York Aviation

GOVERNMENT OFFICE FOR THE EAST OF ENGLAND

AUDIT OF STANSTED GROWTH ASSUMPTIONS

FINAL REPORT
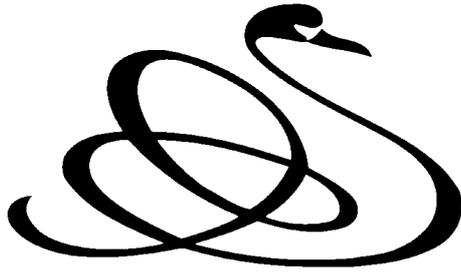
AUGUST 2004

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Contents

EXECUTIVE SUMMARY

1. York Aviation was appointed by GO-E in June 2004 to undertake an audit of the growth assumptions for Stansted Airport within a number of core documents being used to inform preparation of a new Regional Spatial Strategy for the East of England (RSS14).

2. We have reviewed the air traffic - passenger, freight and air transport movement - forecasts and employment forecasts in the following documents:

    ✈ 2002 SERAS Consultation Document and underlying Technical Reports;

    ✈ December 2003 Future of Air Transport White Paper and supporting documents;

    ✈ 2003 Buchanan / Bone Wells Study entitled '*Stansted/M11 Corridor Development Options Study,* referred to in this report as the 2003 Buchanan Study[1];

    ✈ 2004 Cambridge Econometrics Study entitled *'Employment and Housing Growth Implications of a Second Runway at Stansted'*;

    ✈ 2004 Halcrow/PACEC Study entitled *'Employment and Housing Growth Implications of a Second Runway at Stansted Airport'*.

3. In this report we set out the:

    ✈ common assumptions;

    ✈ differences in underlying assumptions;

    ✈ differences in methodology;

    and highlight the implications of those differences in terms of the interpretation of the results of these studies.

4. We concentrate here on options involving existing approved Stansted capacity, maximum use of the existing runway and the provision of one additional runway, rather than those involving construction of two or more additional runways.

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[1] Though it should be noted that most of the analysis in this report of the jobs and housing impacts of various runway options was done by Bone Wells, not Buchanan.

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5. We summarise the key results and assumptions within the various reports in **Table 1**. We highlight the forecasts for the key years relating to the assessment of employment and housing implications using information contained within the published reports for each of the studies, policy and consultation documents.[2]

6. It should be noted that all the passenger forecasts underpinning each of the exercises are based on the Department for Transport's Air Traffic Forecasts for the United Kingdom published in 2000.

7. The forecasts in SERAS, and used in the Buchanan Report, assumed 'seeding' of long haul traffic at Stansted upon the opening of the second runway to enable the Airport to act as a hub. The growth of Stansted was seen, within SERAS, as being heavily dependent upon spill from Heathrow to realise the rapid rates of growth necessary to take up either the full capacity of the single runway or the capacity offered by a new runway. Much of the spill from Heathrow being of conventional short haul scheduled services.

8. The White Paper now assumes that Stansted is capable of developing rapidly to serve its own market, dominated by 'no frills' carriers, regardless of what happens elsewhere. Hence passenger traffic growth is faster, from a higher base, within the White Paper forecasts used as the basis of the more recent work.

9. Under the maximum use scenario, Buchanan did test the full capacity being taken up by 2036 and, to that extent, looked at higher air traffic figures in the longer term than examined in SERAS for this scenario.

10. A key difference between the forecasts used in SERAS, and by Buchanan, and the more recent work based on the White Paper forecasts for the second runway at Stansted is that, in the circumstances where the provision of a second runway at Stansted is combined with one at Heathrow or Gatwick, the Stansted new runway is expected to be delivered first in 2011. In SERAS, under the multiple new runway packages, Stansted was generally assumed to be the later delivered runway. Thus the build up of passenger demand, and hence employment, is generally earlier in the more recent work. The White Paper forecasts underpin both the Cambridge Econometrics and Halcrow/PACEC work.

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[2] It should be noted that there may be minor (1mppa) inconsistencies in the presentation of some figures due to rounding but these are within the tolerance of error of the estimates over a 30 year timeframe.

					Passenger Forecasts						Freight Forecast 2030 (million tonnes)	Employment Forecasts						
Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators		Baseline	2015	2021	2030	2036	Core Assumptions	Implications
Maximum Use of Single Runway	SERAS		2	35mppa	23		26			The majority of Stansted's traffic is projected to be on conventional short haul scheduled services, with only 8% of passengers using long haul services and 23% on 'no frills' services.	1.6-2.3	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a Total: 10,100	Direct: 15,300 Indirect: 4,600 Induced: n/a Catalytic: n/a Total: 19,900		Direct: 14,000 Indirect: 4,200 Induced: n/a Catalytic: n/a Total: 18,200		Initial Employment Density: 816 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.3 Induced - n/a Catalytic - n/a Other: One job is supported by 115 tonnes of Freight or 240 tonnes of mail	In employment terms the SERAS work was undertaken at a time when Stansted was yet to go through the very levels of productivity growth experienced in the last 4 to 5 years, consequently the starting employment density is considerably higher than that in the other studies. When this is combined with a low assumption regarding productivity growth, this is likely to produce relatively high estimates for direct employment. The study also assumes a relatively high indirect multiplier compared to some of the other studies, which will again produce higher estimates in this area. Where the methodology is substantially different is in the treatment of induced and catalytic, neither of which are estimated under SERAS. This will produce some differential compared to other studies which attempt to quantify these effects.
	Buchanan Study	Maximum Use 1	2	25mppa by 2026 growing to 35mppa		23		35	2036	Stated as based on SERAS projections.	No explicit account taken of air freight projections	2001 Direct: 10,300 Indirect: 720 Induced: 2,200 Catalytic: 300 Total: 13,500		Direct: 11,600 Indirect & Induced: 1,800 Catalytic: 300 Total: 13,700		Direct: 14,200 Indirect & Induced: 2,300 Catalytic: 600 Total: 17,090	Initial Employment Density: 756 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants Catalytic - 30 jobs per mppa in 2021, 37.6 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15 Displacement: 5% to 2031, then 10% in 2036	The Buchanan's study was undertaken using a 2001 base for employment, which shows a substantially lower initial employment density, reflecting the rapid growth at the airport, particularly in 'no frills' services. This will tend to produce lower estimates of direct employment compared SERAS, particularly as productivity is assumed to grow at the same rate. In terms of the other effects, Buchanan assumes a much lower indirect multiplier but this is counterbalanced by the inclusion within the estimates of both induced and catalytic effects.
		Maximum Use 2	2	40mppa by 2021		40		40	2021	Used to test the implications of Stansted's growth accelerating to take up full theoretical runway capacity with substantial growth in average aircraft size (implying more long haul services).		2001 Direct: 10,300 Indirect: 720 Induced: 2,200 Catalytic: 300 Total: 13,500		Direct: 20,516 Indirect & Induced: 2,300 Catalytic: 1,600 Total: 24,500		Direct: 16,500 Indirect & Induced: 2,000 Catalytic: 2,000 Total: 20,500	Initial Employment Density: 756 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 1.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants Catalytic - 30 jobs per mppa in 2021, 37.6 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15 Displacement: 5% to 2031, then 10% in 2036	Higher passenger forecasts lead to higher employment forecasts. Greater levels of long haul traffic are assumed to generate more catalytic employment.
	White Paper		2	35 mppa	33		36			50% of Stansted's passengers at 2030 (more at 2015) are projected to be using 'no frills' services, with 27% on long haul flights as the local catchment area is now expected to support a range of leisure oriented scheduled services in any event.	No new forecasts - SERAS presumed	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a Total: 10,100	Direct: 15,300 Indirect: 4,600 Induced: n/a Catalytic: n/a Total: 19,900		Direct: 14,000 Indirect: 4,200 Induced: n/a Catalytic: n/a Total: 18,200		No revised employment estimates produced -see SERAS above	See SERAS
	CEC		2	35mppa	33	36	36		2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects largely subsumed within wider economy		Direct: East of England 10,153 Core Area 7,400 Indirect effects largely subsumed within wider economy			Initial Employment Density: 474 jobs per million workload units per annum Productivity Growth: 2.8-1.6% trending down towards long run 3.5% at Gatwick and Heathrow. Analysis of indirect employment through econometric modelling of employment links with key sectors.	The CEC estimates are based on the 2003 employment headcount adjusted for recent changes at the Airport and projected forward to 2005. This even more recent figure has a much lower employment density again representing growth in traffic, the rise of 'no frills' traffic and cost cutting amongst full service airlines and others. This work also assumes a higher productivity growth rate over the period reflecting a more gradual slowing down in productivity gains following the rapid growth of recent years. These two assumptions combined produce substantially lower estimates of direct employment than either SERAS or Buchanan. The estimates for indirect effects are calculated completely differently to the other studies and hence it is not possible to comment on the resultant likely impact on estimates. The report concentrates on presenting net differences between this and the two runway scenarios.
	Halcrow/ PACEC		2	35 mppa		36		37	2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76	2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 Total 14,300		Study Area Direct 17,200 Indirect 3,400 Induced 3,500 Gross Total 24,100 Net Total 22,900			Initial Employment Density: 380 to 740 jobs per million workload units per annum + 1,020 fixed Productivity Growth: 1.5% Multipliers: Indirect - Low 1.21 Central 1.31 High 1.62 Induced - Low 1.24 Central 1.27 High 1.30 Catalytic - high estimates only - 38 employees per mwlu with capacity at the Airport is below 35 mwlu per annum, growing in a linear fashion to 250 employees per mwlu at over 82 mwlu per annum Displacement: Low 0% Central 5% High 10%	The Halcrow report, similarly to CEC, starts from the 2003 headcount basis. However, different densities are assumed for different traffic types. Overall, in most cases, this density works out slightly higher and will therefore lead to higher estimates of employment. Direct off site activity is also treated differently with 5% allowance assumed compared to around 1% for the CEC work. The work also has a lower productivity assumption which will lead to higher estimates in the longer term. It is difficult to compare the Halcrow assumptions for wider effects with CEC as the methodologies are fundamentally different. However, compared to Buchanan's work it is noticeable that the indirect multiplier is substantially higher but that the treatment of catalytic effects is quite different, with Halcrow not attempting estimate the effect in most scenarios.

Table 1: Summary Comparison of Air Traffic and Employment Forecasts used to estimate employment and housing impacts of the development of Stansted Airport

GO- E Audit of Stansted Growth Assumptions

Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts						Freight Forecast 2030 (million tonnes)	Employment Forecasts						Implications
					2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators		Baseline	2015	2021	2030	2036	Core Assumptions	
Two Runways	SERAS	Mid-point		82mppa	64		74			Traffic at Stansted 'seeded' on the assumption that 40% of Heathrow's long haul network (17mppa) would relocate to Stansted to establish a second hub. One third of passengers would be transferring at the new hub airport and by 2030 up to 46% of the Airport's passengers are projected to be on conventional long haul scheduled services, with only 8% on 'no frills' services.	1.9-4.1 with additional runways quoted in the SERAS reports. 2.2-2.8 million with an additional runway at Stansted and one at Heathrow in 2020 according to Halcrow.	1998 Direct: 7,700 Indirect: 13,800 Induced: 2,300 Catalytic: n/a **Total: 10,100**	Direct: 46,000 Indirect: 13,800 Induced: n/a Catalytic: n/a **Total: 59,800**		Direct: 43,500 Indirect: 13,100 Induced: n/a Catalytic: n/a **Total: 56,600**		Initial Employment Density: 816 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.3 Induced - n/a Catalytic - n/a Other: One job is supported by 115 tonnes of Freight or 240 tonnes of mail	In employment terms the SERAS work was undertaken at a time when Stansted was yet to go through the very levels of productivity growth experienced in the last 4 to 5 years, consequently the starting employment density is considerably higher than that in the other studies. When this is combined with a low assumption regarding productivity growth, this is likely to produce relatively high estimates for direct employment. The study also assumes a relatively high indirect multiplier compared to some of the other studies, which will again produce higher estimates in this area. Where the methodology is substantially different is in the treatment of induced and catalytic, neither of which are estimated under SERAS. This will produce some differential compared to other studies.
		Low Cases					71			Stansted forecasts tend to be lower if the runway there is combined with one or more additional runways at Gatwick.								
		High Cases					78			Stansted forecasts tend to be higher when combined with Heathrow options or delivered earlier.								
	Buchanan Study	Stansted 2nd Runway	7	81-82mppa		69		82	2036	Stated as based on SERAS.	No explicit account taken of air freight projections	2001 Direct: 10,300 Indirect: 720 Induced: 2,200 Catalytic: 300 **Total: 13,500**		Direct: 36,200 Indirect & Induced: 6,500 Catalytic: 6,300 **Total: 48,900**		Direct: 34,300 Indirect & Induced: 6,900 Catalytic: 9,300 **Total: 50,508**	Initial Employment Density: 756 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants Catalytic - 160 jobs per mppa in 2021, 200 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15 Displacement: 15%	The Buchanan's study was undertaken using a 2001 base for employment, which shows a substantially lower initial employment density, reflecting the rapid growth at the airport, particularly in low fares services. This will tend to produce lower estimates of direct employment compared SERAS, particularly as productivity is assumed to grow at the same rate. In terms of the other effects, Buchanan assumes a much lower indirect multiplier but this is counteracted by the inclusion within the estimates of both induced and catalytic effects.
	White Paper	Stansted 2nd Runway Only	7	81-82mppa	57		73			40% of Stansted's passengers at 2030 are projected to be using 'no frills' services and 23% on long haul services.	No new forecasts - SERAS presumed	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a **Total: 10,100**	Direct: 46,000 Indirect: 13,800 Induced: n/a Catalytic: n/a **Total: 59,800**		Direct: 43,500 Indirect: 13,100 Induced: n/a Catalytic: n/a **Total: 56,600**		No revised employment estimates produced -see SERAS above	See SERAS
		Stansted 2nd Runway + Heathrow Short Runway at 2020	12s1		57		70			45% of passengers at 2030 are projected to be using 'no frills' services and 23% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.								
		Stansted 2nd Runway + Heathrow Short Runway at 2016	12s2		57		70			48% of passengers at 2030 are projected to be using 'no frills' services and 21% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.								
		Stansted 2nd Runway + Gatwick Wide-spaced Runway at 2024	13		57		69			47% of passengers at 2030 are projected to be using 'no frills' services and 19% long haul services as the Airport competes with Gatwick for leisure oriented markets.								
	CEC	Stansted 2nd Runway + Heathrow at 2016	12s2	81-82mppa	57	60	70		2039	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects subsumed within wider economy	East of England Direct: 16,800 Indirect: 3,300 Core Area Direct: 12,300 Indirect: 600				Initial Employment Density: 474 jobs per million workload units per annum Productivity Growth: 2.8-1.6% trending down towards long run 3.5% at Gatwick and Heathrow. Analysis of indirect employment through econometric modelling of employment links with key sectors.	The CEC estimates are based on the 2003 employment headcount adjusted for recent changes at the Airport and projected forward to 2005. This even more recent figure has a much lower employment density again representing growth in traffic, the rise of low cost and cost cutting amongst full service airlines and others. This work also assumes a higher productivity growth rate over the period reflecting a more gradual slowing down in productivity following the rapid growth of recent years. These two assumptions combined produce substantially lower estimates of direct employment than either SERAS or Buchanan.
		Stansted 2nd Runway + Heathrow 2020	12s1		57	67	70		2039		1.48	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects subsumed within wider economy	East of England Direct: 15,600 Indirect: 3,700 Core Area Direct: 13,600 Indirect: 800					
		Stansted 2nd Runway + Heathrow 2026	12s extra		57	68	72		2038	44% of passengers at 2030 are projected to be using 'no frills' services and 22% long haul services as the Airport receives more short haul scheduled traffic spilled from Heathrow due to the runway there being delayed.	1.48	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects subsumed within wider economy	East of England Direct: 18,800 Indirect: 3,800 Core Area Direct: 13,700 Indirect: 800					
		Stansted 2nd Runway + Gatwick 2024	13		57	67	69		2041	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.44	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects subsumed within wider economy	East of England Direct: 18,700 Indirect: 3,700 Core Area Direct: 13,700 Indirect: 800					It should also be noted that the CEC estimates assume substantial leakage of direct effects outside of the Region. This further impacts on the lower estimates of employment. The estimates for indirect effects are calculated completely differently to the other studies and hence it is not possible to comment on the resultant likely impact on estimates. Generally levels of additional indirect (including catalytic) employment under the various scenarios show very low additionality as a consequence of Stansted's growth.
		Stansted 2nd Runway Only	7		57	67	73		2037	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects subsumed within wider economy	East of England Direct: 19,200 Indirect: 3,900 Core Area Direct: 14,000 Indirect: 800					

Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts						Freight Forecast 2030 (million tonnes)	Employment Forecasts							Implications
					2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators		Baseline	2015	2021	2030	2036	Core Assumptions		
Two Runways	Halcrow/ PACEC	Reference Case	12s1	81-82mppa		67		78		As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48 (1.76 in 2036)	2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**		East of England Direct 33,500 Indirect 10,400 Induced 11,900 **Gross Total 55,800** Study Area Direct 33,500 Indirect 6,700 Induced 6,800 **Gross Total 46,900** **Net Total 44,600**			Initial Employment Density: 380 to 740 jobs per million workload units per annum + 1,020 fixed Productivity Growth: 1.5% Multipliers: Indirect - Low 1.21 Central 1.31 High 1.62 Induced - Low 1.24 Central 1.27 High 1.30 Catalytic - High Estimates only - 38 employees per mwlu while capacity at the Airport is below 35 mwlu per annum, growing in a linear fashion to 250 employees per mwlu at over 82 mwlu per annum Displacement: Low 0% Central 5% High 10%	The Halcrow report, similarly to CEC starts from the 2003 headcount basis. However, different densities are assumed for different traffic types. Overall, in most cases, this density works out slightly higher and will therefore lead to higher estimates of employment. Direct off site activity is also treated differently with 5% allowance assumed compared to around 1% for the CEC work. The work also has a lower productivity assumption which will lead to higher estimates in the longer term.
		Heathrow Delay	7			67		79				2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**		East of England Direct 35,100 Indirect 10,900 Induced 12,400 **Gross Total 58,300**				
		Maximum Use of 2 Runways	7 extrapolated			68		82	2036	Forecasts extrapolated from White Paper Forecasts.		2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**		East of England Direct 35,100 Indirect 10,900 Induced 12,400 **Gross Total 58,300**				It is difficult to compare the Halcrow assumptions for wider effects with CEC as the methodologies are fundamentally different. However, compared to Buchanan's work it is noticeable that the indirect multiplier is substantially higher but that the treatment of catalytic effects is quite different, with Halcrow not attempting estimate the effect in most scenarios. Halcrow test a number of high and low multipliers for indirect and induced employment to test the sensitivity of their results to these assumptions as well as including some judgemental estimate of catalytic employment within their 'high' employment scenario.
		High No Frills	Overall Forecast as 12s! With higher no frills percentage			67		78		Proportion of no frills passengers increased from 40 to 60% of Stansted's traffic in 2030, with other passenger types reduced proportionately.		2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**		East of England Direct 31,000 Indirect 9,600 Induced 10,900 **Gross Total 51,500**				

11. The White Paper forecasts, because they are predicated on no 'seeding' of traffic at Stansted, project a different mix of traffic and result slightly lower forecasts overall in the longer term, although trending towards the same two runway capacity. The higher 'no frills' traffic element and reduced long haul projections have implications for the employment forecasts as the 'no frills' carriers are driving the industry trend to increased productivity and hence lower levels of employment relative to traffic growth.

12. Unlike the Buchanan work, both Cambridge Econometrics and Halcrow take account of both the passenger and freight forecasts for Stansted and use the concept of workload units (passengers and freight combined) for the production of estimates of direct airport employment (Cambridge Econometrics) and all employment (Halcrow).

13. The SERAS employment estimates were based on general ratios of employment and productivity applied across all airports, with some adjustments for airport specific circumstances. The White Paper presents no new employment estimates and, to the extent that any figures are attached to employment within it, they relate to SERAS work.

14. Buchanan estimates, although based on SERAS work, started from a later base year (2001) for actual employment at Stansted and thus reflected a lower jobs per mppa density as a result of the rapid growth to 'no frills' services.

15. The Buchanan figures are largely non-comparable with those contained in SERAS as they include estimates of catalytic impact, which were excluded from the SERAS work. Despite the inclusion of catalytic impact, their employment estimates are generally lower than those produced within the SERAS exercise.

16. In the Cambridge Econometrics work, more recent on-site employment information from BAA has been used relating to 2003. This confirms the continuation of high industry productivity growth affecting on-site job density. Given the downward pressure on costs in the airline industry, it seems reasonable to assume high rates of productivity growth will continue and the performance of Stansted appears more likely to converge to the lower productivity growth rates seen at Heathrow and Gatwick over the longer rather than the shorter term, particularly given the revised passenger traffic mix within the White Paper. These assumptions drive lower estimates of direct employment in future years than the other studies.

17. Cambridge Econometrics developed an econometric model to model all 'indirect' employment, encompassing the categories called indirect, induced and catalytic in the other studies. The indirect employment generated by the development of a second runway at Stansted is based on an examination of the link between the growth in major airports' traffic, both passenger and freight, and a number of sectors that are linked to air transport either through the supply chain or as purchasers of air transport services. Using this methodology, the incremental effect identified due to the growth of Stansted under any scenario is very small, over and above the natural growth of the regional economy. Thus, the Cambridge Econometrics total employment effects are lower than in the other studies.

18. The Halcrow work starts from the same basis of existing on-site employment as the Cambridge Econometrics work but there are variances in the base employment densities assumed, the treatment of direct off-site employment and in the on-site productivity assumptions that drive the direct employment models. This results in considerably higher estimates of direct employment for future years.

19. The method for the estimation of indirect and induced effects by Halcrow is similar to that employed by Buchanan, save for the estimation of catalytic effects but the results are starting from different bases and consequently are not strictly comparable. Generally, the range of total employment projected sits within the range of the other studies.

1. BACKGROUND

1.1 York Aviation was appointed by GO-E in June 2004 to undertake an audit of the growth assumptions for Stansted Airport within a number of core documents being used to inform the updating of Regional Planning Guidance for the East of England.

1.2 We have reviewed the air traffic - passenger, freight and air transport movement - forecasts and employment forecasts in the following documents:
   ✛ 2002 SERAS Consultation Document and underlying Technical Reports;
   ✛ December 2003 Future of Air Transport White Paper and supporting documents;
   ✛ 2003 Buchanan / Bone Wells Study entitled '*Stansted/M11 Corridor Development Options Study,* referred to in this report as the 2003 Buchanan Study[3];
   ✛ 2004 Cambridge Econometrics Study entitled *'Employment and Housing Growth Implications of a Second Runway at Stansted'*;
   ✛ 2004 Halcrow/PACEC Study entitled *'Employment and Housing Growth Implications of a Second Runway at Stansted Airport'*.

1.3 In this report, we set out the:
   ✛ common assumptions;
   ✛ differences in underlying assumptions;
   ✛ differences in methodology;

   and highlight the implications of those differences in terms of the interpretation of the results of these studies.

1.4 We concentrate here on options involving existing approved Stansted capacity, maximum use of the existing runway and the provision of one additional runway, rather than those involving construction of two or more additional runways there as these are neither supported by the White Paper, nor other stakeholders, for inclusion in RPG. Some tables, taken from other documents, will include information in relation to other packages and options.

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[3] Though it should be noted that most of the analysis in this report of the jobs and housing impacts of various runway options was done by Bone Wells, not Buchanan.

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2. AIR TRAFFIC GROWTH ASSUMPTIONS

2.1 In this section, we summarise the key growth assumptions set out in each of the documents, the core assumptions and methodology. We then go on the present the information in a summary comparative table at the end of the section.

SERAS

Future Development of Air Transport in the United Kingdom: South East February 2003 Consultation Document

2.2 The SERAS February 2003 Consultation Document starts from a base case of the, then, current capacity of the Airport at 15 million passengers per annum (mppa) but noting that planning approval had been granted for the expansion of terminal capacity at Stansted to handle up to 25mppa[4 & 5]. The assumed maximum capacity of the single runway was 35mppa[6]. The air traffic forecasts for Stansted presented in the Consultation Document[7] are given in **Table 2.1**. The underlying rate of passenger growth for the UK as a whole is taken from the Department for Transport's (DfT) Air Traffic Forecasts for the United Kingdom 2000[8], which cover the period to 2020. Forecasts are extrapolated beyond this date, assuming a slowing of growth rates overall as the market matures and assuming that in the period to 2015, increasing propensities to fly in regions outside the South East will result in higher growth rates than in the South East. Generally option appraisal was carried out based upon mid-point total forecasts for the UK as a whole[9], although supporting documentation contains further details of the effect of higher or lower underlying growth rates on the individual packages.

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[4] Department for Transport, Future Development of Air Transport in the United Kingdom: South East, February 2003, para 9.5.
[5] mppa – million passengers per annum
[6] Ibid, para 9.6.
[7] Ibid, Table 9.1.
[8] Department for Environment, Transport and the Regions (DETR), Air Traffic Forecasts for the United Kingdom, 2000.
[9] We do not repeat here details of how the national air traffic forecasts were derived.

2.3 It was noted[10] that, under the forecasts for packages where one or more new runways were provided at Stansted, the expectation that Stansted would become a viable hub airport would require a significant amount of traffic to move there from Heathrow. The forecasts therefore relied on 'seeding' of traffic; that is assuming that the airlines would actually move a number of services from other airports, primarily Heathrow, to Stansted once a new runway became operational. Under these forecasts, long haul scheduled services were seeded to the extent of 40% of Heathrow's 1998 long haul scheduled network. It was further noted that, without this assumption that a mechanism would be found to encourage airlines to move services, it would take a long time for Stansted to build up these types of long haul services.

Table 2.1: Air Traffic Forecasts for Stansted from the SERAS Consultation Document

STANSTED		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		12	133,000
Base Case	Capacity	15	185,000
	Forecast use in 2015	15	194,000
	Forecast use in 2030	15	191,000
Maximum Use	Capacity	35	260,000
	Forecast use in 2015	23	237,000
	Forecast use in 2030	35	291,000
1 new runway	Capacity	82	513,000
	Forecast use in 2015	64	492,000
	Forecast use in 2030	74	492,000
2 new runways	Capacity	108	637,000
	Forecast use in 2015	64	492,000
	Forecast use in 2030	94	624,000
3 new runways	Capacity	129	756,000
	Forecast use in 2015	64	492,000
	Forecast use in 2030	122	746,000

2.4 Although the SERAS base case assumed that the capacity at Luton would be constrained to 10mppa from the single runway, the maximum use of existing capacity scenario assumed that steps would be taken to allow Luton to realise full single runway capacity at around 31mppa.

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[10] Ibid, para 9.10.

2.5 In terms of air freight, the Consultation Document noted that air freight carried on pure freighter aircraft, whether by conventional freight operators or by the express freight operators, was likely to increase more rapidly than the amount of freight carried on passenger aircraft because of the overall high rate of growth projected for air freight demand, outstripping the capacity of passenger aircraft to carry it.

2.6 The air freight forecasts contained within the Consultation Document[11] are set out in **Table 2.2**. The document notes that, with no further runways in the South East, under the constrained (or maximum use) scenario, there would be substantial growth in freight traffic at Stansted and Luton[12], with Stansted reaching a throughput of up to 2.3 million tonnes, limited by its runway capacity to accommodate additional pure freighter movements. It was further noted that to accommodate this increase at Stansted, there would probably need to be a substantial increase in the number of night movements that might not be acceptable. The freight forecasts in the Consultation Document itself do not, however, refer to the specific detailed runway scenarios or packages.

2.7 The Consultation Document then goes on to describe the packages of capacity that could be developed, starting with the SERAS base case assuming no development beyond that already in the planning system[13]. This base case was based on a capacity at Stansted of 15mppa, as we have indicated in para. 2.2. The maximum use case then looked at the provision of terminal capacity at Stansted up to 35mppa to exploit the full potential of the single runway, although usage at 2030 was noted as being only 26mppa under this case[14], with substantial volumes of conventional short haul scheduled traffic being spilled from Heathrow.

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[11] Ibid, Table 13.2.
[12] Ibid, para 13.8.
[13] Ibid, para 14.6.
[14] Ibid, para. 14.8.

Table 2.2: Air Freight Forecasts for Stansted from the SERAS Consultation Document

Airport	2000 actual	2030 Constrained Scenarios	2030 Less Constrained Scenarios
Heathrow			
Tonnes (m)	1.3	2.1 – 2.2	1.9 – 2.3
ATMs ('000)	3	1	3
Gatwick			
Tonnes (m)	0.3	0.5	0.4 – 0.9
ATMs ('000)	3	1	2
Stansted			
Tonnes (m)	0.2	1.6 – 2.3	1.9 – 4.1
ATMs ('000)	14	28 – 40	34 – 59
Luton			
Tonnes (m)	0.0	1.2	0.4 – 0.7
ATMs ('000)	6	25	8 – 14
Alconbury			
Tonnes (m)	–	1.3	–
ATMs ('000)	–	31	–
Cliffe			
Tonnes (m)	–	–	2.8
ATMs ('000)	–	–	33
All Major SE airports			
Tonnes (m)	1.8	6.1 – 6.8	6.2 – 7.6
ATMs ('000)	27	67 – 86	50 – 79

2.8   There are various combinations of runway options across the airports in the South East. In this context, the impact of one or more additional runways being provided at Stansted was looked at in combination with the provision of one or more additional runways at the other main South East airports. The forecast passenger numbers at Stansted in 2030 vary dependent upon which combination of runway options is looked at. Although a single figure of 74mppa is quoted for Stansted with one additional runway in Table 2.1 above, the range of passenger forecasts for Stansted with this runway option is 71mppa to 78mppa, dependent upon the number and location of other runways to be provided.[15]

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[15] Ibid, Table 14.3

2.9 With an additional runway, dependent upon the options for additional runways elsewhere, freight tonnage at Stansted was projected to reach in excess of 4 million tonnes by 2030, to a large extent carried through a substantial increase in pure freighter aircraft movements there. These less constrained options implied more than two runways at Stansted meaning that with two runways only, air freight demand at Stansted would tend to the lower end of the 1.9-4.1 million tonne range.[16]

SERAS Technical Reports

2.10 The information contained within the Consultation Document was backed up by a number of SERAS Technical Reports. These reports explain the methodology and assumptions used in deriving the forecasts for Stansted and the other airports.

2.11 The SERAS Stage Two Appraisal Findings Report[17] sets out in more detail the assumptions underlying the analysis in the Consultation Document. It notes that, in forecasting air traffic growth at Stansted, the role of Stansted will change:

"*Stansted currently is a major airport for low cost services and serves a relatively local catchment for scheduled services. With an additional runway (or runways) at Stansted and no significant expansion of capacity at other South East airports, it is assumed that the role of Stansted could change into that of a second international hub airport in the South East, complementing Heathrow. In the forecasting of demand at Stansted, ………… It has been assumed that at both airports, with two runways being available in 2011, a major airline or an airline alliance, suffering from heavily constrained capacity at Heathrow and Gatwick, would be willing to relocate services to the expanded Stansted…………The services assumed to be relocated to Stansted are 40% of Heathrow's long haul and USA scheduled services. Stansted is assumed to retain its low cost services and the short haul scheduled services will develop in any event.*"[18]

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[16] The Halcrow Report notes a range of 2.2-2.8 million tonnes at Stansted by 2030 as the relevant SERAS range and cites a figure of 2.6 million tonnes as their Reference Case equivalent within SERAS, with 2.3 million tonnes under the maximum use of a single runway scenario.
[17] Department for Transport, SERAS Technical Reports produced by Halcrows
[18] SERAS Stage 2, Appraisal Findings Report, para 9.3.3.

2.12 This description relates to the 'seeding' concept described in the Consultation Document, albeit it is made clear that the 'seeded' services had to demonstrate that they could survive in competition with the development of new services taking up the freed up capacity at Heathrow and/or Gatwick.

2.13 The passenger and air transport movement forecasts for Stansted, as with the other airports, are derived from the DfT's SPASM model, which takes the overall forecasts of air traffic demand to and from the United Kingdom (at the mid-point) and allocates it between UK airports. The key features of the SPASM model are that it models how passengers might make use of different amounts of additional capacity at airports around the UK based on 'generalised costs' comprising:

✈ surface access journey time/costs;

✈ number and range of flights offered;

✈ flight times;

✈ air fares;

✈ fare premia[19] at congested airports.

2.14 The model also assumes that propensity to fly grows more quickly in the regions than in the South East and so allocates proportionately more of the growth to the regions, albeit from a lower base.

2.15 Forecasts are then produced for 29 existing airports and up to 3 new airport sites for each year from 1998 to 2030. The model allows different scenarios of capacity provision to be tested in terms of the effect on the volume and composition of passengers and air transport movements at each airport. Sensitivity tests, such as looking at the effect of 'seeding' can also be carried out.

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[19] This is the extra price charged at a congested airport to bring demand in line with capacity.

2.16 Under the maximum use scenario, Stansted is assumed to continue to operate a similar pattern of services as currently; that is principally low cost services, domestic and short haul scheduled and some charter services. Under this scenario, there is virtually no long haul scheduled traffic by 2030. With runway capacity limited to around 259,000 ATMs by 2011, the forecast passenger throughput is limited to around 23 mppa by 2015 and 26 mppa by 2030[20]. The pattern of services under this scenario is set out in **Table 2.3**.

