

Agenda Item:	Reference: HACC.513
Date: January 8 2008	
Adding Capacity at Heathrow Airport	

Report by the Technical Adviser

1. Copies of the Government's consultation documents on the proposals for extension of Heathrow Airport were distributed to members of the Committee and to their Deputies at the beginning of December 2007. At the meeting of the Committee on 5 December, it was agreed to defer consideration and to hold a Special Meeting on 18 January to discuss the proposals as a preliminary to the preparation of a response. Responses are required by 27 February 2008.
2. The main consultation documents which Members have been able to study are:
 - Additional Capacity at Heathrow Airport – Consultation Document
 - Additional Capacity at Heathrow Airport - Summary
3. In addition to these main documents, there are fourteen other supporting documents with reports of the work done to examine the implications of the Government's proposals. The areas of work which these cover are:
 - National Air Traffic Services (NATS)-
Runway 3 – Summary of 27 Options Analysis
Runway 3 – Runway 3 Study
Runway 3 – Capacity
Heathrow Mixed-Mode – Scenarios
Heathrow Mixed-Mode – Concept of Operations; Maximum Capacity (Baseline) Scenario
Heathrow Mixed-Mode – Capacity
 - BAA Heathrow
Project for the Sustainable Development of Heathrow. Surface Access Report
 - CAA ECRD Report 0705
Revised Future Aircraft Noise Exposure Estimates for Heathrow Airport
 - AEA Energy and Environment
Emissions Methodology for Future LHR Scenarios
Revised Emissions Methodology for Heathrow – Base Year 2002
Heathrow Airport Emission Summaries
 - Cambridge Environmental Research Consultants
Air Quality Studies for Heathrow: Base Case, Segregated Mode, Mixed Mode and Third Runway Scenarios modelled using ADMS-Airport
 - Department for Transport (prepared by ATKINS)
PSDH – Demonstrating Confidence in the PSDH Air Quality Work
PSDH - Population Exposure to Air Pollution

4. The reports, which extend to some 1300 pages in total, contain much information which will be of interest to Members but which it is quite impracticable to try to summarise as there is so much of it and because of its often technical nature.
5. It is proposed therefore to extract some of the more obvious information of interest to Members from these documents and to attach it to this report as appendices, each of which will deal with the separate subjects or sections, of the published reports. This should assist Members in their discussion of the proposals on 18 January but will likely leave unanswered a number of questions. The record of that discussion will be used as a basis for the preparation of a draft response to the consultation document which can then be discussed at the meeting of the Committee scheduled to take place on 30 January.
6. The Minister for Aviation, Mr Jim Fitzpatrick MP, has accepted an invitation to attend the meeting of 30 January to discuss the Government's proposals and the Committee's response will be able then to take account of matters which come up in that discussion.
7. The consultation documents pose a number of questions which Government is looking for replies to. There is a Questionnaire in the Summary document but this is aimed at individuals responses and is not suitable for consideration on the corporate basis which should be the HACC concern
8. The list of questions which is asked at intervals throughout the main consultation document is that which should be used by HACC in discussion and these are listed in Appendix A to assist the Committee in debating all of them in preparing a response. They are also listed in Chapter 4 of the Consultation document but with comments from Government as to its views on each.
9. The Appendices to this report are:
 - A – Questions Posed
 - B – Adding Capacity at Heathrow Airport – the Consultation document
 - C – Revised Future Aircraft Noise Exposure
 - D – Airspace – NATS Heathrow Airport Runways Study
 - E – PSDH Surface Access Report

APPENDIX A

QUESTIONS POSED IN THE CONSULTATION DOCUMENT

A summary of the eleven questions posed in the consultation document together with some short comments outlining the Government's views is set out in Chapter 4 on page 114 of the consultation document. Below is a short version of that summary.

