

Second Edition February 2003

The Future Development of
Air Transport in the
United Kingdom: South East

A National Consultation



SOUTH EAST

Second Edition February 2003





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The Future Development of Air Transport in the United Kingdom

South East Consultation Document Second Edition

February 2003

Department for Transport

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Introduction to the Second Edition

Last year the Government published a series of consultation documents seeking views on the future development of air transport in the UK. One of the consultation documents covered the South East of England. In November, the High Court held that it was wrong to exclude from that consultation document options for development of new runways at Gatwick. The Government decided not to appeal the judgment and accordingly is publishing this second edition of the consultation document covering the South East of England.

The structure and most of the content of this consultation document (and the separate summary of it) are essentially the same as the version published last year. The main difference is the inclusion of options for new runways at Gatwick. Information about these options is contained in **Chapter 8**, and there are a number of other, consequential, amendments elsewhere in the document, notably in **Chapter 14** which compares different possible combinations of airport development in the South East.

We have taken the opportunity of a second edition to correct some small typographical errors. Where it has become evident that clarification would be helpful we have expanded the earlier text. Finally, where things said in the July 2002 text have been overtaken by events since then, we have mentioned this in a footnote.

To help readers identify new text (including footnotes) this is in magenta type. Text in the July version of the document that has been deleted has been moved to **Annex J**.

The consultation period, which had been due to end on 30 November 2002, was extended. **The closing date for responses will now be 30 June 2003.**

The consultation remains open across the UK. Consultees may offer views on this South East document and any or all of the six other consultation documents.

All the representations received so far will be considered together with any responses that are submitted before the new closing date. Anyone who has already responded may, if they wish, add to, replace or amend their earlier response(s).

This is an open consultation. No decisions have been taken. Anyone in the country can express their views on the options put forward in the consultation documents, but it is also open to anyone to submit alternative ideas; several new proposals have already been put forward. We will consider all consultation responses.

Department for Transport
February 2003

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Foreword

Over the last 50 years we have seen a dramatic increase in the amount of air travel across the world. In the UK many more people now fly to holiday destinations or to visit friends and family. Good air links are extremely important to UK businesses, providing access to new markets, as well as bringing investment to the UK. Air transport links are therefore essential to our overall transport network.

We are entering a crucial period for the future of air transport. Demand for air travel is continuing to grow. At the same time, many of the UK's major airports are reaching their capacity limits. We therefore face many difficult issues associated with the growth of aviation.

We need to ensure that, as a country, and as individual consumers, we are getting the most from our aviation services and that the future of the aviation industry is a sustainable one. Aviation has great economic, social and environmental relevance in the UK. We need a long term framework that will maximise the beneficial aspects of aviation and minimise the negative effects.

We intend to set this out in a White Paper on air transport, which will bring together our UK airports policy and new policies on civil aviation. In advance of the White Paper and in order to inform our conclusions, we are now publishing a set of seven consultation documents on regional air services and airports, between them covering the whole of the UK, of which this is one.

These documents describe the anticipated demand for air travel, the possible implications of that for air services and new airport infrastructure, and the potential impacts – economic, environmental and social – of such infrastructure. We have also examined a range of related issues, some of them relevant to the whole of the UK, others to specific parts of the country.

This is an important step in the development of our future air transport policy. We hope that you will take this opportunity to examine the issues facing the future development of the industry, and will give us your views. Your response can help shape the new White Paper on air transport.

Department for Transport

February 2003

CHAPTER 1

Executive summary

This chapter summarises the Government's objectives for its consultation on new airport capacity for the next 30 years. The Government welcomes your views on three key questions: how much demand for air travel should be met, where to locate any new airport capacity, and how to manage the environmental impacts of any airport growth. The chapter goes on to outline how the document has been structured to help address these key issues.

*The questions that we would like consultees to answer are set out in **Annex A**.*

A sustainable airports policy

- 1.1 The Government is committed to ensuring that the long-term development of aviation is sustainable. This will mean striking a balance between the social and economic benefits of air travel and the environmental effects of any development. The Government believes that, in principle, its policy for airports in the South East should aim both to maximise the significant social and economic benefits that growth in aviation would bring whilst trying to minimise the environmental impacts. However, the Government wants to consider the responses to this consultation *before* coming to a view on how to strike the right balance.
- 1.2 The purpose of this consultation is to set out our appraisal of both the benefits and the disbenefits of the options for additional airport capacity, and to seek views on those options in the light of this information. Your responses will help the Government decide how much weight to give to the various factors that will determine the final decisions on airport capacity.
- 1.3 In the South East consultation, we are seeking your views on the following three questions:
 - should new airport capacity be provided in the South East over the next 30 years and, if so, how much? A particular issue is whether there is a case for having at least one major hub airport.
 - where should any additional runway capacity be provided? A particular issue is whether or not Heathrow should be developed further.
 - what controls, mitigation measures and compensation should be put in place to limit and manage the adverse impacts of any additional airport development on people and on the natural and built environment?

- 1.4 We have not taken any decisions on the solutions to these issues. This consultation invites you to comment on the arguments for and against providing different amounts of new airport capacity at different locations. Your comments will be used to help the Government take decisions in the White Paper.
- 1.5 The Government wishes to set out in the White Paper its policy about where it would be willing to contemplate new airport/runway provision over the next 30 years. Implementation will be a matter for private sector investment and will remain subject to the land use planning system.
- 1.6 This document is divided into three sections.

Section 1 – How much capacity should be provided?

- 1.7 **Chapter 3** explains the benefits of aviation to the UK and sets out arguments for meeting demand for air travel in the South East: the large economic benefits; generating tens of thousands of jobs; enabling more people to fly from their preferred airport and more cheaply; maintaining the UK's competitive position; maintaining strong and diverse route networks.
- 1.8 After describing the pressures on South East airports today and the strategies that our European competitors are already implementing, **Chapter 4** considers the benefits to passengers and airlines of hub airports: the ability to attract connecting passengers who make it viable for airlines to serve more routes and provide more frequent services, both of which benefit UK travellers and the UK economy. There is sufficient demand for air travel in the UK, and particularly London, to support at least one large airport.
- 1.9 Key to the issue of a hub in the South East is whether to build a third runway at Heathrow, or to consider an alternative location or to develop Heathrow and a second hub airport. Heathrow is an important national asset. It is the UK's premier airport and any decision on new airport capacity in the South East must address the future of the airport. The demand for Heathrow is by far the greatest of all the airports considered in SERAS and it offers a large route network and high frequency of services.
- 1.10 The Government recognises that the environmental impacts of a third runway at Heathrow, particularly noise and air quality, would be significant and that even with concerted effort by the industry to minimise environmental impacts, it might be difficult to make them acceptable.
- 1.11 **Chapter 5** sets out the Government's forecasts of the demand for air travel up to 2030. These forecasts are of *unconstrained* demand, i.e. they assume no airport capacity constraints. The headline figures are for a national demand of about 500 million passengers per annum (mppa) with about 300mppa in the South East. The Government's policy that

aviation should meet its external costs will tend to push up airline costs, and hence fares.[†] The most significant effect will come from aviation covering the costs of its contribution to global warming. We estimate that this, if considered in isolation, might reduce demand by about 10 per cent. However, other recent developments – since the Department's forecasts were prepared – have tended to reduce airline costs. In particular, the rapid growth of low cost airlines and the emerging competitive response from other airlines might cause demand to rise by at least as much.

Section 2 – Where to provide any extra capacity?

- 1.12 **Chapter 6** introduces the options for airport development and explains in outline how each option was appraised in the SERAS study. **Chapters 7-11** describe options at the four main airports in the South East (Heathrow, Gatwick, Stansted and Luton) as well as a possible new site at Cliffe in North Kent and sets out the appraisal results. **Chapter 12** considers the role of smaller South East airports and an option for the development of a new airport, primarily for freight, at Alconbury near Huntingdon.
- 1.13 **Chapter 13** covers issues relating to air freight.
- 1.14 **Chapter 14** puts forward combinations of possible airport development ranging from no new runways to those with one, two, three or four new runways.
- 1.15 The Government proposes that maximum use should be made of the existing number of runways. In addition to plans already agreed for Heathrow and Gatwick, this could mean additional terminal capacity and a longer runway at Luton (as well as a parallel taxiway); Stansted would require extra terminal capacity. In practice, given the lead time for constructing new runways, this is the only way new capacity could become available for about a decade after the White Paper.
- 1.16 The Government does not at this stage wish to express any preference for the location of new runway capacity. Decisions about how much new airport capacity to provide and where will be made in the light of this consultation and set out in the forthcoming White Paper.
- 1.17 Historically, passengers and airlines have shown a preference for Heathrow. The excess of demand over supply there means that financing a new runway at Heathrow should not present a serious problem. The same is likely to apply to development of a single new runway at Gatwick, the airport with the second largest catchment in the South East. However, it would be more difficult to make Gatwick a major hub airport. **Chapter 15** considers funding issues and suggests that the Government would need to take positive action to create the circumstances in which new capacity at either Stansted or Cliffe could be commercially viable. There is also a brief commentary on the important issue of slot allocation and the UK's desire to press for reform of the current EU rules.

[†] In the Pre-Budget Report, *Steering a steady course: Delivering stability, enterprise and fairness in an uncertain world*, published in November 2002, the Chancellor of the Exchequer announced a commitment to discuss with stakeholders the potential for using economic instruments to ensure that the aviation industry takes more account of its environmental impact and to help deliver a more sustainable aviation sector. A paper on this issue is being published on the Treasury and DfT departmental websites.

Section 3 – Managing the impacts of airport growth

- 1.18 **Chapter 16** considers the national and international context in which action would be taken to address environmental concerns. The key impacts of daytime noise and local air quality are considered in detail and proposals are put forward for how they might be managed to provide a fair balance between the operation of airports and the lives of those who live around them.
- 1.19 On air quality, the chapter notes that mandatory EU limits for nitrogen dioxide (NO₂) will apply from 2010. The modelling of airport options in SERAS has pointed to a serious problem at Heathrow, particularly with the addition of a third runway, that would only be removed through concerted action by the aviation industry. There is, however, uncertainty over the modelling results.
- 1.20 In respect of noise, the chapter considers the scale of the impacts at each of the main airports and suggests the sort of control measures that might be needed. For instance, it is proposed that the noise contour area cap of 145 square kilometres imposed at Heathrow from 2016 as part of the Terminal 5 approval would continue to apply even if a new runway was built. The increase in noise compared to today would be greater at Stansted than Heathrow, although the absolute numbers of people affected are forecast even in the largest Stansted option to be only one tenth of those affected at Heathrow today. The same is true for Cliffe, although the number of people affected would be smaller again than at Stansted. The same principle suggested for Heathrow of imposing a noise contour cap could be applied at Gatwick, Stansted and at Cliffe. The chapter concludes by outlining a range of possible mitigation and compensation measures, including noise insulation, assistance with relocation and monetary compensation.
- 1.21 **Chapter 17** considers how adequate road and rail access to airports would be provided and the basis on which airport operators might contribute to its funding.
- 1.22 **Chapter 18** reports the results of the work in SERAS by the CAA and NATS to estimate the potential impacts of new airport capacity on airspace. The conclusion is that it should be possible to accommodate the increased air traffic envisaged in the combinations of possible airport development.
- 1.23 **Chapter 19** notes the potential effect of prospective and actual airport development on people locally and explains the compensation arrangements currently available.

CHAPTER 2

Introduction

This chapter provides the historical and policy context for this consultation and notes that similar consultations are taking place across the UK. It explains why aviation is important to the UK and why the Government wants to set a long-term framework for airports. Finally, the chapter refers to the SERAS study from which the options in this consultation document and their appraisal have been drawn.

The future of aviation in the UK

- 2.1 In the White Paper, **A New Deal for Transport: Better for Everyone**, published in 1998, the Government announced that it would prepare a UK airports policy looking 30 years ahead and bring forward new policies on civil aviation. The Government intends to publish an air transport White Paper that will provide a policy framework for the long-term future of both aviation and airports in the UK.
- 2.2 We have already consulted on a range of aviation policy issues in our **Future of Aviation** consultation document (Department of Environment, Transport and the Regions, December 2000). We are now consulting on perhaps the most crucial issue: how much extra airport capacity, if any, to plan for over the next 30 years, and where should any new airport capacity be located.
- 2.3 We are tackling this on a UK-wide basis. There are seven sets of consultation documents covering the whole country as shown in **Figure 2.1**. The capacity issues in the South East affect all other parts of the UK.

Figure 2.1: Consultation in the UK



A sustainable airports policy

- 2.4 The Government is committed to ensuring that the long term development of aviation is sustainable. In practice, this will mean striking a balance between the social and economic benefits of air travel and the environmental effects of any developments. The Government believes that, in principle, its policy for airports in the South East should aim both to maximise the significant social and economic benefits that growth in aviation would bring whilst trying to minimise the environmental impacts. However, the Government wants to consider the responses to this consultation before coming to a view on how to strike the right balance.
- 2.5 The purpose of this consultation is to set out our appraisal of both the benefits and the disbenefits of the options for additional airport capacity, and to seek views on those options in the light of this information. Your responses will help the Government decide how much weight to give to the various factors that will determine the final decisions on airport capacity.

Why are we looking 30 years ahead?

- 2.6 Our forecasts tell us that the demand for air travel will rise substantially over the next 30 years. More information about the forecasts is set out in **Chapter 5**.



BA Aviation Picture Library

- 2.7 Development of major transport infrastructure such as airports takes time. In the past, the lack of a coherent long-term framework has hampered development and resulted in protracted and expensive planning inquiries, such as the one for Terminal 5 at Heathrow.
- 2.8 In contrast, our European competitors have built new airport capacity and have strategies for airport development. With the demand for air travel set to increase, if we do not respond our competitors will be well placed to serve that demand.

- 2.9 Heathrow's two runways are already full for most hours of the day and the airport experiences regular delays. Gatwick's single runway is full for most of the day, and Stansted's is coming close to its capacity in peak hours. Against a background of growing demand for air travel, new runway capacity in the South East will be needed soon.
- 2.10 It is less clear how much capacity might be needed over the next 30 years, where any new capacity should be provided or how such developments could be made sustainable.
- 2.11 Quite rightly, people who might be affected by any growth in airports want to understand the implications for them and their local communities, and to have as much assurance as possible for the long-term. A long-term framework will provide greater certainty both about those developments that are likely to happen and those that are not and therefore reduce the anxiety that uncertainty causes.
- 2.12 There is wide acceptance of the view that decisions about major airports have in the past been taken on a piecemeal basis and that difficult issues have not been tackled.



London Luton Airport

Why is aviation important to the UK?

- 2.13 Aviation is a great British success story, and one of the major strengths of the UK economy, both now and for the future.
- 2.14 Flying is today part of the ordinary lives of most people in the UK. In 2001 alone almost 50 per cent of the UK population made at least one journey by air. In London and the South East around 60 per cent of people did so. It seems likely that in the future, people will want to fly more, and expect to be able to fly more, as their prosperity continues to increase.
- 2.15 A large proportion of ordinary British families like to take their summer holidays abroad, and are now able to do so. In the other direction, the UK attracts a large and growing number of tourists from overseas, many of them travelling by air. Inward tourism is worth about £13 billion to the UK each year, 1½ per cent of gross domestic product (GDP).[†]

[†] Figures are for 2000 and do not include fares paid by overseas residents to UK carriers.
Source: Office for National Statistics, International Passenger Survey.

- 2.16 Air travel is also important for our industry and commerce. The UK has for hundreds of years been one of the world's leading international trading nations. In the 21st century, a lot of our exports are high value, low-weight goods which are transported by air. We also gain nearly 8 per cent of our national income from exports of services, not least financial and consultancy services – aviation's contribution in 2000 was worth £7.4 billion. Not just these sectors, but a great many UK businesses, are increasingly international. All this requires more international travel, even though electronic communications can be used for many functions.
- 2.17 All these factors together result in a simple fact: people in the UK fly a lot. For example, the UK accounts for over 40 per cent of all air travel between Europe and the USA. One fifth of all international air passengers in the world begins or ends their journey at a UK airport.
- 2.18 Our airlines and airports are also a major UK success. We have a great many airlines, of many different types, competing vigorously to serve UK consumers. In both long haul and short haul, scheduled and charter, we have many airlines offering a wide range of services to the consumer. The British people are well served by our airlines and airports.



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- 2.19 It is a central economic objective of this Government to achieve high and stable levels of growth and employment so that everybody can share in higher living standards and greater job opportunities. The aviation industry directly employs over 180,000 people in the UK, and, in addition, indirectly supports up to three times that many jobs. Many of these are high quality jobs, highly skilled and well paid. Aviation is itself a high productivity industry and it adds to the productivity of the wider UK economy.

The benefits of hub airports

- 2.20 Airports with substantial capacity can support services to a wider range of destinations and a greater frequency of services than could be supported by local demand alone. This is because major airports attract considerable numbers of passengers connecting from one flight to another, and airlines can therefore operate some routes that would not otherwise be viable at all and to offer more frequent services on routes that are already viable without

connecting traffic. Heathrow's extensive route network is only viable because of the large number of international passengers transferring through the airport (at around 15mppa – almost a quarter of the 2000 total – the most at any airport in the world). As a result, UK travellers and businesses benefit from having direct flights to more destinations and higher frequencies. This is a leading factor in attracting inward investment to the whole of the UK. Regional travellers benefit from having an increased range of destinations served one-stop via a hub.

Why is the Government deciding these issues?

- 2.21 The scale of the challenge facing the UK, and particularly in the South East, is so great and the impacts so wide-ranging that only the Government is able to take the strategic view necessary in setting the policy framework within which specific proposals from the private sector would be taken forward. If the Government does not take the lead, development would be piecemeal and uncoordinated.
- 2.22 The Government's role in relation to aviation is to establish and ensure implementation of an effective national aviation policy. It must do this while also meeting a range of policy and regulatory obligations governed internationally. The White Paper will identify what sort of development is required in the UK and its location, and this will provide the policy framework to underpin such developments and reduce planning risk.
- 2.23 It will still be for the relevant airport developer to carry out project design, to consult with all concerned on the impacts and how to mitigate them, and to seek approval for any projects through the planning system.

Key issues for this consultation

- 2.24 This consultation on South East airports seeks to address three questions:
- Should new airport capacity be provided in the South East over the next 30 years and, if so, how much? A particular issue is whether there is a case for having at least one major hub airport.
 - Where should any new airport capacity be located? A particular issue is whether or not Heathrow should be developed further.
 - What measures would be needed to control and mitigate the environmental impacts of any airport growth?
- 2.25 We have not taken any decisions on the solutions to these issues. This consultation invites you to comment on the arguments for and against providing different amounts of new airport capacity at different locations. Your comments will be used to help the Government take decisions in the White Paper.

- 2.26 The *timing* of any new runways will be a decision for the project promoter and will depend on the commercial case for investment at the time. A key factor will be the actual level of demand. If demand is lower than we forecast, the need for new runways would be delayed. If demand exceeds our expectations new capacity might be needed sooner. To maintain flexibility, if it is decided that new runway capacity might be needed, land for potential additional runways needs to be reserved at suitable sites.

The SERAS Study

- 2.27 To support the production of the new White Paper, the Government commissioned a wide-ranging programme of studies. One of these was the South East and East of England Regional Air Services Study (SERAS)¹. The objectives of SERAS were to give a better understanding of the demand for, and constraints on, airports and air service development in the South East and East of England over the next 30 years, and to consider options for sustainable development of airports and air services.
- 2.28 The study, and in particular the way different options were appraised, is explained in more detail in **Annex B**.
- 2.29 SERAS lasted nearly three years and the full study reports comprise a large number of documents, many of them very long. Given the level of detailed appraisal and the number of options in SERAS, it is possible to include in this consultation document only a summary of the key findings. More details of the appraisal process and how it was applied to the many different options are in the relevant SERAS reports. A full list of reports and how to obtain copies of them is in **Annex C**.

¹ The SERAS study area comprises the three Government Office regions: South East, East of England and London.

SECTION 1

How much capacity should be provided?



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CHAPTER 3

The benefits of growth in air travel

In this chapter we consider the economic and social benefits of air travel and how new airport capacity in the South East could generate greater benefits. It also describes the consequences for the UK of failing to provide more capacity.

Introduction

- 3.1 Aviation today contributes significantly to the national economy and supports several hundred thousand jobs both in the industry itself and in other sectors that rely on air transport, such as tourism. Consumers are enjoying more opportunities to travel than ever before.
- 3.2 As the forecasts set out in **Chapter 5** show, air travel demand will continue to grow. There are strong economic and social arguments for ensuring that aviation continues to flourish throughout the UK, including in the South East. The consequences of failing to develop new airport capacity could, as this chapter illustrates, be significant for UK passengers, the aviation industry and the wider economy. Air fares would be expected to increase where airport capacity supply does not increase in line with demand. As a result, some people might not be able to afford to fly at all, and those who could would have to pay more. More capacity will also both provide employment in the aviation sector itself and support growth in all those areas of the modern economy served directly or indirectly by air travel.
- 3.3 Clearly, expansion of our airports will also have environmental and other consequences. These are addressed in other chapters: **Chapters 7–12** describe possible options for development and their impacts; and **Chapter 16** considers action the Government could take to tackle some of the key environmental impacts.

The case for new airport capacity

LARGE ECONOMIC BENEFITS

- 3.4 Our economic assessment of providing additional capacity at South East airports by 2030, measured above the baseline of no additional airport capacity beyond that in the planning system currently and assuming our central demand forecasts, shows that the net economic

benefits could be up to £18 billion in present value terms[†]. The core passenger benefits of providing more airport capacity come from allowing more people to fly, and from giving all passengers a greater choice of timings and routeings.

3.5 Economic benefits for a given amount of additional capacity vary:

- the capital costs vary significantly – a new airport, for example, is much more expensive than airport expansion involving developments at existing South East airports;
- the location of an airport in relation to the key markets and its accessibility to/from them are key factors in explaining differences in economic benefits. There is currently greater demand on the west side of London; and
- airports with a greater range and depth of existing route networks will generate larger benefits.

3.6 For the purpose of our analysis of development options at South East airports we have assumed additional capacity at regional airports. Benefits from the expansion of South East airports would be larger if such capacity in the regions was not provided.

3.7 There would also be benefits to airlines and passengers from reducing aircraft delays at airports by the timely provision of additional runways; taking this into account could add up to £3 billion to the benefits. On the other hand, the environmental costs that can be valued might reduce the net benefits of some combinations of options by up to £3 billion.

3.8 The detailed results of the economic appraisal are set out in **Chapter 14**.



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[†] See footnote to paragraph 14.25 in Chapter 14 for information about changes to the discount rate used for appraisal of projects by central Government that was used in SERAS.

JOBS

- 3.9 In 1998 it was estimated² that the UK aviation industry directly employed some 180,000 people and supported up to three times as many more jobs indirectly, for example in firms that supply goods and services to the industry such as aircraft fuel and equipment, computer systems of airports and airlines and construction of additional airport facilities.
- 3.10 At the four main South East airports, the number of direct and indirect jobs supported by aviation in the same year was about 160,000. Our studies suggest that this figure would be maintained up to 2030, even after taking account of productivity gains over time, if airport capacity was increased by making more intensive use of existing runways (i.e. if no new runways were built). Adding new runways could **directly or indirectly** generate **up to** an additional 80,000 jobs, depending on how much additional capacity was provided.



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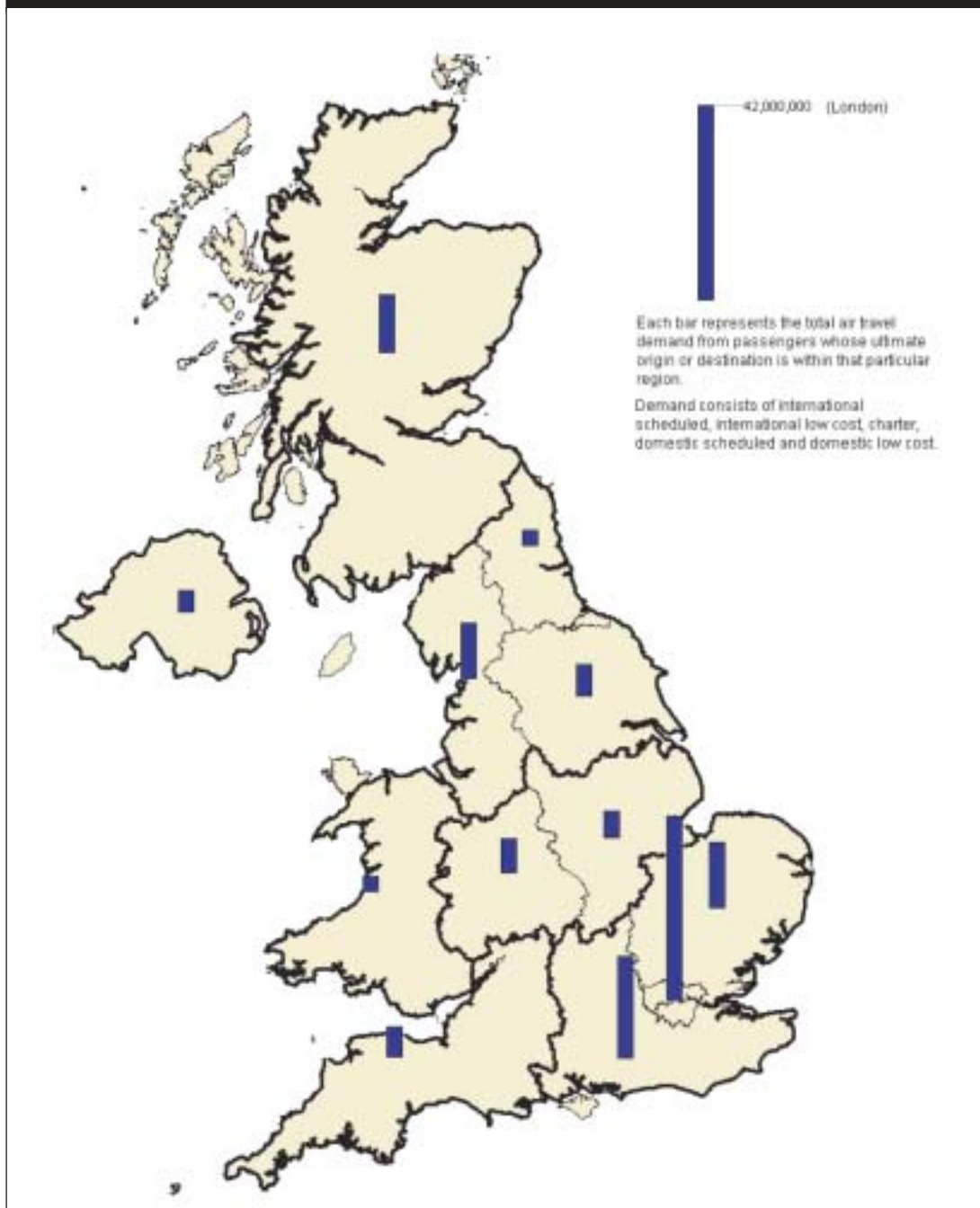
- 3.11 The benefit to the nation from these additional jobs would be enhanced by ensuring that as many as possible go to people who would otherwise not be in work. All parts of the UK have areas of low and high employment rates – sometimes close to each other. The variation is especially marked in London, which includes districts which have employment rates that are among the lowest in the whole of the UK.
- 3.12 The Government's central economic objective is to achieve high and stable levels of growth and employment so that everyone can share in higher living standards and greater job opportunities. Embodied in this objective are two elements: to achieve an overall level of success but also to enable everyone to share in that success.
- 3.13 Even in areas where unemployment is low, there are still many other people on other benefits to take up the jobs that arise from growth in aviation and airport services. The Government's welfare to work agenda not only aims to move people from the claimant count into jobs, particularly the most disadvantaged; but also to help people who are able to work to move off inactivity benefits, into the world of work and into jobs. Expanding the effective supply of labour will allow the economy to grow more rapidly without running into skills shortages and inflationary pressures.

² The Contribution of the Aviation Industry to the UK Economy – Oxford Economic Forecasting, November 1999.

ENABLING MORE PEOPLE IN THE SOUTH EAST TO FLY

- 3.14 Demand for air travel is strongest from people and businesses located in and around London, and from people wishing to fly to London. This is illustrated by **Figure 3A**. In 2000, 28 per cent of air passengers starting or finishing their journeys in the UK had a London origin or destination and a further 25 per cent was accounted for by the South East and Eastern regions. So the three regions in the SERAS study area accounted for more than half of the air travellers (but only 35 per cent of the national population). Providing additional capacity in the South East would serve that very strong local demand and allow travellers in the South East to fly from their preferred airport.

Figure 3A: Demand for air travel in 2000



The seven consultation regions (as indicated by the thick black boundaries) are the South East and East, South West, the Midlands, the North of England, Wales, Scotland and Northern Ireland.

Costs of failing to build new runway capacity

3.15 The costs of failing to build new runway capacity would manifest themselves:

- In *direct costs to the travelling public* through fare increases;
- In *preventing large numbers of people from flying at all*;
- In forcing some *South East air travellers to use regional airports*;
- Through *indirect costs to the economy*, including increased business costs, some reduction in attractiveness for foreign direct investment, a reduction in inward tourism and damage to the UK's competitive position in relation to other European countries; and
- In changes to the *structure of air services* from the South East as lower margin – often European or domestic – services are dropped to make room for higher yielding routes.

DIRECT COSTS TO PASSENGERS

3.16 The greater the shortfall of capacity below the number of people who want to travel, the higher will be the cost of air travel. The shortage of airport capacity therefore results in a fare premium that passengers will have to pay. In practice, unless substantial additional capacity is brought on-stream, airfares from the South East are likely to increase sharply. We estimate **an average** fare premium of £100 or more per person (in today's prices) at Heathrow, Gatwick or Stansted by 2030 if no new runway capacity is provided.



BAA Aviation Picture Library

PREVENTING PEOPLE FROM FLYING

3.17 **Table 3.1** shows how much of national demand in 2030 is met in the South East and in other UK regions when different amounts of new runway capacity are provided at South East airports. Capacity in the UK regions outside the South East is taken as being unconstrained and, implicitly, at Continental hubs, too.

- 3.18 It also shows how many passengers are lost to the UK system completely; these passengers either make their journeys entirely by other (surface) modes, or start their air journey outside the UK, or do not travel at all. For example, if no new runways were built in the South East, around 73 million passengers would not travel by air in the UK.

Table 3.1: Passenger traffic in 2030 (mppa)

Scale of development at SE airports	National demand	South East airports	Other airports	Lost to UK system
Maximum Use (no new runways)	501	189	239	73
1 new runway	501	206-230	218-229	53-65
2 new runways	501	243-252	221-224	29-46
3/4 new runways	501	260-289	198-210	17-32

Source: DfT Air Passenger Forecasting Model.

Different combinations of runway developments generate different throughputs at individual airports.

The figures for South East airports, regional airports and those lost to the UK system show the range of demand forecasts for different combinations of airport development at Heathrow, Gatwick, Stansted, Luton and the possible new airport at Cliffe. **Figures for South East airports are for Heathrow, Gatwick, Stansted, Cliffe (where appropriate), Luton and London City.**

- 3.19 Restrictions on airport capacity tend to reduce leisure more than business passengers. Both types of passengers on domestic routes would be particularly hard hit, especially those interlining at UK hubs. The traffic suppressed would be a mixture of UK residents, foreign residents travelling to or from the UK, and international transfer passengers.

USE OF REGIONAL AIRPORTS

- 3.20 We believe that our airports policy should make more use of regional airports such as Manchester and Birmingham to cater for the demand for air travel. We want to encourage the sustainable growth of regional airports so that they can meet as much as possible of the local demand.



Manchester Airport

- 3.21 We expect that the demand for air travel in the regions will grow more rapidly than in the South East, in part because the market in the South East is more mature. Also, as regional demand increases, it will become possible for airlines to start new services from regional airports which would not be viable today. This trend is being assisted by the recent development of smaller ‘regional’ jets, which airlines are using to operate routes on which the passenger flows are too low to support viable operations by larger planes.
- 3.22 As a result of these factors, regional airports are clawing back local passengers who would previously have had to use one of the South East airports. We expect this trend to continue, and we welcome and support this. However, it would be wrong to assume that regional airports could substitute for capacity in the South East.

Benefits to regional airports of South East constraints

- 3.23 One effect of a lack of capacity in the South East would be displacement of traffic to regional airports. Much of this traffic would be passengers starting or finishing their journeys in the South East ‘spilling over’ to use regional airports. This effect would be particularly acute for price-sensitive leisure traffic, and would increase over time in the absence of adequate infrastructure in the South East. Another effect would be that more passengers originating in the regions would be ‘clawed back’ by regional airports.
- 3.24 In these circumstances, airlines would provide more international services from regional airports as routes reach financially viable critical mass and also feeder services to Continental hubs.

Disbenefits to regional travellers of South East constraints

- 3.25 Air travellers in the regions benefit from the frequency of services and range of destinations offered by South East airports that regional airports could not sustain. As a result of the more limited choice of destinations which will be viable from regional airports, the total number of air journeys by regional residents and visitors to the regions would be lower than it would be if capacity was provided in the South East as well.
- 3.26 **Table 3.2** illustrates the results of modelling two scenarios (one with no new runways in the South East and one with substantial new capacity in the South East) and shows how many passengers would use South East and regional airports in 2030 and where they come from.
- 3.27 In both cases, the capacity at regional airports is assumed to be *unconstrained*. If capacity was constrained in the regions, more UK travellers would be prevented from flying, and fare premiums at South East airports would be higher than otherwise would be the case.
- 3.28 **Table 3.2** shows that the overspill of passengers from the South East to the regional airports (i.e. forced to travel overland to catch a flight), is 23 million higher where no new runways are provided in the South East (25mppa – of which over half use Birmingham Airport – compared with 2mppa where three new runways are provided in the South East).
- 3.29 **Table 3.2** also shows that providing substantial capacity in the South East as well as in the regions results in 16 million more regional passengers travelling via South East airports (26mppa compared with 10mppa). In total six million more regional passengers – i.e. starting or finishing their journeys from regions outside the South East – are able to fly (212mppa compared with 206mppa).

- 3.30 Overall, our analysis shows that more people across the UK as a whole would be able to fly if additional capacity were provided in the South East as well as at regional airports. So constraining the South East airports would disadvantage travellers from *all* parts of the UK, both business and leisure travellers, by reducing the number of destinations served directly and the frequency of services. If we constrain airports in the South East, many passengers would not be able to fly at all (see the line ‘Lost to the UK system’ in Table 3.2).

Table 3.2: Air travellers using South East/other UK airports in 2030 (mppa)

		No new SE runways	Additional new SE runways
SOUTH EAST PASSENGERS (i.e. starting/finishing their journey in the SE)	Using SE airports	159	201
	Using regional airports	25	2
	Total	184	203
TOTAL REGIONAL PASSENGERS (i.e. starting/finishing their journey outside the SE)	Using regional airports	196	186
	Using SE airports	10	26
	Total	206	212
International Transfer Passengers (i.e. originating outside the UK and connecting to international flights)	Using regional airports	8	5
	Using SE airports	28	60
	Total	36	65
GRAND TOTAL		428	480
Lost to the UK system		73	21
Source: DfT Air Passenger Forecasting Model. The impact of additional runways in the South East depends on the package chosen. The example above is an illustrative example of three additional runways. Figures for the South East are for Heathrow, Gatwick, Stansted, Luton, London City, Southampton and Norwich.			

INDIRECT COSTS TO THE ECONOMY

- 3.31 In practice, the additional indirect costs to the economy of failing to develop airport capacity are difficult to measure. The central – unquantifiable – question is to what extent a modern economy can continue to develop and prosper where air travel is constrained. An open economy like the UK’s is crucially reliant on air transport. Over one fifth (by value) of our visible exports are transported by air. In the 21st century economy, air travel is now a modern factor of production. While it is difficult to prove, for example, that Heathrow has been a critical factor in the development of the Thames Valley and the M4 business districts, there is good reason to believe that regional economic growth and airport development are closely linked. Sectors of the economy likely to be the drivers of future economic growth make relatively heavy use of air travel, for example financial services and high tech manufacturing.

Foreign investment

- 3.32 The UK’s attractiveness for foreign direct investment would almost certainly be diluted with significant constraints on air services. Surveys show that London’s attractiveness as an investment location is closely related to good air transport links. For 12 years running, London has been ranked the best city in Europe in which to locate a business³ and a

³ Healey and Baker European Cities Monitor 2001.

quarter of Europe's largest companies has their headquarters in London. Faced with the choice between London and other European cities, footloose international firms might well prefer other cities if their air links were better.

Tourism

- 3.33 Tourism, an industry critically dependent on air travel, would undoubtedly suffer if there were significant constraints on air services. Consumer choice by UK residents is limited if they cannot go on holiday by air. Inward tourism is worth about £13 billion to the UK each year, about 1½ per cent of GDP.[†] Around 13 million foreign tourists come to London, about three quarters of whom fly, spending some £7 billion in 2000. Our forecasts predict that the underlying demand for travel to the UK by foreign tourists is set to grow strongly.



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- 3.34 Tourism is also a major employer, providing more than two million direct jobs. Tourism-related employment in the South East has risen 23 per cent in the last five years.

ROUTE SPECIFIC CHANGES

- 3.35 The route network and destinations served by London airports would also change if capacity does not grow to meet demand. As fare premiums rise, some routes would become unsustainable, particularly if airport capacity was spread between different locations, i.e. there were not at least three runways at one airport. Airlines would tend to focus on more popular, more profitable routes at the expense of less profitable routes. The total number of destinations would fall and, inevitably, London's route network would be eroded compared with Paris, Frankfurt and Amsterdam. Services to many of the less popular destinations are only viable from the major South East airports and so if they were to be dropped it would no longer be possible to fly to them from the UK. These issues are considered further in the next chapter about the role of hub airports in the South East.

[†] See footnote to paragraph 2.15 above.

CHAPTER 4

A hub airport in the South East

- 4.1 There are two fundamental issues that the Government wishes to address to help it to decide whether new capacity should be provided in the South East and, if so, where:
- Does the UK need one or more major hub airports in the South East?
 - Should we develop Heathrow further?
- 4.2 The two questions are in fact closely linked. We need to consider what the benefits are to the UK of having a strong hub airport and, if maintaining a hub airport is a desirable objective of our aviation policy, whether the best way to achieve it is to maintain Heathrow's role as our premier airport. If Heathrow is not to be developed then we should consider other possible alternatives.

DEMAND AND CAPACITY TODAY AT SOUTH EAST AIRPORTS

- 4.3 There is already evidence of a capacity shortfall in the South East, most notably at Heathrow. For many years, the demand for runway slots at Heathrow has far exceeded the available supply. This has forced airlines to move to off-peak times, to the extent that Heathrow's runways are now fully used for over 15 hours a day (07.00-22.00). The position at Gatwick is similar but less severe. The consequences of this capacity shortfall are:
- **More delays** – in the fourth quarter of 2000, 35 per cent of all Heathrow flights were delayed. This is part of the price for squeezing the maximum possible capacity out of the airport;
 - **Less route development** – airlines are constrained in their ability to develop new services and increase frequencies on existing routes;
 - **Less connecting traffic** – Heathrow is not able to operate as a full hub in the sense of incoming and outgoing waves of air services to maximise the number of connections with minimum transit times;
 - **Higher costs** – many scheduled international tickets from Heathrow are more expensive than the same flights from other European capitals and from Gatwick. While it is difficult in practice to separate out all the explanatory factors for the difference, it is likely that at least some part of the existing fare premium is a result of capacity shortages at Heathrow; and
 - **Fewer regional air links** – the number of links between Heathrow and UK regional airports has declined markedly from 19 destinations served in 1989 to nine routes today. The number of services from regional airports to other European hubs is increasing. One reason for this decline is the shortage and consequent high value

of slots at the London end. While the number of point-to-point services to other London airports has grown over the same period, the ability of regional travellers to connect easily to a strong route network has diminished.

- 4.4 This situation will get worse in spite of the completion of Terminal 5, planned for 2008, which will increase the number of passengers capable of being handled at Heathrow but will not substantially increase the number of flights which the airport can handle.



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- 4.5 In the past, Heathrow's existing airport infrastructure has been able to cope with traffic increases through more efficient use, much of which was unanticipated. However, there is little prospect of further gains within the next decade. In order to serve as much as possible of the demand, airlines have been driven to increasing aircraft size. The average aircraft landing or taking off from Heathrow airport carries 136 passengers, compared to 100 at Paris and Frankfurt, and 90 at Amsterdam.

COMPARISON WITH MAINLAND EUROPE

- 4.6 While constraints at UK airports have been getting worse, our main competitors have built new airport capacity and have strategies for airport development in place. **Table 4.1** shows a comparison of European airports.

Table 4.1: Comparison of key European airports				
	Million passengers 2000	Runways 2000 [by 2006]	Air traffic movements 2000	Air traffic movements [Capacity] 2010
Charles de Gaulle	44	4	470,000	710,000
Schiphol	37	4 [5]	400,000	600,000
Frankfurt	46	3 [4]	420,000	660,000
Heathrow	64	2	460,000	480,000
Source: DfT estimates				

- 4.7 Heathrow has two runways, compared to four runways at both Amsterdam Schiphol and Paris Charles de Gaulle. Frankfurt has three. By 2006, Amsterdam will have an additional runway operational, and Frankfurt may also. By comparison, no new runways have been built at major airports in the South East in the last fifty years. Although Heathrow continues to be a highly successful international airport, the shortage of capacity compared with its European rivals is undermining that position. In practice, Heathrow's ability to operate as a full hub – maximising the number of connections with minimum transit times – is being hampered. In summer 2001, Air France was able to schedule 15,000 weekly connections within two hours at Charles de Gaulle, compared to BA's less than 5,000 at Heathrow. It is clear that with demand for air travel set to increase, if we do not respond our European competitors will be well-placed to serve that demand.



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Charles de Gaulle Airport, Paris, France

Does the UK need one or more large hub airports in the South East?

BENEFITS OF HUB AIRPORTS

- 4.8 Airports with substantial capacity are able to support a wider range of destinations and with a greater frequency of services than could be supported by local demand alone. The dense route structure served by Heathrow, for example, is maintained because of the 15 million annual passengers transferring through the airport. A dense route network and higher frequency would bring significant benefits to UK air passengers and to the UK economy.

4.9 For both business and leisure travellers, the main benefits of hub airports are:

- A greater number of destinations is served direct;
- The majority of destinations will be served at higher frequencies increasing convenience;
- The number of destinations served ‘one-stop’ from regional airports is increased;
- Airlines will be able to pass some of the efficiency savings on to passengers in lower fares (on the other hand, if there is a dominant airline or alliance at the airport, that will limit the competitive pressure on fares).

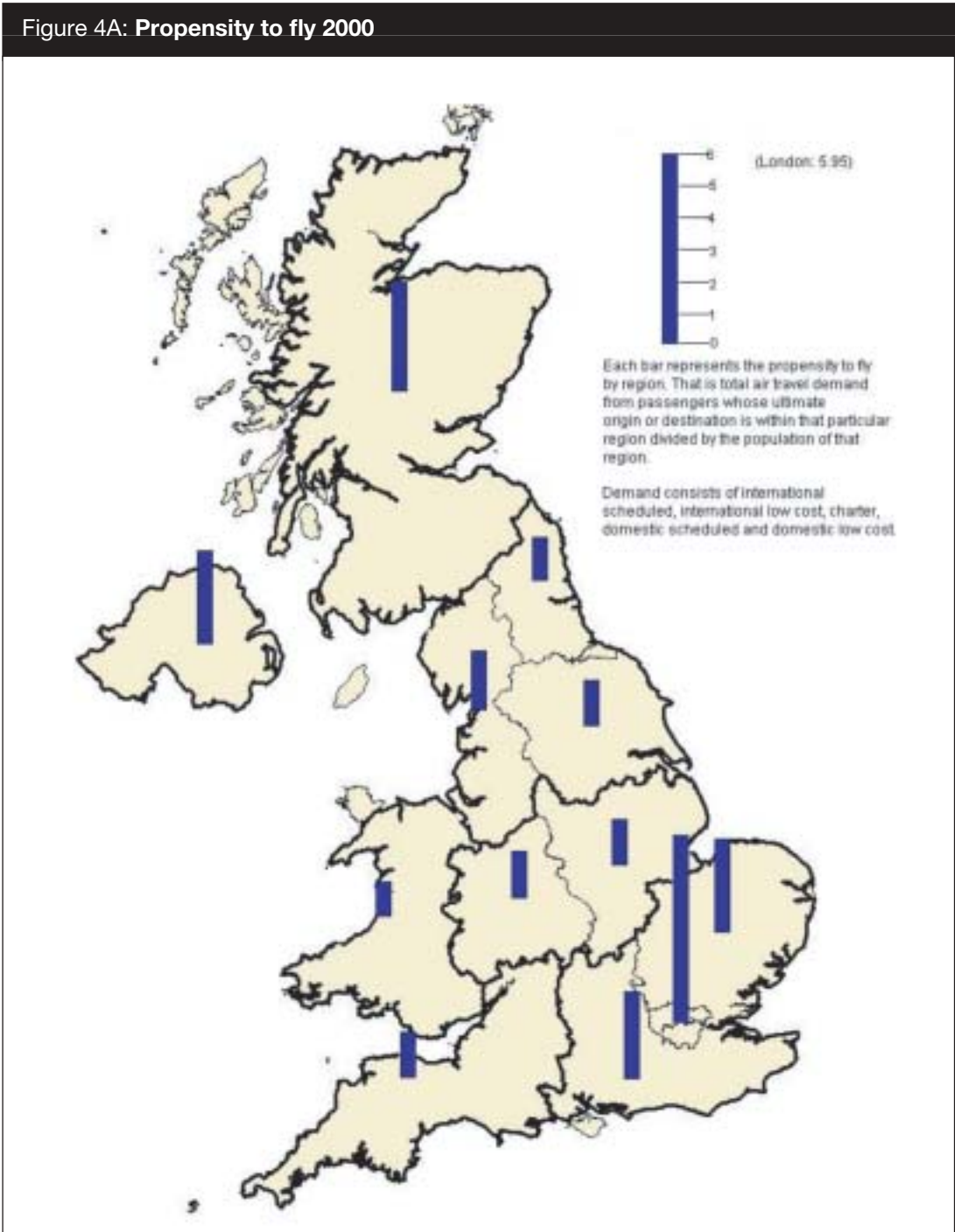
4.10 The benefits to airlines are also significant. Substantial capacity allows airlines to organize schedules efficiently, permitting them to operate ‘waves’ of landing and departing planes, minimising transit times for connecting passengers.

THE CASE FOR A LARGE AIRPORT IN THE SOUTH EAST

4.11 Concentrating capacity at a large airport would typically need to meet certain key requirements:

- Sufficient consumer demand to generate the necessary levels of traffic;
- Proximity to a large number of people who want to fly;
- Good surface access;
- High local attractiveness to business and tourism;
- Adequate airport infrastructure to support the level of demand and allow sufficient operational flexibility;
- Presence of one or two airlines (or a strong alliance) providing a large proportion of capacity, frequency and destinations in a coordinated way.

4.12 In terms of demand for air travel, the UK, and particularly London, would be capable of supporting at least one large airport. Together with its hinterland, London’s GDP is far greater than that of any other city in Europe (and indeed is greater than that of many medium-sized western European countries). **Figure 4A** shows the propensity to fly in the UK in 2000, in other words how many trips are made per head of population broken down by district. This confirms that the demand for air transport in London is much higher than any other part of the UK by a substantial margin.



The seven consultation regions (as indicated by the thick black boundaries) are the South East and East, South West, the Midlands, the North of England, Wales, Scotland and Northern Ireland.

Should we develop Heathrow further?

