



# HEATHROW EXPANSION STAGE 1A DEFINE - ASSESSMENT BRIEF

11 January 18

**Heathrow**  
Building for the future

*“The information contained within this document constitutes a preliminary view and is provided to you to facilitate discussions with Heathrow Airport Limited.”*



## Stage 1 DEFINE

### **Step 1A Assess requirement**

The change sponsor prepares a Statement of Need setting out what airspace issue it is seeking to address. Having reviewed the Statement of Need, the CAA meets with the change sponsor to agree whether an airspace change is a relevant option to consider, and to have a first discussion about the appropriate scale of the airspace change process.

### **Step 1B Design principles**

The design principles encompass the safety, environmental and operational criteria and strategic policy objectives that the change sponsor aims for in developing the airspace change proposal. They are developed through engagement with stakeholders and form a qualitative structure against which design options can be evaluated. Early engagement with stakeholders, optionally facilitated by a third party, should help to avoid disagreement later in the process.

DEFINE Gateway

## *MEETING SCOPE*

- Cover all requirements of Step 1A:
  - Statement of Need
  - Good Design Process
  - Initial Operational Impact
  - Initial Environmental Assessment
  - Design, Optioneering and Appraisal
  - Stakeholder Engagement
  - Consultation Plan
- Request from CAA:
  - Agree scale of the airspace change
  - Seek endorsement of our approach to stakeholder engagement on design principles
  - Seek guidance on how the CAA will evaluate our outputs
  - Agree date for the Gateway Assessment Meeting for DEFINE
- Summary
- Next Steps

# *STATEMENT OF NEED*

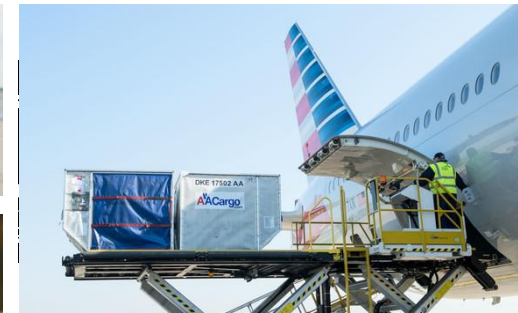
# THE BENEFITS OF HEATHROW EXPANSION

**5,000** additional apprenticeships, bringing the total to 10,000 by 2030



Up to **£187 billion** in economic benefits across the UK

**260,000** additional Air Traffic Movements serving up to **40** new long haul routes



Up to **180,000** jobs created across the UK

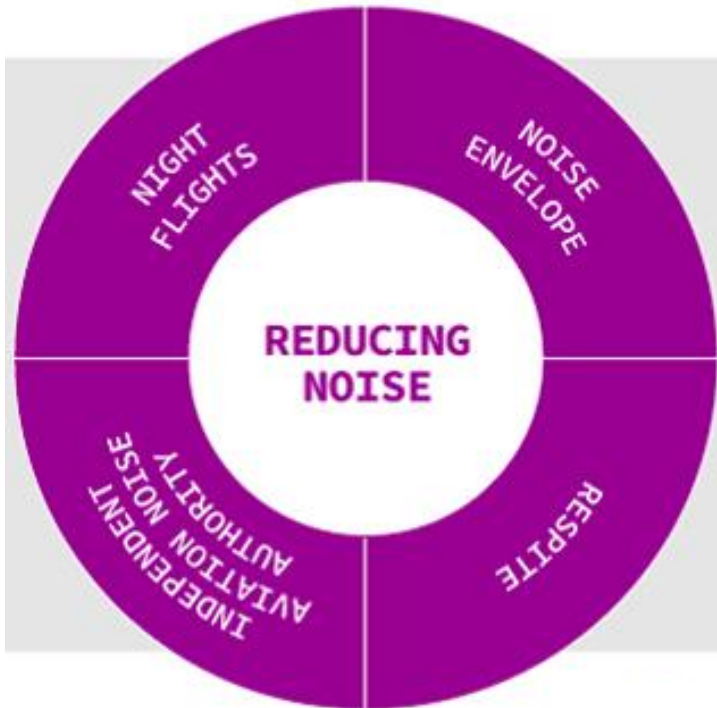
**2x** current cargo volume



Up to **40,000** new local jobs



# COMMITMENTS TO OUR LOCAL COMMUNITIES



# STATEMENT OF NEED

- Heathrow's revised Statement of Need is:
- The Government believes that there is clear and strong evidence that there is a need to increase capacity in the South East of England by 2030 by constructing one new runway (*draft ANPS para 2.32*). On 25 October 2016, the Government announced that its preferred scheme to meet the need for new airport capacity in the South East of England was a Northwest Runway at Heathrow Airport and confirmed that this would be included in a draft Airports NPS.
- Heathrow Airport Limited now needs to design airspace to facilitate a 3 runway, 740K ATM operation by 2025.
- We are seeking to undertake airspace modernisation at the same time as Heathrow expansion, and are starting airspace design development from 'a blank sheet of paper' for both new and existing routes.
- We have begun the necessary work to gain a Development Consent Order (DCO) for the construction of a 3rd runway. This process (currently planned to include a voluntary consultation, a mandatory consultation and then submission) will establish the final position and length of the runway. Environmental Impact Assessments (EIA) of the possible airspace changes/usage will be undertaken for the DCO process, but this will not interfere with the Airspace Change Process. The DCO EIA will identify the Noise Envelope that must be adhered to as we progress through the airspace change process. Therefore, we have two separate approvals for one 'good airspace design' process.
- We have begun engagement with all stakeholders (local airfields, airspace users, local authorities, community groups and the MOD) to inform them of our planned consultation approach. Initial technical feasibility work has also been undertaken, in the form of workshops with NATS, airlines and manufacturers.



## *AIRSPACE MODERNISATION AND HEATHROW EXPANSION*

The expansion of Heathrow will involve the redesign of our entire route system, in line with the Government's plan to modernise the UK's airspace.

The airspace above London and the south east is one of the busiest in the world, and so it will not be possible to design flight paths for a new runway at Heathrow without affecting existing flight paths.

The redesign of Heathrow's flight paths will mean that some communities will experience a change in the position and frequency of aircraft overhead.

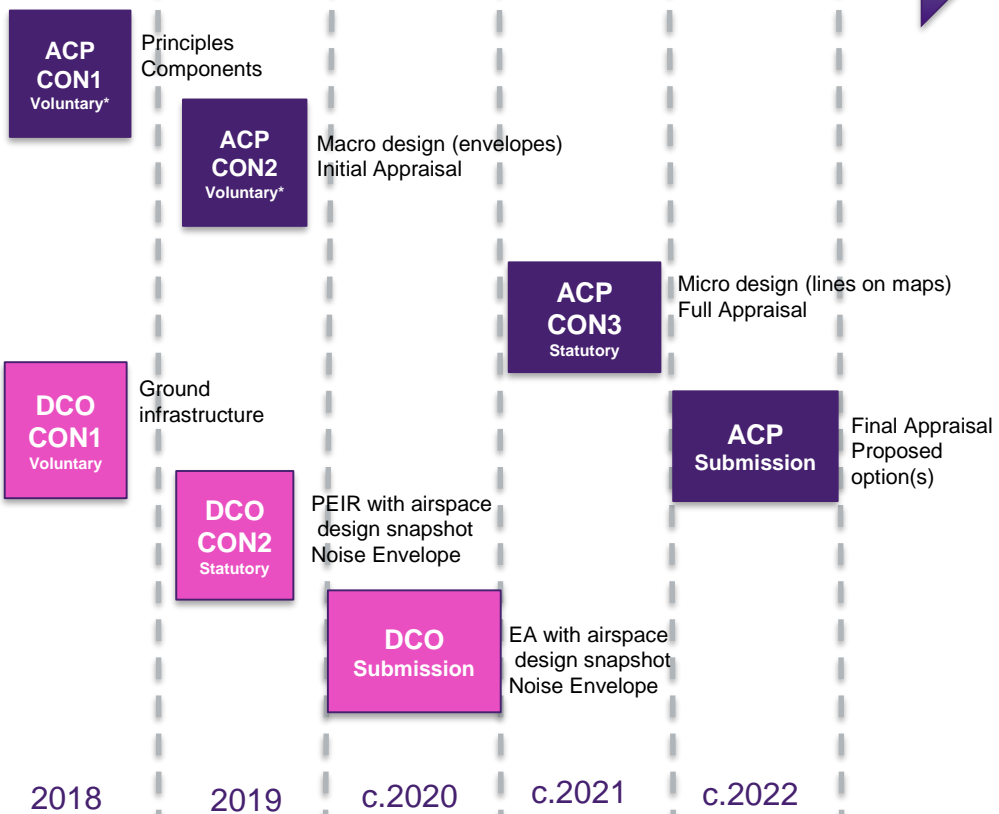
# *ACP AND DCO: ONE GOOD DESIGN PROCESS*

