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Dear Sir/Madam

Airports Commission Discussion Paper 01: Aviation Demand Forecasting
Please find attached to this letter a submission by the Richmond Heathrow Campaign (RHC) to the Airports Commission concerning Aviation Demand Forecasting.

We agree with the basic premise of the Discussion Document that the DfT's aviation demand forecasts need to be supplemented in order to form a clearer view of the breakdown as well as the scale of future passenger demand, against which judgements can be made about the extent to which future demand will be met, how and where.

Yours faithfully,

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Airports Commission Discussion Paper 01:
Aviation Demand Forecasting

RESPONSE BY THE RICHMOND HEATHROW CAMPAIGN

March 2013

INTRODUCTION

1. We set out below the response of the Richmond Heathrow Campaign to the questions posed in paragraph 6.4 (six questions) and paragraph 6.5 (ten questions) of the Discussion Document. We agree with the basic premise of the Discussion Document that the DfT's aviation demand forecasts need to be supplemented in order to form a clearer view of the breakdown as well as the scale of future passenger demand, against which judgements can be made about the extent to which future demand will be met, how and where.

OUR APPRAISAL OF DFT FORECASTS

2. Before answering the Commission's questions we set out our appraisal of the DfT forecasts. Our response focusses on key figures in the forecasts and for ease of reference we summarise these in Appendices 1 to 5 to this response.

3. In commenting on growth rates in this report we have compared matrices in 2011 with their values in 2050 to produce growth multiples, e.g. passenger numbers increase 2.1 times. The graph in Appendix 6 is a ready reference for converting the multiples into compound growth rates, e.g. 1.9 % per annum.

Passenger Numbers

4. Appendix 1 to this response shows that UK Passenger numbers increase from **217mppa in 2011 to 447mppa in 2050 or 2.1 times** in the constrained case without additional runways.

5. Capacity constraints on passengers at London airports start in 2030 and by 2050 mean that from the London airport catchment area 59.9mppa choose to switch to non-London airports and 34.3mppa decide not to travel (suppressed demand). Assuming one new runway supports ATMS to transport around 45mppa (our estimate) then the figures suggest 3/4 of an additional London runway is needed to accommodate the suppressed demand. There remains significant terminal capacity in 2050 at some non-London airports.

6. Appendix 2 to this response shows transfers rising from **28mppa in 2010 to 37mppa in 2050 or 1.3 times** on account of international to international transfers at both southeast and regional airports.

Air Transport Movements (ATMs)

7. ATMs increase from **2,008 ATMs in 2008 to 3,719 in 2050 or 1.9 times** in the constrained case without additional runways. London runways are full in 2050 but 48% of runway capacity in the rest of the UK remains unused.

8. We have not been able to find a table for ATMs in the unconstrained case but expect it would demonstrate a similar runway need to that suggested by the passenger numbers.

Demand Destination

9. Appendix 3 to this response shows that UK domestic and short haul demand both rise between 2010 and 2050 2.2 times including a large increase in short haul demand from non-London airports (3.1 times). UK long haul increases by 2.5 times with the largest growth also at non-London airports (3.7times).

10. The position in 2050 is that short haul demand represents 64% of total UK demand with a share of 59%

at London airports and 68% at non-London airports. Long haul demand represents 22% with 33% at London airports and 14% at non-London airports. Domestic demand represents 14% with 9% at London Airports and 19% at non- London Airports.

Demand Purpose

11. Appendix 3 to this response shows UK business demand growing 2.5 times by 2050 with the rate being 2.8 times at non-London and 2.2 times at London airports. Next in growth is UK Leisure demand at 2.3 times which is heavily slanted towards non-London airports (3.0 times) compared to London Airports (1.6 times). Foreign business and Foreign leisure demand both grow at 2.0 times with high growth of Foreign leisure at non-London airports (3.2 times)

12. The position in 2050 is that UK leisure represents 59% of Total demand - being 48% at London airports and 66% at non-London airports. UK business represents 18% comprising 21% at London Airports and 16% at non-London airports. Foreign leisure is 16% and foreign business 6%.