1. Do you agree or disagree with the proposal that a third runway at Heathrow, if built, should be supported by associated passenger terminal facilities? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 44)
2. Do you agree or disagree with the Government's view on the continuing validity of the environmental conditions? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 49)
3. Do you agree or disagree with the Government's view that a third runway could be added whilst meeting air quality limits, without the need for further measures? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 67)
4. Do you agree or disagree with the Government's view that adding a third runway is achievable within the noise contour limit of 127 sq km at the indicated levels of air traffic? What are your reasons? Are there any significant considerations you need to be taken into account/ If so, what are they? (page 71)
5. Do you agree or disagree with the Government's view that mixed mode operations could be introduced within the noise limits set out in the White Paper? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 87)
6. To what extent would you support the introduction of mixed mode operations:
 - (a) throughout the day
 - (b) Limited to specific hours (if so, would you support mixed mode between 0600 hours and 1200 hours? Some other period? (please specify)
 - (c) Within the current planning cap? (i.e. with no extra capacity overall)(page 88)
7. Do you agree or disagree with the Government's view that full mixed mode operations could be introduced by 2015 and be compatible with compliance with the air quality limits in the vicinity of the airport? What are your reasons? Are there significant considerations you believe need to be taken into account? If so, what are they? (page 91)
8. Do you agree or disagree with the Government's views on retaining westerly preference? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 97)
9. Do you agree or disagree with the Government's proposal to end the Cranford Agreement? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 97)
10. Do you agree or disagree with the Government's views on continuing night time rotation? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 99)

11. Do you agree or disagree with the Government's views on continuing runway alternation in the 0600 to 0700 period? What are your reasons? Are there any significant considerations you believe need to be taken into account? If so, what are they? (page 101)

APPENDIX B

ADDING CAPACITY AT HEATHROW AIRPORT – CONSULTATION DOCUMENT

Chapter 3 – Heathrow in Future: Meeting the Environmental Tests

Part I includes policy support for a short runway now to be 2,200m long rather than the original proposals for one at 2,000m together with a new passenger terminal – Terminal 6 – and changes to the road layout.

Part II deal with Mixed Mode and says that no detailed work had been undertaken at the time of the White Paper (December 2003) to examine the scope for this. This consultation explains how Mixed Mode might work and how it could be implemented, with or without additional air traffic movements, whilst meeting the same environmental conditions.

Part III discusses the merits of ending the “Cranford Agreement” and/or changing “westerly Preference” even if none of the work north of the Bath Road takes place.

This is because consultation and resolution of these questions since they were first proposed has been delayed for a number of years by Government which has resulted in them becoming linked to the emergent Runway 3 proposals in 2003. In practice, the Cranford Agreement would have to be suspended during any period of Mixed Mode operations. But a decision on Westerly Preference is not dependent on any development options.

Part IV presents the results of monitoring of two current noise mitigation measures – night time rotation of easterly/westerly preference and the current trial of runway alternation for arrivals in the 0600 to 0700 period – and asks for views on whether to make the latter permanent – if it is not overtaken by the introduction of Mixed Mode operations.

The earliest date at which a new runway could be in full use has been taken as 2020. The earliest date for Mixed Mode operations on the existing runways is assumed to be 2015.

A further option would involve the use of Mixed Mode operations on the existing runways but within the current movement limit – that is, without increasing the annual number of arrivals and departures.

Page 38 contains Table 3 – Mixed Mode and Runway Options, which gives a concise summary of the options which are being presented with details of each of the Scenario options, number of runways for each of them together with the throughput in terms of air transport movements

Page 41 provides the Indicative map of a Three Runway Airport with road and rail connections

Page 42 contains an Indicative Third Runway layout in 2030

There are several sources of information about the proposals which have been supplied to Members. Firstly, the main consultation document of 238 pages with some quite detailed information in each chapter.

In Chapter 4, page 114, of this there is a Summary of all of the questions which are being asked together with a short explanation of the Government's views about the implications of each of them.

Members may find it helpful to refer instead to the SUMMARY document of the consultation for a rather more informative version of the contents of each of the chapters of the main consultation document.

In addition, there are the appendices to this report which call upon the fourteen supporting reports to the consultation which have not been widely circulated.

APPENDIX C

ERCD REPORT 0705 Revised Future Aircraft Noise Exposure – Estimates for Heathrow Airport. November 2007.

The Executive Summary of this report is attached to this Appendix together with its Conclusions.

The report contains 34 A.4 size maps showing possible noise contours which are forecast to result from the options being proposed by Government. There are also 8 A.3 size maps showing areas for perhaps 20 miles out with the tracks of arriving and departing aircraft for the various scenarios being proposed. These show the forecast details for an average 16 hour summer day and differentiate between westerly and easterly operations. They show:

- average daily arrivals on each incoming route or runway
- average daily departures on each route or runway
- daily range of aircraft on each route or runway
- percentage of all arrivals at the airport on each route
- percentage of all departures from the airport on each route
- days with no arrivals at the airport on each route
- days with no departures from the airport on each route

At this time of writing, it has not been possible to obtain larger scale copies of any of these maps from the authorities involved but an order has been placed with the DfT Publications office in Wetherby for copies of the report of which only a limited number will be available for viewing and distribution at the Committee meeting.