# GOOD DESIGN: 2 PROCESSES, BOTH ANCHORED BY THE SAME 3 KEY NOISE TESTS

ACP Approval

DCO Approval

ONE GOOD DESIGN PROCESS



- Airspace Change Proposal (ACP) and DCO approvals run in parallel, but with DCO submission required ~2/3 years before ACP submission
- ACP process approves the design - this is recognised in the draft NPS para 5.49: "Precise flight path designs can only be defined at a later stage after detailed airspace design work has taken place. Once the design work has been completed, the airspace proposal will be subject to extensive consultation as part of the separate airspace decision making process established by the Civil Aviation Authority".
- Draft NPS requires evidence of Good Design which includes demonstration of "how the design process was conducted and how the proposed design evolved" (para 4.35). Our integrated approach ensures good design by:
  - Allowing time for consultation at key stages ✓
  - Demonstrating response to feedback ✓
  - Seeking, and acting on, balanced feedback ✓
- The draft NPS applies the Noise Policy Statement tests for England, and both the DCO & ACP processes require us to meet these 3 key tests:
  - Avoid significant adverse impacts on health and quality of life from noise;
  - Mitigate and minimise adverse impacts on health and quality of life from noise; and
  - Where possible, contribute to improvements to health and quality of life.

\* The first 2 ACP consultations are voluntary consultations, to meet the statutory stakeholder engagement requirements of CAP 1616

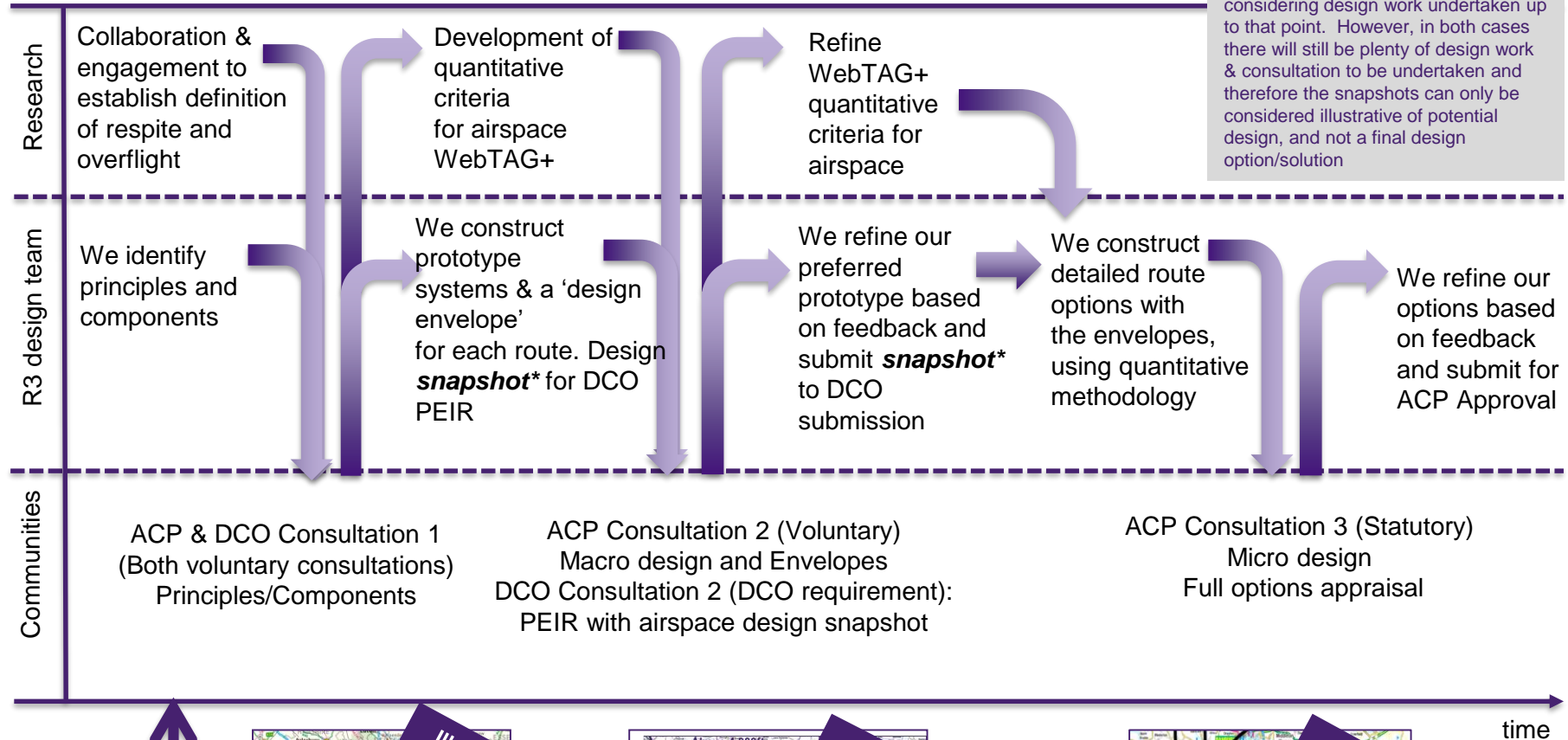
# *MEETING THE REQUIREMENTS OF BOTH ACP & DCO WITH RESPECT TO AIRSPACE DESIGN, MITIGATION AND AIRCRAFT NOISE*

- For the DCO, it will be necessary to assess the “likely significant effects” of the 3rd runway within the parameters of the noise envelope, without certainty of the final airspace design
- **A strategy for DCO/ACP integration has been developed**, recognising that R3 airspace will be subject to two separate consenting/approval regimes:
  - DCO provides consent for the development and use of the new runway
  - ACP provides the approval to implement a specific and detailed airspace change, as defined by the CAA’s airspace change guidance (CAP1616)
- It is the ACP which is charged with designing the future airspace: **the DCO application will not consult on or design airspace** and it is important that the two processes are individually robust and not confused
- The DCO requires an assessment of the “likely significant effects” of flying from a 3 runway airport and this will be based on best estimates of what the future airspace might be, made at the time of the DCO submission – a design ‘snapshot’ - **the DCO cannot require to know the actual future airspace design** or to guarantee that it will be the same as that assessed in the application for or consideration of the DCO
- This is recognised within both the ANPS and Airspace Policy (AP) which state “... the planning process can only consider indicative routes and their potential impacts” (AP 3.19) and “Precise flight path designs can only be defined at a later stage after detailed airspace design work has taken place” (ANPS 5.49).