OUR RESPONSES TO THE 6 QUESTIONS IN PARAGRAPH 6.4 OF THE DISCUSSION DOCUMENT

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

13. We agree that the present number of passengers at UK airports is likely to increase in the period to 2050, unless virtually unimaginable factors intervene (e.g. a drop in global economic growth over many years; or a dramatic loss of consumer appetite for frequent leisure flying). We agree also that the DfT forecasts indicate that airports in the London area may not be able to fully meet the projected passenger demand, due to capacity constraints. But we do not agree that the DfT forecasts constitute proof that the development of an additional runway or runways in the London area is the only feasible response to the implications of the forecasts.

14. The DfT forecasts operate between the parameters at each UK airport set by the terminal capacity (maximum number of passengers) and runway capacity (maximum number of passenger carrying aircraft). Developing an additional runway in the London area would provide extra capacity to increase the number of passenger carrying aircraft, but it would have to be supplemented by the development of additional terminal capacity, because the DfT forecasts predict that the terminals at four of the largest London airports will be full in 2050. But an alternative option for additional capacity, at lower financial and environmental cost than additional runways and terminals, may be to expand some or all of the existing terminals, with the additional passengers carried in larger numbers per aircraft within the existing runway limits.

15. The Government can also respond to the DfT forecasts by taking measures to lower the forecast number of passengers, thereby reducing the risk of capacity constraints (either as an alternative to the provision of any additional capacity or in parallel with the provision of some additional capacity). For example, the present Government considers that economic activity is concentrated unduly in the London area and that more needs to done to stimulate growth in other parts of the UK. If this economic re-balancing succeeds, it should result in the transfer from London to other regions and their airports (which otherwise will have significant surplus capacity in 2050, according to the DfT forecasts) of some of the demand forecast for London in 2050.

16. Other examples of Government action to reduce future passenger numbers (with or without the provision of some additional capacity) include: (a) setting higher rates of air passenger duty for leisure passengers, who account for the majority of passengers at UK airports and will therefore be the primary cause of the

capacity constraints forecast for 2050; and (b) abandoning the chase for international transfer passengers (who are exempt from air passenger duty in order to attract them to UK airports) and who are already a major cause of congestion at Heathrow.

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

17. Laws of market supply and demand would suggest a constraint on supply to impact demand and this we see from the forecast in T5.8 in the DfT forecast where London airports individually start to loose destinations once they reach capacity at around 2030. The airports as a group continue to add destinations presumably by replacing the number of destinations served by more than London airport with individually served destinations. The CAA produce a table 12-1 that lists historic destinations and passenger numbers. It would be helpful to see how the model updates this list for 2050 because the detail is all important.

18. As shown in Appendix 5 in this response, destinations served by London Airports increase from 178 in 2010 to 230 in 2050 and for the UK as a whole destinations increase from 178 to 242 between 2010 and 2050 which is 1.4 times.

19. Comparing the growth in destinations with the passenger growth of 2.1 times suggests that each destination gains more passengers and this seemingly is a combination of more passengers per existing route as well as there being new routes from more UK airports to existing destinations. Connectivity in terms of both destinations and points of origin for the UK therefore seems to improve notwithstanding the London constraints.

20. As with the number of destinations we would expect the frequencies to increase with increasing demand subject to any capacity constraints. Historically, airlines have increased frequency on popular routes to high levels and sometimes with relatively low loads. Transfers have added to the frequencies of popular routes. The average UK frequency per destination (albeit from an increased number of UK origins) increases by 1.4 times between 2010 and 2050. The average frequency on each route does not increase very much - just 1.1 times. But because of the London constraints the average frequency from London airports drops from 106 to 105 ATMs per destination per per week.

21. We suggest that the airlines have the flexibility to vary the frequencies across their destinations and therefore accommodate the market. There are destinations that we believe have unnecessarily high frequencies and that allocation of flights from these to less frequent services will more than make up for runway constraint on frequencies. In 2011 we calculate from CAA Passengers Figures that from Heathrow New York JFK had 17 departures a day with average loads of 216 passengers and New York (Newark) 9 departures with loads of 170 passengers. We do not have the detail from the forecasts but question whether doubling of demand generally will lead to a similar outcome for New York and whether this will be serviced by adding to the already high frequencies or by increased loads.

