

TRANSPORT STATISTICS USERS GROUP

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Discussion paper 01: response of the Transport Statistics User Group (TSUG)
This is the response of the Transport Statistics User Group (TSUG) to the Airports Commission's Discussion Paper 01.

The TSUG, as its name implies, is an organisation bringing together users of transport statistics in the UK. It works with bodies like DfT and ONS, and runs regular seminars where practitioners can learn about and discuss developments in transport statistics, providing professional user input and feedback.

TSUG has both individual and corporate members. This response has been compiled by a Task Force on Aviation Statistics and Demand Forecasting: the Task Force comprised people particularly interested in this specific area. It does not necessarily reflect the views of all members; and some, especially corporate members, will be submitting their own response to the Commission.

A general view was that the long delay in making decisions about future airport capacity has done the UK no good at all.

In the nine sections below we set out our views and some concerns about the current approach, methodology and data used.

- The general suitability of the established forecasting approach to the current requirement was questioned
- Reliance on narrow range of traffic data resources may be a weakness
- Task Force was concerned that assumptions about the complexity of the aviation market has led to unrepresentative modelling
- Unconstrained forecasts may be based on "constrained" data
- Accuracy of econometric modelling may be undermined by analytical issues and the structure of the data used.
- International-international transfers: a need for much more comprehensive modelling
- Maturity and market saturation: limited research makes for modelling challenges at a turning point in aviation development.
- The allocation model: capturing the reality of airport capacities and traveller behaviour has led to some counter-intuitive results
- Scenarios of consistent world views, outside planners control, combined with sensitivity checks of key assumptions as the best way of dealing with uncertainty

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1. The general suitability of the established forecasting approach to the current requirement was questioned

The Task Force considered the appropriateness of the forecasting approach, especially whether the established forecasting model was applicable to deciding on optimal hub airport strategy.

1.1 Forecasts may well look quite different depending on the types of questions being asked. At one level the aim of the DfT's aviation forecasts is to help government develop its policy for the future of UK aviation – presumably the purpose for which they were originally developed. But now they are also being used more specifically to determine the size of a possible future UK hub airport, and UK hub airport strategy generally. There is a question of whether the models being used cope adequately with these two different issues. It is also unclear how well DfT's model can handle both hub and point-to-point traffic and there might be an advantage in developing separate models.

1.2 Whilst capacity planning generally used to be based on a predict-and-provide approach, this has been changing – initially with road traffic, but now more so with aviation too. The aviation industry now has more of a demand management approach. How does this affect the choice of an appropriate type of forecasting?

1.3 However, the Task Force was unaware of good examples of airport system planning in other countries, but commends a trawl to see if useful experience exists elsewhere. It is understood that the Airports Commission have already held some discussions with experts from OECD countries on this topic. The proliferation of airports in Germany and Spain (where two new airports now see no commercial air service) imply that any planning there is limited. One member of the Task Force was aware that regional airport system planning has been attempted in the US but with varying degrees of success. A useful resource here is [ACRP Report 31: "Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-regions"](#), Airport Cooperative Research Program (2010).

2. Reliance on narrow range of traffic data resources may be a weakness

Members of the Task Force – who are statisticians and users of statistics rather than modellers – were interested in the sources of key data (question 6.5(1)). Clearly, some are more comprehensive than others, and it is important to understand the limitations of some sources.

2.1 CAA & IPS data, for example, are based on interviews with departing air passengers. CAA data seems to be used for current pattern of traffic. And IPS is used as the main fare source. The ways in which these two sources are actually combined and used was not clear to the Task Force. There are always suspicions that the characteristics of arriving passengers might be different from departing passengers. The characteristics of those departing may be different from those arriving i.e. they could be the same passenger but with different requirements coming versus going. Also do we know enough about overseas visitors? The National Travel Survey (NTS), on the other hand, looks at all journeys.

2.2 There are some untapped data sources which DfT has not used, though it appears that it has them available. The most important of these is MITD data, which shows the full routings used by actual passengers, and was seen by the Task Force as the ideal. It is understood that this is not used since it does not cover self-inter-liners and has no journey purpose data. But MIDT contains fare data. The DfT and the forecast report both note that the availability and accuracy of foreign fares is an issue.