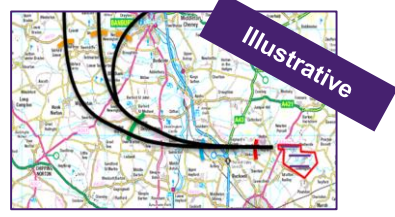
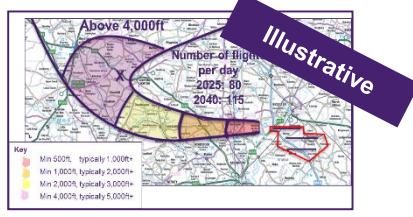
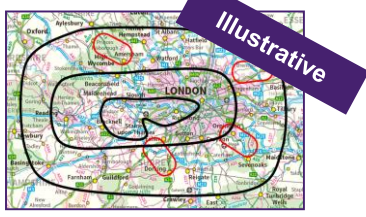
# R3 AIRSPACE DESIGN PROCESS: OVERVIEW

## R3 Airspace Design Process



\*The snapshot will be a set of illustrative prototype designs that represent a feasible airspace design considering design work undertaken up to that point. However, in both cases there will still be plenty of design work & consultation to be undertaken and therefore the snapshots can only be considered illustrative of potential design, and not a final design option/solution

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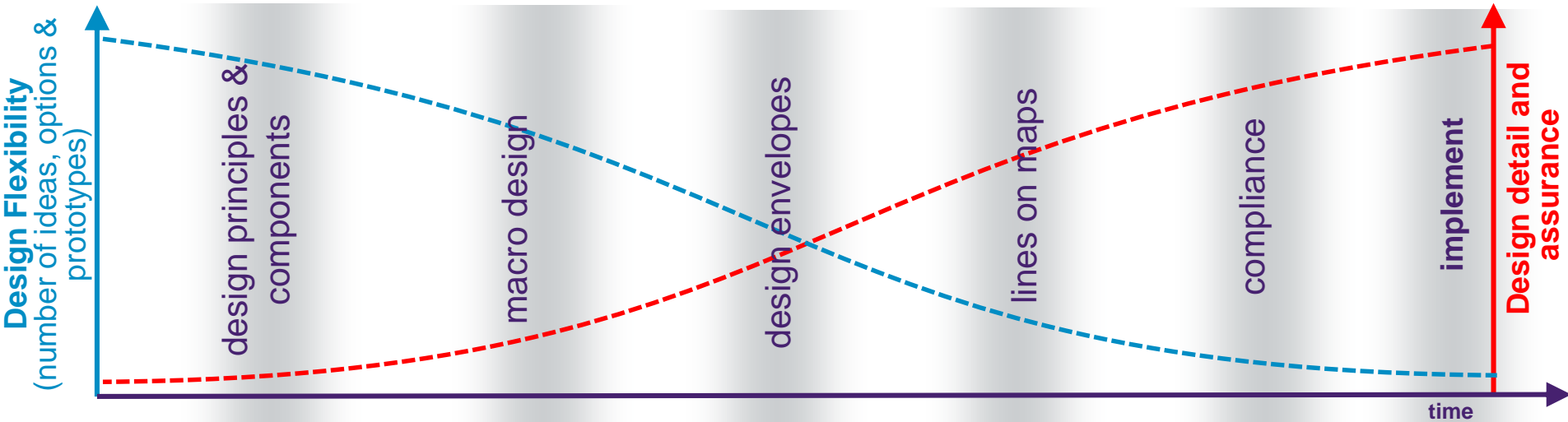


# *DESIGN, OPTIONEERING & APPRAISAL*

## *OPTIONEERING AND APPRAISAL*

- CAP 1616 describes simple design process with one pass at longlisting/shortlisting before full appraisal
- R3 design has more phases - but we are following the CAP 1616 principles around development of options
- Longlisting/shortlisting will be repeated whenever design choices are being made

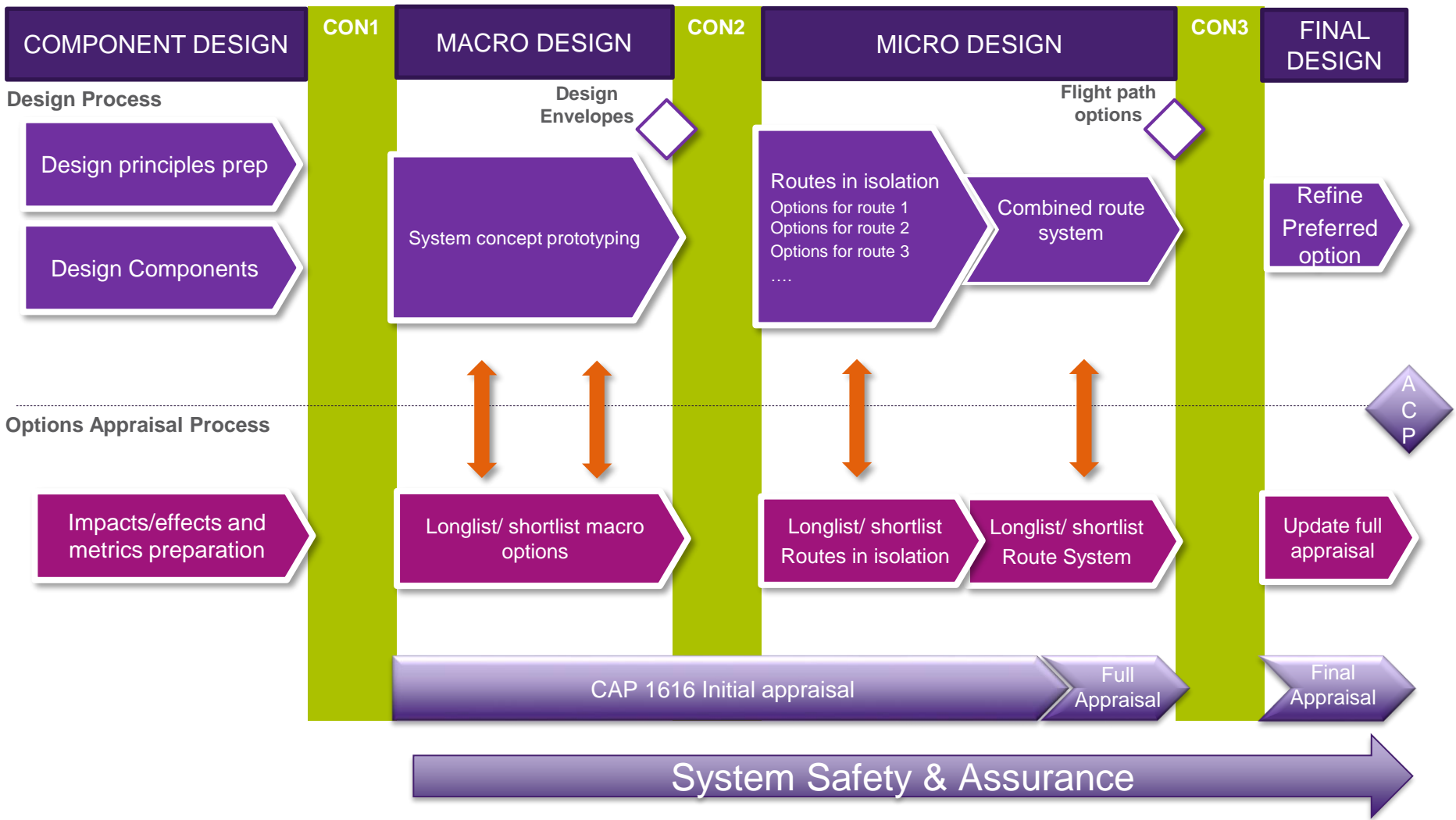
# THE R3 AIRSPACE DESIGN LIFE CYCLE



Activities	<p>Get stakeholder view on principles</p> <p>Collate and filter all design components in isolation, eg runway configs noise mitigations systemisation technology</p>	<p>Build 'macro' view prototypes from components referring to principles.</p> <p>Identify preferred macro design</p>	<p>Establish &amp; consult on design envelopes which define the areas within which the solution would lie for preferred macro design</p>	<p>Develop, measure &amp; consult on 'micro' design options and prototypes that fit within the design envelopes</p>	<p>Choose final design and validate taking into account neighbouring developments</p>	<p>Transition into service</p>
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# LINK BETWEEN OPTIONS APPRAISAL, DESIGN AND CONSULTATION PROCESS.



