Newcastle International
Your Airport

Airports Commission

Discussion Paper 01 – Aviation Demand Forecasting

Response by Newcastle International Airport Ltd

1. Introduction

Newcastle is the largest airport in the North East of England and 11th largest in the UK, serving a catchment area that includes Tyne and Wear, Northumberland, County Durham, Teesside, as well as parts of Cumbria, North Yorkshire and Southern Scotland. The Airport is critical to the economy of the North East. The Airport supports 7800 jobs in the region, and contributes almost £402m to the regional economy every year.

Our Airport accommodated 4.4 million passengers in 2011, but has terminal capacity (with some management of the peak) to handle between 7 and 8 million, and a runway that could accommodate 20 million or more, based upon a typical regional airport fleet mix. There are relatively few environmental constraints to the future development of the Airport, a lower noise impact than most other airports, strong regional support and a balanced view from the local community about the benefits of having an airport.

Newcastle has a reasonable network of air services across the UK and Europe; including 6 flights a day to Heathrow and 4 a day to Gatwick, and in 2007 secured its first long haul scheduled service with Emirates' daily flight to Dubai. The Emirates service has helped significantly increase the region's connectivity and led to increased economic activity in the region with a positive impact upon employment. The service has had a significant impact upon the level of business activity, for example assisting an increase in trade between the North East and Australasia from under £150m in 2007 to just under £275m in the last 12 months, and trade with the UAE, Saudi Arabia, and other more easily accessed economies has grown strongly. The service has recently been enhanced through the introduction of a larger Boeing 777-300 aircraft.

Newcastle International Airport Ltd is a public-private partnership between AMP Capital and 7 Local Authorities (Durham, Gateshead, Newcastle, Northumberland, North Tyneside, South Tyneside, and Sunderland.)

2. Proposed objectives of Government policy

The objectives of Government policy on aviation should be to:-

- place aviation at the centre of economic policy, with the aim of using it to help grow the economy and making the UK more competitive;

- recognise the economic benefits of providing more airport capacity, and plan for this alongside other infrastructure requirements;
- view aviation and high speed rail as being complementary to one another, ensure that they are properly integrated, and recognise that for regions further north aviation is a better option than even high speed rail for domestic and short haul journeys;
- recognise that it is in the interests of the UK that it retains its important hub role, and plan for additional hub capacity to serve London and the rest of the UK. Heathrow Airport presents the most viable and deliverable option in the medium term, although other options should be considered;
- ensure that as part of the planning permission for the above that some of the additional capacity is ring-fenced for regional air services;
- create the conditions for regional airports to flourish, including support for the use of differential rates of Air Passenger Duty (APD) to stimulate new regional air services, thereby encouraging the use of under-utilised runways in the regions, and reduce the need for surface travel within the UK;
- ensure the environmental costs of aviation are balanced with the economic benefits.

3. Comments on the Department for Transport Forecasts

York Aviation has provided some commentary on the robustness of the DfT modelling, and this has informed our comments in this section.

3.1 Inputs

Below we have considered specifically some of the key inputs to and assumptions in the DfT model and their strengths and weaknesses. This is as opposed to comments around methodology adopted and the specification of the models.

Definition of International Markets within the National Air Passenger Demand Model

There must be some concerns as regards the relatively broad geographic groupings in to which international traffic is defined. Excluding domestic traffic, there are four geographic zones used by the DfT model to determine overall growth rates - Europe, OECD, NIC and LDCs. Separate growth rates are estimated using time series regression techniques for each of these groups. However, there must be some concerns as regards the homogeneity within some of these groups. In other words, is it sensible for instance to apply the same growth rates to US traffic as to Australian traffic?

The North East has seen an upswing in trade with Australasia as a result, amongst other factors, of the Emirates service, whereas trade with the US, whilst much greater in volume, has grown more slowly.