3. Task Force was concerned that assumptions about the complexity of the aviation market has led to unrepresentative modelling

Both the demand forecasts and airport allocation models include both implicit and explicit assumptions. We set out below some areas where assumptions about complex features of and changes in the market may bias the forecasts.

3.1 The Task Force was concerned that implicit assumptions of how the aviation market works, may have underestimated the level of detail needed to model it and the complexity of modelling needed.

Airport ownership and strategy

3.2 Airport ownership and strategy is a key point, and as noted in the foreword to Guidance Document 01, airport ownership in the South-East has changed since 2007. A factor which particularly needs to be taken into account here is the breakup of BAA. There are probably two major factors here.

First, the separation of ownership of Heathrow, Gatwick and Stansted in the South-East and Glasgow, Edinburgh and Prestwick in Scotland is likely to – and indeed was designed to – affect competition. This can be seen by the recent investment by Gatwick in differentiation and service, and in Edinburgh by the recent launch of a £15m/year route start-up support scheme specifically designed to capture routes from competitor airports. The latter is airport funded. What impact will this have on terminal capacity in the short-term, and on airport capacity generally in the long term?

Second, an overseas investor looking at Ferrovial's experience with its investment in BAA will not be encouraged. It will be recalled that their purchase of an airport system including seven major UK airports was followed by the forcible divestment of three of them. The regulatory regime also appears to be growing in complexity. This might have been expected to make such investors more averse to investing here. But, on the other hand, since then Qataris and Chinese have invested in Heathrow and the Australians are about to do so in Stansted.

Load factors

3.3 While there is scope for aircraft size to increase, it was thought that average load factors were unlikely to increase much from the present mid-80s. So growth at Heathrow in particular would only come from the introduction of larger aircraft. This, of course, would impact on the number and frequency of destinations served: thin markets (like regional destinations in the UK) would continue to be crowded out. A frequently overlooked factor is the balance of business to leisure passengers on legacy airlines, the former possibly carried at lower average load factors to allow for the last minute booking. Business passengers requiring more space per passenger therefore affect average passenger per aircraft figures.

3.4 The high value of slots at Heathrow in particular might be introducing market distortions. Some airlines might be preserving their slots by flying smaller aircraft on short-haul flights (although such flights do feed profitable traffic into longer haul flights).

This strategy is employed partly because of the 'use it or lose it' provisions of the EU slot directive (which is likely to be tightened). Over time these slots may either be sold or used more profitably by larger aircraft on longer flights and this has been happening at Heathrow in particular, with thin domestic routes being squeezed out. BA's recent acquisition of BMI was largely motivated by the latter's slot-pool at Heathrow. This reduces the accuracy of forecasting based on the present situation – in this case, because in the long-term BA is likely to use these slots for longer sector lengths than BMI did.

Airlines

3.5 Alliances/airline strategy and general footlooseness is a key issue. Figure 3.7 in Discussion Paper 01 identifies two factors explaining the difference between forecasts and actual outcomes – oil prices and GDP. The ability of airlines to react quickly to changes in demand is another – there have been numerous instances of low-cost carriers moving in when another carrier has gone out of business (Ryanair and Wizz Air at Budapest when Malev recently ceased trading, for example). The impact of this on demand is an under-researched factor.

The Task Force noted that the time horizons of different parts of the aviation industry could vary considerably. Airports tend to plan for at least 25 years: legacy airlines have a horizon of around five years whereas low-cost carriers have a significantly shorter time

frame. The ease with which carriers can move away from airports (hub or otherwise) has been illustrated in the US in particular, but Alitalia's withdrawal from Milan Malpensa and BA move from Gatwick in the early 2000 are examples. There are also numerous examples of low cost carriers abandoning bases, Ryanair's from Cardiff, and easyJet's from East Midlands are cases closer to home.

Oil & Fuel prices

3.6 Para. 3.11 of the Commissions Discussion Paper says that oil prices are forecast to remain constant in real terms from 2030. This was considered questionable, at least without some more extensive explanation.

