SUBMISSION TO THE AIRPORTS COMMISSION – RESPONSE TO THE AVIATION DEMAND FORECASTING PAPER: COMMENTS ON THE DEPARTMENT'S MODEL

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Overview

The Department's *UK Aviation Forecasts* sit uneasily with a commercial, privately funded approach to the provision of aviation infrastructure which is the basis of current government policy. This policy framework was first set out in the 1985 White Paper *Airports Policy* (Cm 9542) and, in spite of the previous government taking a more interventionist stance in a 2003 White Paper, the fundamentals of the 1985 policy remain little changed. Central to this policy was an intent that air transport facilities should not in general be subsidised by the taxpayer and that they should operate as commercial undertakings (para. 3.2). This view was re-iterated by the current transport secretary before the Commons transport select committee on 11 February this year. As a consequence, over the last 25 years or so, the UK has developed an airports industry in which competition is important.

In the light of this framework, attempts to forecast beyond 2030 are questionable. The more that one peers into the future, the more likely the actual outturn will be influenced, perhaps very strongly, by unknown unknowns[2]. The commercial world adjusts to an uncertain future by adaption, by adopting a flexible approach to infrastructure provision and by proceeding incrementally and, where the scale of the investment is large, by attempting to underwrite initial commitments through long term contracts with upstream suppliers or downstream customers[3]. One might also question the Department's approach of spilling-over future estimated surplus demand through a fixed network of airports, with limited adjustments of future capacities instead of focusing on the competitive nature of the industry and consider how competition might affect the level of demand at individual airports and, in turn, how this might affect profitable opportunities for expanding infrastructure.

Currently, price competition[4] appears to be absent from the process of allocating demand between airports in the Department's model. But H M Revenue and Customs *Research Report 188* (Modelling the Effects of Price Differentials at UK Airports) provides a potentially useful template for developing a more commercially oriented approach to aviation forecasting more in keeping with the current airport policy framework.[5]. The significance of price competition in determining the level of demand (and thus return on capital) at individual airport is to be seen in a number of UK developments

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[2] The 1985 White Paper, referred to above, took a similar position. It stated: "In the longer term, up to 2000 [15 years hence] and beyond, factors can come into play which either did not exist or were unimportant in the past, so that they cannot be satisfactorily modelled with historical data" (para 4.5).

[3] This is to be contrasted with traditional utility provision by the public sector which has adopted long term horizons with the risks underwritten by the tax-payer.

[4] Manifest in changes to airport charges, including negotiating longer term contracts with the airlines covering both tariffs and quality of service delivery, and changes in charges for car parking.

[5] http://www.hmrc.gov.uk/research/report188.pdf. As part of this research, the Treasury commissioned the Department to use its model to look at how passengers might change their departure airport in response to price changes at different airports. For this purpose changes in the level of APD was used as a proxy. However some of the parameter values used in the surface access model are questionable and are discussed below

during the last decade. In the early 2000s aggressive pricing behaviour by BAA at Stansted, interacting with new airline business models, led to a very rapid increase in traffic (partly at the expense of Luton). Since 2006, a change of policy by airport management leading to the unwinding of deep price discounts, coupled with increased competition from other airports, both in the UK and in continental Europe, at the time of an economic recession, has lead to a major (25 percent) loss of traffic (6mn passengers)[6]. Similarly, competition has brought about significant shifts in the market between Manchester and Liverpool and Glasgow and Prestwick. And, important from the point of view of the Airports Commission, during the last 10-15 years there have been large positive and negative changes in the proportion of interlining traffic through Heathrow airport with competitive factors being an important element driving these changes.

In the rest of my response, I will focus on selected issues which I have organised under the two main components of the existing forecasting model, NAPDM and NAPAM, although some issues overlap the two divisions. My main points are as follows:

- **The inter-relationship between airfreight and passenger demand at Heathrow and the importance of the former in sustaining the network of long-haul routes, requires further research.**

- **A significant component of overall demand for runway capacity appears to have been ignored**

- **Future airport capacities, particularly at smaller airports, have probably been under-estimated and this limitation is accentuated because of the use of a fixed number of airports in the model.**

- **The allocation of demand between UK airports is particularly suspect, partly because of concerns relating to input values in the surface access model (but also because of conceptual issues centred on the absence of competitive dynamics).**

NAPDM

Freight

An assumption about the growth of cargo-only movements is required to determine capacity required for non-passenger movements. The current scale of freighter movements is very small and, therefore, these movements seem to be of little significance for the overall aviation forecast. Probably for this reason the report does not examine freight movements in detail but notes that movements have declined over the last two decades (but are now fairly stable) and it speculates

[6] Although the recession and APD increases have played a part in this decline, note that traffic at competing Luton airport fell relatively little and has now regained pre-recessionary levels. There has been a marked shift in market share in favour of Luton.

about possible causes. Nevertheless, freighter movements are rather concentrated at particular airports, three in particular: Manchester, East Midlands, and Stansted (the largest dedicated air freighter facility in the south); in a future capacity constrained system freighters will have local significance. Therefore, the (unstated) assumptions made regarding the outcome of competition between passenger and freighter aircraft for runway access at the above three airports is important.

