



Applying Environment & Sustainability to Airport Charges

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12.01.2015

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Agenda

Welcome

- Introductions
- Purpose of today's session
- Activity timeline

Andy Garner

Context

- Why good environmental performance is important
- Heathrow's environmental objectives

Matt Gorman

Noise

- Heathrow's obligations
- International standards for measuring noise
- How Heathrow charges

Rick Norman

Air Quality

- Heathrow's obligations
- International standards for measuring air quality
- How Heathrow charges

Rick Norman

Questions

Matt Gorman

Summary and Next steps

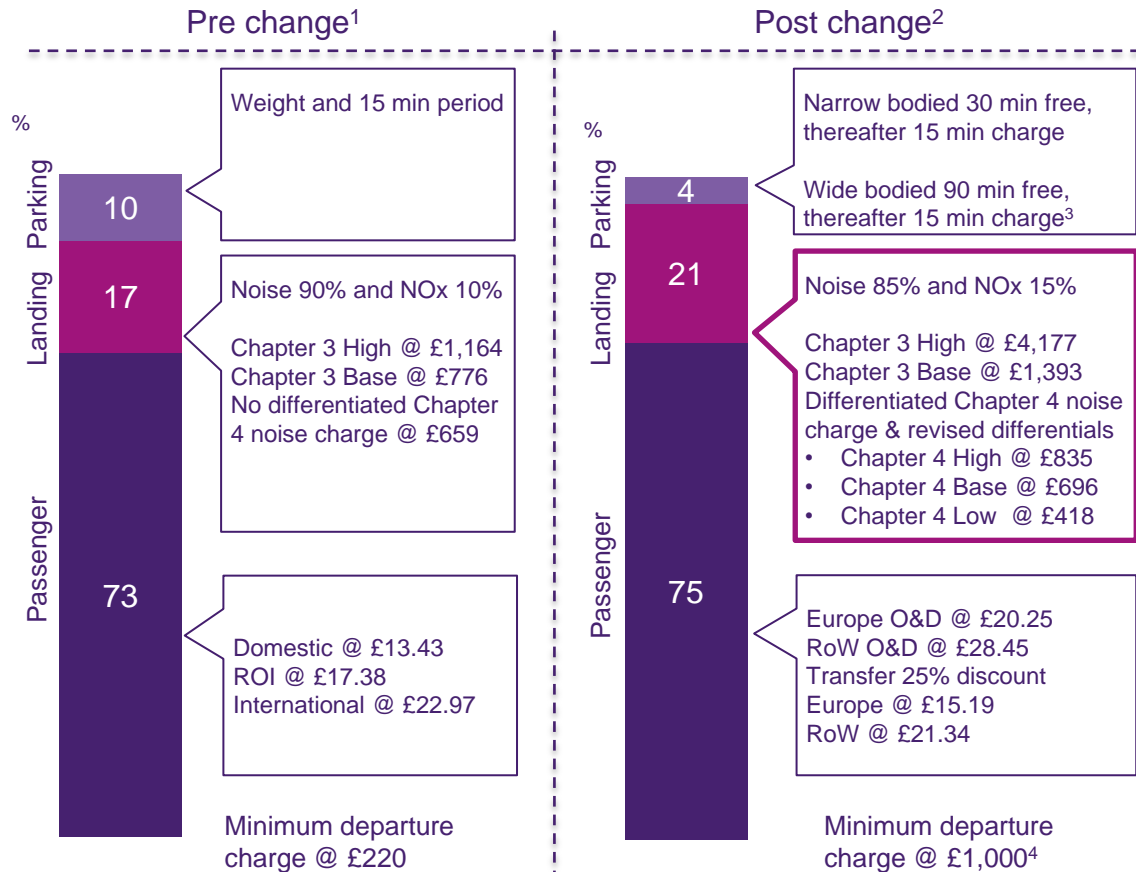
Andy Garner

Purpose of today's session

- Following on from the request from airlines at the 27th November 2014 engagement session on the future structure of airport charges
- Provide a 'teach-in' on environment and sustainability; why it is important and how this currently relates to airport charges
- *This is an information session*

27th November 2014 – Airline Engagement

Refresher: Landing Charges 21% with 85/15 split



1) 2010/11 actual charge
2) 2010/11 charges based on new structure

How this session fits into the overall process to review the structure of charges

The process to review the structure of charges is made up of two phases

1 2 engagement sessions – will help inform Heathrow’s proposal for consultation

a 1st engagement session (27 Nov 2014)

b 2nd engagement session (20 Jan 2015)

and

Environmental session (12 Jan 2015)