3.7 Aviation has tended to rise faster than oil generally. Figure 3.3 discusses how fuel costs were forecast. A factor not mentioned is the 'crack spread' - the premium (reflecting the greater profitability of other products) charged by oil companies for 'cracking' crude oil in such a way that it produces aviation fuel. In the recent past, the cost of aviation fuel has gone up faster than that of oil generally because of this crack spread, something not mentioned in the forecasting report (and, presumably, not included in the oil price forecasts).

4. Unconstrained forecasts may be based on "constrained" data

The numbers and patterns of travellers through the UK's airports show up in the time series of terminal passengers that are the basic input to the demand forecasts. However, as set out below, there is reason to suppose that it may be significantly biased.

4.1 The elasticity coefficients were derived from almost 30 years of demand data and on the hypothesised drivers. But how much history is built into the demand data? Will new facilities risk being under-sized when (if?) forecasts turn out to be too low? The Task Force was surprised that DfT confirmed that they assume that the historical data is unconstrained

4.2 Airport capacity set by terminal and/or runway capacity, together with hours of operation, especially at a few highly constrained airports and those with environmental caps, has surely constrained demand.

4.3 Available services and the effect of bilateral agreements constrain total travel. For example, to what extent is the relative paucity of direct services to/from many non SE airports a cause or a result of low propensity to travel in their hinterlands? It would be interesting to compare propensity to use charter flights by region, as these are more widely distributed and may be better tuned to needs of infrequent fliers.

4.4 There has been much media criticism of the problems of acquiring or extending UK visas which of course, makes travel out of the country virtually impossible. The cost and difficulty of acquiring a visa to enter the UK is criticised, in particular when it is reportedly cheaper and easier to get one for all Shengen countries. This could be discouraging inbound tourism. How valid these criticisms are and what impact they have is difficult to assess.

4.5 It is possible, though difficult to estimate the scale, that airspace management, airline preferences and economics, and long term shifts in exchange rates, may have had an effect on the level of the demand, leading to some bias.

5. Accuracy of econometric modelling may be undermined by analytical issues and the structure of the data used.

The outcome of the econometric work depends on the travel data, and its structure, the underlying drivers and the regression methodology. In this section we focus on some aspects of the method and the structure of the data. We have already said in a previous section that the derivation of elasticity coefficients uses constrained data.

5.1 Concern was expressed by Task Force members that both GDP growth and oil prices are used in some regressions. These are thought to be highly correlated: it was thought to be good practice not to use dependent variables in a demand model in this way. DfT told us that most of the time dependent variables will not be used together in a multiple regression, though probably the two are used in the multiple regressions. Not all economist appear to believe that the two variables are so highly correlated

5.2 Most literature seems to show that disaggregate forecasts produce better results than aggregate forecasts. By combining the very different regional socioeconomic/demographic characteristics and propensities to travel/fly into the 16 international sectors and 2 domestic sectors, the often strongly varying individual trends are lost.

5.3 The structure of the model may also need to be improved. International to international journeys form just one of the model's 19 sectors and there was no breakdown within this for global regions. Similarly all UK flights are included within one group which might be inappropriate, particularly in the light of HS2.

5.4 The structure and linkage between models was also questioned. The Task Force was unclear how compatible the geographies in the demand and allocation models were. The homogeneity of the category OECD outside Western Europe and the accuracy of forecasts using this, were also questioned.

5.5 The Demand and Allocation models operate on two different descriptions of the international ODs. Even if a two stage modelling structure (Forecast + Allocation) is used (and there are some benefits from doing this), it would be desirable to have a single integrated route and O/D zone geography, and indeed one which reflects real differences.

5.6 When very different international OD areas (see below) are also grouped, by combining data from very different areas, the problem is compounded. Reallocating back to national OD zones has some attractive features, but should preferably be done on consistent geographies. If the initial structure was disaggregated and the two stages were linked using consistent geographies it would be easier to check that the allocated volumes and the frequencies offered fitted.