The assessment undertaken by ERCD claims that Mixed Mode operations with 500,000 ATMs in 2015 could meet the White Paper limit; it shows that full capacity with a third runway (702,000 ATMs) may not be realised in 2020 without replacement of the currently large numbers of four engined aircraft by a greater proportion of large twin engined aircraft than is currently the case.

However by 2030, the maximum capacity forecast with a third runway could be accommodated. Whilst the overall noise contour area in 2030 with a third runway is forecast to be somewhat below the 2002 level, some areas would experience noise levels considerably higher than in 2002. Such effects may be mitigated as a part of a future planning application.

Your attention is drawn to the final paragraph of the attached Executive Summary and the comments made about possible night time effects.

Night Period Movements

Preliminary night forecasts (23.00 to 07.00) were provided by BAA for a number of scenarios and the numbers of arrivals and departures in this period on both a historical and a forecast basis were forecast to be:

	2003	2006 segregated mode	2015	2015 mixed mode	2030 R3
No. of arrivals	52	55	54	44	60
No. of departures	17	20	20	29	36
Total movements	69	75	74	73	96

Noise assessment Table 3.2 – 2015 480,000 ATMs Base Case

Noise contour area in 2015 is expected to be slightly smaller than in 2002 although representing a small increase relative to 2006 (118.7 km²). The population within the 57dBA Leq contour is also predicted to increase slightly compared with 2002, rising from 257,800 to 261,900 people, despite the reduction in contour area. This is primarily due to a predicted change in the shape of the noise contours compared to that in 2002.

The report draws attention to departure noise having changed along many of the departure routes due to a re-distribution of movements across different departure routes and these include:

- Dover, Brookmans Park, Woburn, Compton and Southampton

2015 540,000 ATMs mixed-mode noise contour areas, population and household counts

The 57 dBA contour area is calculated to be just below the 127km² White Paper test. However, compared with the 2015 segregated –mode scenario and 2002, the population within that contour is expected to rise slightly reflecting the different shape of the noise contours resulting from the mixed-mode airspace design. Along the westerly arrival flight paths, noise exposure levels increase by around 0.5dB. This results from an increase in daily arrival movements from 621 for segregated mode to 708 per day in mixed-mode split between two runways.

Changes to the Cranford Agreement and Westerly Preference

(para. 5.1.1)The Cranford Agreement is an undertaking dating back to the 1950s that aims to avoid easterly departures from the northern runway (09L) over Cranford whenever possible. Until the main runways were extended westward in the 1960s, Cranford was the nearest residential area to the airport at that time. It is not a written agreement, but it is understood to have been a “best endeavours” undertaking given at a public meeting in 1952. The main effect of the restriction is to only allow take-offs from the southern runway (09R) (whenever possible) during easterly operations, which in turn means that most easterly arrivals must fly over Windsor and Poyle to use the northern runway (09L). In common with the westerly preference arrangements, any change to the Cranford agreement would be likely to have an effect on the level of distribution of noise in the vicinity of the airport; therefore, changes may not be made without the prior approval of the Secretary of State.

To the east of the airport in Harlington and Heston, noise levels in some areas would increase by more than 3 dB, this being associated with the introduction of easterly departures on the northern runway.

To the south east of the airport however, the contours contract due to the removal of half of the departure operations from the southern runway. Around Hounslow Heath noise exposure levels reduce by approximately 1 – 1.5dB.

To the west of the airport, the transfer of half of the arrival operations from the northern to the southern runway during easterly operations, reduces noise exposure in the vicinity of Windsor whilst increasing noise exposure to the south over Old Windsor.

Overall, the changes in population exposed within various contour areas are relatively small and the report shows that one of the effects of removing the Cranford Agreement

would be for it to reduce the number of people exposed further away from the airport, whilst near to the airport, where noise exposure levels are already higher (compared with further-out locations) the number of people exposed is predicted to increase due to the shape of the contours changing.

Cancellation of the Agreement in a 2015 scenario with the current cap of 480,000 ATMs is predicted to increase the 57dBA contour area by 0.3 km² but with a reduction of 10,500 in the affected resident population and another reduction of 4,900 resident households.

