

## **Reply to Transport Select Committee letter of 16/1/2018**

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### **Preamble**

We were advisers to the Airports Commission on aspects of the economic case for new runway capacity in London and the SE and on the interface with the strategic case. Our understanding of the updated case prepared for the NPS is limited to a reading of some relevant documents against a background of the work we did for the Commission three years ago. We have thought it useful to try to set your questions within a framework and to pick them up as we go along.

### **The Economic Case**

As with most transport investment, the economic case is centred around three key components:

- The demand forecasts, which are further split into forecasts of overall market size/growth and market share of individual airports
- The economic appraisal within which the value of benefits to travellers, the airline and airport operators, impacts on the environment, the wider economy and government are assessed as the difference between various 'Do-Something' alternatives and a 'Do-Minimum' Reference Case.
- The incremental capital and operating costs which are built up from various engineering and planning studies, in which we were not involved.

The stream of benefits and costs over the appraisal period is discounted so as to yield summary indicators of project worth such as Net Present Value.

### ***Demand forecasts---Market Size***

The key drivers of the size and growth of the air travel market are :

- UK real income growth and income elasticity
- Rest of the world real income growth and income elasticity
- Changes in the real price of air travel and price elasticity
- Changes in the real price of substitutes (ground travel, internet etc) and complements ( holidays etc) and cross-elasticity
- Changes in accessibility to airports and in availability of air travel which may be capacity constrained at particular locations.

The last decade has seen some economic and political turbulence and the assumptions re long term UK real income and productivity growth are fundamental (because a high proportion of air travel originates in the UK). We understand that OBR has been asked to provide guidance on long run economic assumptions to feed into public sector appraisal. This advice could affect all the forecasts, for the Reference Case, the Do-Something cases and the difference between them.

The end-2017 forecasts from the OBR show that potential output growth, the capacity of the UK economy to generate GDP without inflationary pressures, has been revised down from 2.2% a year to an average of around 1.5% a year. If we were to assume this situation remained over the full period of NPS assessment then the UK economy could be 30% or more smaller than expected in the Airport Commission and DfT projections by 2060. The income elasticities used in the DfT models would imply that, all other things being equal, UK-originating air travel would by 2060 be 35-40% lower than in the baseline forecast. Of course all other things are not equal. The OBR projection for UK potential output is only to 2023 not 2060, and one would imagine that supply-side policies would be implemented to raise productive capacity should this situation look likely to last longer. Nevertheless, the significant downward revision in the OBR's view about the potential capacity of the UK economy to growth without inflationary pressure has the potential to significantly reduce projected growth in UK-originating air passengers at least.

In the air travel market, since a significant proportion of airline costs is in dollars, the exchange rate and terms of trade assumptions are also relevant. Since air travel is a derived demand, future real prices of substitutes and complements such as the hotel costs of foreign holidays are also relevant.

Our appreciation is that in the Department's forecasting work, the results are dominated by the path of real income growth. The real price of air travel is not modelled to change greatly over time. This is due to a balance of factors pushing in opposite directions :

- Improvements in aircraft technology and fuel consumption
- Increases in average aircraft size as the market grows
- Higher world fuel prices
- Introduction of international carbon trading which internalises the environmental costs of carbon consumption within fuel prices.

#### **SC Q Is the carbon trading approach reasonable?**

**A** The approach is reasonable but we cannot comment either on the probability of a fully effective international carbon trading scheme being in place in the timeframe, nor on the striking price of carbon and its trend over time.

We note that a significant proportion of international aviation CO<sub>2</sub> emissions are covered by those States that has already committed to participating in the voluntary first phase of the ICAO Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which suggests there is a reasonable chance for a scheme being in place from 2020. This will not be a trading scheme but a cap-and-offset mechanism, so the carbon price faced by airlines and their passengers will be determined by the cost of offsetting carbon reduction investments. Since the marginal abatement cost curve for carbon reductions to take place within aviation is so steep i.e. it quickly gets very costly for airlines to make reductions beyond normal fuel efficiency gains, airlines would be meeting the cap of a trading scheme through investing in offsets anyway, so the planned CORSIA cap-and-offset scheme can be treated as equivalent to a trading scheme. The effectiveness of such a scheme, as we have seen with the EU ETS, will depend on how rigorously States enforce a cap that is sufficiently below baseline emissions to change behaviour. The use of the BIES traded carbon prices as an input into the forecast price of air travel to model the impact of such a scheme on demand,

and then the use of domestic measures to further reduce UK international aviation emissions to the 37.5 MtCO<sub>2</sub> planning assumptions looks to us to be a sensible approach.