Table 2.3: Mix of Passengers and Air Transport Movements under the Maximum Use Scenario from the SERAS Technical Reports								
		2000	2005	2010	2015	2020	2025	2030
Passengers, mppa								
Scheduled	Domestic	1	1	2	2	2	3	2
	Short haul	2	6	9	14	14	16	18
	USA	**	**	**	**	**	**	**
	Long haul	**	**	**	**	**	**	**
	Total	4	8	11	16	17	19	20
Charter		2	3	2	1	1	**	**
Low cost		8	10	9	6	6	6	6
Total		13	20	22	23	23	25	26
ATMs, '000								
Scheduled	Domestic	19	21	22	23	25	27	24
	Short haul	31	64	96	136	133	137	147
	USA	**	**	**	**	**	**	**
	Long haul	**	**	**	**	**	**	**
	Total	50	86	117	159	158	164	172
Charter		8	13	11	6	4	2	1
Low cost		68	100	99	72	65	65	59
Total		126	199	227	237	227	231	231
Passengers/PATM								
Scheduled		75	90	93	98	105	113	116
Charter		193	196	195	195	209	193	151
Low cost		111	98	94	89	90	94	96
Average		102	101	99	97	103	108	111

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[20] Ibid, para 9.3.6.

2.17 With one additional runway, and associated terminal capacity, and assuming that a hub airline is willing to relocate from Heathrow to Stansted, the forecast passenger mix is expected to be dominated by scheduled services, with a substantial increase in the volume of long haul services and passengers. The forecasts include a large number of interline passengers, including Stansted operating as a domestic hub once the new runway opens in 2011 (Stansted additional runway only) or 2021 (in combination with other options). Transfer passengers would make up almost a third of the airport passenger traffic by 2030. Although the volume of low cost passengers declines, the Airport remains dominated by leisure passengers.

2.18 The effect of 'seeding' of traffic when the new runway becomes operational in 2011 (or 2021) is to generate an immediate demand of 17mppa to US and long haul destinations, growing rapidly from that base thereafter. This results in a higher average number of passengers per aircraft than the alternative, without 'seeding' scenario where short haul services continue to dominate. This has implications for the long run assumed capacity of the two runway airport. The mix of passengers at a two runway Stansted is set out in **Table 2.4** relating to the Stansted additional runway only case.

Table 2.4: Mix of Passengers and Air Transport Movements under the Two Runway Scenario from the SERAS Technical Reports								
		2000	2005	2010	2015	2020	2025	2030
Passengers, mppa								
Scheduled	Domestic	1	1	2	2	2	2	2
	Short haul	2	6	9	25	30	33	34
	USA	**	**	**	12	14	15	15
	Long haul	**	**	**	12	14	15	16
	Total	4	8	11	51	61	65	68
Charter		2	3	2	2	1	**	**
Low cost		8	10	9	11	7	7	6
Total		13	20	22	64	69	72	74
ATMs, '000								
Scheduled	Domestic	19	21	22	32	29	27	27
	Short haul	31	64	96	235	269	276	279
	USA	**	**	**	44	48	51	54
	Long haul	**	**	**	54	62	64	67
	Total	50	86	117	364	407	418	428
Charter		8	13	11	9	5	1	**
Low cost		68	100	99	120	76	68	65
Total		126	199	227	493	488	488	492
Passengers/PATM								
Scheduled		75	90	93	140	149	155	159
Charter		193	196	195	201	204	202	151
Low cost		111	98	94	95	96	96	96
Average		102	101	99	130	141	147	151

Future of Air Transport White Paper

2.19 The Department for Transport published the White Paper, the Future of Air Transport, in December 2003. The White Paper made final recommendations on the strategy for the provision of additional airport capacity in the United Kingdom. Although based on work reported in the consultation documents for the South East and the other regions and their accompanying technical reports, some data was refined and updated as part of the final decision making process.

2.20 The underlying passenger, movement and freight forecasts for 2030 for the UK as a whole remain the same as in SERAS based on the DETR 2000 forecasts. However, the White Paper takes into account the impact of 'no frills' carriers and lower air fares on stimulating the market since the original forecasts were completed, as well as the policy assumption that aviation will in future be required to cover its full external costs. These two factors net each other off in terms of the overall forecasts of growth, but the effect of these changed assumptions is to see a greater proportion of 'no frills' traffic in the overall forecast mix, with growth in this sector being particularly strong in the first 5 years. The White Paper analysis remains based on the mid-point of the forecast range for overall passenger traffic for the UK as a whole taken from the 2000 forecasts[21].

2.21 The White Paper starts from the position that Stansted has planning approval to extend its terminal capacity to handle 25mppa and, furthermore, proposes to seek Parliament's approval to remove the remaining limit on passenger air transport movements at the Airport, leaving growth of the Airport subject to local planning controls.[22] The White Paper anticipates that, with the provision of more terminal capacity, passenger numbers using the Airport should be able to grow to about 35mppa.

2.22 The White Paper then goes onto note that the provision of a second runway could add up to 46mppa's worth of capacity to the South East system[23], and assumes that such a runway could be operational by around 2011/2. The White Paper states that the Government supports the development of a second runway at Stansted[24] but does not does not support the development of a third ahead of another runway at Heathrow or Gatwick within the time period to 2030[25].

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[21] The Future of Air Transport, Department for Transport, December 2003, Annex A.
[22] Ibid, para. 11.24.
[23] Ibid, para. 11.27.
[24] Ibid, para. 11.40.
[25] Ibid, para. 11.46

2.23 The White Paper itself gives no further details on the passenger or freight forecasts underpinning the Government's final decisions. The specific airport passenger forecasts, derived from the SPASM model as described in para. 2.12 above, are contained in a separate technical report[26]. This report suggests that the incremental capacity of the second runway may be as high as 48 mppa.

2.24 The model was subject to refinement from that used for SERAS, in that more specific forecasts were made of the contribution of 'no frills' carriers, allowance was made for aviation meeting its environmental costs and the model was subject to calibration checks to confirm that it made *"credible"*[27] forecasts of airport passenger traffic for the period 2001-2003, working from its 1998 base year traffic. There were other minor refinements made to the SPASM model between the Consultation Document stage and the forecasts underpinning the White Paper.

2.25 In **Table 2.5**, we present the forecasts for Stansted at 2015 and 2030 taken from this supplementary document. These forecasts cross refer to the SERAS scenarios they relate to.

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[26] Passenger Forecasts: Additional Analysis, Department for Transport, December 2003.
[27] The Future of Air Transport, Department for Transport, December 2003, Annex A, para. 24.

	Table 2.5: Terminal Passengers (mppa) at Stansted under Various Capacity Scenarios[28]									
		Type				**Range**		**Purpose**		
SERAS Scenario		**Scheduled**	**Charter**	**NFC**	**Total**	**Short Haul**	**Long Haul**	**Business**	**Leisure**	**Business %**
2015										
	2000 Actual	3	1	8	**12**	8	0	3	9	23%
2	Max Use of Existing Runways	11	0	21	**33**	21	7	7	21	26%
7	STN + 1	28	1	28	**57**	42	11	13	35	27%
12s1	STN + 1, LHR +1 (2020, 550/600)	28	1	28	**57**	42	11	13	35	27%
12s2	STN + 1, LHR +1 (2016, 550-690)	28	1	28	**57**	42	11	13	35	27%
12s3	STN + 1, LHR +1 (2020, 655/700)	28	1	28	**57**	42	11	13	35	27%
13	STN + 1, LGW + 1 (w-s)	28	1	28	**57**	42	11	13	35	27%
15s1	STN+1, LHR+1 (2020), LGW+1(w-s)	28	1	28	**57**	42	11	13	35	27%
2030										
2000	Actual	3	1	8	**12**	8	0	3	9	23%
2	Max Use of Existing Runways	18	0	18	**36**	23	10	9	22	30%
7	STN + 1	44	0	29	**73**	52	17	19	41	32%
12s1	STN + 1, LHR +1 (2020, 550/600)	37	1	32	**70**	50	16	19	42	31%
12s2	STN + 1, LHR +1 (2016, 550-690)	35	1	34	**70**	50	15	18	42	30%
12s3	STN + 1, LHR +1 (2020, 655/700)	34	1	35	**71**	50	15	18	43	30%
13	STN + 1, LGW + 1 (w-s)	36	1	32	**69**	50	15	19	40	31%
15s1	STN+1, LHR+1 (2020), LGW+1(w-s)	29	1	36	**65**	47	13	17	40	30%

[28] Ibid, Annex B1

2.26 Under the scenarios where Stansted has an additional runway, the proportion of airport passengers predicted to be travelling on business rises substantially to up to 32% by 2030, even allowing for the domination of the airport by 'no frills' carriers. The White Paper forecasts no longer rely on 'seeding' of traffic at Stansted, not least as the DfT's view is that, with another runway at Heathrow in prospect, the long haul carriers would be less likely to consider moving a tranche of services to Stansted. Rather Stansted is expected to develop its own range of long haul services, largely to meet the growing demand for long haul leisure services[29], these are categorised into four types:

+ airlines operating to a strong overseas hub;

+ airlines with no existing operation (or access to slots) at Heathrow or Gatwick;

+ airlines catering for overspill leisure demand;

+ long haul charters[30].

Long haul passenger demand by 2030 is fairly strong by 2030 under both the maximum use and additional runway scenarios, although less strong than with 'seeding' assumed.

2.27 There is some substitutability between charter services at Gatwick and 'no frills' services at Stansted in terms of serving the South East leisure market. For this reason, there is greater interaction between traffic growth at Gatwick than at Heathrow in the event of the next new runway, after Stansted, being built there. Generally forecasts with second runway at Stansted by 2011/12 show the Airport handling 57mppa by 2015, on the basis that the second runway is the only additional runway capacity provided in the South East by that date. By 2030, a two runway Stansted is expected to attract passengers in the range 69-73mppa, dependent upon which, if any, other runway option is developed in the South East over the period.

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[29] Passenger Forecasts: Additional Analysis, Department for Transport, December 2003, para. 6.44.
[30] Ibid, para. 6.49.

2.28 Sensitivity tests are also undertaken to illustrate the effect of a higher proportion of national growth over the period to 2030 being taken up by 'no frills' carriers. 'No frills' services are allocated within the modelling according to where this type of carrier has already established bases. Thus, under scenarios of high 'no frills' growth, Stansted tends to attract more of this type of traffic.

2.29 No additional airport specific air freight forecasts have been produced by the Department for Transport consequent upon the White Paper decisions. We discuss the related air freight forecasts below in connection with the recent Cambridge Econometrics and Halcrow/PACEC work.

2003 Buchanan Report

2.30 The impact estimates derived by Buchanan to inform the current draft revision to RPG were based on passenger forecasts contained within the SERAS consultation documents and comprised[31]:

Single Runway:

      i.   **Baseline** (existing approved capacity) – 25mppa by 2021, staying at that level;

      ii.   **Maximum Use 1** (SERAS Package 2) – 25mppa by 2026, growing to 35mppa;

      iii.   **Maximum Use 2** (Buchanan's Brief) - 40mppa by 2021[32];

Two Runways (SERAS Package 7) – capacity of 82mppa;

Three Runways (SERAS Package 10) – capacity of 102mppa;

Four Runways (SERAS Package 14) – capacity of 129mppa.

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[31] Colin Buchanan and Partners; Wardell Armstrong; Bone Wells Associates, Stansted/M11 Corridor Development Options Study – Final Report, December 2003, para. 2.2.6, page 8.
[32] The 40mppa capacity figure was chosen because it represented the theoretical maximum capacity of a single runway and was derived without specific reference to the expected passenger and air transport movement mix at Stansted (Ibid, para 2.2.5).

2.31 Although the scenarios were referred to, mainly, as SERAS scenarios, there appear to be some differences to those actually contained within the SERAS Consultation Document and technical reports as set out above. The Buchanan Issues Report[33] sets out the passenger projections used for key years in their modelling process, 2021 and 2036. We set these out in **Table 2.6**.

Table 2.6: Forecasts of Passenger Traffic (mppa) at Stansted in each key scenario as used by Buchanan		
	2021	**2036**
1 Runway (Package 2)	23	35
2 Runways (Package 7)	69.4	82
3 Runways (Package 10)	92.9	102
4 Runways (Package 14)	90	129
1 Runway capped at 25 mppa	25	25
1 Runway at 40mppa	40	40

2.32 It was noted that BAA assumed a faster growth in demand at Stansted in the short term under the maximum use (Package 2) scenario, but this was not explicitly modelled in the Buchanan work.

2.33 It is notable that, although the Buchanan work looked at the growth of Stansted under various SERAS packages, these were in isolation from the assumptions being made about the provision of and take up of capacity elsewhere, save the underlying assumption that maximum use would be made of runway capacity at other airports in the South East in all packages considered.

2.34 The Buchanan study did not explicitly consider the implications of air freight in relation to employment or housing.

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[33] Colin Buchanan and Partners; Wardell Armstrong; Bone Wells Associates, Stansted/M11 Corridor Development Options Study – Key Issues Report, August 2003.

2004 Cambridge Econometrics Report

2.35 In order to inform the Cambridge Econometrics study into the Employment and Housing Growth Implications of a Second Runway at Stansted, York Aviation assembled a set of forecast scenarios derived from the work reported in and associated with the Future of Air Transport White Paper as discussed above.

2.36 This work was based on the maximum use of the existing runway at Stansted and a number of scenarios with a second runway there but with variations in the location and timing of the provision of further additional runway capacity in the South East. These scenarios were based on the preferred White Paper scenario of the next additional runway, after Stansted, being at Heathrow. Variations in the timing of the provision of the Heathrow runway were examined as was the alternative scenario of the next new runway after Stansted being at Gatwick rather than Heathrow.

2.37 Arising from the White Paper, therefore, there were 6 scenarios considered in terms of the development of additional runway capacity at Stansted and its interaction with the provision and timing of additional capacity elsewhere in the South East. These are (SERAS package numbers are given in brackets):

Maximum Use of Existing Capacity (2);

Stansted + Heathrow 2016 - a new runway at Stansted in 2011/2012 and a short runway at Heathrow in 2016 (12s2);

Stansted + Heathrow 2020 - a new runway at Stansted in 2011/2012 and a short runway at Heathrow in 2020 (12s1);

Stansted + Heathrow 2026 - a new runway at Stansted in 2011/2012 and a short runway at Heathrow in 2026 (12 variant);

Stansted + Gatwick 2024 - a new runway at Stansted in 2011/2012 and a new runway at Gatwick in 2024 (13);

Stansted Only - a new runway at Stansted only in 2011/2012 (7).

2.38 More detailed information relating to the relevant scenarios outlined above was obtained from DfT and its consultants, including an additional sensitivity test relating to a further delay in the construction of a Heathrow runway until 2026. Freight forecasts were also obtained, relating as far as possible to each of the passenger scenarios from DfT's consultants on this topic, Halcrow.

Maximum Use of Existing Runway

2.39 Stansted reaches its theoretical maximum capacity under this scenario in 2019 but continues to exhibit incremental growth in passenger numbers as aircraft size increases. It would be reasonable to assume negligible further growth beyond 2030 traffic levels.

2.40 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.7**.

	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
Table 2.7: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Maximum Use Scenario					
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	32,779,217	64.0%	22.1%	1.2%	500,000
2020	35,117,796	59.9%	23.6%	0.5%	570,000
2025	35,759,345	56.4%	24.2%	0.3%	660,000
2030	36,466,629	50.6%	27.0%	0.1%	760,000

2.41 This scenario assumes that Stansted's dependence on 'no frills' short haul traffic declines over time but the share of 'no frills' activity still accounts for over half of the Airport's traffic in 2030. The proportion of long haul traffic grows substantially, particularly when the actual 2003 long haul traffic is taken into account. It should be noted, however, that these forecasts show a greater dependence on short haul 'no frills' traffic and a lower level of long haul traffic than the original SERAS scenarios.

Stansted + Heathrow 2016

2.42 This scenario assumes the construction of a second runway at Stansted at around 2011/12 followed by a third short runway at Heathrow in around 2016. The second runway is assumed to deliver an airport capacity at Stansted of up to 81/82mppa. Taking the long term growth assumptions beyond 2030 as supplied by Halcrow based on advice from DfT, the Stansted runway would reach full capacity in 2039, handling in excess of 81mppa.

2.43 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.8**.

Table 2.8: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Stansted + Heathrow 2016 Scenario					
	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	57,369,433	48.9%	18.6%	2.0%	750,000
2020	57,986,089	56.7%	17.8%	1.8%	860,000
2025	63,824,762	53.8%	18.5%	2.0%	1,280,000
2030	70,060,174	48.5%	20.6%	1.9%	1,480,000

2.44 Under this scenario, despite having an additional runway, Stansted benefits less from overspill of long haul traffic from Heathrow as the provision of the additional runway there results in retention of long haul services but a greater spill of conventional short haul scheduled traffic. Stansted's overall dependency on 'no frills' traffic is also less, albeit that the overall volume of low cost passengers is greater within the forecast higher airport throughput overall. In the longer term as Heathrow's runway capacity fills up, Stansted is likely to attract more long haul services but not to the extent of it becoming a hub.