Westerly Preference

Since 1962, the airport has operated on a Westerly Preference basis which means that the majority of arrivals at Heathrow approach to land from the east (over the developed areas of London). Actual numbers vary from year to year as a result of changing weather conditions but the airport generally operates on westerlies for between 75 to 85% of the year with the balance being on easterlies.

With westerly preference, the existing runways are available for both landing and departures. If the Cranford Agreement is maintained and an easterly preference were to be introduced, the use of the northern runway for departures would be very constrained to protect residents of Cranford, Heston and adjacent areas and the majority of such movements would have to take place, as they do currently, from the southern runway

The report suggests that on an average summer day as a function of operating mode, the following percentages of directional movements would occur:

<u>Operating Preference</u>	<u>% East</u>	<u>% West</u>
Westerly Preference	24	76
Easterly Preference	55	45

APPENDIX D

AIRSPACE

NATS HEATHROW AIRPORT RUNWAYS STUDY – OCTOBER 2007

The reports record that an operational framework for a three runway Heathrow Airport is a complex proposition. The study is said to be conceptual and it emphasises considerable further detailed design work would be required prior to implementation of any of the designs investigated. The work has concentrated on the immediate vicinity at Heathrow. NATS has not yet had the opportunity to consider in detail the implications of integrating additional traffic from Heathrow within the broader London Terminal Control Area (TMA) or en-route airspace, alongside continuing growth from all other airfield sources.

NATS has designated for the purposes of these studies, the possible three runway layout as being North Runway (a new runway) Centre Runway (the current North runway) and a South Runway (that existing).

Following the NATS studies, it has been decided to whittle the possibilities down to two Core Options for use of a three runway layout and these are shown in diagram form in the annexure to this Appendix. These concentrated on providing for two independent arrival streams although triple arrival streams are proposed during periods of high inbound demand. For modelling purposes and schedule development, BAA/NATS have assumed triple arrival streams between 06.00 and 06.45 local time followed by use of one of the Core options until commencement of “night” operations.

Given three runways and three usage modes on each, NATS had to analyse 27 possible operating modes and it sought to achieve an ICAO compliant solution for arrival sequencing and departure separations which has been the subject of capacity, noise and air quality modelling. The conceptual design provides for 100% Continuous Descent Approach (CDA) through the use of Final Approach tracks which would have to extend to 25 miles from touchdown and with Radar Manoeuvring Areas extending to 30 miles from touchdown.

New technology is expected to allow the implementation of advanced procedures permitting the deployment of shorter Final Approach tracks and 100% CDA availability, subject to regulatory approval.

Traffic departing from the South or Centre departure runways (the existing runways) would operate in a similar way to today. In order to segregate traffic departing from those runways from that from the new North runway, departures there would be designed on the basis of a higher (climb) performance to reach a minimum of 8,000' within 20 miles of departure – an average gradient of 7%.

A new North runway at Heathrow would have implications for operations at Northolt aerodrome and, on current assumptions, maintaining operations at that latter would result in an approximate, **pro-rata reduction in the potential utilisation of a Heathrow North runway.**

Significant work would be required to ensure that procedures for helicopters and other low-level traffic operating in and out of Heathrow could be accommodated safely; it is likely that re-positioning of some current helicopter routes will be required.

NATS – RUNWAY 3 STUDY “CAPACITY” October 2007

The purpose of this study was to arrive at a forecast schedule which maximises capacity within the constraints of the designs detailed in the “Runway 3 Study” summarised above.

To be acceptable, the final schedule needed to deliver an average delay below ten minutes i.e below the delay criteria currently in use at Heathrow. The final schedule would inform the workstream on noise and emissions.

The model used by NATS for this work is “HERMES”, the “Heuristic Runway Movement Event Simulator”

The report documents the results obtained from HERMES following a number of iterations which are summarised. These are illustrated in a collection of 39 graphs dealing with average movement delays, arrival and departure delays for the years 2020 and 2030. In each case, it is shown that all arrival and departure delays would be less than the 10 minute criteria for the whole day.

The modelling criteria included rules regarding traffic distribution

- A.346, A.388, B744, B773 aircraft types are not allowed to arrive or depart from the Northern runway (to be designated 27R/09L)
- T.4 flights should not be assigned to the northern runway
- Dover route departures cannot depart from the northern runway
- T.6 flights should prefer the northern runway

APPENDIX E

BAA HEATHROW – Project for the Sustainable Development of Heathrow. Surface Access Report November 2007

The HACC was only able to achieve membership of the Working Group on this subject out of a number of PSDH groups. The Group met on only a few occasions and the range and detail of the various aspects of this subject published so far exceeds anything the Working Group discussed.