- 4.13 Heathrow is an important national asset. It offers a large route network and high frequency of services. Heathrow has been the UK's premier airport for half a century and any decision on new airport capacity in the South East must address the future of the airport.
- 4.14 The demand for Heathrow is by far the greatest of all the airports considered in SERAS. This is starkly illustrated by our forecasts of unconstrained demand (i.e. where no airports face capacity constraints). Out of a total demand in the South East of 202mppa in 2015 and a little over 300mppa in 2030, we forecast that Heathrow would attract 126 mppa and 202mppa respectively, if unconstrained. Clearly, that amount of growth would be unsupportable, but it illustrates the attractiveness of Heathrow to passengers and airlines.



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- 4.15 The air transport White Paper will need to reach a view on whether Heathrow should continue to be the premier UK airport or whether an alternative airport should be developed to assume that role, and the implications of that for Heathrow.
- 4.16 Currently, Heathrow has more international-to-international interlining passengers³ than any other airport in the world, but in practice, the very high utilization of the airport has made it difficult for airlines to obtain their desired slots and so maximize the number of connections with short transit times. In order more fully to exploit its potential as a hub, Heathrow would need a third runway.
- 4.17 However, the impacts of a new runway at Heathrow are considerable and much would need to be done to make these acceptable. In particular, our modelling suggests that several thousand people might be exposed to levels of nitrogen dioxide that will exceed EU limits binding on the UK from 2010. The scale of daytime noise impacts is also significantly greater than for any other airport. The industry would need to deliver massive improvements to meet these environmental challenges if expansion of Heathrow was to be considered. This is covered further in **Chapter 16**.
- 4.18 For further details about the impacts of a third runway at Heathrow see **Chapter 7**.

³ Passengers originating outside the UK who are connecting to international flights.

ALTERNATIVES TO HEATHROW

- 4.19 If the impacts at Heathrow meant that further development could not be justified, possible alternatives would be to expand another existing airport sufficiently to allow for hub operation or to construct a new purpose built airport at Cliffe. Gatwick is already the second largest airport in the UK. It serves a large catchment area and with the addition of two new runways, it could play a major role as a hub. Expansion of Gatwick, as an alternative to Heathrow, would happen only later in the period of the White Paper if the agreement preventing construction of new runways until after 2019 remained in place (see Chapter 8 for more detail about this agreement).
- 4.20 An entirely new airport at Cliffe could be designed from the outset to be suitable for hub operation. It could have ample runway capacity to cater for even the peak numbers of incoming and outgoing flights which are highly desirable to achieve attractive connections. The airport would be much less congested than airports such as Heathrow today. Terminal capacity could be concentrated in one central area, so that connecting passengers would not need to make long journeys between terminals. The installation across the whole airport of integrated IT and other operating systems would facilitate a high quality of service to airlines and travellers, and low operating costs.
- 4.21 Expanding Stansted into a major hub airport would have the advantage that it could be done in stages, in line with increasing demand. As with Cliffe, it would be possible to have sufficient runway and terminal capacity to support the operation of waves of incoming and outgoing flights. It would be possible at Stansted to locate the terminals reasonably close together. But it might be more difficult to achieve all the operating benefits of an airport designed from the start to function as a major hub.
- 4.22 One of the major challenges facing the creation of a major hub at either Cliffe, Gatwick or Stansted would be attracting sufficient traffic to make the development financially viable. This issue would be particularly serious in the case of Cliffe, because of the high construction costs, and the fact that a large proportion of the costs would need to be committed up-front, before the airport could start operating. Possible measures to address this viability challenge are discussed in Chapter 15.

TWO LARGE AIRPORTS IN THE SOUTH EAST?

- 4.23 The underlying demand that we are forecasting by 2030 would be large enough to support two large airports. Another possible approach might therefore be to expand Heathrow and also to develop a second South East airport into a hub.
- 4.24 UK air travellers would benefit from competition between airlines (perhaps in the form of competing airline alliances) operating at different airports. That would, for example, encourage competition even on fairly thin routes. Heathrow, even with a new runway, would not be large enough to support the hub operations of two alliances; so one alliance would need to shift to another airport.

CHAPTER 5

Forecasts of demand for air travel

This chapter describes how air travel has grown in the last 30 years, both nationally and in the South East; sets out forecasts of passenger traffic to 2030; and describes how we have used those forecasts as the basis for appraising different options for new airport capacity. It also describes certain key factors that may cause the actual level of demand to be either higher (e.g. greater competition between airlines leading to lower fares) or lower (e.g. the effects of aviation meeting the costs of its impact on climate change through emissions of carbon dioxide) than our forecasts. The conclusion reached is that these effects might be broadly comparable.

- 5.1 In this chapter, the Government sets out forecasts of the demand for air travel up to 2030. Looking such a long way ahead is difficult, not least in an industry as dynamic as aviation, but these forecasts set out the scale of the problem that the White Paper will seek to address. The number of people flying in 2030 may in fact be higher or lower than our central forecast of demand. But it is important to remember the strategic nature of the decisions that need to be taken. The White Paper will not prescribe exactly how much new airport capacity should be provided or when, since these decisions will be for the relevant airport developer to take in due course in the light of demand.
- 5.2 The use of the Government's UK air traffic forecasts does not imply a commitment to the "predict and provide" approach; that would only be the case if Ministers were to decide to provide airport capacity to meet unconstrained demand without regard to the consequences. The role of the forecasts is to provide a starting point for assessment. They enable us to identify what additional airport capacity would be needed if demand were to be met, either fully or partially, so that we can then appraise the positive and negative impacts of that additional capacity, and only then come to a view on what, if any, degree of expansion is appropriate.
- 5.3 The objective is to establish a framework for providing new airport capacity, based on the best estimates available today, which gives both the public and aviation industry certainty where the Government wishes to see new capacity provided and which safeguards lands for development in the longer term. It will then be for the market to bring forward proposals within that overall framework.
- 5.4 The next section considers some of the factors that may influence actual air traffic over the next 30 years to test the appropriateness of using the central demand forecast.

MEETING THE COSTS OF GLOBAL WARMING

- 5.5 It is Government policy that aviation should meet its external costs, including environmental costs – that is, the costs to society of aviation noise, and other adverse impacts on, for example, climate change, local air quality, landscape, biodiversity and heritage[†]. Apart from the impact of aircraft emissions on climate change, the effects tend to be local and hence are best handled at the level of each airport individually. Climate change is the exception; it is a cost at the national – and global – level. More information about internalising environmental external costs can be found at the end of **Annex B**.
- 5.6 The impact on climate change of emissions of carbon dioxide (CO₂) from aircraft is the largest environmental cost that can be quantified in monetary terms. Guidance from the Department for Environment, Food and Rural Affairs (DEFRA) on the value of reducing CO₂ has been used to determine the reduction in national air travel demand which would result.^{††}

A CO₂ TAX

- 5.7 The then-DETR publication, *Air Traffic Forecasts for the United Kingdom 2000, May 2000*, undertook analysis of a “CO₂ tax”, introduced globally, assumed to be fully in place by 2015. Fuel costs were assumed to constitute 10 per cent of total airline costs. A 100 per cent fuel tax reflecting DEFRA’s calculations of the cost of CO₂ emissions would therefore lead to a 10 per cent increase in airline costs – and a 10 per cent increase in air fares assuming that the cost increase was fully passed through to passengers.
- 5.8 The analysis in *Air Traffic Forecasts for the United Kingdom 2000*, judged that a 10 per cent increase in air fares would lead to a 10 per cent fall in demand for air travel. Thus, fully meeting national overall CO₂ costs could mean an increase in aviation costs which, if fully passed through into airfares, could depress national demand by up to 10 per cent.

COST PRESSURES ON AIRLINES

- 5.9 The midpoint estimates of national demand for air travel drawn from *Air Traffic Forecasts for the United Kingdom 2000* have been used in this document. These midpoint estimates were predicated on a 1 per cent per annum reduction in fares in real terms over the forecasting period. This is less than the historic trend over the last 20–30 years of minus 2 per cent per annum. Evidence since the forecasts were published suggests that costs have continued to fall by 2 per cent per annum.
- 5.10 *Air Traffic Forecasts for the United Kingdom 2000* suggests, if the reduction of air fares in the long-term is 2 per cent per annum rather than 1 per cent, that demand would rise by 20 per cent, which, if achievable, would comfortably exceed the reduction in demand due to a CO₂ tax.

[†] In the Pre-Budget Report, *Steering a steady course: Delivering stability, enterprise and fairness in an uncertain world*, published in November 2002, the Chancellor of the Exchequer announced a commitment to discuss with stakeholders the potential for using economic instruments to ensure that the aviation industry takes more account of its environmental impact and to help deliver a more sustainable aviation sector. A paper on this issue is being published on the Treasury and DfT departmental websites.

^{††} DEFRA is currently reviewing its estimate of the external cost of CO₂ referred to in Annex B and published in Government Economic Service Working Paper 140. In the meantime the calculations presented in paragraphs 5.7 and 5.8 should be regarded as illustrative.

- 5.11 There are grounds for being much more positive about airline cost – and hence airfare – reductions than two years ago, when *Air Traffic Forecasts for the United Kingdom 2000* was completed. This arises from four principal sources:

No Frills or Low Cost Carriers: in 2001, a poor year for UK (and worldwide) aviation, much of the growth was in the ‘no frills’ sector (such as easyJet, Ryanair, go and buzz). They are now expected to capture much more of the mainstream domestic and short haul market than we expected a couple of years ago. These airlines, with their substantially lower costs and fares than traditional airlines, have contributed a larger stimulus to the UK aviation market than we thought likely.



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Greater Competitive Pressure: It is now clear that the cost base of the typical traditional scheduled airline will need to be cut to ensure commercial survival, in part because of the competitive threat of ‘no frills’ airlines. There is evidence that this has already started to happen.

Liberalisation: The downward pressures on costs arising both directly and indirectly from competition from low cost carriers will be felt primarily in the domestic and short haul markets. In long haul markets, liberalisation of markets represents an important cost driver. This factor was taken into account in the air traffic forecasts, but recently completed CAA research quantifies the potential cost savings – including those from mergers and relaxation of ownership and control restrictions – to airlines potentially arising from liberalisation of the key Europe to US market. The introduction of liberalisation in other long haul markets would have similar impacts. In addition, we believe that increased airline competition resulting from additional airport capacity will put downward pressure on costs.

Supply Side Effects of a CO₂ tax: Finally, the impact of a CO₂ tax (or an open tradeable emissions permit regime) will not only have an effect on the demand side, there will also be a supply-side response as airlines and manufacturers design and build planes to reduce environmental impacts. All the analysis done to date in our air traffic forecasts and for SERAS assumes for simplicity that a tax operates entirely through the demand side. This is a worst case scenario and in practice a higher price of aviation fuel is likely to have supply side impacts, for example, influencing airline purchasing and aircraft retirement behaviour through encouraging the use of more fuel efficient aircraft and in the longer-term acting as

a spur to the development of more fuel efficient technologies. This will mean that the long term price change of a tax designed to reflect external costs will be smaller than the initial effect based on demand impacts alone because the induced cost reductions will have some offsetting effect in stimulating demand. Under a permit trading regime it will mean that for a given emissions target the market clearing price of permits will be correspondingly lower, resulting in a dampened reduction in demand. Alternatively if the target was based on external cost estimates, it would need to be relaxed, again reducing the scale of any demand reductions. Some idea of the scale of these supply side impacts was provided in a report a few years ago on a European environmental aviation charge by CE Delft⁴. They estimated a long term price change with environmental efficiency improvements of 80 per cent of the initial price change based on demand responses only.

- 5.12 The judgement has therefore been reached that airlines will be more successful in reducing their costs than we assumed in our mid point forecasts of two years ago. Demand in the longer-term would be higher than our midpoint forecasts two years ago with long-term fare reductions of 1.5 per cent per annum, even if a 100 per cent aviation fuel tax were in place to internalise CO₂ costs.

DEMAND FOR AIR TRAVEL 1970-2000

- 5.13 Average annual growth rates of terminal passengers at UK airports since the early 1960s have generally been declining slightly over time as the aviation market moves towards maturity, although traffic in the late 1990s was boosted in part due to the emergence of low cost carriers.

Table 5.1: National air passenger growth 1970-2000				
	UK		South East Airports	
	Mppa	Average Annual Growth, per cent	Mppa	Average Annual Growth, per cent
1970	32	–	22	–
1980	58	6.1	40	6.2
1990	102	5.8	68	5.5
2000	180	5.9	114	5.3
Source: CAA statistics South East airports: Heathrow, Gatwick, Stansted, Luton.				

- 5.14 **Table 5.1** shows that for the UK as a whole, air passenger traffic is now nearly six times the level of 30 years ago. In the South East, traffic today is a little over five times the level of 30 years ago.
- 5.15 In 2000, 180 million passengers used UK airports, around 75 per cent more than the number a decade ago. 114 million passengers used the major airports in the South East (see **Table 5.2**). Passenger numbers at major airports in the South East grew at a compound annual average rate of 6.7 per cent in the period 1994-2000. Other airports – including London City, Southampton and Norwich – made only a small contribution, in comparison.

⁴ 'A European environmental aviation charge: Feasibility study', The Centre for Energy Conservation and Environmental Technology, Delft, 1998.

Table 5.2: Terminal passenger traffic at the main South East airports (mppa)					
Year	Heathrow	Gatwick	Stansted	Luton	Total
1970	15.6	3.7	0.5	2.0	21.8
1980	27.5	9.7	0.3	2.1	39.6
1990	42.6	21.0	1.2	2.7	67.5
1995	54.1	22.4	3.9	1.8	82.6
2000	64.3	31.9	11.9	6.2	114.2
Annual average growth, 1995 to 2000, per cent	3.5	7.3	25.0	28.1	6.7
Source: CAA statistics					

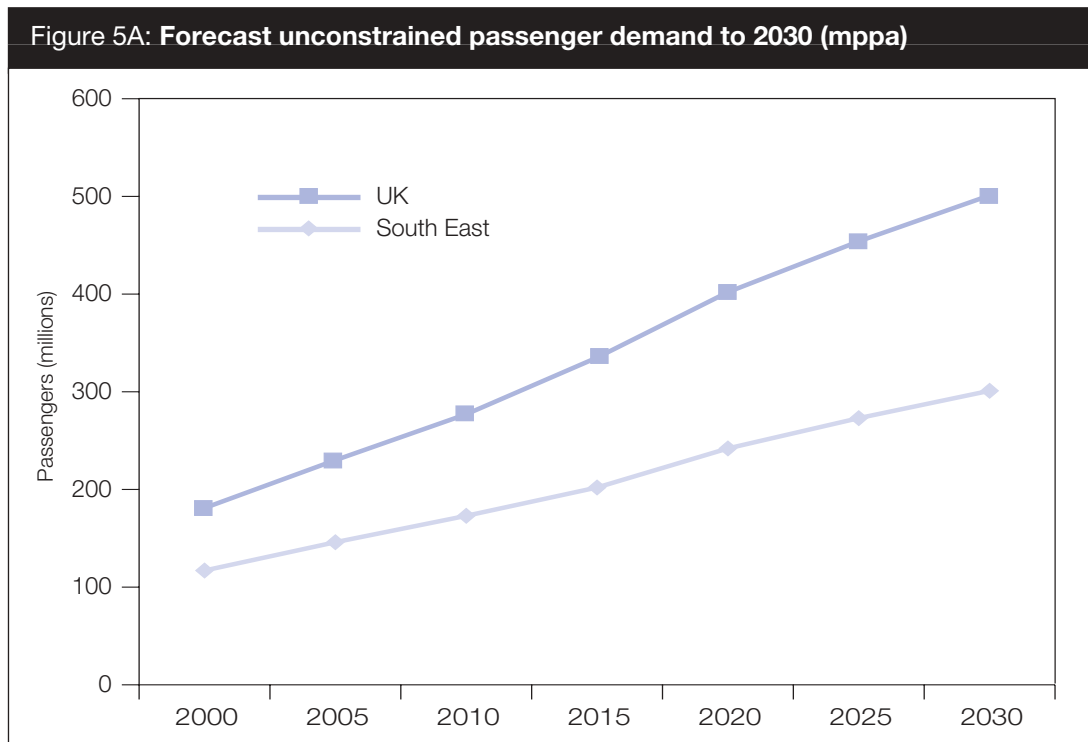
AIR TRAFFIC FORECASTS TO 2030

- 5.16 The most recent national air traffic forecasts were published by the then-DETR in May 2000 in *Air Traffic Forecasts for the United Kingdom 2000*, which forecast national demand to 2020. These are unconstrained forecasts of the underlying demand for air travel, i.e. based on the assumption that there is no restriction on the amount of additional airport and airspace capacity necessary to meet any level of future demand. They are the seventh set of official forecasts since 1984.
- 5.17 The key factors that drive passenger traffic are: UK and foreign GDP growth; air fares; world trade; and exchange rates. A key issue in long-term air traffic forecasts is “market maturity”; this means that for a constant level of GDP growth the rate of growth in demand for air travel declines over time. The forecasts do incorporate increasing market maturity, at different rates in the various market segments. They also take account of the recent strong growth of low cost carriers.
- 5.18 Within *Air Traffic Forecasts for the United Kingdom 2000*, forecasts were made of terminal passenger numbers at UK airports to 2020 by type of journey (international, domestic and low cost), by UK and by foreign residents, and between business and leisure. Taking all the market segments together, air traffic is expected to grow at an average of 4.25 per cent per annum between 1998 and 2020 under the mid-point of the forecasts and at an average of 3.6 per cent and 4.9 per cent per annum under the low and high growth scenarios respectively.
- 5.19 The forecasts are long-term forecasts and show the trend growth in unconstrained demand for UK air traffic. The difficulty in accurately predicting turning points in the economic cycle means that deviations from the long run trend can occur in any given year.
- 5.20 For the purposes of the seven regional air studies, the 2020 forecasts were extended to 2030, at a somewhat lower growth rate than in the period 2010–2020.
- 5.21 The mid-point national forecast is for an increase in unconstrained demand for air travel to 500 million in 2030 and the mid-point forecast for the principal South East airports is a little over 300 million passengers in 2030 (see **Chart 5.3**). As well as a mid-point estimate of demand, higher and lower ranges are also given. For 2030, these are around 20 per cent above and below the mid-point forecast.

- 5.22 In fact, out-turns might be larger: historically, official forecasts have tended to under-estimate future traffic growth. DTLR forecast air travel demand in 1991, 1994 and 1997. The actual out-turns to date have exceeded the upper bound estimate in the earlier 1994 and 1997 forecasts.
- 5.23 The events of 11 September 2001, like the Gulf War ten years earlier, underline the point that air travel demand has a cyclical as well as trend growth element. Traffic returned strongly after 1991 and grew rapidly throughout the 1990s. It is not possible to say yet what long term effects last year's events might have on air travel, but already there are signs of recovery.
- 5.24 A particularly important factor is the level of air fares. In the mid-point forecast fares are assumed to fall by 1 per cent per annum over the period to 2020. However, greater competition especially from the low cost carrier sector could well lower fares at a faster rate. *Air Traffic Forecasts for the United Kingdom 2000* suggest that a 2 per cent reduction in fares per annum would increase the central forecast of demand by 20 per cent by 2020.

THE DfT AIR PASSENGER FORECASTING MODEL

- 5.25 DfT has developed a traffic forecasting model to forecast the way air passengers might make use of different amounts of new capacity at different airports around the UK. The forecasts are on an annual basis from 1998 to 2030, and allocate demand between 29 existing UK airports and up to three possible new airports.
- 5.26 The model allocates air passenger demand on the basis of overall costs faced by passengers. These costs for passengers travelling through a particular airport reflect the cost of the surface access journey to that airport, the number and range of flights offered at that airport, flight times and fares on specific routes from that airport, and, at any airport where demand exceeds capacity, the fare premium which would be required to bring demand into line with the available capacity.
- 5.27 **Figure 3A** in **Chapter 3** shows the distribution of air travellers nationally in the year 2000. The substantial demand in the South East currently is particularly striking, although this reflects not only air trips by UK residents in the South East but also trips by foreign residents, many of whom are visiting tourist attractions or business locations in the South East.
- 5.28 It is clear from **Figure 3A** that London is the largest area of air travel demand. In particular, the Central London area alone, which is made up of the main business and tourism areas of London (City of London, City of Westminster, Kensington & Chelsea and Camden), had a demand for air travel in 2000 of 18 mppa. Elsewhere in the country, substantial levels of demand are seen in large conurbations like Birmingham, Manchester, and Edinburgh, and along the M4 corridor from London to Reading and beyond.
- 5.29 **Figure 5A** shows unconstrained passenger demand, i.e. before account is taken of any capacity limitations at individual airports, in the period to 2030 both nationally and in the South East.



Source: DfT
 Mid-point forecasts.
 South East airports: Heathrow, Gatwick, Stansted and Luton.

	2000	2005	2010	2015	2020	2025	2030
UK	181	230	277	335	402	454	501
South East	117	146	173	202	242	273	301

- 5.30 The national demand growth rate in **Figure 5A** is higher than that in the South East. This arises because the traffic forecasts by airports in the regional studies, including SERAS, were conducted on the basis that propensity to fly would increase more quickly outside the South East, reflecting the greater maturity of the air travel market in the South East. More precisely, the underlying growth rate of passengers with origins or destinations outside the South East, London or Eastern regions grows at one percentage point per annum above the growth rate of passengers with origins or destinations inside the South East, London or Eastern regions in the period to 2015.

SECTION 2

Where to provide any extra runway capacity?



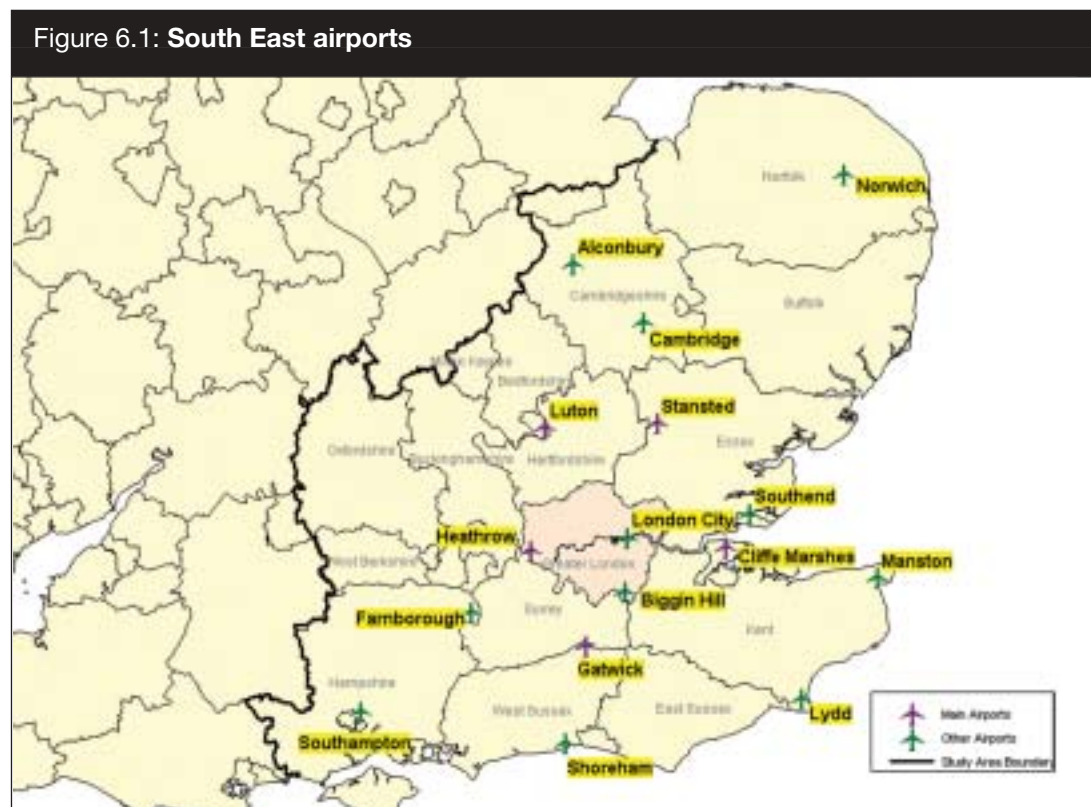
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CHAPTER 6

Introduction to airport options

In the previous section we described the forecast growth in demand for air travel over the next 30 years and described the benefits of providing new runway capacity. This chapter introduces options for adding capacity at each of the main South East airports as well as a potential new airport by the Thames Estuary in North Kent and explains in broad terms how the impacts of the runway options were appraised.

- 6.1 The options for each of the main South East airports, as well as a possible new airport at Cliffe in North Kent, are described separately in **Chapters 7-11**.
- 6.2 These chapters summarize the key local impacts at individual airports that might result from adding one or more new runways, and, in the case of Luton and Stansted, from making maximum use of the existing runway.
- 6.3 **Chapter 12, Other South East airports**, describes the potential role of some of the smaller South East airports. It also describes an option for a small, mainly freight and low cost passenger airport at **Alconbury** near Huntingdon.
- 6.4 **Figure 6.1** shows the airports in the SERAS study region that are discussed in the following chapters.



DESCRIPTION OF OPTIONS

- 6.5 In the SERAS study, options were developed in some detail to allow a robust appraisal of their impacts to be made. But it is important to remember that the Government is not at this stage bringing forward definitive proposals – that will be for the relevant airport developer in due course.
- 6.6 The layout plans of the options at each airport in the following chapters are not detailed design proposals. The location of new runways and the new boundary of each airport have to be reasonably precise to allow their impacts to be appraised; but they are not definitive. New road and rail access is also shown but is illustrative. We are not attempting to say where other facilities such as terminal buildings, car parking and maintenance facilities might be, but adequate space for these has been allowed within the airport boundary. To give an understanding of the scale of the options at each location, the layouts shown are overlaid with Ordnance Survey grids, all at one kilometre spacing.

BASE CASE

- 6.7 The base case for the capacity of each airport, against which the impacts of options for new capacity were measured, assumed only those developments already allowed for in the land use planning system. An assumption was also made about the amount of further development beyond the base case to achieve the potential maximum capacity of the existing number of runways (sometimes referred to in this document as the ‘maximum use’ case). See paragraph 14.8.

TRAFFIC FORECASTS

- 6.8 The air passenger forecasting model used in SERAS was described in Chapter 5. The model was used to forecast the way air passengers might make use of new capacity. The traffic forecasts given in the airport chapters show the effects of new capacity at that airport. The forecasts may differ at a given airport depending on the assumptions that are made about new capacity elsewhere. Large elements of new capacity at one airport will have effects at the other airports.
- 6.9 The capacity of an airport in each option is expressed in terms of both air transport movements (i.e. the number of take-off and landing slots) and terminal passengers. In practice, in the South East, the limiting constraint in most options that have been looked at is runway capacity. In either case, if demand exceeds capacity, the model calculates a fare premium (“shadow cost”), in part to divert traffic to other airports and, in part, to suppress national air travel demand.
- 6.10 The modelling distinguishes between a runway constraint (insufficient take-off and landing slots to serve demand) and a terminal building constraint. If runway capacity is the limiting constraint, the model calculates a fare premium per slot. This converts to a fare premium per passenger which is lower if the passenger is on a large plane. Thus, larger planes tend to be used more. Even with larger planes, fewer passengers than the terminals can accommodate may be able to use the airport when the limiting constraint on its capacity is slots.

APPRAISAL OF OPTIONS

- 6.11 In the following chapters we provide a summary of the key results of the impact appraisal done in SERAS. The full results of the SERAS appraisal are reported in the relevant reports of Stage 1, 2 and 3. (See **Annex B**, *The SERAS Study*, for more information about the study and the appraisal methodology and **Annex C** for a list of available SERAS reports.)
- 6.12 Many of the impacts of airport options are specific to the local area and so can be identified on an option by option basis and these are summarised in the following airport chapters. The principal impacts addressed are grouped under three headings.

Impacts on rail and road networks

- 6.13 The Government's policy is that the proportion of journeys to airports made by public transport should increase. We have assessed what scale of transport infrastructure would be needed, both at the airport and elsewhere, to cater for the increased numbers of people using the airport. The capital costs of transport schemes that are considered necessary for an airport development option have been included in the overall cost estimates of that option and are included in the economic appraisal reported in **Chapter 14**.

Impacts on people and the environment

- 6.14 Each option for new capacity will have an impact on local people. In recognition of this, each option has been assessed against a number of localised factors. These include land taken, residential properties taken, heritage, ecology, noise and local air quality. Many of these factors are important determinants of local people's health, so whilst health does not have an explicit section devoted to it, we have built in some of these concerns into the appraisal. Other impacts on the determinants of good health and quality of life, such as employment and transport, are covered in other sections of the consultation document.

Safety Risk

- 6.15 Contours of 1 in 10,000 and 1 in 100,000 individual 3rd party fatality risk per year were defined for each runway end in each development option, using a methodology based on that developed by DfT for the definition of airport Public Safety Zones⁵. Land uses within the 1 in 10,000 contour and between the 1 in 10,000 and 1 in 100,000 contours were identified and numbers of residential properties assessed.
- 6.16 Guidance based on the DfT's original PSZ policy work indicates that existing residential property (or other development occupied for a high proportion of the day) within the 1 in 10,000 contour should be removed. Existing housing between the 1 in 10,000 and the 1 in 100,000 contours may remain but there should be no further residential development

⁵ *Third Party Risk Near Airports and Public safety Zone Policy, A Report to the Department by Consultants, DETR 1997* (commonly referred to as 'the Green Book').

in this zone. Similarly, most new non-housing development between these two contours should be prohibited but existing uses need not be removed. The presence or development within the 1 in 100,000 contour of sensitive uses such as schools, hospitals and stadia should be considered on a case by case basis.

- 6.17 The small numbers of residential properties within 1 in 10,000 contours have been included in the residential property take totals for each option. Sensitive uses within 1 in 100,000 contours for different runway options include schools, churches, public houses and factory premises, but there is nothing which at this stage would rule out on safety grounds any of the runway options appraised.

Land taken, households displaced, heritage, ecology, water

- 6.18 It is worth noting that the scope for mitigating some of the ecological and heritage impacts has not yet been explored but will need to be examined further.

Daytime Noise

- 6.19 Based on our forecasts of demand under different capacity scenarios, we have modelled the traffic at each airport and the noise it would generate. This has been done by the Civil Aviation Authority in the same way that they currently calculate annual daytime noise ‘contours’ for Heathrow, Gatwick and Stansted. Contours have been produced from 54 to 72 dBA Leq⁶ in 3 decibel intervals. Although 57dBA marks the approximate onset of significant community annoyance due to daytime aircraft noise, 54 dBA is presented as a sensitivity test.
- 6.20 Modelling the long term noise impacts of runway options is sensitive to the assumptions made about changes over time to the aircraft fleet at an airport and implementation of more stringent engine design standards.
- 6.21 The results shown in the following chapters were based on assumptions that we think are a reasonable estimate of the conditions that are likely to prevail:
- for future aircraft types, aircraft noise performance characteristics were defined using available manufacturers’ data and assumptions based on current trends in technology and future international regulations;
 - specifically, new Chapter 3 (or, after 2006, Chapter 4) aircraft⁷ would be designed to achieve a cumulative reduction of 14dB below Chapter 3 permitted noise levels;

⁶ dBA = levels of noise measured on a decibel scale using a frequency that approximates to the characteristics of human hearing.

Leq (equivalent continuous noise) index was adopted by the Government as a metric for daytime noise in 1990. It represents the continuous sound level having energy content equivalent to the aggregation of individual noise events.

⁷ International standards for limiting noise at source from civil aircraft have increased in stringency over time, each stringency level being denoted by a chapter number. Normal commercial operations using aircraft to the last standard (“Chapter 2”) ceased in Europe on 1 April 2002. The current standard is “Chapter 3”. The next standard (“Chapter 4”) will apply to new designs from 1 January 2006.

- for those aircraft types no longer in production in 2000 a retirement profile was produced based on the current age profile of the European fleet (the absence of a mandatory Chapter 3 phase-out regime notwithstanding); and
- the future fleet profile was reviewed to ensure it included those types more likely to be in general use and more compatible with forecast air services (in practice, this meant assuming shorter-range rather than longer-range variants of some new aircraft types on short haul routes).

6.22 These are all reasonable, possibly conservative, assumptions to make for modelling noise some 30 years ahead. However, it is worth noting that they may not be delivered by 2015 unless determined action is taken by both Government and the industry to make it happen.

Night noise

6.23 Limited analysis was undertaken of the potential night-time noise disturbance of each runway option. However, this is merely illustrative since, with the exception of Cliffe and Alconbury, none of the options assumes an increase in night flight numbers. The impact of night-time noise at the three BAA London airports will be determined by future Government policy on the issue rather than the availability of runway capacity, and will be the subject of a separate consultation by 2003.[†] The results of the limited work that was done in the SERAS study are not reported here but can be found in the SERAS Stage Two: Appraisal Findings Report.

Local air quality

- 6.24 Under EU legislation, mandatory limits will come into force in 2010 in relation to several pollutants. The UK Government will be obliged to ensure that critical sites are not exposed to an exceedance of these limits. In the case of airports, the two relevant pollutants are nitrogen dioxide (NO₂) and particulate matter (PM₁₀).
- 6.25 **For Heathrow only**, sensitivity tests were conducted for NO₂ and the results are given. These were based on more challenging assumptions, most notably about faster improvements in engine technology. The tests also made use of more detailed information about the use of reduced thrust on take-off by airlines currently using Heathrow.

Impacts on regional planning

6.26 Estimates have been made of the employment requirements of each airport. These will in turn place demands on the local housing market and we have assessed the scale of that impact, and other urbanisation impacts.^{††}

[†] See footnote to paragraphs 16.47 and 16.48.

^{††} On 5 February 2003, the Deputy Prime Minister, John Prescott, published "Sustainable Communities: Building For The Future", an action programme to deliver sustainable communities. Copies of the document are available on <http://www.odpm.gov.uk/communities/plan/main/index.htm>. Proposals include providing for major growth in the four areas identified in regional planning guidance for London and the rest of the South East in 2000 (RPG9): Thames Gateway; Milton Keynes/South Midlands; Ashford; London – Stansted – Cambridge.

QUANTIFYING ENVIRONMENTAL IMPACTS

6.27 Certain environmental impacts such as those on heritage, ecology and water were appraised using a specially developed methodology for assessing the significance and severity of different impacts. Four levels of adverse impact were used:

- High* adverse (HA*), an effect which in isolation could have a substantial bearing on decision-making;
- High adverse (HA), an effect which in isolation could have a material influence on decision-making;
- Medium adverse (MA), an effect which on its own could have some influence on decision-making, particularly when combined with other similar effects;
- Low adverse (LA), an effect which on its own is likely to have a negligible influence on decision-making, but when combined with other effects could have a more material influence.

ECONOMIC AND FINANCIAL APPRAISAL

6.28 Some impacts can only be addressed for the South East airports as a system, most notably the appraisal of economic and financial benefits, because providing capacity at different combinations of airports meets different amounts of the underlying demand. These impacts are covered in **Chapter 14, *Airport development up to 2030***.

CHAPTER 7

Heathrow

Current situation

- 7.1 Heathrow airport is owned by a subsidiary of BAA plc. Currently it has two main runways operating in segregated mode, i.e. each runway is used only for landing or take-off at any one time⁸. The use of the runways for landing and take-off alternates at 3pm daily, and the pattern alternates weekly, to provide noise relief for local residents. In 2000, Heathrow handled around 64 million passengers and 460,000 air transport movements (ATMs). It also handled 1.3m tonnes of freight (over 50 per cent by weight of the UK total), mainly in the baggage holds of passenger aircraft, and 3,000 freight aircraft movements.



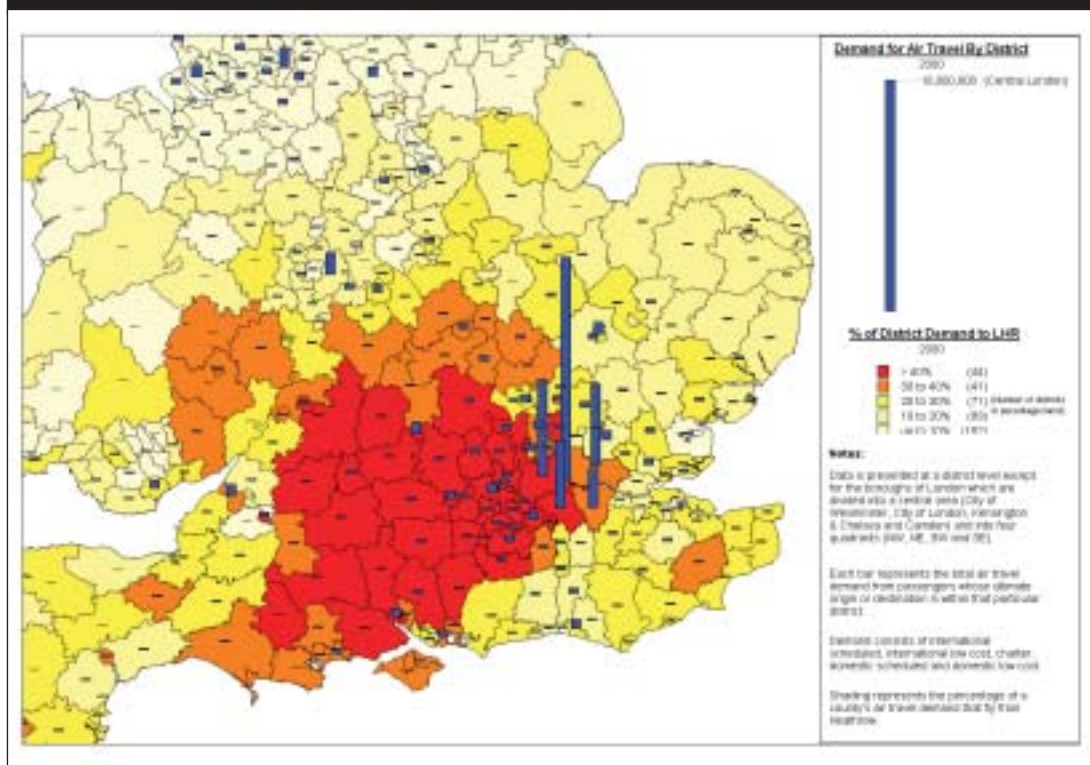
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- 7.2 In November 2001, the Secretary of State for Transport, Local Government and the Regions approved the development of a fifth passenger terminal ('Terminal 5'). That decision laid down several important conditions, including an annual limit of 480,000 on the number of flights at Heathrow from the opening of the new terminal, and a restriction of the area enclosed by the 57 decibel noise contour to 145 square kilometres as from 2016.

⁸ This is not intended to be a full description of the segregated mode arrangements at Heathrow, which for example, also differ between easterly and westerly operations and between day and night. The Government is committed to a separate consultation on certain aspects of segregated mode during easterly operations, which is entirely unrelated to SERAS.

- 7.3 Currently, Greater London accounts for half of the demand at Heathrow (excluding international passengers transferring through the airport) and, of the total air travel demand of 40 mppa from the Greater London area, 55 per cent fly from Heathrow. **Figure 7A** shows that demand for Heathrow is greatest in the western half of London and Central London, and to the west of London, north to the Cotswolds and as far west as Dorset. In excess of 40 per cent of each district's demand in this catchment fly from Heathrow.

Figure 7A: Total air travel demand by district, and percentage of this demand at Heathrow



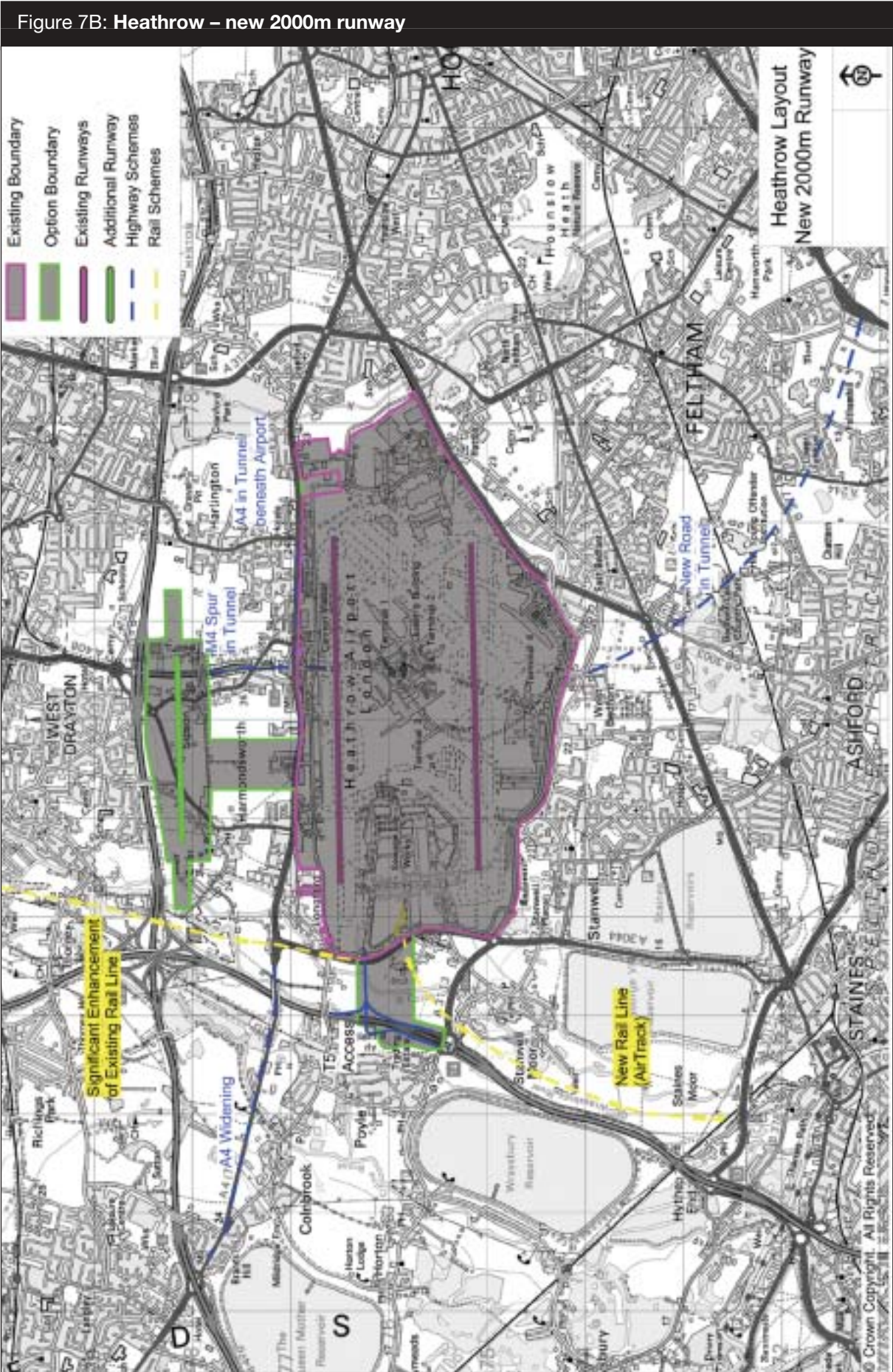
Description of options

- 7.4 At Heathrow, the maximum use case does not provide any more capacity than the base case which already assumes the construction of Terminal 5. Neither maximum use nor the new runway option presented below assumes any alteration to operation in segregated mode on the existing runways or to the numbers of night flights.
- 7.5 In Stage 2 of the SERAS study, options for a single new runway (either 2000m or 4000m long) were considered. The Government has rejected the option of a new 4000m runway, because, while the benefits of short and long runways are comparable, the disbenefits of a long runway (particularly in terms of property demolition) were very much greater than for the 2000m runway.

- 7.6 The additional terminal capacity (beyond Terminal 5) which would be required to support a new short runway is assumed to be provided through reconfiguration of the Central Terminal Area (CTA) – Terminals 1, 2 and 3 – and the space between the existing runways at Heathrow and to the south of the airport site near Terminal 4.

One additional runway

- 7.7 A new 2000m long runway would be built to the north of the existing airport (see **Figure 7B**). This is about half the length of the existing runways, and could be used only by smaller narrow-body planes. The new runway would be used for both landings and take-offs (known as “mixed mode”) throughout the day. The existing runways would continue to operate in segregated mode with alternation, as they do now. Over time, it might be possible to achieve more intensive use of the existing runways through advances in air traffic control technology and/or by introducing mixed mode operation on those runways. Such developments could increase Heathrow’s total capacity in this option from 116mppa to about 128mppa, assuming the construction of additional terminals and other facilities.



- 7.8 The 480,000 limit on the annual number of air transport movements imposed as a condition of the Terminal 5 development would clearly be exceeded with a new runway. The way that the noise and air quality impacts of a new runway might be controlled is discussed in **Chapter 16, Action to tackle environmental concerns**, which suggests, for example, that a noise contour cap of 145 square kilometres should be retained even if it were decided to proceed with a new runway.

Table 7.1: Forecasts of demand for Heathrow			
HEATHROW		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		64	460,000
Base Case/ Maximum use (with T5)	Capacity	89	480,000
	Forecast use in 2015	77	480,000
	Forecast use in 2030	89	480,000
One new runway	Capacity	116	655,000
	Forecast use in 2015	116	655,000
	Forecast use in 2030	116	655,000

- 7.9 **Table 7.1** shows that the estimate of forecast use in 2015 in the maximum use case with Terminal 5 included is lower than the forecasts produced by BAA and CAA for the current price cap review of BAA's London airports. The profile of passengers per ATM is subject to some uncertainty and will depend on the aircraft mix (e.g. trends towards the use of larger aircraft within each traffic category) and changes in the traffic mix (e.g. more long haul traffic where aircraft size is higher). By 2020, our passenger forecast is 86mppa.

Impacts on rail and road networks

RAIL

- 7.10 The planning permission for Terminal 5 requires extension of the Heathrow Express and Piccadilly Line to serve Terminal 5 before the terminal opens. BAA were also expected to consider securing a service to St Pancras and the opening of a Northern Gateway Station at Hayes and Harlington.
- 7.11 If, as seems likely, lack of platform capacity at St Pancras rules out that service, Crossrail could provide a suitable alternative connection between the airport and central London.
- 7.12 For the maximum use scenario it has been assumed that the Heathrow Express and Piccadilly Line are extended to Terminal 5, but that the only new service is a shuttle to Hayes Gateway and Ealing Broadway which does not require any new infrastructure.



BAA Aviation Picture Library



BAA Aviation Picture Library

- 7.13 Further rail services which do require new or upgraded infrastructure have been assessed in association with the increase in airport capacity provided by the extra runway option, both to relieve crowding on the Piccadilly Line and to increase the public transport accessibility of the airport.
- 7.14 Whilst the provision of new services presents opportunities, the scale of works required in the creation of these new rail links is significant. The Strategic Rail Authority points out that the benefits of these links will only be achieved with major expenditure on railway infrastructure, including grade separated junctions where necessary, to create capacity for new services and to ensure the efficient operation of existing rail services.
- 7.15 With a new runway the following services have been assumed: Guildford, Reading via Bracknell and Waterloo via Richmond (requiring the “Airtrack” link between Terminal 5 and Staines); St Albans and Watford (requiring additional tracks between Hayes and Acton); East London via Crossrail; Reading via Slough (requiring the “Western connection” link between Terminal 5 and Iver); and a range of InterCity services to the Regions (requiring an open-air station – for diesel services – to the west of Terminal 5).

ROADS

- 7.16 All road infrastructure required for Terminal 5 has been assumed.
- 7.17 With an additional runway, the A4 and M4 Spur would need to be put into tunnel and road access would need to be further improved. We have assumed a dual 2-lane highway in tunnel from the southern terminals to connect with the A316/M3.

Strategic road improvements needed

- 7.18 Even with no new runways, significantly increased congestion problems are expected to occur in the vicinity of Heathrow on the M3, M4 and M25. These problems, and the strategy to tackle them, are being addressed by the Orbit and Thames Valley Multi-Modal Studies⁹, due to report in Autumn 2002. Widening of the airport perimeter road is likely to be necessary to accommodate the traffic in the maximum use case.