22. Annex E in the DfT forecast shows that UK Business passengers increase from 3.8mppa in 2010 to 11.7mppa in 2050 or an increase of 3.1 which is a very healthy increase. Foreign business passengers increase from 3.2mppa in 2010 to 6.5mppa in 2050 or 2.0 times There are good increases within these numbers for travel to NICs and LDCs, while still maintaining healthy contact with the OECD.

23. Examination of major airlines/alliances and home hubs demonstrates that operators do not have more than 2 or 3 destinations in China or in India. The Chinese airlines have extensive networks in China and now fly to one or two European destinations including the UK. In due course these continents may develop travel nodes matching the 30 or so in North America. We believe it should be possible to re-allocate slots from low yielding destinations as and when required and the constrained forecasts should not prevent the UK providing the desired connectivity.

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

24. Globalisation does seem to mean that the UK should expect to extend its aviation connections to less well served business and leisure long haul destinations. The shorter distances already appear to be well connected and growth over the shorter distances might be expected to arise from increasing the number of passengers per destination rather than new destinations. The relatively strong forecast growth in long haul seems to bear this out. In the previous question we mentioned the CAA table 12-1 that lists historic destinations and passenger numbers. It would be helpful to see how the model updates this list for 2050 together with an assessment of the respective maturity of the various markets.

25. The location of the UK relative to global destinations is important and historically benefited from its position in relation to the Atlantic routes to North America. The UK has less of a location advantage for routes to the east. We expect this to reduce the availability of transfers but we also expect the increasingly efficient long haul aircraft to be able to operate with smaller configurations and lesser need for transfers. In our view the UK single hub concept is already outdated.

26. Passenger-km is an important metric and key to economics and global climate change because it combines passenger numbers with distance travelled and as such measures aviation output. The passenger kms increase from 581bn in 2010 to1,341bn in 2050 or 2.3times (see Annex E12 in the DfT forecast). As mentioned earlier, the passenger numbers increase 2.1 times. The difference is due to an increase in average journey distance from 2,760km in 2010 to 2,997 km in 2050 or 1.1 times. [*Note that Annex 3, 4 and 5 record higher passenger kms. The figure in these annexes are said to be "Available Seat kms". It is not clear why Available kms are used in the CO2 calculations rather than estimated kms travelled.*]

27. The Commission might wish to consider why the average distance increase is not higher. The long haul passenger numbers increase by a relatively high 2.5 times over the same period - domestic and short haul increase by 2.2 times. The distance is an important metric because the more distant markets are where business market penetration is lowest and new connections are valued. Distance also impacts on the aircraft type and UK runway capacity needed. Annex E5 in the DfT forecast shows the highest growth is the Middle East at 3.2 times but the Middle Ease is more distant than the average destination.

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

28. Transfers are generally counted as two passengers at the point of transfer in the passenger numbers since both a landing and departure are involved. In the forecasts (see Appendix 2 to this response) transfers rise from 28mppa in 2010 to 37mmpa in 2050 or 1.3 times. This is significantly less than the 2.1 times for all Passengers and in numbers of people (as opposed to ATMs) is just18.5mppa in 2050 out of total passengers of 429mppa (adjusted for half the transfers). We note that the competition of European and Middle east "hubs" seems unlikely from the model output. The UK transfers at overseas hubs increase from 4mmpa in 2010 to 5.4mmpa in 2050 or an increase of 1.4 times and this is still a small number of passengers. The Dft report says transfers are limited by the focus on long haul at Heathrow which means the short haul component of transfers is restricted due to capacity constraint. Given these results it would be useful to learn more than is presented in the DfT report on how the transfers are modelled and what an increase in transfers would achieve.

29. We have concerns over the assumed benefit of transfers and hence so called hub concept which we will go into more detail in a later submission to the Airports Commission. We suggest passengers do not like transfers and transfers are risky in terms of lost baggage and missed connections. They are costly in terms of fuel, noise and CO2 because they double the take-offs and landings per journey and are limited by the

spatial relation of the three points of the journey. For example, travelling west to then fly east on a long haul is costly in terms of time and fuel etc. London is not ideally located for transfers to the far east. It is well located for the North American market but this is a mature market. Transfers are not efficient in that they require large numbers of passengers to produce a few passengers needed to make particular destinations viable. They can help make a destination viable but many of the transfers at Heathrow merely add to the frequency of service to already popular destinations. New aircraft such as the long distance Boeing Dreamliner with half the payload of older jumbos do not need the same number of transfers to make a destination viable.