# *APPROACH TO OPTIONS APPRAISAL FOR HEATHROW R3 ACP*



*THE OPTIONS APPRAISAL IS NOW REQUIRED BY CAP1616 IN ORDER TO PROVIDE STAKEHOLDERS WITH TRANSPARENCY OF THE DESIGN DECISION PROCESS AND TO PROVIDE A CONSISTENT, OBJECTIVE AND REPEATABLE ASSESSMENT*

**CAP1616 Criteria**

Capacity / resilience

GA access

GA / airlines economic impact

Fuel burn

Airlines training costs

Airline equipage costs

Community noise impact

Community air quality impact

GHG impact

Airport / ANSP economic impact

**Transport Act Criteria**

Safety

Efficient use of airspace

Requirements of all airspace users

Interests of other parties (non-users)

Environmental

MoD access & national security

Contribution to international agreements

**Design Principles Criteria**

TBD post CON1

**METRICS FOR ASSESSMENT HAVE BEEN DEVELOPED BASED ON CAP1616, TRANSPORT ACT AND EXPERT INPUTS. APPRAISAL METRICS/DETAIL WILL VARY DEPENDING ON NUMBER/MATURITY OF THE DESIGN OPTIONS**

**Environmental Assessment**

	<b>Impact/effect</b>	<b>Example metrics*</b>
<b>Economic assessment</b>	Noise	<i>Impact on health, amenity and sleep disturbance (WebTAG/+)</i>
	Greenhouse gas	<i>CO2e (WebTAG)</i>
	Local air quality	<i>Nox, PM10</i>
<b>Qualitative/quantitative assessment</b>	Noise: daytime/night	<i>(New) population within LOAEL, SOAEL, UAEL; N65</i>
	Noise: exposure	<i>Pop. exposed to 60/65/70 L<sub>AMax</sub></i>
	Noise: sensitive receptors	<i>Schools, Hospitals, Nurseries etc.</i>
	Overflights	<i>Population overflown</i>
	Greenhouse gas	<i>CO2e</i>
	Local air quality	<i>NOx, PM10</i>
	Nature	<i>Tranquillity/Biodiversity</i>



**Economic Assessment**

	<b>Impact/effect</b>	<b>Example metrics*</b>
<b>Economic assessment</b>	Airlines	<i>Economic appraisal for airlines (delay reduction, equipment, fuel etc.)</i>
	Passengers	<i>Pax time saved/lost</i>
	GA/MoD	<i>Economic appraisal for GA/MoD (methodology to mature with design)</i>
	ANSP/Airport	<i>ACP costs, ATC systems, noise insulation</i>

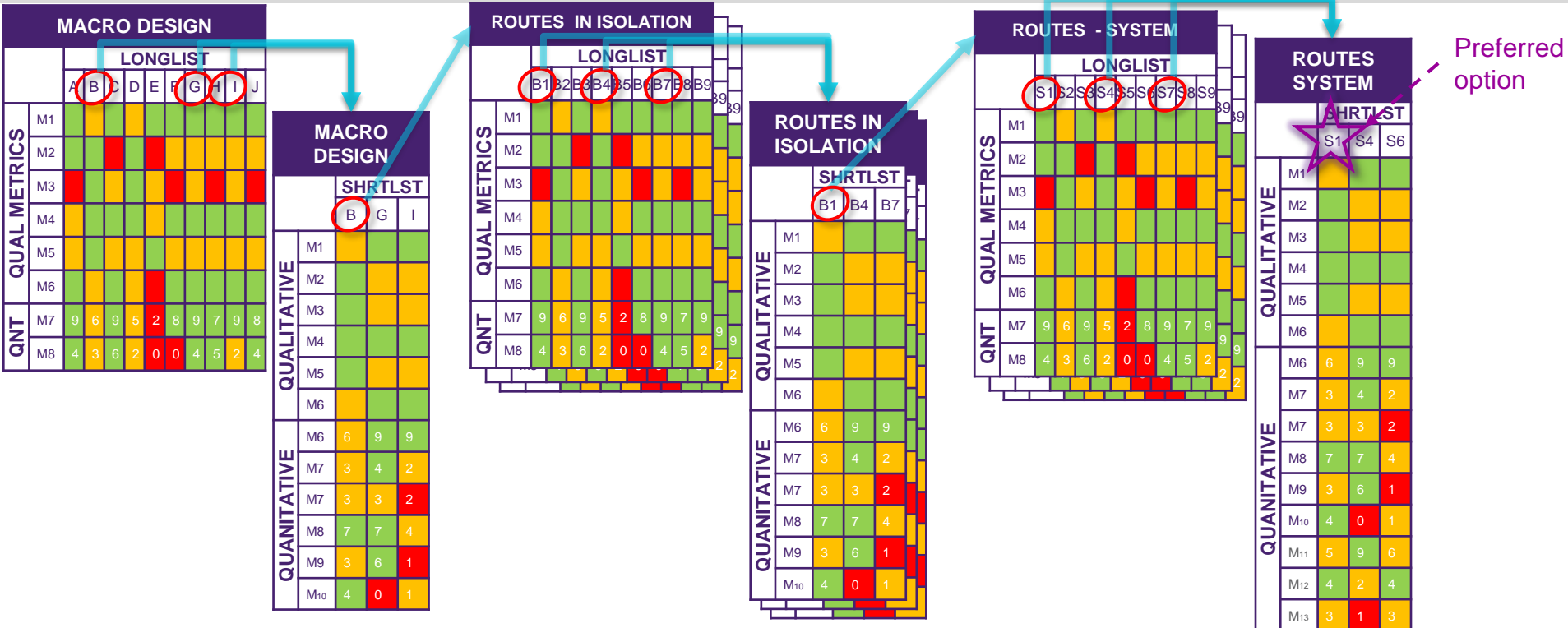


**Operational Assessment**

	<b>Impact/effect</b>	<b>Example metrics*</b>
<b>Qualitative/Quantitative</b>	Full change potential	<i>Delivery of all benefits, Phasing of benefits</i>
	Workload/safety	<i>TC, AC, Oceanic Ops, APP, TWR, Pilot etc.</i>
	Stakeholders/users/strategies	<i>GA, MoD, other airports, airlines, network, Volume of airspace, LAMP/FASI, etc.</i>
	Design	<i>Design principles, Flyability etc.</i>



*THE OPTIONS APPRAISAL WILL BE TRANSPARENT AND FULLY TRACEABLE:  
ANY OPTIONS DISCARDED WILL BE RECORDED AND RATIONALE WILL BE PROVIDED*



Preferred option

**LONGLIST of MACRO DESIGN OPTIONS**  
Mainly qualitative. Quantitative where possible.

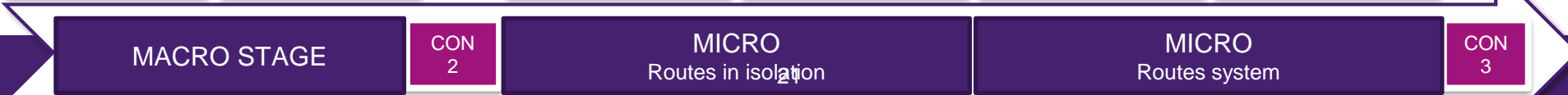
**SHORTLIST MACRO DESIGN OPTIONS**  
More quantitative than longlist.