In the absence of such a scheme (ie an actual carbon price) we would need to fall back on a shadow cost of carbon approach with the aviation sector included in the UK aggregate emissions budget in some appropriate way. The shadow cost would then be that required to bring aggregate carbon emissions to the constrained target level at each point in time. In comparing various Do Something cases with the Reference Case, the difference in the carbon shadow costs would then enter the CBA table as an unpriced real resource cost. We conjecture that in that situation, the net cost of carbon emissions would be higher than in the world carbon trading scenario.

**SC Q Does the constant price elasticity assumption at all price levels potentially understate the changes which might take place in the London market at different price levels?**

**A** This is a point which we made in our May 2015 note. Clearly there is room for argument about what the 'true' demand functional form is, and we favour including a facility to test alternative functional forms such as the elasticity proportional to price (or semilog) form. However, if the Department's price forecasts over the period come true, and the real price of air travel remains broadly stable, this point then has less saliency. It would be relevant if the Committee is considering evidence that the real price of air travel is likely to change significantly over time.

**SC Q What are the expectations for the growth of business travel and long haul?**

**A** We think there should be further significant growth in business travel and long haul.

In the past business travel has grown broadly in line with world trade in goods and services, though communication technology substitutes for face-to-face meetings may lower this trade elasticity. It is true that business travel by air has grown relatively slowly in recent years. This appears to be due more to the weakness of cross-border trade in the period since just before the Global Financial Crisis, rather than a substantial shift to substitutes for face-to-face meetings such as video technology. Advances in video and communications technology have long been thought to lead to a reduction in the need for face-to-face meetings, and therefore a reduction in business travel. Both practice and recent research suggests that there remains a need to meet in person, so the decline in the elasticity of business travel in response to the growth of trade in goods and services may not be very rapid.

What we have seen since 2010 is a sharp slowdown in the growth of world trade relative to GDP growth, which has lowered the demand from businesses for cross-border business travel. The ratio of world trade to GDP growth has fallen from an average of 2x to 1x. Certainly the policy environment with respect to open borders and cross-border integration has changed in the past decade, with a shift toward a more nuanced approach to globalization. Other factors such as an extended period of weakness in business investment have also been advanced as reasons for the recent weakness in world trade. Most economic forecasters are expecting the trade to GDP multiplier to partially recover, which should lead to some recovery in the growth of business travel. The DfT's forecasts for business travel look plausible to us.

### **SC Q How is the London airport system placed to cater for future business travel in the context of constrained capacity at LHR?**

**A** Business travel with London as origin or destination is among the least price-elastic market segments. Therefore it is core high value traffic and almost by definition capacity will be deployed to serve it ahead of other more elastic segments.

So we agree with the DfT that the number of business travel passengers would only be marginally reduced if no new capacity were built. The more price sensitive leisure travel segment would be reduced by the higher costs generated by excess demand, rather than business travel. That is not to say that there would not be adverse economic impacts from increasing business costs, nor business benefits from expansion. But the bulk of the costs of capacity constraint and benefits from expansion are borne by leisure passenger.

Long distance INT to INT traffic using LHR as an aircraft carrier is by definition more elastic since it can choose between hubs. It will therefore be more responsive to relative hub frequencies which will in turn affect the quality of service for terminating traffic. So we would expect the range of long haul destinations and frequencies out of LHR to be somewhat responsive to capacity as the models suggest. So

- There will be a relatively small number of world destinations available from LHR by non-stop in the Do Something which require one stop at a regional hub (Dubai etc) in the Reference Case.
- There will be a small number of UK origins (Newquay etc) which are world-connected by air through LHR in the DS but not in the Reference Case
- There will be better frequencies on a range of Os and Ds than would otherwise be the case.

We think these differences should be viewed as incremental in nature rather than transformational from the perspective of the representative business traveller with London as an origin or destination.

#### ***Demand forecasts--- Market Share***

In general, we think that the airport traffic allocation model NAPAM works reasonably well although the set of questions it needs to answer when considering additional runway capacity in the London market is very demanding.

### **SC Q --- Split of traffic between Gatwick and an expanded Heathrow**

**A** We agree with the model logic which says that if LHR is expanded, some traffic both short haul and long haul will transfer to LHR. Considering the catchment areas of the various airports, it is clear to us that LHR is already constrained in the range of point to point destinations and the frequencies offered. So the forecast of some rebalancing of such traffic, both short and long haul, seems credible.

In the long haul market, we think further development of the new entrants alongside the alliances is credible. Given that LGW is actually better located for several million London and SE residents than

LHR, a two tier market of this kind with the alliances operating out of LHR and long haul point to point services out of LGW seems a likely scenario. There is room for both to grow.

