comprised Operations and Service, Delivery, Business Case, Sustainability, Community, Planning and Property.

Stage 3 – Masterplan Assembly: in this stage, preferred options from the key components were combined to create frameworks for a range of Masterplan options. The Masterplan options were continually improved and added to as design development progressed for other components. The resulting Masterplan options went through a similar process to that in the Component. Options Development stage, in that the list of options was reduced by applying discontinuation rules and the remaining options were evaluated. The Preferred Masterplan was selected at the end of this stage and we are now consulting on it.

Stage 4 – Masterplan Finalisation: in this stage, the Preferred Masterplan will be developed further, supported by further stakeholder engagement and the feedback from this Airport Expansion Consultation (June 2019). This stage will conclude with the submission of the DCO application.

4.1.3 Please refer to the *Updated Scheme Development Report* for more information on our design process (see Figure 4.1.1).

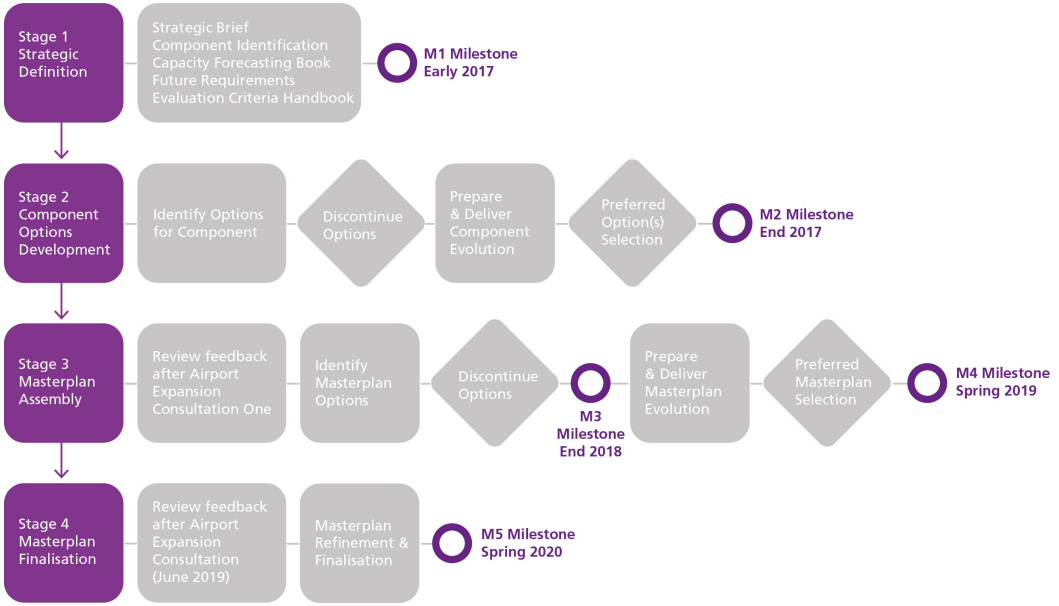


Figure 4.1.1: Masterplan scheme development process overview

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4.2 Demand Forecasts

4.2.1 Forecast demand has been driven by both the ANPS and Department for Transport (DfT) traffic forecasts. The ANPS sets out that the preferred scheme must accommodate additional demand of at least 260,000 air transport movements (ATMs) per annum. This would increase Heathrow's capacity from 480,000 ATMs per annum today to at least 740,000 ATMs per annum in future.

4.2.2 The DfT traffic forecasts of 2017 set out the following upper demands, expressed in millions of passengers per annum (mppa) of:

- 130mppa, 741k ATMs pa in 2030;
- 136mppa, 751k ATMs pa in 2040; and,
- 142mppa, 756k ATMs pa in 2050.

4.2.3 The Preferred Masterplan currently anticipates that a third runway will be open at the end of 2026. As a result, traffic build-up in the early years will be slightly behind the 2017 DfT traffic demand forecasts but will then converge with the DfT forecasts in later years. The traffic forecast profile for the Preferred Masterplan contains the following demand:

- 115mppa, 665k ATMs pa in 2030 (assumes a third runway opening end 2026);
- 130mppa, 740k ATMs pa in 2035;
- 135mppa, 750k ATMs pa in 2040; and,
- 142mppa, 756k ATMs pa in 2050.

4.2.4 Recognising that it is difficult to forecast the precise profile of traffic into the future, we are proposing a Framework for Environmentally Managed Growth that will control the effects of growth rather than specific passenger or ATM numbers. For more information, please see our *Environmentally Managed Growth* document.

4.2.5 The new runway will allow cargo volumes to grow approximately in line with the forecasted growth of ATMs, and are anticipated to reach three million tonnes per annum by 2040.

4.2.6 The Preferred Masterplan is flexible to respond to changes in demand. Our intention is to expand the airport at appropriate times to meet growing demand, ensuring that we meet our environmental obligations at each stage. This approach helps to meet airline and passenger requirements as they develop over time.



Figure 4.2.1: DfT UK Aviation Forecasts

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4.3 Commercial Imperatives

4.3.1 Alongside other influences, the generation of the Preferred Masterplan has considered the need to deliver an expanded airport within the Government's stated expectations on affordability. There is confidence that we can expand the airport whilst keeping passenger charges close to 2016 levels in real terms – which represents significant value for money for consumers.

4.3.2 Our plans and business case assumptions have been developed in conjunction with our airline partners and local stakeholders. As part of this, an agreed set of commercial facility provision assumptions have been made in relation to Airport Supporting Development. This includes cargo, maintenance, catering and car parking as well as airport related hotels and offices, including assumptions around the business models that will be adopted (e.g. brought forward as part of the DCO or taken forward by others), and the extent to which displaced facilities will be re-provided.

4.4 Consumer Benefits

4.4.1 We have engaged with consumers to gather new insights into consumer needs and desires, to promote innovative thinking about how the Heathrow of the future could and should fulfil consumer needs and to create a great travel experience. Their insights have helped inform the development of the Preferred Masterplan, as well as the Design Strategy described in Section 4.5.

4.4.2 The Project provides an opportunity to scale up consumer engagement, offering an active voice and guaranteed consideration of consumer needs against a multitude of other priorities.

4.4.3 To date, Heathrow has completed significant amounts of consumer research, totalling over 70,000 hours and generating over 1,200 pieces of consumer insight. This has been achieved via a broad range of interactions (e.g. face-to-face interviews, focus groups, workshops, in-depth interviews and online surveys).

4.4.4 Consumer insight is integral to how Heathrow evaluates expansion opportunities, and significant effort has been made to ensure this insight is continually validated so that it accurately represents the views and needs of the consumer.

4.4.5 The Project is an ambitious and complex development. It is therefore of great importance that we ensure that visibility of consumer interest is at the forefront of our work. The process we have undertaken to date has allowed Heathrow to understand consumer benefits better, to identify where improvements can be made as well as being in a strong position to represent consumer needs and requirements against other potentially competing interests.

4.5 Design Strategy

4.5.1 The Preferred Masterplan has been developed with regard to achieving a high quality of design in the arrangement of facilities, and with a view to securing design quality in the subsequent realisation of buildings, routes and open spaces.

4.5.2 A number of mechanisms have been employed to ensure the quality of the Preferred Masterplan including regular reviews of emerging proposals by subject matter experts together with the leadership of an integrated design team; the formulation of 'Design Challenges' issued to all teams responsible for the design work; and regular reviews of the emerging proposals by an independent design review panel (organised by the Design Council) and Heathrow's own Design Panel.

4.5.3 Considerations of design quality are rooted in Heathrow's vision, which is defined in the Strategic Brief: to give passengers the best airport service in the world. This vision is expanded by Heathrow's plan for sustainable growth, Heathrow 2.0, which identifies four strategies under the headlines:

- A great place to work;
- A great place to live;
- A thriving sustainable economy; and,
- A world worth travelling.