Stansted + Heathrow 2020

2.45 This scenario assumes that the construction of a second runway at Heathrow is delayed until 2020. Under this scenario, the rate of traffic growth at Stansted is somewhat lower as the delay to the construction of the second runway at Heathrow results in a faster build up of traffic at Luton, so depressing marginally passenger growth at Stansted. The second runway at Stansted would still reach full utilisation of capacity in 2039.

2.46 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.9**.

Table 2.9: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Stansted + Heathrow 2020 Scenario					
	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	57,369,433	48.9%	18.6%	2.0%	750,000
2020	62,229,990	51.8%	18.8%	1.7%	860,000
2025	66,523,696	48.5%	20.3%	1.7%	1,280,000
2030	69,938,290	45.7%	21.7%	1.6%	1,480,000

2.47 The delay to the Heathrow runway results in the proportion of long haul passenger traffic at Stansted being slightly higher and the 'no frills' proportion being lower, with some of this displaced to Luton.

Stansted + Heathrow 2026

2.48 This scenario represents a sensitivity test whereby the additional runway at Heathrow is delayed until 2026. Under this scenario, the rate of traffic growth at Stansted is somewhat higher as the further delay to the construction of the second runway at Heathrow results in Stansted's traffic building up more quickly. Under this scenario, the second Stansted runway would reach capacity in 2038.

2.49 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.10**.

Table 2.10: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Stansted + Heathrow 2026 Scenario					
	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	57,369,433	48.9%	18.2%	2.0%	750,000
2020	66,048,912	46.6%	19.3%	1.5%	860,000
2025	69,352,394	43.5%	20.9%	1.1%	1,280,000
2030	71,999,999	44.2%	21.9%	1.0%	1,480,000

2.50 Despite the further delay to construction of the third runway at Heathrow, Stansted's long haul traffic proportion remains unchanged but overspill of conventional short haul traffic from Heathrow puts 'no frills' services under further pressure.

Stansted + Gatwick 2024

2.51 This scenario reflects the circumstances where the environmental issues surrounding the construction of a third runway at Heathrow cannot be overcome and a second, wide spaced, runway is constructed at Gatwick to be operational in 2024. This scenario sees passenger growth at Stansted slightly lower than other two runway scenarios as Gatwick more directly competes with Stansted. Under this scenario, the capacity of Stansted's second runway would be fully taken up by 2041.

2.52 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.11**.

Table 2.11: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Stansted + Gatwick 2024 Scenario					
	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	56,835,350	49.0%	18.8%	1.9%	750,000
2020	66,886,677	46.0%	20.3%	1.4%	870,000
2025	67,774,096	50.2%	20.0%	1.0%	1,260,000
2030	68,812,764	47.2%	20.9%	0.9%	1,440,000

2.53 Because of competition from Gatwick, Stansted develops its conventional scheduled service network more slowly, hence it is more reliant on 'no frills' services, with the proportion of long haul traffic being similar to the maximum use case.

Stansted Only

2.54 This scenario reflects the circumstances where the only additional runway constructed in the South East is at Stansted. Under this scenario passenger growth is somewhat faster at Stansted but traffic growth overall is depressed as demand is priced off. This affects Luton as well as Heathrow or Gatwick. Runway capacity at Stansted is fully taken up by 2037 under this scenario.

2.55 The mix of air traffic demand at Stansted under this scenario is set out in **Table 2.12**.

Table 2.12: Mix of Air Passenger Demand and Freight Traffic at Stansted under the Stansted Only Scenario					
	Total Passengers	% No Frills	% Long Haul	% Charter	Freight and Mail Tonnes
2005	25,418,802	72.5%	13.9%	4.1%	280,000
2010	30,133,389	69.5%	20.2%	1.5%	380,000
2015	57,125,506	49.1%	18.7%	2.5%	950,000
2020	66,231,261	46.4%	20.4%	1.8%	1,130,000
2025	70,097,643	43.3%	21.8%	1.3%	1,300,000
2030	73,150,289	39.5%	23.0%	0.5%	1,480,000

2.56 Because Stansted provides the only reservoir of additional capacity under this scenario, more conventional short haul services develop, displacing 'no frills' services. The proportion of long haul services is higher than under some other scenarios but less than in the maximum use case.

2.57 As indicated, the freight projections contained in the tables above were derived from work undertaken by Halcrow, which was responsible for the airport specific freight forecasts undertaken for SERAS, and the use of their figures was advised by DfT. The freight forecasts used by Cambridge Econometrics are thus the same as those used by Halcrow for all equivalent scenarios. We will discuss the rationale for these revised freight forecasts in the next section.

2004 Halcrow/PACEC Report

2.58 Halcrow, like Cambridge Econometrics, derives its passenger forecasts from the scenarios underpinning the White Paper. The Halcrow forecasts as used as a basis for employment forecasting are presented in terms of million workload units[34], although they are separately derived from passenger and freight forecasts taken from the White Paper analysis.

2.59 A number of scenarios are defined:

The Base Case – the Halcrow work starts from a counterfactual 'case' to represent the scenario of no intervention in terms of additional runway capacity at Stansted, as well as Heathrow and Gatwick, and assumed a maximum capacity of 35 million passengers per annum. This is equivalent to the Cambridge Econometrics' Maximum Use of the Single Runway Case;

The Reference Case – the Halcrow work assumed that the most likely future runway provision in the South East is that, in addition to a second runway at Stansted, there would be a third runway at Heathrow towards the end of the 2015/20 period with no additional runway at Gatwick. This is equivalent to the Cambridge Econometrics' Stansted + Heathrow 2020 case;

Heathrow Delay – the effect of a delay to the provision of an additional runway at Heathrow beyond the forecast period to 2030 was tested. This is equivalent to the Cambridge Econometrics' Stansted Only case;

Maximum capacity – the maximum throughput of an additional runway at Stansted of 82 mppa (depending on traffic mix) was tested through an extrapolation of the forecasts in the Heathrow Delay case.

High No Frills Scenario – in addition, Halcrow tested the effect of a higher proportion of 'no frills' traffic within the Reference Case total passenger numbers, reflecting more closely the current dominance of 'no frills' traffic at Stansted, which made up 86% of Stansted's traffic in 2003. The proportion of 'no frills' traffic is projected to decline to 40% in the DfT 2030 forecasts as used in the Halcrow Reference Case. This case tested no frills traffic making up 60% of the passengers at Stansted in 2030, with an equivalent reduction in other scheduled traffic.

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[34] One million work load units (mwlu) = one million passengers or one hundred thousand tonnes of freight.

2.60 Halcrow extrapolated the DfT 2030 forecast to the end of their forecast period, 2036, taking into account that at an airport approaching runway capacity the average size of aircraft will increase until terminal capacity is reached. The passenger forecasts for the Base Case are given in **Table 2.13**.

Table 2.13: Base Case Air Traffic forecasts (by year) (mwlu)								
	2001	**2006**	**2011**	**2016**	**2021**	**2026**	**2031**	**2036**
No Frills	10.4	18.2	21.3	21.3	20.7	20.0	18.1	16.3
Long Haul Scheduled	0.0	4.1	6.2	7.6	8.8	8.8	10.1	11.6
Other passenger	3.3	3.4	2.9	5.0	6.4	7.1	8.5	10.1
Freight	1.8	3.0	4.0	5.1	5.9	6.8	7.8	9.1
Passenger	13.7	25.7	30.4	33.9	35.8	35.9	36.7	38.0
All Traffic	15.5	28.7	34.4	39.0	41.7	42.7	44.5	47.1
Source: DfT/Halcrow (Note: Totals may not add up due to rounding)								

2.61 As with the Cambridge Econometrics work, no specific sensitivity tests were carried out regarding traffic growth or capacity at Luton as the White Paper now projects Luton growing more rapidly to take up the capacity of its single runway independent of the growth at Stansted.

2.62 The individual passenger forecast components for each of the scenarios are shown in **Tables 2.14 to 2.16**, with the totals shown in **Table 2.17**.

Table 2.14: No Frills Traffic – Passengers (mppa) by Runway Assumption				
	Reference (2R)	Base (1R)	Heathrow delay	High No Frills	Max capacity
2001	10.4	10.4	10.4	10.4	10.4
2006	18.2	18.2	18.2	19.5	18.2
2011	21.1	21.3	21.0	24.1	21.0
2016	28.9	21.3	29.0	35.1	29.0
2021	32.4	20.7	30.5	41.6	30.5
2026	32.5	20.0	30.0	44.0	29.2
2031	31.9	18.1	28.6	45.5	27.9
2036	31.3	16.3	27.3	46.9	26.5
Source: DfT, Halcrow					

Table 2.15: Long Haul Scheduled Traffic – Passengers (mppa) by Runway Assumption				
	Reference (2R)	Base (1R)	Heathrow delay	High No Frills	Max capacity
2001	0.0	0.0	0.0	0.0	0.0
2006	4.1	4.1	4.1	3.4	4.1
2011	5.9	6.2	6.1	4.0	6.1
2016	10.9	7.6	11.1	8.6	11.1
2021	13.1	8.8	13.9	9.6	13.9
2026	13.2	8.8	15.7	8.6	15.6
2031	15.7	10.1	17.1	10.2	17.2
2036	18.6	11.6	18.6	12.3	18.9
Source: DfT, Halcrow					

Table 2.16: Other Passenger Traffic – Passengers (mppa) by Runway Assumption				
	Reference (2R)	**Base (1R)**	**Heathrow delay**	**High No Frills**	**Max capacity**
2001	3.3	3.3	3.3	3.3	3.3
2006	3.4	3.4	3.4	2.8	3.4
2011	3.4	2.9	3.4	2.3	3.4
2016	19.1	5.0	19.3	15.1	19.3
2021	21.6	6.4	22.7	15.8	22.7
2026	20.1	7.1	24.7	13.1	27.3
2031	23.5	8.5	28.2	15.3	32.0
2036	27.6	10.1	32.8	18.2	36.6
Source: DfT, Halcrow					

Table 2.17: Total Passenger Traffic – Passengers (mppa) by Runway Assumption				
	Reference (2R)	**Base (1R)**	**Heathrow delay**	**High No Frills**	**Max capacity**
2001	13.7	13.7	13.7	13.7	13.7
2006	25.7	25.7	25.7	25.7	25.7
2011	30.4	30.4	30.5	30.4	30.5
2016	58.9	33.9	59.4	58.8	59.4
2021	67.1	35.9	67.1	67	67.1
2026	65.8	35.9	70.4	65.7	72.1
2031	71.1	36.7	73.9	71	77.1
2036	77.5	38	78.7	77.4	82
Source: DfT, Halcrow					

Freight forecasts

2.63 As indicated earlier, the DfT has not produced freight forecasts to accompany the latest passenger demand forecasts associated with the White Paper. The original DfT freight forecasts assumed a growth in all cargo movements at Stansted from 13,000 in 1998 to 40,000 in 2030. By 2003 air cargo movements had fallen to 10,300, suggesting that the SERAS forecast of a large expansion in cargo air transport movements (ATMs) at Stansted may not take place. Reflecting this updated position, Halcrow produced a revised set of freight forecasts, based on a much lower forecast of cargo ATMs at Stansted, with a cap on cargo ATMs of 13,000 for a single runway and 19,500 for a two runway and adjustments to reflect the latest passenger forecasts.[35]

2.64 The SERAS study forecast that by 2030, freight volumes at Stansted would reach between 2.2 and 2.8 million tonnes per year, compared to 0.2 million tonnes in 2003. The majority of this freight was forecast to be carried on dedicated cargo aircraft. In the Halcrow forecasts, the decline in cargo ATMs has been more than offset by an increase in the average load of aircraft, consistent with recent trends. Around 1% of freight at Stansted is carried in the bellyhold of passenger aircraft. The SERAS bellyhold freight forecasts were based on passenger forecasts that predicted fewer long haul passenger flights at Stansted. The bellyhold freight forecasts have therefore been adjusted to reflect the revised passenger forecasts. Freight forecasts for 2031 and 2036 have been calculated by extrapolating on the basis of the growth between 2025 and 2030. The forecasts are illustrated in **Table 2.18**.

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[35] Increased all cargo ATMS would have a marginal impact on employment forecasts.

Table 2.18: Freight Traffic (million tonnes) by Runway Assumption					
	Reference (2R)	Base (1R)	Heathrow delay	High No Frills	Max capacity
2001	0.18	0.18	0.18	0.18	0.18
2006	0.30	0.30	0.30	0.30	0.30
2011	0.43	0.40	0.45	0.43	0.45
2016	0.77	0.51	0.98	0.77	0.98
2021	0.93	0.59	1.16	0.93	1.16
2026	1.32	0.68	1.33	1.32	1.33
2031	1.52	0.78	1.52	1.52	1.52
2036	1.76	0.91	1.76	1.76	1.76
Source: DfT, Halcrow					

Summary

2.65 In **Table 2.19**, we summarise the air traffic forecasts used as the basis of the assessment of employment number associated with the growth of Stansted and the provision of additional runway there. We highlight the forecasts for the key years relating to the assessment of employment and housing implications using information contained within the published reports for each of the studies, policy and consultation documents.[36]

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[36] It should be noted that there may be minor (1mppa) inconsistencies in the presentation of some figures due to rounding but these are within the tolerance of error of the estimates over a 30 year timeframe.

Table 2.18: Summary Comparison of Air Traffic Forecasts										
					Passenger Forecasts					Freight Forecast 2030 (million tonnes)
Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators	
Maximum Use of Single Runway	SERAS		2	35mppa	23		26			The majority of Stansted's traffic is projected to be on conventional short haul scheduled services, with only 8% of passengers using long haul services and 23% on 'no frills' services.	1.6-2.3
	Buchanan Study	Maximum Use 1	2	25mppa by 2026 growing to 35mppa		23		35	2036	Stated as based on SERAS projections.	No explicit account taken of air freight projections
		Maximum Use 2		40mppa by 2021		40		40	2021	Used to test the implications of Stansted's growth accelerating to take up full theoretical runway capacity with substantial growth in average aircraft size (implying more long haul services).	
	White Paper		2	35 mppa	33		36			50% of Stansted's passengers at 2030 (more at 2015) are projected to be using 'no frills' services, with 27% on long haul flights as the local catchment area is now expected to support a range of leisure oriented scheduled services in any event.	No new forecasts - SERAS presumed
	CEC		2	35mppa	33	36	36		2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76
	Halcrow/ PACEC		2	35 mppa		36		37	2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76

GO- E Audit of Stansted Growth Assumptions

Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts						Freight Forecast 2030 (million tonnes)
					2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators	
Two Runways	SERAS	Mid-point		82mppa	64		74			Traffic at Stansted 'seeded' on the assumption that 40% of Heathrow's long haul network (17mppa) would relocate to Stansted to establish a second hub. One third of passengers would be transferring at the new hub airport and by 2030 up to 46% of the Airport's passengers are projected to be on conventional long haul scheduled services, with only 8% on 'no frills' services.	1.9-4.1 with additional runways quoted in the SERAS reports. 2.2-2.8 million with an additional runway at Stansted and one at Heathrow in 2020 according to Halcrow.
		Low Cases					71			Stansted forecasts tend to be lower if the runway there is combined with one or more additional runways at Gatwick.	
		High Cases					78			Stansted forecasts tend to be higher when combined with Heathrow options or delivered earlier.	
	Buchanan Study	Stansted 2nd Runway	7	81-82mppa		69		82	2036	Stated as based on SERAS.	No explicit account taken of air freight projections
	White Paper	Stansted 2nd Runway Only	7	81-82mppa	57		73			40% of Stansted's passengers at 2030 are projected to be using 'no frills' services and 23% on long haul services.	No new forecasts - SERAS presumed
		Stansted 2nd Runway + Heathrow Short Runway at 2020	12s1		57		70			45% of passengers at 2030 are projected to be using 'no frills' services and 23% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.	
		Stansted 2nd Runway + Heathrow Short Runway at 2016	12s2		57		70			48% of passengers at 2030 are projected to be using 'no frills' services and 21% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.	
		Stansted 2nd Runway + Gatwick Wide-spaced Runway at 2024	13		57		69			47% of passengers at 2030 are projected to be using 'no frills' services and 19% long haul services as the Airport competes with Gatwick for leisure oriented markets.	
	CEC	Stansted 2nd Runway + Heathrow at 2016	12s2	81-82mppa	57	60	70		2039	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48
		Stansted 2nd Runway + Heathrow 2020	12s1		57	67	70		2039		1.48
		Stansted 2nd Runway + Heathrow 2026	12s extra		57	68	72		2038	44% of passengers at 2030 are projected to be using 'no frills' services and 22% long haul services as the Airport receives more short haul scheduled traffic spilled from Heathrow due to the runway there being delayed.	1.48
		Stansted 2nd Runway + Gatwick 2024	13		57	67	69		2041	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.44
		Stansted 2nd Runway Only	7		57	67	73		2037	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48

Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts						Freight Forecast 2030 (million tonnes)
					2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators	
Two Runways	Halcrow/ PACEC	Reference Case	12s1	81-82mppa		67		78		As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48 (1.76 in 2036)
		Heathrow Delay	7			67		79			
		Maximum Use of 2 Runways	7 extrapolated			68		82	2036	Forecasts extrapolated from White Paper Forecasts.	
		High No Frills	Overall Forecast as 12s! With higher no frills percentage			67		78		Proportion of no frills passengers increased from 40 to 60% of Stansted's traffic in 2030, with other passenger types reduced proportionately.	