**LONGLIST of ROUTES IN ISOLATION**  
Mainly qualitative. Quantitative where possible.

**SHORTLIST of ROUTES IN ISOLATION**  
Quantitative. Qualitative where needed.

**LONGLIST of ROUTES SYSTEM**  
Mainly qualitative. Quantitative where possible.

**FULL APPRAISAL - ROUTES SYSTEM**



*IN ORDER TO FOLLOW BEST PRACTICE, WE WILL SEEK ADVICE FROM CAA EXPERTS TO ENSURE ALL ASPECTS OF THE OPTIONS APPRAISAL PROCESS ARE UNDERTAKEN AS INTENDED IN CAP 1616*

- The CAP 1616 requires the sponsor to compare each option against a 'do nothing'/'do minimum' scenario:
  - What is a credible 'do minimum' scenario for Heathrow with three operational runways?
- WebTAG guidance, which CAP1616 refers to, has certain shortcomings for airspace related noise assessment:
  - Heathrow is driving the WebTAG+ activity: What is the CAA stance and recommendation?
- The economic appraisal of proposed airspace changes, especially calculation and attribution of benefits stemming from Heathrow expansion, is potentially complex and can be approached in a number of different ways:
  - It is important to agree on the scope and approach to the economic appraisal, and to provide regular updates as the airspace design matures, to avoid surprises at the end of the appraisal process

# *INITIAL OPERATIONAL IMPACT*

# *INITIAL OPERATIONAL IMPACT ASSESSMENT OF THE PROPOSED AIRSPACE CHANGE*

- We expect changes to all of Heathrow's routes
- We expect knock-on changes to adjacent airports and the en-route network
- Changes to airspace boundaries are not yet known
- We expect improved resilience for airport, airlines and passengers
- We expect no impact on airspace of adjoining states
- We expect no operational impact to the European Airspace Programmes



# *INITIAL ENVIRONMENTAL IMPACT*

# *ROBUST ENVIRONMENTAL ASSESSMENT WILL BE UNDERTAKEN THROUGHOUT THE DESIGN PROCESS*

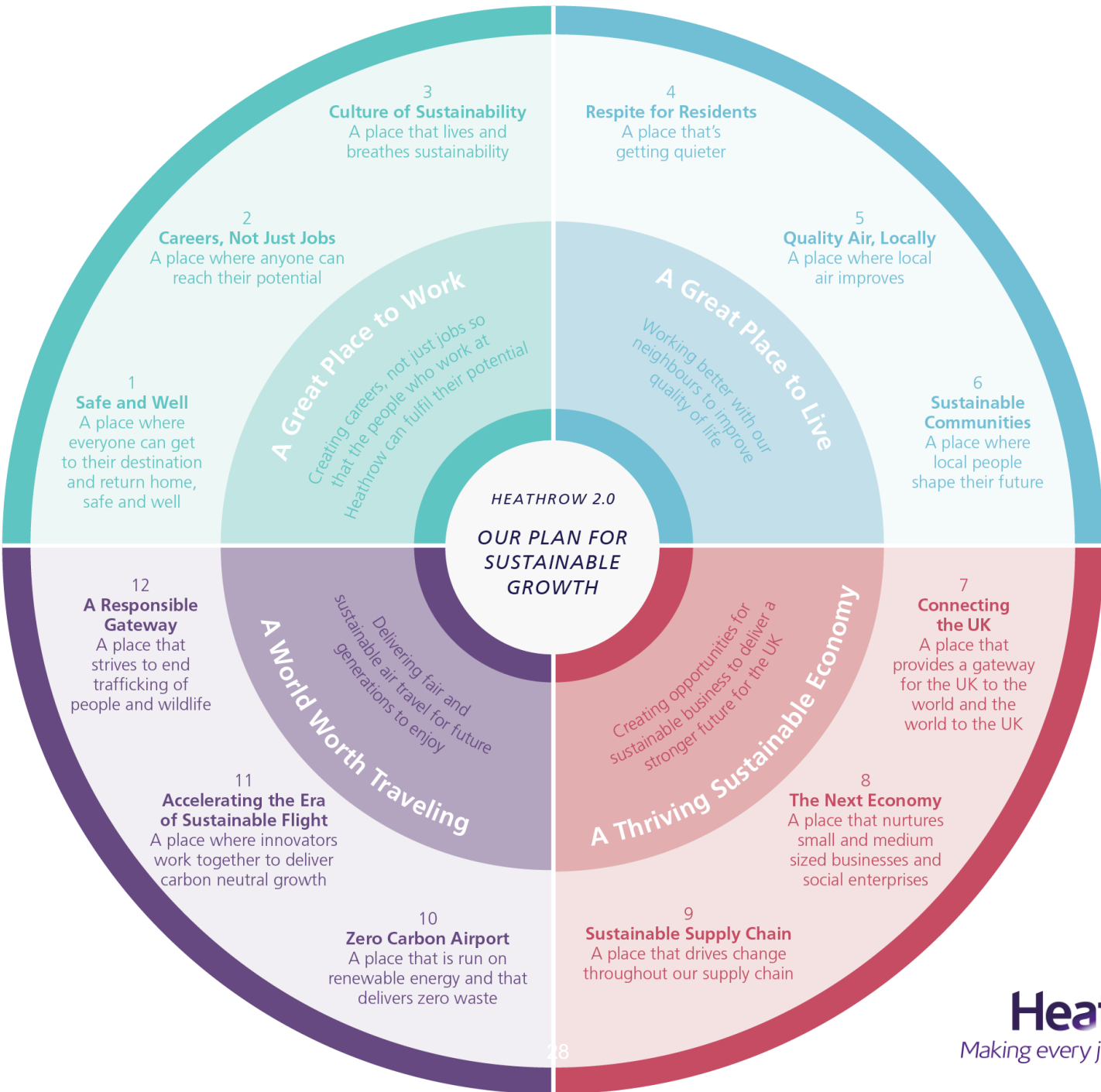
## 1. Aims:

- Achieve compliance with relevant policy and guidance
- Demonstrate best practice, drawing on elements of EIA approach:
  - Scoping to focus on significant issues for Level 1 airspace change:
    - Noise; air quality; carbon dioxide; tranquillity; biodiversity.
  - Use of proven assessment methodologies from DCO process
  - Distinguishing between significant and non-significant effects
  - Options appraisal
  - Engagement and consultation, utilising sound demos where appropriate
  - Monetisation of noise effects using WebTAG (with WebTAG+ sensitivity analyses)
  - Technical and non-technical summary reports
  - Peer review process (noise and AQ)
  - Noise envelope integrating with DCO process

2. Objective: achieve compliance with CAP 1616 process and secure approval from CAA and SoS

*Expanding Heathrow will strengthen the UK economy, improve connectivity and secure a lasting legacy for future generations.*

*Working collaboratively we will deliver a world class, affordable airport that can grow and operate sustainably, now and in the future.*



# *STAKEHOLDER ENGAGEMENT TO DATE*



# 3R AIRSPACE CHANGE: STAKEHOLDER ENGAGEMENT SO FAR...

Heathrow has already undertaken a thorough and targeted programme of pre-consultation stakeholder engagement. Engagement has been undertaken with the following groups:

## Aviation

NATMAC NATS  
CAA FASIIG  
FASVIG

## Airfields & Aerodromes

RAF Northolt Farnborough London Heliport  
White Waltham Biggin Hill Denham Booker  
Halton Wycombe Benson Elstree

## Airports

Luton Gatwick  
City Stansted

## Airlines

BA Workshops  
Virgin Atlantic

## Environment

Environment Agency Historic England  
Natural England Public Health England

## Communities

HCNF HACC LFF  
HACAN

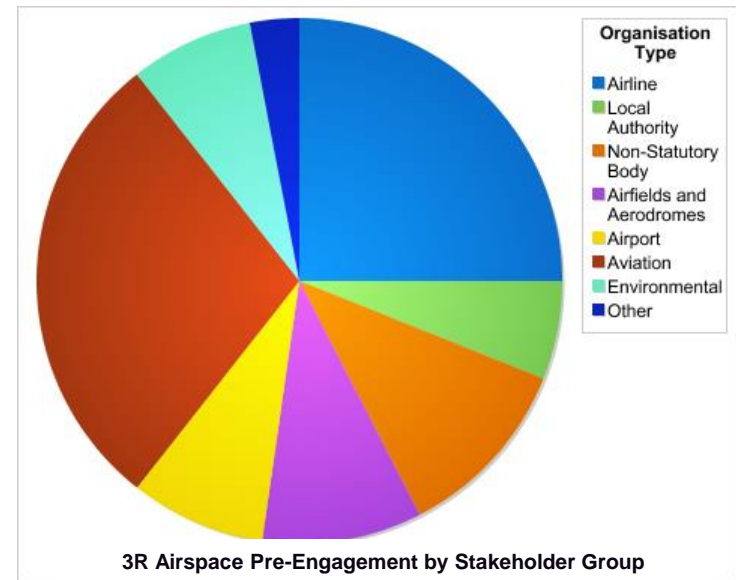
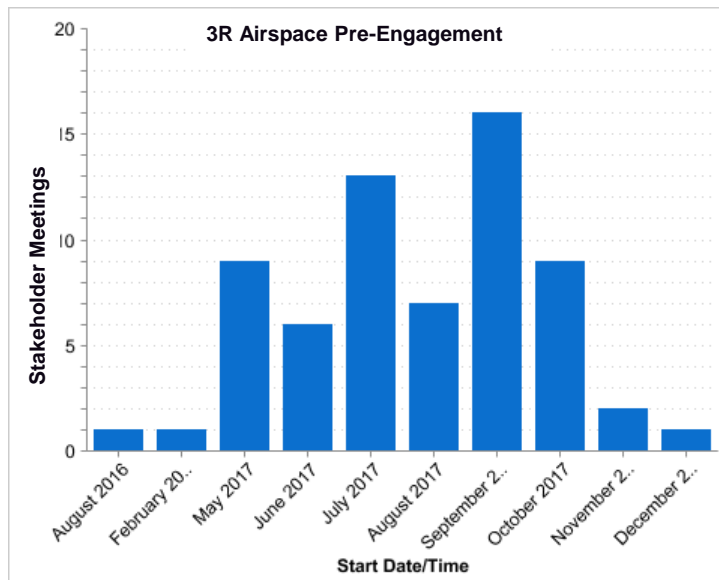
## Govt & Local Authorities