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?

30. There are two possible strategies upon which to forecast the UK's share of the international aviation market. One strategy would focus on attracting as many international transfer passengers as possible to UK airports (i.e. non-UK residents changing aircraft at a UK airport en route between two overseas destinations), on the assumption that attracting a large number of international transfer passengers would itself deliver optimum international connectivity at UK airports. The second strategy would focus on delivering optimum international connectivity for passengers who begin and end their air travel at a UK airport (i.e. UK residents flying overseas and non-UK residents flying to the UK) without any intentional stimulation of the transfer market.

31. In practice the UK has followed the first strategy, by exempting transfer passengers from air passenger duty and by giving Heathrow a de facto monopoly role in the transfer market to the exclusion of other UK airports. As a consequence, Heathrow has since 1990 boosted its number of international transfer passengers in absolute numbers and in proportion to the number of terminating passengers. But Heathrow serves fewer destinations now than in 1990, thereby undermining the main connectivity justification for international transfers; and the disproportionate increase in the number of transfer passengers has contributed to the capacity difficulties at Heathrow. Transfer passengers have become part of the problem at Heathrow rather than part of the solution.

32. We therefore consider that the Airports Commission should model both strategies for the UK's share of the international market and should not simply continue to model the strategy that has been followed over the last twenty years; particularly bearing in mind that the projected increase in overall passenger numbers should increase the economic viability of international connections that previously depended on a cross-subsidy from transfer passengers.

33. We would also suggest that the modelling should differentiate between international destinations that are popular among business travellers and international destinations that are essentially leisure oriented. The leisure market accounts for the largest number of passengers but it is just one economic sector. Business travellers come from many sectors and are therefore likely to be more significant than leisure passengers for the wider economy, despite business passengers forming only a minority of all passengers.

How well do you consider that the DfT's aviation model replicates current patterns of demand? How could it be improved?

34. We have made a number of comments and suggestions on how the DfT's aviation model could be developed in our responses to the questions set out in paragraph 6.5 of Discussion Document 01.

Continued/

OUR RESPONSES TO THE 10 QUESTIONS IN PARAGRAPH 6.5 OF THE DISCUSSION DOCUMENT

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

35. We make the following observations on seven issues that we consider are relevant to the input data and modelling assumptions.

    a. Airspace. Has airspace been modelled to accommodate nearly double the ATMs and with no increase in noise impact and preferably with existing noise levels reduced and if so by how much?

    b. Interventions of government - preferably not through increased regulation but through improving market performance and competition. We note that APD is modelled but there are taxes and charges that could be varied or introduced with implications for the forecast demand. It is not clear whether the interventions have been set in the model to achieve maximum demand or to satisfy other objectives?

    c. **Corporate decisions by the airlines and airports** to increase demand, market share, profit and return on capital could all impact the demand forecasts. The recent breakup of airport ownership could have major impact on the forecasts as will airline alliances. We are not sure how this has been modelled?

    d. **Surface access** is potentially a constraint on demand growth due to congestion and pollution. Conversely, improved airport access could improve the quality of travel and increase demand. We believe Surface Access is not given enough consideration in the debate and that the demand forecasts would benefit from examination of options for improvement and what constraints might otherwise arise.

    We note 90 minutes of travel is used as a base in the model but we believe this is too long. At the moment there is great difference in travel times to London comparing Heathrow, Gatwick and Stansted. We have not done a great deal of research but suggest that investment in surface transport is a priority for the current level of demand but becomes even more so with a doubling of the number of passengers by 2050. The congestion and pollution caused by increasing passenger numbers travelling to Heathrow for example could prevent the full passenger capacity being achieved. We believe there is a real opportunity to significantly improve surface transport to the southeast airports and produce world beating access for a large catchment area. Benefits would accrue to the community at large and not just the aviation sector and passengers.