4.5.4 In order to ensure that Heathrow's vision and sustainable growth strategies are embedded in the design of the expanded airport, recognising the unusually wide range of design encompassed by the proposals, a strategy was developed that utilised a series of 'Design Challenges'. These challenges were established to guide all designers across the Expansion Programme, ensure adherence to Heathrow's vision and strategies, and ensure that the resultant design proposals are exemplary.

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4.5.5 Seven Design Challenges were identified:

Responsible – Heathrow and its designers will be responsible for delivering sustainable growth in support of a thriving airport business that is affordable, safe and inclusive; and is considerate of the needs of surrounding communities.

Human Centred – Heathrow and its designers will focus on enriching the experience for the diverse user groups that use or interact with the airport and the surrounding related development.

Belonging – Heathrow and its designers will create distinctive places and experiences that respond to their specific location and purpose, bringing associated benefits to neighbouring communities.

Considered – Heathrow and its designers will demonstrate that a thorough process of technical and functional analysis of concepts and strategies has been undertaken, alongside careful consideration for spatial quality and elegance.

Creative – Heathrow and its designers will actively and collaboratively nurture ingenious ideas that have the potential to bring tangible economic, social and environmental benefits to the Project and lead to exemplary design.

Smart – Heathrow and its designers will foster a culture of pragmatic future thinking. Always on the search for smart ways of working and timely opportunities to introduce future technologies and innovation to positively influence a thriving business and the design outcome.

Enduring – Heathrow and its designers will leave a legacy of resilient, flexible and adaptable buildings and infrastructure that will influence the aviation industry and how major infrastructure projects are delivered.

4.5.6 The Design Challenges have been used as guidance by all design teams in the development of the proposals for the expanded airport, at reviews by our independent design review panel (the Design Council) and, at senior level, by Heathrow's own Design Panel.

4.5.7 The Masterplan design strategy is explained in more detail in Chapters 5 to 7 of this document. The Preferred Masterplan integrates landscape, sustainability, surface access, land use, operational (refer to *Future Runway Operations* document) as well as the Design Challenges described above, in order to ensure a high quality and balanced development.

4.5.8 The Design Challenges will continue to be employed in the development of further detail in the proposed scheme, and through the implementation of this design in construction and operation.

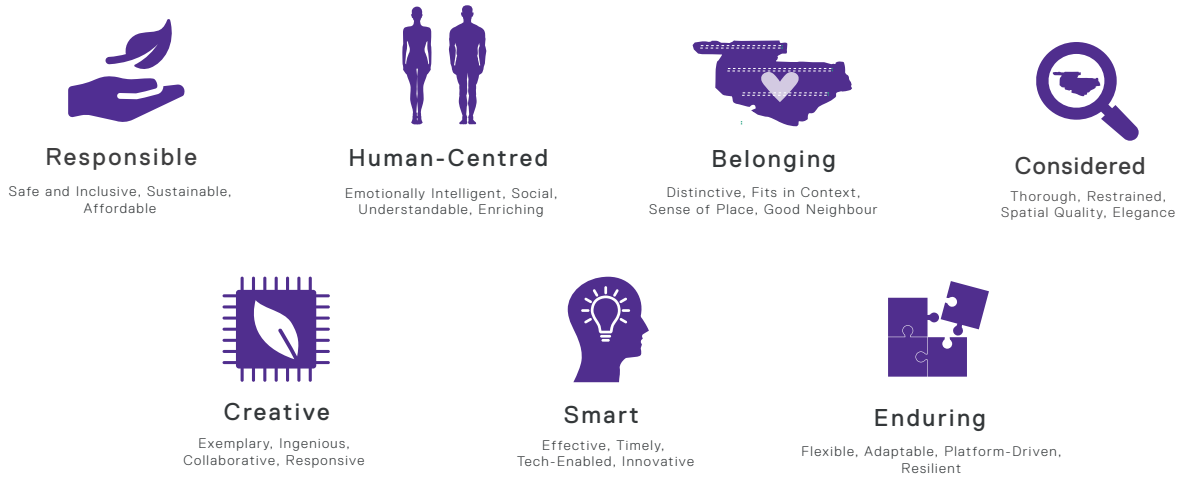


Figure 4.5.1: Design Challenges

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4.6 Approach to Sustainable Design

4.6.1 The design of the Preferred Masterplan responds to the Design Strategy, and Heathrow's plan for sustainable growth, Heathrow 2.0. The expansion of Heathrow Airport has the potential to be an exemplar of sustainable thinking in the built environment. The design team have responded by identifying a number of 'sustainability challenges', focusing on areas that have maximum influence on the design of the physical infrastructure associated with the expansion of the airport. These challenges are:

- Challenge 1 – Towards achieving zero carbon;
- Challenge 2 – Limiting the construction impact;
- Challenge 3 – Ensure Heathrow is resilient to potential impact of extreme climate events;
- Challenge 4 – Driving operational resource efficiency; and,
- Challenge 5 – Designing for the safety and wellbeing for colleagues, passengers and other users.

4.6.2 These challenges have helped shape elements of the Preferred Masterplan, as described below:

Terminal Buildings and Transport Interchanges

4.6.3 Concepts for Heathrow's next generation of terminal buildings and transport interchanges have been developed to optimise material and energy efficiency as well as to create a unique airport experience for passengers, colleagues and communities. Environmental design principles include naturally daylit spaces and an innovative low energy approach to heating and cooling; extensive planting inside the building will support user health and wellbeing. A component-based architectural system is being developed to maximise off-site manufacture, minimise embodied carbon and utilise the expansion innovation hubs located around the UK. In this way the new built infrastructure will embrace principles of 'the circular economy', including design for disassembly and re-use components. These concepts have informed the scale and location of new terminal and Public Transport Interchange (PTI) infrastructure within the Preferred Masterplan.

Airfield

4.6.4 There is a team working with BRE (a leading building science centre) to investigate and develop low-carbon concrete solutions for airfield pavements, as well as measures to reduce volumes of material required, leading to lower whole-life environmental impacts. The Preferred Masterplan includes a number of innovative approaches that reduce the amount of infrastructure required; examples include the M25 and Covered River Corridor crossings where we are reducing the length of tunnels by delivering bridge type solutions. Other areas include challenging loading requirements on sub-structures and underground services to deliver more efficient solutions. These will lead to reduced embedded carbon and lower carbon emissions through the life of the assets.

Land Use

4.6.5 The focus of the land use strategy is to minimise land take and use of resources by maximising the density of developments where appropriate – for example, by planning for new cargo building typologies with automation systems to stack uses and reduce building footprints. The land use strategy has also sought to locate proposed developments as close as possible to public transport hubs to reduce the need to travel by car and for parking facilities. Overall, the amount of land required for expansion has been minimised as far as is practicable.

Landscape

4.6.6 The Landscape Strategy is described in more detail in Section 4.7. It includes concepts for using landscape in a 'multi-functional' way to help improve amenity, active travel, biodiversity, wildlife habitats and carbon sequestration. The proposals will seek to restore and enhance ecological services and functions, resulting in a net biodiversity gain. The Preferred Masterplan has been developed to allow space within which landscape design can be developed to achieve these outcomes.

Parkways

4.6.7 Parking structures integrate photovoltaic panels as part of Heathrow's strategy to maximise renewable energy generation onsite. The car park structures are being designed to safeguard for future trends by allowing for a 100% uptake in electric vehicles, while being designed to be adaptable to emerging autonomous parking systems and operation. The construction strategy uses framing systems that utilise offsite techniques to minimise construction impact and duration, together with selecting materials that offer minimum embedded carbon, as well as the most potential for easy dismantling, reuse and recycling at the end of the structure's lifespan.