⁹ For more information about these multi-modal studies:
Orbit – project website: www.orbitproject.com or contact [Stephen Dapaah \(0148 388 24826\)](mailto:Stephen.Dapaah@orbitproject.com).
Thames Valley – project website: www.thamesvalleytransport.org.uk Telephone: 01372 756909
[See also the footnotes on page 168.](#)

- 7.19 With a new runway, capacity problems on the M3, M4 and M25 would be brought forward. However, the only additional required improvement to the strategic road network, i.e. specifically required to accommodate airport related traffic, would be dualling on the A4 west of the airport to junction 5 of the M4. With that exception, and subject to the multi-modal study recommendations, the new runway would require no further enhancement of capacity on the strategic road network beyond what would in any case be required to cater for 'background' demand by 2030.

Impacts on people and the environment

LAND AND PROPERTY

- 7.20 Construction of the new runway would result in the following:
- the area of the airport would increase from 12 km² today to about 14 km²;
 - around 260 residential properties would need to be physically taken; and
 - around 230ha of agricultural land (all Green Belt) would be required.

HERITAGE

- 7.21 Construction of the new runway might impact on the Harmondsworth Tithe Barn, a Grade 1 listed building (also classified as a Scheduled Ancient Monument) – but it might be possible to reconstruct it in a new location. Also one church, eight Grade II listed buildings and 25 per cent of Harmondsworth Conservation Area would be lost.

ECOLOGY

- 7.22 No impacts were assessed as High*/High.

WATER

- 7.23 Both options, maximum use of the existing runway and a new runway option, present potential High Adverse impacts on surface water and groundwater. There are numerous areas of contamination around the airport that are at risk of being mobilised within all of the development options. Although this could be controlled through appropriate management, there is a high risk to the aquifer which is an important resource. All of the options require engineering works, diverting or culverting, to at least one river. The Environment Agency is generally opposed to culverting and such works are seen as a significant impact.
- 7.24 The extra passengers associated with an additional runway add to the demand for water which may be difficult to meet, even with supply and demand management and water saving technology.

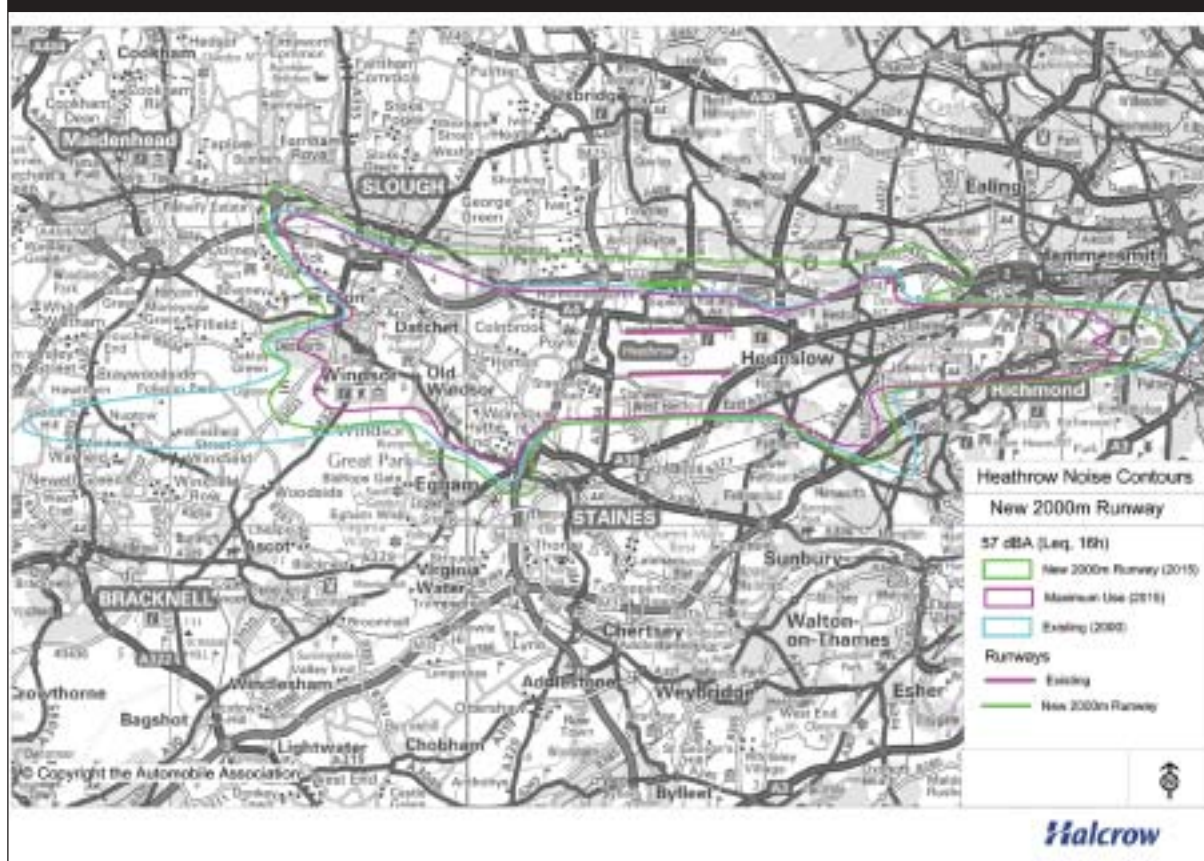
DAYTIME NOISE

- 7.25 Tables 7.2 and 7.3 show the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (0700–2300). See also **Figure 7C**.
- 7.26 It was assumed that the new runway would be limited to narrow-bodied aircraft, with few larger than Boeing 757s, operating within a range of 750 km.

Table 7.2: Size of area affected (km²)					
2000		2015		2030	
Level of Noise Leq (dBA)		Base Case/ Maximum use	1 new runway	Base Case/ Maximum use	1 new runway
>54	261	195	276	238	269
>57	149	110	156	130	153
>60	84	64	96	75	94
>63	52	39	58	45	57
>66	33	25	33	28	33
>69	21	13	19	17	19
>72	11	7	10	8	9

Table 7.3: Numbers of people affected ('000s)					
2000		2015		2030	
Level of Noise Leq (dBA)		Base Case/ Maximum use	1 new runway	Base Case/ Maximum use	1 new runway
>54	603	499	748	597	715
>57	307	226	333	278	332
>60	159	103	162	122	154
>63	82	53	76	62	73
>66	33	19	27	24	26
>69	13	5	9	8	8
>72	4	2	2	2	2

Figure 7C: 57dBA noise contours: 2000, maximum use (2015), one new runway (2015)



AIR QUALITY

7.27 Population exposed to an exceedance of EU limits:

PM_{10} – nil

NO_2 – our modelling predicts there will be significant numbers of people exposed – some 35,000 in 2015 if a third runway is built, falling to 33,000 in 2030. Table 7.4 shows that 14,000 people are exposed if no new runway is built. More than half of the NO_2 concentrations estimated are airport-related, mainly aircraft emissions.

Table 7.4: Number of people exposed to an exceedance of EU limit on NO_2 in 2015

	Maximum use	1 new runway
Core run	14,000	35,000
Sensitivity test		5,000

7.28 This modelling is based on what might be seen as conservative assumptions and so a more aggressive set of assumptions about improvements in future engine technology and both aircraft and ground operations were tested to see what more could be achieved on NO_2 with positive intervention. The number of people exposed to an exceedance falls to about 5,000 in the option with an additional runway, with airport-related sources predominant in areas around the A4 and in Harlington, Hayes and around the M4 in West Drayton. The number exposed with no new runway could be expected to fall significantly as well.

- 7.29 Another runway at Heathrow could not be considered unless the Government could be confident that levels of all relevant pollutants could be consistently contained within EU limits.
- 7.30 The Terminal 5 approval is conditional upon BAA bringing forward an action plan to show how it intends to minimise the emissions of pollutants from, and attributable to, Heathrow. NO₂ has been monitored continuously at Heathrow since 1992 at one site (LHR2). Since the Terminal 5 decision was issued a further six construction monitoring sites have been established. A further background-monitoring site in Harlington is planned.
- 7.31 The emission inventory for Heathrow is being updated for the base year 2000 and this will be used as the basis of future predictive air quality modelling at Heathrow.

Impacts on regional planning

- 7.32 Heathrow is within an area to the west and south of London referred to as the Western Policy Area in Regional Planning Guidance for the South East (RPG9). This is identified as an economically very buoyant area, where the policy is to ensure that the economy continues to grow in a sustainable way, with the minimum additional pressure on the limited labour or land resources.

EMPLOYMENT

Table 7.5: Forecast of employment ('000s)					
	1998	2015		2030	
		Base Case/ Maximum use	1 new runway	Base Case/ Maximum use	1 new runway
Direct on-site	68	65	97	61	78
Direct off-site	10	10	16	10	12
Indirect	24	23	34	21	27
TOTAL	102	98	147	92	117

- 7.33 The scope for further major expansion of Heathrow is limited by low unemployment levels and strong competition for labour from other firms in the Western Policy Area and the M4 corridor. Currently the airport accounts for 14.5 per cent of the jobs in its core catchment area (Hillingdon, Hounslow, Ealing and Spelthorne). With the proposed additional runway, this could increase to 20 per cent in 2015 (147,000 employees up from 102,000 in 1998), then decline to 16 per cent by 2030 (117,000 employees). See **Table 7.5**.

LAND USE/URBANISATION

- 7.34 The core catchment area for Heathrow is generally densely developed, with most open space designated as Green Belt. The scope for providing additional housing without incursion into the Green Belt is limited, even assuming intensive use of previously developed land.
- 7.35 The additional airport employment with the proposed runway accounts for 19 per cent of additional employment in the combined catchment areas by 2015 but 4 per cent by 2030. This would add considerably to the current pressures in the Western Policy Area, for example, on housing and property markets and also transport infrastructure. Estimates suggest that the number of dwellings required as a result of the airport development, in addition to those envisaged with the extension of RPG provision to 2030, could be in the order of 30,000 by 2015 and 10,000 by 2030.
- 7.36 If no new runway were built at Heathrow, there is likely to be a decline in airport-related employment by 2015 and 2030 through productivity improvements. If an additional runway were to be built, it is unlikely that the housing requirements or the employment land requirements could be met without loss of Green Belt to expanded urban areas.

CHAPTER 8

Gatwick

*The content of this chapter is new although much of it is based on **Annex F** of the July 2002 version of this consultation document. It also contains some new material. **Annex F** of the July document has been reproduced in **Annex J** for reference.*

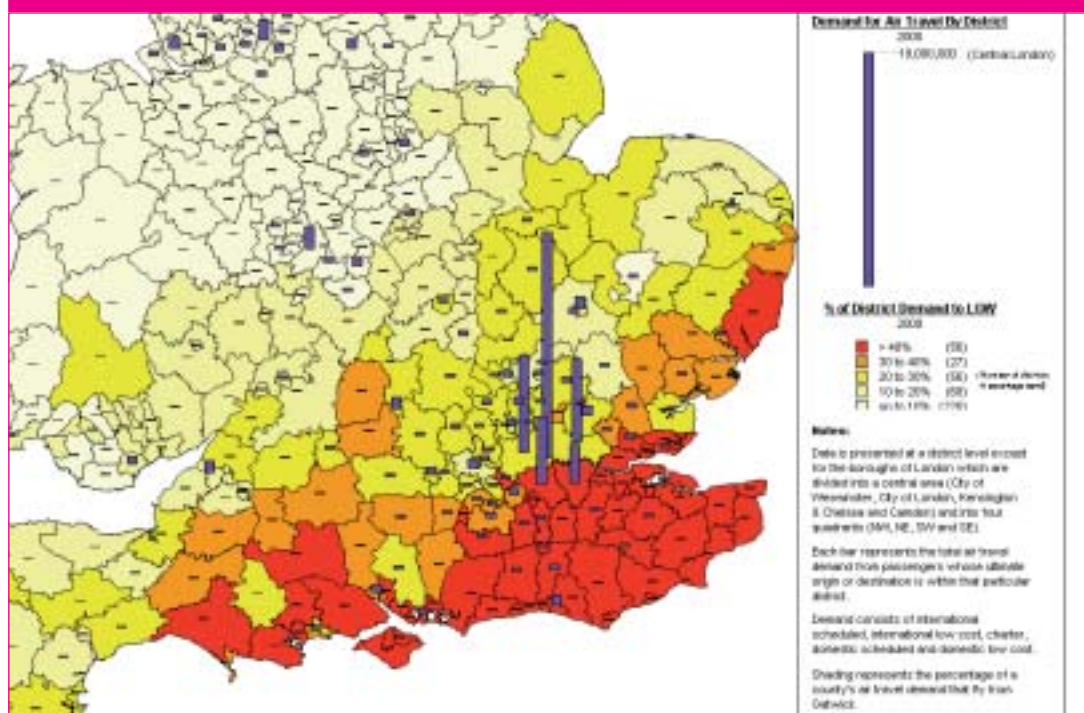


BAA Aviation Picture Library

Current situation

- 8.1 Gatwick airport is owned by a subsidiary of BAA plc. It has a single runway and two terminals. In 2000, Gatwick handled nearly 32 million passengers and around 250,000 air transport movements (ATMs), making it the second busiest airport in the UK. In addition the airport handled 320,000 tonnes of freight and 3,400 freight aircraft movements.
- 8.2 In 2001, the airport and surrounding local authorities signed an agreement under section 106 of the Town and Country Planning Act 1990, that allows Gatwick to move over time towards a terminal capacity of 40 million passengers per year (mppa) based on a single runway, two terminal airport with development remaining within the current boundaries.
- 8.3 Of the current air travel demand of 40 mppa from the Greater London area, 27 per cent fly from Gatwick. The figure below shows that Gatwick's demand comes mainly from the southern half of the London metropolitan area, and the area to the south and south east of London throughout Surrey, Sussex and Kent. Greater London accounts for 40 per cent of passengers at Gatwick.

Figure 8A: Total air travel demand by district, and percentage of this demand at Gatwick



The 2019 agreement

- 8.4 In 1979, the then British Airports Authority (now BAA plc) signed an agreement with West Sussex County Council in which the airport operator promised not to undertake various specific actions which would or might lead to a second operational runway at Gatwick. The agreement runs until 2019, and is referred to as the 2019 agreement in this consultation document.
- 8.5 The SERAS study appraised runway options at Gatwick both on the basis that the 2019 agreement was left to run its course and on the basis that action was taken, either by the parties to the agreement, or by Government through legislation, to overturn it. Information about the impacts of the runway options is provided in this document to illustrate the alternatives of new runway(s) opening both before and after 2019.
- 8.6 For the purposes of SERAS it was assumed that the first new runway in the South East would open in 2011. Common assumptions were also made about the opening dates of any subsequent runways as well as the order in which they would be built. These assumptions were applied at Gatwick regardless of the 2019 agreement. In addition, Stage 3 of SERAS considered the impact on options for a single new runway at Gatwick of leaving the 2019 agreement in place, in which case it was assumed that a new runway at Gatwick would not be open before about 2024. This assumed that all design and authorisation for a new runway would be completed by 2019. Construction could then begin on expiry of the agreement in 2019 and would last five years, which was the standard construction period applied in SERAS. Stage 3 of SERAS did not consider provision of two new runways at Gatwick with the 2019 agreement in place. In order to understand the fullest possible impacts of the option for two new runways at Gatwick with the 2019 agreement in place, it has been

assumed in further work for this second edition that both new runways would open in 2024. Information about Stages 2 and 3 (and the more recent work) is in **Annex B**.

- 8.7 For the most part the information presented below is based on appraisal done in Stages 2 and 3 of SERAS. For provision of two new runways, both in 2024, an assessment of the impacts has been made by interpolating the results from Stages 2 and 3.

Description of options

- 8.8 Options for one and two extra runways were considered as part of the SERAS study. In the base case, Gatwick is assumed to have a capacity of 40mppa, in line with the section 106 agreement signed in 2001 (see paragraph 8.2).

Maximum Use

- 8.9 This option assumes no further development of Gatwick beyond that envisaged in the 2001 agreement (see paragraph 8.2). It has been assumed that a small increase in capacity over the period to 2030 to meet rising demand could be achieved by an increase in the average size of aircraft using the airport (and hence in passengers per aircraft movement) and more intensive use in off-peak hours of terminal and other facilities.

One additional runway

- 8.10 Two options were considered and were appraised on the basis that a new runway would open either in 2011 or in 2024 (i.e. after expiry of the 2019 agreement):
- 8.11 **Close parallel** – a new full-length runway would be built to the south of and parallel to the existing runway. The two runways would be separated by 385 metres and operate in segregated mode; that is aircraft using one runway for departures and the other for arrivals. A full-length taxiway would be provided between the runways. All supporting facilities would be provided to the north of the existing runway. The capacity of the airport with this option is 62mppa. See **Figure 8B**.
- 8.12 **Wide-spaced** – a new full-length parallel runway would be built 1035 metres south of the existing runway. This additional separation allows for independent, mixed mode operation on the two runways; that is aircraft arriving and departing from the same runway (as is the case for the current runway). Aircraft stands would be situated between the two runways, which would also increase capacity by reducing the need for taxiing movements across the existing runway. The capacity of the airport with this option is 83mppa. See **Figure 8C**.

Two additional runways

- 8.13 One option with two new runways is presented in this chapter on the basis that the runways would open either sequentially in 2011 and 2018, or both in 2024 (i.e. after expiry of the 2019 agreement).

- 8.14 Two new full length wide-spaced runways would be added: a parallel full length runway 1035m to the south of the existing runway (in effect the wide-spaced runway option described above) and another some 2900m to north, staggered 2000m to the west, permitting independent operations on the three runways. The new northern runway would be operated only to and from the west, to avoid overflying Horley, with the new southern runway operating to and from the east. The existing runway would continue to operate as it does today. The capacity of the airport with this option is 115mppa. See **Figure 8D**.

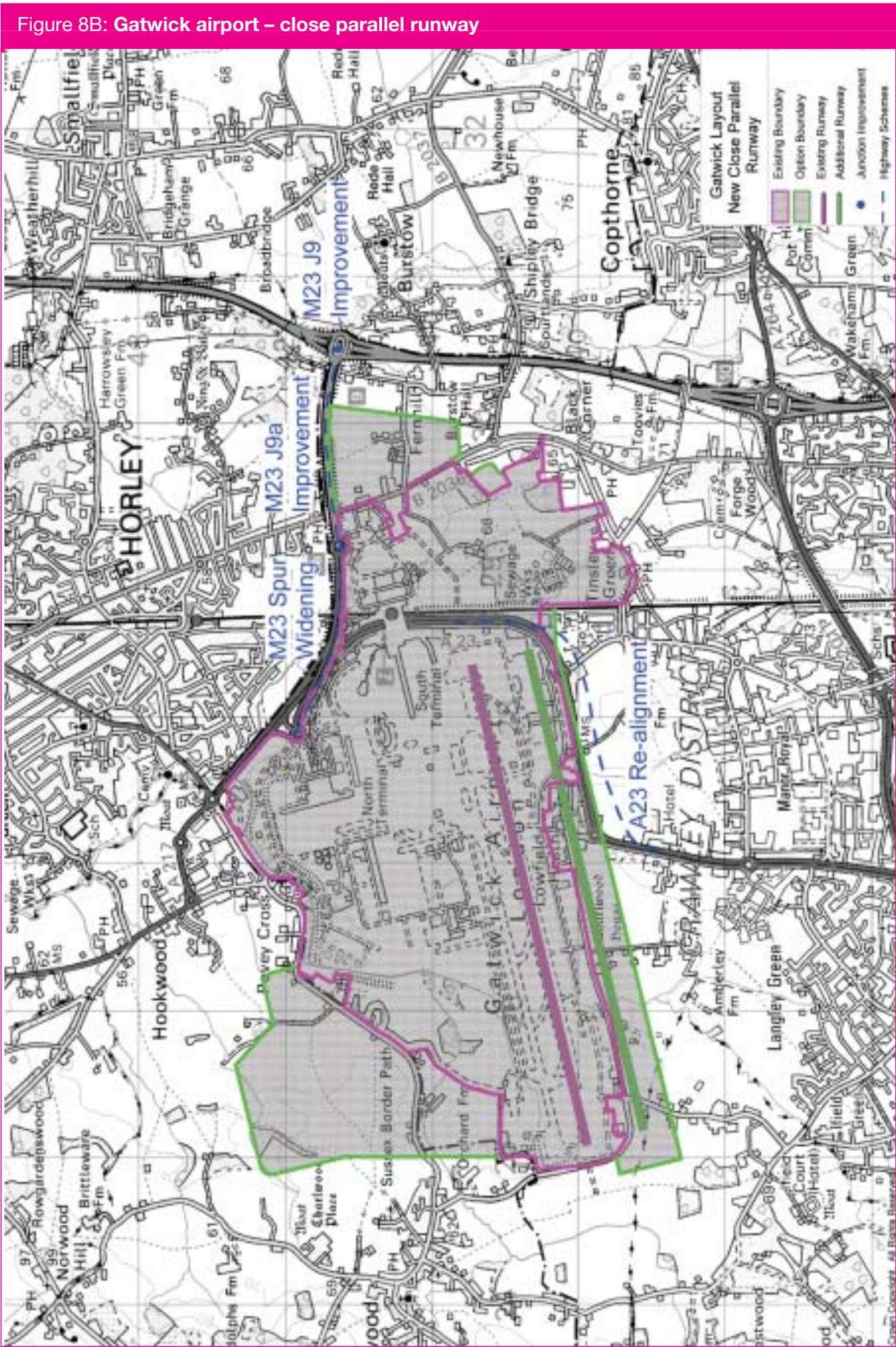


Figure 8C: Gatwick airport – wide-spaced runway

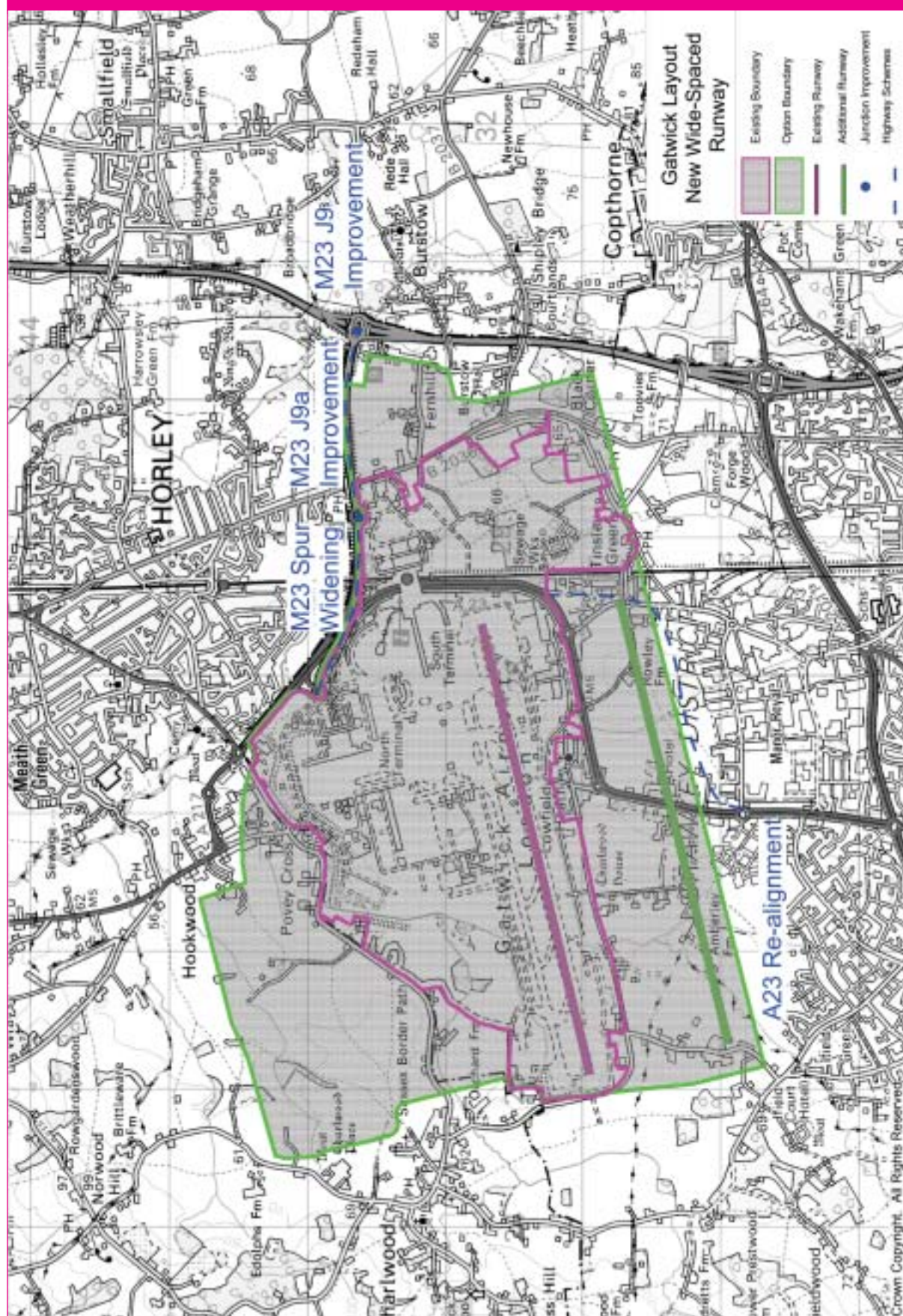
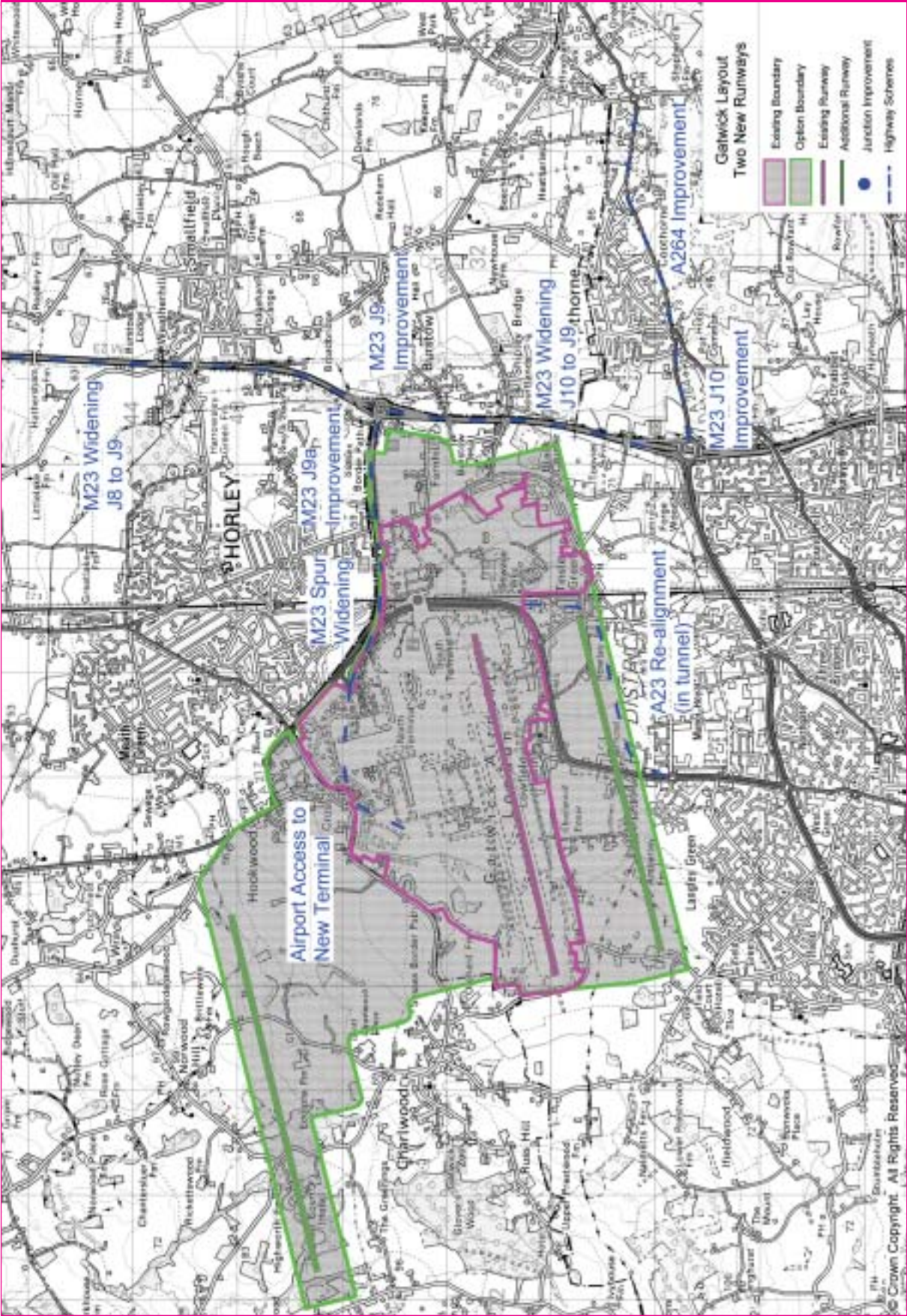


Figure 8D: Gatwick airport – two new runways



8.15 Table 8.1 summarises the capacity of various options and forecasts of air traffic.

Table 8.1: Forecasts of demand for Gatwick			
GATWICK		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		32	250,000
Base Case	Capacity	40	260,000
	Forecast use in 2015	36	260,000
	Forecast use in 2030	40	260,000
Maximum Use	Capacity	46.5	260,000
	Forecast use in 2015	37	260,000
	Forecast use in 2030	41	260,000
Close parallel runway [opening in 2011]	Capacity	62	378,000
	Forecast use in 2015	52	378,000
	Forecast use in 2030	61	378,000
Close parallel runway [opening in 2024]	Forecast use in 2015	N/A	N/A
	Forecast use in 2030	62	378,000
Wide-spaced runway [opening in 2011]	Capacity	83	486,000
	Forecast use in 2015	68	486,000
	Forecast use in 2030	77	486,000
Wide-spaced runway [opening in 2024]	Forecast use in 2015	N/A	N/A
	Forecast use in 2030	76	486,000
Two new runways [one in 2011, one in 2018]	Capacity	115	675,000
	Forecast use in 2015	68	486,000
	Forecast use in 2030	109	675,000
Two new runways [opening in 2024]	Capacity	115	675,000
	Forecast use in 2015	N/A	N/A
	Forecast use in 2030	112	675,000

Impacts on rail and road networks

RAIL

- 8.16 Enhancements are already planned to Gatwick airport station itself and to the South Central, Thameslink and CrossCountry rail services to Gatwick. No further additions in the scale and scope of rail services were assumed for the addition of the close parallel runway. By 2020, in the maximum use scenario, or with the addition of a close parallel runway, some enhancements would be necessary to track, signalling and the station itself at Gatwick to allow more trains to call in the peak. With the close parallel runway, works to enhance capacity elsewhere might be necessary to cater for airport-related and other users of the London-Brighton line.
- 8.17 To cope with the greater demand generated by a wide-spaced runway, or with the option for two new runways, additional, accelerated airport expresses were assumed in order to attract airport demand (and some commuters) away from crowded peak period services via London Bridge. To accommodate these trains, infrastructure works would be needed between Coulsdon and Selhurst/Norwood Junction, possibly including a long, tunnelled underpass at East Croydon, together with increased capacity at London terminals.

ROADS

- 8.18 The addition of one or two new runways would require some local road closures and the widening of both the M23 airport spur and the A23 access road to the airport.

Strategic road improvements needed

- 8.19 Construction of one new runway would require the diversion of the A23 to the south of the airport (at-grade for the close parallel runway option, in tunnel for the wide-spaced runway option and the option for two new runways). One new runway would require no further enhancement of capacity on the strategic road network to provide for airport-related traffic beyond what would in any case be required to cater for 'background' demand by 2030.
- 8.20 By 2030, the option for two new runways would require widening of the M23 between junctions 8 and 10.

Impacts on people and the environment

LAND AND PROPERTY

- 8.21 Construction of a new runway would result in the following:
- the area of the airport would increase from 7.7 km² today to 11 km² (close parallel), 15 km² (wide spaced) or 18 km² (two new runways);
 - around 50 (close parallel), 300 (wide-spaced) or 430 (two new runways) residential properties would need to be physically taken;
 - the loss of 130ha (close parallel), 200 ha (wide-spaced) or 260ha (two new runways) of high grade agricultural land; and
 - the loss of 120ha (close parallel), around 240ha (wide spaced) or 530ha (two new runways) of Green Belt.

HERITAGE

- 8.22 Three (close parallel), five (wide-spaced) or six (two new runways) Grade II* listed buildings would be lost as a result of construction, as well as four (close parallel), 12 (wide-spaced) or 18 (two new runways) Grade II listed buildings. In addition the two new runway option would result in the loss of a part of the conservation area at Charlwood Village.

ECOLOGY

- 8.23 No impacts were assessed as High* or High adverse with either option for one new runway. The two runway option would have effects on a number of sites, including three Sites of Nature Conservation Interest and the Glovers Wood SSSI, which, in aggregate, might result in High Adverse impacts.

WATER

- 8.24 All runway options would require engineering work, diverting or culverting, to several rivers. The Environment Agency is generally opposed to culverting and such works are seen as a significant impact.

DAYTIME NOISE

- 8.25 **Tables 8.2 and 8.4** show the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (0700–2300) on the assumption that the 2019 agreement is overturned. **Tables 8.3 and 8.5** show the same information on the assumption that the 2019 agreement remains in place and no new runways come into operation at Gatwick before 2024. See also **Figures 8E, 8F, 8G, 8H and 8J**.

Table 8.2: **Size of area affected (Km²)**

Noise Level (Leq) in dBA									
2000			2015			2030			
Level of Noise Leq (dBA)	Base Case	Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway	Two new runways	
>54	118	87	88	112	133	110	159	184	305
>57	72	52	52	65	80	63	87	107	178
>60	44	31	31	39	51	37	51	67	107
>63	27	18	18	23	32	22	30	42	63
>66	16	10	10	14	19	13	18	26	39
>69	9	5	6	8	10	7	11	15	22
>72	5	3	3	4	5	4	6	7	11

Table 8.3: **Size of area affected (Km²) [With the 2019 agreement]**

Table 8.5: Noise level (Leq) in dB(A) for different runway configurations						
2000		2030				
Level of Noise Leq (dBA)		Base Case	Maximum use	Close parallel runway	Wide spaced runway	Two new runways
>54	118	87	110	145	172	See footnote below Table 8.5
>57	72	52	63	82	102	
>60	44	31	37	48	64	
>63	27	18	22	29	41	
>66	16	10	13	17	25	
>69	9	5	7	10	14	
>72	5	3	4	6	7	

See footnote
below Table 8.5

Table 8.4: Numbers of people affected ('000s)

2000			2015			2030			
Level of Noise Leq (dBA)	Base Case	Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway	Two new runways	
>54	21	9	11	14	29	14	25	42	61
>57	9	4	4	5	13	6	10	23	31
>60	3	1	1	2	5	2	3	8	15
>63	1	0.7	0.7	1	2	1	1	3	5
>66	0.5	0.3	0.3	0.5	0.5	0.3	0.4	1	2
>69	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.9
>72	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.2

Table 8.5: Numbers of people affected ('000s) [With the 2019 agreement]

2000		2030				
Level of Noise Leq (dBA)		Base Case	Maximum use	Close parallel runway	Wide spaced runway	Two new runways
>54	21	9	14	23	40	
>57	9	4	6	9	21	
>60	3	1	2	3	8	See footnote below Table 8.5
>63	1	0.7	1	1	3	
>66	0.5	0.3	0.3	0.5	1	
>69	0.2	0.1	0.2	0.3	0.2	
>72	<0.1	<0.1	<0.1	0.1	<0.1	

Note – the noise impacts of the option for two new runways both opening in 2024 have not been appraised. However, the results of the traffic forecasting model for this scenario show that the number and type of aircraft movements by 2030 are very similar to the option with the first new runway assumed to open in 2011 and the second in 2021. It is possible to conclude that the noise impacts of this option in 2030, assuming opening in 2024, would be broadly as shown in Tables 8.2 and 8.4.

Figure 8E: 57 dBA noise contours: 2000, maximum use (2015), new close parallel runway (2015)

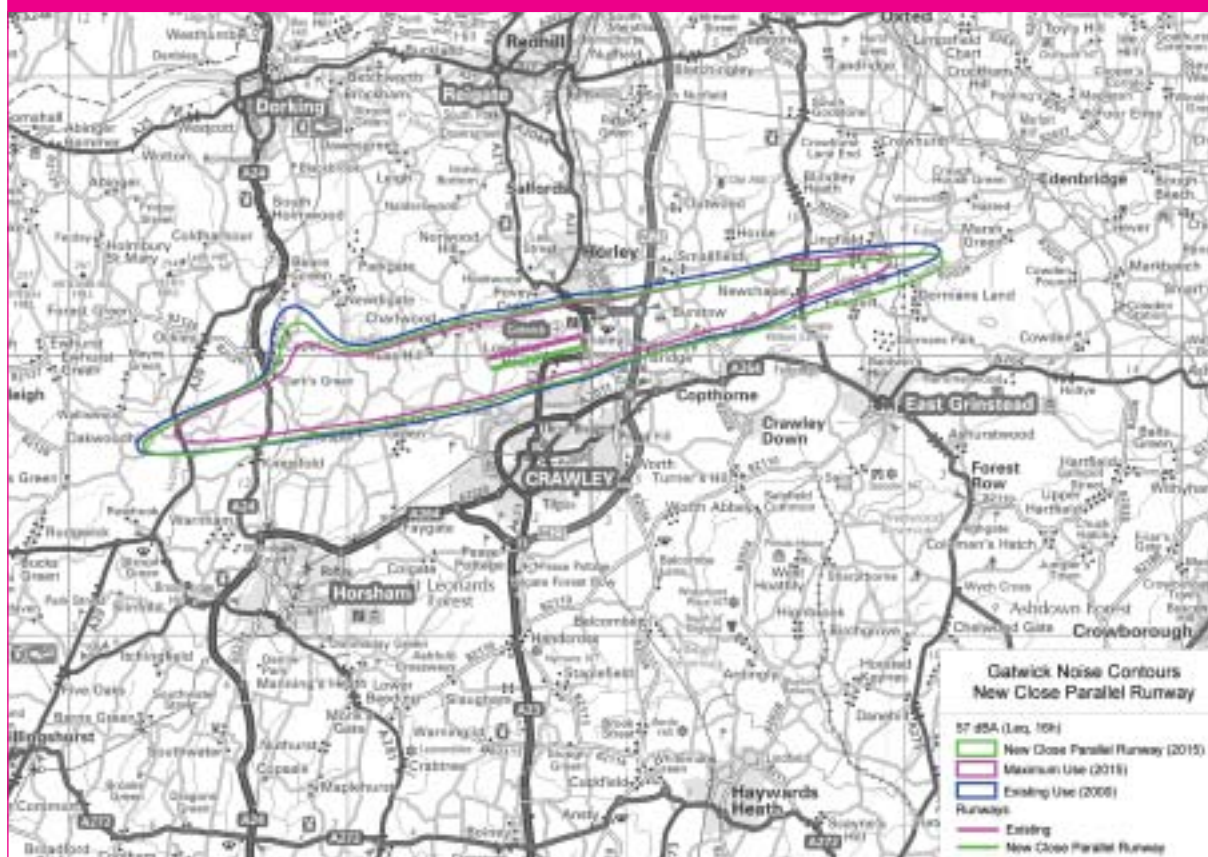


Figure 8F: 57 dBA noise contours: 2000, maximum use (2030), new close parallel runway (2030 – assumes opening in 2024)

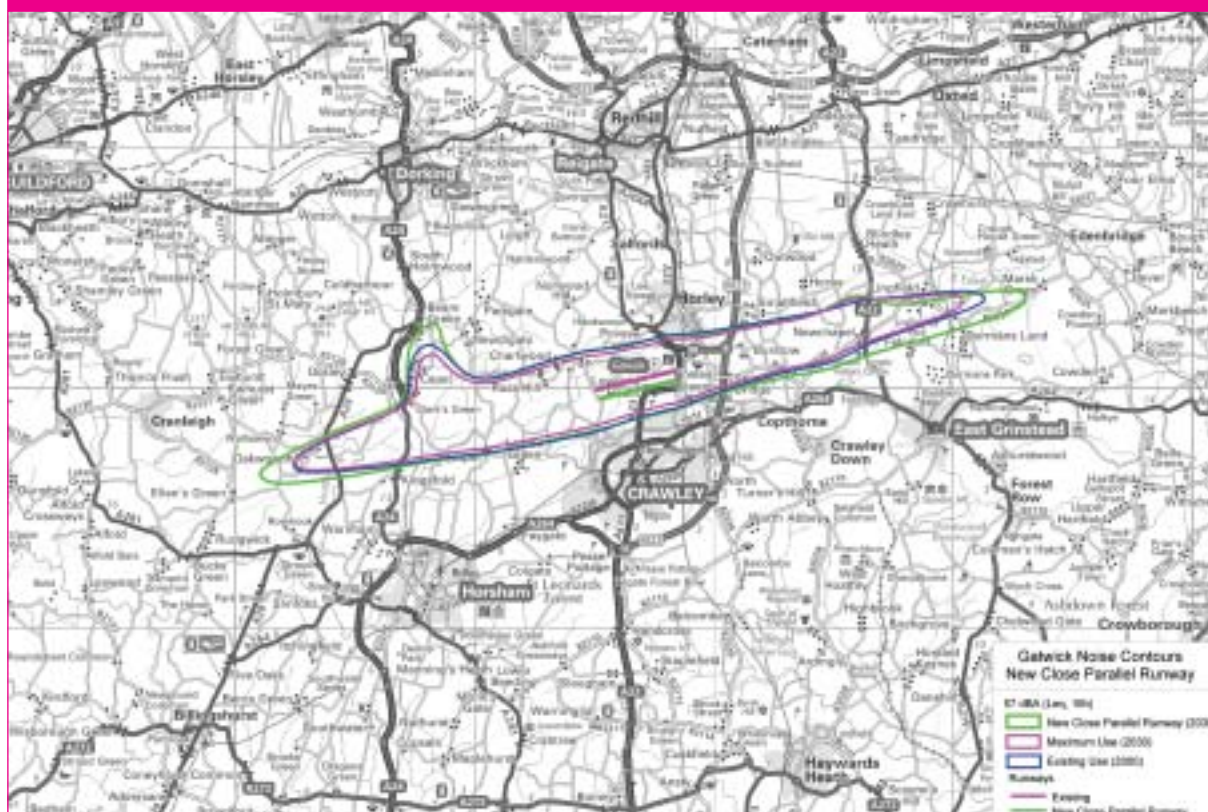


Figure 8G: 57 dBA noise contours: 2000, maximum use (2015), new wide-spaced runway (2015)

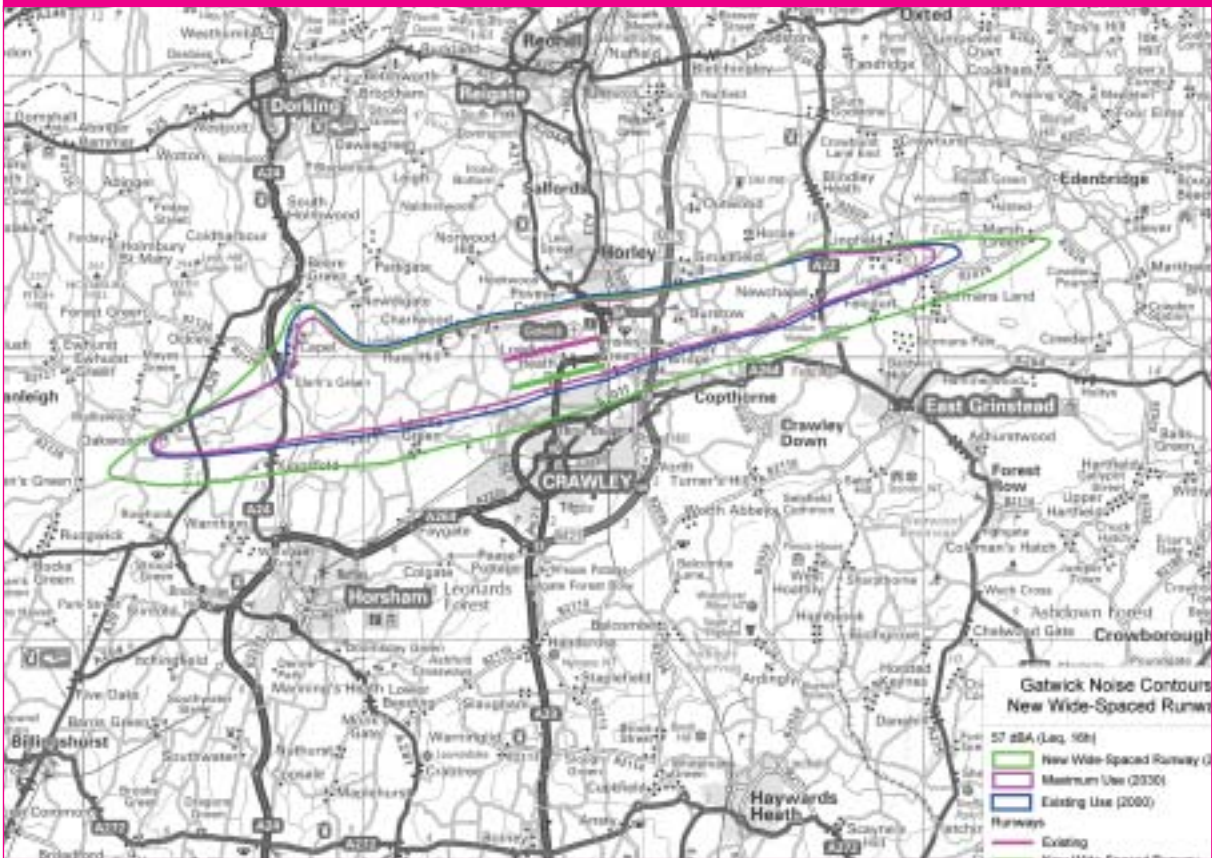


Figure 8H: 57 dBA noise contours: 2000, maximum use (2030), new wide-spaced runway (2030 – assumes opening in 2024)

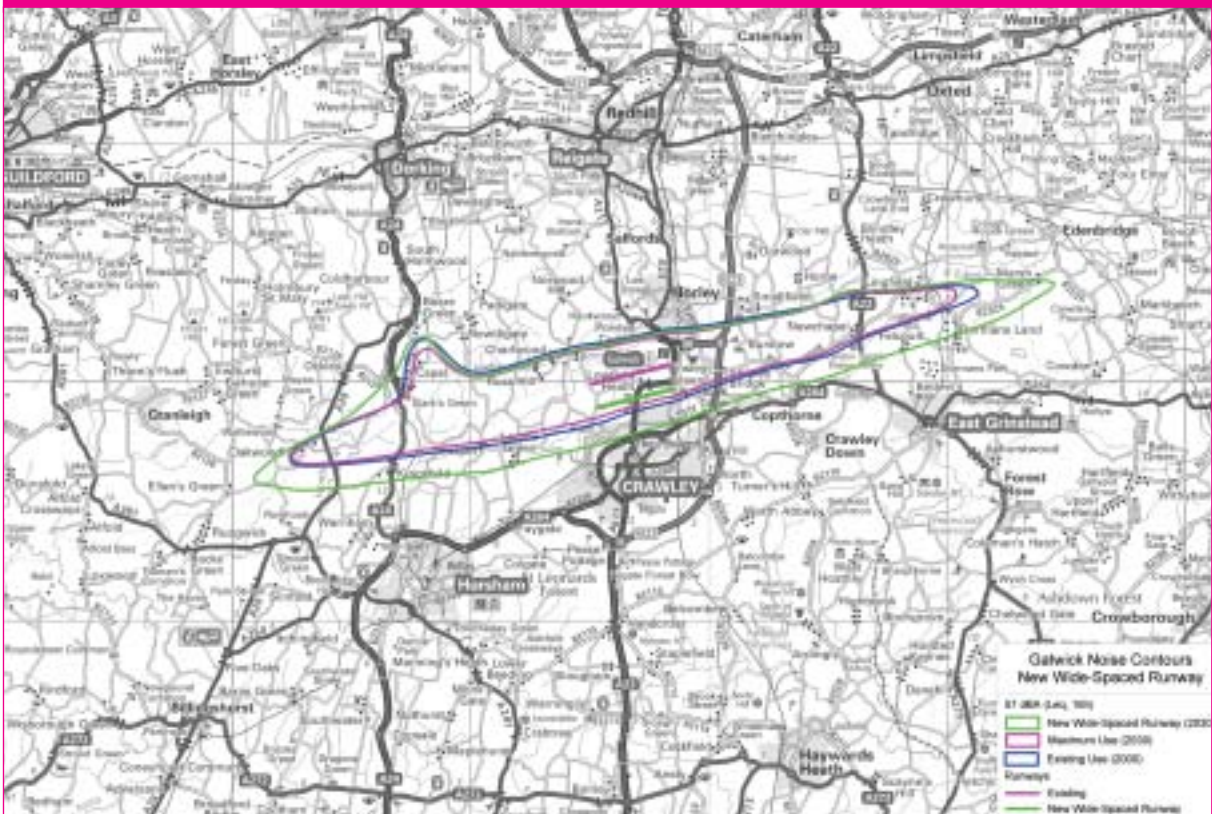
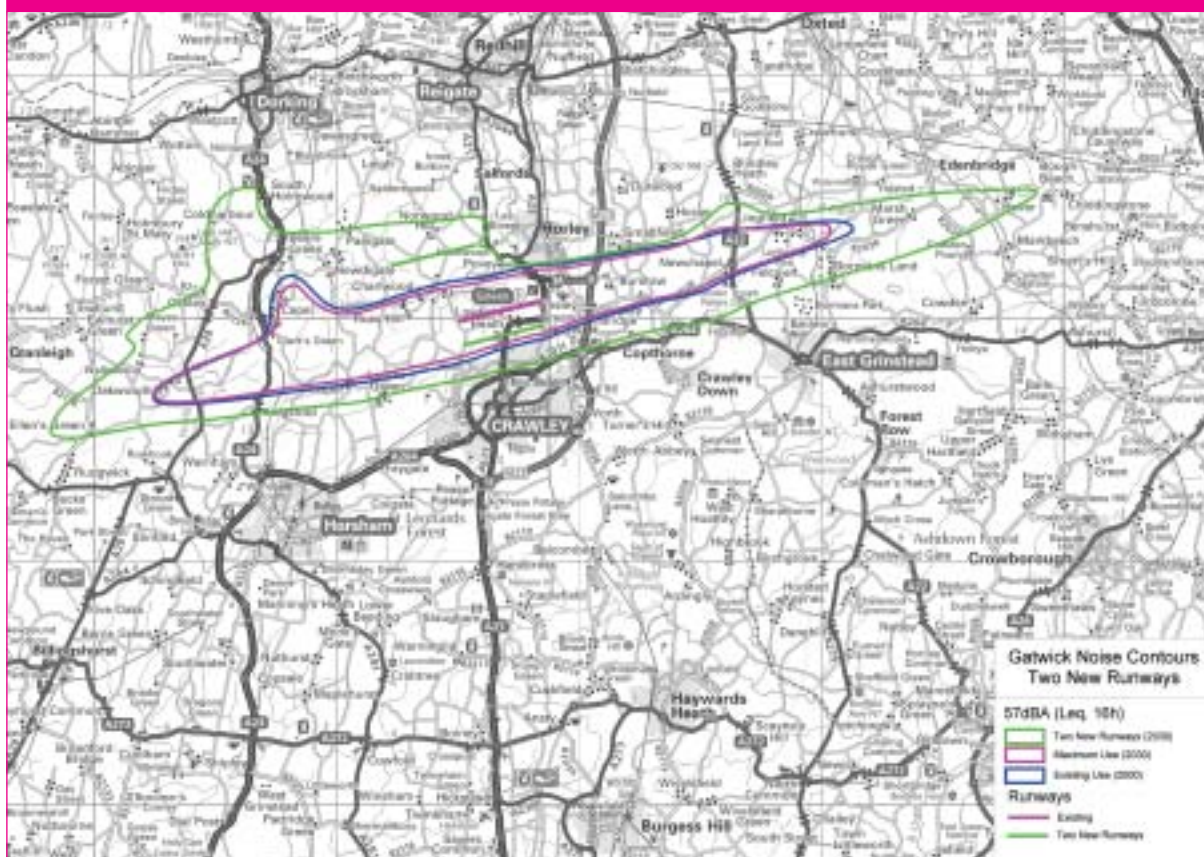


Figure 8J: 57 dBA noise contours: 2000, maximum use (2030), two new runways (2030)



AIR QUALITY

8.26 Population exposed to an exceedence of EU limits:

PM_{10} – nil for both options.