With increasing globalisation and the centres of economic growth in the world shifting and polarising, it must be questionable as to whether the current DfT groupings now offer a sufficient level of granularity to enable a real picture of changing spatial dynamics to emerge. The largest markets in 2030 and 2050 will be different to those today, with China, South East Asia, South America, etc., becoming increasingly important.

Immaturity of Carbon Markets and Impact on Forecasts

Moving forward one of the key drivers of the lower overall growth identified by DfT in its 2013 forecasts is the end to what has been a sustained period of falling air fares.

One of the main causes of this is the increasing level of carbon costs associated with the EU Emissions Trading Scheme (or any similar future scheme). The difficulty here is the certainty that can be placed on the current forecasts of carbon allowance prices. The DfT model uses forecasts from DECC as its input to the model. These forecasts have changed significantly over recent years as approaches to carbon valuation have changed and better understanding has been developed of the operation of the market. However, the market remains relatively immature and as a consequence there must be the possibility that estimates of carbon prices will continue to move substantially with knock on effects to air traffic forecasting.

Market Maturity

The DfT model includes an assumption that over time air transport markets will mature and become less responsive to economic growth. This in itself is not an unreasonable assumption. Most products have a life cycle of this nature, whereby in the early stages take up is rapid, compared to growth drivers and ultimately this slows. This inclusion of considerations around market maturity should be considered strength. However, equally, the actual assumptions and methodology could be considered a weakness. The DfT assumptions are based around work undertaken by Dr Anne Graham of the University of Westminster in 2000. They essentially assume that different markets are currently at different levels of maturity and that therefore maturity assumptions should start at different points in time and that the effect will result in a gradual fall and convergence in economic growth elasticities over the long term. Whilst the general presumption may be valid, the work upon which the assumptions used are based is somewhat out of date and may not give a realistic indication of the current state of maturity of markets. Whilst the DfT is quite clear that ultimately these are judgemental assumptions, this may be the only possible approach given there is very limited evidence of this effect to date against which some form of quantitative analysis could be performed. However, this means that there is considerable uncertainty in the future modelling of this effect. This would matter less if the impact was marginal but it is not and, as a consequence, a significant driver of future market growth rates is in fact judgemental. By 2050, the impact of market maturity is to reduce total demand by around 21% in the Central Case. A small error in this judgement could result in a very significant change in the market.

A further issue that has not been considered within the DfT forecasts is the extent to which aviation markets in different parts of the UK may in fact be more or less mature and hence more or less sensitive to economic growth or indeed changes in price. This is perhaps our major concern.

It would seem reasonable to assume that the London market is a relatively mature air transport market. However, it would also be reasonable to suggest that many UK regional airports are some way behind London in terms of the product life cycle. Hence, it would be reasonable to suggest that higher elasticities in relation to economic growth and potentially air fares might be experienced in relation to demand in regions away from London and the South East. This is something that has been suggested for some time by regional airports across the UK and has, to some extent, been recognised by DfT in the past. Earlier versions of the UK aviation forecasts produced around the time of the Future of Air Transport White Paper in 2003 included different growth rates for London and the regions to reflect this point.

We are strongly of the view that this applies to the market in the North East. Our experience has shown that the market is more sensitive to price, that demand is stimulated by new services and that economic growth accelerates growth in passenger numbers. The introduction of no frill services to the North East market in

the 2001-2007 period triggered a significant increase in demand, the economic downturn and upward pressure on price, mainly as a result of rising APD, caused a rapid reduction in demand during 2008 and 2009.The Newcastle to Dubai service has shown how a new service can stimulate demand, and we believe that other new services, particularly long haul, would have a similar effect.

General Treatment of Uncertainty in Inputs

DfT clearly recognises the importance of considering the impact of uncertainty in relation to the inputs in to its modelling process. It publishes sensitivity tests that examine the impact of varying individual inputs and also scenarios which alter a number of inputs at the same time to examine high and low case forecasts. However, although there are a considerable number of these tests they are relatively unsophisticated and the scenario testing appears to be relatively arbitrary in the inputs it varies and therefore the highs and lows it actually defines. It is perhaps therefore reasonable to suggest that currently the treatment of uncertainty in the DfT model is relatively weak. The use of probability techniques, such as Monte Carlo analysis, to analyse uncertainty would have considerable merit and is something that could be built in to the DfT framework. This is a key theme in the Davies Commission Discussion Document.