Water

4.6.8 Initiatives for rivers include ensuring fish migration is possible along the complete length of river diversions, reuse of existing river substrate in diverted rivers, use of soft engineering materials for erosion protection in preference to hard engineering measures and an aim to improve the water environment where possible.

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4.6.9 Provisions for airfield drainage and pollution control will utilise new vertical flow Aerated Reed Beds, a more efficient treatment method requiring a smaller footprint. Rainwater harvesting and greywater recycling infrastructure is proposed to be fitted to existing and proposed terminal buildings. A more extensive airfield-wide non-potable water strategy will be implemented to reduce Heathrow's overall potable water usage.

Energy and Utilities

4.6.10 A site-wide energy strategy has been developed and incorporated in the Preferred Masterplan, considering the generation, storage and efficient utilisation of energy throughout the expanded airport. The approach harnesses the network of buildings and infrastructure, and includes the use of inter-seasonal thermal storage facilities to collect waste heat during summer periods and reuse at other times to maximise thermal system efficiency. The use of cooling towers will be avoided to reduce water consumption. Efficient use of electricity and reduction in gas usage will lower carbon emissions. Local air quality will be improved through the reduction and eventual elimination of on-site combustion.

Surface Access Proposals

4.6.11 The Surface Access proposals are described in more detail in Section 4.9. The Preferred Masterplan incorporates improvements to existing sustainable travel links to the airport, as well as the introduction of new options. This includes increasing the number of rail, bus and coach routes available, with significant improvements to the existing public transport interchanges being delivered through the Preferred Masterplan.

4.6.12 The plan for the consolidation of parking, largely into the Northern and Southern Parkways, supports the intention of the Surface Access proposals to increase the proportion of passengers and colleagues using public transport modes. There is a strong focus in the Preferred Masterplan on providing a network of routes for active travel, encouraging walking and cycling for both leisure and commuter journeys.

4.6.13 Having established the Preferred Masterplan, these initiatives and others will be developed in more detail and will further inform the scheme to be submitted for the DCO application. Heathrow intends to build on the proposals developed in response to the five sustainability challenges and develop a strategy for sustainable design. Its aim will be to help guide the implementation of sustainability innovation towards the most efficient use of resources in the expansion of Heathrow, and in the subsequent operation of the airport. The strategy will identify approaches for all assets and infrastructure to be tested for resilience against future climate projections. This strategy will consider established sustainability frameworks to ensure the right breadth of focus, such as the UN's Sustainable Development Goals and the UK Green Building Council's framework to achieve net zero carbon buildings in both construction and operation.

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4.7 Landscape Strategy

4.7.1 The Landscape Strategy has been developed through a thorough understanding of the landscape setting of Heathrow, with extensive mapping and research, informed landscape appraisals and international benchmark studies. The Strategy also takes into account the requirements of the ANPS and national strategies such as the National Pollinator Strategy and regional strategies and such as the All London Green Grid, the Colne Valley Regional Park objectives and the ambition to make London into the first National City Park.

4.7.2 A key aim of the Landscape Strategy is to reconcile the airport development and its relationship with the local context, using this opportunity to generate positive change and influence environment. The Landscape Strategy seeks opportunities across all areas of the local context, using this opportunity to generate positive change and influence. It provides both a long-term strategy and short-term projects which incorporate strategic actions and demonstrate good design.

4.7.3 Understanding the local and regional landscape context of Heathrow has identified a number of key considerations relating to:

- Fragmentation of landscape and ecosystems in areas surrounding of Heathrow;
- Decline in the area of productive landscape in the region;
- An opportunity for improved landscape design to help provide better character, identity and positive presence for Heathrow and its neighbouring communities; and,
- An opportunity for landscape design to contribute positively towards Heathrow's aspiration to become a sustainable international hub airport.

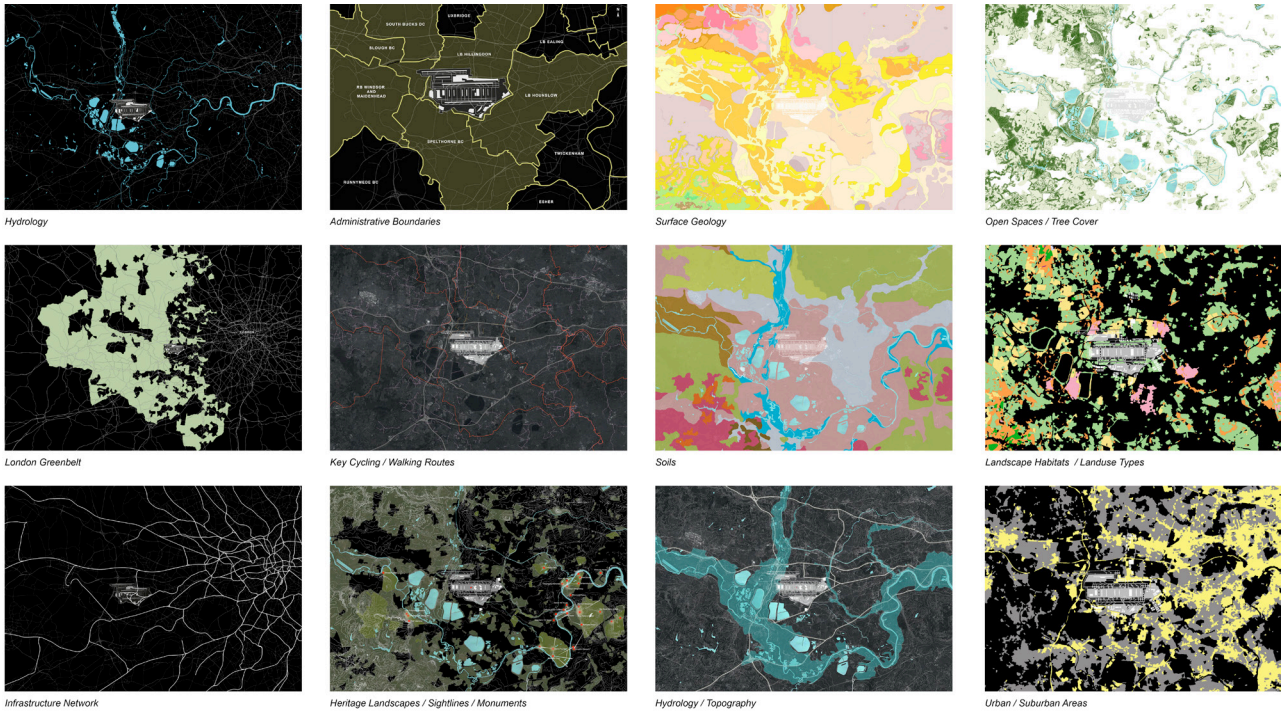


Figure 4.7.1: Examples of mapping the existing landscape context

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Landscape Strategy Core Themes

4.7.4 The Strategy encompasses three core themes:

- Smarter – seeks to optimise land-use for a more innovative, sustainable and resilient future. For Heathrow to become a sustainable hub airport with ambitious targets such as carbon neutral growth the way we design and organise the landscape will be smarter;
- Brighter – is about place making and the overall experience and appearance of the airport. For Heathrow to become more integrated with its surrounding communities and to provide a world class passenger experience that delivers a great place to live, work and travel, it will be brighter; and,
- Greener – this promotes a campaign of extensive tree planting and sustainable practice that can make the greenbelt greener. For Heathrow to generate a more robust water and green infrastructure that delivers better connected, more multifunctional green open space for wildlife and for people, it will be greener.