2.66 In **Figure 2.1** and **2.2**, we graphically illustrate the passenger forecasts used in the different studies. Where specific data is not available in the published reports, we have interpolated between the figures given and the graphs should be interpreted with this in mind.

2.67 In the absence of 'seeding', the air traffic forecasts for the scenario of maximum use of a single runway at Stansted within SERAS were considerably lower than those now used in the White Paper. Recent growth trends at Stansted show that it is capable of sustaining its own traffic growth in its core market and the more recent forecasts reflect natural growth of Stansted's own market rather than a view of the Airport as an alternative to Heathrow. This results in more rapid take up of single runway demand than assumed in SERAS.

2.68 Under the maximum use scenario, Buchanan's did test the full capacity being taken up by 2036 and, to that extent, looked at higher air traffic projections for the longer term than examined in SERAS under this scenario.

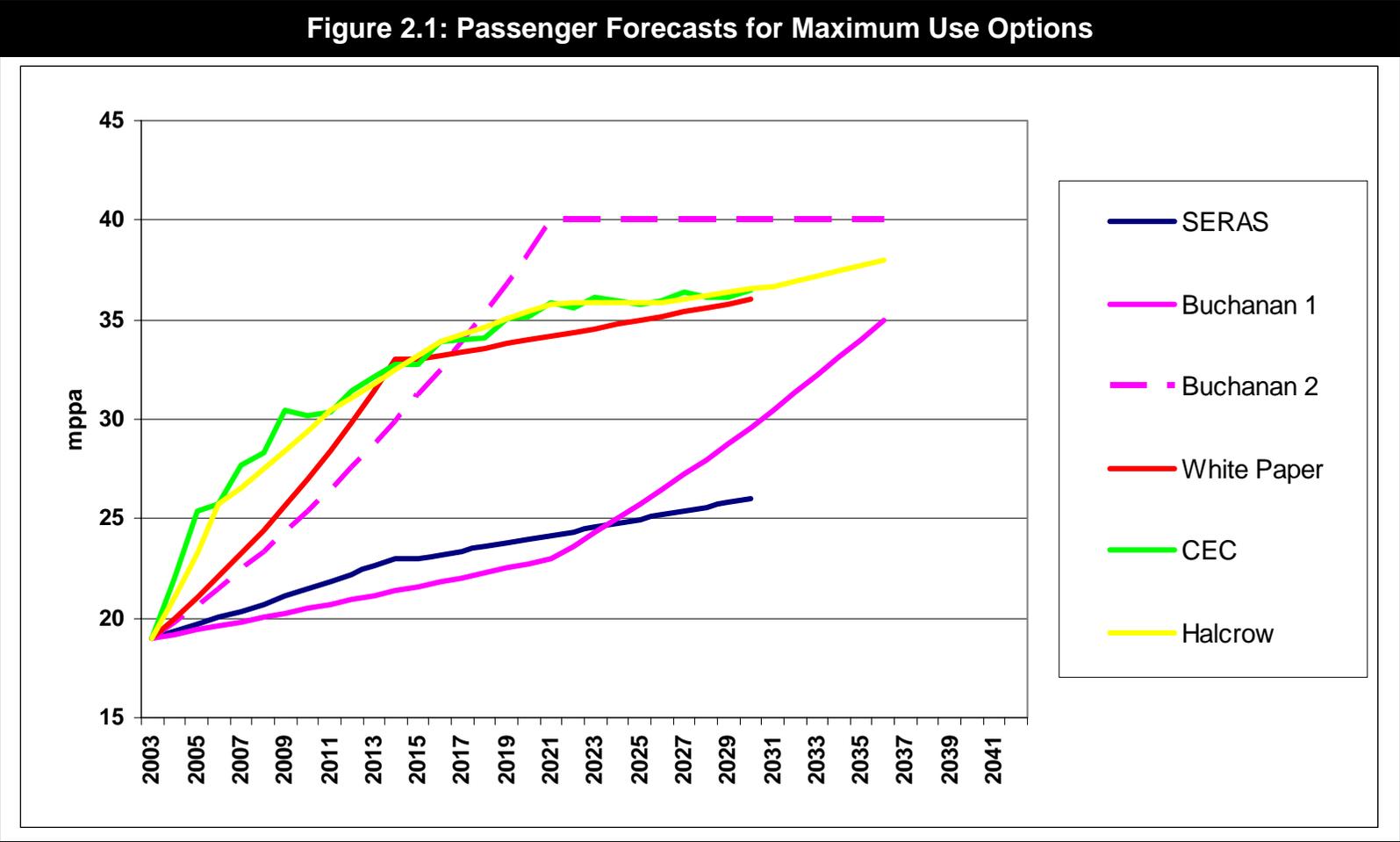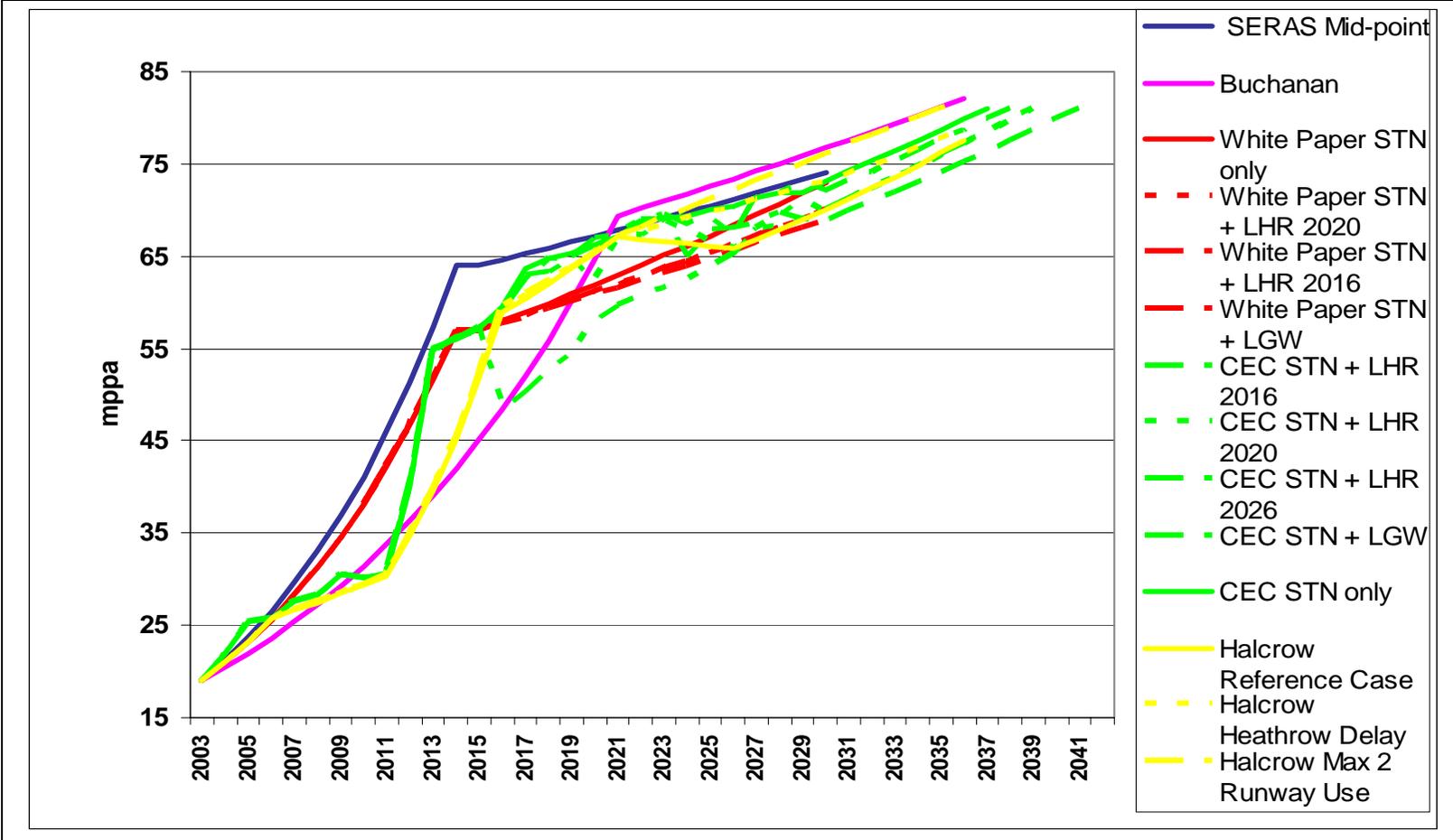**Figure 2.1: Passenger Forecasts for Maximum Use Options**

Figure 2.2: Passenger Forecasts for Two Runway Option Packages

2.69 A key difference between the forecasts used in SERAS, and by Buchanan's, and the more recent work based on the White Paper forecasts for the second runway at Stansted is that, in the circumstances where the provision of a second runway at Stansted is combined with one at Heathrow or Gatwick, the Stansted new runway is expected to be delivered first in 2011. In SERAS, under the multiple new runway packages, Stansted was generally assumed to be the later delivered runway. Thus the build up of passenger demand, and hence employment, is generally earlier in the more recent work.

2.70 The White Paper forecasts, because they are predicated on no 'seeding' of traffic at Stansted, project a different mix of traffic and result slightly lower forecasts overall in the longer term, although trending towards the same two runway capacity. The higher 'no frills' traffic element and reduced long haul projections have implications for the employment forecasts as the 'no frills' carriers are driving the industry trend to increased productivity.

2.71 Both the Cambridge Econometrics and Halcrow/PACEC work use forecasts derived from the White Paper, albeit with some different scenarios tested. Three core scenarios of:

✈ Maximum Use of Single Runway (Base Case);

✈ Stansted 2nd Runway + Heathrow 3rd Runway 2020 (Reference Case);

✈ Stansted 2nd Runway only by 2030 (Heathrow Delay);

are common to both studies. The Cambridge Econometrics work considers interim cases of an additional runway at Heathrow in 2016 or 2026, whilst the Halcrow/PACEC work considers the effect of Stansted expanding more rapidly up to the maximum use of two runways and the effect of the forecast passenger traffic at Stansted containing a higher proportion of 'no frills' traffic in 2030.

3.   EMPLOYMENT GROWTH ASSUMPTIONS

3.1   It should be noted that, in most cases, the employment forecasts derive from the air traffic forecasts, so differences in the air traffic forecasts will, in part, explain differences in the employment forecasts.

3.2   In this section, we summarise the key employment growth assumptions set out in each of the documents, the core assumptions and methodology. We then go on to present the information in a summary comparative table at the end of the section.

SERAS

Future Development of Air Transport in the United Kingdom: South East February 2003 Consultation Document

3.3   The SERAS Consultation Document presents employment forecasts for Stansted[37] and these are set out in **Table 3.1**. The Consultation Document notes that the 1998 core catchment area for employees is in Uttlesford, East Hertfordshire and Harlow districts.   It notes that, to support the larger development options, this would need to be extended to include Braintree, Chelmsford, Harlow, Broxbourne, Epping Forest and North East London.

Table 3.1: Employment Forecasts (1,000s) for Stansted from the SERAS Consultation Document						
	1998	2015		2030		
		Maximum use	1 new runway	Maximum use	1 new runway	2 new runways	3 new runways
Direct on-site	7	13	39	12	37	48	61
Direct off-site	1	2	7	2	6	9	11
Indirect	2	5	14	4	13	17	21
TOTAL	10	20	60	18	56	74	93

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[37] Department for Transport, Future Development of Air Transport in the United Kingdom: South East, February 2003, Table 9.4.

3.4   It was further noted that the employment growth was large in relation to the employment growth projected for the area as a whole (45,000 jobs to 2015 and 74,000 jobs to 2030) and that RPG provision could result in an additional 83,000 houses being required.[38]   The Consultation Document went onto note that meeting this additional labour demand would require a sectoral shift in employment patterns, from a low base of 5% of employees currently working at the Airport and require to draw from a wider area, such as the Lea Valley, as well as giving rise to broader development and planning implications.   It was estimated that the growth of the Airport with one additional runway would give rise to housing demand 44% in excess of the provision identified in the then current RPG, requiring 18,000 additional homes and an increase in population of 40,000[39].   The Consultation Document went on to note that this was beyond the level that could be accommodated in the existing core employee catchment area.

SERAS Technical Reports

3.5   The SERAS Stage Two Appraisal Findings Report[40] sets out in more detail the basis of the employment estimates contained in the in the Consultation Document[41]. We set out these figures in **Table 3.2**.

3.6   The methodology by which these employment estimates have been derived is set out in the SERAS Stage Two Methodology Report.[42] This document sets out the economic impact framework employed and the key assumptions adopted in developing the employment estimates.

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[38] Ibid, para 9.31.
[39] Ibid, para 9.33.
[40] Department for Transport, SERAS Technical Reports produced by Halcrows
[41] SERAS Stage 2, Appraisal Findings Report, Table 9.34
[42] SERAS Stage 2, Methodology Report, Chapter 5.

Current & Forecast Employment by Option	Current 1998	Max Use 2015	Option 5 2015	Max Use 2030	Option 5 2030
Direct on-site	6,700	13,100	39,200	12,000	37,100
Direct off-site	1,000	2,200	6,800	2,000	6,400
Indirect	2,300	4,600	13,800	4,200	13,100
Total Employment	10,100	19,900	59,800	18,200	56,600
Passengers (mppa)	10	23	64	26	74
Direct employees/mppa	816	664	715	544	585
Total employee/mppa	1,061	864	930	708	761

Table 3.2: Mix of Passengers and Air Transport Movements under the Two Runway Scenario from the SERAS Technical Reports

3.7 The framework of impact used is that broadly accepted as the standard framework for analysis of the quantifiable economic impact of airports, outlining four main categories of effect:

✦ Direct On-Site – employment wholly or largely related to the of operation of the airport and generated on-site in the Operational Area;

✦ Direct Off-Site - employment wholly or largely related to the of operation of the airport and generated within a 20-minute drive time of the Airport;

✦ Indirect – employment generated in the chain of suppliers of goods and services to the direct activities;

✈ Induced – employment generated by the spending of incomes earned in the direct and indirect activities.

3.8 There are two key things to note about this framework:

✈ firstly, no attempt is made to quantify the so called catalytic or attracted effect of airports. This is employment generated by the attraction, retention or expansion of economic activity as a result of access to Stansted. The quantification of catalytic effects is an area of some controversy because of the difficulty of distinguishing between airport specific effects and the underlying growth of the economy generally. It is generally assessed qualitatively and SERAS follows this convention;

✈ within the SERAS framework the inclusion of an induced effect is an option. There is some concern that this effect is less likely to be apparent or quantifiable for small changes in capacity and may be absorbed within the local economy. Effectively this means that SERAS is assuming 100% displacement in the labour market, that jobs will simply be drawn from other sectors. As such its inclusion within the SERAS estimates is on an airport case by case basis. In the case of Stansted, as can be seen in Table 3.2, this effect is not included.

3.9 Within this basic framework of analysis there are a number of key assumptions that affect the employment estimates:

✈ **baseline for modelling** – the SERAS methodology works from a 1998 baseline and a starting employment density of 816 employees per mppa;

✈ **freight traffic** – based on an analysis of the experience of Nottingham East Midlands Airport, the following assumptions have been made:

  – 115 tonnes of either express or standard freight supports 1 job;
  – 240 tonnes of mail supports 1 job.