There is a further, potentially important, issue regarding air freight. As the report notes there is some interaction between belly-hold freight and cargo-only flights, and passenger aircraft have taken an increasing share of air freight at the expense of freighter flights. Belly-hold cargo is important at Heathrow and it is estimated that over a quarter of UKs visible exports by value fly out of the airport[7]. But absent from the narrative of the forecasting report is an indication of the importance of the contributory revenues from airfreight in sustaining long-haul flights at Heathrow and, if a long-haul passenger flight disappears from the schedule, what happens to its freight export component. Is it trucked to a continental hub, to another UK or Continental airfreight centre, or become seaborne cargo, or does the trade become non-viable? More research is needed on the relationship between belly-hold airfreight, connecting and originating passenger traffic at Heathrow and on the significance, if any, of airfreight for sustaining the commercial viability of a long-haul network of routes.

ATMs vis OMs

The aviation demand forecasting model appears to focus exclusively on ATMs (passenger and freight) but these are only part of the picture; to be precise they account for just over 70 per cent of total runway movements in 2011 at UK airports reporting to the CAA[8]. The balance of movements was accounted for by test and training flights, business aviation, private aviation, etc (collectively **Other Movements** or OMs). At London area airports OMs account for only 6 per cent of total movements but, nevertheless, they are important at Luton Airport, where in 2011, they account for over 20 per cent of the total and at Southend. Outside London, OMs dominate at airports such as Bournemouth and Exeter, account for half the traffic at Norwich and Cardiff, and remain a sizable proportion at Liverpool, Leeds and East Midlands. Generally speaking, the smaller the airport the more important OMs are but as **Figure 1** shows (based on 2005/6 data) they remain important at medium size airports[9].

It is not clear how OMs interact in the model with the ATM forecasts: whether OMs are taken into account when forecasting demand for runway capacity or when calculating the future supply of runway capacity for ATMs (in Table 3.10 for example). It is possible that the model is based on the assumption that OMs are of little consequence because, as the demand for passenger and freight movements grows, OMs are squeezed out of **all** airports included in the model, so that training flights etc migrate to smaller or peripheral airports not included in the model e.g. Farnborough. But this would seem unrealistic bearing in mind that currently, in areas of high demand such as the London area, OMs can still account for a sizable proportion at particular airports and, therefore,

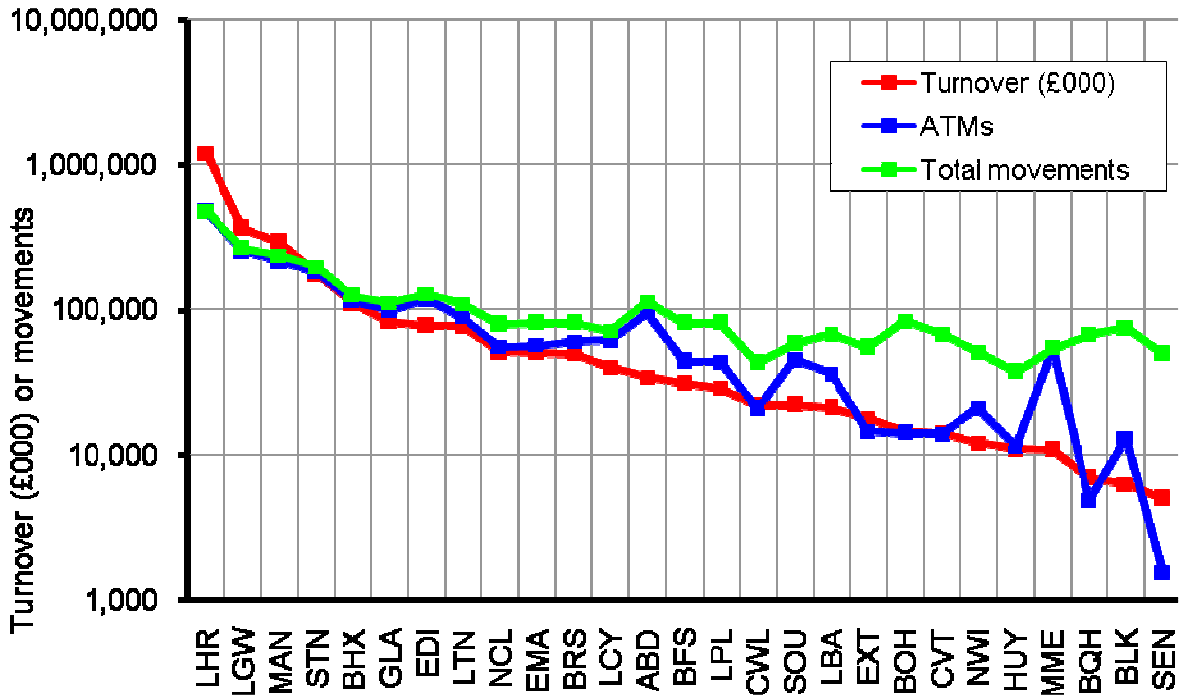
[7] Heathrow accounts for about 60 per cent of total UK air freight tons.