5.7 The treatment of maturity and of behavioural changes are both based on quite limited analyses and data (see below for discussion of maturity)

5.8 Journey purpose is very simply represented as a binary Business/Leisure split. (VFR and, perhaps, personal (study, and miscellaneous) travel should be added as well. DfT has indicated that adding a VFR journey purpose would be the next enhancement). As changing real fare prices have very different effects on travellers with different journey purposes, the Task Force felt that this is quite a serious omission. Higher levels of net immigration – - are likely to lead to higher volumes of travel. Higher gross immigration and higher emigration both play a part in driving VFR traffic. in the 'Visiting Friends and Relations' (VFR) market. While we sympathise with the DfT's view that ethnicity is difficult to forecast e.g. no one predicted the influx of Polish workers into the UK, but we do believe that "shock changes" should certainly be handled as part of a scenario

5.9 The Task Force considered whether the structure of sectors and routes should reflect UK/Airports/Airlines or groupings/traffic flows in a way which is useful for understanding trends. A number of the considerations might include:

- Most of London's European/Middle Eastern hub competitors are to the east and south of London: only a potential regional hub at Madrid is further west. It might be

useful to introduce an east/west origin/destination split. Within OECD, LDC and NICs there are natural W-bound and E-bound groupings.

- Short haul European ODs include more or less mature, wealthy and rail accessible markets, as well as some which are primarily traditional leisure markets and others which (at least now) are much less so. Western Europe appears to include Turkey but not Israel (both OECD members).
- Level of development definitions may be out of date. Using the NIC and LDCs definitions (based on a small scale DfT 2006 map--difficult to interpret easily--on p16 of 2013 forecast report) it appears that the NICS are only

| | |
|-----------|---------------------|
| China | Malaysia |
| Taiwan | Singapore |
| Hong Kong | Burma (apparently). |

- Meanwhile it seems that the LDCs include the whole of South/Central America, Middle East, Other Asia and Africa, and, perhaps controversially,

| | |
|---------|----------|
| India | Bulgaria |
| Russia | Romania |
| Brazil | Belarus |
| Ukraine | |

- A sector (for demand forecasting) with a route structure (for allocation) based on up to 16 geographical sectors might be of the form

| Main DfT sectors | Possible 3 or 4 way split in sectors | | | |
|-------------------------|--|-----------------------------|--------------------|--------------------------|
| Short haul | Largely/partly rail accessible (F,B,NL,D & CH) | Traditional leisure markets | Other EU | Remote (and some non EU) |
| OECD (non Europe) | West (US & Canada) | Asia | Other (mostly ANZ) | |
| NICS | West (Central, Southern America) | Middle East | Asia | Africa and ROW |
| LDC | West (Central, Southern America) | Middle East | Asia | Africa and ROW |

We were very surprised to be told by DfT that lack of computer power was the main constraint to using more geographical splits.

5.10 Because of the lack of capacity at Heathrow, there is a market in slot trading. This market, together with regulatory price caps on landing charges at the main London airports, distorts the aviation market. The Task Force agreed that there was need to include a demand management variable in air travel demand forecasting models, and that this seemed to be missing from the DfT's current models.

6. International-international transfers: a need for much more comprehensive modelling

A crucial component of demand in a hub airport, forecasting international-international demand at a UK hub presents great modelling challenges, and is complicated by the need to reflect the strategies and interests of airlines, and the behaviour of passengers in a particularly un-transparent market

6.1 The possible market maturity of the European and North America market is discussed in more detail in Section 7 below. If world-wide growth is continuing at the

historical level of 5% a year, a key question is: should the UK attempt to benefit from this (by providing hub capacity) and if so, how?

6.2 The benefits to the UK economy of doing so are clear: they include more choice of direct flights, and a greater attractiveness of the UK as a place to do business. The disbenefits – in terms of land-take, noise and pollution – are also clear. Profitability to the UK economy and the aviation sector as a whole may be positive, which may not always be the case for airlines separately.

It is worth noting that a transfer (or connecting) passenger is defined as someone who arrives and leaves less than 24 hours later, so permitting time enough to spend money locally or indeed allow a ‘trip into town’.

6.3 Furthermore, the competition between hubs for transfer traffic is likely to grow. Those airports that have become well established hubs in the last decade or so are being joined by airports, whose owners and often a national airline based there, have ambitions to build this business. Some of the new Gulf hubs are backed by strong sovereign wealth, and are often well located for the purpose. The UK at the extreme West of the Eurasian land mass may have to be satisfied by a niche or specialised role.

6.4 The Task Force also considered that using global GDP as a forecasting basis for the international-international component of the market (as implied paragraph 4.8 of the Consultation) was unlikely to reflect the actual situation.