    It would be useful for the Dft model to explore further improvements in surface transport. This would need to tie in with the options for aviation expansion.

    e. **Operations** could play a major part in the demand. Our work suggests that increased aircraft loads through larger aircraft and seat occupancy and less emphasis on transfers and the hub concept could increase passenger throughput, maintain connectivity and reduce the need for additional runway capacity. This is as much to do with airline fleet capacity as it is with airport capacity. **The fleet mix** is crucial to increasing passenger numbers and connectivity without more flights and runways. We are not clear what objectives have been set for the fleet mix in the demand model and how the model makes best integrated use of aircraft and airport assets? We deal with aircraft passenger loads in Appendix 4 to this response.

    f. **Noise and pollution impact** from doubling of passengers and ATMS will increase and it is not clear what noise and pollution constraints have been applied to the model. It appears that CO2 is dealt with solely by use of carbon credits and their assumed price but it is not clear what Carbon

limits the model is working to and whether these credits will be sufficient.

g. **Safety**. Doubling the ATMS, for example, over heavy populated areas must surely increase the risk and impact of serious accident or terrorist act and the effect on subsequent demand and airport location.

Do you agree with the choice of outputs modelled?

36. Broadly, yes but we suggest the following and have referred to each of these earlier in our response:

a. That the airline and surface transport sectors also be modelled (we appreciate that elements of these are included in the existing model),

b. That the economics of transfers be separately investigated and output (we appreciate that transfers are already included in the model),

c. That there be more detail on the output of aircraft fleet mix and loads,

d. That marginal analysis be applied to the high and low frequency routes to determine whether in the context of scarce runaway resources the higher frequencies are justified and in the case of low frequencies whether the service remains beneficial,

e. That metrics such as pro forma accounts, rate of return, and discounted cashflow be output. A relatively small point, but when presenting the trend outputs in graphical form it may help to use a logarithmic scale.

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

36. It is a good start but we suggest the comments made elsewhere in this response be included in the modelling.

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

37. We suggest the assessment would be improved with the comments we make in this response.

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

38. Companies tend to differentiate their products and segment their markets in order to compete and the aviation industry is probably no exception. We suggest the international airline industry and in particular routes and resources of the major alliances be examined. Our examination of the route maps of some 20 airlines is revealing as to the destination coverage and direction of travel. The North American aviation market is mature and the GNP higher than that of the UK so it might be instructive to examine by way of comparison the trends in that market.

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

39. We suggest that pro-forma accounts would add to the understanding of the forecasts whereas a longer forecast period may be necessary to deal with long-term airport projects.

a. **Pro-forma Accounts and cash flows are needed we suggest and for both the airline and airport sectors**. Demand needs to be considered in a commercial context expressed as profit and loss and balance sheet and related cashflow for both the airline and airport sectors and possibly the surface transport sector. Pro-forma accounts can show how the sectors relate in terms of investment, revenue, costs and profit. The cashflows can be discounted to include the cost of capital and net present values. This information is available historically and it should not be difficult to convert the demand forecast model inputs and outputs into pro forma accounts and cashflows.

b. **The period of the Forecasts may not be sufficient**, particularly if capacity is added in large singular amounts. Other things being equal, it is likely that large airport capacity additions when compared to smaller additions will take longer to prepare and install to "first take off" and will take longer for demand to grow to reach full use. People providing capital finance will need to know at the outset the likely time to discounted break-even and the length of the tail needed to repay debt. Forecasts for these purposes may well extend beyond 2050, even if the development period is condensed.

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

40. The model clearly includes a large amount of detail. It can help to have an appreciation of the statistical normality of the input variables (e.g. mean and standard deviation and any bias) and we are not sure how much work has been done in this regard. Also, we aim not to rely on average outputs but to consider the distributions and also to consider the marginal rather than average impact of any variable as well as the economies and diseconomies of scale.

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

41. We suggest that treatment of uncertainty would benefit from including variations around trend in so far as capacity needs to accommodate them. Also, we suggest that the uncertainty of demand is best assessed not in isolation but in relation to investment and that the net risk should be considered after taking steps to reduce or offset the risk.

a. **Forecasts need to include trends, cycles and short term fluctuations.** The forecasts contain long term demand trends and passenger response to these trends. But historic trends are rarely straight line or consistently exponential - they usually include cycles and short term fluctuations around these cycles. As far as we can see the Forecasts do not include these variations.