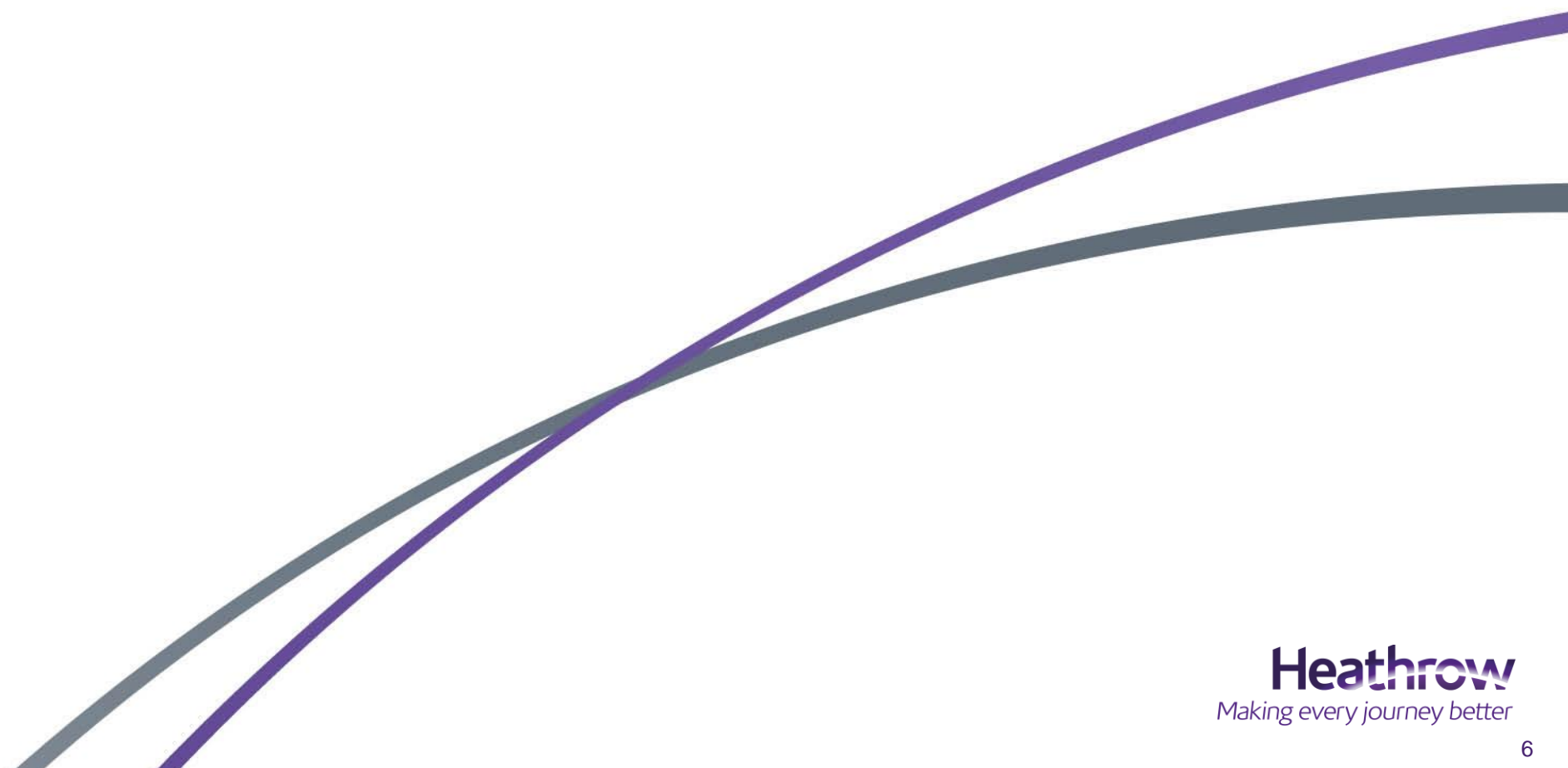
2 Formal consultation process

April 2015 to July 2015

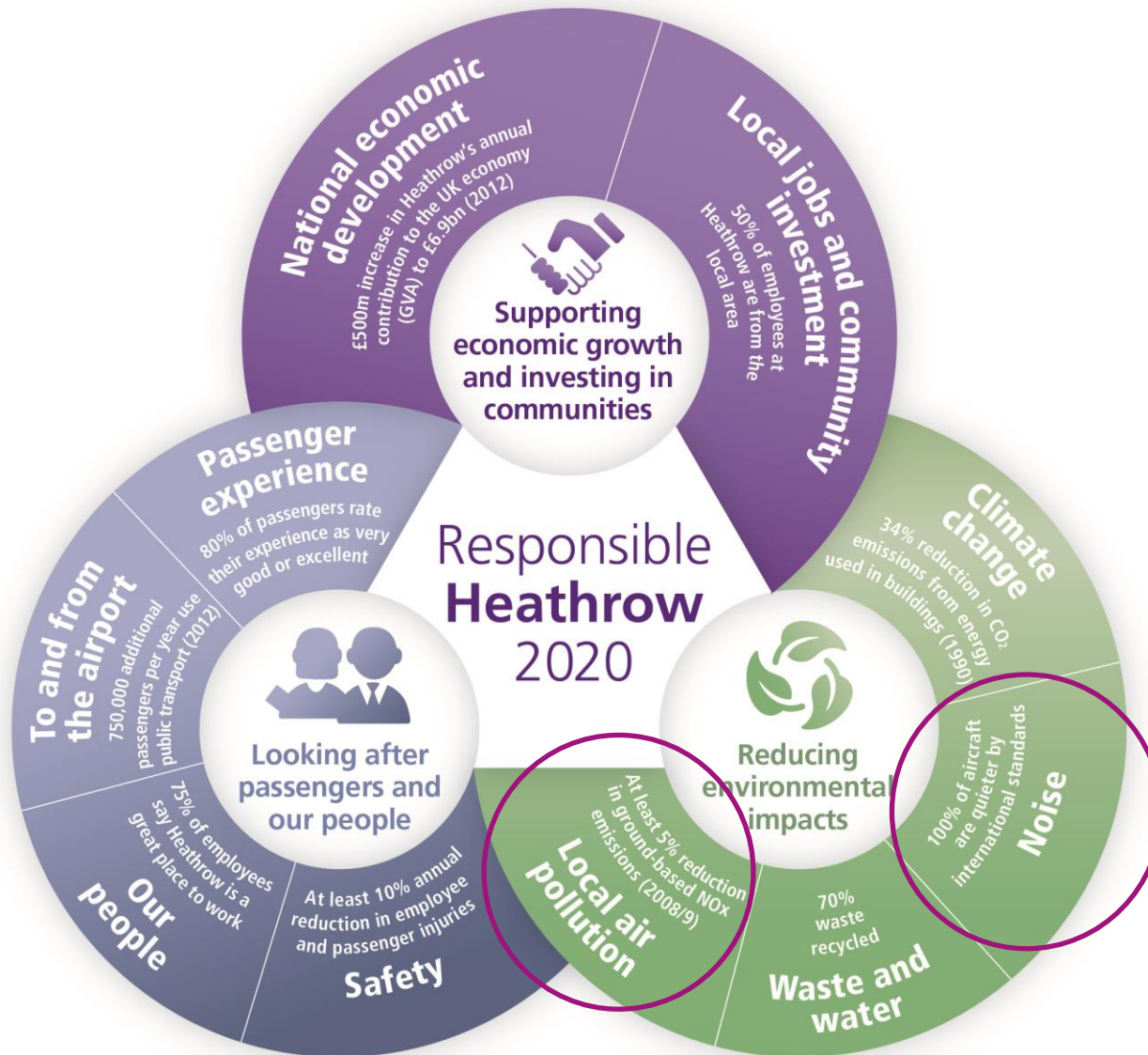
Feed into Heathrow’s annual price consultation – start in August 2015
(any structural changes implemented on 1 January 2016)

This is an educational session to help inform understanding of environmental aspects of airport charges