Pricing Off Elasticities

The recent HMRC report on the impact of price differentials at UK airports identifies that the mechanism by which passengers are priced out of the market within the model in the event of an airport being constrained uses the air fare elasticities identified within the National Air Passenger Demand Model. This may be a misapplication of these elasticities as they are being applied to generalised cost rather than an air fare. The generalised cost facing passengers is a function of the monetised costs of accessing the airport and waiting for flights. It does not include the fare as this variable has been dropped. Therefore, applying an air fare elasticity to this generalised cost may be erroneous and produce skewed results.

3.2 Assumptions

Above we have outlined some strengths and weaknesses in relation to the key inputs and assumptions in the DfT model. However, this only presents some of the picture and in some cases, while the DfT model has flaws, these are potentially universal flaws that will face any model. Below we have set out some key issues in relation to the methodology and specification of the model, essentially the way in which the model actually works. At the outset, it is again helpful to make a couple of overarching points:

- our comments relate almost exclusively to the National Air Passenger Allocation Model. This is by some margin the more complex of the two models and in our view is the one that gives rise to most concerns. The regression techniques and specification of the National Air Passenger Demand Model are well established, less complex and generally appear robust. While it is possible to question inputs to this process, the model itself appears robust;

- while we have significant concerns regarding the National Air Passenger Allocation Model and the results it produces, the type of model and the overall approach is sensible. The model is a multinomial LOGIT model, a type of model that is commonly used for transport forecasting in competitive markets. This type of model's ability to statistically analyse passenger choice in competitive environments is potentially powerful. However, these models are

just tools. Their strengths and weaknesses need to be recognised, their results interpreted along with other evidence and, ultimately, the outputs considered for rationality. As much as anything it is the current failure to recognise the limitations of such a tool that is the greatest failure of the DfT's approach to forecasting.

Composition of the Generalised Cost Function

At the centre of the allocation model is a monetised generalised cost function. This identifies the cost to passengers of using different airport options and, based on past patterns, estimates the market share of each airport option on this basis. In broad terms, there are three elements to this generalised cost within the model:

- Access costs – the time and costs associated with getting to a particular option;
- Frequency costs – the cost associated with waiting for a flight at the relevant option. The greater the frequency, the lower the wait time and the lower the cost;
- Capacity constraint costs – if an airport is capacity constrained, the model applies an additional cost to this option to make it less attractive to passengers.
- Clearly this is a simplified view of the world as are all models and DfT has stated that there are of course other components to a passenger's decision that are not reflected in this generalised cost. However, there are two that are potentially particularly important:
- Air fares – the level of air fare on offer is clearly an important consideration in passenger choice. If one airport offers consistently lower fares, it is likely to be more attractive. The fare term was excluded following comments in the 2011 Peer Review of the model on the grounds that the data available was unreliable. We would wholly support that conclusion but the implications of excluding the fare do need to be considered. DfT suggests that over time average fares to a single destination from different airports are probably similar and hence it is not likely to be a significant determinant in airport choice. This may to some extent be true (although we would question if this is really the case in situations where LFAs at one airport are competing with full service airlines at another) but it is not just the relationship within the route market that is important within the model. Routes are not exogenous entities. As soon as capacity constraints enter in to the equation, then there is interaction across different routes. The overall size of the generalised cost then becomes important as constraint costs will be a larger proportion of overall cost on some routes than others and if a component as important as the fare is excluded from the original absolute generalised cost the impact of the constraint cost within this process could be skewed. This would result in problems in relation to how and which passengers are priced off or reallocated and from which markets;
- flight times – as described above, there is some confusion as to whether flight times are included within the generalised cost function or not. However, if they are not there is again the potential for difficulties once constraint costs start to be applied within the system. Again, the failure to include a flight time cost will reduce the overall absolute starting point generalised cost, potentially upsetting the balance between a constraint cost and other elements of the

generalised cost equation. The effects are potentially similar to that of not including the fare.