If LHR remained capacity constrained, then LGW would obviously grow faster. But we share the doubts of the AC about the likelihood of LGW becoming a fully fledged hub airport with one of the alliances transferring across to offer a wide range of long haul services with a network of domestic and European feeders. To achieve minimum efficient scale up against not only LHR but other European and world hubs would be a big ask.

### **SC Q --- Phasing of growth after 2026**

**A** Our understanding of the model is that as capacity limits are approached, a shadow cost is added to the surface access costs of reaching constrained airports so as to ration demand to available capacity. This is a model representation of mechanisms such as full planes and higher fares out of the constrained airport causing people at the margin to choose alternatives. The model is predicting that these capacity limits will really begin to bite at LHR in ten years or so (hence the importance of the background growth rate discussed above). If runway three at LHR is built, the shadow costs at LHR is reduced so that

- Traffic transfers from competing airports because people are able to access their preferred airport
- A wider range of Os and Ds and higher frequencies are offered at the hub
- The hub is better able to compete with other hubs in the INT to INT market, so there are second round effects on profitable frequencies.

In a commercial market, we could envisage these responses occurring quite rapidly. But presumably the demand model (NAPAM) is fed with capacity limits which assume that runway and terminal capacity at LHR are in synch. If the reality is that for a time after runway three is open, terminal capacity is the governing constraint, that would act as a brake on growth and should be reflected in the capacity modelling. Similarly, if the regulator decided that it would be prudent to roll out the new slots over a period rather than in one fell swoop, that ought to be reflected in the capacity model and profile of shadow costs over time.

The sensitivity test carried out by the DfT shows the present value of passenger benefits reduced by £0.5 billion if capacity was instead phased in over a 10 year period. That is just 1% of estimated passenger benefits so would appear to be a marginal issue. But given an overall NPV of -1.8 to 3.3 for the LHR options it perhaps is more significant.

### ***Appraisal Issues***

This is an extremely demanding problem in appraisal terms and slavish adherence to guidelines intended to apply to the general run of transport schemes is not appropriate. The principles of appraisal need to be adhered to but the practice adapted to the special circumstances.

**SC Q Is it best practice to include benefits accruing to non-UK residents and transfer passengers in this sort of appraisal?**

**A** Conceptually there is a choice between undertaking a ‘world’ appraisal of benefits, revenues and costs and a ‘UK plc’ appraisal. The Green Book says that appraisal should do the latter. But actually in previous cases involving international traffic (HS1, M2 schemes) this guidance has been honoured more in the breach than the observance. The reason for this is that conducting a true consistent UKplc CBA is extremely difficult

- Presumably non-UK residents flying to the UK to do business, visit friends and relatives, engage in tourism bring benefits to UK residents, firms and workers. The consumer surplus from an improved flight offer is really a proxy for a set of interactions which are difficult to disentangle. The same is true of UK residents travelling abroad .
- Allocating the Producer Surplus effects between UK and non UK residents who are ultimately the airport and airline owners through financial institutions is very difficult in an international industry. The AC chose not to attempt it, we think for good reason.
- Having said that, the inclusion of the consumer surplus from the INT to INT traffic is probably questionable. Though we prefer a world CBA in which this is included in the CBA table, this is a judgement call.

It is not clear that a UK-only CBA if it could be done consistently would necessarily produce a less positive result in NPV terms. Nor is it clear what would happen to the relativity between schemes. It is important to bear in mind that significant amounts of the revenue flows to airports and airlines come from non-UK residents.

**SC Q What effect might a real change in airfares because of higher landing charges have on passenger demand at an expanded Heathrow?**

**A** It would have a dampening effect by partially offsetting the reduction in shadow costs. We think it is important that the economic case and the financial case should be in reasonable synch. As we understand it, the Department’s main case assumes that the benefit of the reduced shadow cost will be fully passed through to travellers while increases in landing charges to fund the infrastructure will be absorbed by airlines. This particular combination seems a bit unlikely. In their sensitivity analysis of October 2016, the Department tested the sensitivity of demand and benefits to alternative pass through assumptions, but decided not to change the basis of their main case in this respect.

Going beyond this particular question, this could be seen as one of a series of questions about the appraisal which include the appropriateness of the 60 year appraisal period and the use of the public sector discount rate for a scheme which is predominantly funded from private revenue streams (aero charges and ancillary revenues).

***Wider Economic Benefits***

**SC Q How might the wider economic benefits of an expanded LHR be substantially greater than LGW if the relative connectivity benefits are broadly the same?**

**A** Firstly this comes back to the issue of the value of a hub. There could be a compositional effect if the incremental traffic with R3 contains a higher proportion of business traffic than with LGW2. Also if some of the wider impacts occur through the freight hub, this would be likely to favour LHR differentially. Freight at LHR is carried almost entirely in the belly holds of wide-body aircraft, and so

the forecast gains to long-haul markets at LHR relative to LGW will boost this channel of wider economic impact.