Amongst the matters considered in this 125 page document are:

- ground traffic forecasts
- methods of controlling it
- improving use of public transport to/from the airport
- road charging
- the impact of road traffic on air quality
- noise impact and accidents.

BAA had identified three aspects for charging for the use of airport roads which were noted in its response to a consultation on the Draft Local Transport Bill. The response sought powers in principle to introduce such charging schemes at the company's South East airports although there is no committed timetable for the introduction of such a scheme at any particular airport at the current time.

The report sets out a case for a charging scheme at Heathrow which is said to have some merit with reasons, including improvement of air quality and a contribution to the funding which BAA currently puts into surface access management to address congestion and pollution issues.

Within the airport boundary there are three main geographic areas that could form the basis of a charging scheme:

- charging for access to the terminal forecourts – **forecourt charging**
- charging for access to the central terminal area (CTA) road network, to T4 and T5 – such a terminal network charging scheme would have three entry points to the charged area (CTA tunnel approach, T4 approach and T5 approach road) – **terminal network charging**; and
- charging for access to the airport road network, whose outer limit is defined by the Perimeter Road – such a scheme would have nine entry points to the charged area, including the new T5 access road – **airport network charging**

The report concludes that, looking more widely than the airport network, there is a good case for BAA considering support for a wider charging scheme in the Heathrow area.

The report deals in some detail with the level of charges which might be considered appropriate and tested the implications in a variety of scenarios for:

- a £20 forecourt charge with a £20 increase in parking charges
- a park and ride system with charges as on-airport and a shuttle coach service assumed to have zero fares for air passengers

The implications of instituting a charge of £3.00 for Heavy Goods Vehicles inbound to the Heathrow area and passing through a cordon line around the airport with the implications for improvement of air quality were also tested.

The travel modes of airport employees were examined with a finding that the proportion of staff travelling to Heathrow by car had fallen significantly, from 82% in 1992 to 75% in 1999,

entirely due to a decline in the proportion of drivers. This was allied to a compensatory increase in bus and coach use, from 6% to 11% during a period in which the workforce at Heathrow increased by 32%.

At present, there are 17,000 car parking spaces for Heathrow staff plus 11,000 tenanted spaces; the aim is to reduce the total staff car parking spaces substantially, to 14,000 by 2013 whilst keeping Heathrow an attractive centre of employment.

The report considers currently available parking and park and ride opportunities for the public at the airport . It considers the case for remote park and ride locations at key points on the motorway network outside the area of air quality problems with lower parking charges than would apply at the car parks within the air quality problem areas, and with high frequency shuttle bus services to the terminals.

In conclusion, the most promising way of reducing car and taxi travel to/from Heathrow by air passengers was introduction of some form of restraint measure, either:

- some form of airport access charging, coupled with a wider area public road pricing scheme; or
- some form of park and ride scheme, with the main dimensions being the availability and price of parking space

APPENDIX F

DEPARTMENT FOR TRANSPORT (ATKINS) PSDH – POPULATION EXPOSURE TO AIR POLLUTION

In the several reports which were commissioned by the Department dealing with air quality, there is a great deal of information about how the analysis and testing were undertaken with very many tables and schedules of the aircraft assumed to be operating at the times of the various operational and development scenarios which have been considered. The reports are of a very technical nature and include little which can be quoted in the way of conclusions as to the extent and level of air pollution in specific areas which Members would recognise.

Probably the most revealing comments on this score are made in the Executive Summary of this particular report which is attached to this Appendix.

In the documents on air quality, there is reference to the fact that airport emissions (oxides of nitrogen) can be detected over one kilometre from the airport boundary to the north-east, supporting early indications from the technical report and using data collected for this purpose. There is said to be strong evidence that the air quality model performs well in reflecting how quickly the aircraft concentrations decrease with distance from the runway.

The reports do show convincingly the major influence which road vehicles have on air quality in the vicinity of local roads and on the M.4 in the Heathrow area and that exceedances of prescribed standards are not due only to airport related activities.

Sources of air pollution which were included in these assessments included:

- aircraft engines, auxiliary power units, airside ground support vehicles, road traffic including emissions from road vehicle brake and tyre wear, from car parks, taxi queuing, the fire ground, paint shops and heating plants