There are economic impacts of capacity shortfall and excess in relation to demand caused by the variations and decisions on the appropriate level of contingency need to be made. We suggest statistically generated variation, based on historic variation, could be applied to the key output demand trends that are used in the capacity decisions, e.g. +- 5%. These variations as applied to the central case will probably be within the high and low demand trends.

b. **Demand Forecasts need to be considered in conjunction with capacity and not in isolation.** Airport capacity can be added gradually with relatively small frequent steps or in larger less frequent steps. The difference, for example, might be one runway or four runways at a time. There are economic impacts of capacity shortfall and excess in relation to demand caused by the step addition of capacity not exactly matching the demand trend.

Furthermore, there is the added cost of uncertainty of demand and hence the size and timing of the capacity shortfall and excess. Small frequent capacity additions can be adjusted over time to match demand and reduce the risk more easily than is the case with large less frequent additions of capacity. It follows that the weight given to the demand sensitivities should depend on the capacity shortfall/excess rather than the demand in isolation. Without knowing at this stage the options for

adding capacity it is premature for us to judge the significance of the sensitivity output.

c. The sensitivity analysis suggests that in the low demand case passenger demand in 2050 is 350mppa and in the high demand case 660mppa, i.e. a surplus of 130mppa or gap of 180mppa, respectively. While further examination might reveal the runway shortage and where it occurs we have not attempted this analysis here. It would be helpful for the low and high demand forecasts to quantify where in the UK the surpluses and gaps arise.

d. We suggest that where there is uncertainty and risk it is helpful to examine who bears the risk and how might the risk and its impact be reduced or offset.

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

42. We suggest that a probability approach is best suited to relatively simple decisions with few variables. The DfT model has a large number of variables and combining probabilities could lead to unreliable outputs.

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

43. We suggest that forecasting demand is an iterative process together with capacity and also that maximizing demand is not necessarily an end in itself and that objectives for inputs and outputs should be established and included in the model.

a. **The Demand Forecast response to new capacity needs to be considered**. Demand will vary according to when, where and how much new aircraft and airport capacity is provided and whether it is additional capacity or replaces capacity existing at the time. Therefore, comment provided here is on the demand forecasts in relation to status quo capacity and not on demand arising in relation to various capacity options. Hopefully the forecasts will be re-issued to reflect the impact of various capacity options.

b. **Optimisation needs to be considered**. Demand is not and end in itself and for example corporate profit, rate of return on capital and national economic contribution need to be considered. A set of corporate and national objectives are needed together with examination of how the model decisions might lead towards achieving these objectives. Environmental objectives for CO2, pollution and noise need to be included.

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APPENDIX 1

Air Transport Movements (ATMs) & Passenger demand 2011 and 2050

	Runway capacity	Runway use		Terminal capacity	Unconstrained			Constrained			
		Actual	Constrained								
	ATMs 000	ATMs 000	ATMs 000	mppa	mppa	mppa	grwth	mppa	mppa	mppa	grwth
Source DfT	2050	2011	2050	2050	2011	2050			Suppress	2050	
Tab/annex	*T3.10*	*T3.10*	*F3*	*T3.10*	*D8*	*D8*				*E2*	
London Airports	1299	1004	1265	198	133.5	293.8	2.2	-59.9	-34.3	199.6	1.5
Rest of UK	4714	1004	2454	297	84.0	188.0	2.2	+59.9		247.9	3.0
Total UK	6013	2008	3719	495	217.5	481.8	2.2	0	-34.3	447.5	2.1
London Airports: Heathrow, Gatwick, Stansted, London City and Luton											

1. Growth multiples are from 2011 to 2050

2. The table compares runway capacity and use and passenger demand in each case between 2011 and 2050.

3. The figures are taken from the central case.

Passenger Transfers

Source DfT E6 & E7	2010	2050
	mppa	mppa
Domestic - International	7.2	0.4
International-International SE Airports	21.0	28.1
International-International at regional airports	.1	8.1
Sub total	28.5	36.6
UK transfers at overseas hubs	4.0	5.4
Total	32.5	42.0
SE Airports: Heathrow, Stansted, Luton, London City, Southampton, Southend & Norwich		