Context -
Matt Gorman

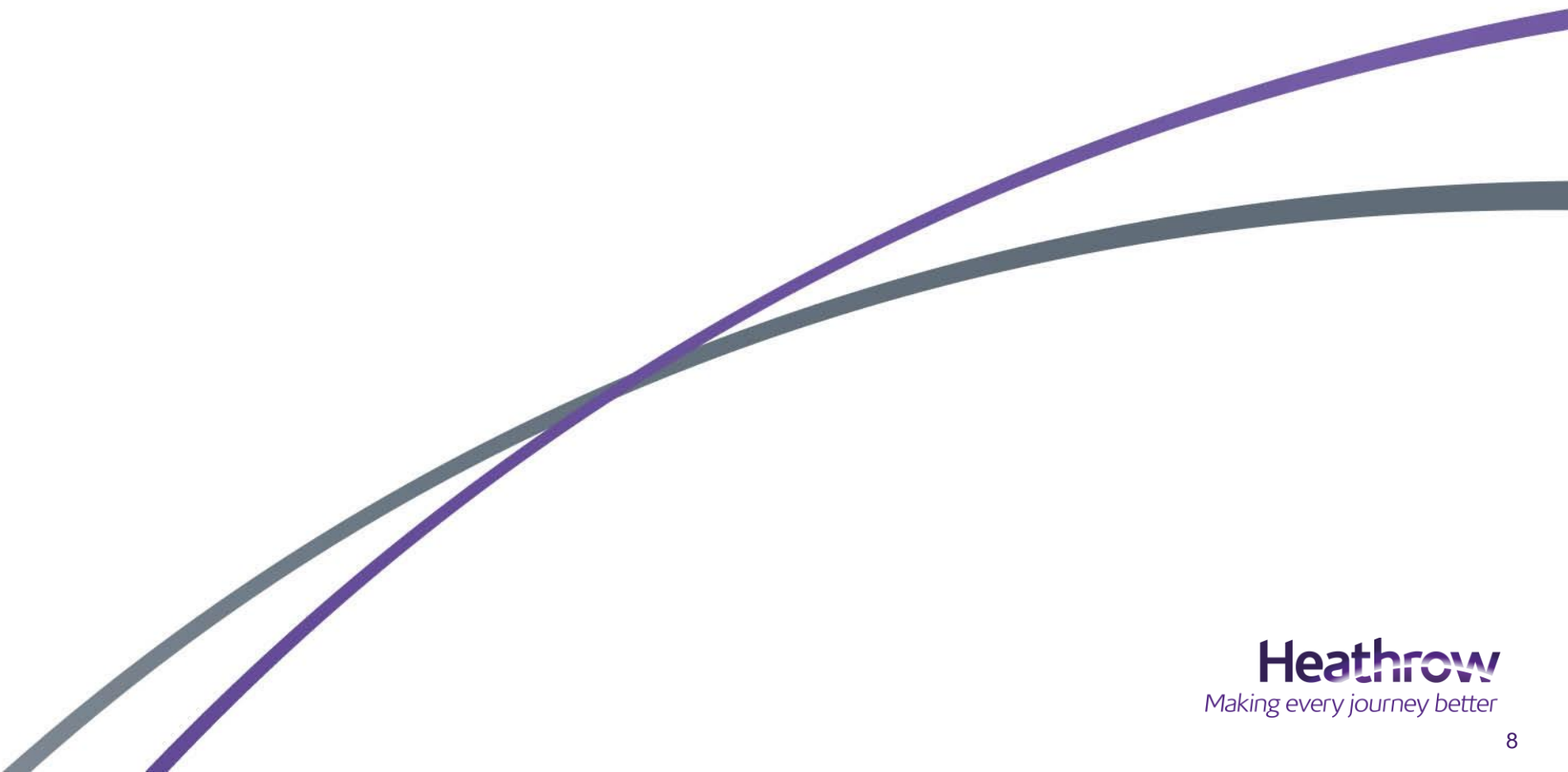


What does a responsible Heathrow mean?



Current key environmental issues for Heathrow addressed through airport charges

Noise



Heathrow has clear obligations on noise

- Heathrow is a “designated” airport with regard to noise which means the Government sets noise policy.
- The Governments overall objective on noise is *to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise.*
- In order to comply with EU law Heathrow is required to submit a Noise Action Plan to the Government for adoption at least every 5 years.



Civil Aviation Act 1982

CHAPTER 16



Aviation Policy Framework

Presented to Parliament by the
Secretary of State for Transport
by Command of Her Majesty
March 2013

www.defra.gov.uk

Directive 2002/49/EC

Guidance for Airport Operators to produce
airport noise action plans under the terms
of the Environmental Noise (England)
Regulations 2006 (as amended)

March 2009



Environmental Noise Directive
Noise Action Plan 2013-2018

The action plan – Revised draft submitted in January 2014
(approved and approved by the Secretary of State for the Environment, Food and Rural Affairs – August 2014)

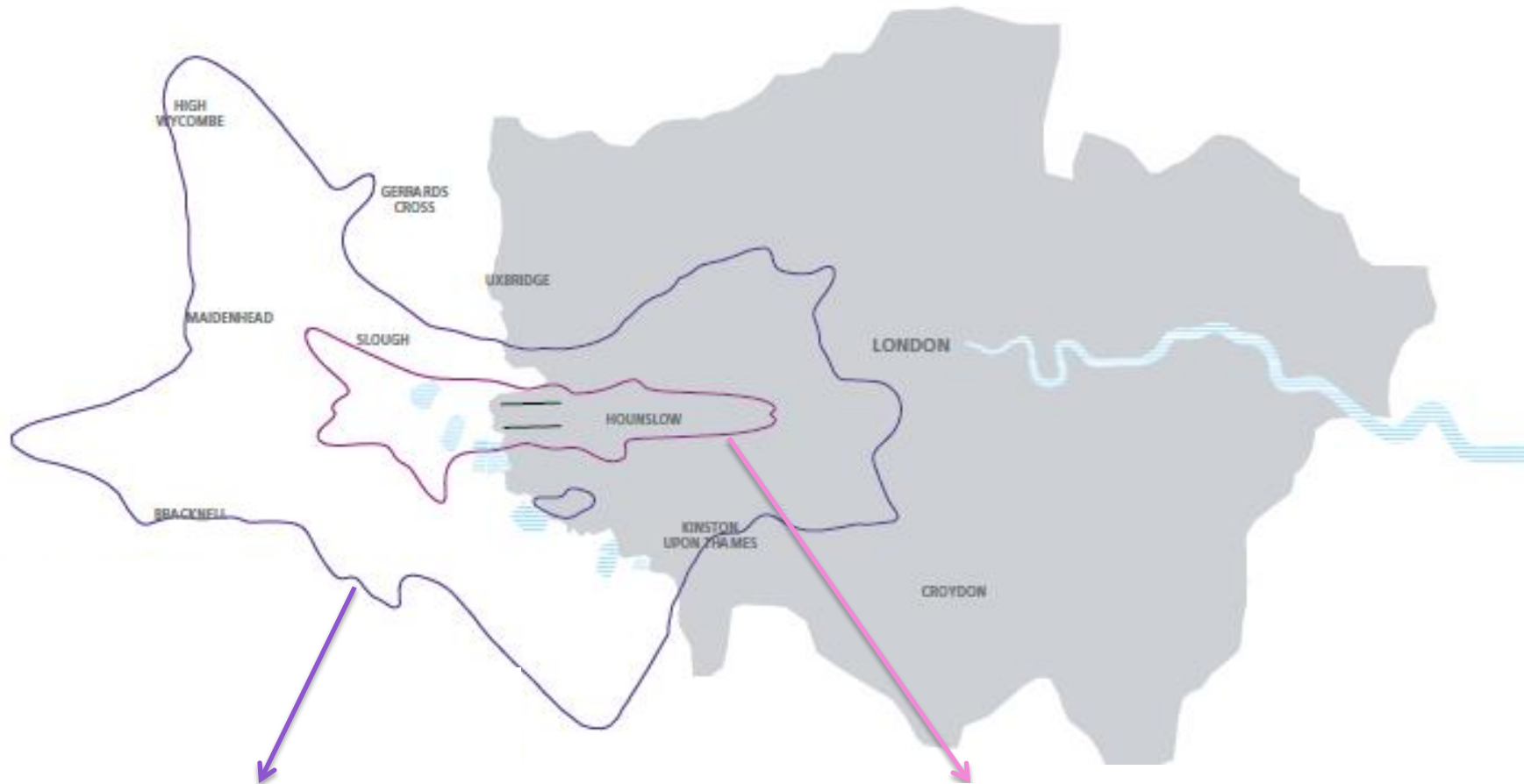
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Heathrow takes noise pollution seriously