DfT HSPG EHO Workshop GLA / TfL

## 3R AIRSPACE CHANGE – ENGAGEMENT SO FAR...

Between August 2016 and November 2017, for 3R airspace change, we have undertaken:

- Engagement with **117 stakeholder organisations** at
- **65 engagement events** (meetings, briefings, workshops)



# *CONSULTATION PLAN*

# AIRSPACE CHANGE CONSULTATION PROCESS

Heathrow's Airspace Change programme consists of three stages of consultation



## Stage One

- **Design principles**

This stage will seek views to inform the design principles which will help shape and underpin the design and structure of Heathrow's future airspace



## Stage Two

- **Design envelopes**

This stage will seek to understand what local factors (within the defined geographical envelopes) should be taken into consideration when designing where the future flight routes should go



## Stage Three

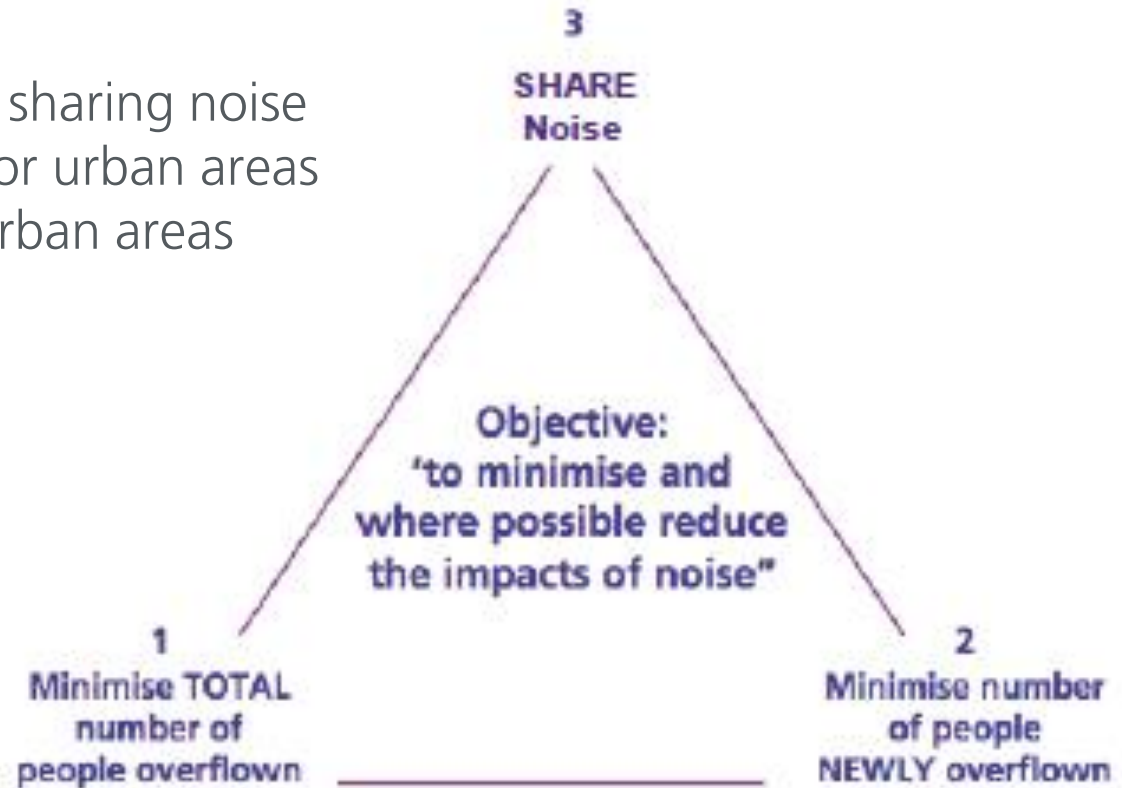
- **Flight path options**

This stage will present flight path options

## *AIRSPACE DESIGN PRINCIPLE: WHAT WE WILL CONSULT ON*

The Airspace Principles consultation will set out and ask for feedback on the principles and trade-offs that come with airspace design including:

- Concentration versus sharing noise
- Prioritisation of rural or urban areas
- Prioritisation within urban areas
- Noise versus emission