APPENDIX 3

Passenger Demand - Purpose and Destination

Table	UK Demand 2050 mppa				Source DfT E8,E9 & E10				Growth 2010 to 2050			
2050	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total
UK Bus	28.7	33.3	11.7	73.7	7%	8%	3%	18%	2.3	2.5	3.2	2.5
UK Lei	25.7	162.1	54.1	241.9	6%	39%	13%	59%	2.1	2.3	2.6	2.3
Fo Bus		20.0	6.3	26.3	0%	5%	2%	6%		2.0	2.0	2.0
Fo Lei		47.5	16.5	64	0%	12%	4%	16%		2.0	1.9	2.0
Misc	5.0			5	1%	0%	0%	1%	2.0			2.0
	59.4	262.9	88.6	410.9	14%	64%	22%	100%	2.2	2.2	2.5	2.3
	London Airports Demand 2050				mppa				Growth 2010 to 2050			
2050	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total
UK Bus	8.0	19.6	8.0	35.6	5%	11%	5%	21%	2.2	2.1	2.4	2.2
UK Lei	6.0	46.3	30.4	82.7	4%	27%	18%	48%	1.9	1.4	2.2	1.6
Fo Bus		12.5	5.4	17.9	0%	7%	3%	10%		1.8	1.8	1.8
Fo Lei		22.0	12.3	34.3	0%	13%	7%	20%		1.4	1.8	1.5
Misc	0.6			0.6	0%	0%	0%	0%	1.2			1.2
	14.6	100.4	56.1	171.1	9%	59%	33%	100%	2.0	1.5	2.0	1.7
	Non-London Airports 2050 mppa								Growth 2010 to 2050			
2050	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total	Domestic	Short Haul	Long Haul	Total
UK Bus	20.7	13.7	3.6	38	9%	6%	2%	16%	2.3	3.4	9.0	2.8
UK Lei	19.7	115.9	23.7	159.3	8%	48%	10%	66%	2.2	3.1	3.7	3.0
Fo Bus		7.5	0.9	8.4	0%	3%	0%	4%		2.8	3.0	2.8
Fo Lei		25.5	4.2	29.7	0%	11%	2%	12%		3.3	2.5	3.2
Misc	4.4			4.4	2%	0%	0%	2%	2.2			2.2
	44.8	162.6	32.4	239.8	19%	68%	14%	100%	2.3	3.1	3.7	3.0

1. These tables do not include transfers because in the DfT report we could not find a table linking transfers to purpose and destination.

2. The first table covers the UK as a whole and the second covers London Airports and the third covers Non-London Airports.

3. London Airports are Heathrow, Gatwick, Stansted, London City and Luton.

4. The figures are from the DfT Central case.

Aircraft Passenger Loads

Not much publicity by the aviation industry or media is given to passenger loads in the debate on capacity. We believe that aircraft capacity is no less important than airport capacity and with higher loads passenger growth could be met with reduced runway capacity.

Table B Average Loads (Passengers per ATM) Constrained

Calc from Table 1

	2011	2050	Growth
London Airports	133	158	1.2
Rest of UK	84	101	1.2
Total UK	108	120	1.1

We are concerned that passenger loads have been growing too slowly historically and that the model continues this into the future. The UK average load in 2011 was 108 passengers per ATM and this grows to just 120 passengers in 2050 or 1.1 times which compares with 2.1 times in passenger numbers. Heathrow is an example where loads are predicted to grow at 1.3 times to 2050 so that while constrained to 480,000 ATMs, passenger numbers rise from 69.4mppa in 2011 to 81.8mppa in 2030 and 92.9mppa in 2050 (Annex E3). The Heathrow loads rise from 144 to 193 passengers per ATM. If London Airport loads rose to 185 by 2050 or 1.4 times that would support the suppressed demand of 35.4 million passengers without the need for a further runway.