4.7.5 The Landscape Strategy for a smarter, brighter and greener Heathrow will mean that:

- Local communities will be actively engaged in how the effects of the Project will be mitigated and in opportunities to improve the landscape setting of their communities, with improved access to the surrounding green open spaces and attractive placemaking;
- Colleagues in and around Heathrow will be provided with innovative and healthy work environments with increased opportunities to travel by bicycle and on foot, benefitting from place-making which creates new focal areas for meeting and entertainment; and,
- Passengers will experience a new generation of airport with increased comfort, clarity of organisation and gateway experiences.



Figure 4.7.2: Illustrative visualisation of the Preferred Masterplan

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Landscape Strategy Layers

4.7.6 The Landscape Strategy is structured across the Masterplan in an interconnected set of landscape layers.

4.7.7 Multifunctional Green Loop and Public Open Spaces – A series of green open spaces will anchor Heathrow into its wider landscape context. The open spaces provide landscape buffers in between existing settlements and expanding Airport Supporting Developments. The open spaces are connected by a Green Loop that encircles Heathrow Airport and connects to the wider regional network of pathways.

4.7.8 Landmarks and gateways – Heathrow Airport is connected by major infrastructure corridors which, together with parkways and transit hubs, provide travellers with a successional journey of arrival, culminating in the T5 and T2 areas expressed as iconic Gateways on the threshold of land and air. The arrival/departure travel gateway connects the airport with its wider context. A series of landmarks, such as the M25 portal below the third runway, will punctuate the landscape. Together with existing landmarks such as the Heathrow control tower and historic church spires, this will create a visual network across the wider landscape.

4.7.9 Water and green infrastructure – Heathrow is sandwiched between the natural floodplain landscapes of the Colne Valley to the west and Crane Valley to the east. These floodplain landscapes form important ecological corridors composed of woodland, meadows, wetlands and watercourses connected with the wider regional landscape linking the Chilterns with the River Thames. The combination of proposals for land-reclamation of former landfill, high-quality environmental mitigation, increased tree planting, compensatory flood storage areas and improved accessibility to the countryside will create a legacy of enhanced, more coherent, better connected and more resilient blue and green infrastructure.

4.7.10 Boundary and perimeter – The airport boundary and perimeter will be carefully designed in response to its surrounding context and improve the overall experience and appearance of the airport while ensuring Heathrow's security. Further description can be found within Section 7.10.

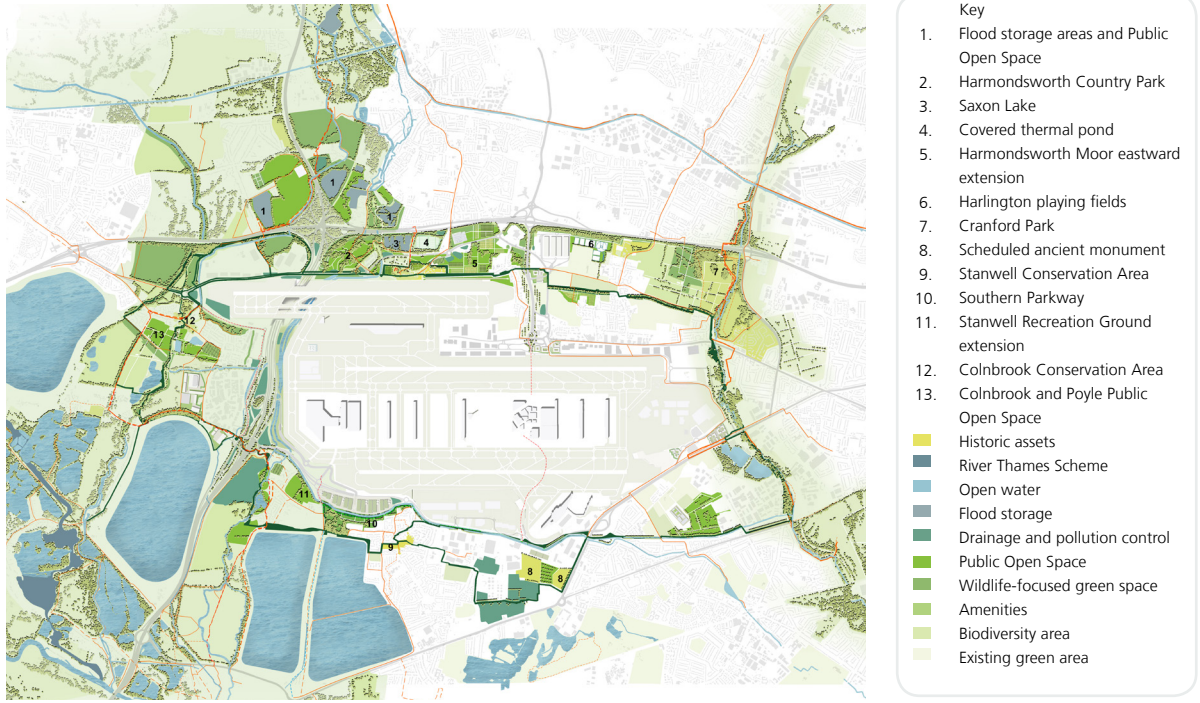


Figure 4.7.3: Illustrative landscape strategy plan

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Landscape Focus Areas

4.7.11 The Landscape Strategy identifies a series of overlapping focus study areas through which to carry out more in-depth study, design and coordination in the next design phases.

- Colne Valley Regional Park South will be strengthened as a Regional Park set in a dynamic floodplain landscape to become an important part of the legacy of the Project. Our approach will be one of collaboration with stakeholders such as Colne Valley Park Community Interest Company.
- Harmondsworth Country Park will create a new large-scale public landscape for cultivation, growth, health and wellbeing. Our approach will look for brighter ways to engage with communities in the long term, for example by engaging with a charitable trust that could ensure long term sustainable management strategies and a sense of local ownership through programmes for involvement.
- The Heathrow Southern Gateway will choreograph a fascinating journey of arrival and departure and complement the new terminal expansion with a unique landscape setting. Our approach here will be one of coordinated infrastructure landscapes and mitigation that offers quality green open space and improved connectivity to a wider range of open spaces, for example by coordinating and connecting with the Environment Agency River Thames Scheme.
- Hatton Cross Quarter will establish a connected landscape between Heathrow, the wider communities and the key recreational spaces while developing new models of sustainable urban development. Our approach is based on the renewal of sites along the southeastern boundary of the airport for smarter, brighter, greener examples of how ASD can be implemented.
- Crane Valley will seek to offer enhancements along the west London's 'wild river' and to heritage assets such as Cranford Park. Our approach will be to align the Landscape Strategy in collaboration with stakeholders such as Friends of the River Crane, and with other established local and regional strategies such as the All London Green Grid (ALGG), to find the best ways to invest in Heathrow's surrounding environments. The Landscape Strategy acknowledges existing connections such as the London Loop and Feltham Loop Walk.