NO_2 – The modelling predicts that by 2015, on the assumption that the 2019 agreement is overturned, about 600 people could be exposed if maximum use is made of the existing runway and 1000 people with the close parallel runway (and a similar number with the wide-spaced option). By 2030, some 3800 people could be exposed to an exceedence with either the close parallel or the wide-spaced option and about 7,000 with the option for two new runways.

8.27 If runway development was delayed until after 2019, the numbers potentially affected in 2030 would be slightly lower, between 3,500 and 3,700, for the single runway options and would be broadly similar with two new runways.

8.28 Application of the different assumptions used in sensitivity tests of the air quality appraisal at Heathrow (see paragraph 7.28 and Chapter 7 of the SERAS Stage 3 report) would suggest that the predicted exceedences for Gatwick described above could be greatly reduced or eliminated through control and mitigation measures.

Impacts on regional planning

- 8.29 The area to the west and south of London is referred to as the Western Policy Area in Regional Planning Guidance for the South East (RPG9). This is identified as an economically very buoyant area where the policy is to ensure that the economy continues to grow in a sustainable way with the minimum additional pressure on the limited labour or land resources. Gatwick is identified as being within this area, although RPG9 does also suggest that growth at Gatwick airport could have economic benefits for Brighton and other coastal towns in need of regeneration.

EMPLOYMENT

- 8.30 Without a new runway, continuing improvements in labour productivity are likely to drive down airport-related employment. On the assumption that the 2019 agreement is overturned, runway development could generate between 10,000 and 27,000 additional airport-related jobs in total by 2015. By 2030, the total additional employment might be 8,000 (close parallel runway), 20,000 (wide spaced runway) or around 50,000 (two new runways).

Table 8.6: Forecast of employment ('000s)

	1998	2015	2030					
		Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway	Two new runways
Direct on-site	26	25	35	46	22	33	42	61
Direct off-site	4	4	6	8	3	6	7	10
Indirect	13	19	12	16	8	12	15	21
TOTAL	43	38	53	70	33	51	64	92

- 8.31 With development of the close parallel runway, off-site employment needs in 2015 could be met by forecast labour surpluses on the South Coast and in Croydon assuming provision of good surface transport links. The higher employment demands of the wide-spaced runway would put pressure on the labour market.
- 8.32 In the longer term, assuming development of two new runways, the additional requirement for workers would put further pressure on the labour market. However, if the road and rail improvements mentioned above are in place, and taking account of the fact that airport employees do not generally travel in peak hours when capacity is most heavily used, airport growth could be accommodated in the wider Croydon-Gatwick-Brighton corridor.
- 8.33 If the 2019 agreement remains in force and runway development at Gatwick is delayed until after 2019, labour market pressures with one new runway would be reduced, but a very rapid development of two new runways after 2019 would place heavy pressures on labour markets.

LAND USE AND URBANISATION

- 8.34 On the assumption that the 2019 agreement is overturned, the additional employment at Gatwick with an additional close parallel runway would represent an increase in the airport's share of core catchment area (Crawley, Reigate and Banstead, Mid Sussex) jobs from the current 13.8 per cent to 15 per cent in 2015. With an additional wide-spaced runway the airport's share of core catchment area jobs would have to increase to 20 per cent in 2015.
- 8.35 By 2030, the airport's share of core catchment area employment would be 13 per cent (close parallel runway), 18 per cent (wide spaced runway) or 24 per cent (two new runways) whether or not the 2019 agreement is overturned.
- 8.36 The core and wider catchment areas for Gatwick (the wider catchment area includes the boroughs of Sutton and Croydon, Mole Valley, the West Sussex districts of Horsham and Worthing, Brighton and Hove, and the East Sussex districts of Lewes and Wealden) are areas with a potential housing shortfall. If the current rates of planned housing provision for these areas were to be extended to 2030, around 145,000 additional dwellings could be provided. This would imply a shortfall of around 60,000 on the number of dwellings likely to be required to satisfy total employment needs. The close parallel and wide-spaced runway options would account for around 6 per cent and 15 per cent respectively of employment growth in these areas, and so can be said to be responsible for around 3,000 or 9,000 of that additional housing requirement. The option for two new runways would account for 35 per cent of employment growth in these areas, or around 21,000 of the additional housing requirement.
- 8.37 Providing additional houses in the core catchment area would require Green Belt releases, which would be difficult to achieve in areas said to be approaching their environmental capacity, particularly for the option for two new runways. There may be scope for meeting some employment requirements by locating off-airport employment in areas such as Brighton, within the designated Priority Area for Economic Regeneration.

CHAPTER 9

Stansted

Current situation

- 9.1 Stansted airport is owned by a subsidiary of BAA plc. It has a single runway and terminal. In 2000, 12 million passengers used the airport and there were around 133,000 air transport movements. The airport also handled 168,000 tonnes of freight and 14,000 freight air transport movements.

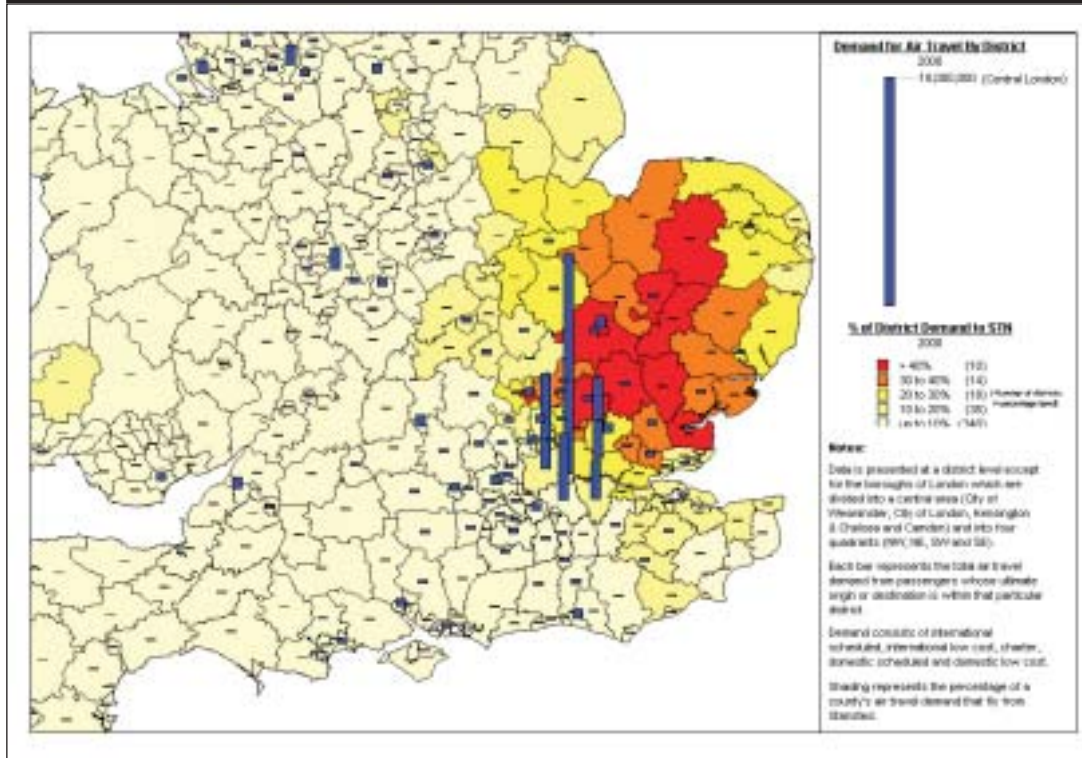


BAA Aviation Picture Library

- 9.2 In August 2001, Stansted Airport Ltd (part of BAA) submitted a planning application to Uttlesford District Council to increase the capacity of the airport from 15 to 25 mppa.[†]
- 9.3 **Figure 9A** shows that currently Stansted meets 5 per cent of Greater London demand, with a higher proportion from North East London. Over 40 per cent of Stansted's traffic is from Greater London. Stansted's catchment also includes the whole of the East of England region.

[†] Permission was granted subject to planning conditions and a section 106 agreement in September 2002 and was confirmed in January 2003.

Figure 9A: Total air travel demand by district, and percentage of this demand at Stansted



Description of options

- 9.4 Options for one, two and three extra runways are proposed. For the larger options it is assumed that the role of the airport would change. Stansted is currently a major airport for low cost carriers and serves a relatively local catchment. With expansion there, and particularly if there were no significant increase in capacity at other South East airports, Stansted would have the infrastructure to become a second international hub airport.
- 9.5 The base case assumes the current capacity of 15mppa (i.e. it does not assume the additional 10mppa increase to 25mppa for which BAA is seeking planning permission).[†]

Maximum use

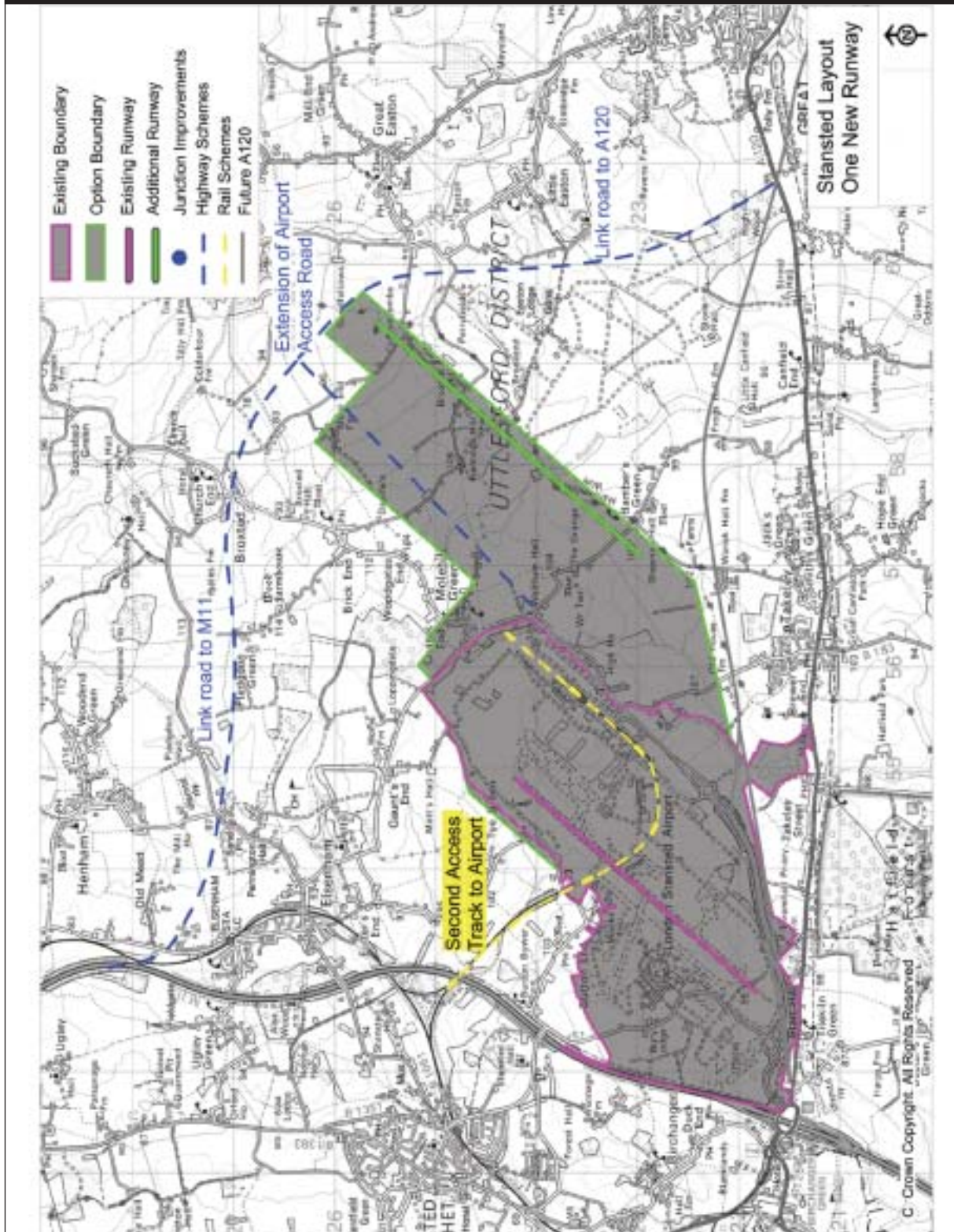
- 9.6 The assumed capacity of the existing runway is 35mppa.

[†] Permission was granted subject to planning conditions and a section 106 agreement in September 2002 and was confirmed in January 2003.

One new runway

- 9.7 A new full-length runway is added 2450m to the east of the existing runway. Terminal and aircraft stand capacity is provided between the two runways. It is assumed that the runways would, eventually, when demand required this, be operated in ‘mixed mode’. See Figure 9B.

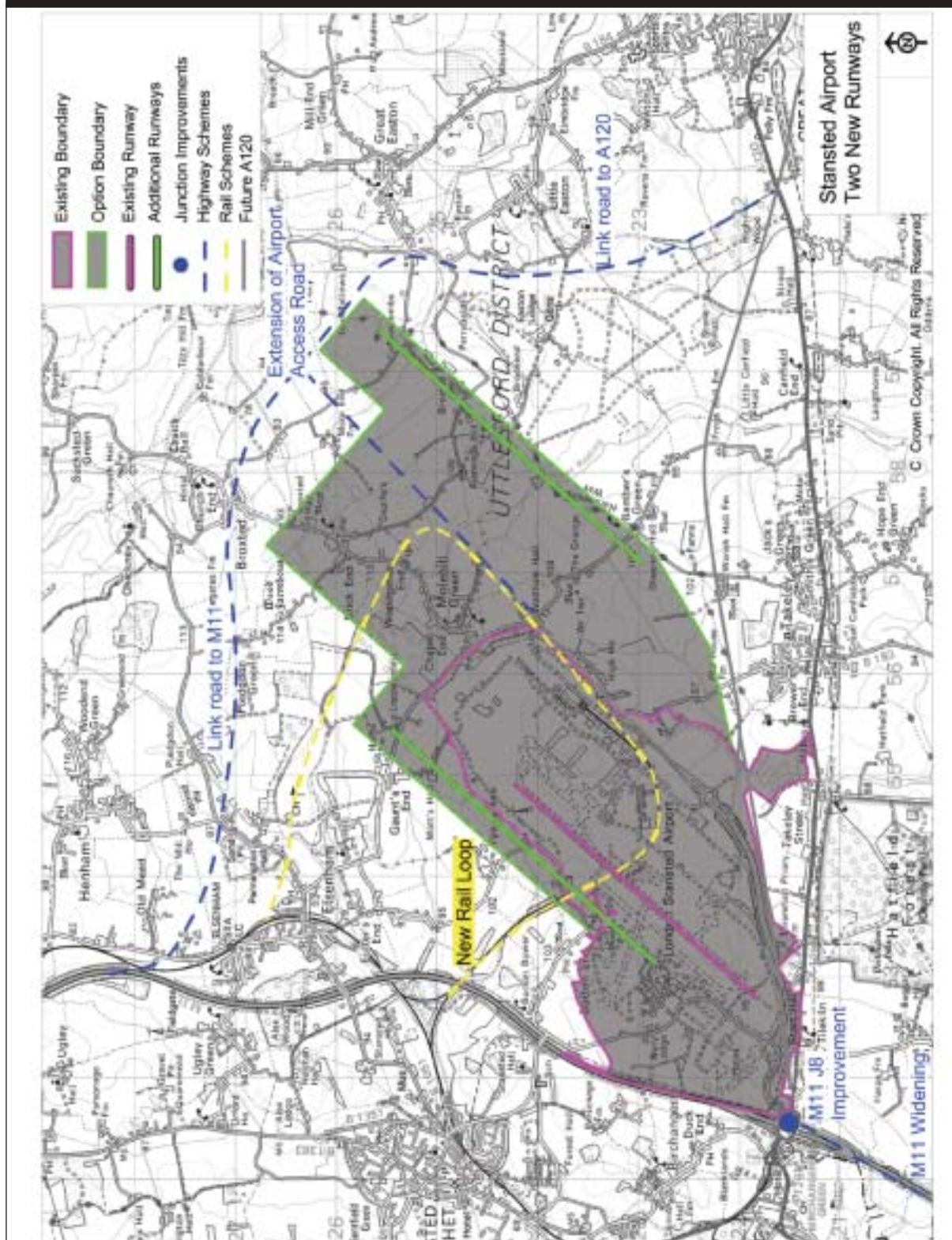
Figure 9B: Stansted – one new runway



Two new runways

9.8 A close parallel runway is added to the north west side of the existing runway. See Figure 9C.

Figure 9C: Stansted – two new runways



Three new runways

- 9.9 A close parallel runway is added to the east side of the new wide spaced runway (see ‘one new runway’ above). As a result the airport has two pairs of close parallel runways. See Figure 9D.

Figure 9D: Stansted – three new runways

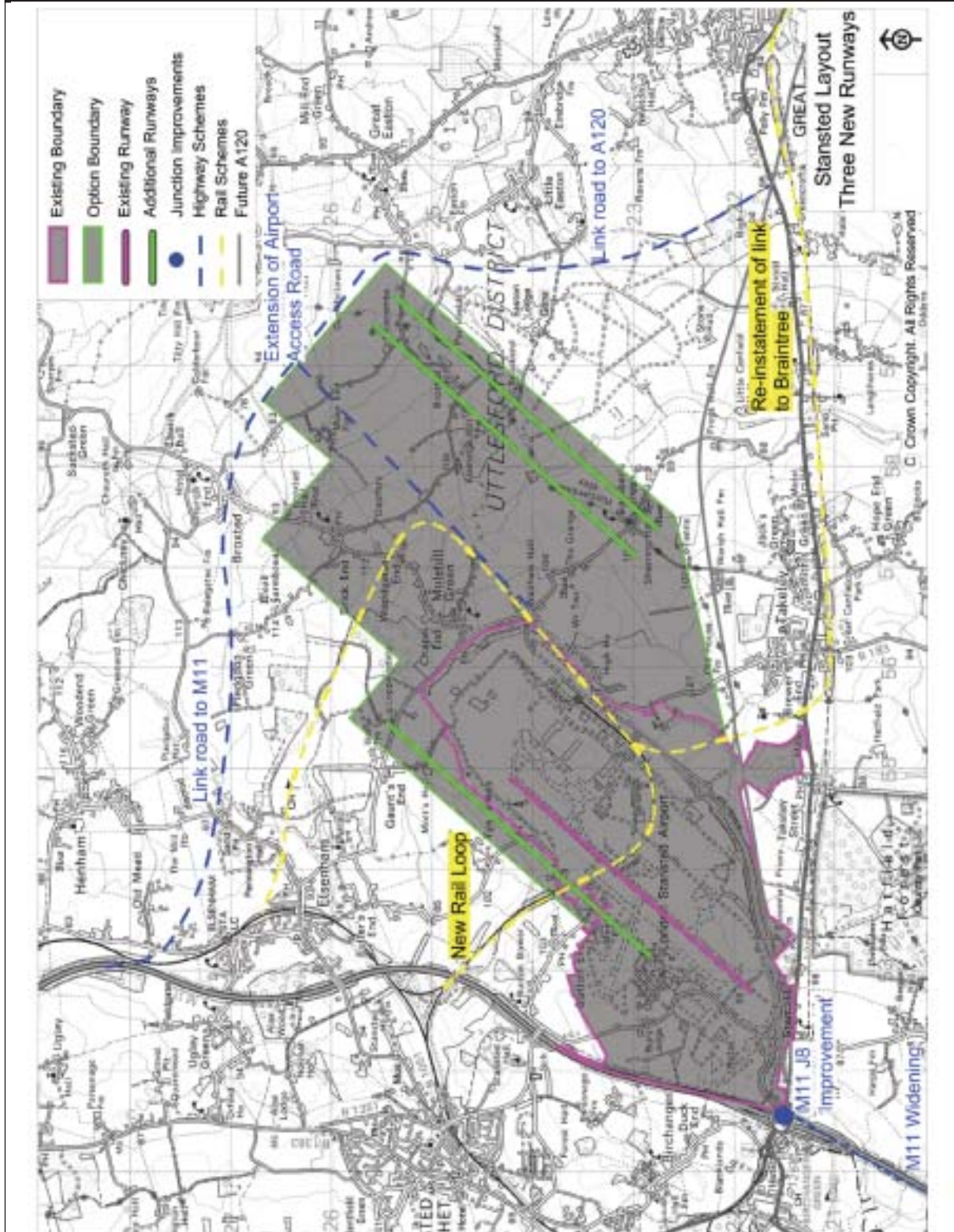


Table 9.1: Forecasts of demand for Stansted

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	158,000
	Forecast use in 2030	15	131,000
Maximum Use	Capacity	35	260,000
	Forecast use in 2015	23	237,000
	Forecast use in 2030	26	231,000
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	102	637,000
	Forecast use in 2015	64	492,000
	Forecast use in 2030	98	624,000
3 new runways	Capacity	129	756,000
	Forecast use in 2015	64	492,000
	Forecast use in 2030	122	746,000

- 9.10 For Stansted to be viable as a hub airport, a significant amount of traffic would need to move there at the outset to create a network of services and frequencies. To replicate this we have in our forecasting “seeded” the airport. Seeding effectively means that an operator or operators move a major tranche of services to an airport as a new runway opens. Long haul scheduled services are seeded – to the extent of 40 per cent of Heathrow’s 1998 scheduled services in these markets – from the opening of a new runway in 2011. Otherwise it would take a long time for Stansted to build up significant capability in these markets.

Impacts on rail and road networks

RAIL

- 9.11 The Strategic Rail Authority (SRA) is currently working with BAA on proposals to increase the capacity of the West Anglia route under its West Anglia Route Modernisation Enhancements Project (WARM-E). In addition, Railtrack plc (currently in administration)[†] is undertaking work to the route to improve reliability and replace life-expired infrastructure on the route under its West Anglia Route Modernisation Renewal Project (WARM-R).
- 9.12 The SRA has identified, as part of its evaluation of BAA’s planning application proposing to expand Stansted’s capacity to 25 mppa,^{††} certain elements of additional rail infrastructure necessary to accommodate the growth of the airport. The SRA has also identified that the growth of the airport up to the maximum use of the single current runway will require additional rail infrastructure, including the provision of an additional tunnel bore on the approach to the airport.

[†] Now Network Rail

^{††} Permission was granted subject to planning conditions and a section 106 agreement in September 2002 and was confirmed in January 2003.

- 9.13 The precise timing and nature of the railway infrastructure works required to support Stansted Airport will depend on the mix of air services using the airport as it expands. Details of the railway works set out below give an indication of what may be needed.



BAA Aviation Picture Library

- 9.14 To cater for increased demand with the addition of one new runway (as is the case for the full use of the existing runway), a second rail tunnel between the airport and the West Anglia route would be needed. Further works on the line to London would be required including additional tracks. Works to provide additional capacity on the line to Cambridge and on to the East and West Midlands would be required to accommodate any increase in services necessary to support the airport and to allow more frequent airport expresses to overtake stopping trains.
- 9.15 In the options for two new runways, very significant new rail infrastructure would be required. A second access line to the Cambridge line and works on the railway in Cambridgeshire and in the Midlands would be required to provide a wider range of services to the north and East Anglia, so increasing the airport's public transport accessibility. Increased frequencies of services to London would require the construction of a new railway (either parallel with the existing railway lines or in a new corridor) south of the airport and other enhancements depending on the pattern of services proposed. Additional London terminal capacity will also be required. Alternatively, Stansted services via Stratford might be incorporated into Crossrail, but they would need to displace other Crossrail services in the current plans. The Crossrail project is currently identifying preferred routes, and these routes might have to be reconsidered in the light of future airports policy.
- 9.16 The three runway Stansted option might, in addition, require a new line to the east of the airport, allowing services to Norwich, Ipswich and Chelmsford.

ROADS

- 9.17 We have assumed completion of the new slip roads at the M11 junction 8 (currently under construction),[†] and improvement and re-alignment of the A120.

[†] The slip roads opened to public traffic in December 2002.

- 9.18 All the new runway options would require dual carriageway access roads to be built connecting the airport to the improved A120 to the east and to the M11 to the north at a new junction between junctions 8 and 9.

Strategic road improvements needed

- 9.19 With maximum use of the existing runway, there would be significantly increased congestion problems in the vicinity of Stansted Airport on the A10, A120 and M25. The Orbit and London-South Midlands Multi-Modal Studies¹⁰ are addressing problems on these roads.
- 9.20 Even with no new runway, the SERAS consultants assumed that by 2030 the M25 would need to be improved to dual 4-lane standard between junctions 26 and 27. This will be reviewed in the light of the Orbit Multi-Modal Study recommendations.
- 9.21 With one new runway, no further need for improvements to the strategic road network has been identified over and above those that would be required to accommodate the maximum use case. By 2030, the option adding two runways would require widening of the M11 between junctions 6 and 7. Adding three runways would also require widening between junctions 7 and 8.



M11 motorway junction 8

BAA Aviation Picture Library

Impacts on people and the environment

LAND AND PROPERTY

- 9.22 Construction of the airport would result in the following:
- the area of the airport would increase from 9.5 km² today to 16.5 km² (one runway) 19 km² (two runways) or 22 km² (three runways);

¹⁰ For more information about these multi-modal studies:
 Orbit – project website: www.orbitproject.com or contact [Stephen Dapaah \(0148 388 24826\)](mailto:Stephen.Dapaah@orbitproject.com).
 London – South Midlands project website: www.lsmmultimodal.com or contact Sue Freedman (0121 262 1980)
 See also the footnotes on page 168.

- just over 100 (one runway) or 200 (two/three runways) residential properties would need to be physically taken;
- 700 ha (one runway) or 1200 ha (two/three runways) of high grade agricultural land would be lost; and
- encroachment onto 457 ha (one runway), 683 ha (two runways) or 747 ha (three runways) of the Stansted Airport Countryside Protection Zone.

HERITAGE

- 9.23 Two Scheduled Ancient Monuments – the site of Waltham Manor and The Grange – are lost in all three options. A third – the site of the medieval Takeley Priory at Warish Hall – might be lost in the three runway option. One Grade II* listed building is lost in the two and three new runway options. A number of Grade II listed buildings are lost in each option as follows: 29 (one new runway); 50 (two new runways); or 64 (three new runways).

ECOLOGY

- 9.24 The two or three runway options would result in the loss of about half of the Elsenham Wood SSSI.

WATER

- 9.25 All options require engineering work, diverting or culverting, to several rivers. The Environment Agency is generally opposed to culverting and such works are seen as a significant impact.
- 9.26 The extra passengers associated with additional runways add to the demand for water which may be difficult to meet, even with supply and demand management and water saving technology.

DAYTIME NOISE

9.27 Tables 9.2 and 9.3 show the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (0700–2300). See Figures 9E/F/G.

Table 9.2: **Size of area affected (Km²)**

2000		2015			2030			
Level of Noise Leq (dBA)		Base Case	Maximum use	1 new runway	Maximum use	1 new runway	2 new runways	3 new runways
>54	92	46	74	127	87	214	326	393
>57	53	28	43	79	50	127	191	228
>60	33	16	25	42	30	76	111	136
>63	20	10	15	23	18	40	63	78
>66	13	5	9	13	10	23	35	42
>69	8	3	5	7	6	13	20	25
>72	4	2	3	4	3	7	12	15

Table 9.3: **Numbers of people affected ('000s)**

2000		2015			2030			
Level of Noise Leq (dBA)		Base Case	Maximum use	1 new runway	Maximum use	1 new runway	2 new runways	3 new runways
>54	13	5	9	15	12	27	42	50
>57	6	2	5	8	6	14	24	28
>60	2	1	2	4	2	7	10	14
>63	1	0.3	0.8	3	1	4	6	7
>66	0.5	0.1	0.3	2	0.3	3	3	4
>69	0.2	<0.1	0.1	0.4	0.2	2	2	3
>72	0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.7	2

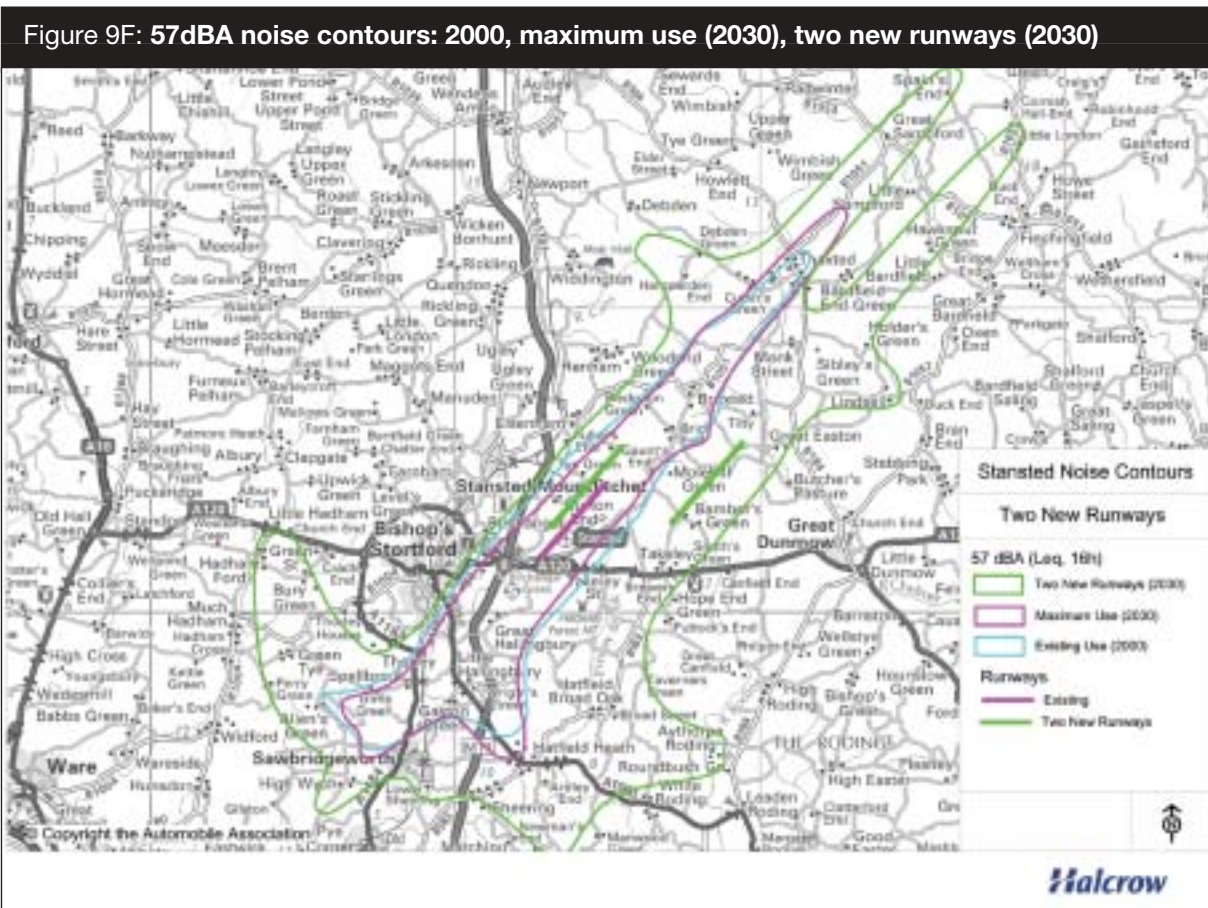
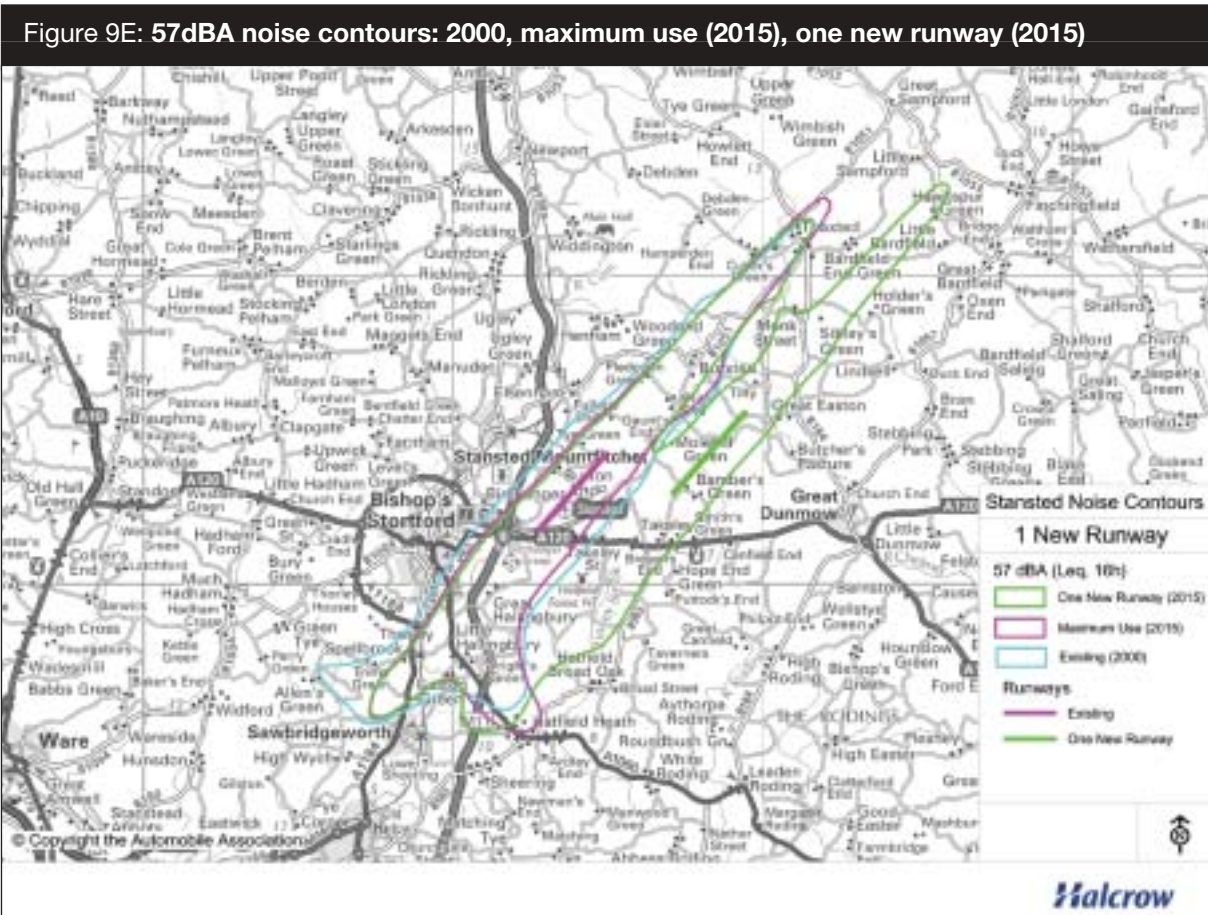
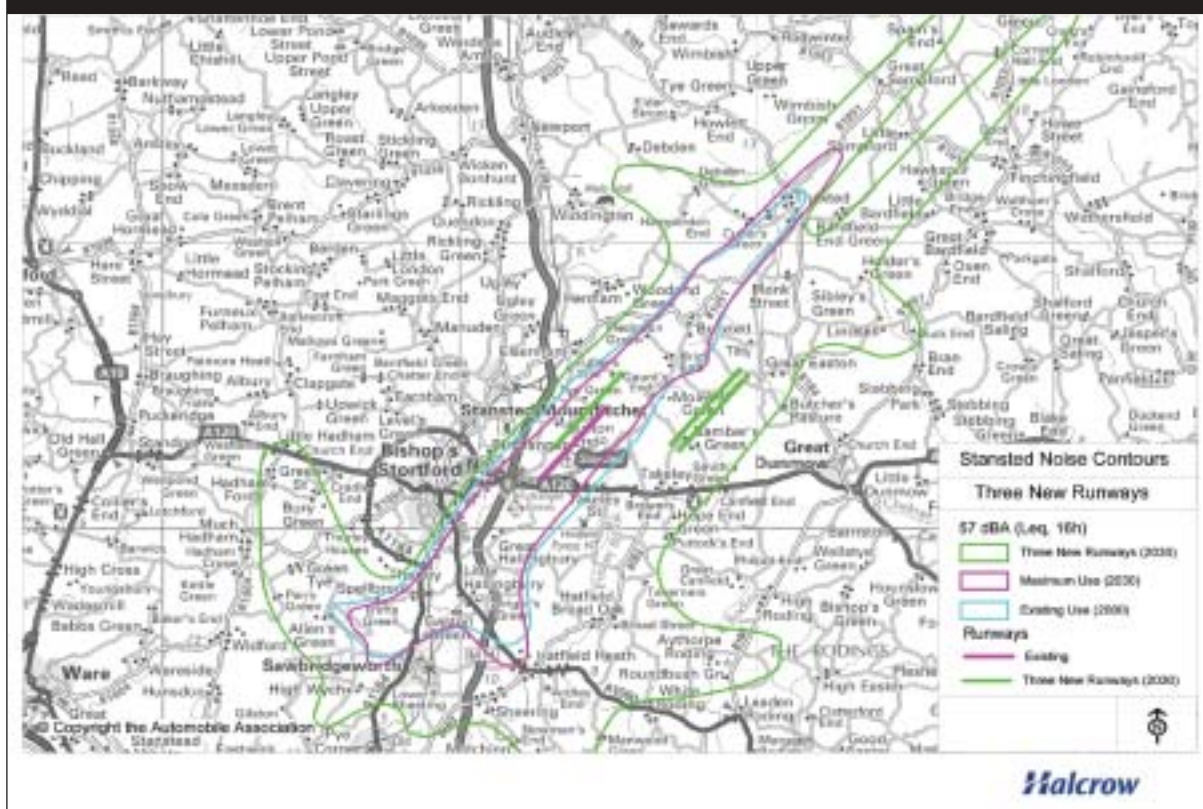


Figure 9F: 57dBA noise contours: 2000, maximum use (2030), three new runways (2030)



AIR QUALITY

9.28 Population exposed to an exceedance of EU limits:

PM₁₀ – nil

NO₂ – there are estimated to be small numbers of people exposed to an exceedance of NO₂ – just over 300 by 2030 in the largest option (with three new runways) and about 20 by 2015 with one new runway. It is likely that such impacts could in practice be prevented.

Impacts on regional planning

9.29 Stansted Airport impacts on the wider London/Stansted/Cambridge sub-region. This includes East London/Lower Lea Valley and Harlow, which are designated in Regional Planning Guidance for the South East (RPG9) as Priority Areas for Economic Regeneration (PAER). It also includes the Cambridge sub-region which has a buoyant economy. Overall, the London/Stansted/ Cambridge sub-region is identified as a potential growth area and is the subject of a study to examine the scope for this¹¹.

¹¹ For more information about this study, contact Michael Hargreaves, Team Leader, Regional Planning at the Government Office for the East of England (01223 202045) or Alan Moore at EELGC (01284 729441).

EMPLOYMENT

Table 9.4: **Forecast of employment ('000s)**

	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

- 9.30 **Table 9.4** shows that the employment generated by the airport in 1998 was around 10,000 jobs. The runway options appraised could increase these totals to around 60,000 jobs by 2015 and between 57,000 and 93,000 jobs by 2030. The current core catchment area is Uttlesford, East Hertfordshire and Harlow districts. A wider catchment area, potentially embracing Braintree, Chelmsford, Harlow, Broxbourne, Epping Forest and North East London would need to be considered for the larger options.
- 9.31 The potential employment growth is large in relation to the Government's projections of total employment growth in the core and wider catchment areas (of 45,000 jobs to 2015 and 74,000 jobs to 2030). RPG provision, projected forward, could result in an additional 83,000 houses in the core and wider catchment area to 2030.
- 9.32 Meeting the additional labour demand associated with new runways would require a sectoral shift in current employment patterns (from the low base of 5 per cent of current core catchment area jobs being at the airport), attracting some employees from more distant areas (in the Lea Valley, for example) and additional development, requiring a change in current planning policies.

LAND USE AND URBANISATION

- 9.33 By 2015, we estimate that the housing provision in the two districts (East Hertfordshire and Uttlesford) around the airport required to meet the needs of one new runway would be some 44 per cent in excess of the provision identified in current regional planning guidance. This equates to about 18,000 dwellings and a growth in population of over 40,000. This demand for housing could be met only by a fundamental change in the settlement pattern (i.e. major urban extension or new urban community, possibly involving loss of Green Belt). In practice, the labour catchment area of a two runway airport at Stansted would extend beyond these two districts, reducing the need for additional housing.

- 9.34 By 2030, the labour catchment area of a three or four runway airport is likely to expand as indicated in paragraph 9.30. The potential growth in airport employment (up to 83,000 jobs) is large, however, in relation to RPG additional housing provision in this wider area projected forward to 2030 (83,000 additional houses by 2030), reinforcing the need for a sectoral shift in employment and the remote sourcing of labour in order to reduce the need for additional housing.
- 9.35 Significant change in the pattern of development in the partly rural core catchment area would be required to accommodate development on the scale envisaged. Such a scenario does not form part of the current planning policy for the area and any decision to expand Stansted would need to inform future RPG reviews.