6.5 The difficulties of modelling international-international transfers (paragraph 4.8 of the Consultation) are recognised by the Task Force, but as they account for 25% or more of Heathrow’s traffic, it is clearly important to get it right. Hub competition is an important issue, and one which is growing in importance.

6.6 A wide area hub competition model is clearly needed. The Task Force concluded that one really needed a model which encompassed all key European and Middle Eastern hubs – in particular Amsterdam Schiphol, Paris Charles de Gaulle, Frankfurt, Helsinki, Madrid, Istanbul, Abu Dhabi, Dubai and Doha. Only then could the complex interactions be properly teased out.

6.7 Growth in international-international transfers (not only at UK hubs) is being fostered by changes in APD (incentivising long-haul passengers to interline at near-Europe hubs) as well as congestion at Heathrow (crowding out flights from the UK regions, making interlining in London more difficult for domestic passengers).

6.8 Growing concentration in the aviation market is also impacting on this. Recent changes (mergers like United and Continental, American and US Airways, and agreements like that between Delta and Virgin Atlantic) are changing and will continue to change the way or routes that people fly.

6.9 Changes in aircraft size and range will also have an impact, and one which is very difficult to forecast. The fact that Boeing are assuming a proliferation of long thin routes flown by mid-size aircraft like the 787 while Airbus are going for both mid-size (A350) and larger aircraft (in particular the A380, suited to classic high-volume hub-and-spoke operations), speaks volumes.

6.10 A key difficulty is handling the reactions, and especially the pricing policy, of airlines, particularly across their hubs. A Task Force member commented that he and some German colleagues had made a number of recent business trips to Delhi. His fare on Lufthansa from London via its Frankfurt hub was less than BA’s fare on a direct flight: their fare on BA from Frankfurt via its Heathrow hub was less than Lufthansa’s fare on a direct service! This is a clear illustration of airline hub pricing models and their impact on interlining passengers.

6.10 The modelling will need to establish the nature of any connection between international-international transfer traffic and the competitiveness of point-to-point services.

7. Maturity and market saturation: limited research makes for modelling challenges at a turning point in aviation development.

Market maturity, mentioned in paras. 3.17 and 3.42 of the Discussion Paper, is a key issue – how mature is the UK air travel market, and how close is it to the top of the saturation curve? Forecasts of demand will need to combine demand from slower growing established markets, and that potentially faster growing newer markets, and international-international transfers which combine elements of both. On the other hand, any maturity in the UK market (outbound), will coexist with (inbound) traffic from faster growing markets.

7.1 Overall passenger growth world-wide continues, but how much is this driven by growing demand in emerging markets? IATA's 2012 figures (for the years 2008 – 2012) show growth in international travel in the Middle East and Latin America, but virtually none in Asia-Pacific and North America: for domestic demand, the US market shows almost no growth and in Japan there has been a drop in excess of 20% over the period.

7.2 A paper presented at the Transportation Research Board's annual meeting in 2010 suggesting that the US domestic market had hit saturation. It was stressed that, although the author worked for the Federal Aviation Administration (FAA), this was not an official FAA forecast. The data presented showed that his was certainly a tenable hypothesis.

7.3 The Task Force felt that despite some recent valuable work (for example by Dr. Graham at the University of Westminster) this area was still inadequately researched, and that there was a likelihood that poor decisions might be taken as a result. Members commended more research, and more scenario planning: the point is made further in Section 9 below.

7.4 If maturity is indeed already present in the data or imminent, then some sense checks in reviewing the final outcomes seem to be needed. Looking at the unconstrained central forecasts between 2010 and 2030 of UK against Foreign, Business and Leisure, UK growth is greater than Foreign growth in both categories (3.1% compared with 1.9% compound annual (CAGR) for Business and 2.5% compared with 1.7% CAGR for Leisure). Traditionally UK outbound air trips have grown faster than incoming air trips: this pattern is still present in the central forecasts. Does that match the widely held view of Europe, including the UK, declining in relative wealth, compared with other areas, especially the NICs?

7.5 On the other hand some members wondered why, if global aviation demand is continuing to rise at 5%, the Department considers it realistic for the unconstrained growth of UK airport traffic to be quite different?