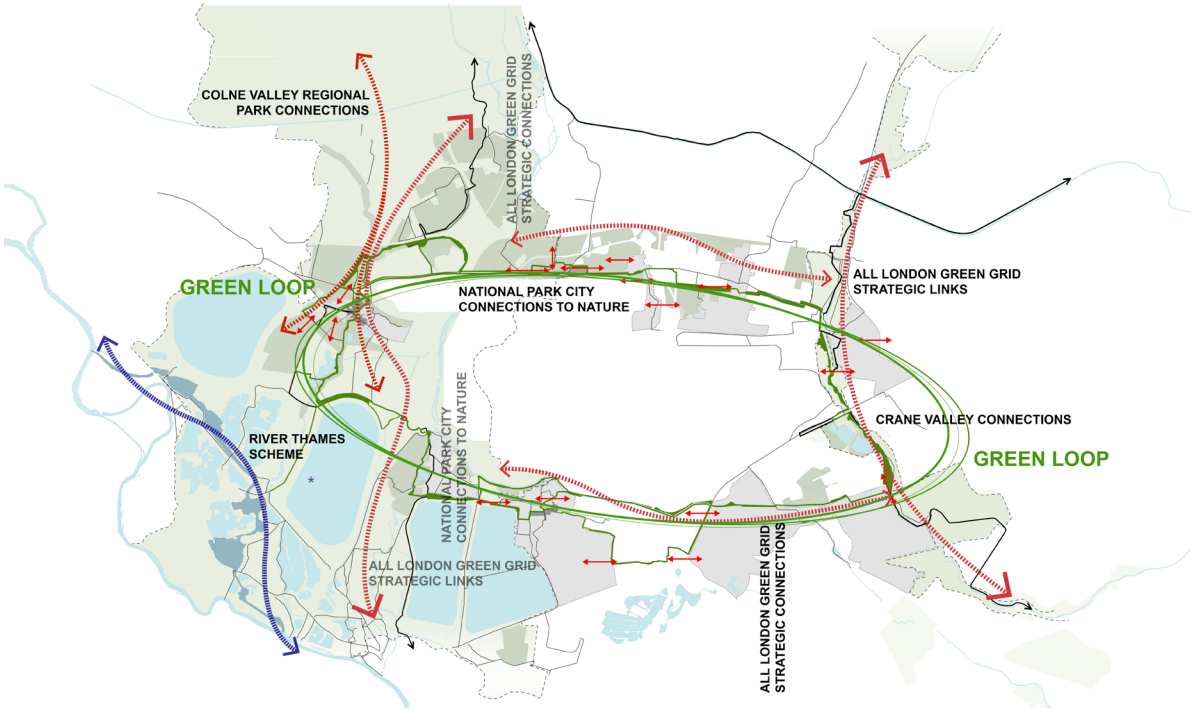


Figure 4.7.4: Links to regional strategies

* The Environment Agency plans for a flood alleviation scheme in the Thames south of Heathrow are well known to us. We are discussing how our landscape plans can be integrated with theirs to enhance connectivity and overall benefit of the two neighbouring schemes.

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Strategic Pilot Projects

4.7.12 A series of strategic pilot projects have been identified to illustrate the overall vision of creating a smarter, brighter, greener Heathrow which exemplify the overall Landscape Strategy. Each pilot project acts as a catalyst and stimulates the collaboration and co-creation of the landscape between various disciplines and stakeholders. The Pilot Projects are broad ranging and include strategic projects such as:

- The Green Loop – a pedestrian and cycle network encompassing Heathrow which makes connections to the wider regional pedestrian and cycle networks, links communities and provides access to Heathrow itself;
- Harmondsworth Great Barn and Community Gardens – looks to enhance the setting of the Great Barn, providing a new community hub;
- The Poynings – an excellent example of multifunctional green infrastructure offering flood storage, informal recreational space as well as the opportunity for community spaces, biodiversity offsetting through habitat creation and the enhancement of existing watercourses;
- Carbon Sink Meadow – trials for the potential transformation of the airfield grassland with specific grass species which can sequester greater amounts of carbon into the ground; and,
- Heathrow Experimental Farm – could form the base of operations for the Carbon Sink Meadow trials, with an additional range of tests that could see this smarter landscape technology applied to a number of other grassland types and applications such as verges and amenity spaces. The site could also be home to community collaboration projects such as the sourcing of local provenance tree and hedge species in a community nursery run in collaboration with a charity such as Green Corridor.

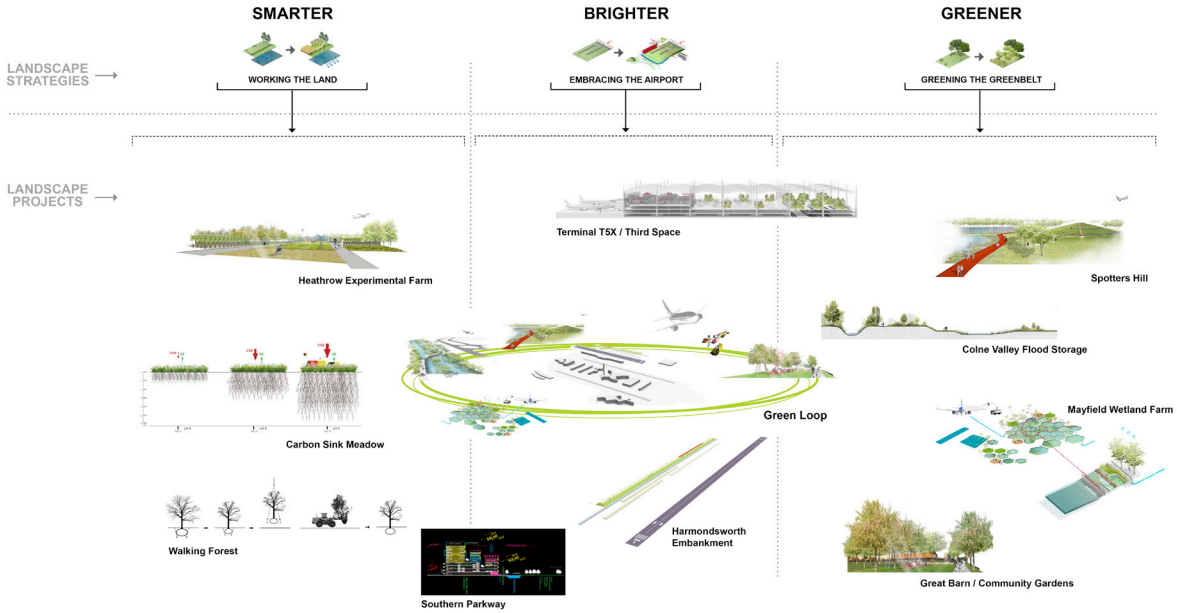


Figure 4.7.5: Landscape strategy indicating potential 'pilot' projects

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Landscape Toolkit

4.7.13 The Landscape Strategy is accompanied by a landscape toolkit (refer to appendix C of this document). The toolkit provides a specific set of landscape devices such as ecological woodland or biodiverse grassland, each of which will be accompanied by design guidelines and design parameters which help to describe how good design is secured. This will ensure landscape design quality throughout the Project and the airport related development in the years to come.

4.7.14 The Landscape Toolkit sets out guidelines and parameters in order to achieve good design such as:

- Ways to achieve smarter, brighter and greener aspirations;
- Key design principles, considerations and drivers;
- Integration with Local, Regional and National Strategies;
- Management and Maintenance principles;
- Appropriate species selection, taking into account – for example – growth rates, appropriateness to character and micro-climate, habitat and wildlife corridor, bird strike risk and resilience to climate change;
- Sourcing and re-use of soils;
- Safe and secure design;
- Airport operations, security and bird strike risk; and,
- Relevant British Standards and other relevant guidance and regulations.