CHAPTER 10

Luton

Current situation

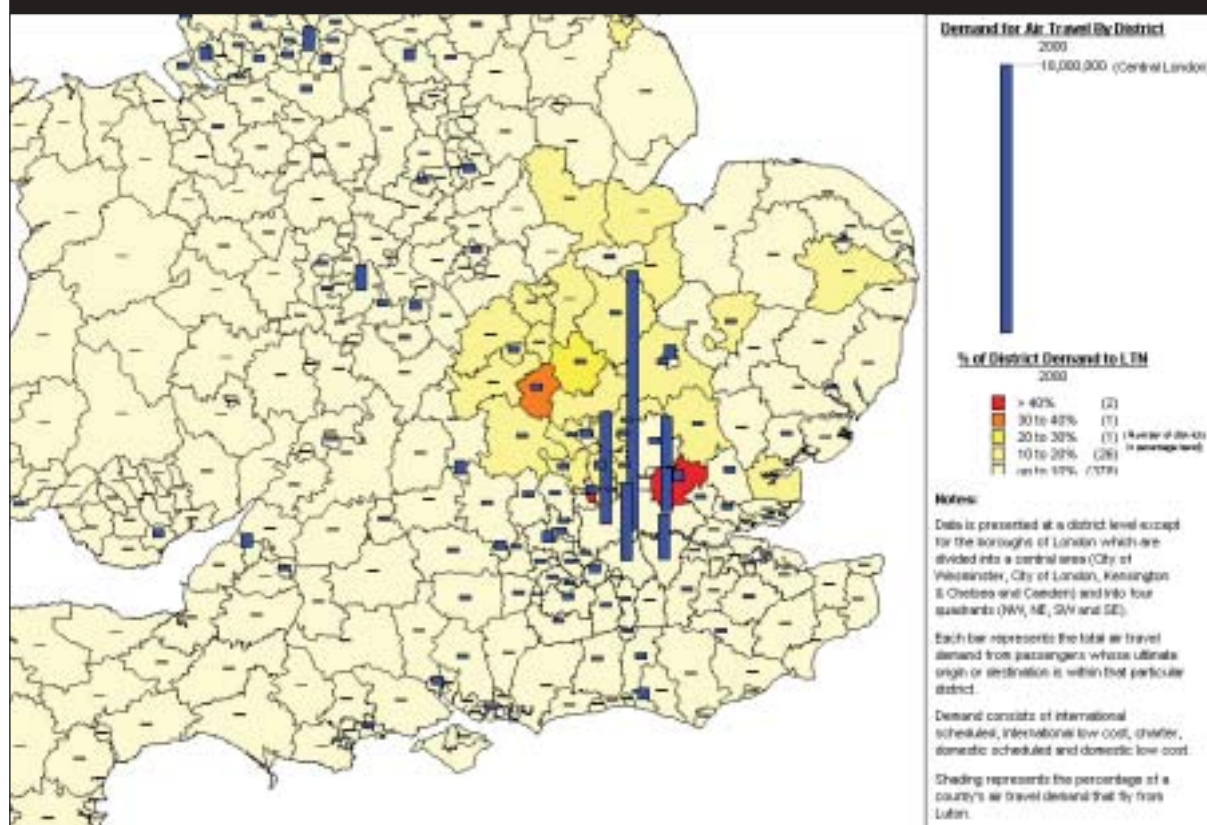
- 10.1 Luton airport is owned by Luton Borough Council and operated, managed and developed by a private consortium. The airport has a single runway and passenger terminal. In 2000, over 6 million passengers used the airport and there were around 54,000 air transport movements (ATMs). In terms of passengers carried it is the seventh busiest airport in the UK. The airport handled over 36,000 tonnes of freight and 6,000 freight air transport movements in 2000.



London Luton Airport

- 10.2 In recent years, Luton has been one of the fastest growing airports in the UK. This has been mainly due to the rapid growth of the low cost carrier market. To cope with this rapid growth a new passenger terminal and a railway station were opened in 1999.
- 10.3 Currently, Luton serves about 5 per cent of Greater London demand for air travel with one third of Luton's passengers coming from the Greater London area. **Figure 10A** shows that Luton's catchment area also includes Hertfordshire and neighbouring counties.

Figure 10A: Total air travel demand by district, and percentage of this demand at Luton



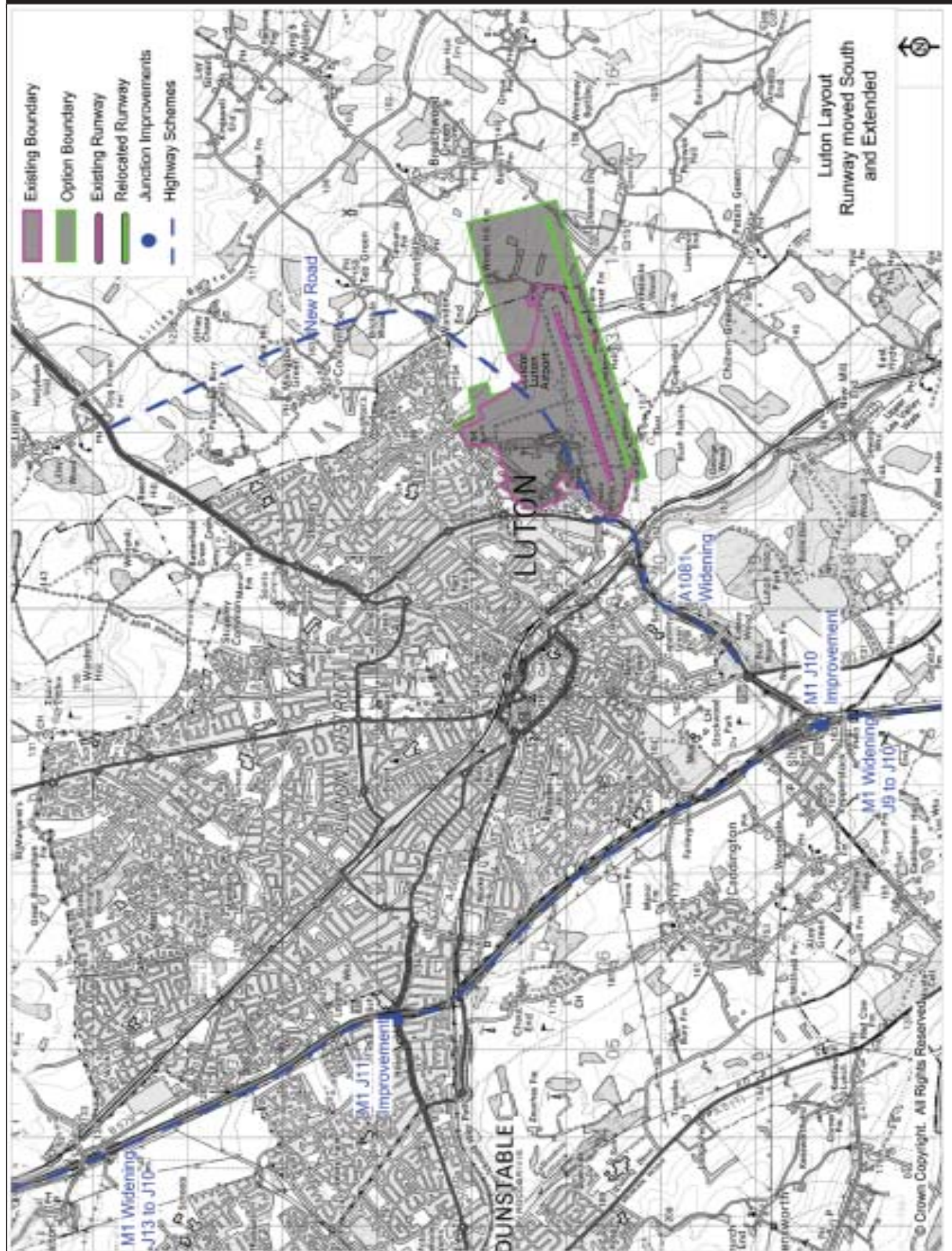
Description of options

- 10.4 The Bedfordshire Structure Plan provides for the airport to seek an increase in capacity of up to 10 million passengers per annum (mppa) subject to meeting a number of environmental conditions.
- 10.5 No options for additional runways were considered due to the severe physical constraints at and around the site. The capacity of the current runway is constrained particularly by the absence of a parallel taxiway which limits the number of ATMs achievable to around 100,000 per year, carrying around 10 mppa. The options worked up consider how best to maximise the use of a single runway.
- 10.6 **SERAS considered** two options for maximum use at Luton: a new southern runway and a new realigned runway. **Chapter 14** shows that the forecast use of Luton is strongly influenced by the amount of airport capacity elsewhere in the South East. So, in practice, the extent of development at Luton and any requirement for additional land to facilitate it will be affected by decisions about those other airports. Increased use of the airport might, for example, be based on the existing runway alignment.

Southern runway

- 10.7 This option has a new 3000m runway built 200m to the south of, and parallel to, the present runway. The latter would be retained to form a parallel taxiway. Supporting facilities would be provided to the north of the existing runway. See **Figure 10B**.

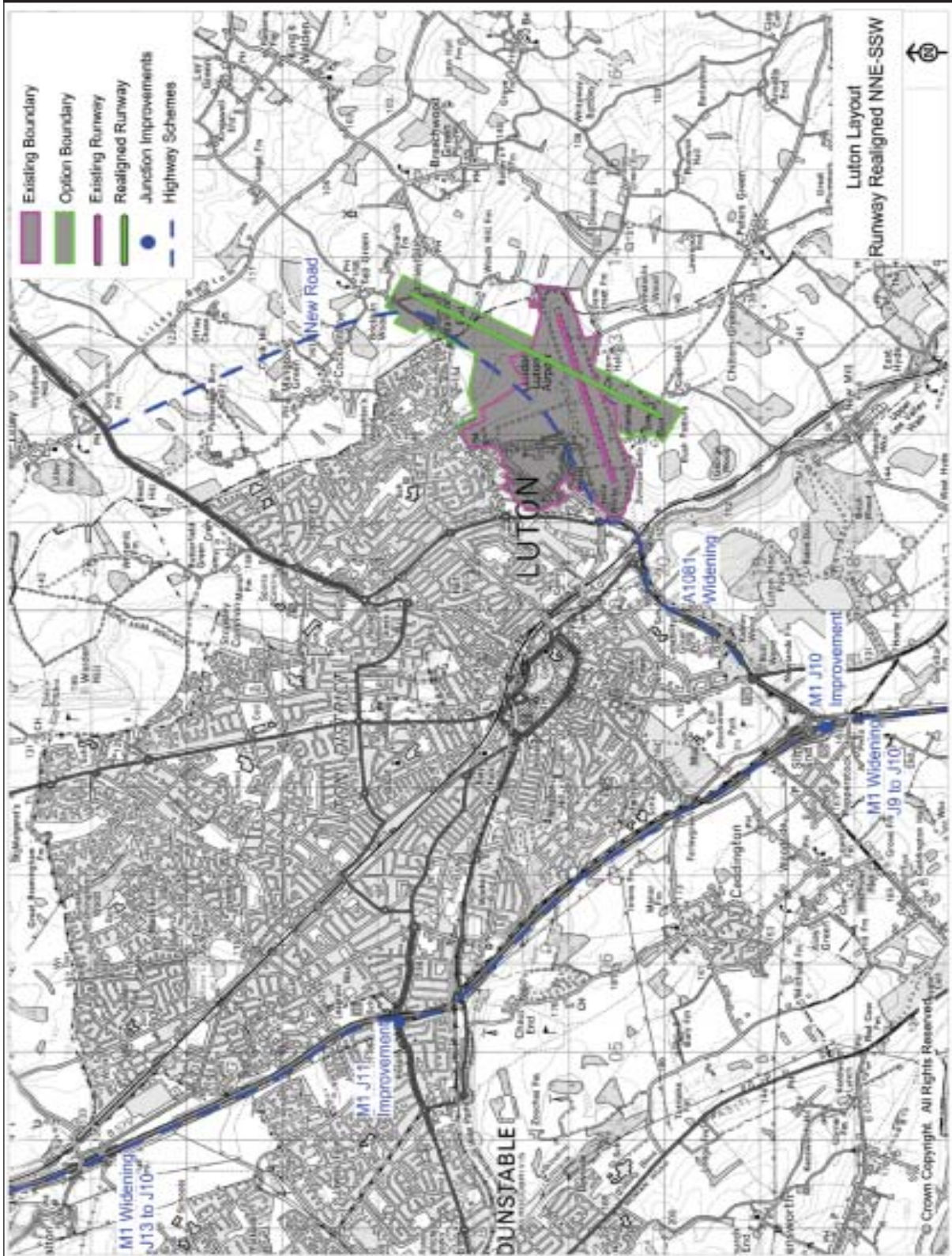
Figure 10B: Luton airport – southern runway



Realigned runway

- 10.8 A second single runway option creates a new 3000m runway on an alignment similar to that of Stansted (NNE-SSW). A parallel taxiway would also be provided. Supporting facilities would again be provided to the north of the existing runway. See **Figure 10C**.

Figure 10C: Luton airport – realigned runway



- 10.9 For both options it is assumed that the new runway could be in place by 2011 and would have a runway capacity of 240,000 ATMs supported by a terminal capacity of up to 31mppa.
- 10.10 Variations of both options providing additional facilities for substantial dedicated air freight were also considered. These are reported in the SERAS Stage Two report. This chapter focuses on the core options outlined above.

Table 10.1: Forecasts of demand for Luton			
LUTON		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		6	54,000
Base Case (Current Land Use Planning)	Capacity	10	100,000
	Forecast use in 2015	8	100,000
	Forecast use in 2030	10	100,000
BOTH runway options	Capacity	31	240,000
	Forecast use in 2015	17	146,000
	Forecast use in 2030	29	221,000
Notes – both options have the same runway and terminal capacities, therefore one set of forecasts can be applied to both. The traffic forecasts for the runway options assume no new runways are built in the South East. With extra capacity elsewhere in the South East the traffic levels would be somewhat lower – see Table 14.3 in Chapter 14.			

Impacts on rail and road networks

- 10.11 The following impacts apply to both options.

RAIL/BUS

- 10.12 Enhancements to the service provision and patterns are already planned for Thameslink, Thameslink 2000 and Midland Mainline. No further additions to the scale or scope of rail services are assumed.
- 10.13 It is assumed that the proposed Luton–Dunstable guided busway could be extended to the airport via the Airport Parkway station. Alternatively the link between the station and airport could be provided by a tracked transit system.

ROADS

- 10.14 Provision of a Luton North-East by-pass and widening of the A1081 from the M1 to Airport Way are assumed.

Strategic road improvements needed

- 10.15 The runway options would require enhancement of junctions 9–13 of the M1 to provide for airport-related traffic beyond what would in any case be required to cater for ‘background’ demand by 2030.

Impacts on people and the environment

LAND AND PROPERTY

- 10.16 Construction of the airport **options** would result in the following:
- the area of the airport would increase from around 2.4 km² today to 3.3 km² (with a new runway to south) and 3.6 km² (with a realigned runway);
 - up to 10 residential properties would need to be physically taken;
 - just over 100ha of grade 3 agricultural land would be lost with either option; and
 - both options would result in the loss of around 80ha of Green Belt.

HERITAGE

- 10.17 No designated sites or buildings would be lost if the new southern runway option is constructed. Two Grade II listed buildings would be lost with the realigned runway option.
- 10.18 One locally designated archaeologically sensitive site would be lost with the realigned runway option.

ECOLOGY

- 10.19 No impacts were assessed as significant.

WATER

- 10.20 There is a potential groundwater effect. The airport is in the area of a major aquifer and both runway options intersect a source protection zone for a public water supply. Potential impacts might be mitigated using appropriate construction techniques.
- 10.21 The extra passengers associated with a higher capacity runway add to the demand for water which might be difficult to meet, even with supply and demand management and water saving technology.

DAYTIME NOISE

- 10.22 **Tables 10.2 and 10.3** show the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (0700–2300). As both options are for maximum use of a single runway, the current land use planning system has been taken as the **base case** for 2015 and 2030. The results are based on traffic levels assuming no new runway capacity is provided elsewhere in the South East. If new capacity was provided elsewhere, our forecasts suggest that there would be less traffic by 2030 at Luton, thus reducing these noise impacts.
- 10.23 The 1999 contours were produced for the airport using a different noise model from the one used by the CAA for Heathrow, Gatwick and Stansted. Comparisons between the existing situation and future contours should only be taken as approximate. See also **Figures 10D and 10E**.

Table 10.2: Size of area affected (Km²)

	1999		2015		2030		
Level of Noise Leq (dBA)		Base Case	Southern runway	Realigned runway	Base Case	Southern runway	Realigned runway
>54	N/A	26	59	57	31	82	83
>57	19	15	36	33	18	49	47
>60	12	9	21	19	10	29	27
>63	8	5	12	11	6	17	16
>66	5	2	7	7	3	9	9
>69	3	1	4	4	2	5	5
>72	2	0.7	2	2	1	3	3

Table 10.3: Numbers of people affected ('000s)

	1999		2015		2030		
Level of Noise Leq (dBA)		Base Case	Southern runway	Realigned runway	Base Case	Southern runway	Realigned runway
>54	N/A	8	26	16	10	45	23
>57	8	5	9	7	6	19	14
>60	4	2	4	0.9	2	7	3
>63	1	0.8	1	0.1	1	2	0.8
>66	1	<0.1	0.3	0.1	<0.1	0.4	0.1
>69	<0.1	<0.1	0.1	<0.1	<0.1	0.1	0.1
>72	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1

Figure 10D: 57dBA noise contours: 1999, base case (2015), new southern runway (2015)

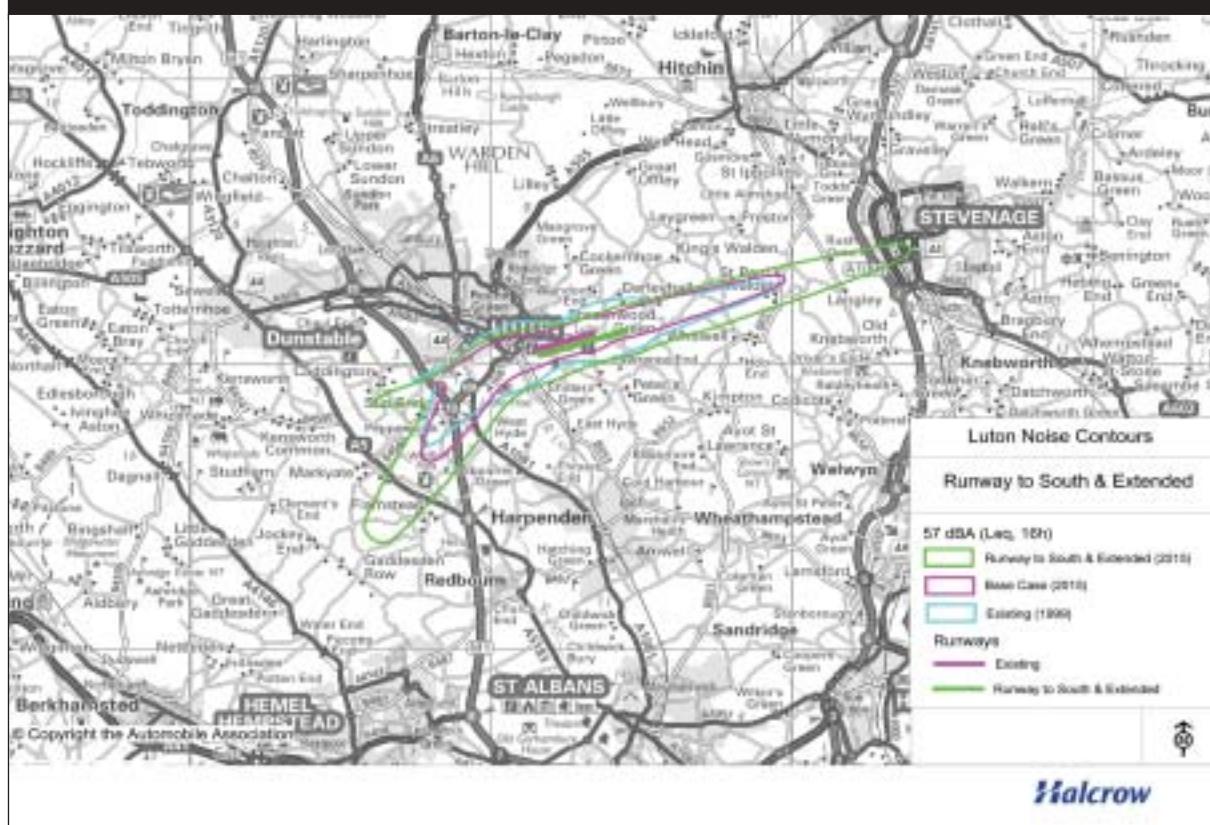
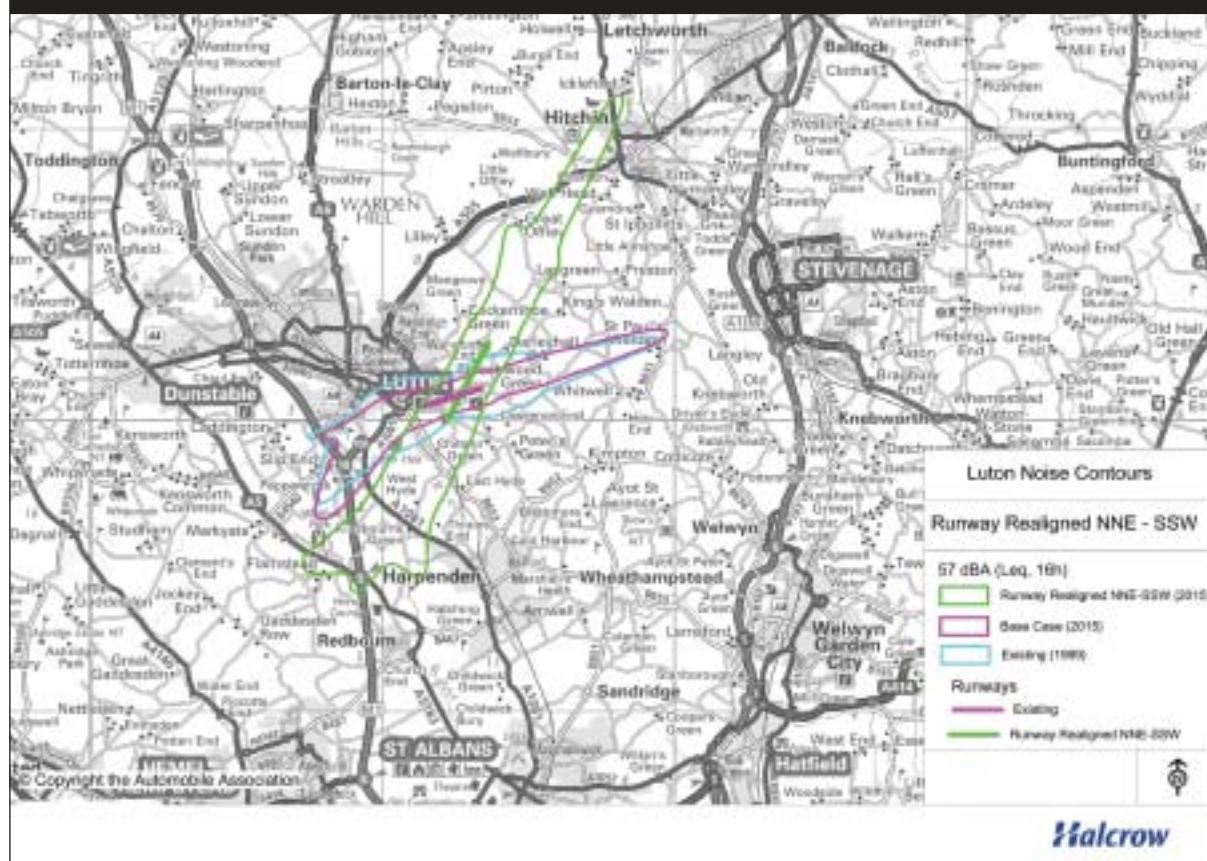


Figure 10E: 57dBA noise contours: 1999, base case (2015), realigned runway (2015)



AIR QUALITY

10.24 The population exposed to an exceedance of EU limits:

PM_{10} – nil

NO_2 – by 2015 less than 50 people are estimated to be exposed to an exceedance with the new southern runway option (and to levels only moderately above the EU limit value) and none with the realigned runway option. It is likely that such minor impacts could in practice be prevented.

Impacts on regional planning

10.25 Luton is identified in Regional Planning Guidance for the South East (RPG9) as a Priority Area for Economic Regeneration (PAER) and can be expected to welcome new sources of employment. The sub-region has potential for supporting both the employment and labour market growth associated with airport expansion.

EMPLOYMENT

- 10.26 Forecasts of employment are shown in **Table 10.4**. The forecasts for each year refer to both core options. The employee/passenger ratio reflects the proportion of low cost passengers. If the existing runway capacity and alignment were retained, the total figures in 2015 would be similar to those in 1998 and would decline slightly by 2030 as productivity gains would offset a small increase in passenger numbers.

Table 10.4: Forecast of employment ('000s)			
	1998	2015	2030
BOTH runway options			
Direct on-site	6	11	14
Direct off-site	1	2	2
Indirect	2	4	5
TOTAL	9	17	21

- 10.27 It appears there is scope to accommodate these levels of airport related employment as a result of industrial restructuring. This restructuring might bring forward previously developed sites for redevelopment.

LAND USE AND URBANISATION

- 10.28 It is estimated that by 2015 around 2,600 additional airport related houses, over and above that currently planned for in RPG9, would be needed. This represents a modest amount in excess of planned provision. It is considered that there is sufficient flexibility to accommodate the scale of housing likely to be required.

CHAPTER 11

Cliffe

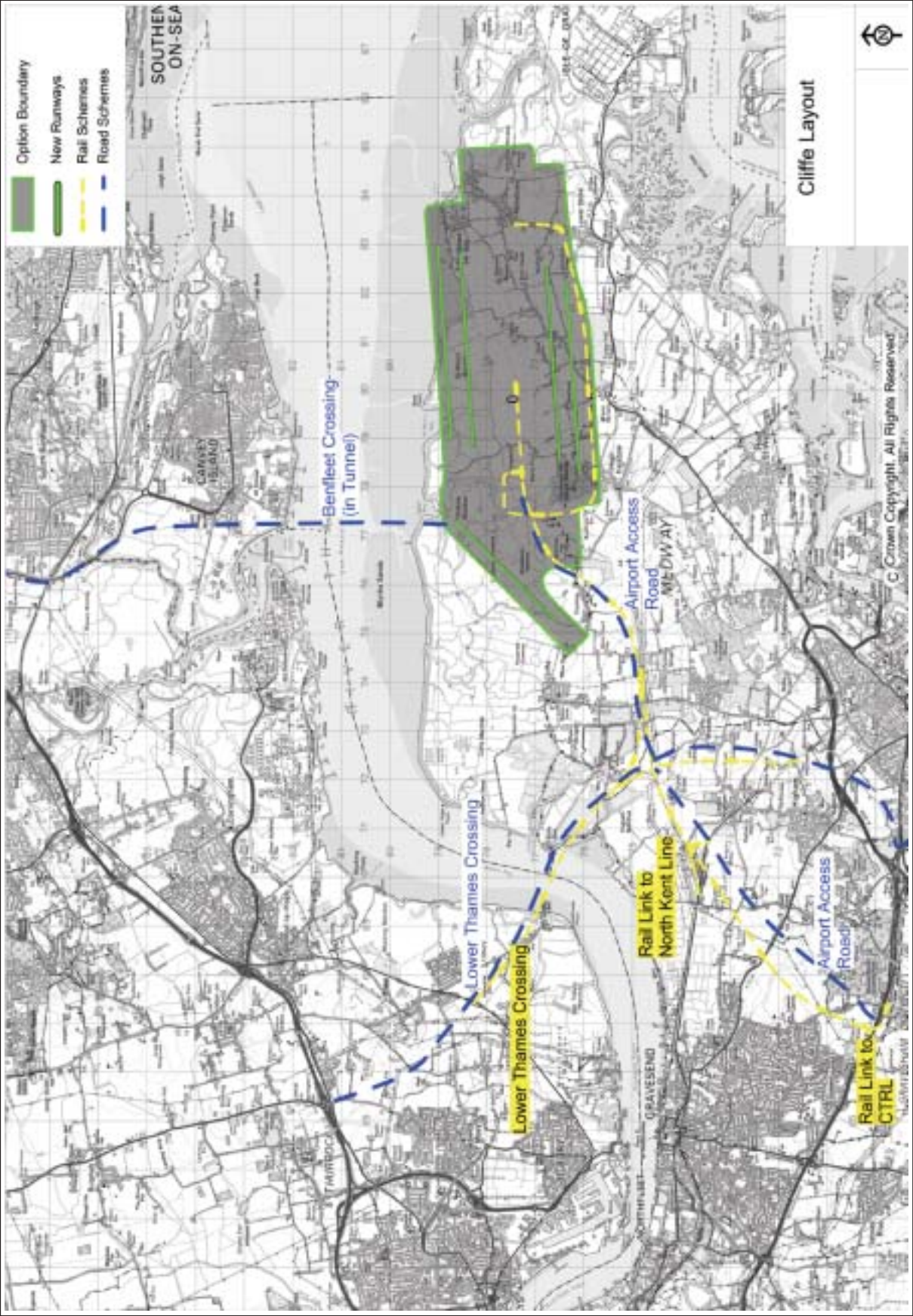
- 11.1 Building a new airport on the Hoo Peninsula in North Kent would represent a radical change to airport provision in the South East of England. It offers the prospect of a purpose-built hub airport providing a large amount of new runway capacity, but at the same time minimising a number of negative impacts on people – although there would be major environmental impacts.
- 11.2 Cliffe was identified following a detailed study of potential sites for a new airport¹². The main reasons for this were:
- sufficient land available for a major new airport;
 - potentially good surface transport links with London and other parts of the South East and the UK;
 - relatively few people would be displaced by the airport's construction for the amount of new capacity provided;
 - relatively low numbers of people would be affected by aircraft noise;
 - the potential for 24-hour operation to meet the needs of air freight; and
 - development of an airport in this location would support regeneration policies in the Thames Gateway.
- 11.3 The success of a new airport would depend crucially on its ability to attract airlines. Airport development costs are estimated at just over £9 billion in today's prices for a two runway airport and around £11.5 billion for a four runway airport. In order to remunerate this expenditure, the airport would need to attract, quickly, a large number of air services.

Description of options

- 11.4 Two core options were considered in SERAS: a two runway airport and one with four runways. The option put forward in this consultation is for the larger option, comprising two pairs of close parallel runways (see **Figure 11A**). The option of a fifth runway, aligned north east – south west to be used to reduce night-time noise impacts, was also appraised and is indicated on the layout plan. **This runway would be used only at night and only then in certain weather conditions, by aircraft approaching to land from the south west. Departures would be from the main runways.** The four runway airport could handle 113 mppa.

¹² Preliminary Site Search of Options for New Airport Capacity to Serve the South East and East of England, Scott Wilson, June 2001.

Figure 11A: Cliffe – four runways (plus potential crosswind runway)



- 11.5 All four runways would not be needed until later in the period to 2030. Based on demand forecasts, it is envisaged that the airport could open in 2011 with the first two runways operational. The third and fourth runways could be opened later as demand for capacity rose. Construction of the earthworks platform on which the airport would stand would be done more cost effectively in one go at the outset. This explains in part the high capital cost of the first stage of the airport with only two runways.

Table 11.1: Forecasts of demand for Cliffe

CLIFFE		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		N/A	N/A
2015 (Two runways)	Capacity	77	530,000
	Forecast use	58	436,000
2030 (Four runways)	Capacity	113	781,000
	Forecast use	110	712,000

- 11.6 For Cliffe to be viable as a hub airport, a significant proportion of traffic would need to move there at the outset to create a network of services and frequencies. To replicate this in our forecasting we have “seeded” the airport. Seeding effectively means that an operator or operators moves a major tranche of services to an airport as a new runway or the airport opens. The seeded service frequencies at Cliffe amount to 40 per cent of Heathrow’s 1998 scheduled services, 23 per cent of Gatwick’s 1998 charter services and 11 per cent of Stansted’s 2000 low cost services.

Impacts on rail and road networks

RAIL

- 11.7 It is assumed that the existing Grain freight branch, joining the North Kent Line at Hoo Junction, will be upgraded and that a new line will be provided from near there to the Channel Tunnel Rail Link (CTRL) at Singlewell. Airport express services are assumed to run via CTRL to St Pancras, and on to the Midlands and the North if necessary. The fastest journey time to central London would be of the order of 26 minutes. Regional trains may operate via Bromley South to Victoria or Waterloo.
- 11.8 A multi-modal Lower Thames Crossing was also assumed, which would provide a rail connection from the airport to the Tilbury – Southend line near East Tilbury.
- 11.9 These connections would allow a range of local rail services to parts of Kent, Essex and Greater London. The Crossrail Project is currently identifying its preferred route(s) and is considering a branch to interchange with CTRL at Ebbsfleet. The options may need to be considered again in the light of future airports policy. Crossrail services could be extended via Woolwich and Dartford to connect Cliffe with central London, Heathrow and areas to the west.

- 11.10 Capacity on the CTRL, and St Pancras platform capacity, will be fully utilised by international and domestic services. Choices may have to be made between different uses of the line, altering the balance between international, Kent domestics and airport services. Alternative rail networks were also considered. By 2030, with all four runways operational, there might be a case for further infrastructure including a new high-speed link between the Lower Thames Crossing at East Tilbury and CTRL at Wennington, sharing the A13 corridor. This would reduce the airport demand for train paths through the CTRL Thames Tunnel.

ROADS

- 11.11 The principal road connections to the airport would be a link to the A2 west of Shorne Wood and a link from the A2/M2 interchange at Shorne Ridgeway via the Lower Thames Crossing to the A13/A128 interchange at Orsett. The Lower Thames Crossing may be progressed irrespective of whether a new airport is built at Cliffe. A new airport at Cliffe of the scale envisaged would require such a crossing to improve its accessibility.

Strategic road improvements needed

- 11.12 There may be a need for further improvement to the A13 just to the west of the connection to the Lower Thames Crossing and capacity problems on the eastern sections of the M25 would arise sooner.
- 11.13 As the airport grows, a second road crossing of the Thames to the A13/A130 at Benfleet could in time give better access to the labour market north of the Thames as well as relieving crossings to the west.

Impacts on people and the environment

LAND AND PROPERTY

- 11.14 Construction of the airport would result in the following:
- the airport would cover a total of about 26 km² (including extensive cargo and maintenance facilities);
 - around 1100 residential properties, some of which are holiday homes, would need to be physically taken (half a dozen more with the crosswind runway); and
 - around 2000 ha of agricultural land would be lost (2200 ha with the crosswind runway).

HERITAGE

- 11.15 Based on the layout of the new airport developed for SERAS, one Grade 1 – the Church of All Saints at Allhallows – one Grade II* and seven Grade II (eight if the crosswind runway is also built) listed buildings would be lost.

ECOLOGY

- 11.16 A new airport at Cliffe would impact on several nationally and internationally designated areas, notably the Thames Estuary and Marshes Special Protection Area (SPA) and the Northward Hill Site of Special Scientific Interest (SSSI)/National Nature Reserve.
- 11.17 The Thames Estuary and Marshes SPA and Ramsar¹³ site (of very high ecological value) is a site of international importance for birds, flora and fauna and is given protection laid out in the EC Habitats Directive. Any potentially adverse effect to that site would require the Government to demonstrate that it has considered all reasonable alternatives and that compensatory measures will be carried forward to prevent an overall loss of habitat and bird numbers. One possibility could be land purchase and habitat creation elsewhere in Kent. Potential sites have been considered and discussed with the Department for Environment, Food and Rural Affairs and English Nature. Preliminary cost estimates are in the order of £200 million. There is more information on this in one of the SERAS reports¹⁴.
- 11.18 The presence of large bird populations raises the risk of birds colliding with aircraft which is an important safety issue for any airport. A preliminary assessment was made of this risk at Cliffe. The consultants noted the potentially significant hazards of the Cliffe location and identified some options for mitigating the risks in the design and layout of the airport and in measures in the surrounding area. They acknowledge that further research would be needed to assess fully both the risk and the best mitigating measures. The Department will be commissioning work during the consultation period.[†] More information about impacts of the Cliffe proposals on ecology can be found in the report mentioned in the previous paragraph.

WATER

- 11.19 Options at Cliffe generate High Adverse impacts against all the water objectives, except groundwater.
- 11.20 The topography of the site requires a level platform area to be created on up to 15 metres of fill over the low lying marshes. A number of marshes and creeks would effectively be destroyed.
- 11.21 While the raised airport platform will solve any flooding problems in the airport itself, it is likely to increase the risk of flooding elsewhere on the peninsula.
- 11.22 The extra passengers associated with a new airport would add to the demand for water which may be difficult to meet, even with supply and demand management and water saving technology.

DAYTIME NOISE

- 11.23 **Tables 11.2 and 11.3** shows the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (07.00–23.00). See **Figure 11B**.

¹³ Ramsar – the name of an intergovernmental treaty relating to the conservation of wetland habitats.

¹⁴ North Kent Marshes Ecological Study, Phase 1 Report, Scott Wilson, January 2002.

[†] It is intended that the final report of this further work will be published during the extended consultation period.

Table 11.2: Size of area affected (Km²)

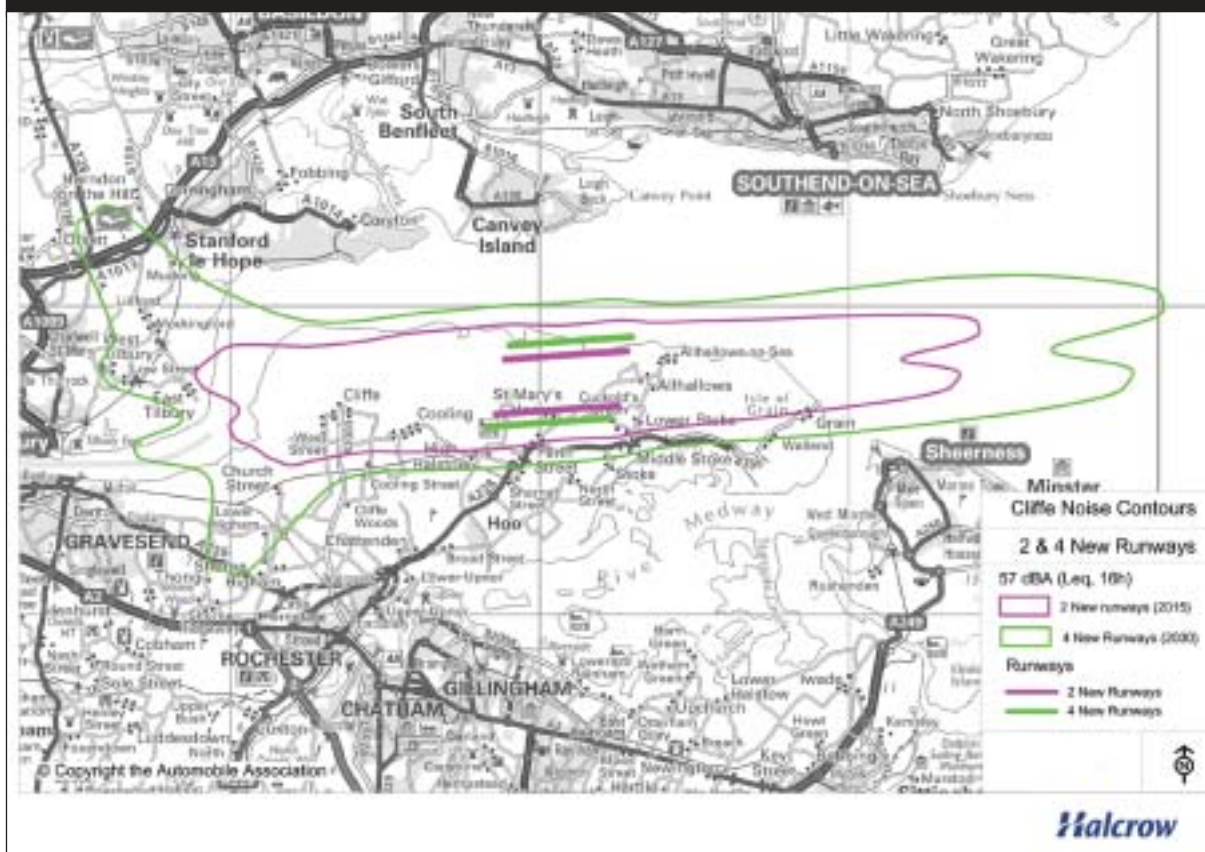
Level of Noise Leq (dBA)	2015 (2 runways)	2030 (4 runways)
>54	79	176
>57	57	111
>60	44	75
>63	25	56
>66	14	38
>69	7	20
>72	4	11

NB Does not include the area of sea within the noise contour.

Table 11.3: Numbers of people affected ('000s)

Level of Noise Leq (dBA)	2015 (2 runways)	2030 (4 runways)
>54	11	32
>57	4	14
>60	3	9
>63	1	5
>66	0.3	3
>69	0.2	0.4
>72	<0.1	<0.1

Figure 11B: 57dBA noise contours: two runways (2015), four runways (2030)



AIR QUALITY

- 11.24 No population is forecast to be exposed to exceedances of EU limits for either NO₂ or PM₁₀.

Impacts on regional planning

- 11.25 Regional Planning Guidance for the South East (RPG9) and the Mayor of London's emerging Spatial Development Strategy¹⁵, identify the Thames Gateway as being a regional and national priority for regeneration. It is recognised as having the potential for making a vital and major contribution to the growth of the regional economy and the enhancement of the environment.
- 11.26 The development of Cliffe would be strongly in accordance with these **regeneration** policies **and with** existing strategic objectives for the Thames Gateway. The airport has the potential to accelerate and enhance the regeneration of the area.

EMPLOYMENT

Table 11.4: Forecast of employment ('000s)		
	2015 2 runways	2030 4 runways
Direct on-site	35	52
Direct off-site	6	9
Indirect	12	18
TOTAL	53	79

- 11.27 The core labour catchment area for a new airport at Cliffe is taken to include boroughs on both sides of the Thames estuary: Medway Towns, Gravesham and Dartford in Kent and Thurrock, Castle Point, Southend-on-Sea, Basildon and Rochford in Essex. This area currently provides around 100,000 more workers than jobs.
- 11.28 A large airport at Cliffe will provide a large number of jobs across the skill spectrum in a regional and national priority area for regeneration and in close proximity to a labour force where unemployment and out-commuting rates are high.

LAND USE AND URBANISATION

- 11.29 The SERAS consultants have calculated that if the scale of housing development indicated in Regional Planning Guidance were rolled forward to 2030, this could amount to some 162,000 additional households. That forecast housing growth, together with a reduction in the relatively high rates of unemployment in and out-commuting from the relevant catchment area suggests the airport's employment needs could be met with a fairly limited additional housing development. Suitable land, including previously developed land, exists both for housing and off-airport employment activity. The possible exception might arise from a rapid build up of employee requirements during the period to 2015 if the airport achieves a high level of patronage from its outset.

¹⁵ The draft strategy, **The Draft London Plan**, was published by the Greater London Authority in June 2002.

CHAPTER 12

Other South East airports

This chapter summarises how other airports in the South East were addressed in the study and explores the future role they might play. It also describes a potential new airport at Alconbury, principally for freight use.

- 12.1 The main focus of SERAS has been on the region's four major airports, which, in 2000, accounted for around 98 per cent of total passenger traffic in the SERAS region.
- 12.2 The other airports in the South East can, however, play an important niche role in the future by:
- serving their local markets on routes where local demand is sufficient to make air services viable;
 - catering for a proportion of the passenger and freight traffic displaced by capacity constraints at larger airports;
 - in the case of London City, serving a specialized role as a mainly business airport;
 - playing an increasing role in providing facilities for General Aviation¹⁶.
- 12.3 The other airports covered in this chapter are indicated in green on **Figure 12A**.



¹⁶ Comprising a wide range of activities including aircraft owned or chartered for business, flying training and leisure flying

- 12.4 The precise future role of these airports is difficult to assess. It depends, mainly, on two factors: firstly, the amount, and timing of future capacity provided at the main airports in the region and elsewhere; and, secondly, the commercial choices made by both passengers and airlines. All these airports have plans or aspirations for future development, some of which are quite extensive. The SERAS analysis has considered how much air traffic these airports might attract based on certain assumptions about their future capacity and the airport capacity in the South East as a whole.
- 12.5 These other airports were considered in two tiers.

First tier airports

- 12.6 At the more developed sites of **London City**, **Southampton** and **Norwich** potential expansion options were examined¹⁷.



London City Airport



BAA Aviation Picture Library

Southampton Airport



Sterling Helicopters

Norwich Airport

The options taken forward were:

London City – retention of the existing 1200m runway with a new runway holding area, apron extension and additional terminal capacity. This would continue to support services using aircraft of a similar nature to those used today and assumes maximum use of the existing runway within the current air transport movement limits. The terminal capacity of this option is around 5mppa.

¹⁷ London City optioneering report (Gibb); BAA optioneering; and Small Airports Optioneering (Halcrow, December 2000).

Southampton – upgrading of current runway to handle code D (medium size) planes and providing terminal and support facilities within the existing site boundary. The terminal capacity of this option is around 7mppa.

Norwich – retention of the existing 1800m runway with additional terminal, apron and parking areas. The terminal capacity of this option is around 5mppa.

Impact appraisal

- 12.7 The impacts of, and constraints on, development at the three airports were appraised, although not to the same level of detail undertaken for the main airports.
- 12.8 At London City, surrounding land use and airspace interactions were assessed as the principal impacts. The main constraints at Norwich are its limited immediate catchment to core markets and poor surface access links. At Southampton, local highway congestion, aircraft noise and local air quality over and around populated areas are considered the main impacts.

Forecasts of passenger demand

- 12.9 The DfT air passenger forecasting model includes London City, Norwich and Southampton. **Table 12.1** presents the forecasts of demand under two scenarios: one with no additional runway capacity in the South East but maximum use made of existing runways at the main airports (constrained case) and one with three new runways at the main airports (high capacity).

Table 12.1: Demand forecasts for London City, Southampton, Norwich (mppa)					
	Terminal passengers (mppa)	Forecast use (constrained)		Forecast use (high capacity)	
	2000 actual	2015	2030	2015	2030
London City	1.6	4.3	5.1	2.0	4.8
Norwich	0.4	0.7	4.4	0.5	0.7
Southampton	0.9	2.8	7.1	1.6	3.0
Source: DfT Air Passenger forecasting model Note: impacts of three runways (high capacity scenario) will depend on the particular combination of airport developments chosen, so the example above is illustrative.					

- 12.10 The forecasts show that London City, which serves a mainly business market in London, would attract traffic quite quickly if there were constraints elsewhere in the South East and that it would retain much of that traffic even if there was significant growth at the main South East airports. Norwich and Southampton attract overspill traffic if the South East is constrained, but this is significantly reduced if capacity is provided at the main airports.

Second tier airports

- 12.11 The second tier of airports considered were Biggin Hill, Cambridge, Farnborough, Lydd, Manston, Shoreham, and Southend¹⁸. These sites were considered to have the runway and land suitable to support commercial aviation. Some already accommodate scheduled, charter passenger or freight services along with business aviation – and Manston has substantial freight activity, being ranked seventh among all UK airports for freight tonnage in 2001. Possible development of Redhill and Northolt, as satellite runways of Gatwick and Heathrow respectively, was considered but rejected in favour of other development options at those airports.
- 12.12 At each site, the scale of possible development, the potential capacity and the main impacts and constraints were considered and an overall assessment made of the potential contribution of the airport at 2030. This assessment assumed that maximum use was made of existing runways at the major South East airports but that no new runway capacity was provided in the region.



Biggin Hill

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Cambridge

Marshall of Cambridge



Lydd



Farnborough

Tag Farnborough Airport

Biggin Hill – an upper limit of 500,000 passengers per annum was assumed. Constraints include poor surface access links and noise impacts on nearby residential properties.

Cambridge – no contribution was assumed as there are considerable noise constraints and the site might be redeveloped for housing.

¹⁸ Small Airports – Demand and Impact Appraisal, Halcrow, August 2001

Farnborough – no contribution was assumed because of significant planning constraints surrounding the type, number and size of aircraft which can operate. The airport operators do, however, have well developed plans for the continued development of the airport as a specialist business aviation facility. (see paragraphs 12.14 – 12.16 below on business aviation.)

Lydd – an upper limit of 125,000 passengers per annum was assumed. The limited immediate catchment population and poor surface access are the key constraints.



Manston Airport

Manston



Shoreham



Southend

Manston – an upper limit of 3 million passengers per annum was assumed. Manston has a long runway, and has a relatively supportive planning environment. Key constraints are its geographic position in relation to the major sources of demand and noise impacts over the nearby town of Ramsgate.

Shoreham – an upper limit of 500,000 passengers per annum was assumed. The runway length is the key constraint to development.

Southend – a capacity of 2 million passengers per annum was assumed. Constraints are the ability to lengthen the runway and noise impacts on residential areas of Southend.