Loads depend on fleet mix of aircraft size and seat occupancy. Table 2 illustrates the growth in seat availability and occupancy for London Airports that could achieve loads of 185 passengers per ATM although the figures used are not actual or forecast and are for illustration only.

Table 2 Illustration Only London Airports	2011	2050	Growth
Avg. Available seats per ATM	190	247	1.3
Avg. Seat occupancy	70%	75%	1.1
Avg. Passenger Loads per ATM	133	185	1.4

Airlines are increasing **seat occupancy** rates and the low cost airlines do already have relatively high rates but higher occupancy could have a material benefit on loads.

The **fleet mix of aircraft size** is very relevant to loads and aircraft such as the new Airbus A380 with typical seat configuration of 525 seats and max. 853 seats should be able materially to increase loads, particularly on high frequency long haul routes. The new Boeing 787 Dreamliner, with 210-290 seats and Boeing 777 with 301-386 seats could also add to the average fleet load. The 787 can also fly economically to the farthest destinations with less need for transfers to make the destinations viable and fewer transfers could free up runway capacity.

There is possibly an issue of increased weight vortices from larger aircraft and greater separation which could reduce runway throughput but the overall impact we suggest will depend on the diversity of the fleet and how it is managed operationally. We suggest that at Heathrow, for example, an increase in the number of super jumbos and reduction in the smallest aircraft could significantly increase the average load. In financial terms it is the airlines that replace the fleet but this they do anyway and the incremental cost of investing in larger aircraft may well be favourably compared with the cost of additional runway capacity needed to support more ATMs with lower loads.

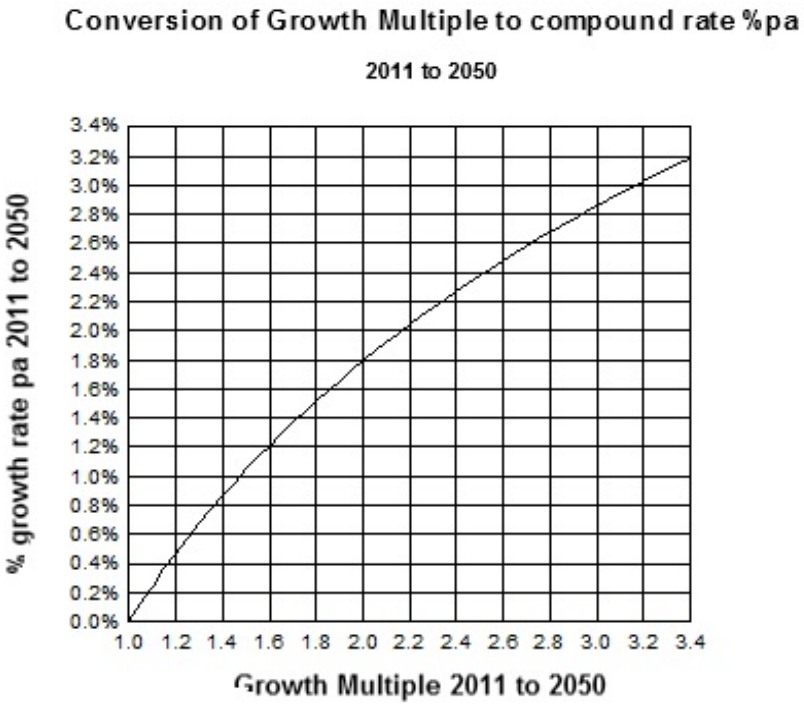
APPENDIX 5

Number of UK Destinations and Frequencies

Table C	Table/Annex	2010	2050	growth
ATMs '000	F1	1996	3768	1.9
Destinations	T5.8	178	242	1.4
Aggregate Destinations	T5.8	455	778	1.7
Avg Frequency (ATMs per destination per week)		216	299	1.4
Avg Frequency (ATMs per route per week)		84	93	1.1
Route: individual destination-origin				

1. The table shows the number of individual destinations and also their aggregate which in effect also takes account of different points of origin in the UK and is therefore a route analysis.

2. The figures are based on the DfT central case



1. Growth multiples between 2011 and 2050 can be converted to compound annual growth rates using the table. For example a growth multiple of 2.0 times is equivalent to annual growth of 1.8%.