Average noise levels around Heathrow have reduced significantly over the last four decades



1974 – area exposed to noise >57db;
c. 2 million people

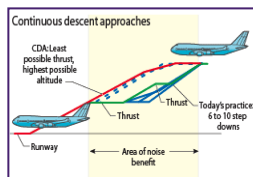
2011 – area exposed to noise >57dB;
c. 240,000 people. A fall of nearly 90%, even
with nearly double the air traffic

Our “Blueprint for Noise Reduction” – a ten point plan for 2015

Quieter technology



Quieter procedures



Land-use & mitigation



Operating restrictions



1. Voluntary phase-out of noisiest planes

2. Fitting quiet technology to A320s

3. Campaign on “quiet approach”

4. Campaign on “low drag”

5. Proof of concept – step approaches

6. Improve night-time rotation

7. School double-glazing complete by April 15

Now Feb 15

8. More adobe buildings in local primaries

5 on track for 2014

9. New levels of noise fines

Implemented from end Oct

10. Focus on late-running departures

First flight 16 Dec

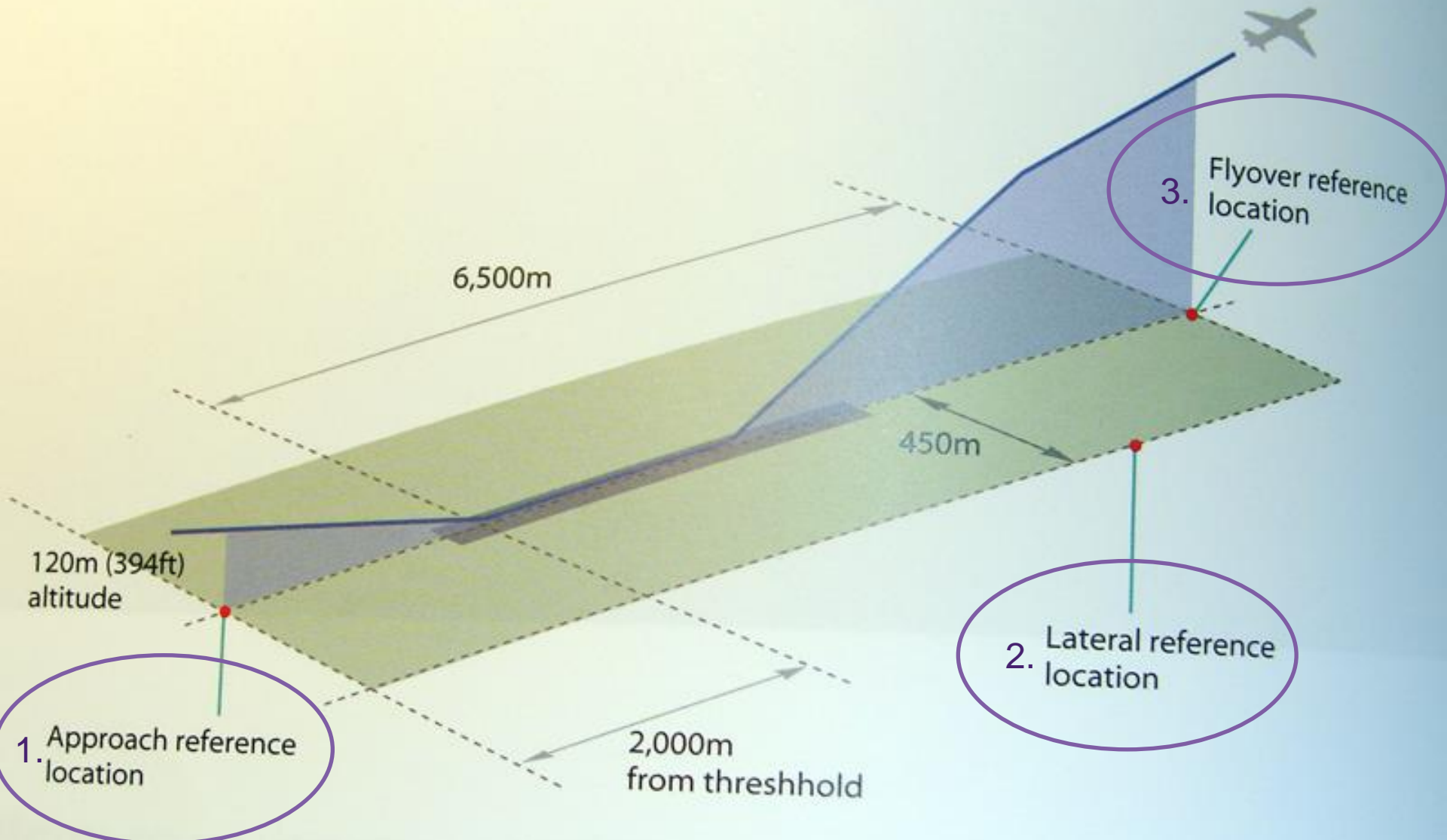
Target to be agreed with NATS by end 2014