Frequency Term and Mechanism

The specification of the frequency term within the model and the way in which it operates is central to many of our concerns regarding the DfT model. The frequency term is very important as it essentially articulates the supply side reaction to the growth in demand in the market. It is a key driver in market share over time. If frequency grows at one airport and not another, the former will become stronger and stronger over time, gaining market share. This is in essence correct. However, the difficulty comes if this frequency term is not specified correctly or there are issues around calibration. In our view both are an issue here.

We are concerned that over time frequency simply becomes too important a part of the generalised cost facing a passenger. The model is calibrated on a balance between access time and frequency that is correct currently. However, access times do not change significantly in most cases over time while clearly the number of frequencies does. The result is that the balance in the generalised cost function may be becoming upset, with frequency becoming more and more important, drowning out passengers' considerations around distance. This has the effect of making it hard for the model to recognise airports' abilities to grow in line with the potential of their own catchment areas as they begin to compete more and more on frequency rather than access time. The result is that airports that gain a slight advantage over others in one market or another rapidly develop frequency that sucks in more and more traffic resulting in a 'ballooning' effect in terms of the demand they attract. We provide some examples of what believe to be this effect below.

Calibration is Beholden to History

As stated above, the allocation model is calibrated on historic patterns of behaviour by passengers. The result is that in some markets if an airport has no track record of performance it is unlikely to attract any traffic. The model estimates regression coefficients for the key choice determinants described above. It also estimates what are termed airport constants. These could be seen as reflecting the innate attractiveness of the individual airports to passengers within the given market stemming from the elements of passenger choice that are not modelled. The difficulty is that with a limited generalised cost function, if an airport has no history in a given market its attractiveness in terms of its constant will be low. As a result, even if there is demand in the future for a service it has not served before, it is very hard within the model for it to attract the traffic and sustain the service in the face of competition from incumbent airports in the market. This can lead to perverse patterns of development; particularly again when constraint effects are applied and significant volumes of demand start to spill out of London and the South East, mostly to airports nearby.

Over the past few years, we have had discussions with the modelling team at DfT about the forecast for Newcastle. These have covered the overall forecast figures, but have specifically focussed on the absence of long haul, despite the existence of the Emirates service. This has been partly corrected in the most recent run of the model, but we are still of the view that the potential is underplayed.

Treatment of International to International Interline Passengers

The way in which international to international interline passengers are forecast in the model is another area of particular concern and is particularly pertinent to the current debate around new capacity in London and the South East and the deliberations of

the Davies Commission. The issue is in fact highlighted specifically within the Discussion Document.

This market is essential to the operation of a 'hub' airport. The function of a hub is concentrate demand from a wide geographic on a single point so an airline or airlines can consolidate demand to enable a broader range of destinations to be served at a higher frequency than would be possible based on airport's local catchment area.

The competitive market for these passengers is quite different to that for surface origin passengers in the UK. Competition is primarily beyond UK boundaries, Heathrow (the UK's only true hub) competes not with other UK airports but with overseas airports such as Amsterdam, Paris CDG, Frankfurt, Munich, Madrid, Dubai, Doha or Abu Dhabi.

Currently, the DfT model only considers a small slice of this market and only in a very simplistic way. The National Air Passenger Demand Model estimates the number of international to international interline passengers using UK airports as hubs using a relationship to overseas economic growth. The numbers at each airport simply grow in line with this forecast. When there is a constraint cost a proportion are simply priced out of the market. There is no consideration of the overall size of the potential market or indeed how UK airports compete with overseas airports for this market. Given that the current discussions around additional airport capacity in London are focussing around maintaining hub status this is a crucial problem.