A hypothesis is that the DfT's model is not picking up the complex dynamics in the global and European air traffic market and it is still reflecting a base situation at Heathrow (in particular) and Gatwick – half of all UK traffic - that is heavily capacity constrained, as discussed earlier. Whilst accepting that modelling global market dynamics is difficult, the UK forecast perhaps does not pass the sense test. It implies that the UK will miss out on opportunities (if that is what they are?) to capture some of that air traffic growth and it is not obvious why some of this wider growth should not show up in UK airports, given the global nature of flying.

7.6 While acknowledging that OBR's UK population forecast is included in the model, and that GDP growth also reflects this, and that drivers for growth are GDP, carbon, oil prices, the comparison with history is instructive:

- The UK's population is forecast to increase to 73.2m by 2035 –at an annual rate of 0.7%.
- DfT's 2013 unconstrained forecast of air travel demand is that passenger numbers will increase in this period by between 1% to 3% per annum
- So the population growth rate (0.7%) is almost half of the rate of that for unconstrained air travel demand (taking the average of 1 to 3%).
- This contrasts with a much more pedestrian UK annual population growth rate of 0.19% over the period 1971 to 2001 – a period in which aviation demand rose by 5% per annum.
- In that period the UK's population growth rate was less than 4% of the rate of growth in air travel demand.
- Given that total UK air passenger numbers have been rising for the last 2 years (but within a constrained airport capacity environment) and globally demand is continuing to increase at 5% per annum, it is not clear why DfT thinks that the unconstrained growth at UK airports will be so muted.

Is market maturity so strong a restraining influence? Or, to put it another way, can key mature and important, but not-yet-mature markets co-exist, with out the latter influencing the former.

7.7 In this context, some members of the Task Force were surprised to see in Table 4.1 that forecast business travel growth in Western Europe, at 2.15%/year, was higher than that from Newly Industrialised Countries (2.13%/year). See the comments on market maturity below.

7.8 There was a strong feeling in the group that the propensity to travel differences are not yet well understood and in some respects (as noted earlier) the current model is too aggregate to allow proper analysis. There was much discussion amongst members about propensity to travel, and a concern that it had not properly been taken into account. Market research on drivers of different travel behaviours is urgently needed

7.9 Propensity to travel will vary with age, income, time budgets and trip purpose. Assessing how these components might change over time and the impact this would have on travel demand would give a sense check on the forecasts.

7.10 It was noted, for example, that the number of international journeys made by Italians is about half that of residents of the UK, yet both countries have approximately the same GDP/head. Clearly the fact that the GB is an island and Italy (even more than the UK) a major holiday destination play some role. How secure is the relationship between GDP and travel? There is clearly some decoupling: how much? London, as a major world financial centre, produces much high-yielding demand from Heathrow – a factor behind the large number of transatlantic flights. Assuming its status remains, high-yielding demand is likely to remain. The maturity of the business market could well be different from that of the leisure market; and the international – international market is of course totally different from either of these.

7.11 The entry of low-cost carriers and environmental concerns were two of the factors which had probably strongly affected the relationship between GDP and travel: the latter might have more impact in the future. The point was made that smoking has changed from being a social grace to socially unacceptable in a couple of decades: how likely was it that flying – especially of the 'stag night in Dubrovnik' type - would go the same way?

7.12 Under-researched factors include changing attitudes to travel with climate change concerns, (although findings from the British Social Attitudes Survey presented to TSUG earlier this year does have questions on this aspect) congestion, fear of flying and the sheer hassle factor of air travel today. The need to check in two hours before departure for long-haul flights and the intrusive (and variable) security checks are serious disincentives to flying. Even inconvenient flight times and an element of unreliability – associated with airports operating at capacity – are an issue affecting demand. Of

course, the issue here is whether flying will get more or less onerous in the future

7.13 National Travel Survey data show that a significant proportion of the population in all income brackets does not fly. The relationship between air travel demand and income is an under-researched area, potentially affecting the validity of forecasts.

8. The allocation model: capturing the reality of airport capacities and traveller behaviour has led to some counter-intuitive results

The Task Force had several concerns about the nature and results of the Allocation model. These reflected airport capacities, the nature and scope of generalised costs, airport access modes. Given some of the results, the logic of the calculations was not clear.