✈ **low cost carrier employment density adjustment** – data analysis undertaken at both Stansted and Luton identified that low cost services operate at a significantly lower employment density than traditional full fare operators. The SERAS model therefore allows for separate analysis of low cost capacity which uses an employment density deflator of – 200 employees per million passengers;

✈ **productivity growth** – based on an analysis of changes in employees per passenger at a sample of airports, it was identified that at airports with a stable pattern of traffic growth, productivity growth ranged between 1% and 2.5% per annum. Based on the 30 year timeframe and the mature status of the majority of SERAS airports, an assumption was therefore made that productivity would grow at 1.5% per annum over the period. It should be noted that in the case of Stansted, this assumption may be somewhat flawed. The Airport has experienced rapid growth in recent years and this has been accompanied by high productivity growth rates, which although they are generally expected to fall, are likely to be above this assumed level for the near future;

✈ **direct off-site employment** – the size of off-site activities is another area which can be difficult to assess without direct survey work. At most airports there is some direct activity located off-site and it is correct that this should be included within estimates, but the size of the effect does depend considerably on the availability of land on-site and the nature of the surrounding area. Based on an analysis of this effect at other UK airports, SERAS identified a range of between 10% and 17% of direct employment located off-site. A base assumption was therefore adopted that 15% of all future direct employment would be located off-site. It should be noted again that this assumption may not be particularly appropriate to Stansted considering its physical and geographical properties. The extensive nature of the site and the predominance of rural land surrounding the airport is likely to mean that the proportion of direct employment located off-site is rather smaller;

✈ **indirect employment multiplier** – based on an analysis of observed indirect multipliers this was assumed to be 0.3.

Future of Air Transport White Paper

3.10 In relation to employment forecasting, the White Paper provides no additional estimates at an airport level over and above those already provided by the SERAS Stage 2 Study. The Regulatory Impact Assessment for the Future of Air Transport identifies employment supported in 2030 with the development of the second runway as 56,000[43], in line with that outlined in Table 3.2 above.

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[43] Regulatory Impact Assessment: The Government's White Paper: The Future of Air Transport – Department for Transport 2003, Page 4.

3.11 There are therefore no additional assumptions or methodological points to be examined in relation to the White Paper.

2003 Buchanan Report

3.12 The Buchanan Key Issues Report[44] identifies a two ring study area for the purposes of the economic modelling work undertaken. This area is outlined in **Table 3.3**. These districts are assumed to provide the primary catchment area for jobs at the Airport.

Table 3.3: Stansted Airport Employment Impact Study Area	
Core Area	**Outer Area**
Braintree	Cambridge City
East Hertfordshire	Chelmsford
Harlow	Colchester
Uttlesford	Epping Forest
	South Cambridgeshire
	St Edmundsbury
Source: Colin Buchanan and Partners, 'Stansted/M11 Corridor Development Options Study – Key Issues Report', Table 3.1 page 77.	

3.13 The estimates that are derived by Buchanan for SERAS Package 2: Maximum Use (35 mppa by 2036) and SERAS Package 7: 2 Runways (82 mppa by 2036) are set out in **Table 3.4**. These results are as published in the Final Report (December 2003)[45]. In addition we have included the results for two alternative (non-SERAS) scenarios based around a one runway Stansted, but with traffic growth reaching 25mppa and 40mppa by 2021 respectively and then remaining stable thereafter.

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[44] Stansted/M11 Corridor Development Options Study – Key Issues Report – Colin Buchanan and Partners 2003.
[45] Note: there are some unexplained differences between figures in the Key Issues and Final reports.

	Baseline	**2021**				**Baseline**	**2036**			
		SERAS P2	**SERAS P7**	**Non SERAS 25 mppa**	**Non SERAS 40 mppa**		**SERAS P2**	**SERAS P7**	**Non SERAS 25 mppa**	**Non SERAS 40 mppa**
Direct	11,600	11,600	36,178	12,604	20,516	10,168	14,236	34,329	10,168	16,507
Indirect & Induced	1,173	1,760	6,457	1,911	2,344	1,004	2,259	6,908	1,518	1,987
Catalytic	312	312	6,274	339	1,568	425	595	9,271	425	1,961
Total	13,085	13,672	48,909	14,879	24,468	11,597	17,090	50,508	12,136	20,495

Table 3.4:
Buchanan Report Employment Estimates for Stansted Airport for Selected Scenarios

Source:
Colin Buchanan and Partners, 'Stansted/M11 Corridor Development Options Study –
Final Report', Table 2.10 Page 22

3.14 This analysis shows total employment supported by Stansted growing from a 2001 base of 13,522 jobs to between 17,090 (SERAS Maximum Use) and 50,508 jobs (SERAS Second Runway) by 2036. These estimates are substantially different from those generated by SERAS for 2030 (the nearest comparator year). Below we examine more closely the assumptions and methodology used by Buchanan in developing these estimates and consequently analyse the reasons behind these differences, over and above the differences in air traffic forecasts discussed in Section 2.

Methodology and Assumptions

3.15 The Buchanan Report uses a similar framework for analysis as that set out by SERAS but there are some important differences that start to account for some of the differences in the employment projections:

✈ Direct Employment – as defined before, but the onsite and offsite distinction is not made. It appears that no provision is made for off-site direct employment within the estimates;

✈ Indirect Employment – as defined above, but with a substantially different multiplier applied. We set out more details of this assumption below;

✈ Catalytic Employment – this category was not quantified in the SERAS work as estimation was not felt to be possible. Buchanan has used a methodology based on traffic multipliers as described below;

✈ Induced Employment – while this category was included in the SERAS framework, it was not estimated for Stansted for the reasons described above, at para 3.8. Buchanan has included an estimate;

✈ Displacement – this attempts to quantify the employment at the airport that will simply be drawn from other sectors of the economy rather than genuinely 'grown'. This has the overall effect of reducing labour demand.

3.16 Broadly this framework differs from SERAS in that it attempts to quantify two categories of impact, catalytic and induced, that were excluded in the SERAS work. Buchanan's also seek to quantify the displacement effect of the growth of the Airport, while this is seen to be implicit within the SERAS estimates.

3.17 This framework provides the basic building blocks for the employment estimates in the Buchanan report, below we examine the key assumptions that impinge on these different categories.

Direct Employment

3.18 The direct employment estimate is driven by both the traffic forecasts described in Section 2 and the following assumptions:

⤴ the estimates draw on a 2001 employment 'head count' undertaken by BAA at Stansted. This identified that 10,332 people were employed directly on site at the airport. When combined with the traffic figures for the year this implies a base employment density for projection of 756 jobs per million passengers per annum. This is substantially below that assumed by the SERAS 1998 base;

⤴ similarly to SERAS, Buchanan has assumed a long run productivity growth of 1.5% per annum. They do, however, note that productivity growth has been as high as 11.2% in recent years at the Airport but argue that continued growth at this rate is not likely, especially as much of the growth due to the advent of low cost carriers is past and that forecasts for the future assume a greater proportion of full service traffic, which they feel will be unable to improve productivity at such rates.

3.19 When combined these two assumptions help explain the observed differences the estimates of direct effects between SERAS and Buchanan. The lower initial employment density in 2001 combined with the same productivity assumption will produce lower estimates in the Buchanan's report.

Indirect Employment

3.20 Indirect employment is driven by a multiplier assumption that operates on the direct employment estimate. Buchanan has assumed an initial indirect multiplier of 1.06 based on survey evidence from BAA. However, they have linked the size of multiplier to passenger traffic at the Airport, suggesting that as an airport gets bigger it reaches points of critical mass at which time it becomes worthwhile for suppliers to locate nearer to the airport. Consequently the estimates assume indirect multipliers of:

> ✈ 1.06 up to 30mppa;
> ✈ 1.08 up to 70mppa;
> ✈ 1.1 at levels above 70mppa.

3.21 All of these multipliers are substantially lower than those assumed by SERAS and consequently account for the lower estimates of indirect in the Buchanan's work.

Induced Employment

3.22 Induced employment is excluded from the SERAS estimates but included within the Buchanan's Report. This is a key difference in the methodologies of the two studies. Fundamentally SERAS is assuming complete displacement within their approach and consequently there is no additional induced employment. While this is theoretically possible under particular circumstances, Buchanan states that this is not possible where there is extra migration or where the population is effectively fixed. An assumed induced multiplier of 1.24 is therefore included on the basis evidence from BAA.

3.23 The model also adds an additional 0.1 jobs per person in the public services created by additional migration, which is not felt to be fully covered by the induced multiplier employed by the Study.

Catalytic Employment

3.24 The catalytic or attracted employment effect of airports is an area of considerable controversy and it is worth noting that this is the only one of the studies that attempts to estimate this effect explicitly. Catalytic or attracted employment refers to jobs attracted to an area because of the airport and the accessibility (both in and out) that it provides. The difficulty in its estimation is primarily twofold:

> ✈ the existence of an airport and air services is only one in a catalogue of factors that effect either company location decisions or a tourist's destination choice;

> ✈ what drives catalytic impact is not necessarily size in terms of airport traffic but accessibility. The destinations, schedules and frequencies of flights are more important than the volumes of people using them.

3.25 These difficulties not withstanding, Buchanan has sought to draw on studies of catalytic impact from around Europe and North America to produce what is effectively a multiplier[46] dependent on the level of traffic[47]. These have then been adjusted to allow for Stansted's particular situation:

✈ all the other studies considered by Buchanan to be relevant have examined the effects of a single hub airport operating in isolation. Stansted is part of a considerably larger airport system, not least including Heathrow. It was therefore felt to be unrealistic to assume that Stansted would attract employment of this nature to the same extent as the airports used to derive the multipliers. To allow for this the original employment densities were deflated by 50%;

✈ an allowance was also made for the fact that not all attracted employment would choose to locate within the study area. Based on the experience at Chicago's O'Hare Airport, it was assumed that 80% would locate within the area.

3.26 The results of this process for the two scenarios relevant to this work, SERAS Package 2: Maximum Use (35 mppa by 2036) and SERAS Package 7: 2 Runways (82 mppa by 2036), are outlined in **Table 3.5**, which sets out the jobs per mppa ratio assumed.

3.27 Once a 'directly generated' catalytic effect is identified a further multiplier of 1.15 is applied to the result to allow for employment attracted by the catalytic effect itself.

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[46] [46] Stansted/M11 Corridor Development Options Study – Key Issues Report: Appendix 4 Catalytic Employment– Colin Buchanan and Partners 2003. Pages 58-64
[47] Higher levels of traffic are assumed to imply more international destinations and hence greater overall attractiveness of location

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York Aviation LLP

Table 3.5: Catalytic Impact Employment Density Multipliers				
	Package 2: Maximum Use		Package 7: 2 Runways	
	mppa	Jobs per mppa	mppa	Jobs per mppa
2001	13.4	20.0	13.4	20.0
hi		20.0		20.0
2006	20.5	22.4	20.5	40.0
hi		22.4		80.0
2011	22.8	25.2	47.4	120.0
hi		25.2		180.0
2016	22.8	27.6	64.7	140.0
hi		27.6		232.0
2021	23.0	30.0	69.4	160.0
hi		30.0		240.0
2026	25.6	32.4	72.3	180.0
hi		32.4		300.0
2031	25.8	35.2	74.4	180.0
hi		35.2		300.0
2036	35.0	37.6	82	200.0
hi		37.6		300.0
2041	35.0	40.0	82	220.0
hi		40.0		300.0
Source: Stansted/M11 Corridor Development Options Study – Key Issues Report Appendices, Colin Buchanan and Partners. Page 64 Table A4.5				

Displacement

3.28 The final element in the Buchanan employment estimates is an allowance for displacement. This looks at the extent to which jobs created at the airport will simply draw labour away from existing employment in the economy. Once again this is an area where precise quantification is extremely difficult[48].

3.29 In their analysis, Buchanan has examined a range of existing empirical evidence on the subject[49]. This work identified two clusters of observations:

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[48] Treasury guidance in this area suggests testing a range between 0% and 100%. This is noted by Buchanan's on Page 94 of the Key Issues Report
[49] Stansted/M11 Corridor Development Options Study – Key Issues Report Appendices, Colin Buchanan and Partners. Page 66

✈ a lower level ranging from 0-5%, mainly observed around urban projects programmes;

✈ a higher level ranging from 20-33%, with lower paid jobs more likely to be displaced that higher levels.

3.30 Buchanan also identified a further complication, in that market adjustments over time will reduce the net impacts of displacement. No attempt has been made to try to calculate this but instead a series of displacement factors between 0 and 1 have been applied to different displacement rates for different levels of pay and types of occupation at Stansted. This resulted in an average initial displacement rate of 24.5%, in line with the higher end of the observed estimates.

3.31 As a result of this analysis Buchanan assumed two alternative levels of displacement in the model, a minimum of 5% and a maximum of 25%. The assumptions adopted for each relevant scenario are shown in **Table 3.6**.

Table 3.6: Displacement Assumptions	
Scenario	
SERAS Package 2: Maximum Use	5% to 2031, then 10% in 2036
SERAS Package 7: Two Runways	15%
Non SERAS 25 mppa by 2021	5% to 2031, then 10% in 2036
Non SERAS 40 mppa by 2021	5% to 2031, then 10% in 2036
Source: Stansted/M11 Corridor Development Options Study – Key Issues Report, Colin Buchanan and Partners. Page 97 Table 3.4	

Location of Jobs

3.32 The Buchanan's Study splits the study into a **Core and Outer Area**. All direct jobs are allocated to the Core area, which contains Stansted. Indirect jobs falling within the Study Area are then allocated 30% to Core and 70% to Outer, reflecting the ratios of total employment in each area at the time of the Study. The induced and catalytic multipliers used then act on the direct and indirect effects and hence reflect this distribution. This allocation is then held constant through to 2041.

2004 Cambridge Econometrics Report

3.33 The Cambridge Econometrics report takes a quite different approach to the estimation of Stansted's employment impact from the other studies discussed here. Whereas the others have worked from a purely 'bottom up' basis, Cambridge Econometrics has taken a mixed approach, using both a 'bottom up' and econometric estimation approach.

3.34 The econometric estimation of indirect effects necessarily requires a model of considerable complexity and the genesis of this model is outlined in full in the Cambridge Econometrics Report. Simplifying this estimation to any great degree is not effectively possible but what we have sought to do in this section is to draw together the key results and explain broadly how the results have been arrived at.

3.35 The report provides estimates of employment at a district level but predominately reports by the following two areas:

✈ the four district core area Braintree, East Hertfordshire, Harlow and Uttlesford;

✈ the East of England region.

3.36 While this means that the core area is largely common with the more recent studies, the outer area covers a substantially larger geographical area. This will mean that for the outer area a greater proportion of overall employment impact should be captured.

Analytical Framework

3.37 The Cambridge Econometrics work identifies an economic impact framework within which there are five different types of airport related employment:

✈ the direct required jobs within the boundary of the airport in those core businesses physically handling aircraft, passenger and freight movements;

✈ ancillary jobs in support services located within the airport boundary that support these direct jobs;

✈   jobs located outside the airport boundary but in the first link of the purchase supply-chain to airport businesses;

✈   jobs located outside the airport boundary but linked through the sales chain and employed by businesses that have a preference for proximity to airports with suitable service characteristics;

✈   jobs generated outside the boundary of the airport as the economic 'multiplier' consequences of the income and spending activities of the other four categories.

3.38 However, the final three categories are contained within one broad estimate of 'indirect' employment. It should be noted that this is substantially different from the indirect effect reported in the other reports and is therefore not comparable. The Cambridge Econometrics definition includes what has been termed by others as the induced and catalytic effects of the growth of the Airport.

Direct Employment

3.39 As described above, the Cambridge Econometrics work uses a mixture of 'bottom up' and econometric estimation. The Direct Employment estimates have been derived by York Aviation on behalf of Cambridge Econometrics using a 'bottom up' approach.

3.40 These estimates were derived using the following assumptions:

✈   the forecast workload units for the different passenger and freight scenarios as outlined in Section 2 of this Report;

✈   an initial on-site employment density of 474 jobs per million workload units per annum. This density is derived from the 2003 annual on-site employment 'head count' undertaken by BAA at Stansted. This has then been deflated by 300 jobs to reflect known changes at the Airport since the survey was undertaken;

✈   productivity growth between 2003 and 2030 starting at around 2.9% before slowly declining to around 1.6% per annum. These growth rates reflect the tail of a long run trend in productivity growth of around 3.5% per annum between 1992 and 2030. Through the 1990s and early 2000s Stansted has experienced high productivity growth, this necessitates relatively low growth over the remainder of the period to enable convergence on the long run trend.

3.41 The results of this process and the later allocation to geographic areas undertaken by Cambridge Econometrics are shown in **Table 3.7**.

		2005	2011	2016	2021	2026	2030
Table 3.7: Cambridge Econometrics Report Direct Employment Estimates							
Maximum Use of Existing Runway	Core Area	7,171	7,535	7,662	7,423	6,952	6,711
	Region	9,808	10,306	10,479	10,153	9,509	9,179
	Total	12,647	13,290	13,512	13,091	12,262	11,836
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2016	Core Area	7,171	7,603	11,051	12,267	12,759	12,923
	Region	9,808	10,399	15,115	16,778	17,451	17,676
	Total	12,647	13,409	19,490	21,635	22,505	22,792
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2020	Core Area	7,171	7,603	13,081	13,588	12,851	12,904
	Region	9,808	10,399	17,892	15,585	17,578	17,650
	Total	12,647	13,409	23,071	23,965	22,666	22,759
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2026	Core Area	7,171	7,603	13,081	13,708	13,135	13,218
	Region	9,808	10,399	17,892	18,750	17,965	18,080
	Total	12,647	13,409	23,071	24,177	23,165	23,313
Stansted New Runway in 2011/12 and Gatwick Short Runway in 2024	Core Area	7,171	7,609	13,112	13,651	13,185	12,672
	Region	9,808	10,408	17,935	18,671	18,034	17,333
	Total	12,647	13,421	23,126	24,075	23,254	22,349
Stansted New Runway in 2011/12	Core Area	7,171	7,700	13,597	14,020	13,633	13,394
	Region	9,808	10,532	18,597	19,175	18,646	18,319
	Total	12,647	13,580	23,980	24,726	24,043	23,622
Source: Cambridge Econometrics and York Aviation							

Indirect Employment

3.42 The indirect employment generated by the development of a second runway at Stansted is based on an examination of the link between the growth in Stansted traffic, both passenger and freight, and a number of sectors that are linked to air transport either through the supply chain or as purchasers of air transport services.