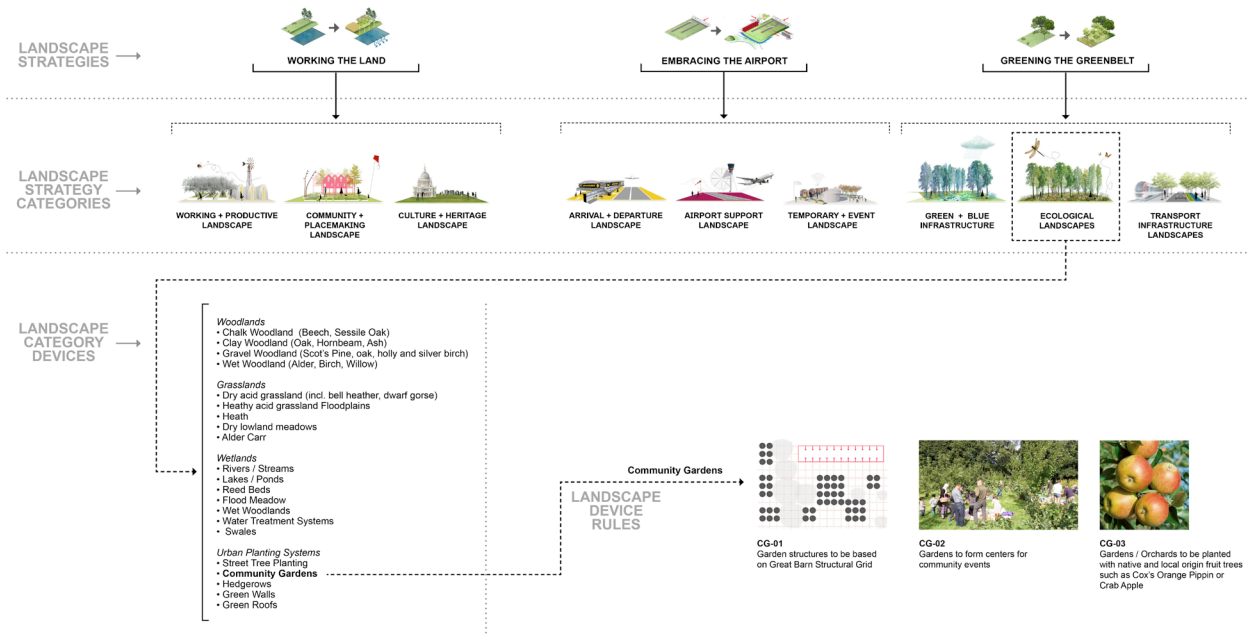


Figure 4.7.6: Diagram indicating Landscape Toolkit approach

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4.8 Surface Access

4.8.1 A strategy for surface access is being developed and will be submitted as part of the DCO. The emerging principles of the surface access strategy has influenced both the facilities provided and their strategic location in the Preferred Masterplan.

4.8.2 The *Surface Access Proposals* (SAP) document, which we are also consulting upon, sets out how access to the airport by all travel modes will be managed to meet targets set out in the ANPS as well as fulfilling Heathrow's pledge to not increase landside airport-related traffic through expansion. The targets set out in the ANPS are:

- To achieve a public transport mode share of at least 50% by 2030 and at least 55% by 2040 for passengers; and,
- From a 2013 baseline level to achieve a 25% reduction of all staff car trips by 2030, and a reduction of 50% by 2040.

4.8.3 Heathrow's surface access proposals are flexible and seek to retain the ability to react to ongoing monitoring of travel to and from the airport. To ensure that it can react to change, the SAP document sets out a 'toolbox' of measures. It includes measures that can be introduced or altered by Heathrow as and when it is necessary to do so, such as road user charging.

4.8.4 The SAP document is cognisant of infrastructure projects likely to be brought forward by other promoters.

4.8.5 The SAP document contains a number of more specific proposal documents to manage particular aspects of surface access. The first of these is the Public Transport proposals document. This sets out how the usage of existing and committed public transport to the airport will be optimised through measures such as better ticketing, cheaper fares on the Heathrow Express and earlier and later services.

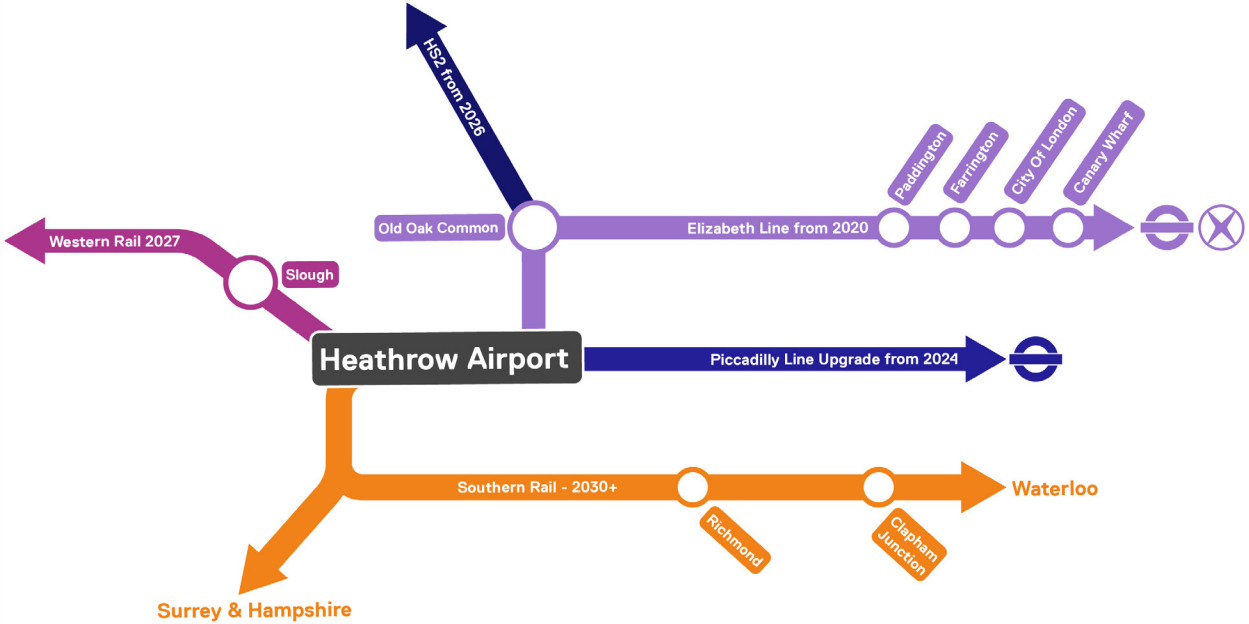


Figure 4.8.1: Future planned and potential improvements to Heathrow's rail connectivity

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4.8.6 It also sets out the new bus and coach services Heathrow is proposing to support, and how Heathrow will support the DfT and Network Rail to bring forward the proposed Western and Southern Rail schemes.