8.1 It was noted that airport capacity figures had been obtained in discussion with airport operators. It was not clear what margin of spare capacity – ‘white space’ – was assumed within these. Notoriously, Heathrow is 98% full: this leaves little resilience, little scope for recovery from problems like an unexpected runway closure or even bad weather. IATA are understood to recommend a 70% capacity usage figure in normal operations: it is understood that this not the figure used in the forecasts, which will adversely affect future reliability and performance. DfT told us that they recognise that seasonality would have to change in order to achieve these capacities

8.2 Local expertise is clearly valuable, but the Task Force felt that there were so many factors coming into play that figures would have a wide range of uncertainty. How consistent are the forecasting methods used by individual airports? How good have they been, historically? Previous DfT reallocation forecasts have produced some curious results (especially at small airports like Coventry and Plymouth): these need to be re-examined to see what lessons can be learnt.

8.3 The generalised costs on which the allocation model operates were questioned. Indeed, the robustness of generalised costs is increasingly being debated, especially when considering rail as an alternative to short-haul air (because it is much easier to do productive work when travelling by train than by air (and of course driving), so travel time is no longer a cost.. This, of course, is true of the business traveller: the value of time of the leisure traveller is totally different. A recent report on travel time efficiency by Thalys (https://www.thalys.com/img/pdf/b2b/etude/Etude_Travel_Time_Efficiency_en.pdf) makes some interesting points about the cost-efficiency of travel time using different modes.

8.4 The fact that air fares are not considered in allocating journeys to airports is likely to work where fares are not a factor in airport choice. At somewhere like Stansted, clearly they are. Concern was expressed about the accuracy of an allocation model based essentially on surface access generalised costs and frequency of flights when a low cost airport was being compared with one dealing with legacy carriers. It was also noted that some forecasts did include the impact of the cost of air travel. For example HMRC’s “Modelling the effects of price differentials at UK airports”, published last October, explicitly modelled the impact of the change in APD (and therefore air fares) at specific airports.

8.5 The point was also made that Stansted is very much a Ryanair fortress: that it was very difficult for other airlines to start service there. How much has this kind of issue been taken into account?

8.6 The impact of HS2 to Heathrow on long-haul air travel from the UK regions via non-UK hubs needs more study: the Task Force felt that this was an under-researched area. Members were not aware of much quantified work on the volumes involved and the likelihood that it would divert to Heathrow under certain scenarios (for example half-hourly trains, integrated ticketing and check-in, and more capacity at Heathrow). The HS2 link to LHR decision has been shelved awaiting the outcome of the Airports Commission, but could be reinstated to the same timescale. On the other hand of the four main stations on HS2 North of London, two were airports (Birmingham and Manchester). The impact of this needs more research too!

8.7 The Task Force felt that the impact of intermodal competition was likely to be relatively small. Historically, rail has been observed to capture half of the air+rail market on a route when the rail journey is three hours or less. However, it is worth noting that this will have depended on relative prices and service qualities; flying domestically within France, for example, has been expensive in the past and will have affected these ratios; the ratios are not necessarily transferable between countries. There are examples of routes where the rail journey time is 4½ hours and rail has over 50% of the market, which shows that this could be on the increase. Members also wondered how homogenous the London air traffic market was, and how HS2 would impact on this overall. Do, for example, people fly Edinburgh – Stansted or Edinburgh – Gatwick because their destinations are near those airports, or merely because of fare and service issues?

8.8 Some results of the allocation process in the 2013 report appear counterintuitive

- About 75% of Southend's traffic is forecast to be 'stimulated' - these will be passengers from the locality just flying because there is an airport there. (Para. 8.10) They are assumed not to fly now. An effect on this scale is hard to believe.
- The difference between actual and predicted ATMs is low - ±2% at Heathrow and Stansted (Para. 9.13) - so by implication their model is good. But Table 9.4 below it shows the figure for Stansted is 8%.
- Domestic passengers doubling by 2050 (Appendix E5). Again, this is difficult to believe (given HS2 in particular) - another reason for doubting the accuracy of the models.

8.9 Domestic-international transfer assumptions seem to be producing odd results For example, UK transfers at overseas hubs - the Norwich to New York via CDG type of traffic - actually declining between 2010 and 2020/2030 (Appendix E6). Can this really be right?