3.43 The first stage in this process was to identify these relevant sectors using the 2000 input-output tables for the UK economy. This identifies air transport both as a sector that consumes products and services but also as a product to be consumed by other sectors. Cambridge Econometrics used this information identify key supply chain links and purchasers of the service, including any sector which accounted for more than 1% of total demand of either air transport's supply chain or purchaser demand. These results are set out in **Table 3.8**.

Table 3.8: Analysis of Air Transport Input-Output Structure					
Intermediate Demand by Air Transport Services	**£m**	**% Share**	**Intermediate Demand for 'Air Transport' as a Product**	**£m**	**% Share**
Air transport	807	12.4	Air transport	807	9.1
Coke ovens, refined petroleum & nuclear fuel	1,744	7.5	Postal and courier services	344	7.5
Aircraft and spacecraft	408	4.9	Banking and finance	1,180	3.3
Ancillary transport services	1,643	4.5	Insurance and pension funds	600	2.0
Hotels, catering, pubs etc	304	3.5	Ancillary transport services	423	1.8
Other service activities	66	3.5	Accountancy services	67	1.8
Computer services	1,104	3.2	Oil and gas extraction	91	1.6
Insurance and pension funds	266	2.5	Advertising	74	1.4
Water transport	43	2.3	Other business services	377	1.3
Made-up textiles	12	1.6	Market research, management consultancy	107	1.3
Advertising	322	1.5	Legal activities	64	1.2
Motor vehicle distribution and repair, automotive fuel retail	102	1.4	Cement, lime and plaster	7	1.2

Table 3.8: Analysis of Air Transport Input-Output Structure					
Intermediate Demand by Air Transport Services	£m	% Share	Intermediate Demand for 'Air Transport' as a Product	£m	% Share
Retail distribution	1	1.4	Renting of machinery etc	69	1.0
Soft drinks and mineral waters	11	1.2			
Public administration and defence	33	1.0			
Owning and dealing in real estate	315	1.0			
Source: Cambridge Econometrics					

3.44 In addition an analysis of effects not relating directly to the supply and demand structure of air transport were identified using an analysis of location quotients over time in the districts around Stansted. This identified three additional sectors to be taken forward to the next stage of the process:

✈ electronics;
✈ electrical engineering;
✈ pharmaceuticals.

3.45 The modelling then moves on to examine the link between the existence of an airport, using total passengers as proxy variable, and the relative employment concentration, using location quotients, of these sectors across the South East. This analysis then produced a shorter list of sectors that would be used at the full modelling stage. These sectors were then further investigated to identify the primary airport activity driver most suitable for projecting change in employment. These were derived statistically from relationships in the data, rather than through inferred causality. These sectors are shown in **Table 3.9**.

Table 3.9: Selected Sectors and Airport Influence	
Sector	**Air Traffic Indicator(s)**
Pharmaceuticals	International no frills and International conventional
Electronics	Total passengers
Electrical engineering	Total passengers
Aerospace	Total no frills and Freight
Retailing	Total passengers
Wholesale distribution	Freight
Hotels and catering	International conventional
Air transport	Total passengers
Other transport services	Total passengers
Communications	Freight
Banking and finance	International conventional
Professional services	International conventional
Computing services	Total passengers
Other business services	Total conventional
Source: Cambridge Econometrics	

3.46 Employment in each of these sectors is then estimated using the econometric model outlined below:

$$EMP_{i,j,t} = f(PopD_{i,t}, AirD_{j,t}, Road_{i,t}, Rail_{i,t}, Port_{i,t}, Trend_t) + u_t$$

Where:

✈ $EMP_{i,j,t}$ is head count employment by district i, sector j, in time t;
✈ $PopD_{i,t}$ is population density by district i in time t;
✈ $AirD_{j,t}$ is a combined variable including $Air_{a,t}$ air traffic by airport a in time t, using the airport driver identified in the Table above dependent on sector, and $Def_{a,i}$ a distance deflator by district i;
✈ $Road_i$ is a dummy variable for the presence of a major road by district i;
✈ $Rail_i$ is a dummy variable for the presence of train stations by district i;
✈ $Port_i$ is a dummy variable for the presence of passenger or container ports by district i;
✈ Trend is a linear time trend;
✈ u_t is an error term in the regression to allow for unexpected changes to employment.

3.47 The results of this analysis are shown in **Table 3.10**. This Table shows the projected growth in indirect jobs above the maximum use scenario between 2001 and 2021.

Table 3.10: Growth in Indirect Jobs Supported by Stansted Airport 2001 to 2021		
	Core Area	**East of England**
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2016	633	3,292
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2020	770	3,707
Stansted New Runway in 2011/12 and Heathrow Short Runway in 2026	796	3,837
Stansted New Runway in 2011/12 and Gatwick Short Runway in 2024	786	3,708
Stansted New Runway in 2011/12	818	3,880
Source: Cambridge Econometrics		

2004 Halcrow/PACEC Report

3.48 The Halcrow Report on the employment and housing impact of Stansted Airport report has been produced as part of the same exercise as the Cambridge Econometrics work described above. The methodology used is, however, quite different focussing on a more conventional 'bottom up' approach to the estimation of the employment impacts.

3.49 Similarly to the other work described within this report, Halcrow starts out by defining the study area for employment impact surrounding the Airport and once again this is split in to a core and outer area. The districts within these areas are shown in **Table 3.11**.

Table 3.11: The Stansted Employment Catchment Area	
Core Area	Uttlesford East Herts. Braintree Harlow
Outer Area	Chelmsford Colchester Basildon Epping Forest Cambridge South Cambs. St Edmundsbury
Source: Halcrow	

3.50 It should be noted that while the core area is the same as that identified by Buchanan and Cambridge Econometrics, there are some differences in the Outer Area. This is most extreme when compared to the Cambridge Econometrics work that uses the whole East of England region as the outer area, while, compared to the Buchanan's work, Basildon has been added.

3.51 There are also some differences with the area defined in the SERAS consultation, here Braintree and Harlow were included in the Outer Area and Enfield and Great Yarmouth included where they are not here.

3.52 The overall effect is that estimates for employment within the Halcrow report will be directly comparable with both Cambridge Econometrics and Buchanan's in relation to the core area, but the outer areas are not directly comparable.

Analytical Framework

3.53 Halcrow identify an analytical framework for employment with four basic categories of effect:

✈ **Direct employment** – employment directly related to the operation of the airport. Principal airport related activities include: aircraft maintenance, airlines, air traffic control, car parking, car rentals, cleaning, couriers, customs & immigration, freight forwarders, fuel services, ground handling, in-flight catering, passenger handling, restaurants, retail, security.

✈ **Indirect employment** – employment in the chain of suppliers of goods & services to direct business activities, starting with (but not including in the chain) direct organisations.

✈ **Induced employment** – employment generated in the economy of the study area by spending of incomes by direct and indirect employees.

✈ **Catalytic employment** - generated in the economy of the study area by the wider role of the airport in improving the productivity of businesses and in attracting economic activities such as inward investment and inbound tourism. Employment (excluding direct, indirect and induced) which would not exist in the absence of the airport, due to the direct business usage of the airport or due to its use by consumers.

3.54 These categories produce a basic gross effect for the different air traffic scenarios, which is then adjusted by displacement to provide a net employment effect.

Assumptions

3.55 Throughout the Report, Halcrow refer to three assumptions schemes in relation to the derivation of employment demand:

✈ Low – which reflects conservative assumptions of airport employment growth and multipliers;

✈ Central – which reflects Halcrow's 'best' or 'most likely' estimates of airport growth and multipliers;

✈ High – optimistic assumptions of employment growth and multipliers.

3.56 Below we summarise these assumption schemes in relation to each of the elements of the analytical framework.

Direct Employment

3.57 As with most of the other studies this category of effect has been split into on-site and off-site direct employment. We set out the Halcrow assumptions around both of these separately.

3.58 The on-site estimates are based around the head count employment survey undertaken by BAA at Stansted in 2003 that identified 10,025 employees working on site at the Airport. This provides an on-site employment density of 540 direct employees per mppa or 480 employees per million workload units per annum.

3.59 However, the report moves on to note the rapid increases in productivity at Stansted in recent years and examines this issue in further detail to identify the cause of this trend. Halcrow put forward two possible explanations:

✈ the increase in terminal utilisation as the airport grows which will have a knock on effect in terms of reducing employment density as overhead and other staff are covering a great flow of passengers;

✈ the rapid growth in the low fare ('no frills') services at Stansted with their attendant less labour intensive business models.

3.60 This latter explanation is felt to be the most likely and this has led Halcrow to specify an econometric model with varying base employment densities for different activities. This different categories are as follows:

✈ Fixed – 1,020 employees always included;
✈ No Frills – 380 employees per million work load units per year;
✈ Other Passengers – 740 employees per million work load units per year;
✈ Cargo – 450 employees per million work load units per year.

3.61 These assumptions remain the same in the high and central forecast scenarios but in the low forecast the current employment density across all traffic is used (480 employees per million work load units per year).

3.62 In terms of off-site employment, Halcrow has undertaken some survey work that has identified that currently off-site employment is low. Therefore they assume that Stansted will a single runway will probably have an additional 1% direct employment off-site. However, the addition of a second runway will increase pressure for space on-site and consequently more employment will be moved off site however this is still assumed to remain relatively low at 5%.

3.63 In terms of productivity growth based on recent experience at the Airport and the evidence submitted to the Heathrow Terminal 5 Inquiry Halcrow have assumed a central assumption of 1.5%. This has been varied by 0.5% in the high (1%) and low (2%) assumption schemes.

Indirect Jobs

3.64 Based on analysis of airport supply chains using the PACEC input-output model, Halcrow has used the following indirect multipliers:

- ✈ Low – 1.21;
- ✈ Central – 1.31;
- ✈ High – 1.62.

3.65 The low and central multipliers are felt to be consistent with previous studies and guidance, but the high multiplier is recognised as being at the high end of the range.

Induced Jobs

3.66 Based on a similar analysis using the PACEC input-output model the following induced multipliers have been assumed:

- ✈ Low – 1.24;
- ✈ Central – 1.27;
- ✈ High – 1.30.

3.67 These are felt to be consistent with assumptions made by BAA in their Environmental Statement on Stansted and with the SERAS study.

Catalytic Employment

3.68 Halcrow starts out by noting that effective quantification of catalytic benefits resulting from airport expansion is not possible and that past attempts have often been widely discredited. This element is not, therefore, included in the Central and Low estimates of employment growth supported by Stansted. However, in response from a request from the Steering Group, this category has been included within the high assumption set for employment growth. These assumptions assume the same multipliers as derived by Buchanan in relation to Package 2 (1 runway) and Package 7 (2 Runways). This implies a range of between 38 employees per mwlu while capacity at the Airport is below 35 mwlu per annum, growing in a linear fashion to 250 employees per mwlu at over 82 mwlu per annum.

Displacement and Location of Airport Jobs

3.69 Once the gross employment numbers are estimated through this method two adjustments are made:

✈ the effect of displacement on labour demand – in the central assumption scheme this set at 5%. This is varied by 5% for the low (0%) and high (10%) assumption schemes;

✈ the allocation of jobs to geographical areas – this done on the basis outlined in **Table 3.12**. These estimates are drawn from the PACEC Local Area Supply-Demand Model based on National Input-Output tables and local employment data.

Table 3.12: Location of Net Airport Jobs			
	Core	**Outer**	**External**
Direct on-site	100%		
Direct off-site	100%		
Indirect	39%	25%	36%
Induced	35%	22%	43%
Catalytic	30%	70%	
Source: Halcrow			

Employment Estimates

3.70 Based on the assumptions above Halcrow have produced the following estimates based on the traffic scenarios discussed in Section 2. The gross estimates of employment in 2003 and 2021 are outlined in **Tables 3.13 and 3.14**.

Table 3.13: Gross Airport Related Employment in 2003 (000s)					
	Core	**Outer**	**External**	**Catchment**	**East of England**
Direct on-site	10.0	0.0	0.0	10.0	10.0
Direct off-site	0.1	0.0	0.0	0.1	0.1
Indirect	1.3	0.8	1.2	2.1	3.3
Induced	1.3	0.8	1.6	2.1	3.7
Catalytic	0.0	0.0	0.0	0.0	0.0
Gross Total	12.7	1.6	2.8	14.3	17.1
Source: Halcrow					

Table 3.14: Gross Airport Related Jobs in 2021 in East of England (000s)							
	Reference			Heathrow Delay	Maximum Capacity	High No Frills	Base Case
Assumption Set	Central	Low	High	Central	Central	Central	Central
Direct on-site	31.9	24.2	35.2	33.4	33.4	29.5	17.0
Direct off-site	1.6	1.2	3.5	1.7	1.7	1.5	0.2
Indirect	10.4	5.3	24.0	10.9	10.9	9.6	5.3
Induced	11.9	7.4	18.8	12.4	12.4	10.9	6.1
Catalytic	0.0	0.0	16.7	0.0	0.0	0.0	0.0
Gross Total	55.8	38.1	98.4	58.3	58.3	51.5	28.6
Source: Halcrow							

3.71 **Tables 3.15 and 3.16** move on to outline the net projections of employment in 2021, allocated to geographic areas for the Base Case (1 runway) and Reference Case (Central Assumptions). These are then adjusted by the Displacement to provide net estimates.

Table 3.15: Gross Airport Related Employment in 2021 (000s) Base Case					
	Core	**Outer**	**External**	**Catchment**	**East of England**
Direct on-site	17.0	0.0	0.0	17.0	17.0
Direct off-site	0.2	0.0	0.0	0.2	0.2
Indirect	2.1	1.3	1.9	3.4	5.3
Induced	2.1	1.3	2.6	3.5	6.1
Catalytic	0.0	0.0	0.0	0.0	0.0
Gross Total	**21.4**	**2.7**	**4.5**	**24.1**	**28.6**
Net Total	**20.3**	**2.5**	**4.3**	**22.9**	**27.2**
Source: Halcrow					

Table 3.15: Gross Airport Related Employment in 2021 (000s) Reference Case					
	Core	**Outer**	**External**	**Catchment**	**East of England**
Direct on-site	31.9	0.0	0.0	31.9	31.9
Direct off-site	1.6	0.0	0.0	1.6	1.6
Indirect	4.1	2.6	3.7	6.7	10.4
Induced	4.2	2.6	5.1	6.8	11.9
Catalytic	0.0	0.0	0.0	0.0	0.0
Gross Total	**41.7**	**5.2**	**8.8**	**46.9**	**55.8**
Net Total	**39.7**	**4.9**	**8.4**	**44.6**	**53.0**
Source: Halcrow					

Summary

3.72 In **Table 3.18**, we summarise the employment forecasts used in each of the studies.

3.73 The White Paper did not present updated the employment estimates over and above those made at the time of the SERAS Consultation. The Buchanan estimates, although based on SERAS work, started from a later base year (2001) for actual employment at Stansted and thus reflected the lower jobs per mppa density as a result of the rapid growth to 'no frills' services.

3.74 The Buchanan figures are largely non-comparable with those contained in SERAS as they include estimates of catalytic impact, which were excluded from the SERAS work. Despite the inclusion of catalytic impact, their employment estimates are generally lower than those carried out within the SERAS exercise.

3.75 In the Cambridge Econometrics work, more recent on-site employment information from BAA has been used relating to 2003. These confirm the continuation of high industry productivity growth. Given the downward pressure on costs in the airline industry, it seems reasonable to assume high rates of productivity growth will continue and the performance of Stansted appears more likely to converge to the productivity growth rates seen at Heathrow and Gatwick over the longer rather than the shorter term, particularly given the revised passenger traffic mix within the White Paper.

3.76 The Halcrow work starts from the same basis of on-site employment as the Cambridge Econometrics work but there are variances in the base employment densities assumed, the treatment of direct off-site employment and in the on-site productivity assumptions that drive the direct employment models. However, the estimation of indirect effects uses a quite different methodology and need to be examined with this in mind.