- 12.13 In total, therefore, these airports might contribute capacity of about 6mppa by 2030. While our assessment of the contribution of each airport is not definitive, it is clear that, taken as a group, their overall contribution to meeting demand in the South East would be very small. Furthermore, it is doubtful that they would attract the level of traffic shown above if additional runways were built at major airports in the South East. In practice, passengers and airlines may prefer, even in a highly constrained situation, to fly from more distant, but larger airports outside the SERAS region.

- 12.14 Some of the options discussed in **Chapters 7–11** might have very direct implications for some of these smaller airports. For example, development of a new airport at Cliffe would probably require Southend to close.

BUSINESS AVIATION

- 12.15 In 1997, business aviation activity in the South East – that part of General Aviation undertaken in owned or chartered aircraft for which the passenger's principal purpose is 'business' – was running at about 55,000 aircraft movements per year. In 1998, two reports published by the then DETR quantified the level of activity in the region and assessed the economic contribution made by business aviation.
- 12.16 About half of the identified activity was handled at five London airports: Heathrow, Gatwick, Stansted, Luton and London City. A further 40 per cent at Farnborough, Northolt and Biggin Hill. Business aviation has relied to a large extent on a level of access to the major airports that is set to decline – at least over the next decade – as capacity constraints cause the airports to focus on more valuable, commercial traffic.
- 12.17 A third report on business aviation – *Business Aviation in the South East Part 3: Future Capacity for Business Aviation* – has identified the following sites where the forecast demand for business aviation and other General Aviation could be accommodated:
- Biggin Hill
 - Blackbushe
 - Fair Oaks
 - Farnborough
 - Northolt
 - Southend
- 12.18 We welcome your views on the merits of these sites.

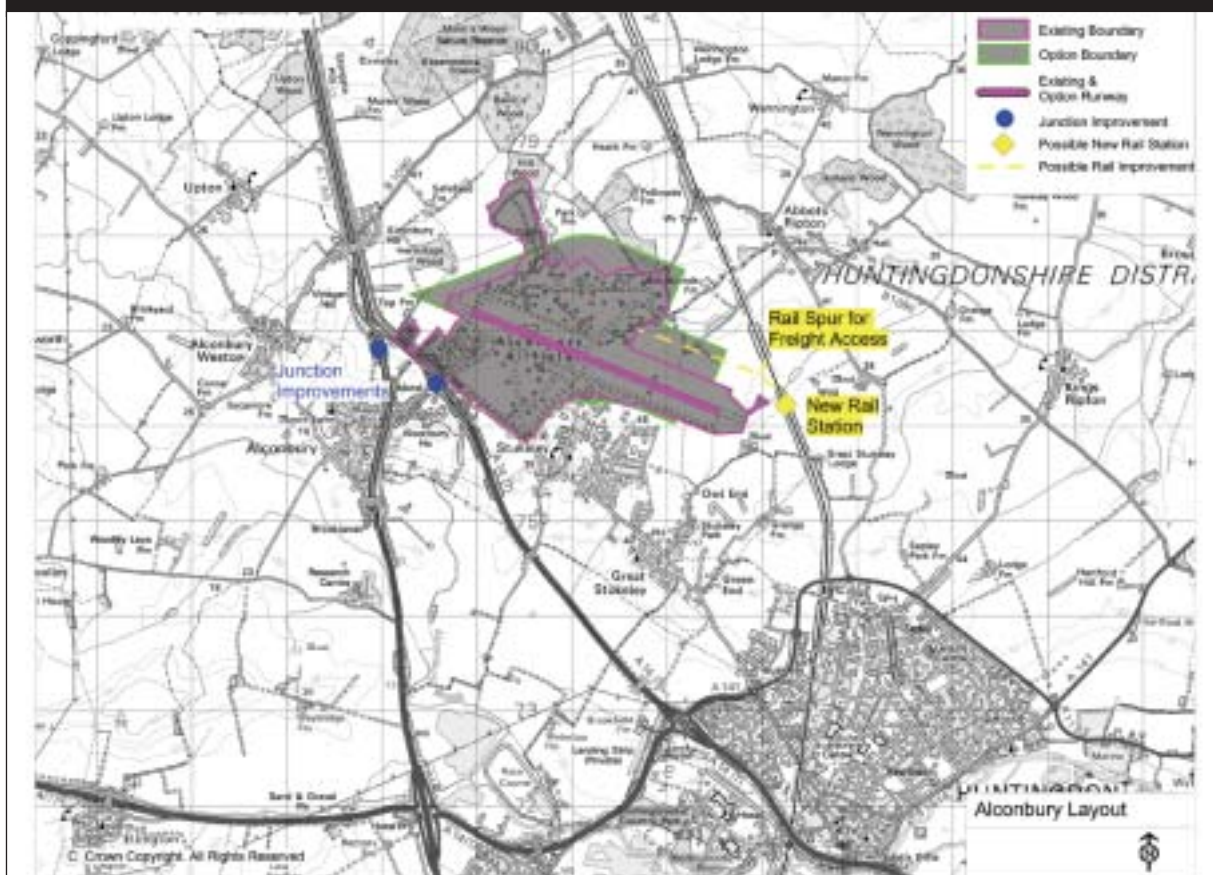
Alconbury

- 12.19 Alongside looking for a major new airport site, the detailed study of potential new airport sites¹⁹ identified Alconbury near Huntingdon (see **Figure 12A** in paragraph 12.3 above) as a prospective small scale development.
- 12.20 The former military airfield has been considered in the SERAS study as a possible site to provide substantial, dedicated air freight provision, an express parcel hub, third party aircraft maintenance²⁰ and low cost passenger operations. **Figure 12B** shows the airport layout.

¹⁹ Preliminary Site Search of Options for New Airport Capacity to Serve the South East and East of England, Scott Wilson, June 2001

²⁰ Alconbury: Airport Optioneering, Halcrow, August 2001

Figure 12B: Alconbury



- 12.21 Alconbury has the advantages of an existing runway, accessibility to the South East market, close to strategic road and rail infrastructure, and it is sufficiently remote from large population centres allowing the possibility of night time operations.
- 12.22 Facilities enabling 1 million tonnes of freight annually were assumed, together with an aircraft maintenance facility equivalent in size to that at Marshall Aerospace Cambridge. The airport was also assumed to have a passenger terminal capacity of about 5mppa.
- 12.23 In the forecasting work we have assumed that the airport would open in 2011, with a small number of low cost routes assumed to be in place from the outset. If existing runway constraints in the South East remain, the airport might handle around 0.2 million tonnes of freight, largely on dedicated freighter aircraft, by 2015, rising to around 1.3 million tonnes by 2030. Passenger throughput is forecast to reach the assumed terminal capacity by 2030. If additional runway capacity is provided at the major airports in the South East, Alconbury is forecast to handle around a quarter of a million tonnes of freight by 2030 and just over 1 million passengers per annum.

Impact appraisal

12.24 An appraisal of the impacts of the development option was carried out²¹ and the main points are presented below.

ROAD AND RAIL

12.25 The principal changes required to support such a facility are listed below:

- A1(M)/A14 junction to be revised to allow movements in all directions;
- new road to the north-east providing access to facilities north of the runway; and
- a rail spur, including grade-separated junctions, from the East Coast Main Line into the airport.

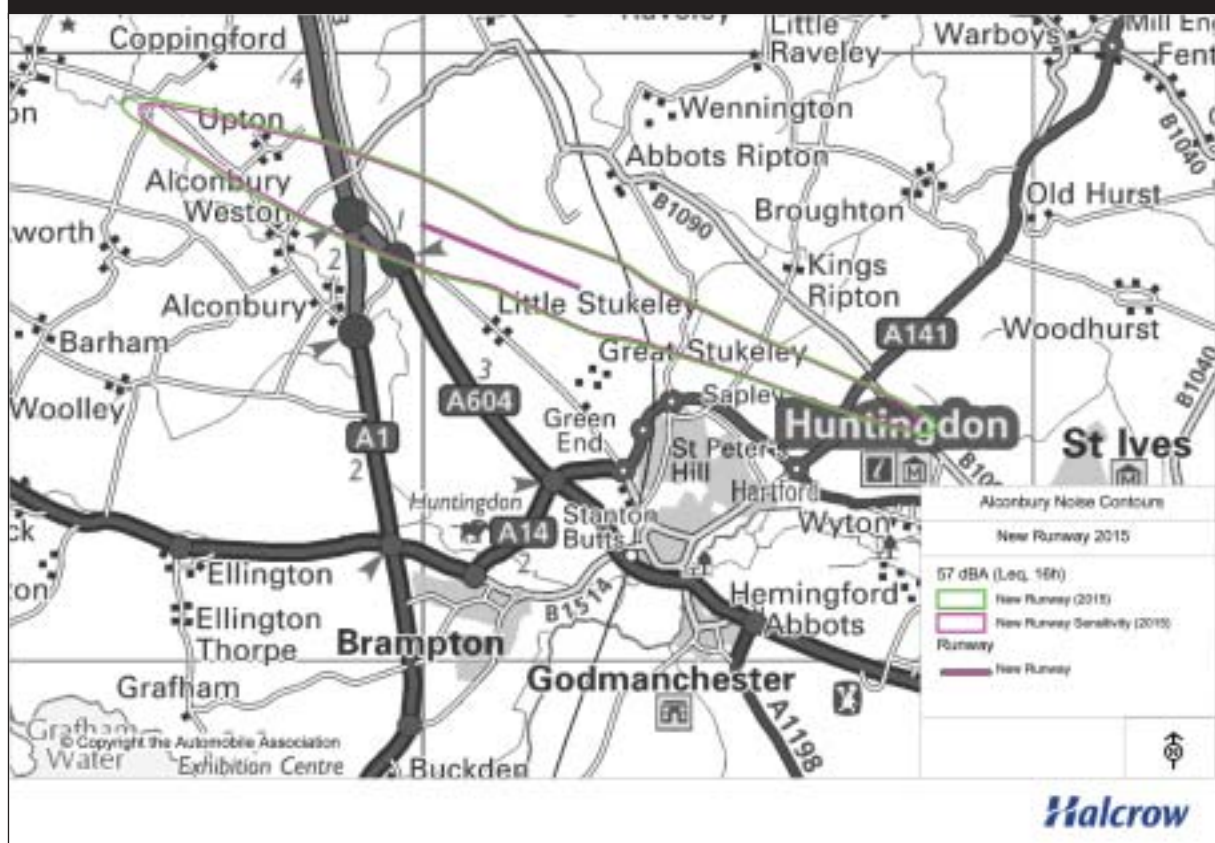
DAYTIME NOISE

12.26 **Table 12.2** shows the areas and number of people exposed to different amounts of aircraft noise in 2015 based on an average 16 hour day (07.00 – 23.00) based on an assumption that no additional runway capacity is provided in the South East. See **Figure 12C**.

Table 12.2: Daytime noise		
Noise level Leq (dBA)	Area (km ²)	Population (000's)
>54	21.6	2.4
>57	12.5	0.9
>60	6.9	0.1
>63	3.7	<0.1
>66	2.0	<0.1
>69	1.1	<0.1
>72	0.7	<0.1

²¹ Stage One: Alconbury and [Hullavington](#), Halcrow, August 2001.

Figure 12C: 57 dBA noise contours (2015)



PLANNING IMPACTS

- 12.27 We forecast that around 12,000 direct jobs might be associated with Alconbury based on 5mppa and around 1 million tonnes of freight. Analysis suggests that much of this employment could be met from local labour markets without necessarily resulting in in-migration.
- 12.28 It is anticipated that all of the proposed airport's employment land needs could be accommodated within the relevant catchment area.

CHAPTER 13

Freight

CURRENT SITUATION

- 13.1 Air freight in the UK doubled in the two decades 1969 to 1989, doubled again in the decade to 1999 and is forecast to grow even more rapidly over the next 10 years. Although air cargo, at 2.3 million tonnes a year, represents only a small proportion, by weight, of total freight movements, the emphasis on high value goods means that aircraft carry about one fifth of all UK exports of goods, by value. London airports – and particularly Heathrow – predominate, accounting for around 80 per cent of the market. Around 70 per cent of all air freight and parcels traffic is carried in the baggage holds of passenger aircraft, not least because of the constraints on dedicated freighter services operating out of major airports during peak hours. At Heathrow, the percentage is over 90 per cent, and rising.



- 13.2 The growth of passenger traffic has led both Heathrow and Gatwick to operate at or near to peak capacity throughout most of the day. This has left little scope for dedicated, all-cargo freighter flights from these two airports. Freight traffic has been forced further afield with freight traffic growing rapidly at both Stansted and East Midlands.

FUTURE PROSPECTS

- 13.3 The proportion of freight carried by dedicated freighter flights is forecast to increase, for two principal reasons: first, the small package/express parcel sector dominated by the four integrators, DHL, Fedex, TNT and UPS, is the fastest growing part of the air freight market and is increasingly carried on dedicated freighters; secondly, the underlying demand for

freight carried in passenger aircraft is forecast to grow faster than passenger demand, thus probably requiring some of that demand to transfer to freighters.

- 13.4 The express parcel sector has experienced growth rates in excess of 20 per cent per year over the last decade. While continued growth at this rate is unlikely in the long term, it is expected that the express sector would account for around half of the UK air freight market by 2030, similar to the share in the US. Air freight demand forecasts are summarized in **Table 13.1**.

Table 13.1: Express and standard air freight forecasts (million tonnes)				
	1998	2010	2020	2030
Express	0.4	2.3	4.8	7.1
General cargo	1.7	3.1	4.7	6.5
Total	2.1	5.4	9.5	13.6
Annual growth (% per annum)		8.3%	5.8%	3.7%
Express share	20%	42%	50%	52%

- 13.5 The main issues for the air freight business are capacity and night-time access.

FORECASTS AND CAPACITY REQUIREMENTS

- 13.6 Air freight traffic forecasts for the main London airports are shown in **Table 13.2** for highly constrained (no new runways in the South East) and less constrained (three or four new runways in the South East) scenarios.
- 13.7 Freight traffic at the main London airports is forecast to grow from 1.8 million tonnes in 2000 to between 6 and 8 million tonnes in 2030, depending on the level of capacity provided. Much of this growth is forecast to occur in freighter traffic, accommodated by an increase in freighter air transport movements (ATMs) and a substantial increase in freight carried per ATM.



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- 13.8 In the constrained case, with no new runways in the South East, there is forecast to be substantial air freight demand at Stansted and Luton. The introduction of an additional runway at Alconbury would divert some freight away from Stansted but increases the total freight traffic through South East airports.
- 13.9 In the less constrained scenarios, it is the additional capacity at Stansted and Cliffe which is forecast to attract a large part of total air freight movement.
- Heathrow's bellyhold capacity would be fully utilised and Heathrow's throughput is forecast to be around 2 million tonnes.
 - Gatwick's bellyhold capacity would also be well utilised – accounting for about 90% of total freight at the airport – with throughput of up to about 1 million tonnes with the option for two new runways. There would be greater scope for dedicated freighter traffic with that larger option. The figures in **Table 13.2** are based on freight forecasts produced for Stage 2 of SERAS and therefore did not take account of the 2019 agreement which would delay opening of new runways until about 2024. A change in the timing of new runway capacity will change the freight throughput at an airport. For example delaying additional runway capacity at Gatwick would reduce passenger traffic and therefore bellyhold freight at the airport.
 - Stansted's freight throughput could increase to around 4 million tonnes, making it the largest freight airport in the UK.
 - The air freight demand at Luton and at Alconbury would be reduced by additional capacity at either Stansted or Cliffe.

Table 13.2: Air freight forecasts by airport

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

- Assuming Cliffe was built, the forecasts show that it might handle 2.8 million tonnes while freight throughput at Stansted would reduce to around 2 million tonnes.
- The number of freighter ATMs, allowing for further increases in tonnes per ATM, is forecast to increase to almost 80,000, mainly at Stansted or, if the new airport were built, a substantial part would be at Cliffe.

NIGHT-TIME ACCESS

- 13.10 The express sector requires airports with 24-hour operation so that ‘next day delivery’ requirements can be met. The rapid growth in express freight is likely to lead to increased demand for night time movements, particularly at South East airports.
- 13.11 In 2000 there were 13,000 night time (between 2200 and 0600 **Universal Time Constant**) freighter ATMs at the four major London airports (Heathrow, Gatwick, Stansted and Luton).[†] By 2030 more than half of the forecast 80,000 freighter movements, i.e. 40,000 ATMs, might prefer night time slots, three times as many as in 2000. Significantly increased night time activity would need to be demonstrably necessary for the economic wellbeing of the UK in order to outweigh the disturbance to local people.
- 13.12 Possible ways of meeting forecast demand might be:
- a new 24-hour runway to serve freighter demand in the South East, with Cliffe and Alconbury the possible locations. These locations are estimated to impose noise impacts on fewer people than any of the existing South East airports;
 - additional use of existing or new 24-hour runways outside the South East, perhaps at East Midlands airport, but this would be less well located in relation to the market;
 - a change in the way in which air freight markets, and particularly express air freight, operate, so they make more use of daytime runway capacity and fewer night-time movements;
 - substantial trip suppression, use of continental airports, or use of other, less preferred modes; **and**
 - relaxation of night-time movement caps at existing airports, notably Stansted and Luton, would help but this might not be acceptable.
- 13.13 The other major issue for the provision of air freight capacity is location. **Gatwick**, Stansted, Luton and Cliffe offer similar levels of accessibility to London and the South East and major developments at any of these airports would allow much of the air freight demand in the South East to be accommodated locally. Although situated further from the South East, East Midlands would offer freight operators the potential to consolidate UK operations, although any efficiency benefits that this would provide would be somewhat offset by increased surface access times and costs.

[†] Note that these figures are provided by the airport operators and are based on a definition of night time which is different to the definition currently used by Government in setting night restrictions at the three BAA London airports: ‘night period’ 2300–0700 and ‘night quota period’ 2330–0600, local times.

CHAPTER 14

Airport development up to 2030

In this chapter we describe potential combinations of airport development options on which the Government is consulting the public. One is based on options for maximum use of the existing number of runways (but no additional runways). The others contain proposals for a total of one, two, three or four new runways at a range of locations, including the possible new site at Cliffe in North Kent. We report the results of the economic appraisal of the various potential combinations of development.

- 14.1 **Chapter 3** set out the benefits to consumers and to the economy of a flourishing aviation industry. **Chapter 4** addressed the key issues of whether there should be at least one large hub airport in the South East and whether it should be at Heathrow or some other site. **Chapters 7–11** described options for possible development at each of the main airport sites (including the possible new airport at Cliffe) and the impacts of each.

Possible combinations of airport development

- 14.2 In order to establish a framework for as far ahead as 30 years, we need to consider which options or combinations of options might best provide the basis of a sustainable airports policy.
- 14.3 We have examined a number of possible combinations of development that provide different amounts of new airport capacity as well as options that limit development in the South East.

REGIONAL AIRPORT CAPACITY UP TO 2030

- 14.4 We have assumed for the purposes of appraising all the combinations of development in the South East (including the maximum use case in which no new runways are built) that there is ample capacity up to 2030 at airports outside the South East.
- 14.5 This does not mean that any decisions have been taken in respect of additional capacity in the regions. Options for additional capacity at regional airports and appraisals of the impacts are contained in the relevant consultation document. Decisions about new capacity at these airports will be taken in the light of the consultation.

BASE CASE

- 14.6 The base case used in the SERAS study to measure the impacts of new airport capacity assumes no development beyond what is already envisaged in the planning system. So at Heathrow we have assumed the opening of Terminal 5 but nothing further, giving a capacity of 89mppa. The capacity at Gatwick would be 40mppa as fixed in a recent local

planning agreement. At Stansted our baseline is the current planning permission to handle up to around 15mppa.[†] Current planning policies give Luton the potential to develop up to a capacity of 10mppa.

14.7 **Table 14.1** shows the combinations of options that were considered in the later stages of the SERAS study. (See **Annex D** for a full list.) There are other possible permutations, but we believe the combinations in **Table 14.1** cover a sufficiently wide range of alternative approaches. Where a combination includes a single runway at Gatwick together with development elsewhere, the runway could be either the close parallel or the wide-spaced option. For the purpose of the appraisal in this chapter, however, the close parallel runway option is assumed. More detailed information, including appraisal of combinations with the wide-spaced runway option at Gatwick, is in the addendum to the SERAS Stage 3 report – see **Annex B**. As **Chapter 8** explains, runways at Gatwick could not be provided until after 2019 if the agreement there runs its full course. This chapter presents two alternative scenarios in respect of the timing of Gatwick runway options:

- **Scenario one** – the 2019 agreement is disregarded and new Gatwick runways can be built before 2019. For example, it was assumed in Stage 2 of SERAS that a first new runway in the South East would be open in 2011.
- **Scenario two** – the 2019 agreement is assumed to run its full course. New Gatwick runways would not be open until 2024.

Where development of one or two new Gatwick runways is combined with new runways elsewhere in the South East, the **order** of new runways assumed in SERAS is different under the two scenarios. For example, with one new runway at both Gatwick and Stansted, the order and timing of these would be:

- **Scenario one** – Gatwick (one new runway in 2011), Stansted (one new runway in 2021).
- **Scenario two** – with the agreement in place, this would become: Stansted (one new runway in 2011), Gatwick (one new runway in 2024).

More detail about the assumptions used in SERAS about the timing and order of runways is in **Annex B**, see page 166.

[†] BAA secured planning permission to expand the airport to handle up to 25mppa subject to planning conditions and a section 106 agreement in September 2002 and this was confirmed in January 2003.

Table 14.1: Possible combinations of airport options

Airport options included
Base case (no development)
Maximum use of existing number of runways only
Heathrow: one new runway
Gatwick: one new runway (close parallel or wide-spaced)
Stansted: one new runway
Stansted: two new runways
Gatwick: two new runways
Heathrow and Gatwick: one new runway each
Heathrow and Stansted: one new runway each
Gatwick and Stansted: one new runway each
Heathrow, Gatwick and Stansted: one new runway each
Heathrow: one new runway and Stansted: two new runways
Heathrow: one new runway and Gatwick: two new runways
Gatwick: one new runway and Stansted: two new runways
Gatwick: two new runways and Stansted: one new runway
Stansted: three new runways
Cliffe: four runways

Where a combination of development includes one new runway at Gatwick this is either the close parallel or wide-spaced option.

GROWTH WITH NO INCREASE IN THE NUMBER OF RUNWAYS (‘MAXIMUM USE’)

- 14.8 The principal differences between this combination and the base case arise at Stansted and Luton. At Luton, an option is the combination of a longer runway and parallel taxiway – with two choices of alignment – and extra terminal capacity providing a capacity of up to 31mppa. By 2030 forecast traffic reaches 29mppa. At Stansted, the terminal capacity of the airport would rise from 15mppa today to 35mppa (but we forecast that traffic might only reach about 26mppa). At Heathrow, there is no difference: Terminal 5, but nothing more, is assumed in both cases. At Gatwick, there are no extra facilities, but there is scope for a little more throughput if greater use is made of spare capacity in off-peak periods.
- 14.9 In this scenario, the shortages of runway capacity already evident throughout the day at Heathrow, and for much of the day at Gatwick, would spread to Stansted and Luton. There will, within the next few years, be a shortfall of runway capacity in the peak hours at *all* the major South East airports, and this would spread rapidly across all daytime hours. Over time passenger throughput might increase slowly as average plane sizes increased in the face of heavy constraints.
- 14.10 As a result, passengers in the South East would face more delays and face extra travel costs – we estimate a fare premium of £100 or more per person at Heathrow, Gatwick or Stansted by 2030. There would also be indirect costs and changes to the route networks served by South East airports as rising fares made some routes unsustainable.

- 14.11 **Table 14.2** shows estimates of the capacity of South East airports in the base case and with maximum use as well as forecasts of traffic at each airport in 2015 and 2030.

Table 14.2: Base case/maximum use capacities and traffic forecasts by airport (mppa)					
	Heathrow	Gatwick	Stansted	Luton	Total
Base Case capacity	89	40	15	10	154
Forecast traffic in 2015	77	37	15	8	137
Forecast traffic in 2030	89	45	15	10	159
Maximum Use Capacity	89	46.5	35	31	201.5
Forecast traffic in 2015	77	37	23	17	154
Forecast traffic in 2030	89	41	26	29	185

- 14.12 The mid-point forecast of unconstrained demand for air travel in the South East is a little over 200mppa by 2015 and around 300mppa by 2030. So in the base case, half of the total demand would not be met. These constraints are so severe before 2030 that the model is only able to compute the allocation of passengers between airports nationally if the assumed capacity of 40mppa at Gatwick is increased. With maximum use of existing runways, over a third of South East demand would not be met.
- 14.13 The reason that passenger numbers at Gatwick, Stansted and Luton do not reach their stated capacity by 2030 is because the effective constraint in each case is the number of take-off and landing slots – i.e. runway capacity – rather than the capacity of passenger terminals. Passenger throughput would only increase if the average size of plane were to be greater than has been assumed.
- 14.14 **Chapter 12, Other South East airports**, described the contribution that some of the smaller airports might make to overall capacity. The DfT air passenger forecasting model includes London City, Southampton and Norwich. London City serves a business market in London and traffic levels by 2030 are not much affected by the amount of capacity provided at the main South East airports. The forecasts show that Southampton and Norwich would attract overspill traffic from the main airports if more runway capacity is not provided in the South East, and even more if constraints are as severe as in the base case. Demand at these two airports would fall away sharply if capacity is provided at the larger airports. The other small airports that have been considered would attract more traffic only in the very constrained base case.
- 14.15 As **Table 14.6** later in this chapter shows, the net economic benefits of the ‘maximum use’ case compared with the base case are high because the increase in capacity of around 40mppa by 2030 is achieved at relatively small cost. No additional runways are built in the South East in this scenario; the only significant airport development costs are incurred at Stansted and Luton. The ratio of total benefits to costs is nearly four to one – a particularly high ratio.

- 14.16 The impacts are felt principally at Luton and Stansted where the increase in capacity by 2030 is greatest. At Stansted, road and rail improvements would be needed but there would be only very minor noise and local air quality impacts. Unlike Stansted, land **could be** required at Luton, including some Green Belt, with potential loss of two listed buildings in one of the options. The number of people affected by lower levels of noise could more than double; the predicted impact on local air quality is deemed to be manageable. On the other hand, growth at Luton would be positive for the local economy. **As Table 14.3 illustrates, there is a strong inter-relationship between traffic at Stansted and Luton and the amount of airport capacity provided elsewhere in the South East. Essentially, where capacity is provided at Heathrow, Gatwick, Cliffe or Stansted, passenger numbers at Luton are substantially less than capacity. The same is true, but to a lesser extent, at Stansted where capacity is provided at Heathrow, Gatwick or Cliffe. So the amount of capacity that would be needed at Luton, and, to some extent, at Stansted, would be related to the amount of capacity at the other South East airports. See Chapters 9 and 10 for more details about these airports.**
- 14.17 The Government proposes that maximum use (as described in paragraph 14.8) should be made of **the existing number of runways at the main South East airports (Heathrow, Gatwick, Stansted and Luton)**. In practice, given the lead time for constructing new runways, this is the only way new capacity could become available for about a decade after the White Paper. **But of course the Government invites views on this matter.**

COMBINATIONS WITH RUNWAY DEVELOPMENT

- 14.18 Table 14.3 shows for each of the combinations listed above the total potential amount of capacity at each of the main South East airports and our forecast of the traffic using each airport by 2030 (both in millions of passengers per annum). **The table specifies in each case the number of new runways and their assumed opening date. For packages of development with new runways at Gatwick, figures are shown both with and without the 2019 agreement.** As a reminder, the underlying demand for air travel through the main South East airports is forecast to reach about 300mppa by 2030. Neither this figure nor the figures in Table 14.3 include the contribution that smaller airports in the South East might make (see Chapter 12, *Other South East airports*).

Table 14.3: Capacity/Forecast demand in 2030 (mppa)							
		Heathrow	Gatwick	Stansted	Luton	Cliffe	Total
Base Case	Capacity	89	40	15	10	–	154
	Traffic	89	40	15	10	–	153
Maximum Use	Capacity	89	46.5	35	31	–	201.5
	Traffic	89	41	26	29	–	185
Heathrow (one – 2011)	Capacity	116	46.5	35	31	–	228.5
	Traffic	115	46.5	26	27	–	214.5
Gatwick (one close parallel – 2011)	Capacity	89	62	35	31	–	217
	Traffic	86	61	26	28	–	201
Gatwick (one close parallel – 2024)	Capacity	89	62	35	31	–	217
	Traffic	89	62	26	28	–	205
Gatwick (one new wide-spaced – 2011)	Capacity	89	83	35	31	–	238
	Traffic	89	77	26	27	–	219
Gatwick (one new wide-spaced – 2024)	Capacity	89	83	35	31	–	238
	Traffic	89	76	26	29	–	220
Stansted (one – 2011)	Capacity	89	46.5	82	31	–	248.5
	Traffic	84	38	74	29	–	225
Stansted (two – 2011 & 2021)	Capacity	89	46.5	102	31	–	268.5
	Traffic	82	40	98	23	–	243
Gatwick (two – 2011 & 2021)	Capacity	89	115	35	31	–	270
	Traffic	89	109	27	19	–	243
Gatwick (two – both 2024)	Capacity	89	115	35	31	–	270
	Traffic	89	112	29	16	–	246
Heathrow (one – 2011) & Gatwick (one – 2021)	Capacity	116	62	35	31	–	240
	Traffic	112	62	27	20	–	221
Heathrow (one – 2011) & Gatwick (one – 2024)	Capacity	116	62	35	31	–	240
	Traffic	116	62	26	22	–	226
Heathrow (one – 2011) & Stansted (one – 2021)	Capacity	116	46.5	82	31	–	275.5
	Traffic	116	41	76	16	–	249
Gatwick (one – 2011) & Stansted (one – 2021)	Capacity	89	62	82	31	–	261
	Traffic	86	58	74	25	–	243
Stansted (one – 2011) & Gatwick (one – 2024)	Capacity	89	62	82	31	–	261
	Traffic	83	59	75	23	–	240
Heathrow (one – 2011), Gatwick (one – 2018) & Stansted (one – 2024)	Capacity	116	62	82	31	–	291
	Traffic	116	59	78	13	–	266
Heathrow (one – 2011), Stansted (one – 2018) & Gatwick (one – 2024)	Capacity	116	62	82	31	–	291
	Traffic	116	60	74	13	–	263
Heathrow (one – 2011) & Stansted (two – 2018/2024)	Capacity	116	46.5	102	31	–	295.5
	Traffic	116	42	96	12	–	266

Table 14.3: Capacity/Forecast demand in 2030 (mppa)

		Heathrow	Gatwick	Stansted	Luton	Cliffe	Total
Heathrow (one – 2011) & Gatwick (two – 2018/2024)	Capacity	116	115	35	31	–	297
	Traffic	116	108	28	12	–	264
Heathrow (one – 2011) & Gatwick (two – both 2024)	Capacity	116	115	35	31	–	297
	Traffic	116	108	28	14	–	266
Gatwick (one – 2011) & Stansted (two – 2018/2024)	Capacity	89	62	102	31	–	294
	Traffic	81	59	98	18	–	256
Stansted (two – 2011 & 2018) & Gatwick (one – 2024)	Capacity	89	62	102	31	–	294
	Traffic	82	58	98	17	–	256
Gatwick (two – 2011/2018) & Stansted (one – 2024)	Capacity	89	115	82	31	–	314
	Traffic	84	106	71	12	–	273
Stansted (one – 2011) & Gatwick (two – both 2024)	Capacity	89	115	82	31	–	314
	Traffic	83	107	78	17	–	285
Stansted (three – 2011/2018/2024)	Capacity	89	46.5	129	31	–	295.5
	Traffic	81	41	122	15	–	258
Cliffe (4 runways – 2011/2021)	Capacity	89	46.5	35	31	113	314.5
	Traffic	87	40	26	9	110	272

For the purposes of this table, where one new runway at Gatwick is indicated together with development elsewhere, this is the close parallel option. Construction of the wide-spaced option would add a further 20mppa of capacity at Gatwick. The strength of demand for Gatwick and its large catchment area mean that most of that additional capacity would be rapidly taken up. Detailed information about these impacts, under the different scenarios, is in the addendum to the Stage 3 report – see **Annex B**.

The timing of additional runway capacity would have consequences for the allocation of traffic between the major South East airports and other UK airports. The effects would vary for different combinations of development. Some of these effects are illustrated in **Table 14.4**.

Note – totals may not sum due to rounding.

14.19 The demand figures in **Table 14.3** are the starting point for the economic appraisal below.

14.20 **Table 14.4** shows how much traffic is forecast at the main South East airports and at other UK airports in 2030 for each combination of development. The table also indicates how many passengers are lost to the UK system (i.e. passengers either make their journeys entirely by surface travel, or start their air journey outside the UK, or do not fly at all). For packages of development with new runways at Gatwick figures are shown both with and without the 2019 agreement.

Table 14.4: Forecast traffic at the main South East and other UK airports in 2030 (mppa)

	SE Airports	Other UK Airports	National demand	Lost to the UK system
Maximum Use	189	239	501	73
Heathrow (one – 2011)	220	217	501	63
Gatwick (one close parallel – 2011)	206	229	501	65
Gatwick (one close parallel – 2024)	210	226	501	65
Gatwick (one new wide-spaced – 2011)	233	201	501	57
Gatwick (one new wide-spaced – 2024)	227	218	501	56
Stansted (one – 2011)	230	217	501	54
Stansted (two – 2011 & 2021)	248	221	501	32
Gatwick (two – 2011 & 2021)	248	224	501	29
Gatwick (two – both 2024)	252	208	501	41
Heathrow (one – 2011) & Gatwick (one – 2021)	226	211	501	63
Heathrow (one – 2011) & Gatwick (one – 2024)	237	213	501	51
Heathrow (one – 2011) & Stansted (one – 2021)	255	216	501	30
Gatwick (one – 2011) & Stansted (one – 2021)	247	223	501	31
Stansted (one – 2011) & Gatwick (one – 2024)	245	222	501	33
Heathrow (one – 2011), Gatwick (one – 2018) & Stansted (one – 2024)	272	203	501	26
Heathrow (one – 2011), Stansted (one – 2018) & Gatwick (one – 2024)	268	203	501	30
Heathrow (one – 2011) & Gatwick (two – 2018/2024)	272	204	501	24
Heathrow (one – 2011) & Gatwick (two – both 2024)	276	197	501	27
Gatwick (one – 2011) & Stansted (two – 2018/2024)	260	208	501	32
Stansted (two – 2011 & 2018) & Gatwick (one – 2024)	261	209	501	31
Gatwick (two – 2011/2018) & Stansted (one – 2024)	278	203	501	20
Stansted (one – 2011) & Gatwick (two – both 2024)	289	194	501	18
Stansted (three – 2011/2018/2024)	263	210	501	28
Heathrow (one – 2011) & Stansted (two – 2018/2024)	271	204	501	26
Cliffe (4 runways – 2011/2021)	273	203	501	25

Source: DfT Air Passenger Forecasting Model South East airports are Heathrow, Gatwick, Stansted, Luton and London City and, where relevant, the proposed new airport at Cliffe.

For the purposes of this table, where one new runway at Gatwick is indicated together with development elsewhere, this is the close parallel option. Construction of the wide-spaced option would add a further 20mppa of capacity at Gatwick. This would have three effects: to increase passenger throughput nationally, to reduce the number of South East passengers using other UK airports and to increase overall the throughput at South East airports. The relative weight of these effects varies for each of the combinations of development shown above. Detailed information about these impacts, under the different scenarios, is in the addendum to the Stage 3 report – see **Annex B**. The timing of additional runway capacity would have consequences for the allocation of traffic between the major South East airports and other UK airports. The effects would vary for different combinations of development. Some of these effects are illustrated in this table.

Economic appraisal

- 14.21 The core passenger benefits of providing more airport capacity come from allowing more people to fly, and from giving all passengers a greater choice of timings and routeings. We have quantified the benefits arising from the first, larger factor by estimating the reduction in fare premiums enabled by additional capacity at each airport where this is provided. As **Table 14.5** shows, fare premiums vary by airport depending on underlying demand for each airport. Our analysis makes no assumption about future airline or airport operation or ownership.

Table 14.5: Average fare premium (£ per return journey in 2030, 2000 prices)			
	Heathrow	Gatwick	Stansted
Maximum Use	135	112	112
One New Runway	120	86	85
Two New runways	66	40	38
Three New runways	26	6	0
Source: DfT Air Passenger Forecasting Model. Different combinations of runway developments generate different fare premiums. Examples above are therefore illustrative.			

- 14.22 Heathrow has a particularly large excess of demand over supply because of the range and depth of its air services and its very large catchment area. In 2000, at Heathrow compared with Gatwick, there were three times more passengers on international flights who started or finished their journey no more than one hour's average drive time away from the airport. Heathrow has many more passengers than Gatwick travelling to the airport by public transport as well. Currently, Heathrow serves about half of London's overall demand for air travel and half of its traffic is London-based.
- 14.23 **Table 14.6** shows the results of the economic appraisal of each of the combinations of development compared with the base case of development currently allowed for in the land use planning system. **For packages of development with new runways at Gatwick figures are shown both with and without the 2019 agreement.**

Table 14.6: Economic benefits and costs (£billion, present value discounted at 6 per cent in real terms)

Principal Components	Total benefits	Costs	Net benefits
Maximum use	6.7	1.8	4.9
Heathrow (one – 2011)	12.0	4.2	7.8
Gatwick (one close parallel – 2011)	8.6	2.8	5.9
Gatwick (one close parallel – 2024)	8.2	2.3	5.9
Gatwick (one new wide-spaced – 2011)	11.1	4.1	7.0
Gatwick (one new wide-spaced – 2024)	9.8	3.0	6.8
Stansted (one – 2011)	11.0	3.9	7.1
Stansted (two – 2011 & 2021)	14.1	4.6	9.5
Gatwick (two – 2011 & 2021)	16.1	4.5	11.6
Gatwick (two – both 2024)	14.2	3.6	10.7
Heathrow (one – 2011) & Gatwick (one – 2021)	14.6	4.8	9.8
Heathrow (one – 2011) & Gatwick (one – 2024)	14.5	4.8	9.8
Heathrow (one – 2011) & Stansted (one – 2021)	17.8	5.5	12.3
Gatwick (one – 2011) & Stansted (one – 2021)	13.7	3.9	9.8
Stansted (one – 2011) & Gatwick (one – 2024)	13.8	4.0	9.8
Heathrow (one – 2011), Gatwick (one – 2018) & Stansted (one – 2024)	21.0	6.1	15.0
Heathrow (one – 2011), Stansted (one – 2018) & Gatwick (one – 2024)	21.3	6.2	15.1
Heathrow (one – 2011) & Gatwick (two – 2018/2024)	25.3	6.9	18.3
Heathrow (one – 2011) & Gatwick (both – 2024)	22.6	5.9	16.6
Gatwick (one – 2011) & Stansted (two – 2018/2024)	16.9	4.8	12.1
Stansted (two – 2011 & 2018) & Gatwick (one – 2024)	17.4	5.2	12.2
Gatwick (two – 2011/2018) & Stansted (one – 2024)	22.6	5.7	16.9
Stansted (one – 2011) & Gatwick (two – both 2024)	21.7	5.7	16.0
Stansted (three – 2011/2018/2024)	17.8	5.2	12.6
Heathrow (one – 2011) & Stansted (two – 2018/2024)	20.9	6.2	14.7
Cliffe (4 runways – 2011/2021)	17.3	8.8	8.5

Note – For the purpose of this table, where one new runway at Gatwick is indicated together with development elsewhere, this is the close parallel option. Construction of the wide-spaced option would add a further 20mppa of capacity at Gatwick. This would have three effects: to increase passenger throughput nationally, to reduce the number of South East passengers using other UK airports and to increase overall the throughput at South East airports. The amount of the increase in overall traffic would depend on the total airport capacity available and so would vary for each of the combinations of development shown above. The increase in the net economic benefits of the relevant combinations would also vary: from about £1 billion where the only development is at Gatwick to up to £3 billion in multiple runway combinations. Detailed information about these impacts, under the different scenarios, is in the addendum to the Stage 3 report – see **Annex B**.

- 14.24 If over time it proved possible to use the existing runways at Heathrow more intensively – as explained in **Chapter 7** in the description of the single runway option – the net economic benefits might increase by up to £2.5 billion.

- 14.25 Economic net benefits in the table above are net present values (NPV) of benefits less construction and maintenance costs of additional airport infrastructure.[†]
- 14.26 Benefits to international transfer passengers are not counted, but benefits to other passengers from the increase in air services and frequencies enabled by the international transfer market are counted. Producer benefits to airports where expansion takes place are included but not benefits to UK airlines since in principle they could re-direct their activities to other world locations. In particular, these figures do not include benefits to airlines and passengers from relieving aircraft delays; if they did, this could add up to £3 billion to the benefits for the larger combinations of airport development.
- 14.27 In this appraisal it is assumed that airport capacity in the UK regions outside the South East is provided to meet demand. If capacity in the regions were constrained, benefits from increasing capacity in the South East would be higher still.

Valuation of environmental costs

- 14.28 In SERAS, calculations were made of the external costs arising from the two environmental impacts that it is possible to quantify in monetary terms: aircraft emissions of CO₂ (as the principal indicator of aviation's impact on climate change) and noise. Robust values of the effects of local air quality on health are not available.

(i) CO₂

- 14.29 As **Chapter 5** explains (paragraph 5.5 – 5.8), the Government has calculated that meeting the cost of CO₂ emissions might lead to a 10 per cent increase in air fares which would reduce demand by the same amount. An assessment of combinations of development with three or four new runways and with 10 per cent lower demand shows that the net economic benefits are reduced by about £1 billion (Cliffe), £1.5 billion (Stansted, three new runways) and £2.5 billion (Heathrow, one runway, and Stansted, two new runways).
- 14.30 However, as **Chapter 5** goes on to say (paragraphs 5.9 – 5.11), greater competition than was assumed in our national forecasts – which are now two years old – will put greater pressure on airline costs and hence fares. Overall unconstrained demand could be at least 10 per cent higher than our original estimates. This would offset the 10 per cent reduction in demand due to CO₂ adjustment. The net loss on the timing of development options and the net economic benefits would be minimal.

[†] SERAS used the then standard central Government discount rate for appraisal and evaluation of projects of 6 per cent per annum in real terms. Following a public consultation in 2002, on 16 January 2003 the Treasury issued a revised version of their guide to appraisal of projects known as “the Green Book” (N.B. this is a different “Green Book” to the one referred to in footnote 5 on page 45 in relation to public safety zones). The recommended discount rate has been revised to 3.5 per cent. There is also guidance in the Green Book on how to evaluate factors implicitly included in the previous 6 per cent discount rate to account for risk and uncertainty. The new Green Book recommends the use of lower discount rates for calculating costs and benefits that will accrue more than 30 years into the future: for example, a figure of 3 per cent for periods between 31 and 75 years ahead. Costs and benefits were calculated in SERAS over a 60 year period. Net benefits of additional airport capacity tend to be higher with a lower discount rate largely because the stream of benefits is larger in discounted terms with a lower discount rate. Economic appraisal of airport options across the UK (including the options in this consultation document) drawing on the revised Green Book methodology is being carried out and the results will be published as soon as possible during the extended consultation period.

(ii) Noise

- 14.31 Monetary values for the effects of noise were estimated by assessing the impact of increased air traffic noise on house prices around the affected airport. Past research has tentatively found that a 1 decibel change in noise results in an approximate 0.5 to 1 per cent change in house prices. On that basis, values at Heathrow range between 36 and 40 pence per passenger; at all other airports in the South East, values never exceed 5 pence per passenger. So for Heathrow, where the noise impacts are an order of magnitude greater than at any other South East airport, the increase in traffic from a third runway (27mppa, i.e. 116mppa with a new runway compared to 89mppa without) would add about £120m of costs in present value terms.

Wider Economic Benefits

- 14.32 In addition to the direct benefits, increased airport capacity is expected to have wider, indirect economic impacts for the economy as a whole, for those parts of the economy most closely linked to aviation and air transport, and for those sub-regions most affected by airport development. Wider economic impacts identified and assessed in SERAS are:
- the potential increase in productivity across the economy as a whole due to an increase in aviation capacity;
 - the increase in foreign direct investment and trade; and
 - the costs imposed on or the benefits to individual industries, for example, tourism, closely associated with aviation.
- 14.33 The focus in the economic evaluation of the SERAS packages has been on the estimation of the direct impacts of increased airport capacity, as being the most tangible, most certain and most measurable indicators of the economic benefits of increased airport capacity and the enhanced air services thereby made possible. In addressing the wider economic impacts, the intention has been to explore the issues and to present an order of magnitude estimate of their potential. It is important to avoid double counting benefits: the value of improved services to business travellers themselves, for example, is already recognised in the direct user benefits which count foreign business and leisure residents as well as UK residents. Basically, the approach adopted for wider economic benefits is to recognise the larger contribution of an airport package which enables more foreign business travellers to fly to and from the UK, without attempting to quantify the contribution of those passengers to foreign direct investment.
- 14.34 **Table 14.7** shows the number of business and leisure trips forecast for the possible combinations of development.
- 14.35 The potential effect of increased airport investment and air services on **productivity across the economy** can be gauged from the total additional business travel that is made possible.



- 14.36 One way of measuring the effects of additional airport capacity on **foreign direct investment** is to consider the number of business trips by foreign residents shown in the first column.
- 14.37 **Tourism** is an industry that would be particularly affected by increased airport capacity. There are two elements to this: trips abroad by UK residents and trips by overseas visitors to the UK. According to British Tourist Authority statistics, overseas tourists in the UK currently spend about 20 per cent per person more on average than UK tourists abroad. At present the number of UK tourists travelling abroad is almost double the number of foreign tourists visiting the UK. Using this one crude measure, **based on forecasts of trips through South East airports only, tourist expenditure in the UK as a result of air trips through South East airports** is less than expenditure by UK residents travelling abroad. The Government's forecasts of underlying demand for leisure trips is stronger for foreign residents than for UK travellers. If capacity is provided to meet that demand (such as in the larger combinations of airport development), over time the higher number of foreign tourists coupled with their higher average expenditure could bring total expenditure levels broadly into line.

Table 14.7: Forecasts of trips through South East airports in 2030 (mppa)

Principal components	Foreign Business Trips via SE Airports (millions)	UK Business Trips via SE Airports (millions)	Foreign Leisure Trips via SE Airports (millions)	UK Leisure Trips via SE Airports (millions)
2000	11.4	12.5	22.0	39.0
Unconstrained	40.1	42.5	61.9	71.6
Maximum use	33.8	32.5	37.3	41.3
Heathrow (one – 2011)	35.7	35.7	45.5	51.2
Gatwick (one close parallel – 2011)	34.8	33.9	43.1	46.6
Gatwick (one close parallel – 2024)	34.8	33.9	43.8	47.8
Gatwick (one wide-spaced – 2011)	35.7	35.7	47.1	51.7
Gatwick (one wide-spaced – 2024)	35.9	35.5	48.7	52.9
Stansted (one – 2011)	35.7	35.7	47.3	53.2
Stansted (two – 2011 & 2021)	36.8	37.2	52.2	57.6
Gatwick (two – 2011 & 2021)	37.0	37.6	52.9	58.0
Gatwick (two – both 2024)	36.3	37.3	52.8	56.6
Heathrow (one – 2011) & Gatwick (one – 2021)	35.3	35.7	46.9	49.0
Heathrow (one – 2011) & Gatwick (one – 2024)	36.5	36.8	49.9	56.2
Heathrow (one – 2011) & Stansted (one – 2021)	37.6	38.5	53.9	59.6
Gatwick (one – 2011) & Stansted (one – 2021)	36.9	37.3	52.3	57.2
Stansted (one – 2011) & Gatwick (one – 2024)	36.5	36.8	51.1	57.4
Heathrow (one – 2011), Gatwick (one – 2018) & Stansted (one – 2024)	38.5	39.9	57.6	64.8
Heathrow (one – 2011), Stansted (one – 2018) & Gatwick (one – 2024)	38.3	39.7	56.3	63.5
Heathrow (one – 2011) & Gatwick (two – 2018/2024)	38.4	40.1	57.6	66.2
Heathrow (one – 2011) & Gatwick (both – 2024)	38.7	40.5	58.7	67.5
Gatwick (one – 2011) & Stansted (two – 2018/2024)	37.6	38.4	54.7	60.3
Stansted (two – 2011 & 2018) & Gatwick (one – 2024)	37.6	38.4	54.8	61.0
Gatwick (two – 2011/2018) & Stansted (one – 2024)	38.6	40.1	58.3	65.8
Stansted (one – 2011) & Gatwick (two – both 2024)	39.0	41.0	59.6	68.8
Stansted (three – 2011/2018/2024)	37.8	38.5	55.2	60.9
Heathrow (one – 2011) & Stansted (two – 2018/2024)	38.4	39.8	57.1	63.9
Cliffe (4 runways – 2011/2021)	38.4	39.5	57.9	66.1
Note – For the purposes of this table, where one new runway at Gatwick is indicated together with development elsewhere, this is the close parallel option.				
Source: DfT Air Passenger Forecasting Model. South East airports are Heathrow, Gatwick, Stansted, Luton and London City and, where relevant, the proposed new airport at Cliffe. Excludes international transfer passengers and passengers on internal domestic end-to-end flights.				