9. Scenarios of consistent world views, outside planners control, combined with sensitivity checks of key assumptions as the best way of dealing with uncertainty

In most of the areas covered in the eight sections above, uncertainty is present in the assumptions made and in the way that the world economy develops and is constrained by policy and natural factors. As a result the range of future aviation demand is likely to be too wide for simple sensitivity tests. An alternative approach is needed.

9.1 The Task Force members feel that more creative and realistic scenario planning should be used to explore outcomes. The Task Force is concerned that the existing methodology is closer to a set of sensitivity tests; the use of a high, low and central forecast might result in overlooking something important.

As an alternative, the use of scenario planning – not the same thing as the production of high, low and central forecasts, of course - is commended. While it is mentioned in the Discussion Paper (para. 2.20) it is not clear how far it has really been taken into account. Para. 3.38 and figure 3.6 of that paper show the necessity.

9.2 An area where scenario planning might be particularly valuable is that of the UK leisure market, 45% of the demand (see table 3.2 of the Consultation document). The

impact of (for example) Polish workers in the UK and low-cost carriers stimulating their VFR travels is probably large and under-researched. How would reasonable changes to elasticities here impact overall demand? Should VFR be introduced as a new trip purpose? Because some immigrant communities tend to be spatially concentrated this has important implications for modelling demand at the local level.

9.3 Given the uncertainties over international to international flows, here too scenario planning might be valuable.

9.4 The impact of video-conferencing is mentioned: are there other developments in IT and communications which are likely to impact on air travel demand?

9.5 Some of the other factors listed above might be inputs to different scenarios. The constrained nature of London's runway space may of itself be distorting forecasts: another possible scenario might remove this. The use of constrained data for unconstrained forecasts was considered to be a possible source of error. Similarly, a back-check on previous forecasts might be valuable. Why are some better than others? What lessons can be drawn from this? Table 3.4 of the Consultation document shows a current 2030 forecast of 320mppa, two thirds of the figure (465mppa) made as recently as 2009. Clearly, the financial crisis was a major reason: again, it emphasises the need to use scenarios in forecasting.

9.6 The forecasting process should ideally start by defining a range of "strategic" views of UK population, industry, commerce and society and covering broadly likely developments and how these would be associated with regional and global developments and linked to its needs for travel and attraction to inbound travel.

9.7 But the forecasts so far lack underlying scenarios which are based on the UK's commercial, industrial and social situation and position in Europe and the wider world. This should directly feed into forecasts of consumer expenditure, for example, and other key drivers of demand, being based on expectations of specific developments in:

- Status of membership of EU
- Future of the financial services base of the economy
- Future of the UK as an exporting and manufacturing economy
- Working through of education system improvements, and thus competitiveness
- £ against main trading currencies
- Implications for the leisure and VFR markets of changing demographics (ageing population, growing immigrant population, UK as source, or recipient, of diasporas), affecting inbound and outbound VFRs.
- Schengen and access to and cost of visas, as possible limiting factors (see above, though clearly some assumptions have to be aligned with expectations of future government policies).

9.8 Are forecasts developed by the OBR for economic planning and budgeting as well based in the real drivers of air travel demand as they need to be? And if such measures are used should they not be part of a wider international forecast such as those made by the IMF, the OECD and the EU where UK and other developments can be seen as part of a single view?

9.9 In addition wider shifts such as changes in climate should perhaps be included in scenarios. Forecasts of extreme warming (within the forecast period) of current outbound destination leisure areas (which are sometimes also current inbound origins and equally affected) could be considered. Outbound demand may be deterred and

inbound demand might be encouraged by such trends. As nations with growing wealth act as new tourist sources, what will the competitive position of the UK be? Will declining traditional “Britishness” of Britain be a factor in damping or increasing incoming tourist growth? Similarly, the capacity of outbound leisure destination areas or inbound tourist destinations in UK are not included explicitly in any scenario.

9.10 But perhaps there are some other existing scenarios which have not yet been published? We have heard from DfT that Monte Carlo analysis has been done, leading to the removal of any counter-intuitive scenarios; and that 5/6 future world scenarios have been considered.