3.77 While the methodology is similar to that employed by Buchanan, save for the estimation of catalytic effects, the results are starting from different bases and consequently are not strictly comparable.

						Passenger Forecasts							Employment Forecasts						
Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators	Freight Forecast 2030 (million tonnes)	Baseline	2015	2021	2030	2036	Core Assumptions	Implications
Maximum Use of Single Runway	SERAS		2	35mppa	23		26			The majority of Stansted's traffic is projected to be on conventional short haul scheduled services, with only 8% of passengers using long haul services and 23% on 'no frills' services.	1.6-2.3	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a **Total: 10,100**	Direct: 15,300 Indirect: 4,600 Induced: n/a Catalytic: n/a **Total: 19,900**		Direct: 14,000 Indirect: 4,200 Induced: n/a Catalytic: n/a **Total: 18,200**		Initial Employment Density: 816 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.3 Induced - 0 Catalytic - n/a Other: One job is supported by 115 tonnes of Freight or 240 tonnes of mail	In employment terms the SERAS work was undertaken at a time when Stansted was yet to go through the very levels of productivity growth experienced in the last 4 to 5 years, consequently the starting employment density is considerably higher than that in the other studies. When this is combined with a low assumption regarding productivity growth, this is likely to produce relatively high estimates for direct employment. The study also assumes a relatively high indirect multiplier compared to some of the other studies, which will again produce higher estimates in this area. Where the methodology is substantially different is in the treatment of induced and catalytic, neither of which are estimated under SERAS. This will produce some differential compared to other studies which attempt to quantify these effects.
	Buchanan Study	Maximum Use 1	2	25mppa by 2026 growing to 35mppa		23	35		2036	Stated as based on SERAS projections.	No explicit account taken of air freight projections	2001 Direct: 10,300 Indirect: 720 Induced: 2,200 Catalytic: 300 **Total: 13,500**		Direct: 11,600 Indirect & Induced: 1,800 Catalytic: 300 **Total: 13,700**	Direct: 14,200 Indirect & Induced: 2,300 Catalytic: 600 **Total: 17,090**		Initial Employment Density: 756 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 0.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants Catalytic - 30 jobs per mppa in 2021, 37.6 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15 Displacement: 5% to 2031, then 10% in 2036	The Buchanan's study was undertaken using a 2001 base for employment, which shows a substantially lower initial employment density, reflecting the rapid growth at the airport, particularly in 'no frills' services. This will tend to produce lower estimates of direct employment compared SERAS, particularly as productivity is assumed to grow at the same rate. In terms of the other effects, Buchanan assumes a much lower indirect multiplier but this is counterbalanced by the inclusion within the estimates of both induced and catalytic effects.
		Maximum Use 2	2	40mppa by 2021		40	40		2021	Used to test the implications of Stansted's growth accelerating to take up full theoretical runway capacity with substantial growth in average aircraft size (implying more long haul services).		2001 Direct: 10,300 Indirect: 720 Induced: 2,200 Catalytic: 300 **Total: 13,500**		Direct: 20,516 Indirect & Induced: 2,300 Catalytic: 1,600 **Total: 24,500**	Direct: 16,500 Indirect & Induced: 2,000 Catalytic: 2,000 **Total: 20,500**		Initial Employment Density: 756 jobs per million passengers per annum Productivity Growth: 1.5% Multipliers: Indirect - 1.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants Catalytic - 30 jobs per mppa in 2021, 37.6 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15 Displacement: 5% to 2031, then 10% in 2036	Higher passenger forecasts lead to higher employment forecasts. Greater levels of long haul traffic are assumed to generate more catalytic employment.
	White Paper		2	35 mppa	33		36			50% of Stansted's passengers at 2030 (more at 2015) are projected to be using 'no frills' services, with 27% on long haul flights as the local catchment area is now expected to support a range of leisure oriented scheduled services in any event.	No new forecasts - SERAS presumed	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a **Total: 10,100**	Direct: 15,300 Indirect: 4,600 Induced: n/a Catalytic: n/a **Total: 19,900**		Direct: 14,000 Indirect: 4,200 Induced: n/a Catalytic: n/a **Total: 18,200**		No revised employment estimates produced - see SERAS above	See SERAS
	CEC		2	35mppa	33	36	36		2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76	2005 Direct: East of England 9,800 Core Area 7,200 Indirect effects largely subsumed within wider economy		Direct: East of England 10,153 Core Area 7,400 Indirect effects largely subsumed within wider economy			Initial Employment Density: 474 jobs per million workload units per annum Productivity Growth: 2.8-1.6% trending down towards long run 3.5% at Gatwick and Heathrow. Analysis of indirect employment through econometric modelling of employment links with key sectors.	The CEC estimates are based on the 2003 employment headcount adjusted for recent changes at the Airport and projected forward to 2005. This even more recent figure has a much lower employment density again representing growth in traffic, the rise of 'no frills' traffic and cost cutting amongst full service airlines and others. This work also assumes a higher productivity growth rate over the period reflecting a more gradual slowing down in productivity gains following the rapid growth of recent years. These two assumptions combined produce substantially lower estimates of direct employment than either SERAS or Buchanan. The estimates for indirect effects are calculated completely differently to the other studies and hence it is not possible to comment on the resultant likely impact on estimates. The report concentrates on presenting net differences between this and the two runway scenarios.
	Halcrow/ PACEC		2	35 mppa		36	37		2019	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	0.76	2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**		Study Area Direct 17,200 Indirect 3,400 Induced 3,500 **Gross Total 24,100** **Net Total 22,900**			Initial Employment Density: 380 to 740 jobs per million workload units per annum + 1,020 fixed Productivity Growth: 1.5% Multipliers: Indirect - Low 1.21 Central 1.31 High 1.62 Induced - Low 1.24 Central 1.27 High 1.30 Catalytic - high estimates only - 38 employees per mwlu while capacity at the Airport is below 35 mwlu per annum, growing in a linear fashion to 250 employees per mwlu at over 82 mwlu per annum Displacement: Low 0% Central 5% High 10%	The Halcrow report, similarly to CEC, starts from the 2003 headcount basis. However, different densities are assumed for different traffic types. Overall, in most cases, this density works out slightly higher and will therefore lead to higher estimates of employment. Direct off site activity is also treated differently with 5% allowance assumed compared to around 1% for the CEC work. The work also has a lower productivity assumption which will lead to higher estimates in the longer term. It is difficult to compare the Halcrow assumptions for wider effects with CEC as the methodologies are fundamentally different. However, compared to Buchanan's work it is noticeable that the indirect multiplier is substantially higher but that the treatment of catalytic effects is quite different, with Halcrow not attempting estimate the effect in most scenarios.

Table 3.18: Summary Comparison of Air Traffic and Employment Forecasts used to estimate employment and housing impacts of the development of Stansted Airport

GO- E Audit of Stansted Growth Assumptions

Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts 2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators	Freight Forecast 2030 (million tonnes)	Baseline	Employment Forecasts 2015	2021	2030	2036	Core Assumptions	Implications
Two Runways	SERAS	Mid-point		82mppa	64		74			Traffic at Stansted 'seeded' on the assumption that 40% of Heathrow's long haul network (17mppa) would relocate to Stansted to establish a second hub. One third of passengers would be transferring at the new hub airport and by 2030 up to 46% of the Airport's passengers are projected to be on conventional long haul scheduled services, with only 8% on 'no frills' services.	1.9-4.1 with additional runways quoted in the SERAS reports. 2.2-2.8 million with an additional runway at Stansted and one at Heathrow in 2020 according to Halcrow.	1998 Direct: 7,700 Indirect: 2,300 Induced: 720 Catalytic: n/a **Total: 10,100**	Direct: 46,000 Indirect: 13,800 Induced: n/a Catalytic: n/a **Total: 59,800**		Direct: 43,500 Indirect: 13,100 Induced: n/a Catalytic: n/a **Total: 56,600**		Initial Employment Density: 816 jobs per million passengers per annum. Productivity Growth: 1.5%. Multipliers: Indirect - 0.3, Induced - n/a, Catalytic - n/a. Other: One job is supported by 115 tonnes of Freight or 240 tonnes of mail	In employment terms the SERAS work was undertaken at a time when Stansted was yet to go through the very levels of productivity growth experienced in the last 4 to 5 years, consequently the starting employment density is considerably higher than that in the other studies. When this is combined with a low assumption regarding productivity growth, this is likely to produce relatively high estimates for direct employment. The study also assumes a relatively high indirect multiplier compared to some of the other studies, which will again produce higher estimates in this area. Where the methodology is substantially different in the treatment of induced and catalytic, neither of which are estimated under SERAS. This will produce some differential compared to other studies.
		Low Cases					71			Stansted forecasts tend to be lower if the runway there is combined with one or more additional runways at Gatwick.								
		High Cases						78		Stansted forecasts tend to be higher when combined with Heathrow options or delivered earlier.								
	Buchanan Study	Stansted 2nd Runway	7	81-82mppa		69		82	2036	Stated as based on SERAS.	No explicit account taken of air freight projections	2001 Direct: 10,300 Indirect & Induced: 6,500 Induced: 2,200 Catalytic: 300 **Total: 13,500**		Direct: 36,200 Indirect & Induced: 6,500 Catalytic: 6,300 **Total: 48,900**	Direct: 34,300 Indirect & Induced: 6,900 Catalytic: 9,300 **Total: 50,508**		Initial Employment Density: 756 jobs per million passengers per annum. Productivity Growth: 1.5%. Multipliers: Indirect - 0.06 up to 30 mppa, 1.08 up to 70 mppa, 1.1 at levels above 70 mppa. Induced - 1.24 plus an additional 0.1 jobs per person in public services for additional migrants. Catalytic - 160 jobs per mppa in 2021, 200 jobs per mppa in 2036 for Direct Effect. Indirect Catalytic of 0.15. Displacement: 15%	The Buchanan's study was undertaken using a 2001 base for employment, which shows a substantially lower initial employment density, reflecting the rapid growth at the airport, particularly in low fares services. This will tend to produce lower estimates of direct employment compared SERAS, particularly as productivity is assumed to grow at the same rate. In terms of the other effects, Buchanan assumes a much lower indirect multiplier but this is counteracted by the inclusion within the estimates of both induced and catalytic effects.
	White Paper	Stansted 2nd Runway Only	7	81-82mppa	57		73			40% of Stansted's passengers at 2030 are projected to be using 'no frills' services and 23% on long haul services.	No new forecasts - SERAS presumed	1998 Direct: 7,700 Indirect: 2,300 Induced: n/a Catalytic: n/a **Total: 10,100**	Direct: 46,000 Indirect: 13,800 Induced: n/a Catalytic: n/a **Total: 59,800**		Direct: 43,500 Indirect: 13,100 Induced: n/a Catalytic: n/a **Total: 56,600**		No revised employment estimates produced -see SERAS above	See SERAS
		Stansted 2nd Runway + Heathrow Short Runway at 2020	12s1		57		70			45% of passengers at 2030 are projected to be using 'no frills' services and 23% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.								
		Stansted 2nd Runway + Heathrow Short Runway at 2016	12s2		57		70			48% of passengers at 2030 are projected to be using 'no frills' services and 21% long haul services as the Airport receives less short haul scheduled traffic spilled from Heathrow.								
		Stansted 2nd Runway + Gatwick Wide-spaced Runway at 2024	13		57		69			47% of passengers at 2030 are projected to be using 'no frills' services and 19% long haul services as the Airport competes with Gatwick for leisure oriented markets.								
	CEC	Stansted 2nd Runway + Heathrow at 2016	12s2	81-82mppa	57	60	70		2039	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48	2005 Direct: East of England 9,800 Core Area 7,200. Indirect effects subsumed within wider economy		East of England Direct: 16,800 Indirect: 3,300. Core Area Direct: 12,300 Indirect: 600			Initial Employment Density: 474 jobs per million workload units per annum. Productivity Growth: 2.8-1.6% trending down towards long run 3.5% at Gatwick and Heathrow. Analysis of indirect employment through econometric modelling of employment links with key sectors.	The CEC estimates are based on the 2003 employment headcount adjusted for recent changes at the Airport and projected forward to 2005. This even more recent figure has a much lower employment density again representing growth in traffic, the rise of low cost and cost cutting amongst full service airlines and others. This work also assumes a higher productivity growth rate over the period reflecting a more gradual slowing down in productivity following the rapid growth of recent years. These two assumptions combined produce substantially lower estimates of direct employment than either SERAS or Buchanan. It should also be noted that the CEC estimates assume substantial leakage of direct effects outside of the Region. This further impacts on the lower estimates of employment. The estimates for indirect effects are calculated completely differently to the other studies and hence it is not possible to comment on the resultant likely impact on estimates. Generally levels of additional indirect (including catalytic) employment under the various scenarios show very low additionality as a consequence of Stansted's growth.
		Stansted 2nd Runway + Heathrow 2020	12s1		57	67	70		2039		1.48	2005 Direct: East of England 9,800 Core Area 7,200. Indirect effects subsumed within wider economy		East of England Direct: 15,600 Indirect: 3,700. Core Area Direct: 13,600 Indirect: 800				
		Stansted 2nd Runway + Heathrow 2026	12s extra		57	68	72		2038	44% of passengers at 2030 are projected to be using 'no frills' services and 22% long haul services as the Airport receives more short haul scheduled traffic spilled from Heathrow due to the runway there being delayed.	1.48	2005 Direct: East of England 9,800 Core Area 7,200. Indirect effects subsumed within wider economy		East of England Direct: 18,800 Indirect: 3,800. Core Area Direct: 13,700 Indirect: 800				
		Stansted 2nd Runway + Gatwick 2024	13		57	67	69		2041	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.44	2005 Direct: East of England 9,800 Core Area 7,200. Indirect effects subsumed within wider economy		East of England Direct: 18,700 Indirect: 3,700. Core Area Direct: 13,700 Indirect: 800				
		Stansted 2nd Runway Only	7		57	67	73		2037	As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48	2005 Direct: East of England 9,800 Core Area 7,200. Indirect effects subsumed within wider economy		East of England Direct: 19,200 Indirect: 3,900. Core Area Direct: 14,000 Indirect: 800				

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Stansted Runways	Study or Report	Scenario	SERAS Package	Capacity	Passenger Forecasts						Freight Forecast 2030 (million tonnes)	Employment Forecasts						Implications
					2015	2021	2030	2036	Year Full Capacity Reached	Traffic Mix Indicators		Baseline	2015	2021	2030	2036	Core Assumptions	
Two Runways	**Halcrow/ PACEC**	Reference Case	12s1	81-82mppa		67		78		As White Paper. Direct Employment estimates use workload units combining passenger and freight figures.	1.48 (1.76 in 2036)	2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**	East of England Direct 33,500 Indirect 10,400 Induced 11,900 **Gross 55,800** Study Area Direct 33,500 Indirect 6,700 Induced 6,800 **Gross Total 46,900 Net Total 44,600**					Initial Employment Density: 380 to 740 jobs per million workload units per annum + 1,020 fixed Productivity Growth: 1.5% Multipliers: Indirect - Low 1.21 Central 1.31 High 1.62 Induced - Low 1.24 Central 1.27 High 1.30 Catalytic - High Estimates only - 38 employees per mwlu while capacity at the Airport is below 35 mwlu per annum, growing in a linear fashion to 250 employees per mwlu at over 82 mwlu per annum Displacement: Low 0% Central 5% High 10%	The Halcrow report, similarly to CEC starts from the 2003 headcount basis. However, different densities are assumed for different traffic types. Overall, in most cases, this density works out slightly higher and will therefore lead to higher estimates of employment. Direct off site activity is also treated differently with 5% allowance assumed compared to around 1% for the CEC work. The work also has a lower productivity assumption which will lead to higher estimates in the longer term.
		Heathrow Delay	7			67		79				2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**	East of England Direct 35,100 Indirect 10,900 Induced 12,400 **Gross Total 58,300**						
		Maximum Use of 2 Runways	7 extrapolated			68		82	2036	Forecasts extrapolated from White Paper Forecasts.		2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**	East of England Direct 35,100 Indirect 10,900 Induced 12,400 **Gross Total 58,300**						It is difficult to compare the Halcrow assumptions for wider effects with CEC as the methodologies are fundamentally different. However, compared to Buchanan's work it is noticeable that the indirect multiplier is substantially higher but that the treatment of catalytic effects is quite different, with Halcrow not attempting estimate the effect in most scenarios. Halcrow test a number of high and low multipliers for indirect and induced employment to test the sensitivity of their results to these assumptions as well as including some judgemental estimate of catalytic employment within their 'high' employment scenario.
		High No Frills	Overall Forecast as 12s! With higher no frills percentage			67		78		Proportion of no frills passengers increased from 40 to 60% of Stansted's traffic in 2030, with other passenger types reduced proportionately.		2003 Study Area Direct 10,100 Indirect 2,100 Induced 2,100 **Total 14,300**	East of England Direct 31,000 Indirect 9,600 Induced 10,900 **Gross Total 51,500**						