REGENERATION BENEFITS

- 14.38 In the case of Cliffe, as **Chapter 11** points out in the assessment of impacts on regional planning, the airport could be expected to have positive effects in terms of regeneration of the Thames Gateway. These benefits would, for instance, include the creation of a total of 80,000 new jobs by 2030. On a much smaller scale, development at Luton would also be in a regeneration area.

CHAPTER 15

Funding airport development

This chapter discusses the issue of how major new airport capacity could be funded, particularly at Cliffe or Stansted given the historic preference of airlines and passengers for Heathrow and Gatwick. It acknowledges the importance of an efficient mechanism for allocation of new slots

Introduction

- 15.1 Airport companies receive aeronautical charges for use of their airport as well as non – aeronautical revenues such as rents and retail franchise income. Airport charges at the London airports have been low, reflecting BAA's success in delivering efficiency improvements and new sources of revenue, but also a long period of relatively modest investment in the system and, especially at Heathrow, a generally high level of asset utilisation.
- 15.2 The financial model used in SERAS estimates the rate of return generated by the additional investment and capacity provided in each combination of development options. This requires, among other things, estimates of capital costs, the capacity of additional infrastructure and the build-up of its use, and assumptions on revenues. The calculated rate of return can be compared with a target pre-tax rate of return to establish the financial viability of a package. If a package fails to achieve an acceptable rate of return, the model establishes what might be required to meet the funding gap.
- 15.3 In recent years, the great majority of airport projects have been undertaken on a fully commercial basis, without public sector subsidy. This applies both to airports which are privately owned and those which are owned by local authorities. The Government expects this pattern to continue and does not expect to commit public funds.

The Regulatory Regime

- 15.4 The importance of ensuring that the regulatory system for utilities provides appropriate incentives for investment was a key feature of the Better Regulation Task Force report issued in 2001 and the Government's response to it.²² This objective is central to CAA's proposals for setting airport price caps at BAA's London airports and Manchester for 2003–2008; they place heavy emphasis on strengthening incentives for investment in aeronautical capacity where it is in demand. The CAA recognise that its proposals would result in a transfer of economic rents from airlines to airports, but see this transfer as being an acceptable price for the delivery of new capacity and the more efficient use of existing capacity.[†]

²² Economic Regulators: Better Regulation Task Force; July, 2001
Better Regulation Task Force Report on Economic Regulators: The Government Response; February, 2002.

[†] Since July 2002 the Competition Commission (CC) has produced its recommendations on the price caps for BAA's London airports and Manchester. The CAA has issued consultation documents setting out its final proposals prior to announcing its decisions. It has largely accepted the CC recommendations for Heathrow and Gatwick, even though they differed in several important aspects from CAA's initial proposals, but its proposals for Stansted and Manchester differ significantly. However, both the CAA and the CC accept that the price cap should, where appropriate, facilitate investment projects such as T5 at Heathrow and allow BAA to meet its cost of capital.

- 15.5 The CAA proposes that, if the current regulatory regime with the so-called “single till” which takes account of both aeronautical and non-aeronautical revenues is retained, the price cap should allow for a rising profile of airport charges over the five year period to ensure that investment projects such as Heathrow Terminal 5 meet their cost of capital. The CAA’s preferred approach of a “dual till”, taking account of aeronautical charges only, would allow for higher aeronautical charges than under a “single till,” and give stronger incentives to invest in aeronautical capacity. The CAA also propose a price path commitment, linked directly with output delivery, which would provide a stronger and more credible long-term signal than exists under the current regime i.e. that airports would be able to earn a reasonable return on capital investment projects over their life, which extends far beyond the five year regulatory period.[†]

FUNDING MAJOR AIRPORT DEVELOPMENTS

- 15.6 Our analysis shows that by 2011 there will be a substantial excess of demand for runway capacity over supply throughout South East England. Therefore new runway capacity, at any location which is well connected to the major centres of market demand, should attract large numbers of flights and passengers. However, experience at Stansted in the early 1990s suggests that there is no guarantee of a rapid growth of traffic.
- 15.7 A very large London airport will draw passengers from throughout the South East and Eastern regions, but will also be dependent on the strength of demand in its more immediate hinterland. Relative to population, the demand for travel is highest in parts of central London, including the City of London and the City of Westminster. This in part results from the location of incoming demand from foreign residents travelling on business or for leisure.

SLOT ALLOCATION

- 15.8 The Government wishes to ensure that the best economic use is made of new runway capacity. Crucial to that is an efficient market-based system for allocating new slots. The Government is pressing hard for the current EU rules on slot allocation to be reformed to enable the auctioning of new slots and a transparent system of secondary trading between airlines. While we are pressing for these reforms in the EU, we will continue to seek to maximise the economic benefits – to airlines and their customers – from existing and new slots.

[†] Since July 2002 the Competition Commission (CC) has produced its recommendations on the price caps for BAA’s London airports and Manchester. The CAA has issued consultation documents setting out its final proposals prior to announcing its decisions. It has largely accepted the CC recommendations for Heathrow and Gatwick, even though they differed in several important aspects from CAA’s initial proposals, but its proposals for Stansted and Manchester differ significantly. However, both the CAA and the CC accept that the price cap should, where appropriate, facilitate investment projects such as T5 at Heathrow and allow BAA to meet its cost of capital.

HEATHROW & GATWICK

- 15.9 There is generally a higher demand for air travel arising in the West of London than in the East, which partly explains the historic preference for Heathrow on the part of passengers as well as airlines. The excess of demand over supply at Heathrow suggests that there should not be any serious problems in the private sector financing another runway there. **The same would probably be true, albeit to a lesser extent, in the case of a single new runway at Gatwick. However, it would be more difficult to make Gatwick a major hub airport and to finance the construction of two additional runways there. It would probably be necessary to consider measures such as those set out in paragraphs 15.13 to 15.15 below.**

STANSTED AND CLIFFE

- 15.10 Demand at Stansted has been growing strongly in recent years. This most recent growth has been fuelled by the low cost airlines, who have been particularly keen to avoid high airport charges. Capital costs of a unit of additional capacity at Stansted are projected to be significantly less than at Heathrow. However, net airport revenues per passenger at Stansted would be low with its existing pattern of traffic. But Stansted with additional runways might be acting more as a hub predominantly for international scheduled passengers. Net revenues per passenger for the airport operator could be closer to those at Heathrow.
- 15.11 At Cliffe, the market would have to fund an entirely fresh development. Capital costs per passenger would be high by comparison with other sites, partly because of the upfront costs of building the platform on which all four runways would be built.
- 15.12 For Cliffe (in particular) or a large Stansted to be funded by the private sector, the new airport capacity would have to be substantially used from the time the new capacity became available. The most likely way of achieving that would be if a major airline alliance could be attracted to set up a hub operation at the airport; for this reason, routes in our modelling have been “seeded” at Cliffe and at a large Stansted (see paragraphs 9.10 and 11.6, the respective airport chapters). Such high use of capacity at Cliffe or at a large Stansted would also, of course, be necessary if the overall policy objective was to create a new hub, either to replace Heathrow as the UK’s main hub or to become a second hub alongside Heathrow.
- 15.13 Established major carriers would only switch from Heathrow to a new hub if the right economic and commercial signals were in place. The current regulatory environment would be unlikely to facilitate the movement of carriers to a new airport: airlines would not only be leaving the profitable environment of Heathrow for a location where the commercial prospects would inevitably be less certain, but they would also be freeing up valuable scarce capacity at Heathrow for major competitors.
- 15.14 A new hub would have significant attractions for airlines. In particular, the terminal and other facilities would be designed to operate as a hub, there would be adequate runway capacity to operate waves of incoming and outgoing flights (to optimise connections), there would be much less congestion and delays, and there would be space for future expansion. Cliffe would also be much more suitable for night flights.
- 15.15 However, we expect that this would need to be accompanied by changes at Heathrow. Better price signals to airlines and passengers, through charging, auctions or other mechanisms, would help underpin a more effective utilisation of new capacity elsewhere.

SECTION 3

Managing the impacts of airport growth



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CHAPTER 16

Action to tackle environmental Concerns

Individuals and communities are rightly concerned about local quality of life issues. This chapter describes action that is already being taken at national and international level to address the environmental effects of aviation. It goes on to outline what is being done to counter the impact of aviation on climate change and then discusses two of the key local environmental impacts of airport development: noise and local air quality. It describes how the scale of those impacts might be reduced and their effects managed. In the case of noise, it goes on to suggest how the remaining impacts could be mitigated and, ultimately, what compensation might be available to those affected.

- 16.1 The Government is committed to aviation and airport policies that are sustainable. This means finding – and then maintaining – a proper balance between economic, social and environmental considerations. Government and others can take steps to minimize the environmental impacts of aviation and airport development in order to strike that balance. These impacts may be global or local in their effects. Overall we believe in finding local solutions to local problems, but within a framework that recognizes the UK's international obligations and commitments.[†]

Action at international level

- 16.2 A broadly accepted, long-term international framework of environmental regulation is essential to deal with problems such as climate change that have global consequences. It is also necessary to provide stability for investment decisions by the civil aerospace industry and avoid a worldwide proliferation of conflicting local rules. The UK therefore engages constructively in the International Civil Aviation Organisation (ICAO) and the European Union (EU) to promote the welfare of those affected by environmental impacts. In considering the range of environmental measures that can be taken to address problems at UK airports, it is important to understand this in an international context.

ICAO

- 16.3 The ICAO environmental effort is focused on the Committee on Aviation Environmental Protection (CAEP). The work of CAEP and its five working groups is overseen by a steering committee, and the UK is one of 18 states with a seat on this committee.

[†] In the Pre-Budget Report, *Steering a steady course: Delivering stability, enterprise and fairness in an uncertain world*, published in November 2002, the Chancellor of the Exchequer announced a commitment to discuss with stakeholders the potential for using economic instruments to ensure that the aviation industry takes more account of its environmental impact and to help deliver a more sustainable aviation sector. A paper on this issue is being published on the Treasury and DfT departmental websites.

- 16.4 UK Government officials participate in CAEP working groups, either directly or by contracting specialist technical advice, where this is justifiable. The UK Government was also a key player in securing a new consolidated statement of continuing ICAO policies and practices related to environmental protection at the 33rd ICAO Assembly in October 2001. This statement, known as Resolution A33-7, was unanimously accepted by all 184 ICAO member states.
- 16.5 Resolution A33-7 deals with both noise and emissions issues. On noise, it promotes a 'balanced approach' to noise management, comprising four elements:
- reducing noise at source (through more stringent noise standards for aircraft and the development of quieter engines and airframes);
 - noise abatement operational procedures (flying aircraft in the most environmentally friendly way);
 - land use planning and management (for example discouraging noise sensitive development near existing airports and as far as practicable using less populated areas for new ones); and
 - operating restrictions (for example controls on night flights or bans on the noisiest types of aircraft).
- 16.6 It is intended that the 'balanced approach' will be applied on an airport-by-airport basis. It requires airport operators and regulators to consider all available options before deciding which measure or measures are appropriate to achieve their environmental objectives. Although the 'balanced approach' does not envisage a national or regional approach to noise management, Resolution A33-7 recognises that similar solutions may be applied at airports with similar problems.
- 16.7 Resolution A33-7 also addresses the problem of limiting exhaust pollution from aircraft. CAEP is now working on three particular market-based measures in response to Resolution A33-7 – emissions trading, emissions-related levies, and voluntary agreements.
- 16.8 Overall, ICAO has helped to deliver substantial improvements in reduced engine noise and emissions in the last 30 to 40 years. Modern aircraft are far quieter and cleaner than they were 30 years ago, and the UK continues to press for even tougher standards. But membership of ICAO brings with it responsibility as well as opportunity. Contracting states undertake to enact legislation giving effect to ICAO technical standards and recommended practices (SARPS), or to file a formal difference if they do not do so. Members also undertake to act in accordance with ICAO resolutions, including Resolution A33-7. This is relevant, for example, to the issue of taxation of aviation fuel – ICAO has a long-standing policy that there should be no tax on aviation fuel used for international services.
- 16.9 ICAO has a regional structure and the part to which UK belongs is the European Civil Aviation Conference (ECAC), with 39 member states. ECAC has an environmental committee on the Abatement of Nuisances Caused by Air Transport (ANCAT), comprising member states, regulatory bodies, industry, civil society groups, and relevant European institutions such as Eurocontrol and the European Commission. ANCAT has proved a useful vehicle for developing ideas such as improving operating practices to reduce

noise that are then taken forward with potentially good prospects of success at the global ICAO level. ANCAT has also proved helpful in getting a European consensus on common practical issues such as emissions reporting, and certification and charging matters.

European Union (EU)

- 16.10 In recent years EU competence has expanded into aircraft noise and emissions issues. Over the past ten years there has been a series of EU legislative measures. These include on noise:
- the 1992 Directive on the withdrawal of ‘Chapter 2’ aircraft;
 - the 1999 ‘hushkits’ Regulation (now repealed);
 - the 2002 Directive [2002/30/EC] on managing noise at airports, which replaced the ‘hushkits’ Regulation (see below);
 - the current draft Regulation to create a European Aviation Safety Agency (EASA) which amongst other things will assume the independent noise certification function currently carried out in UK by the Civil Aviation Authority; ^{and}
 - an ‘horizontal’ Directive, due to come into force in Summer 2002, which covers noise from major transport modes, including aviation, from industry and from major urban areas (“agglomerations”). This is seeking to harmonise the way in which ‘environmental noise’ is measured and assessed. It requires the publication of information about noise including noise maps and the preparation of action plans to address the noise climate in affected areas.[†]
- 16.11 On emissions, the 1996 *Framework Directive on Ambient Air Quality* [96/62/EC] and subsequent associated ‘daughter’ directives [in particular 1999/30/EC] prescribe mandatory limit values for specific pollutants that will apply at and around airports as anywhere else where the public might be exposed.
- 16.12 The 2002 Directive on managing noise at airports came into force on 28 March 2002, and EU member states have 18 months to take the legislative and other action needed to implement it. This Directive refers to the ICAO ‘balanced approach’ to managing aircraft noise but is largely focused on only one element of the approach, namely operating restrictions. The Directive preserves the flexibility permitted under ICAO Resolution A33-7 and member states retain the ability to tailor local solutions to local problems.
- 16.13 Taken together, these EU measures provide substantial controls in response to aviation environmental concerns. Moreover the European Commission is considering other possible Directives, for example on infrastructure charges including at airports, which may bear on the environmental impact of aviation and what can be done to mitigate it. Other EU developments such as the proposed airport slots Directive and the Single Sky^{††} proposals could also bear on the environment, and the UK Government will play an active role in seeking to shape the direction of EU policy.

[†] Directive 2002/49/EC was published in the Official Journal in June 2002. Strategic noise maps must be produced no later than June 2007 based on data from the preceding calendar year. Action plans to tackle noise effects must be produced by 2008.

^{††} Political agreement on the Single Sky proposals was reached by the EU Transport Council in December 2002

Climate Change

- 16.14 A discussion of the international framework cannot be complete without reference to climate change, a global environmental concern.
- 16.15 The aviation industry's contribution to climate change is growing. Aircraft emit the greenhouse gases that cause climate change directly into the atmosphere, altering concentrations of carbon dioxide, methane and ozone. In its Special Report on Aviation and the Global Atmosphere, published in 1999, the Intergovernmental Panel on Climate Change forecast that, globally, carbon dioxide emissions from aviation are expected to increase from around 140 million tonnes of carbon (MtC) per year in 1992 to between **255 MtC and 385 MtC** per year by 2015 (**an 82 per cent to 175 per cent increase**). The growth in aviation could also lead to a growth in the levels of road traffic in and around airports, with consequent increases in emissions of both greenhouse gases and air pollutants.



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- 16.16 Under the Kyoto Protocol, an international agreement on reducing greenhouse gas emissions from all sources, developed countries are required to take action to reduce emissions from *international* flights through the International Civil Aviation Organisation (ICAO). ICAO is currently working on options to address aviation's contribution to climate change that include technological solutions, improvements in air traffic management and other operating procedures, and market based options.
- 16.17 Emissions from flights within the UK, from airports themselves and from road transport to and from airports are included within the UK's targets under the Kyoto Protocol which is to reduce greenhouse gas emissions by 12.5 per cent below 1990 levels by 2008-2012. The Government also has a domestic goal to reduce CO₂ emissions by 20 per cent below 1990 levels by 2010.
- 16.18 Current commitments under the Kyoto Protocol cover the period to 2008-2012. Discussions are due to begin shortly on commitments beyond this period.
- 16.19 For illustrative purposes an analysis of the impact of CO₂ emissions, a key greenhouse gas, was carried out using two scenarios: no new runway capacity in the UK ('constrained'); and three new runways in the South East and unconstrained capacity elsewhere ('unconstrained').

- 16.20 The work estimated that over 95 per cent of these emissions would relate to *international* flights. And that by 2030 emissions from such flights would account for 65 and 74 million tonnes of carbon in the constrained and unconstrained case respectively. It is also estimated that emissions that would count against UK's present target for limiting CO₂ would be 5.2 and 5.6 million tonnes respectively.
- 16.21 The analysis broadly calculated that meeting the damage costs of these increases in CO₂ emissions would have the effect of increasing air fares by between 5 and 10 per cent. This in turn would reduce demand for air travel by a similar order.
- 16.22 Details of the analysis and the effect on demand are in **Annex E**. Information on how SERAS tested the effects of introducing an environmental tax in response to climate change concerns is in the section at the end of **Annex B** in a section called **Internalising Environmental Costs**.
- 16.23 In sum, the effects of climate change will increasingly be felt in the UK over the coming decades. It could lead to an increased risk of structural damage to buildings and infrastructure and disruption and strain on services through flooding and drought. This will affect decisions on investment and site locations being made now – and hence the backdrop to decision making on airport growth and development. DEFRA launched new climate change scenarios for the UK on 26 April 2002. These provide greater detail on changes in climate and more information on weather extremes, which will help implement adaptation strategies at a local and regional level. DEFRA have also recently proposed that a comprehensive and co-ordinated approach to building climate change assumptions into national policymaking should be developed to increase resilience to future climate change. This will include the air transport White Paper.

Action at national level

- 16.24 Working within the international framework described above, there are things the Government can do to tackle key environmental impacts.
- 16.25 The responses to our ***Future of Aviation*** consultation revealed a large degree of consensus that our priorities should be:
- first, to control and reduce the scale of the adverse impacts;
 - second, to take mitigation measures against the remaining impacts; and
 - third, to provide compensation for those impacts which remained following the mitigation measures.
- 16.26 We agree with this order of priorities, and intend to follow this approach where justifiable. In the remaining paragraphs of this chapter we set out proposals for tackling impacts on local air quality and noise. We address other impacts in the chapters on each location, for example the impact of Cliffe on the natural environment.

- 16.27 Our appraisal of the options for additional runways shows that they would all, but especially the Heathrow option, have adverse environmental impacts. We are clear that none of the options could be approved on the basis of accepting these impacts without any form of control or mitigation. So we need to establish our environmental objectives for each airport, and then decide on the most effective way to meet those objectives.

Local air quality

- 16.28 To improve and maintain local air quality, mandatory EU limits for particular pollutants will be coming into force in the coming years. They will apply irrespective of the source of the pollution. Key pollutants of concern at and around airports are nitrogen dioxide (NO_2) and particulates (PM_{10}). The EU limits for NO_2 are binding from 2010. Those for PM_{10} are binding from 2005 with mandatory further tightening from 2010.



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- 16.29 Meeting the EU limits for NO_2 at Heathrow will be challenging, even without the addition of a third runway at the airport. This was explored at length in the Inspector's report on the Fifth Terminal planning application and in the Secretary of State's subsequent decision letter of 20 November 2001. Stringent measures will be necessary and are being taken or planned. Our modelling shows that without very significant improvements in aircraft performance an extra runway at Heathrow would lead to homes being exposed to exceedences in respect of the NO_2 limit. Emissions from aircraft are in this scenario the main, but not the only, source of NO_2 .
- 16.30 There are uncertainties when modelling possible future concentrations of particular pollutants. However, it remains clear that another runway at Heathrow could not be considered unless the Government could be confident that levels of all relevant pollutants could be consistently contained within the EU limits. This means that the aerospace manufacturers and airlines would need to provide the Government with convincing reassurance. They might, for example, do one or more of the following:

- undertake that suitably clean technology will be available and brought swiftly into use;

- confirm that they will accept restrictions on access to some airports by aircraft that do not meet the most exacting emissions standards; and
 - undertake fully to fund the purchase (and, if necessary, demolition) of properties which would otherwise be made subject to exceedences, and to properly compensate the owners.
- 16.31 Our appraisal indicates that there are unlikely to be any unmanageable air quality problems arising from the options being considered for Luton, Cliffe or Stansted. Potential problems at Gatwick would be considerably less than at Heathrow.

Noise at the main South East airports

(a) Heathrow

- 16.32 The Government's policy is to take all practicable steps to prevent any deterioration in the noise climate around the airport after the phase out of Chapter 2²³ aircraft is completed (as it was from 1 April 2002), and to continue efforts to do everything practicable to improve the noise climate over time. The Government is clear that an extra runway should not provide an excuse to renege on this policy.
- 16.33 The Secretary of State's decision on the Heathrow Fifth Terminal planning application imposed a cap on the size of 57dBA Leq daytime noise contour²⁴ of 145 square kilometres from 2016, in line with the Inspector's recommendation. We consider that a contour cap of this nature should also be a condition of any approval for a third runway at Heathrow. The precise size of the cap would need to be determined after examination of detailed modelling of the likely effects of building the runway, for example to assess the implications of a different pattern of aircraft movements when the runway is operational, but our starting presumption is that the overall 145 square kilometres limit would continue to apply.
- 16.34 Our current appraisal suggests that meeting this condition will be challenging but possible. While existing night noise performance requirements at Heathrow are already setting a *de facto* world standard for wide-bodied long-haul aircraft, that would not be enough. Aircraft and engine manufacturers would also need to deliver the reductions in noise which they are targeting now for future types, and would need to push noise reduction technologies still further to deliver even greater reductions in noise at source. Airlines would also need to eliminate from their Heathrow operations all but the quietest aircraft in each class of their fleets (i.e. long, medium and short haul). Such requirements would involve action by airlines that goes beyond the minimum requirements of the ICAO noise standards coming into effect for new aircraft from 2006, and this needs a very clear commitment from the industry. The consequences of this action in the long term would of course not be confined to Heathrow – they would spill out for the benefit of noise-impacted communities across the world.

²³ International standards for limiting noise at source from civil aircraft have increased in stringency over time, each stringency level being denoted by a chapter number. Normal commercial operations using aircraft to the last standard ("Chapter 2") ceased in Europe on 1 April 2002. The current standard is "Chapter 3". The next standard ("Chapter 4") will apply to new designs from 1 January 2006.

²⁴ Leq represents the continuous sound level having energy content equivalent to the aggregation of individual noise events. The 57 dBA Leq daytime noise contour marks the approximate onset of significant community annoyance due to daytime aircraft noise (of course no such boundary can completely describe the wide range of individuals' reactions to noise). It marks the boundary between noise exposure categories A and B in the planning guidance note PPG24, *Planning and Noise*.

- 16.35 This would not be cheap or easy and some airlines might prefer to move some or all of their operations to another airport. But we believe that if it was decided to proceed with a third runway, it should be feasible to maintain the 145 square kilometres contour cap, especially as we would be giving advance notice of a decade or more. If it subsequently proves to take longer for sufficiently quiet equipment to become available, then it would be necessary either to delay the runway or to use it less intensively in the meantime.
- 16.36 These measures would ensure that those who suffer noise today from aircraft using the existing two runways would enjoy a significant improvement in the daytime noise climate. Night time noise is considered separately at paragraph 16.45 to 16.48.
- 16.37 There would inevitably be some people, living close to the new runway and its approach and departure routes, who would suffer an increase in noise. The numbers affected would be less than those affected by the existing runways, because the approach and departure routes for the new runway would be largely over the M4 corridor. Nevertheless, we believe that everything that could reasonably be done should be done to keep the impacts on these people to a minimum. The new runway, since it would be much shorter than the existing runways, could only be used by relatively small types of aircraft and these tend to be the quieter types. However, we would want to go further than this, by imposing a strict daytime QC limit²⁵ on the types of aircraft permitted to use the new runway. We envisage a limit of QC/1 in the first instance, perhaps falling to QC/0.5 over time.
- 16.38 Our proposals for Heathrow recognise that the option for another runway there offers both much greater economic benefits than a runway at any other location, but also much more significant impacts on air quality and noise. Effectively, what we are proposing is to use a substantial proportion of the higher economic benefits to reduce the environmental impacts to acceptable levels.

(b) Gatwick

- 16.39 Our modelling suggests that making maximum use of the existing runway would result in no overall increase in noise by 2015, indeed there could be an improvement. Under the terms of its sustainable development strategy and obligations in its agreement with surrounding local authorities under section 106 of the Town and Country Planning Act 1990, the airport operator is committed to reduce the daytime noise contour up to 2008. We think that this is an appropriate arrangement for managing the noise impacts of Gatwick with a single runway. The addition of a close parallel runway at Gatwick before or after 2019 would result in almost no increase in the numbers of people exposed to noise today. On that basis, the same principle as suggested for Heathrow of projecting forward an existing noise contour cap might be appropriate. But with a wide-spaced runway, and even more so with two new runways, the numbers affected would increase significantly. We would still propose to follow the same general principle as we have proposed for Heathrow, namely of declaring what size of contour would be a reasonable limit (for when the new runway(s) were fully operational), allowing any relevant planning permission to be granted subject to legally binding conditions which impose the limit.

²⁵ QC = quota count. The current night restrictions at Heathrow classify aircraft into seven QC categories according to how much noise they make on take off and landing, ranging from zero to 16. The quieter types are classified as QC/0, QC/0.5 and QC/1.

(c) Stansted

- 16.40 At Stansted the option for even one additional runway would provide a total capacity equivalent to around six times the number of passengers using Stansted today. This means that it would be more difficult than at Heathrow to avoid deterioration in the overall noise climate. Also, the projected economic benefits of these options are less than those of a Heathrow runway; and therefore the ability of airlines to spend heavily on new and quieter equipment would be less than in the Heathrow case. The total number of people affected by noise is, however, small compared with Heathrow.
- 16.41 While the size of the noise contours at Stansted would be bound to increase somewhat if it was decided to proceed with one or more new runways, we would still **propose** to follow the same general principle as we have proposed for Heathrow, namely of declaring what size of contour would be a reasonable limit (for when the new runway(s) were fully operational), with a view to such a limit being imposed in a legally binding form as part of the conditions attached to statutory authorization of the runway. It might be feasible to achieve some improvements on the noise forecasts presented in **Chapter 9**.

(d) Cliffe

- 16.42 In the case of Cliffe, the aircraft noise impacts will be entirely new and inevitably they would lead to a worsening of the local noise climate compared with now. But the numbers of people affected would be a small fraction of those affected around Heathrow and substantially less than the numbers around Stansted if all development was to be concentrated there. However, the net economic benefits would also be much less than for Stansted options offering equivalent capacity (and would be similar to the net benefits from only one additional runway at Heathrow). But again we would propose to follow the same approach of setting a contour limit as described in the preceding paragraphs. In addition, if Cliffe were developed fully it would remove the pressure for expansion at other South East airports, notably Heathrow, so that stricter environmental objectives could be set for those airports, with a resulting net reduction in future noise impacts. Also, a new airport at Cliffe would be designed from scratch to meet the highest environmental standards.



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Questions on control of noise impacts

- 16.43 We shall welcome views on the following points on the control of noise impacts:
- do you think that contour caps are the best way to determine a noise limit for an airport? If not, what other limits might you suggest?
 - If you agree with the concept of contour caps, what size of noise contours might be desirable and feasible for each option?
 - How do you think a contour cap might be regulated and enforced?
- 16.44 In the above questions, caps should be considered as possible controls on noise for each of the options for new runways which form the whole or part of the possible combinations of airport development considered in **Chapter 14**, namely:
- Heathrow, with one additional runway;
 - Gatwick, with one additional runway (close parallel or wide-spaced);
 - Gatwick, with two additional runways;
 - Stansted, with one additional runway;
 - Stansted, with two additional runways;
 - Stansted, with three additional runways;
 - Cliffe, with four parallel runways; and
 - Luton, with a replacement runway.

NIGHT NOISE

- 16.45 The Government is aware that night noise is a source of particular annoyance to people. None of the options we have appraised need lead to more night flights, and we have assumed *no* increase in night flights at any location other than at the possible new airports at Cliffe and Alconbury. While there would, as noted in **Chapter 13**, be demand for more air freighter movements at night, this would not require any additional runways. The future regime for night movements will be decided in the light of periodic consultations on that issue. The majority of flights that operate at night do so for a mix of operational reasons and not for lack of daytime runway capacity.
- 16.46 Policies in relation to night-time noise at the major London airports have been implemented by limits on the overall number of flights plus ‘noise quotas’, which take account of the number of night-time flights, permitted aircraft types and noise emissions by aircraft type. The October 2001 judgment by the European Court of Human Rights on night flights at Heathrow has been referred to the Grand Chamber of the Court.

[†] The hearing did not take place until 13 November 2002. A decision is not expected for several months.

Until a final judgment is made, which will not be until Autumn 2002 at the earliest, the implications for future night-time noise regulation remain uncertain.[†]

- 16.47 Previous practice has been to review the night restrictions regime for Heathrow, Gatwick and Stansted approximately every five or six years. This has enabled us to consider the restrictions in the light of both technological improvements – quieter aircraft – and the findings of research into sleep disturbance. Each review has also been able to consider the success, or otherwise, of the then current night restrictions regime in meeting its objectives and whether those objectives remain appropriate. We intend to consult on the next night restrictions regime for Heathrow, Gatwick and Stansted by the end of 2003.[†] That regime will apply from October 2004 until about 2009. None of the new runways proposed in this consultation document could be built and become operational during that time.
- 16.48 We shall also consider whether the five yearly review cycle remains appropriate or whether we should attempt to develop a longer term strategy. We would welcome your views on this.[†]

Noise mitigation and compensation

- 16.49 In this section, we consider possible measures for mitigating noise impacts and providing compensation for those impacts that remain.
- 16.50 In accordance with our policy that aviation should meet its external costs, we start from the premise that the industry should be expected to fund such measures. In the first instance, as a matter of practicality, this implies that the airport should be expected to meet any such reasonable and proportionate costs. It would be appropriate, in principle, for the airport to pass these costs on to airlines (the actual ‘polluters’), subject to any constraints implied by treaty commitments, charges regulation and legal or contractual obligations. Provided the scale of the total costs were broadly proportionate to the ‘value’ of the nuisance, this would be generally consistent with the ‘polluter pays principle’.
- 16.51 There are three main issues: the total level of the costs; the basis on which the funding might be gathered; and the mechanism for putting the revenues to use in funding mitigation and compensation measures.
- 16.52 In principle, the charges payable in respect of an aircraft could be related to the degree of nuisance caused by that aircraft. But it would not be essential to strive for absolute precision. The administrative cost and efficiency of the scheme would also need to be considered.
- 16.53 Probably the simplest and most direct system for distributing the proceeds into mitigation and compensation measures would be for the proceeds to go into a ringfenced fund, which could be drawn on to finance the necessary mitigation and compensation measures. The projects to be funded could be determined by aviation and local community representatives working together.

[†] The Government intends to commence consultation shortly on a proposal to extend the present night restrictions regime to October 2005, as an interim measure.

- 16.54 Again, the international context within which the Government works is important here. The European Commission is considering possible legislation which could limit the Government and individual airports in respect of the form, and possibly level, of noise-related charges.
- 16.55 The Department (then DETR) has previously consulted on proposals to clarify and extend airports' powers to make surcharges relating to exceedance of departure noise limits²⁶. Decisions on the detailed proposals, in the light of the responses to that consultation, will be set out in the White Paper.

EXISTING ARRANGEMENTS FOR MITIGATION AND COMPENSATION

- 16.56 **Chapter 19** describes existing statutory arrangements covering compulsory purchase and blight during the construction and pre-construction stages, as well as the provisions for compensating those whose property is devalued as a result of an increase in noise (or other defined physical factors) due to operation of a new runway.
- 16.57 Airport noise insulation grants may be made either voluntarily, or by order of the Secretary of State through a scheme for airports designated for the purposes of section 79 of the Civil Aviation Act 1982. At present, only Heathrow and Gatwick airports are so designated. Designated status for this purpose does not require a statutory scheme to be in force, nor preclude the airport from entering into a voluntary scheme.

POSSIBLE FURTHER MEASURES

- 16.58 We shall welcome comments on the following possible measures and invite proposals for additional or alternative measures:
- should any residential property which suffers a projected increase in noise of 3dB or more as a result of any of these options, and which would be exposed to a daytime noise level of 63dBA or more, eligible for acoustic insulation?
 - should acoustic insulation for households be extended to other noise-sensitive buildings, such as schools and hospitals, depending on detailed circumstances?
 - should those eligible for insulation be given the choice of either having the insulation work done or accepting a cash payment of an equivalent amount?
 - should assistance with relocation expenses be offered to households subject to very high levels of noise (such as 69dBA or more)?
 - should offers be made to purchase those properties which would be subject to both a very high level of noise and a large increase in noise?
 - should cash compensation be offered to those households suffering a significant increase in noise to a level greater than 57dBA but less than 63dBA – and therefore not qualifying for insulation?

²⁶ *Control of noise from civil aircraft: consultation paper* – DETR, July 2000.

CHAPTER 17

Access to airports by rail and road

Earlier chapters on airport options discuss the impacts of individual proposals on rail and road networks. This chapter discusses the general approach to surface access issues, and the principles on which it is proposed that necessary connections and improvements will be made.

- 17.1 Airports are key transport interchanges. The Government is committed to improving access to airports by public transport to help reduce congestion and pollution on nearby roads. At major new airport developments, access to the airport will be an important feature of any planning application. Conditions can be attached to planning approvals requiring appropriate links.

NEW OR IMPROVED RAIL ACCESS TO AIRPORTS

- 17.2 The Strategic Rail Authority (SRA) is the strategic, planning, and co-ordinating body for the rail industry. It acts as purchaser of train services and rail infrastructure on behalf of the Secretary of State and the Greater London Authority, and is responsible for consumer protection and for rail franchising.



BAA Aviation Picture Library

- 17.3 The SRA has a duty to contribute to improved transport integration and to promote modal shift. The SRA's Strategic Plan, published in January 2002,[†] includes improving rail access to Stansted airport as a medium term priority and gives details of existing and proposed improvements. In addition, the SRA is actively involved in the Government's multi-modal studies seeking to address transport problems in major corridors.

[†] The SRA published its latest Strategic Plan on 30 January 2003.

- 17.4 The broad principle, previously set out in the Integrated Transport White Paper, is that aviation should contribute funding for surface access improvements, taking account of the extent to which it benefits.
- 17.5 Briefly, where a rail project is undertaken entirely for the benefit of airport users and staff, for example, a dedicated spur from the main rail network – aviation is expected to finance and fund the whole cost of provision. Where the service operates profitably, after taking into account the costs on the core rail network, including the implications for other users, the airport should be entitled to enjoy the proceeds.
- 17.6 Where a scheme is also likely to benefit non-airport rail users, for example, increasing service capacity on the existing network beyond what is needed to meet long-term airport needs, a contribution from public funds may be justified to realise these benefits. In such circumstances, the broad aim will be to divide the net costs between the airport and the SRA in proportion to the benefit each will derive. Benefits will be assessed using the NATA (New Approach to Appraisal) framework. The division of costs will be a matter for negotiation and the SRA will need to take into account value for money considerations and the extent to which any SRA contribution would divert funding from other priorities.
- 17.7 Airport contributions to rail projects could be met from a variety of sources. At major airports where there is sufficient critical mass of passengers, it may be possible to fully recover costs through the fares. Elsewhere, funding through airport user charges would be consistent with the principle that aviation should bear the costs of facilities used by them or their passengers.

Rail/air substitution

- 17.8 Work has been done with the Strategic Rail Authority (SRA) as part of the regional air services studies to consider the potential impacts of upgrades of the East Coast Main Line (ECML) and West Coast Main Line (WCML).
- 17.9 The competitiveness of rail depends largely on its distance from London. There are no air services from the Midlands to London, and the upgrade of the WCML is projected to reduce significantly point-to-point air passenger demand between Manchester and London, although less so for those air travellers using London airports to join connecting flights.
- 17.10 Air and rail compete for domestic passengers from Scotland, particularly those making less time-sensitive leisure trips. However, even with somewhat shorter journey times from Edinburgh with the ECML upgrade, the effect on air passenger demand is likely to be small.
- 17.11 Following completion of this work, the SRA announced that it is also considering a proposal for a new North-South High Speed Line opening in 2015 or later. The proposals being studied would allow for possible links to Heathrow, Manchester and Birmingham as well as the possible new airport sites at Cliffe and in the Midlands (described in detail in the Midlands regional consultation document). Links would not be feasible to Stansted or Gatwick.
- 17.12 Shorter rail journey times made possible by a high speed line are likely to have most effect at intermediate distances from London, e.g. Manchester rather than the Midlands or Scotland. An SRA study of this project is expected to report by the end of 2002.[†]

[†] The SRA has now received a draft report and intends to consult on the conclusions of this study during 2003. For more information see the SRA's strategic plan 2003.

NEW OR IMPROVED ROADS TO AIRPORTS

- 17.13 It is already a well-established principle that developers meet the costs imposed by their development on the road network. The Highways Agency and/or relevant local authority will be consulted in all cases where airport development is likely to lead to a material increase in road traffic; and planning conditions can be imposed to ensure that appropriate highway connections or improvements are carried out safely and efficiently. Airport operators will be expected to meet the full costs of construction and maintenance, and of any other enhancements needed to accommodate the resulting traffic. This will normally be secured through a section 278 agreement under the Highways Act 1980.
- 17.14 Airport development proposals eventually supported in the White Paper will have significant medium to long-term implications for all the main surface transport modes. Arrangements will be made to ensure that they are properly prioritised in the investment programmes for other transport modes, either through periodic reviews of the 10 Year Plan, and through Regional Transport Strategies contained in Regional Planning Guidance, Local Transport Plans and the normal strategic planning processes of the SRA and Highways Agency; or under special arrangements.

CONCLUSION

- 17.15 Further work will be required to identify in more detail the level of surface transport investment required to deliver any airport development proposals put forward in the White Paper and the allocation of costs between the airports and the transport network providers.

CHAPTER 18

Implications of growth for the safety of our airspace

This chapter describes the work done in SERAS to consider the ability of the UK air traffic control system to cope with the potential growth in air travel contemplated in this consultation document.

- 18.1 An important strategic issue is the ability of the UK air traffic control system to cope with an increase in traffic. Equally important is the efficient operation and integration of national systems. In December 2000 it was agreed that a new institutional structure was necessary for Europe's air traffic management system – a concept known as 'Single Sky' – which is currently under discussion by Member States. The Government supports moves to improve co-ordination and development of a more integrated and seamless service in Europe.



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- 18.2 National Air Traffic Services (NATS) provides the UK's air traffic management services by seeking to ensure that all aircraft flying in UK airspace are safely separated. It also provides air traffic control services at 14 of the nation's airports including Heathrow, Gatwick, Stansted, Luton and London City. Last year NATS handled over 2 million movements nationally and have long term plans to enable the safe handling of around 4 million by 2015. The Civil Aviation Authority (CAA) is the UK's independent aviation regulator. It is responsible for air safety and airspace regulation and seeks to ensure the airspace needs of all users are met as equitably as possible. Through its Directorate of Airspace Policy (DAP), the CAA is responsible for the planning and regulation of all UK airspace including the navigation and communications infrastructure to support safe and efficient operations.

18.3 The addition of runway capacity at any of the London area airports would have to be matched by capacity in the airspace system: airports and airspace have to be regarded as one system. Balanced capacity must be available at all stages (incoming airways, holding points, approach and departure routes, runways) if unacceptable levels of delay are to be avoided. Past experience has indicated that a precise definition of long-term airspace capacity would be an unrealistic target. Airspace structure and air traffic control (ATC) operations are very complex and the technology that supports them is constantly evolving.

18.4 The CAA's Directorate of Airspace Policy and NATS were therefore commissioned as part of the SERAS study to undertake preliminary high-level airspace modelling, simulating potential airport development packages using the Total Airport and Airspace Modeller fast-time simulation software package. Throughout the work it was assumed that the following capacity enhancing ATC tools and working practices would be in place by 2010:

- Aircraft arrival and departure management tools to assist controllers in sequencing aircraft more efficiently;
- The application of 'gate to gate' management of flights;
- More precise tracking and separation of aircraft on departure routes by use of area navigation (RNAV);
- Use of multiple closely-spaced departure and en-route procedures.

Apart from the above, the modelling assumed that current operating practices apply. By 2030, however, operating techniques can be expected to have evolved further.

18.5 Four airport development scenarios were modelled. These were:

- A new airport at Cliffe;
- An additional runway at Heathrow;
- Additional runways at both Gatwick and Stansted;
- An additional runway at Stansted plus the re-alignment of the runway at Luton with the Stansted runways.

The numbers of air transport movements (ATMs) simulated varied between the scenarios but were broadly similar to those required to meet the high end of demand in 2030. The modelling focused on westerly operations (which accounts for between 70 to 80 per cent of operations at South East airports over the past 20 years), with the Cliffe scenario also modelled on easterly operations to investigate the potential conflicts between the new airport and both London City and Heathrow traffic.

- 18.6 The broad conclusion reached from the modelling work was that for all scenarios the additional ATMs could be accommodated with changes envisaged to the structure and management of airspace within the London Terminal Control Area (LTMA). Although these changes would require substantial time and resources for design, simulation and phased implementation, we are confident that the difficulties are not insuperable and any additional capacity could be accommodated.
- 18.7 A detailed safety analysis of all proposed procedures and changes would be required along with an assessment of the environmental impact of the changes. This work will be carried out in the light of the policy framework set out by the Government in the air transport White Paper.

CHAPTER 19

The next stage

This chapter describes some of the practical steps that the Government envisages to take forward the final choices for airport development that will be set out in the White Paper. It describes statutory arrangements for compensation.

- 19.1 The forthcoming air transport White Paper will set out a 30-year national policy for airports.
- 19.2 For the purposes of the SERAS study, it was assumed that a new runway in the South East could not be open before 2011 – based on two years for detailed design and project definition, two years for authorisation, and five years for construction. The experience of the Terminal 5 enquiry suggests that this timetable is ambitious. The Government's proposals for speeding up the decision-making process for major projects are clearly very relevant for airports in the South East.
- 19.3 A clear statement of policy in the White Paper will be an essential component of the subsequent authorisation process, whatever form that may take under revised planning procedures.

SAFEGUARDING

- 19.4 If in the White Paper the Government decided in favour of any particular airport development, it would take steps to safeguard any land needed for development at the relevant airport location. It is envisaged that this might be done by giving directions under Article 14 of the Town and Country Planning (General Development Procedure) Order 1995. It would be important in accordance with human rights principles to establish exactly what land would be affected and the extent of any development restrictions to be placed upon it.

STATUTORY ARRANGEMENTS FOR COMPENSATION

- 19.5 Major projects such as the ones described in **Chapters 7–12** inevitably have an effect on the surrounding area both before and during construction, and once the new facilities are in use. The current statutory blight provisions enable certain categories of landowner, in defined circumstances, to serve a notice requiring his affected land to be purchased at open market value. The intention is that a qualifying affected landowner should be able to require the purchase of his interest in the affected land once a scheme has reached a position of reasonable certainty. The Government is looking at ways of making these arrangements work more fairly as part of its fundamental review of the planning system.

During the consultation period

- 19.6 There are no statutory provisions for dealing with the type of blight which is sometimes referred to as “generalised” blight and which occurs where, as in this consultation document, several options are put forward, but decisions about which option will be pursued will be taken later. The Government recognises that this may cause anxiety amongst residents and businesses who fear they may be affected. However, an important feature of these proposals is that they should be taken forward in an open and consultative manner and that interested parties should be able to express their views on their preferred option at an early stage in the process. The Government is aiming to keep this period of uncertainty as short as possible consistent with allowing people enough time to comment on the airport options.
- 19.7 There are no provisions for compensation to be paid to those who consider they may be affected by any of the options put forward at this stage. Anyone who feels that they are affected by proposals in this consultation document may wish to seek independent legal advice.

After the White Paper is published

- 19.8 If any of the options are carried forward in the White Paper in such a way that there is a firm proposal, then, even though (as in the case of South East airports), actual development might not happen for many years, the provisions of the Town and Country Planning Act 1990 will apply if that proposal is expressed in a way which fulfils any of the criteria set out in schedule 13 to that Act, for example, those set out in paragraphs 5 and 6.

Compulsory purchase of land

- 19.9 Owners whose property is compulsorily acquired for airport development would be eligible for compensation, constituting the open market value of their property (in the absence of the proposed scheme), disturbance payments to cover the costs of moving and Home Loss Payments worth a further 10 per cent of the open market value of the property in question. Currently, Home Loss Payments are subject to a minimum payment of £1,500 and a maximum payment of £15,000 and are limited to residential owner-occupiers and tenants who satisfy certain criteria. However, the Government will shortly be consulting on proposals to significantly increase the minimum and maximum payments for Home Loss Payments.[†] The Government also said in the Compulsory Purchase consultation paper published in December 2001, that it is considering introducing new primary legislation to extend the Loss Payments scheme to cover businesses and agricultural units.^{††}
- 19.10 Developments at existing airports would be a matter for the relevant airport operator using their compulsory purchase powers. These powers are laid down in statute, and all acquiring bodies have to follow the procedures and compensation arrangements defined by law.

[†] A consultation document was published in September 2002 by the Office of the Deputy Prime Minister. Consultation ended in January 2003.

^{††} The Planning and Compulsory Purchase Bill was introduced to Parliament on 4 December 2002.

- 19.11 You can find out more about compulsory purchase procedures and your potential entitlement to compensation from a series of five free booklets entitled “Compulsory Purchase and Compensation”²⁸.
- 19.12 As part of the reform of the planning system, the Government is engaged in a fundamental review of compulsory purchase procedures and compensation, with a view to introducing legislation in due course to make the arrangements simpler, fairer and quicker.

Other compensation arrangements

- 19.13 Compensation would also be available for certain indirect effects of any new airport development – both during construction (under the 1965 Compulsory Purchase Act) and following opening for use (Part 1 of the Land Compensation Act 1973). Under this legislation, property owners are eligible for full compensation for any reduction in the value of their land caused by physical factors (e.g. noise) associated with the new development. For example, residential property owners and the owners of small businesses affected by the noise generated by aircraft landing and taking off would be eligible for compensation for the depreciation in the value of their land caused by the additional aircraft noise.