[8] Note that the CAA's reporting statistics include air taxi and positioning flights in ATM's and are included thus in the statistics quoted here. C.f. footnote 9 in Discussion Paper 01.

[9] Note that the vertical scale in the Figure is in logarithms. The source of the data is CRI Airport Statistics 2005/6.

presumably at the margin these flights are high value users of capacity competing with passenger and cargo flights. Moreover, as GDP increases it is possible that demand for business aviation might grow more strongly than passenger and freight demand.

Figure 1: Air Transport Movements v Total Movements: Airports Ranked by Turnover



Capacity Measures

Runway Capacity assumptions "are a key input to the forecasts" (Box 3.2). Runway capacity is an elastic concept, depending as it does on a variety of factors which are not always runway related; declared capacities are influenced by limitations of stand and terminal capacities particularly at space constrained airports like Heathrow and by the levels of delay and reliability that are acceptable. Possibly because of changes in acceptable level of delay, changes in the traffic mix and because of changes in technology and operating practices, capacities have had a remarkable ability to grow over time. For example, the working assumption of the Roskill Commission was that the combined capacity of Heathrow and Gatwick (with a single runway) was 440,000 ATMs, but Heathrow alone now exceeds this number. And the CAAs central estimate at the time of the 1985 White Paper was that the capacity of passenger ATMs at Heathrow would be only 275,000 in 2000.

Although the Department has consulted with airports to obtain their latest estimates of current and future capacity, these views will reflect current commercial profitability, mind sets and technology. As pressures grow, there will be increasing commercial incentives to find entrepreneurial ways of increasing capacity; it is likely that current estimates will prove to be under estimates. This is in spite

of the Department allowing "where possible" for a capacity addition by 2030 of 13 percent in excess of the airports own estimates, to allow for operational and technical improvements[10].

An additional cross check might be to undertake a trend analysis of past (aggregate) increases in capacity of *existing* airports and project these forward for purposes of comparison. (See also comments under Airport Numbers below). In addition, a consistency check is called for regarding estimates at some of the airports. For example, the relationship between ATM capacity and terminal capacity at Doncaster-Sheffield appears inconsistent with the other relationships shown in Table 3.10. At Southend, although there are current runway constraints, nevertheless, the (relatively modest) maximum terminal capacity in 2030 is the same as that for the current terminal (once current construction work is completed). This is in spite of Southend being in an area of high suppressed demand because of supply constraints (Figure 5.6). One might have expected a combination of market forces and a competitive environment to have resulted in a higher capacity outturn by 2030, notwithstanding planning and environmental constraints.

NAPAM

Airport Numbers

In the allocation model the same number of airports (31) is used over the (long) forecast period. However this number has changed in the recent past and in the 2000 allocation model there were only 29 airports (see footnote 20). Southend was a new addition to the 2013 model and previous additions have included Doncaster-Sheffield and Newquay. There have also been deletions; Plymouth on closure has recently been removed from the set. The overall network of relevant airports, therefore, is fluid and these supply-side dynamics, driven by commercial considerations, should be allowed for in the model.

As demand increases, relative to the supply of airport services, economic rents increase and this, in turn, increases the incentive for profitable entry into the scheduled/charter market. Consequently, more airports, additional to the 31, can be expected to offer commercial services in the future, including short-haul international services. Although planning consent might be required in some, but not all, instances, often the scale of the required development will be minor, for example where there are existing facilities currently focussed on OMs, as was the case at Southend until its purchase by Stobarts. Some additions to the network might be conversions from military aerodromes, as was Doncaster Sheffield and Newquay.