At present, the DfT model implicitly assumes that the UK (essentially Heathrow) has a 'right' to a slice of this market. This is not the case. Interline passengers are by nature footloose, they can shift routings very easily, much more easily than a surface passenger in many cases. This means that if Heathrow continues to lose destinations and become a less attractive hub there is the potential for others to pick up substantially more traffic from Heathrow than is implied by the DfT approach. Equally, the DfT approach cannot hope to replicate the potential of a rejuvenated London 'hub' in taking traffic from other hub airports. Ultimately, the decision to route a passenger through one hub or another is controlled by the airline or alliance in terms of how it prices tickets for transfer passengers in a competitive market. Hence, the real determinant of hubbing is the extent to which airlines need to attract transfer traffic to sustain their network.

The DfT model needs improvements in this area. It needs to make estimates of the total relevant market flows, perhaps using MIDT or similar data, and it needs to effectively consider the competitive dynamic with other hub airports, using a LOGIT or Quality of Service Index (QSI) type approach. This is not necessarily a simple task but it needs to be considered in more depth. Only then can the full potential of an expanded Heathrow be understood, and the economic benefits to UK PLC calculated.

3.3 Evidence of Issues in the Forecasts

We have described above a number of issues and potential problems with the DfT forecasting model. However, it is also helpful to consider what these issues mean in practical terms in relation to the outputs from the process. In the latest version of the forecasts, with total demand growing relatively slowly, up until 2030 the forecasts look relatively sensible. The 'spill' effects that highlight a lot of the problems we have described are not yet strong enough to cause major problems. However, by 2050, the irrationalities in the model are beginning to appear, suggesting that they are there earlier on but are simply are harder to spot in the published data available.

Below, we have set out a small number of examples that help to illustrate and provide evidence in relation to some of our concerns:

- Long Haul Traffic at Stansted Airport – the latest 2013 forecasts show a strange pattern in terms of long haul demand at Stansted. Unlike in previous versions of the forecasts Stansted does secure some long haul traffic by 2030 (around 2.5 mppa). This is rational. The Airport is close to London, has a strong natural catchment area (including strong long haul markets) and runway capacity and capability. However, by 2050 all this traffic has gone again. We suspect that it has been sucked in to Birmingham instead, which has gone from having 2.6 million long haul passengers in 2030 to nearly 15 million by 2050. This does not seem rational. With a significant presence at Stansted established, presumably serving the natural catchment area, why would airlines then leave that base? The answer in the model probably relates to the weakness of Stansted's previous track record as a long haul airport and a frequency 'ballooning' effect at Birmingham;

- Growth at East Midlands – this is classic example of the model not allowing an airport to develop in its own catchment. Between 2010 and 2030, East Midlands grows by only 100,000 passengers, reaching 4.4 million in 2030. However, as 'spill' starts to roll out of London in earnest, by 2050 it has reached 14.1 million passengers. Again, however, there is a lack of rationality in the pattern. Despite having 14.1 million passengers, there is no long haul traffic. The Airport has no track record in these markets and hence it cannot sustain any services;

- Long Haul in the East of the UK – despite constraint in London and despite a number of regional airports developing significant long haul presences, notably Birmingham and Manchester, no airport in the Eastern half of the country, including Luton and Stansted (at 2050), develops any long haul traffic until as far North as Newcastle. Even then the pattern is strange. Between 2010 and 2030, Newcastle loses 100,000 long haul passengers, but by 2050 it has gained 600,000. This suggests that it is in fact a beneficiary from spill, probably from Manchester as it has filled up on the back of demand spilling from further South. Essentially, the model is just pushing demand from London until it hits an airport with capacity and a track record in long haul traffic. That airport then experiences a ballooning of frequency, which stops others from developing these services, until it itself is full and demand flows to the next airport in the chain. This is not how air services develop in practice, as we can demonstrate here at Newcastle. We would urge the Commission to look closely at our Emirates example as a case study in the potential of long haul from regional airports.