Actions 1, 2, 3, 4, 10

Letters sent to CEOs end Nov 2014

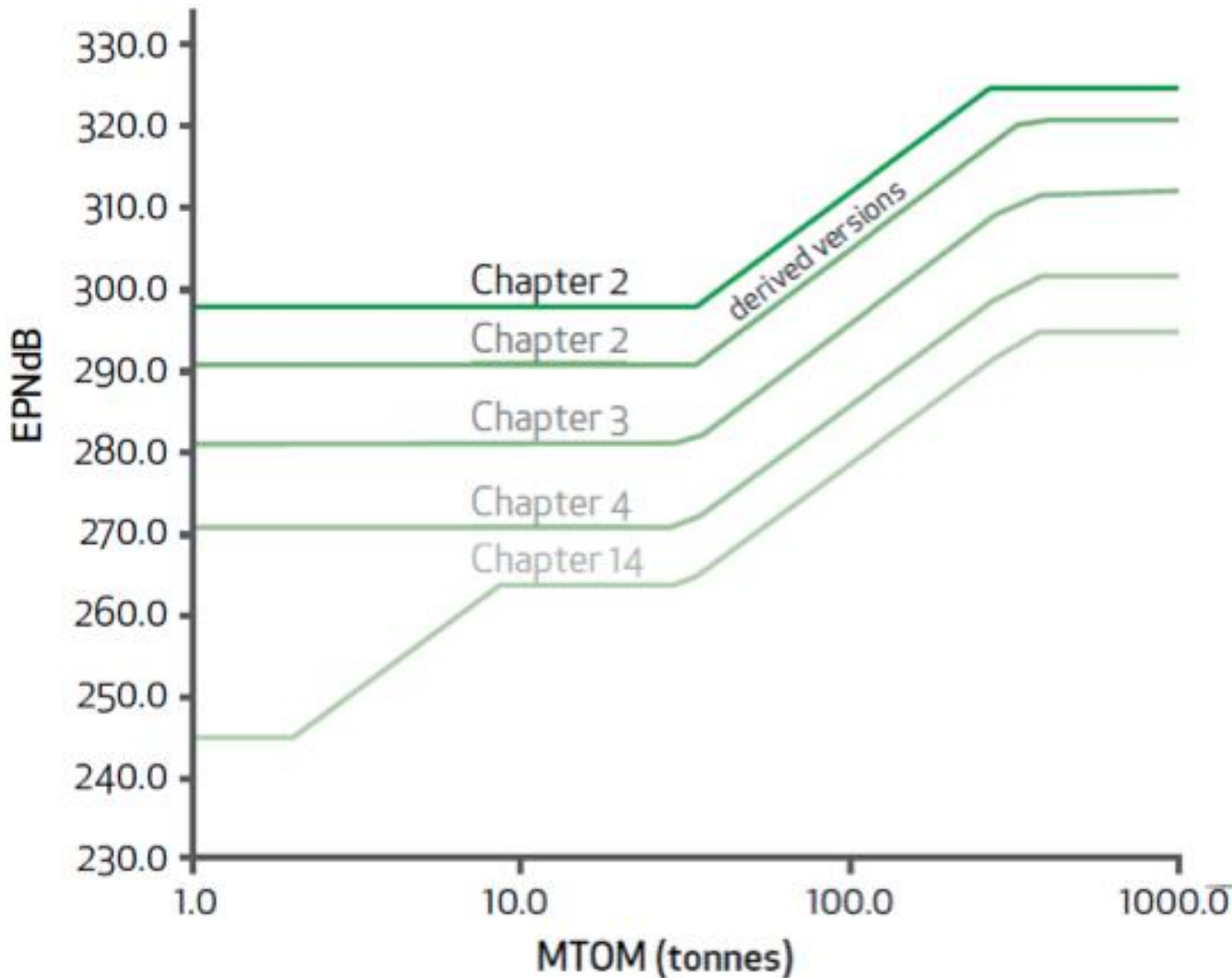
Heathrow uses international standards for measuring noise (ICAO)

Cumulative values are derived from the arithmetic sum of the three certification points and are used to define the Chapter Standard.



How the ICAO aircraft noise certification process works

Which Chapter Standard?



*Categories should be of equal width, typically 5 EPNdB, or narrower, to ensure adequate differentiation of noise performance – CAA Guidance

*EPNdB – Effective Perceived Noise decibels (noise levels)

*MTOM – Maximum Take-off Mass

ICAO aircraft noise certification process

New Chapter 14 standard

- Agreed on February 2013 as the fourth ICAO noise standard for large transport aircraft.
- Increase in stringency of 7 EPNdB (cumulative level) relative to current Chapter 4 cumulative levels
- First standard that incorporates even more stringent limit criteria for aircraft with a maximum certificated take-off mass of less than 8,618kg.
- Supplementary condition of not less than 1.0dB below Chapter 3 limits at each certification point.
- Will apply to new aircraft types submitted for certification on or after 31st December 2017.

The Heathrow charging process

Noise
Certificate



All Up
Weight
Return

Step 1: Certificated Maximum Take Off Weight + number of engines = **limit values for each measuring point.**

Step 2: (Lateral limit – certificated lateral noise level) + (Flyover limit – certificated flyover noise level) + (Approach Limit - certificated approach noise level) = **Cumulative Margin**



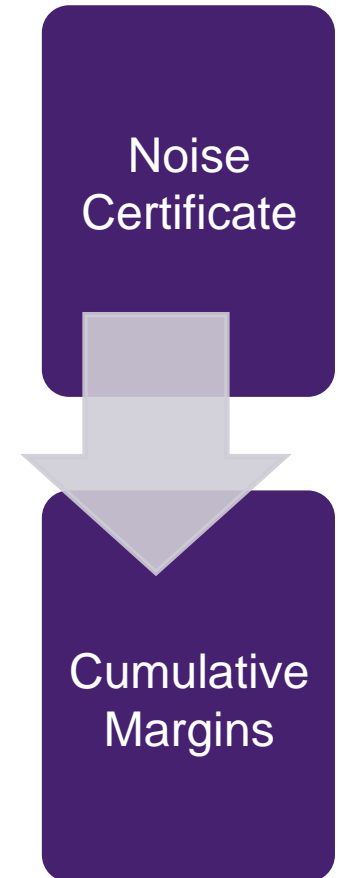
Invoice

Cumulative Margin

<-5 = Chapter 3 High
<-10= Chapter 3 Base
<-15= Chapter 4 High
<-20= Chapter 4 Base
≥-20= Chapter 4 Low

Example: Why can the same aircraft fall into different categories? Calculating the cumulative margin: noise & weight

9. Μέγιστη μάζα απογείωσης (kg): Maximum Take-Off Mass (kg): 77.000		10. Μέγιστη μάζα προσγείωσης (kg): (*) Maximum Landing Mass (kg): (*) 64.500		11. Προδιαγραφές θορύβου: Noise Certification Standard: ICAO ANNEX 16/I CH.4 ΔΟΠΑ ΠΑΡ. 16/1 ΚΕΦ.4	
12. Πρόσθετες μετατροπές που ενσωματώθηκαν με στόχο τη συμμόρφωση με τις ισχύουσες προδιαγραφές πιστοποίησης θορύβου: Additional modifications incorporated for the purpose of compliance with the applicable noise certification standards: Technical Adaptation:TA-SEUYB-2011-630275-1 ADVANCE EMBODIMENT OF SB 00-1248 FOR WV CHANGE FROM WV008 (MTOW 73.5T) TO WV010 (MTOW 77T)					
13. Επίπεδο πλευρικού θορύβου / θορύβου μέγιστης ισχύος: (*) Lateral/Full-Power Noise Level: (*) 91,3 EPNdB	14. Επίπεδο θορύβου προσέγγισης: (*) Approach Noise Level: (*) 94,3 EPNdB	15. Επίπεδο θορύβου υπέρπτησης: (*) Flyover Noise Level: (*) 84,6 EPNdB	16. Επίπεδο θορύβου πτήσης υπεράνω: (*) Overflight Noise Level: (*) N/A	17. Επίπεδο θορύβου κατά την απογείωση: (*) Take-off Noise Level: (*) N/A	