The other point is that the NPVs are the aggregate over sixty years. In the first half of the period we understand that the connectivity benefits of LHR R3 are significantly higher than LGW2. Attention needs to be focussed on the credibility of the conditions in the second half of the appraisal period when the Gatwick scheme 'catches up' with the Heathrow scheme. Is this an artefact of only considering the pairwise choice between LHR R3 and LGW2? Should we also be keeping in mind the possibility of LHR R3 by 2030 plus LGW2 by 2050? The realism of the assumed balance between supply and demand in the second half of the appraisal period requires consideration ; in appraisals with which we are familiar, a demand cap would typically be applied.

**SC Q How is jobs growth usually accounted for in economic appraisal?**

**A** Within the economic case, changes in employment relative to the reference case are seen as an outcome of the various mechanisms such as agglomeration effects, the relationship between trade and productivity, the direct effects on air system UK employment including the supply chain. The tax wedge, accounting for the divergence between the gross cost to the employer and the wage received by the employee should appear as a benefit to government. The net effect on employment at national level relative to the Reference Case should be seen as a reporting number rather than a source of additional benefits to the wider impacts and tax wedge effects enumerated above.

The local jobs numbers reported in the appraisal are the estimated gross impacts in the area around the airports. They do not take account of any jobs lost through displacement from other regions or by any upward pressure on real wages. In principle the net addition to jobs can be estimated through the use of a Spatial Computable General Equilibrium (S-CGE) model. But as we have commented on elsewhere this was tried by the AC and the results were not considered robust.

***Strategic Case***

**SC Q Are hub airports still the best way to maintain connectivity or is the market heading more towards a point to point dominant market?**

**A** Consider the number of world city regions with a population of over a million and the proportion of those city pairs which enjoy direct service. It is small, and is likely to remain small. Particularly for the business traveller the efficient way to cover the matrix is through one stop, or at the most two stop service, via regional hubs. As the market grows, some city pair markets cross the threshold for direct service while many others will see direct service frequency increase relative to one stop. New aircraft models are improving the economics of connecting thinner markets, but these new aircraft are also being deployed on the spokes of hubs also. Therefore hubs will remain important especially for business traffic even if point to point via non-hubs or secondary hubs increases its market share. As noted above, there is room for both.

Having said that, LHR is one of many hubs. To take a random example, the first two screens of potential routeings from Manchester to Shanghai show eight credible routeings of which via LHR is one. So, from the point of view of many travellers (as distinct from airports and airlines), we think increased capacity at LHR should be viewed as offering incremental improvement relative to the Reference Case rather than transformational change.

**SC Q What capacity is there for increased airline competition at LHR, particularly induced by new entrant airlines in the context of slot allocation rules and possible landing charge rises?**

Firstly, the model is predicting that within the next decade or so, LHR will run into absolute capacity limits a lot of the time. Slots will be traded at higher prices and lower yielding use of slots will be replaced by higher yielding. Some mainly point to point traffic routes will be decanted elsewhere. So the first effect of more capacity at LHR will be to permit increased competition between the alliances and other existing carriers. This is very likely to happen.

Secondly, there may in ten years time be long haul carriers at LGW and elsewhere who would really prefer to operate out of LHR but cannot acquire slots at the times they require at prices which fit their business model.

Thirdly, given the once in a generation possibility of entering the LHR market at or above minimum efficient scale under the new entrant slot allocation rules, entry to serve a mixture of UK domestic, European capitals and sun routes is credible. The possibility of Easyjet fulfilling that role has been mooted.

Fourthly, we think that if capacity is expanded, the threat of entry will be far more credible than it is today and that this will discipline incumbent behaviour. Were that to be proved wrong, the Department's assumption about the shadow costs being passed through to consumers would be in serious doubt.

Fifthly, if the allocation of new slots follows existing EU slots rules – which allocate 50% of any new capacity to new entrants - this will clearly help increase competition. There are issues with the administrative system that currently allocates slots at congested airports, but for new capacity the rules offer preferential treatment to new entrants and so are not a barrier to increased competition.

**SC Q Should the potential benefits of airline competition be considered against greater airport competition under the scenario of an expanded Gatwick Airport?**

**A** Yes, the likely responses of airline and airport operators and air travellers needs to be considered under all capacity scenarios. The balance between the alliances and other carriers in the long haul market will probably be different if LGW is expanded rather than LHR. But on balance we think the combination of effects listed above if capacity is expanded in the place where it is most at a premium will be somewhat more effective than providing capacity elsewhere.

30/1/2018