Whilst it is easier to identify the patterns in the long haul category as it is separately identified, we suspect that the same errors infect individual short haul markets as well rendering detailed results spurious as congestion bites at Heathrow.

3.4 Recommended changes to the DfT Model

The DfT modelling is highly complex and has been developed over many years. However, there are significant issues, particularly around the functioning of the allocation model. In our view there are a number of priority areas for action:

- The approach to analysing uncertainty in the inputs to the National Air Passenger Demand Model needs overhauling, probably using a probability approach. There will always be difficulties around input assumptions and

forecasts but the effects of these can be minimised by appropriate approaches to uncertainty;

- The frequency term within the model needs re-examining to consider the 'ballooning' impact it seems to create when traffic is spilled. Fundamentally the model needs to allow airports to develop their own catchment areas appropriately. We would suggest Emirates from Newcastle as a case study;
- The treatment of international to international hub traffic needs to be substantially overhauled, particularly in the context of the terms of reference for the Davies Commission;
- There needs to be a step change in the way the forecasts are used and considered. The model is just that. It is a piece of evidence that needs to be viewed in the round. It is not sufficiently robust or accurate to be a sole basis for policy decisions. Wider evidence on growth and patterns of growth will always be vital. Even an enhanced version of the model should be viewed in this light.
- Peer review needs to include industry forecasting expertise to sense check the results to how airlines are actually likely to respond to growth and constraint.

4. Newcastle International Airport Ltd Forecasts

All airports have their own forecasts based upon increasing market share and these forecasts are typically higher than those produced by the DfT model. We are confident of higher growth and an increasing market share for Newcastle. Our base case forecast is for a demand of 8mppa by 2030, and we have other scenarios indicating higher growth should we secure a greater market share.

We believe the Commission should look closely at the potential for direct long haul scheduled services to stimulate demand from regional airports and economic activity across the regions they serve. The Emirates service from Newcastle has helped significantly increase connectivity for the North East and led to increased economic activity in the region with a positive impact upon employment. Around 150,000 passengers a year are using the service, of which 25% are flying to Dubai and 75% are connecting to onward destinations across the Far East, China, India, Australasia, etc.

The service has had a significant impact upon the level of business activity, for example assisting an increase in trade between the North East and Australasia from under £150m in 2007 to just under £275m in the last 12 months, and trade with the UAE, Saudi Arabia, and other more easily accessed economies has grown strongly. The value of exports passing through the Airport grew to £173M in 2012, of which no less than £150M was carried on the Emirates daily flight.

The service has recently been enhanced through the introduction of a larger Boeing 777-300 aircraft. This has provided a 50% increase in passenger and cargo capacity.

5. The role of Air Passenger Duty

Air Passenger Duty (APD) has reached levels that are making the UK economy uncompetitive. We request that government is more joined up, i.e. that aviation and taxation policy and looked at alongside each other. This is particularly important in the carrying out of passenger forecasting, where variations up or down in APD could result in large changes in passenger forecasts.

Regional airports have proposed the restructuring of APD such that a higher rate applies to the most congested airports and a lower rate applies to un-congested airports. HMRC have carried out some modelling of the impact of price differentials on the distribution of passengers and we believe that this work will be of interest to the Commission, and could be taken further, particularly as the Commission looks at short term measures to make best use of existing available runway capacity around the country.

6. Answers to questions

To what extent do you consider that the DfT forecasts support or challenge the argument that additional capacity is needed?

We have a number of concerns about the modelling, but notwithstanding these our view remains that the forecasts support the argument for additional capacity. Changes to the methodology and modelling of additional scenarios are likely to delay the trigger point for more runways by only a few years.

What impact do you consider capacity constrains will have on the frequency and number of destinations served by the UK?

Capacity constraints, particularly at Heathrow, have a significant impact on frequency and range of destinations, but over time have also had an impact on the number of UK feeder services. Newcastle has managed to retain 6 a day to Heathrow, carrying almost 500,000 passengers a year, of which 50% are interlining. These slots will come under intense pressure without the provision of additional capacity.