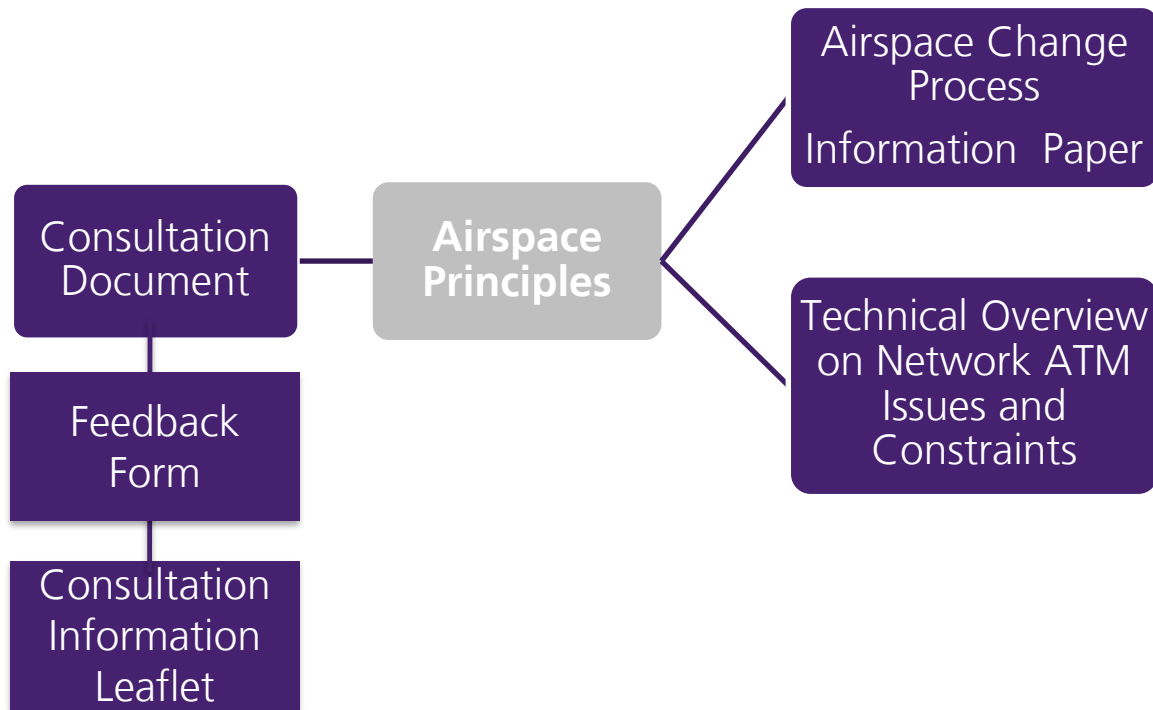


# AIRSPACE PRINCIPLES CONSULTATION MATERIALS

Area of Content

Technical

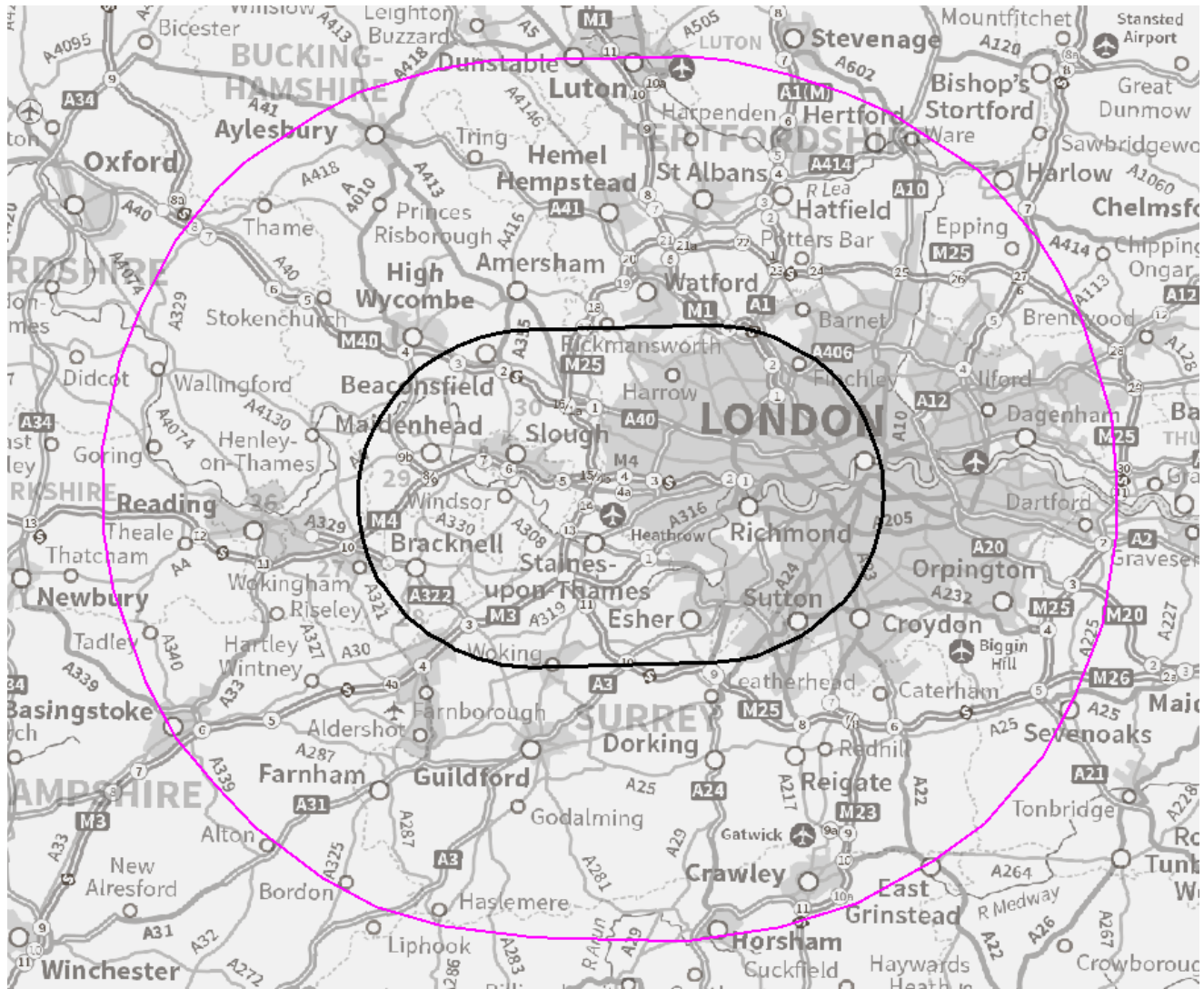
Background



Heathrow  
Operations  
Handbook



# WHO WE WILL CONSULT



**Outer ring** based on furthest possible reach of routes to 7000ft agl

**Inner ring** based on estimate of max extent of LOAEL

**INNER RING**  
(letters, leaflets & adverts)  
**OUTER RING**  
(adverts)

## *HOW WE WILL CONSULT*

We will use a range of methods to communicate and engage including:

- A dedicated consultation website
- Public exhibitions where our consultation documents will be available and members of our team on hand to answer questions;
- Document inspection locations (e.g. civic buildings) where reference copies of our documents will be available to view;
- A community phonenumber.



# TRANSPARENT AND CLEAR CONSULTATION MATERIAL

Clear information to support local people to understand potential effects

Enough information to ensure people can take part and contribute



**Main Consultation Documents**

Audio and visual tools to help people understand the information



Plain English, jargon-free, using visuals and graphics

Clear signposting to location of more detailed information



# PUBLIC EXHIBITIONS

District/Borough Council	Location
Barnet	Brent Cross
Bracknell Forest	Bracknell
Camden	Camden Town
Ealing	Ealing
Ealing	Greenford
Elmbridge	Esher
Elmbridge	Weybridge
Epsom and Ewell	Ewell
Hammersmith & Fulham	Hammersmith
Harrow Council	Harrow
Hillingdon	Harmondsworth
Hillingdon	Hayes
Hillingdon	Hayes End
Hillingdon	Longford
Hounslow	Brentford
Hounslow	Hounslow
Hounslow	Feltham

District/Borough Council	Location
Lambeth/ Southwark	Lambeth
Merton	Wimbledon
Richmond Upon Thames	Richmond
Richmond Upon Thames	Twickenham
Runnymede	Englefield Green
Slough	Colnbrook
Slough	Slough
South Bucks	Beaconsfield
South Bucks	Richings Park
Spelthorne	Ashford
Spelthorne	Stanwell
Surrey Heath	Westend
Wandsworth	Putney
Windsor & Maidenhead	Ascot
Windsor & Maidenhead	Maidenhead
Windsor & Maidenhead	Windsor
Woking	Woking

Subject to change

## *WHAT ARE WE DOING WITH THE CONSULTATION RESPONSES?*

- We will develop our design principles for the CAP1616 gateway using the feedback from Consultation 1
- We will use the number of responses as an indicator of local preference rather than a sole reason for adopting different priorities: a new and relevant argument could influence our direction, whether it is raised by one person or a thousand
- All of our analysis will be documented in a consultation feedback report which we will publish and share with the Civil Aviation Authority (CAA) as part of the airspace change process

## *WHAT ARE WE DOING WITH THE DESIGN PRINCIPLES?*

- The consultation output will enable us to define our Airspace Strategy, which will set out our approach to all future airspace changes
  - This document will be published on our website
- The design principles will shape the design process and will be used to appraise and compare design options together with other criteria, e.g. the need to run the full schedule