Aircraft Type	Engine Type	No. Engines	MTOW	Cumulative Margin	Charging Category
A319	V2522-A5	2	64000	20.1	Chapter 4 Low
	V2522-A5	2	66000	19.6	Chapter 4 Base
A320	CFM56-5B4/P	2	73500	12.6	Chapter 4 High
	V2527-A5	2	75500	20.0	Chapter 4 Low

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Calculation of Noise Charge

Illustrative A320 noise charges

Cumulative Margin
<-5 = Chapter 3 High
<-10= Chapter 3 Base
<-15= Chapter 4 High
<-20= Chapter 4 Base
≥-20= Chapter 4 Low

Step 1. Noise Certificate Information

- MTOW = 77,000
- Certified Noise Levels = 91.3L, 94.3A, 84.6F

Step 1a. ICAO Set Standards Based on MTOW and # of Engines

- Set Noise Limits (ICAO) = 96.9L, 100.7A, 91.7F

Step 2

- $(L_{SNL}-L_{CNL})+(A_{SNL}-A_{CNL})+(F_{SNL}-F_{CNL})$
- $(96.9-91.3)+(100.7-94.3)+(91.7-84.6)$
- Cumulative Margin = 19.1
- 19.1 = Chapter 4 Base

- Ch. 4 Base Noise Charge = £1,430.35

Calculation of Noise Charge

Illustrative A380 noise charges

Cumulative Margin
<-5 = Chapter 3 High
<-10= Chapter 3 Base
<-15= Chapter 4 High
<-20= Chapter 4 Base
≥-20= Chapter 4 Low

Step 1. Noise Certificate Information

- MTOW = 569,000
- Certified Noise Levels = 94.2L, 98.0A, 95.6F

Step 1a. ICAO Set Standards Based on MTOW and # of Engines

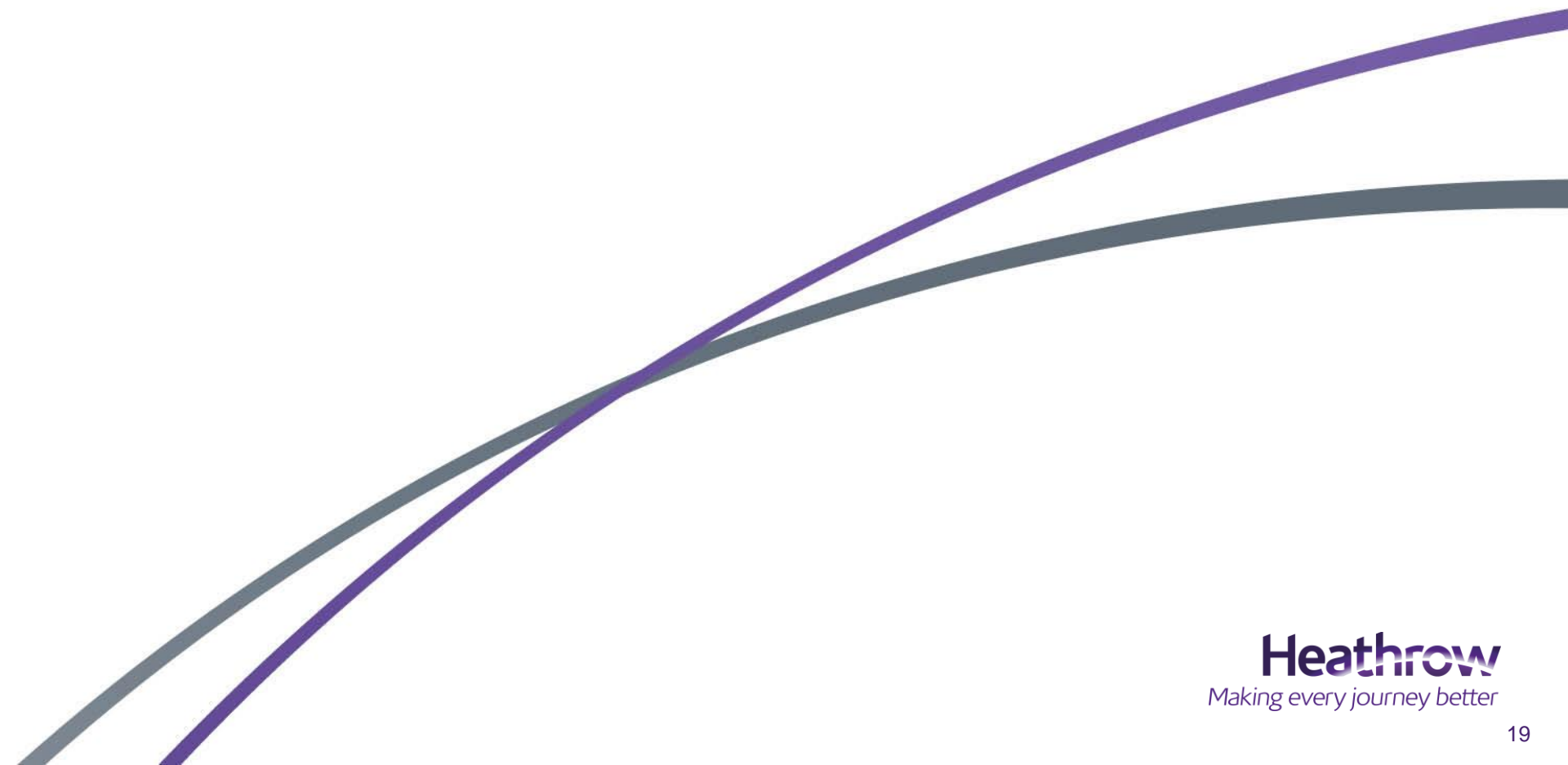
- Set Noise Limits (ICAO) = 103.0L, 105.0A, 106.0F

Step 2

- $(L_{SNL}-L_{CNL})+(A_{SNL}-A_{CNL})+(F_{SNL}-F_{CNL})$
- $(103-94.2)+(105-98)+(106-95.6)$
- Cumulative Margin = 26.2
- 26.2 = Chapter 4 Low