How effectively do the DfT forecasts capture the effect on UK aviation demand of trends in international aviation?

We have a number of concerns, as set out in section 3 of our response above.

How could the DfT model be strengthened, for example to improve its handling of the international passenger transfer market?

As stated in our main response above, we suggest the following improvements:-

- The approach to analysing uncertainty in the inputs to the National Air Passenger Demand Model needs overhauling, probably using a probability approach. There will always be difficulties around input assumptions and forecasts but the effects of these can be minimised by appropriate approaches to uncertainty;
- The frequency term within the model needs re-examining to consider the 'ballooning' impact it seems to create when traffic is spilled. Fundamentally the model needs to allow airports to develop their own catchment areas appropriately. We would suggest Emirates from Newcastle as a case study;
- The treatment of international to international hub traffic needs to be substantially overhauled, particularly in the context of the terms of reference for the Davies Commission;
- There needs to be a step change in the way the forecasts are used and considered. The model is just that. It is a piece of evidence that needs to be viewed in the round. It is not sufficiently robust or accurate to be a sole basis for policy decisions. Wider evidence on growth and patterns of growth will

always be vital. Even an enhanced version of the model should be viewed in this light.

- Peer review needs to include industry forecasting expertise to sense check the results to how airlines are actually likely to respond to growth and constraint.

What approach should the Commission take to forecasting the UK's share of the international aviation market and how this may change in different scenarios?

We are strongly of the view that a strategy to secure a greater share of the international aviation market would benefit the UK economy, improve connectivity and increase our competitiveness.

How well do you consider the DfT's aviation model replicates current patterns of demand?

We have had an ongoing concern that the model underplays the potential of regional airports, as set out in 3 above.

Do you agree with the source of the input data and assumptions underpinning the DfT model?

We have set out our concerns about inputs and assumptions in 3.1 and 3.2 above. The Commission should seek to overcome at least some of these concerns.

Do you agree with the choice of outputs modelled?

Outputs should include, as a minimum, forecasts of passenger numbers and for all airports.

Do you consider that the DfT modelling approach presents an accurate picture of current and future demand for air travel? If not, how could be improved?

We are concerns that the modelling underplays the potential of regional airports, particularly in respect of long haul, and is too heavily influenced by the ballooning effect at airports close to the South East when capacity constraints kick in.

Is the DfT model suitable to underpin an assessment of the UK's aviation connectivity and capacity needs?

With the improvements we have suggested, plus the modelling of additional scenarios relating to APD differentials, we would be happy to support the modelling approach.

What alternative or complementary approaches could be used to assess the impact of international competition?

We have no suggestions.

What factors, if any, are missing from the DfT's modelling approach? How can these be more effectively analysed?

We have identified some issues with the methodology in 3.2 of our response above.

Is the DfT's model granular enough to underpin the Commission's assessment of future demand?

We agree with what the DfT have said in the past that the modelling is not intended to be as accurate when broken down by airport, and that it is not intended as a forecast on an airport by airport basis. This is fine when used in the context of, for example, a national CO2 forecast, but when used to shape airport policy it is a cause for concern.

Does the DfT approach to demand uncertainty capture a reasonable range of uncertainty? Could the approach be improved?

See our comment in 3.1 above.

Would a probability based approach to dealing with uncertainty help the Commission to test the robustness of the model's outputs?

See our comment in 3.1 above.

We have reviewed four alternative forecasts. Do you consider that there are others we should be looking at and why?

Yes. Regional airports have proposed the restructuring of APD such that a higher rate applies to the most congested airports and a lower rate applies to un-congested airports. HMRC have carried out some modelling of the impact of price differentials on the distribution of passengers and we believe that this work will be of interest to the Commission, and could be taken further, particularly as the Commission looks at short term measures to make best use of existing available runway capacity around the country. We would recommend that the Commission models further scenarios which explore the impact of intervention via a restructuring of APD.