There are a number of obvious candidates for entry into the NAPAM list. In the south east, Manston, Kent already has scheduled services and KLM is a recent entrant with services to its Amsterdam hub. Lydd, also in Kent, was once one of the world's major freight airports, and its current owner is seeking to lengthen the runway[11]. Oxford is starting scheduled services to Edinburgh and Dublin in March (although the runway is currently too short for LCC operations). MoD aerodromes in the south east include RAF Odiham and Benson. With defence cut-backs it might be reasonable to

[10] This uplift was based on a now rather dated technical note of 2001.

[11] http://www.thisiskent.co.uk/Lydd-Airport-future-hit-Government-dithering/story-18011639-detail/story.html#axzz2LuVFmU1m

assume that one such facility might become available for civilian use by 2030. One might reasonably expect further entry elsewhere in the UK.

Thus, the allocation model could be supplemented by an airport supply model; as shadow costs increase in the model, this leads to a response as befits a commercial airport industry by encouraging an increase in the supply of airport capacity at currently operational airports not currently included in the model because of their current focus on non-ATMs. This introduces a challenge of judging which additional facilities might offer future services; Manston is one obvious candidate. A possible modelling approach might be to introduce dummy capacity in various geographical sectors when the capacity premium/shadow costs in that sector are high enough to signal a commercial response.

Choice Model

Air fares differences are excluded from the allocation model, although the model does include the cost of accessing different airports. This omission is peculiar given that fares are a key driver in the national demand model. The reason given for their exclusion in the allocation model is that they have rarely proven significant in airport choice. However, paragraph 2.39 gives the impression that this is due to data problems stating that it is difficult to get reliable mean fares given the wide spread of fares on a particular route and one gets the impression when reading this paragraph that the Department is itself not entirely happy with this situation. The circle might be squared, at least to some extent, by arguing that there is a strong competition between flights from different airports which drives (quality adjusted) fares to equality. This line of reasoning is alluded to in paragraph 2.32. However, this argument would be more difficult to make in the long-haul market segment and it would sit awkwardly with observed shifts in market shares between airports (which can be long lasting) previously noted. Nevertheless, the competition argument should either be made explicit or further effort made to understand the role of airfares in passenger choice of airport. As matters stand the situation is unsatisfactory[12].

The allocation model makes use of generalised cost measures based on the Department's standard values for travel time. Aspects of these values have been challenged by economists, some are based on now dated surveys and these surveys have not had an air passenger focus. In particular, there is an absence of information on travel time values for overseas residents; the latter make up a significant proportion of the total market and the NAO and PAC were particularly critical of the use of standard values for this component of demand when these organisations reviewed the evaluation methods used in relation to HS1[13].

The assumptions made with respect to surface access costs to airports are also unclear, particularly with respect to parking costs that, airport competition apart, will differ between airports depending upon local circumstances (availability of land, off-airport competition, need for expensive parking

[12] It should be noted that by including flight frequency in the allocation model a quality dimension is thus included which makes the exclusion of price (fares) look even more eccentric.

[13] See http://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news/hs1-report/.

infrastructure etc.). Similarly, taxis and hire cars are used more heavily at some airports and the mode split will also be influenced by rail connections and their quality.

Overall, the allocation model faces many challengers. Although the fit of the calibrated model to observed data is said to be very successful/highly accurate/accurate (depending upon the aspect modelled)[14] good results can be achieved by use of catch-all factors in the model such as 'travellers' preferences for particular airports' (2.33)[15], in which case an 'accurate' model will be poor in a predictive context. Even without this complication of likely shifts in 'sentiment' for different airports, there are anomalies in forecast outputs. For example, Norwich in 2030 is allocated 0.7mn (central demand case) for the unconstrained case but only 0.6mn for the constrained case, in spite of the most proximate airport, Stansted, being at or very close to capacity and the local Norwich region showing suppressed demand (in Figure 5.6). A similar situation arises at Newcastle, whilst Coventry is shown as having zero use through-out (even though in the mid-2000 it had well in excess of 0.5mn. passengers) because in the base year it had zero ATMs.

[14] The "accurate" calibration was for actual vis predicted ATMs. For the larger airports outside London, only Bristol fell within +/- 5% with the range extending up to -15% (9.12-9.14).
[15] This might reflect competition between airports.