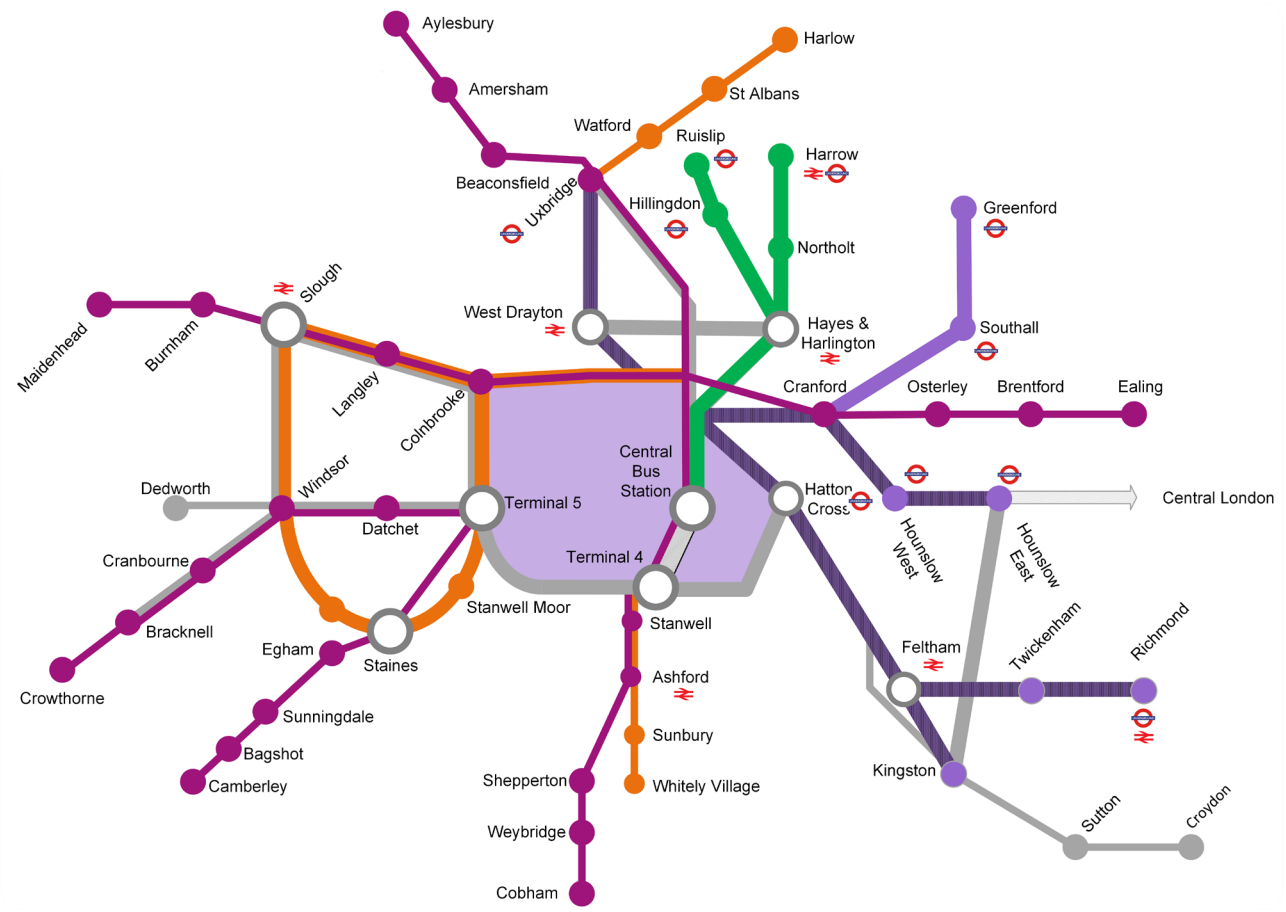


Figure 4.8.2: Bus routes for Heathrow expansion

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4.8.7 Improved access and legibility for those accessing the airport by non-motorised means, including by bicycle and foot, are also important parts of the SAP document and have informed the layout of the Preferred Masterplan.

4.8.8 Parking forms an integral component of the SAP document for the Project. In order to meet the colleague car trip reduction targets required within the ANPS there will need to be a significant phased reduction in colleague parking spaces. It is estimated that the current (2016) approximate 25,000 spaces of colleague parking will need to be reduced to around 17,000 spaces by 2030 and to approximately 12,000 spaces by 2040. The phased reduction will be achieved in line with vehicle demand reductions delivered through the SAP document which will include measures to enhance and promote public transport and active travel modes as well as increasing car sharing.

4.8.9 Car hire, taxi and private hire waiting areas (the 'Taxi Feeder Park' and 'Authorised Vehicle Area') are proposed to be consolidated in a multi-storey car park on the former Terminal 4 Long Stay Car Park. This consolidated location would enable efficient service of Terminal 5, Terminal 4 and Central Terminal Area (CTA), via the proposed Southern Road Tunnel.

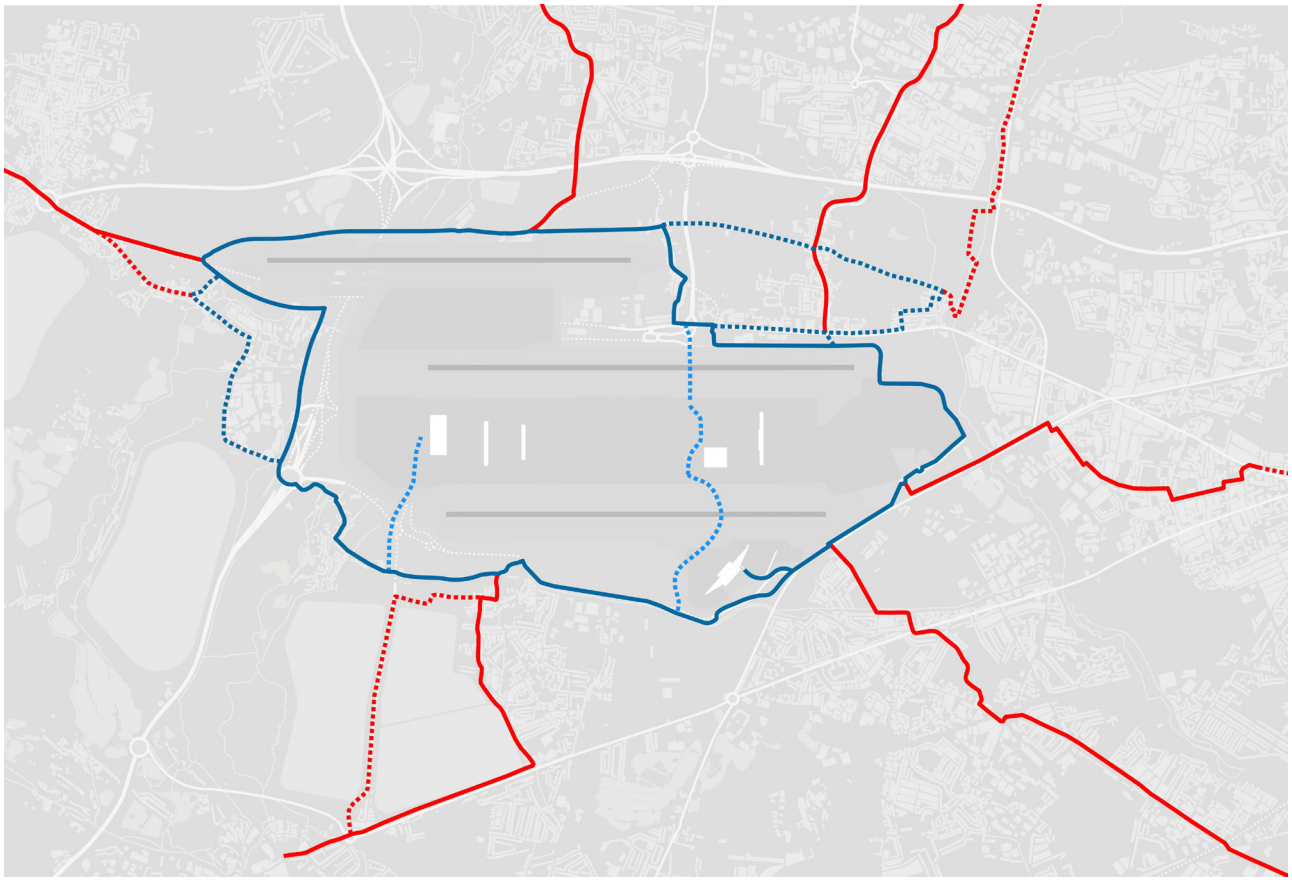


Figure 4.8.3: Hub and spoke network

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4.9 Approach to Land Use

4.9.1 Since our Airport Expansion Consultation One in 2018, further work has been undertaken to refine our approach to land use. Engagement with the local community and the Heathrow Strategic Planning Group (HSPG) has helped to refine this approach, which has guided the development of the Preferred Masterplan in terms of the location and scale of displaced uses and plans on how to respond to future demand.

4.9.2 The following paragraphs summarise the approach taken to a number of land use categories.

Displaced Uses

4.9.3 Various buildings and facilities in use today will need to be displaced (i.e. required to be removed) as a result of the expansion of Heathrow, including business properties, utilities and airport-related facilities, open space, recreation and community facilities, as well as homes. These buildings and facilities are identified in plans elsewhere in this document, including Chapter 6.

Housing

4.9.4 As explained at our Airport Expansion Consultation One, Heathrow does not believe that expansion will generate any material need for additional homes in the local area. A jointly commissioned evidence base study undertaken in conjunction with the HSPG of local authorities has since confirmed that expansion would only lead to around 3,000 additional homes in the local area by 2041, which is negligible in the context of background housing growth requirements.