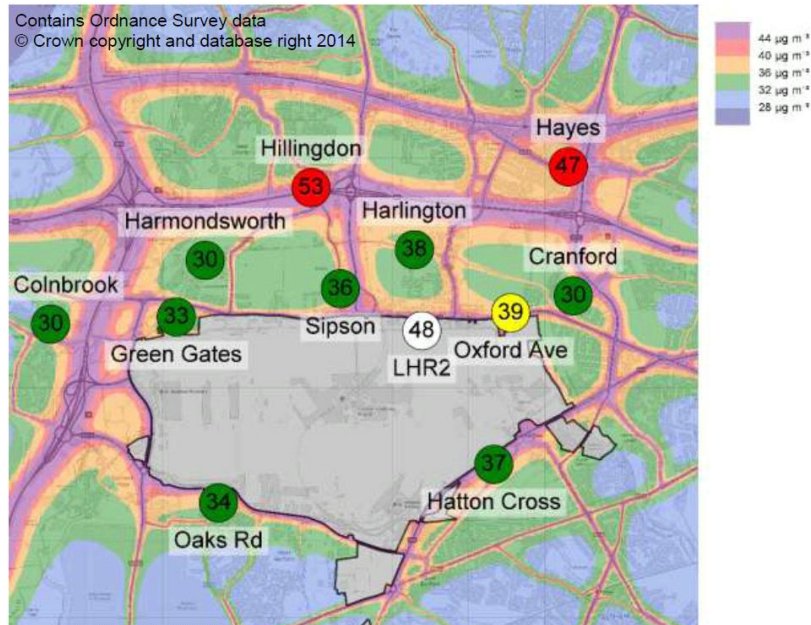
- Ch. 4 Base Noise Charge = £836.20

Air Quality



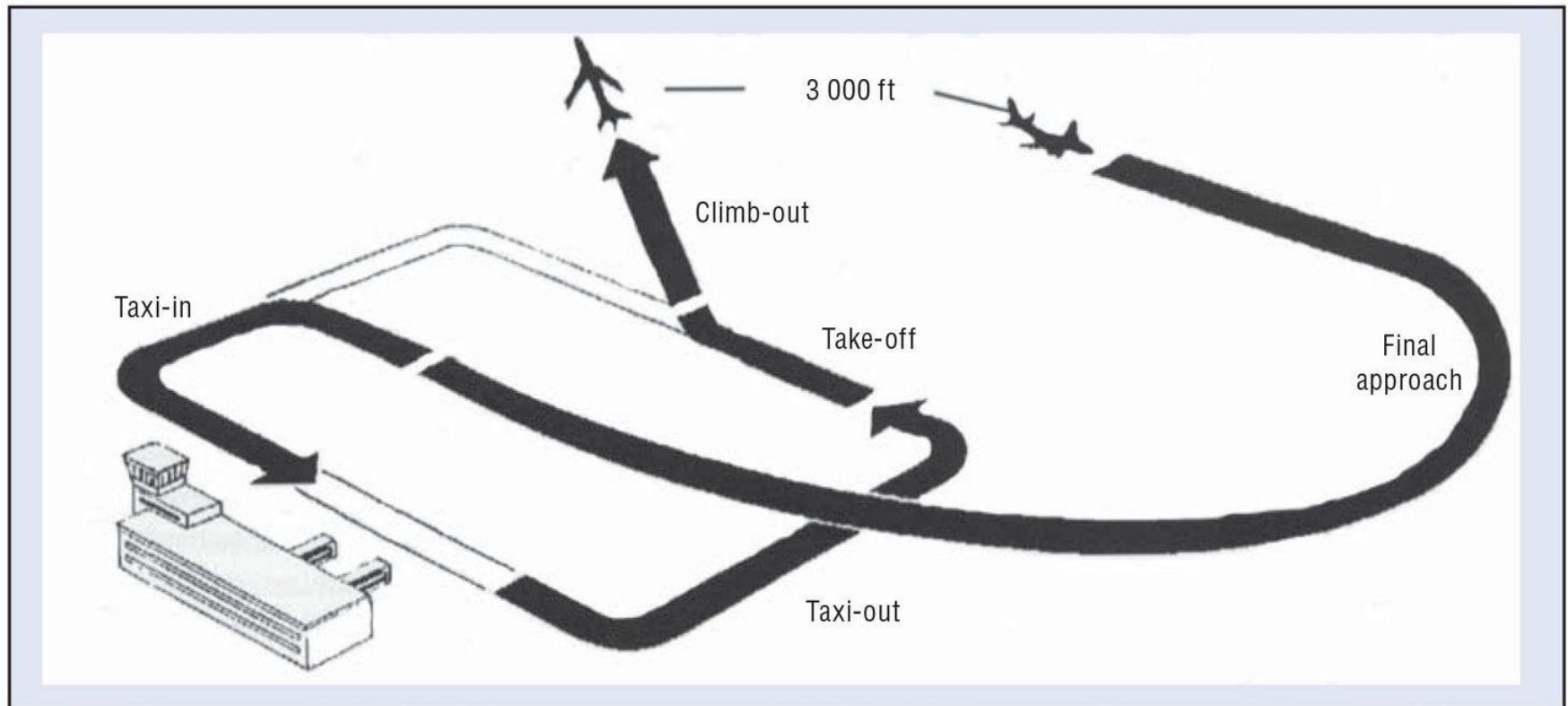
Heathrow has clear obligations on air quality

- EU Law established local air quality limit values
- Member States are required to identify areas where these limits are not met and submit action plans to move them to compliance.
- Heathrow is within an Air Quality Management Area and under our Terminal 5 Planning Permission have a responsibility to produce an Air Quality Action Plan



Heathrow uses international standards for emissions certification Based on NOx emissions

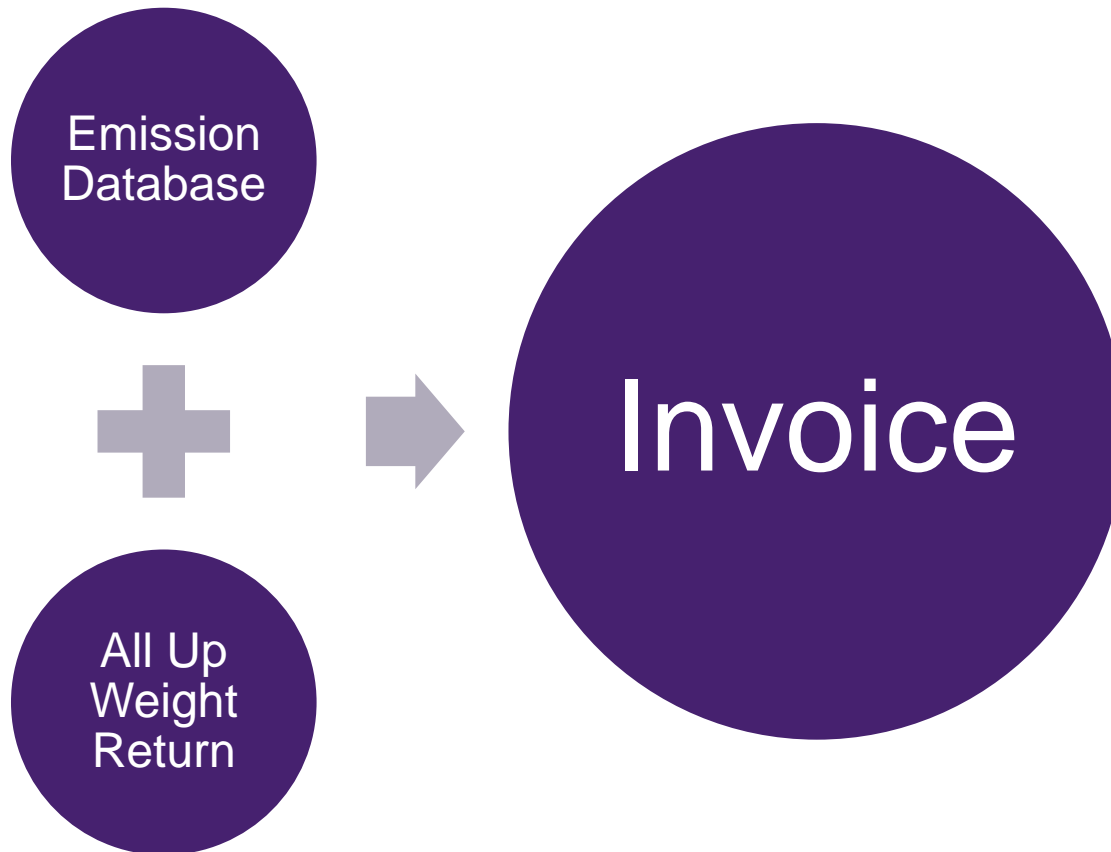
- The certification process is based on the Landing Take-off (LTO) cycle