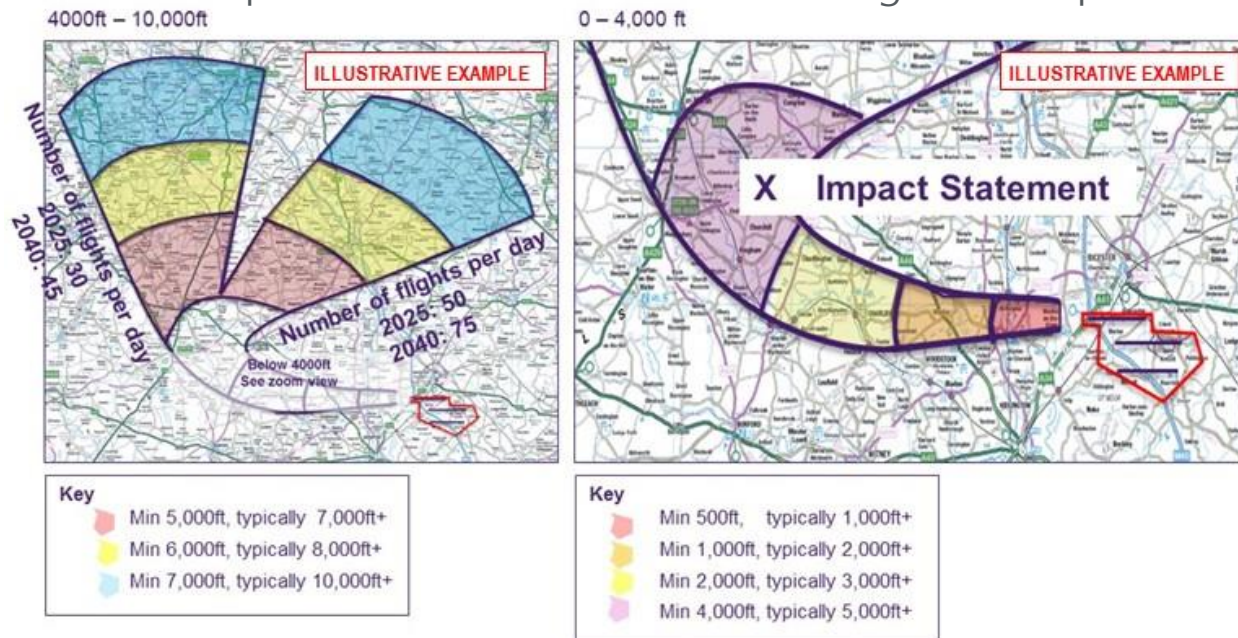


# WE PROPOSE A SECOND AIRSPACE CONSULTATION (VOLUNTARY) APPROXIMATELY 1 YEAR LATER

**Objective:** Seek feedback on the design envelopes and route prototype options before detailed options development.

## Content:

- The design story & decision-making process for discontinued options;
- Design envelopes (specific routes will not have been designed, but may fall anywhere within the bounds of an envelope);
- Initial Environmental Impact Assessments for each design envelope.



*Illustrative example of design envelopes for an airspace option*

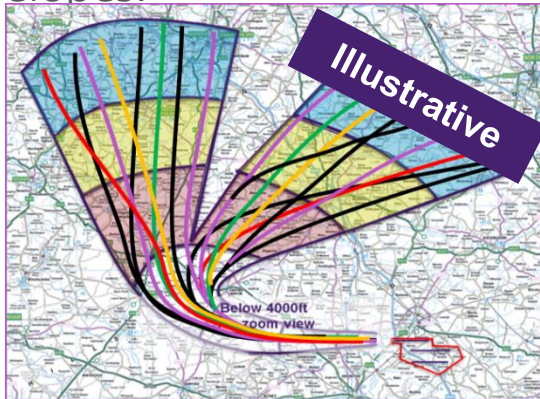


# WE PROPOSE TO UNDERTAKE THE SECOND DCO CONSULTATION (STATUTORY) ALONGSIDE THE SECOND AIRSPACE CONSULTATION

**Objective:** Present PEIR/EA for airspace design snapshot(s)

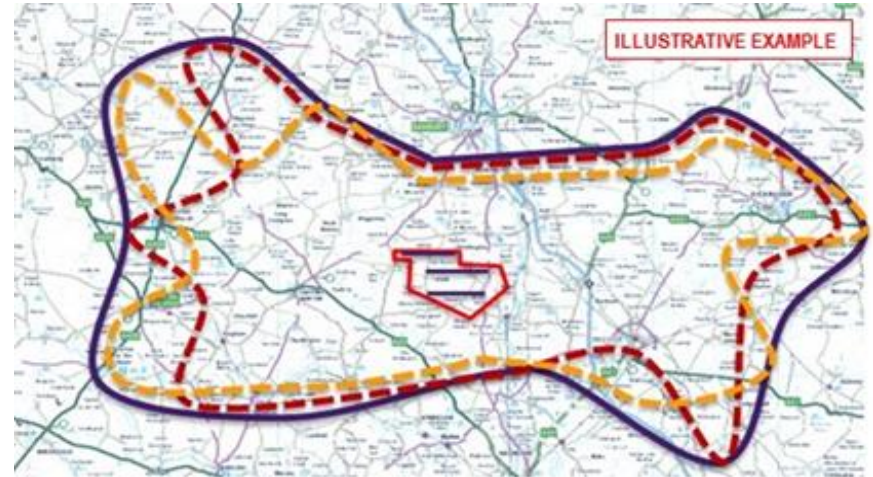
**Content:**

- Range of prototypes including “worst case” and “most likely” at the time of the assessment;
- Range of noise contours for the snapshot;
- Noise envelopes.



- Sharing
- Avoid Population
- Minimise Population
- Balanced Examples

*Illustrative route prototypes*



*Illustrative example of noise contours from the final EIA*

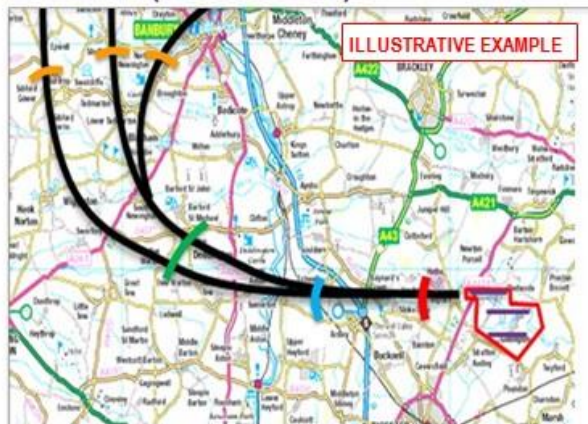
# A THIRD AIRSPACE CONSULTATION (STATUTORY CAP 1616 REQUIREMENT) IS TENTATIVELY PROPOSED FOR 2021

**Objective:** Explain the design options in detail (including route configurations, lines on maps, noise contours, full appraisal)

## Content:

- Detailed maps and route locations for preferred options;
- Noise, emissions and air quality assessments for preferred options;
- Quantitative assessments of the socio-economic costs and benefits.

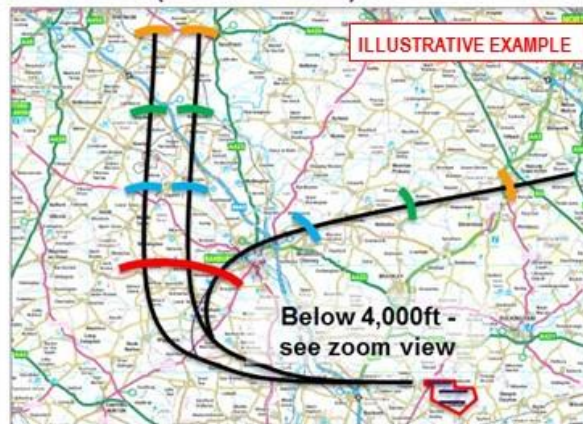
**OPTIONA (below 4000ft.)**



**Key**

- Min 500ft, typically 1,000ft+
- Min 1,000ft, typically 2,000ft+
- Min 2,000ft, typically 3,000ft+
- Min 4,000ft, typically 5,000ft+

**OPTIONA (above 4000ft.)**



**Key**

- Min 4,000ft, typically 5,000ft+
- Min 5,000ft, typically 7,000ft+
- Min 6,000ft, typically 8,000ft+
- Min 7,000ft, typically 10,000ft+

*Illustrative route configurations for design options in the ACP consultation*

# *SUMMARY*

# *SUMMARY OF INFORMATION PROVIDED AND GUIDANCE QUESTIONS*

- Statement of Need
- Good Design Process
- Initial Operational Impact
- Initial Environmental Assessment
- Design, Optioneering and Appraisal
- Stakeholder Engagement
- Consultation Plan
  
- From CAA we require:
  - Agree scale of the airspace change
  - Seek endorsement of our approach to stakeholder engagement on design principles
  - Seek guidance on how the CAA will evaluate our outputs
  - Agree date for the Gateway Assessment Meeting for DEFINE

## *NEXT STEPS*

### CAA

- Assess and publish the Statement of Need
- Publish the determination
- Publish the minutes

### HAL

- Write minutes within a week and submit to CAA
- Write to CAA confirming whether or not the ACP will proceed
- Undertake Step 1B through voluntary consultation

# Heathrow

Building for the future