Community Assets

4.9.5 Heathrow's expansion will impact a number of community facilities. Where possible, Heathrow has designed the scheme to avoid loss or disruption, and where this is unavoidable, has proposed options to mitigate the effects of this disruption.

4.9.6 Typical community facilities identified as being potentially affected by the Project can be grouped into three categories: buildings, allotments and sports facilities. Buildings potentially impacted by the expansion are Harmondsworth Primary School, Heathrow Special Needs Centre (HSNC), Green Corridor, Harmondsworth Community Hall, Wonderland Day Nursery and Littlebrook Nursery (Longford).

4.9.7 Allotments that will be impacted by the expansion are Moor Lane Allotments, Pinglestone Allotments (Harmondsworth) and Vineries Allotments (Stanwell Moor). Sports facilities potentially adversely affected are Harmondsworth Recreation Ground, Little Harlington Playing Fields and Townmead Recreation Ground.

4.9.8 In some cases, where it is a policy requirement of the ANPS, or where the Project would result in a likely significant adverse effect on that facility or its users, Heathrow has committed to providing an equal or better alternative facility, or other compensation as appropriate. This is the case with Harmondsworth Primary School and HSNC, which will be re-provided as part of our scheme on locations close to the existing facilities and with good access to the local road network and to green areas.

Airport Supporting Development (ASD)

4.9.9 Heathrow has previously used the terms Airport Related Development (ARD) and Airport Supporting Facilities (ASF) to refer to those uses which would be considered as Associated Development to the Nationally Significant Infrastructure Project (NSIP). However, to avoid confusion, Heathrow has sought to redefine these categories of land use as Airport Supporting Development (ASD).

4.9.10 ASD is a term which is used to describe a range of development that is related to the airport's operation, and includes uses such as airport operations, cargo, maintenance, industrial, freight forwarding, hotels and offices. In some cases, where there is a particularly strong functional link with the airport's operation, this development is provided within the operational boundary, e.g. maintenance, cargo, terminal-linked hotels and supply chain offices. Where there is insufficient space within the airport boundary, or where there is an argument for locating a particular use off-airport, ASD has been provided outside of the airport perimeter, but close to the airport.

4.9.11 As described during Airport Expansion Consultation One, research by Lichfields (a planning and development consultancy) on behalf of Heathrow established the scale of existing airport supporting hotels, offices and freight forwarding facilities today and in the future. This work has since been updated by Lichfields, with HSPG input, to refine the scale of demand for these ASD uses.

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4.9.12 A survey conducted in 2017 identified a total land take of circa 293 hectares for existing airport operations, cargo, maintenance and industrial ASD. Growth factors related to the increase in passenger numbers or aircraft movements were used to generate a figure for the increased demand for these ASD uses due to the Project. Efficiencies and optimisation were applied where possible to minimise land take. The proposed land take forecast was calculated as cumulative circa 386 hectares by 2035. It is anticipated that the additional demand beyond 2035 can be met mainly by intensifying use of the existing sites.

4.9.13 The Preferred Masterplan only includes replacement and additional ASD that is essential for the successful operation of the airport, with regards to site suitability, planning considerations and other factors. We are working with the HSPG planning authorities to plan for any demand that exceeds that shown in the Preferred Masterplan. The areas surrounding Heathrow will need to adjust over time to the growth of the airport, and the property market will inevitably respond to the increased demand for commercial and other floorspace generated by the increased passenger and cargo activity.

ASD - Airport Operations

4.9.14 Airport Operations comprises an array of facilities, such as emergency response, aircraft turnaround support, vehicle access control points, airport operations buildings, winter resilience, Very Important People (VIP), Ground Service Equipment Maintenance (GSEM), baggage including stillage, aircraft fuelling and General Service Equipment (GSE) parking.

4.9.15 There are several regulatory requirements that dictate the location of some airport operational uses, such as emergency facilities, e.g. fire stations. For other facilities, such as turnaround support facilities, aircraft fuelling, baggage, winter resilience, GSEM and GSE parking, airfield performance and standard operating practice dictate where these uses need to be located.

4.9.16 Vehicle access control points are required to screen vehicles and passengers entering the critical part of the Security Restricted Areas and are subject to security screening procedures to meet standards set by the Department for Transport (DfT). The location of access control points is governed by the type of traffic and availability of space with proximity to both landside and airside roads.

ASD - Cargo

4.9.17 On-airport cargo facilities at Heathrow are principally located within the cargo area to the south of the airport. The on-site cargo area comprises two key areas: International Airlines Group (IAG) site; and Horseshoe site (encompassing both Shoreham and Sandringham Roads). This is supplemented by two further sites to the east of the airport adjacent to the aircraft maintenance area: X2 and Kuehne and Nagel; and the dnata City site located on Bedfont Road, immediately south of the cargo area.

4.9.18 A key factor cited by the Government in support of an expanded Heathrow was the airport's cargo operations and its proposals for doubling freight capacity approximately. This was set down in the ANPS. The growth in capacity at Heathrow will be met through intensification and some redevelopment of existing shed facilities, the provision of new facilities on the airport, and the provision of dedicated trans-shipment facilities closer to the aprons to reduce journey times and maximise utilisation of cargo facilities.

4.9.19 In addition to these strategies, the proposal includes a single truck park which would provide appropriate facilities for long distance drivers near the airport and help reduce congestion in the cargo area and parking on local roads.

ASD - Maintenance, Repair and Overhaul (MRO)

4.9.20 Heathrow has significant Maintenance, Repair and Overhaul (MRO) facilities for aircraft operating from the airport, and with expansion, the number of facilities required for this function will increase. There are currently two airlines that carry out aircraft maintenance at Heathrow: British Airways (BA) and Virgin Atlantic Airways (VAA), both of which are home-based carriers. Today, the MRO facilities for these carriers are located on the eastern side of the airport, with the sites split into an East Base and a West Base. These bases occupy an area of 77 hectares.

4.9.21 The approach to assess the future demand for MRO facilities has been to use forecast schedules to analyse demand, as well to engaging with both incumbent and potential new entrant airlines to discuss their future maintenance requirements. Based on this analysis and engagement, the requirements for MRO to service at least 740,000 ATMs have been estimated as amounting to up to three additional wide body hangar bays, a shared use ground run pen, and a narrow body hangar for a new potential entrant home-based operator.

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4.9.22 These new facilities will be provided within the existing MRO area, through consolidation and intensification of the space available.

ASD - Industrial

4.9.23 Industrial facilities consist of engineering and construction compounds and in-flight catering facilities. Construction compounds and engineering facilities are required to maintain the current airport assets, separately from facilities for new construction. New and re-provided construction compounds and engineering facilities have been located primarily in the area northwest of the new runway to benefit from being situated close to the railhead and a major access point to the airside road network.

4.9.24 In-flight catering facilities will be provided on, or close to, the airport boundary in order to minimise vehicles on local roads.

ASD - Freight Forwarding

4.9.25 Additional freight forwarding facilities to support the growth in cargo operation have been focused in established locations for these uses around the airport, including to the south of the airport, in an arc between the industrial area in Poyle and Feltham Trading Estate. These locations are in close proximity, or adjacent, to on and off-airport cargo functions, major highways, and create efficiencies by clustering.

ASD - Hotels and Offices

4.9.26 Hotels and offices are needed to replace those lost by the Project and meet additional demands associated with the expansion of the airport. Our approach has been to prioritise locations within or immediately adjacent to terminals, where space allows which is the preferred location by passengers. Subject to airport safety requirements, the height and density of development within the terminal area can be higher, thereby reducing the need for additional sites outside the airport. We are also prioritising sites close to existing train stations, followed by sites on the perimeter of the airport or next to the parkways, where transit links offer excellent public transport accessibility.

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