The Heathrow charging process

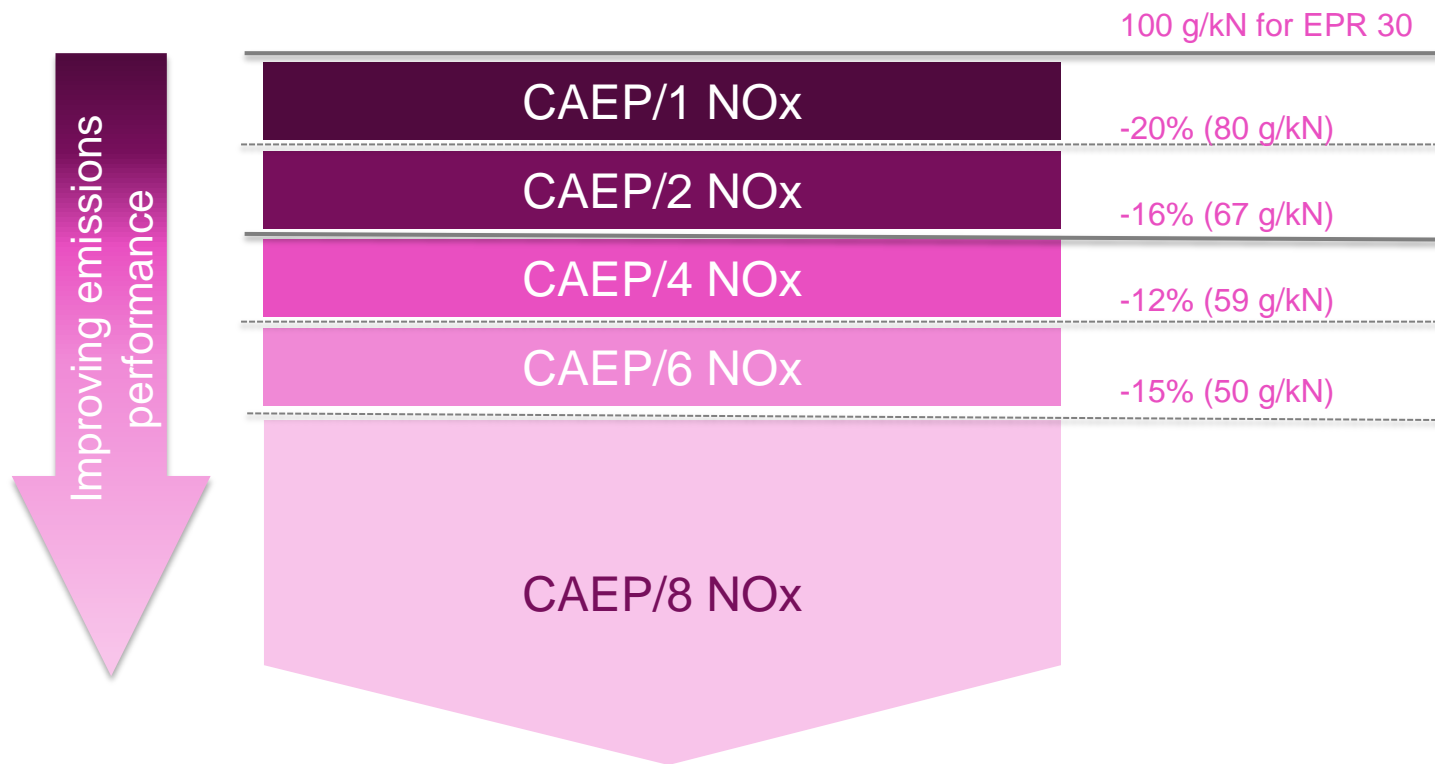
A NOx emission charge is payable on each landing by a fixed wing aircraft over 8,618kg. The charge per kg of NOx is calculated on the Aircraft's Ascertained NOx Emission.

Aircraft's Ascertained NOx Emission means the product of the Engine NOx Emission as set out in the ICAO Emission Database and based on the number of engines on the aircraft.



CAEP NOx standard banding system

- Engine emissions standards are defined according to upper limits on NOx emissions of rated engine thrust for Engine Pressure Ratio (EPR) 30.



To note... potentially new international standards are being introduced for carbon emissions certification

Calculation of NOx Charge

Illustrative A320 NOx charges

Step 1. Noise Certificate Information

- Engine Type V2527-A5, UID 11A003

Step 1a. EASA Emissions Database

- NOx Total Mass = 5.382 kg per engine

Step 2

- $\text{NOx}_{\text{KG}} \times E_{\text{N}} \times \text{Unit}_{\text{£}}$
- $5.382 \times 2 \times 8.57$

- NOx Charge = £92.25

Calculation of NOx Charge

Illustrative A380 NOx charges

Step 1. Noise Certificate Information

- Engine Type Trent 970-84, UID 8RR046

Step 1a. EASA Emissions Database

- NOx Total Mass = 16.555 kg per engine

Step 2

- $\text{NOx}_{\text{KG}} \times E_{\text{N}} \times \text{Unit}_{\text{£}}$
- $16.555 \times 4 \times 8.57$

- NOx Charge = £567.51

Summary

- Heathrow has a responsibility to reduce both its noise and local air quality impacts. We have made good progress to date but this will need to continue into the future.
- The ICAO certification process underpins our approach to incentivising a cleaner and quieter fleet.
- The noise certificate contains the critical information needed for the All Up Weight Return to be accurately completed and enable the correct charges to be applied.

Questions

Next Steps - Consultation process

	Date	Milestone	
Engagement sessions	Bilaterals	27 November 2014	1 st engagement session
		18 December 2014	Further feedback (bilateral sessions or written)
		20 January 2015	2 nd engagement session
	April 2015 to July 2015	Formal consultation	
	August 2015 to October 2015	Annual price consultation	
	1 January 2016	Structure and annual price decision effective	