²⁸ Available from [DfT Publications](#), PO Box 236, Wetherby, LS23 7NB (tel 0845 100 5554) – Product Code 01PD0458/1-5.

ANNEX A

Summary of questions for consultees

SECTION 1 – HOW MUCH CAPACITY SHOULD BE PROVIDED?

- Q1 Should new airport capacity be provided in the South East over the next 30 years and, if so, how much? What are the main reasons for your answer and how does it measure against the environmental, economic and social objectives of the Government's strategy for sustainable development?
- Q2 Should the Government aim to maintain at least one large hub airport in the South East? Is a second hub plausible, and if so, should Government seek to promote one, and what would it need to do to achieve this?
- Q3 Are there any benefits of aviation to passengers, the aviation industry or the wider economy that the Government should aim in particular to secure through its airports policy? Are there any drawbacks it should aim to avoid?
- Q4 Should the Government seek to ensure that the potential employment benefits of aviation growth are spread to those people and localities which are most in need of such benefits? If so, what should it do to achieve this?

SECTION 2 – WHERE TO PROVIDE ANY NEW AIRPORT CAPACITY?

- Q5 To which criteria should the Government attach the most and the least weight in reaching decisions about the location of any new capacity, and why?
- Q6 What are the relative merits of these alternative combinations of possible airport development as set out in Chapter 14?
- Q7 Giving reasons for your answer, which combinations do you prefer and which do you not favour? **If the combinations on which you comment include one new runway at Gatwick, please make clear if you have any preference for or against the two options for one runway (close parallel or wide-spaced) and why.**
- Q8 If you think either **Gatwick**, Cliffe or Stansted should be developed as a hub airport, should the Government take action to ensure such development can be financed and subsequently fully utilised and if so what form should any action take?

Other South East airports (Chapter 12)

- Q9 Should the Government encourage the development of smaller airports to meet as much of the demand as they can attract?
- Q10 Should support be given for a specialized low cost/freight and maintenance facility at Alconbury?
- Q11 If so, what conditions, in broad terms, should be attached to this support?
- Q12 What views do you have about the six sites identified in the SERAS study as having the potential to cater for the demand for Business and other General Aviation?

Freight (Chapter 13)

- Q13 How far should the Government make specific provision for the air freight sector in its decisions about future airport capacity in the South East? What might this involve in practice?

SECTION 3 MANAGING THE IMPACTS OF AIRPORT GROWTH

- Q14 Are there any specific conditions that you feel should be attached to any or all of the airport options described in Chapters 7-11?
- Q15 Are there any impacts reported in the chapters on individual airport options that you consider unacceptable?
- Q16 How can local noise and air quality impacts in particular, best be reduced, controlled and mitigated?

Noise controls (Chapter 16)

- Q17 What are your views on the following points on the control of noise impacts:
- Do you think that caps on the size of noise contours are the best way to determine a noise limit for an airport? If not, what other limits might you suggest?
 - If you agree with the concept of contour caps, what size of noise contours might be desirable and feasible for each option?
 - How do you think a contour cap might be regulated and enforced?

Noise mitigation and compensation (Chapter 16)

- Q18 What views do you have on the following possible measures:
- Should any residential property which suffers an increase in noise of 3dBA or more as a result of any of these options, and which would be exposed to a noise level of 63Dba daytime or more, be eligible for acoustic insulation?
 - Should acoustic insulation for households be extended to other noise-sensitive buildings not normally eligible, such as schools and hospitals, depending on detailed circumstances?

- Should those eligible for insulation be given the choice of either having the insulation work done or accepting a cash payment of an equivalent amount?
- Should assistance with relocation expenses be offered to households subject to very high levels of noise (such as 69dBA or more)?
- Should offers be made to purchase those properties which would be subject to both a very high level of noise and a large increase in noise?
- Should cash compensation be offered to those households suffering a significant increase in noise to a level greater than 57dBA but less than 63dBA – and therefore not qualifying for insulation?

Night noise (Chapter 16)

- Q19 Do you think that a five-yearly review cycle for the night restrictions regime for Heathrow, Gatwick and Stansted is appropriate or should some other review cycle be considered and, if so, what would you suggest? Are specific night noise restrictions needed at any other airport, and if so how should these be determined?

Access to airports by rail and road (Chapter 17)

- Q20 Are there specific surface access improvements that should be made a condition of any airport option and any that should *not* be included?
- Q21 How should any surface access schemes that are required for a particular airport development option be funded?

ANNEX B

The SERAS Study

This Annex explains the background to the SERAS study that was commissioned by the Government in 1999 to examine the demand for airports up to 2030 and consider options for airport capacity to meet that demand. It goes on to explain how SERAS was carried out including the different criteria that were used to appraise the various airport development options.

1985 White Paper

The most recent major statement of the Government's airports policy was contained in the 1985 White Paper **Airports Policy**. It was envisaged that the decision relating to expansion at Stansted, together with already approved plans for developing Gatwick (Gatwick North Terminal opened in 1988) and Heathrow (Terminal Four opened in 1986), would lead to the provision of enough capacity within the South East airports system to the mid 1990s. In the event, traffic at Stansted has grown more slowly than envisaged in 1985, despite the recent rapid growth of low cost carriers, but the use of Heathrow has grown to a level well beyond what was envisaged.

RUCATSE

The last long-term airport planning exercise for the South East was RUCATSE (Runway Capacity to Serve the South East) carried out by a Working Group led by the Department of Transport. RUCATSE started in 1990 when the CAA advised that another runway's worth of capacity would be needed to serve South East demand by around 2005. RUCATSE looked for a full runway's worth of capacity, and did not look at variants offering less capacity but with reduced environmental impact. On 2 February 1995 the then Secretary of State for Transport, Dr Brian Mawhinney, announced that the Government was rejecting RUCATSE options for new runways at Heathrow and Gatwick (the statement was silent on the RUCATSE option for Stansted). Further work was commissioned from the CAA on making more use of existing capacity at Heathrow and from BAA to consider less environmentally damaging options for new runways.

The SERAS Study

The SERAS study was announced in March 1999 and had the following objectives:

- To assess the demand for airport capacity in the South East and East of England, consider options for how this might be addressed, and appraise their economic environmental and social implications.
- To help the Government devise a 30 year sustainable development policy for UK airports.

There are a number of lengthy reports and a larger number of supporting technical documents. A complete list of study documents is in **Annex C**. This consultation document contains the key information from those reports needed to understand the choice of packages of airport development and the options at each airport. But for a full understanding of the complex appraisal process you will need to look at the relevant supporting documents.

From its outset, for a number of reasons, SERAS was seen to be larger and more complex than comparable studies in the other regions: the size of the region, the scale of the demand it generates, the diversity and status of the airports it contains, and the range of air services which are available. Also, given the capacity constraints that already exist at some of the region's airports, SERAS had to look in greater detail at options for runway and terminal capacity enhancement, including options for new airports. The scale and complexity of SERAS involved a comprehensive appraisal of a wide range of options.

The appraisal framework

The method of assessing impacts in SERAS is described in *The Appraisal Framework for Airports in the South East and Eastern Regions of England*²⁹. The appraisal framework was used as the basis for examining options over the next 30 years including:

- No development beyond that already envisaged in the land-use planning system;
- Development of terminal capacity to make full use of existing runway capacity; and
- Development of additional runway and terminal capacity.

The approach to airport appraisal follows that in the then DTLR's *Guidance on Methodologies for Multi-Modal Studies* which sets out the Government's five objectives for transport investment – safety, economy, environment, accessibility and integration. A further consideration is commercial viability, which is a hurdle that must be passed for airport developments on both existing and new sites. A policy that relied on options that could not be funded by the private sector for the bulk of a major airport investment would not have been a useful outcome.

²⁹ Department of the Environment, Transport and the Regions, November 2000

The appraisal framework enables decisions to be made on the basis of trade-offs between indicators for each of these considerations. The framework does not make judgements on the relative value to be put on different considerations and does not provide a mechanistic way of reaching decisions. The weight Ministers put on each consideration will be made clear in the decisions set out in the air transport White Paper.

The stages of SERAS

There have been four main appraisal stages in SERAS: Stage 0, Stage 1, Stage 2 and Stage 3.

Stage 0	Stage 1	Stage 2	Stage 3
'New site' search	Identifying options for increased capacity at both selected new sites and existing airports	More detailed analysis of a shortlist of options Economic cost/benefits and financial appraisal of packages of options	Sensitivity testing

SERAS STAGE 0

Stage 0 involved a “site search” to identify potential new sites to serve the South East and East of England, so that these could be evaluated alongside further development of existing airports. Sites examined included those within the SERAS region itself and others in adjacent regions, that could serve at least part of the South East and East of England catchment area. The study evaluated the full range of potential new locations including ‘greenfield’, ‘brownfield’ and ‘offshore’ sites (including several previous proposals e.g. Maplin, Foulness, Marinair and Cublington). Two types of new site were considered: a major new passenger airport and specialist facilities designed to cater for freight and low cost carriers.

The new sites proposed in this consultation are **Cliffe** in North Kent for a major airport and Alconbury in Huntingdonshire for a more specialist airport.

SERAS STAGE 1

The principal objective of Stage One was to establish the feasible **options** for the development of capacity at each airport in the South East, and to appraise those options in order to determine which should be carried forward to Stage Two. In Stage One each airport was considered in isolation.

SERAS STAGE 2

In Stage 2, the **options** selected from Stage 1 were appraised in more detail. Airport development options were combined and the economic and financial costs and benefits of those combinations of options (many of which comprise options at more than one airport) were assessed. In the SERAS study these combinations were referred to as ‘**packages**’. A list of the packages is in **Annex D**.

The study results in this consultation document are taken largely from the SERAS Stage 2 report.

SERAS STAGE 3[†]

In Stage 3, sensitivity testing has been undertaken on selected packages. These tests have included:

- Government’s policy requirement that aviation should bear its full costs, by estimating the effects on demand and economic and financial appraisal of incorporating environmental costs (based on Stage 2 findings in respect of noise, local air quality and global warming) into air fares;
- The effects on noise and local air quality of alternative assumptions about the performance in respect of the aircraft using different airports. We have used the results from this sensitivity work to inform our thinking on the measures that might be introduced to manage the adverse impacts of airport options; and
- Some limited revisions to the airport layouts and capacities in different packages and the phasing of options within packages.

How were different packages and options compared?

*The following is a summary of the appraisal process. It gives some background on the different criteria used in the appraisal to help you understand the information presented in **Chapters 7–12** about options at each airport and in **Chapter 14** about the possible combinations of airport development.*

The central objective of the study was to provide robust appraisal of various airport options and packages that would allow comparisons to be made between them. The SERAS methodology was therefore geared to assessing the *relative* impacts of options rather than the impacts of options compared to the present position or the mitigation of impacts that might be brought about through intervention (e.g. faster improvements in technology or regulation).

[†] Since publication of the SERAS Stage 3 report, some further technical work has been done. This is set out in an addendum to the Stage 3 report which will be published at the same time as this second edition of the consultation document. See **Annex C** for further information.

Economic and financial appraisal was conducted over the period to 2030 and beyond, so that the effect of increasing airport capacity could be assessed year by year over the life of new infrastructure. These annual effects were summarised in net present values of providing increased capacity relative to the base case (no development beyond that already envisaged in the land-use planning system).

To measure the impacts and benefits of developing airports over 30 years, two appraisal years – 2015 and 2030 – were used. The 2015 appraisal year was used for packages involving no new capacity; additional terminal capacity but no new runway; various options for one new runway; and for a new airport at Cliffe with two runways. The 2030 appraisal year was used for packages with larger numbers of new runways.

Key appraisal assumptions

In order to compare options a number of assumptions were made about how each new runway scheme might be taken forward. This enables us, for instance, to estimate the cost of construction and measure the impacts on people and the environment. Outline layout plans were produced for terminal and other facilities as well as an assessment of the road and rail infrastructure needed to support the airport development. A year for the opening of each runway was assumed. The capacity of different airport options was estimated and forecasts produced of how many passengers would use the new facilities.

Key assumptions for the purposes of comparing options on a consistent basis were:[†]

- the timing of construction of new runways . The first new runway (or the first two at Cliffe) is assumed to be open in 2011. In packages of three new runways, the second and third runways were assumed to open in 2018 and 2024. Cliffe's third and fourth runways are assumed to open in 2021, as is the second runway in packages with two new runways;
- the order of construction of new runways. In our modelling, the principle followed was to assume that the first runway would be built wherever there was the greatest pent-up demand and therefore the project was most likely to be commercially viable; and
- airport capacity in the regions outside the South East is always sufficient to meet demand. This includes a new runway at Birmingham, and possibly also (if necessary) at Manchester, to be built in 2021.

We made the latter assumption because the Government's policy, set out in the 1998 New Deal for Transport White Paper, is to encourage the growth of regional airports to meet local demand for air travel where consistent with sustainable development principles. However, the Government has not yet reached a view on any specific projects at any of the regional airports, but will do that as part of the forthcoming air transport White Paper.

[†] In Stage 3 and in subsequent work to underpin this second edition of the consultation document, SERAS also appraised new runway options at Gatwick on the basis that the 2019 agreement was maintained. SERAS assumed that new runways at Gatwick would be operational by 2024. Therefore, in combinations of development involving runways at Gatwick and at other airports, SERAS assumed that these other runways would be built first. For example: in the package with one new runway at each of Heathrow, Gatwick and Stansted, the order (and years of opening) became Heathrow (2011), Stansted (2018) and Gatwick (2024); in the package with a new runway at Stansted and Gatwick the revised assumptions were Stansted (2011) and Gatwick (2024).

Appraisal of options and packages

Many of the impacts of airport **options** can be identified on an option by option basis. Some impacts can only be addressed for the South East airports as a system i.e. in **packages** (e.g. economic benefits) or even at a national level (CO₂ emissions).

APPRAISAL OF OPTIONS

Chapters 7–11 identify the impacts of the options appraised at Heathrow, Gatwick, Stansted, Luton and Cliffe. The principal impacts reported in these chapters are:

- surface access;
- environmental impacts;
 - land take, residential properties taken, heritage, ecology, water;
 - noise;
 - local air quality;
- employment;
- land use and urbanisation; and
- regional impacts.

The full SERAS appraisal considered some other impacts. There is not space in this consultation document to set out all the results of the SERAS appraisal. These can be found in the SERAS Stage 2 and 3 reports.

SURFACE ACCESS

The impacts of additional air travel on surface transport networks – airport access links and wider impacts on strategic road and rail networks – are potentially significant and have been modelled and assessed in some detail. Forecast airport-related trips – by passengers, employees, air freight and other – have been added to background, non-airport traffic for 2015 and 2030, and their combined consequences for road and rail networks assessed.

Particular rail infrastructure and service improvements were assumed to accompany airport development options and their performance appraised. On the strategic road network, the principal intention has been to identify where airport-related trips would cause particular problems, and, if those problems were to be tackled through capacity enhancement, what that would entail.

This work had to be undertaken while a transport strategy for the East and South East was still being developed. The Government's 10 Year Plan³⁰ sets a broad vision and investment levels for the current decade. Regional Transport Strategies will set out regional priorities

³⁰ Transport 2010: The 10 Year Plan, DTLR, July 2000

for transport policies and proposals, across all modes, to support the wider spatial strategy in Regional Planning Guidance. These plans will be informed by the findings of the multi-modal studies (MMSs), some of which are due to present their strategies this summer, others later. The principal MMSs of relevance to SERAS are:

- **Orbit**: looking at orbital travel round London (the M25)[†];
- SWARMMS: London to the South West and Wales[†];
- Thames Valley: London to Reading[†];
- London – South Midlands[†]; **and**
- London – Ipswich (LOIS)[†].

In January 2002, the Strategic Rail Authority (SRA) published its Strategic Plan setting out a series of projects and timescales to deliver the targets of the 10 Year Plan. SERAS is liaising with the MMSs and the SRA, and has passed details of airport-related trips to them for inclusion in their considerations.

ENVIRONMENTAL IMPACTS

This part of the appraisal took the form of detailed computer modelling (for noise and air quality) and a more qualitative assessment based on desktop research (for other factors).

(i) Noise

Daytime noise

SERAS modelled the impacts of daytime noise from aircraft based on the frequency and types of service (e.g. long or short haul) and, on this basis, a stylized depiction of the mix of different aircraft types that would use the airport. In the chapters describing the options at each airport there is information about the noise levels today and what they might be in 2015 and 2030 both with no new runway and with one or more new runways.

Critical to the modelling of noise impacts were assumptions about future improvements in engine technology and the fleet mix at airports. These were intended to be fairly conservative (i.e. pessimistic). It is quite possible that the actual noise impacts of these airport developments could in fact be reduced, for example, through the faster introduction of quieter engines.

[†] Orbit MMS reported in November 2002. See www.orbitproject.com

SWARMMS was published May 2002. See www.swarmms.org.uk

Thames Valley MMS was published in January 2003. See www.thamesvalleytransport.org.uk.

London to South Midlands MMS reported in February 2003. See www.lsmmultimodal.com

LOIS MMS was published in December 2002. See www.lois-mms.co.uk

Sensitivity testing was carried out to consider the possible improvements in the noise climate that might be achieved by: a faster retirement programme for aircraft types no longer in production; a better matching of future aircraft types to service requirements to minimise noise levels; and more stringent noise standards for future aircraft types – of 14dB below Chapter 3 noise levels as opposed to the 8 dB assumed in the initial noise modelling and the 10 dB required by ICAO member states for new aircraft designs submitted after 1 January 2006. Since these more challenging assumptions better reflect the conditions that might prevail, it is the results of these extra tests that are presented in this document.

Subject and pursuant to the ‘balanced approach’ agreed by ICAO, and to EU Directives (in particular 2002/30/EC), noise impacts could also be reduced or mitigated in other ways, for example, the use of operational controls (e.g. the way aircraft take off and land), by imposing noise limits or by providing noise insulation for those affected. Proposals for various policy measures of this kind to deal with aircraft noise are discussed in more detail in **Chapter 16, Action to tackle environmental concerns**.

Night Noise

Policies in relation to night-time noise at the major London airports have been implemented by limits on the overall number of flights plus ‘noise quotas’, which take account of the number of night-time flights, permitted aircraft types and noise emissions by aircraft type. The October 2001 judgment by the European Court of Human Rights on night flights at Heathrow has been referred to the Grand Chamber of the Court.[†] Until a final judgment is made, which will not be until Autumn 2002 at the earliest, the implications for future night-time noise regulation remain uncertain.

As illustrative examples of potential night-time noise disturbance, SERAS produced 90 dBA SEL (Sound Exposure Level) footprints for each runway option, for both arrivals and departures and for both directions of runway operation, based on a single movement by the loudest (QC2) aircraft typically likely to operate at night in the forecast years.

(ii) Local Air quality

The SERAS air quality assessment has focused on NO₂ and PM₁₀ as important air pollutants sensitive to increases in aviation activity and associated surface access movements. Mandatory EU limits³¹ will come into force for these pollutants in 2010 (NO₂) and 2005/2010 (PM₁₀). The SERAS air quality methodology has been developed to provide a comparison between options in 2015 and 2030 using these mandatory limits. Where approximations or simplifications have had to be made, and where there is inadequate information, the SERAS methodology over- rather than under-estimates the air quality impacts.

At Heathrow where the worst exceedences were identified, sensitivity tests have been run embracing more stringent NO_x performance for future new engines and more precise estimates of the degree of thrust used by aircraft. The results are shown in **Chapter 7**.

³¹ Council Directive 1999/30/EC

[†] The hearing did not take place until 13 November 2002. A decision is not expected for several months.

(iii) Environmental appraisal

With so many factors to take into account, SERAS required a carefully constructed and consistent approach to determining whether an environmental effect is significant and, if so, its level of severity. Criteria were established to define four levels of severity:

- High* adverse (HA*), an effect which in isolation could have a substantial bearing on decision-making;
- High adverse (HA), an effect which in isolation could have a material influence on decision-making;
- Medium adverse (MA), an effect which on its own could have some influence on decision-making, particularly when combined with other similar effects; and
- Low adverse (LA), an effect which on its own is likely to have a negligible influence on decision-making, but when combined with other effects could have a more material influence.

The impacts described in **Chapters 7–11** on airport options are generally those that meet the definition of High* or High Adverse.

EMPLOYMENT/LAND USE AND URBANISATION

The development of an airport will have a number of consequences, both for the area it is in and the wider region. Jobs will be created both at the airport and further afield generating demand for employment land and housing. The impact on the local housing market takes account of the potential need for workers from outside the airport catchment area (known as “in-migration”).

The SERAS appraisal allows us to consider whether the expansion of an airport might place demands on the housing market beyond what is currently envisaged by regional planning.

REGIONAL IMPACTS

A qualitative assessment has been made of the impact of development options against existing regional policy, for example Regional Planning Guidance (RPG) published by Government Offices and economic strategies of the Development Agencies for the East of England, South East and London.

Appraisal of packages

Principal impacts addressed on a package basis – with results described in **Chapter 14, *Airport Development up to 2030*** – deal with the economic benefits. Although important in their own right, the treatment of principal environmental externalities also has to be considered.

ECONOMIC APPRAISAL

Economic appraisal requires assessment of both direct benefits, capital costs, and wider economic benefits.

Direct Benefits

As part of the SERAS Stage 2 study, an economic assessment has been carried out to measure the direct benefits and net benefits of each package. A model was developed to calculate direct benefits and to bring costs and benefits together so as to calculate the present value of the net benefits for each package.

The key outputs are the present value of the net benefits (NPV), the benefit: cost ratio (BCR) and the NPV per additional million passengers per annum (mppa) of each package of investment.[†]

Much the largest element of benefit quantified is the benefits to passengers who in the absence of additional airport capacity would transfer to less preferred airports or not travel by air at all. Other benefits quantified are those to existing passengers from additional air frequencies because of higher airport capacity *plus* benefits to airports from additional capacity *plus* Air Passenger Duty *plus* benefits to air freight users less capital and operating costs of new airport developments.

The assessment of economic benefits is conservative, as no account is taken of, in particular: suppressed traffic at the *peak* of daily and annual demand; the traffic which is already being suppressed at Heathrow and Gatwick; the market premium Heathrow currently enjoys; benefits to airlines including those of reducing aircraft delays as a result of higher airport capacity; and indirect benefits to the economy, including lower business costs, and the impact of additional air services on foreign direct investment, tourism and the UK's competitive position *vis-à-vis* other European countries (but see below).

Wider Economic Benefits

In addition to the direct benefits, increased airport capacity is expected to have wider, indirect economic impacts for the economy as a whole, for those parts of the economy most closely linked to aviation and air transport, and for those sub-regions most affected by airport development. Wider economic impacts identified and assessed in SERAS are:

- the potential increase in productivity across the economy as a whole due to an increase in aviation capacity;
- the increase in foreign direct investment; and
- the benefits in the tourism industry.

[†] See footnote to paragraph 14.25.

The focus in the economic evaluation of the SERAS packages has been on the estimation of the direct impacts of increased airport capacity, as being the most tangible, most certain and most measurable indicators of the economic benefits of increased airport capacity and the enhanced air services thereby made possible. In addressing the wider economic impacts, the intention has been to explore the issues and to present an order of magnitude estimate of their potential. It is important to avoid double counting benefits: the value of improved services to business travellers themselves, for example, is already recognised in the direct user benefits. Basically, the approach adopted for wider economic benefits was to recognise the contribution of an airport package which enabled more foreign business travellers to fly to and from the UK, without attempting to quantify the contribution of those passengers to Foreign Direct Investment.

Capital costs

Capital costs include both costs of providing additional capacity and major repair expenditure to keep the extra infrastructure in good order.

Estimates of capital costs are required both for the assessment of net economic benefits of providing infrastructure and for financial analysis on the part of airport companies regarding the financial viability of projects.

Capital costs of options have been estimated under a number of headings and summarised under the following main cost categories: terminals and satellites; aircraft pavements; enabling works and infrastructure; navigation aids; cargo and maintenance; support facilities; and associated surface access schemes if their provision is “tied” to the provision of additional airport infrastructure.

To ensure consistency, a common set of unit rates was used for all major cost items, with any difference between airports carefully documented.

Measures of capital cost per amount of capacity provided (£ million per mppa) were calculated to compare one option with another.

FINANCIAL APPRAISAL

The financial model estimates the rate of return generated by the additional investment and capacity provided in each package. This requires, among other things, estimates of capital costs, the capacity of additional infrastructure, and the build-up of its use.

The calculated rate of return can be compared with a target pre-tax rate of return (set at a deliberately demanding 12.5 per cent in pre-tax money of the day terms) to establish the financial viability of a package. The funding assumptions incorporated in a model run enable standard ratios, particularly interest cover and asset cover to be calculated. If a package fails to achieve an acceptable rate of return, the model establishes what might be required in terms of a levy per passenger, at an individual airport or more widely across the South East airport system, in order to achieve the target rate of return.

INTERNALISING ENVIRONMENTAL COSTS

Estimates of external costs arising from aircraft emissions and noise were published by the then DETR in *Valuing the External Costs of Aviation*, published in parallel to the *Future of Aviation* consultation document in December 2000. In SERAS, noise and air quality were modelled at the airport-specific level. Climate change impacts, however, arise at the global level and are appropriately modelled by assessing the degree to which national aviation demand would be reduced by measures to internalise the costs, in terms of global warming, that aircraft emissions impose.

Climate Change

CO₂ has been taken as the principal indicator of SERAS options on climate change. Estimates were made of CO₂ emissions in 2030 for three combinations of development options, representing different levels of capacity provision. These estimates, together with an allowance for other relevant aircraft emissions suggested equivalent taxes could add up to a 10 per cent increase in air fares.

Two environmental sensitivity tests have been run using the DfT air passenger forecasting model for selected SERAS packages. It was assumed that the phased introduction of an environmental tax would cause the demand for air travel to be reduced by 0.5 and 1 per cent in 2006, increasing annually to 5 and 10 per cent by 2016 and then remaining at those levels for every subsequent year to 2030.

In both tests, forecast usage of Heathrow and Gatwick is not affected, given the extent of excess demand at these airports, but there are reductions in passengers at other South East airports.

The lower SERAS environmental sensitivity tests used assumptions which were somewhat more adverse than in *Valuing the External Costs of Aviation*. The higher SERAS environmental sensitivity test is considered more realistic.

Further information on the scientific understanding of aviation's contribution to global warming, together with some revised estimates of the damage costs of carbon emissions, is now available. Recent evidence indicates that aircraft have approximately three times the radiative forcing effect than would be expected from their CO₂ emissions alone. In addition, DEFRA has revised its guidance on the social cost of carbon with a central estimate of £70 per tonne of carbon, increasing by £1 per tonne of carbon per annum to reflect increasing damage costs over time. The combined effect of these two revisions indicates that the demand for air travel could reduce by about 12 per cent.

However, a higher price of aviation fuel is likely to have supply side effects through encouraging the use of more fuel-efficient aircraft and, in the longer term, acting as a spur to the development of more fuel-efficient technologies.

The long term effect of a tax designed to reflect external costs will be smaller than the initial effects based on demand impacts alone. The induced cost reductions will have some effect in stimulating demand.

Noise

Monetary values for the effects of noise were estimated by assessing the impact of increased air traffic noise on house prices in the region of the airport option. The tentative finding of past research, that a 1 decibel change in noise level results in an approximate 0.5 to 1 per cent change in house prices, was used to estimate the order of magnitude of the noise value of different options. Values at Heathrow ranged between 36 and 40 pence per passenger; at all other airports in the South East, values never exceeded 5 pence per passenger.

Local Air Quality

Robust values of the effects of local air quality changes, primarily NO₂, on health are not available. But information supplied by DEFRA suggests that respiratory hospital admissions might increase by 0.5 per cent for each 10ug/m³ of NO₂. This implies an increased admission rate of approximately 5 per 100,000 people at an NHS cost of £1500 – 2700 per respiratory hospital admission. These values give a total cost of around £10,000 for every 100,000 people subject to an increase of 10ug/m³ of NO₂ arising from respiratory illnesses (this does not include any deaths brought forward for which there is no evidence at present). The analysis indicates that within the South East, only an additional runway at Heathrow could (without preventative measures) lead to a significant number of people being subject to changes in NO₂ of this magnitude, and this on conservative assumptions. These estimates of the costs of respiratory illnesses indicate that the total amount would be too low to be expressly represented in any environmental levy.

ANNEX C

Key documents

The SERAS study comprises a number of reports. There are also a number of other documents that are relevant to the issue of airport capacity and which you might find useful.

Unless otherwise indicated, paper copies of the following documents can be obtained from:

DfT Publications
PO Box 236
Wetherby
West Yorkshire LS23 7NB

Telephone: 0845 100 5554
Fax: 0870 1226 237
Textphone: 0870 120 7405
e-mail: dft@twoten.press.net

All documents are available to view by appointment at the Ashdown House library in Victoria, London. To make an appointment please telephone the library enquiry desk on 020 7944 3039. The opening hours are:

Monday	10.00am to 4.00pm
Tuesday	2.00pm to 4.00pm
Wednesday	Closed
Thursday	10.00am to 4.00pm
Friday	2.00pm to 4.00pm

SERAS Tier 1 documents

These documents have been identified as the key background reports for SERAS and made available in a variety of formats – hard copy, CD-Rom and on the website www.airconsult.gov.uk

Subject	Doc Ref No.	Title of report	Author	Date	ISBN no. 1-85112-	Price
Terms of Reference	1	SERAS – Terms of Reference	DTLR	Feb-00		
Appraisal Framework	2	The Appraisal Framework for Airports in the South East and Eastern Regions of England	DTLR	Nov-00	528-0 SET OF 3	£3
Traffic Forecasts	3	Air Traffic Forecast for the United Kingdom 2000	DTLR	May-00		
Methodology	4	SERAS Stage Two: Methodology	Halcrow	Feb-02	529-9	£17
Stage Two Appraisal Findings	5	SERAS Stage Two Appraisal Findings Report (Text and Figures)	Halcrow	Feb-02	530-2 SET OF 2	£100
Stage Three Report	64	SERAS Stage Three Report	Halcrow	Apr-02		
Stage Two Appraisal Summaries	6	SERAS Stage Two Airport Appraisal Summary Tables	Halcrow	Feb-02	531-0	£15
Stage Three Addendum	68	SERAS Stage Three Report – Addendum[†]	Halcrow	Feb-03	612-0	£3

[†] This is a newly published document.

SERAS Tier 2 documents

These documents are other reports that have been produced as part of the SERAS Study. They are available in paper format only from the DfT Publication Sales Centre.

Subject	Doc Ref No.	Title of report	Author	Date	ISBN no. 1-85112-	Price
Stage One Methodology	7	SERAS Stage One Methodology Report	Halcrow	Apr-01	532-9	£18
Stage One Appraisal Findings	8	SERAS Stage One Appraisal Findings Report	Halcrow	Jan-02	533-7	£100
Stage Two Appraisal Summaries	9	SERAS Stage Two Package Appraisal Summary Tables	Halcrow	May-02	534-5	£65
Stage Two Appraisal Supporting Documents	10	“SPASM” ³² Runs for SERAS: Input Assumptions and Model Outputs	Halcrow	Apr-02	535-3	£36
Stage Two Appraisal Supporting Documents	11	Surface Access Impacts	Halcrow	Jul-02	536-1	£15
Stage Two Appraisal Supporting Documents	12	Environmental Appraisal Groups 2 and 3 Volume One: Main Report	Scott Wilson	Dec-01	537-X. SET OF 2	£37
Stage Two Appraisal Supporting Documents	13	Environmental Appraisal Groups 2 and 3 Volume Two: Appendices	Scott Wilson	Dec-01		
Stage Two Appraisal Supporting Documents	14	Aircraft and Surface Access Noise	Halcrow	Jan-02	538-8	£25
Stage Two Appraisal Supporting Documents	15	Land Use and Urbanisation	Arup	Apr-02	539-6	£10
Stage Two Appraisal Supporting Documents	16	SERAS Regional Impact Appraisal	Arup	Oct-01	540-X. SET OF 2	£15
Stage Two Appraisal Supporting Documents	17	SERAS Social Impact Appraisal	Arup	Oct-01		
Stage Two Appraisal Supporting Documents	18	Economic Appraisal	Halcrow	Apr-02	541-8	£10
Stage Two Appraisal Supporting Documents	19	Financial Modelling and Analysis	Halcrow	Apr-02	542-6	£10
Stage Two Appraisal Supporting Documents	23	Safety	Halcrow	Jan-02	543-4	£5
Stage Two Appraisal Supporting Documents	24	Capital Costs	Halcrow	Jan-02	544-2	£10
Stage Two Appraisal Supporting Documents	26	North Kent Marshes Ecological Study: Phase 1 Report	Scott Wilson	Jan-02	546-9	£15
Stage Two Appraisal Supporting Documents	27	New South East England Airport – Airline Development Strategy	Booz Allen	Oct-01	547-7	£10

³² “SPASM” – The DfT Air passenger forecasting model.

Subject	Doc Ref No.	Title of report	Author	Date	ISBN no. 1-85112-	Price
Stage Two Methodology Supporting Documents	29	Rules and Modelling: A Users Guide to SPASM	Scott Wilson	Jan-02	548-5	£25
Stage Two Methodology Supporting Documents	30	Surface Access Modelling	Halcrow	Jul-02	549-3	£35
Stage Two Methodology Supporting Documents	31	Airport Employment Forecasting	Halcrow	Jan-02	550-7	£5
Stage Two Methodology Supporting Documents	32	Air Quality Appraisal	Halcrow	May-02	551-5	£10
Business Aviation	36	Business Aviation in the SE – Demand/Capacity Studies – Part 1	Halcrow	Jul-98	553-1. SET OF 3	£28
Business Aviation	37	Business Aviation in the SE – The Economic Impact of Business Aviation – Part 2	Halcrow	Mar-99		
Business Aviation	38	Business Aviation in the SE – Future Capacity for Business Aviation – Part 3	Halcrow	Feb-01		
Small Sites	47	Small Airports Optioneering	Halcrow	Jan-02	555-8. SET OF 2	£20
Small Sites	48	Small Airports – Demand and Impact Appraisal	Halcrow	Aug-01		
Thames Gateway	49	Implications of a Thames Gateway Airport	Arup	Jul-01	555-6	£15
Optioneering – Heathrow	50	Stage 2 Report – Heathrow Optioneering Studies	Arup	Jan-01	557-4 SET OF 2	£20
Optioneering – Heathrow	63	Stage 1 Report – Heathrow Optioneering Studies – Update	Arup	Mar-02		
Optioneering – London City	53	Airport Optioneering: London City	Gibb	Feb-00	558-2	£15
Optioneering – Luton	54	Final Report: London Luton Airport	Snow	Feb-02	559-0 SET OF 2	£22
Optioneering	62	Final Report: London Luton Airport – Addendum to Final Report	Snow	Feb-02		

Subject	Doc Ref No.	Title of report	Author	Date	ISBN no. 1-85112-	Price
Optioneering – Cliffe	56	Stage 1 Report New Airport Site Optioneering Study	Arup	Jan-01	560-4 SET OF 2	£18
Optioneering	57	Further optioneering New Site C Final Draft	Arup	Aug-01		
Optioneering – Hullavington	58	RAF Hullavington Capacity Development Options	Scott Wilson	Apr-01	561-2 SET OF 3	£15
Optioneering – Alconbury	55	Alconbury Airport Optioneering	Halcrow	Aug-01		
Optioneering	59	Stage One: Alconbury and Hullavington	Halcrow	Aug-01		
Optioneering – Redhill	61	Capacity Development Options Gatwick/Redhill	Halcrow	Jan-02	562-1	£5
Stage Two Appraisal Supporting Documents	28	SERAS Runway Throughput/ Delay Modelling – Final Report	NATS/ORR, Halcrow	Nov-01	564-7	£8
Stage Two Appraisal Supporting Documents	20	CAA(DAP) Report 01/2001 (External & NATS (R&DG) Report 0133 (External)	DAP/ NATS	Nov-01	563-9 SET OF 2	£10
Stage Two Appraisal Supporting Documents	22	CAA(DAP) Report 02/2001 (External) Addendum	DAP/ NATS	Nov-01		
Site Search	45	Preliminary Site Search of Options for New Airport Capacity to Serve the SE and East of England – Final Report	Scott Wilson	Jun-01	568-X SET OF 2	£50
Site Search	46	Preliminary Site Search of Options for New Airport Capacity to Serve the SE and East of England – Appendices	Scott Wilson	Jun-01		
Optioneering LGW/STN/SOU	51	SERAS – Report on Behalf of DTLR – Gatwick, Stansted and Southampton International Airports	BAA	Apr-01	570-1 SET OF 2	£17
Optioneering LGW/STN/SOU	66	SERAS – Report on Behalf of DTLR – Gatwick, Stansted and Southampton International Airports: A3 Figures	BAA	Mar-01		
Stage 2 Appraisal Supporting Documents	67	Freight Forecasting	Halcrow	Apr-02	580-9	£10

Other useful supporting documents

These are other useful documents that have been used during the Study but were not written as part of it.

Subject	Doc Ref No.	Title of report	Author	Date	ISBN no.	Price	Other Information
Stage Two Methodology Supporting Documents	33	DORA Report 9120 The CAA Aircraft Noise Contour Model: ANCON Version 1	CAA	Nov-02	1-85112-SET OF 2	£15	These have already been published by CAA. To obtain a copy, contact: Westward Documedia Ltd Tel: 08708871410 Fax 08708871411 e-mail: sales@documedia.co.uk
Stage Two Methodology Supporting Documents	34	R&D Report 9842 The UK Civil Aircraft Noise Contour Model ANCON: Improvements in Version 2	CAA	Jun-99			
Future Technology	35	Study into the Potential Impact of Changes in Technology on the Development of Air Transport in the UK	ADL	Nov-00		£10	
Air Freight	39	The UK Air Freight Study Report: Part 1	MDS Transmodal	Aug-00	566-3 SET OF 2	£23	
Air Freight	40	UK Air Freight Study Stage 2	MDS Transmodal	Aug-01			
Commercial Trends	41	Study to Identify Future Commercial Trends Affecting the Aviation Industry in the Period 2000 to 2015 – Final Part 1 Report	ADL	May-01	554-X SET OF 2	£23	
Commercial Trends	42	Study to Identify Future Commercial Trends Affecting the Aviation Industry in the Period 2000 to 2015 – Final Part 2 Report	ADL	Oct-01			
Economic Impact	43	The Contribution of the Aviation Industry to the UK Economy	OEF	Nov-99	SET OF 3 567-1	£5	Available in PDF format on the OEF website www.oef.com under “UK economy”, “Aviation and the UK economy”.
Economic Impact	44	The Contribution of the Aviation Industry to the UK Economy: Part 2	OEF	May-02			
Economic Impact	65	The Contribution of the Aviation Industry to the UK Economy: Summary Report	OEF	Nov-99			

Economic Instruments

The paper referred to in the footnote to paragraph 5.5 will be available on the DfT and Treasury websites. Hard copies can be obtained using the contact details on page 175.

Subject	Doc Ref No.	Title of report	Author	ISBN no.	Price	Other Information
Economic Instruments	69	Aviation and the Environment: Using Economic Instruments	DfT/HMT	613-9	£3	

ANNEX D

SERAS packages

In Stages 2 and 3 of the SERAS study (described in **Annex B**) the following combinations of airport development options were appraised.

SERAS Package Reference Number	New Runways	Principal Components
1	0	BASE CASE
2	0	Maximum use of existing runways
3	0	Heathrow: partial mixed mode (a.m. only)
4	0	Heathrow: full mixed mode
5A	1	Heathrow: 2000m runway, all 3 in mixed mode or equivalent
5B	1	Heathrow: 2000m runway, existing runways at existing capacity
5C	1	Heathrow: 4000m runway, 1 of 3 in mixed mode
6	1	Gatwick: close parallel runway OR wide-spaced runway
7	1	Stansted: wide spaced runway
8	2	Cliffe: 2 wide spaced runways
9	2	Gatwick: 2 new runways
10	2	Stansted: 2 new runways
11	2	Heathrow and Gatwick: one new runway each
12	2	Heathrow and Stansted: one new runway each
13	2	Gatwick and Stansted: one new runway each
14	3	Stansted: 3 new runways
15	3	Heathrow, Gatwick and Stansted: one new runway each
16	3	Heathrow: one new runway. Stansted: 2 new runways
17	3	Gatwick: one new runway. Stansted: 2 new runways
18	3	Heathrow: one new runway. Gatwick: 2 new runways
19	3	Gatwick: 2 new runways. Stansted: one new runway
20	3	Cliffe: 2 new runways. Gatwick: one new runway
21	4	Cliffe: 4 new runways

ANNEX E

CO₂ appraisal

Approach

While there are a number of aircraft emissions that contribute directly or indirectly to climate change, CO₂ is considered to be the most important greenhouse gas overall and is used as the standard indicator in a wide range of transport appraisals. Our analysis therefore focuses on CO₂ emissions and aims to present a broad brush analysis of the level of aviation related CO₂ emissions (measured at a national level).

We have assessed the impact based on two illustrative cases: a constrained case in which no new runways are provided anywhere in the UK and a high capacity case in which three new runways are provided in the South East and the regional airports are assumed to be unconstrained. The high capacity package estimates can be taken to apply to any of the larger packages described in **Chapter 14**.

Forecasts of aircraft movements (for both passengers and freight) are shown in **Table E.1**.

Table E.1: Air transport movements ('000s) in 2030							
	Constrained			High Capacity			
	SE airports	Regional airports	Total	SE airports	Regional airports	Total	+/-
Passenger ATMs	1438	2118	3557	1778	1850	3630	+73
Freight ATMs	61	209	271	67	247	314	+43
Total	1499	2329	3828	1845	2097	3944	+116

RESULTS

Our estimates of CO₂ in tonnes at 2030 for the constrained case and the higher capacity case are set out in **Table E.2** below.

Table E.2: CO₂ estimates in (tonnes, 2030)			
	Constrained Capacity	High Capacity	+/-
Surface access sources			
South East airports related	1,455,772	1,358,079	-97,693
Regional airports related	1,715,328	1,915,790	+200,462
Total surface access sources	3,171,100	3,273,868	+102,768
Airport sources – South East			
International passenger traffic	34,948,754	48,746,826	+13,798,072
Domestic passenger traffic	607,755	753,454	+145,699
International freight traffic	2,349,263	2,207,593	-141,670
Domestic freight traffic	129,991	122,579	-7,412
Total airport sources – South East	38,035,763	51,830,452	13,794,689
Airport Sources- Regional Airports			
International passenger traffic	23,507,745	19,026,113	-4,481,632
Domestic passenger traffic	1,037,248	1,222,378	+185,130
International freight traffic	4,186,441	4,191,307	+4,866
Domestic freight traffic	221,597	230,132	+8,535
Total airport sources- regional airports	28,953,031	24,669,930	-4,283,101
UK total			
Total South East CO ₂	39,491,535	53,188,531	+13,696,996
Total Regional CO ₂	30,668,359	26,585,720	-4,082,639
Total surface access CO ₂	3,171,100	3,273,868	+102,768
Total aircraft CO ₂	66,988,812	76,500,382	+9,511,570
Total UK CO₂	70,159,912	79,774,251	+9,614,339

Table E.3 summarises our forecasts of CO₂ emissions into international and domestic emissions, where domestic emissions combine surface access and domestic aircraft emissions.

Table E.3: International and domestic CO₂ estimates (tonnes, 2030)			
	Constrained Capacity	High Capacity	+/-
International CO ₂	64,992,202	74,171,839	+9,179,637
Domestic CO ₂	5,167,710	5,602,412	+434,702
Grand total	70,159,912	79,774,251	+9,614,339

Total CO₂ emissions in 2030, at a national level, are estimated at 70.2 million tonnes in the Constrained Case, increasing to 79.8 million tonnes in the High Capacity Case. This is an increase of 14 per cent, compared with increases of 16 per cent in terminal passengers and 3 per cent in ATMs. Most of the total emissions and the increase in CO₂ are associated with additional international movements. The estimate of domestic CO₂ emissions increases from 5.2 million tonnes to 5.6 million, an increase of 8 per cent.

Very approximately, we calculate that meeting the damage costs of these increases in CO₂ emissions might add of the order of between 5 and 10 per cent to air fares which would have the effect of reducing underlying demand by the same amount. We have modelled

the effects of constraining national demand on scenarios with different amounts of new capacity in the South East: no new runways at the main South East airports and three new runways. **Table E.4** shows the results.

Given that demand is forecast to exceed supply of runway capacity considerably, if no new runways are built then this would constrain demand growth by more than its environmental costs, putting up the price to the travelling public unnecessarily and generating substantial net welfare losses to the UK. If however new capacity were provided then we would still need two or three runways to meet the forecast demand, even if it were reduced by 10 per cent.

Table E.4: Effects of environmental policy tests on demand (mppa, 2030)			
	0 per cent	Demand Reduction 5 per cent	10 per cent
Unconstrained Demand	501	476	451
South East Airports	306	291	276
Regional Airports	195	185	175
Maximum Use (No new runways)			
South East Airports	198	198	198
Regional Airports	230	211	195
Passengers lost to UK System	73	67	58
Three new runways			
South East Airports	275	269	255
Regional Airports	200	189	178
Passengers lost to UK System	26	18	18

Note: Impacts of three runways will depend on the particular package chosen, so the example above is illustrative. The totals for the main South East airports in the combinations of development with three/four runways set out in **Chapter 14** all produce very similar results to those reported here for three new runways.

ANNEX F

Gatwick

[INTENTIONALLY BLANK]

ANNEX G

The consultation process

Introduction

This consultation will run for approximately 4 months, until **30 June 2003**.

The Government is keen to consult widely in producing the air transport White Paper. We recognise the importance of taking into account, and seeking to balance appropriately, the views of all interested parties. Your views are essential in informing this process.

Further information about the consultation process and copies of all the consultation documents and some main background documents are on our website **www.airconsult.gov.uk**

If you have a query on any aspect of this consultation please call: **0845 100 5554**

Documents

If you would like additional copies of this document, or any of the other consultation documents or their summaries, you can:

- download them from our website: **www.airconsult.gov.uk**
- phone our enquiry number: **0845 100 5554**
- send an e-mail request to: **dft@twoten.press.net**
- send a fax to: **0870 1226 237**
- or write to: **DfT Publications
PO BOX No 236
Wetherby
LS23 7NB**

The main background reports for the South East consultation are available on the website site to view or download. The main background reports and other supporting technical documents can also be purchased from **the address given above by telephone, fax, e-mail or post**.

These are listed in **Annex C** and on the website **www.airconsult.gov.uk**

All documents are available to view by appointment at the Ashdown House library in Victoria, London. To make an appointment please telephone the library enquiry desk on 020 7944 3039. The opening hours are:

Monday	10.00am to 4.00pm
Tuesday	2.00pm to 4.00pm
Wednesday	Closed
Thursday	10.00am to 4.00pm
Friday	2.00pm to 4.00pm

Responses

IMPORTANT INFORMATION

Please note that if you have already submitted a response to the Freepost address below, it will be taken into account. If you wish to add to, amend or replace an earlier response you are free to do so. Please indicate clearly if you have previously responded to the consultation and how you wish us to take account of it.

The NOP questionnaire issued in July 2002 has been revised to reflect the changes to the consultation document. NOP will contact all those who completed the original questionnaire and provide more information including advice on how to complete the new questionnaire.

We would appreciate it if you could both respond to the detailed questions in **Annex A** and complete the NOP questionnaire that accompanies this document. If there are any other comments which you wish to make please submit them to the Department with your response.

Completed NOP questionnaires:

Future Development of
Air Transport – South East
NOP Research Group Ltd
Caxton House
FREEPOST KE4466
Chelmsford CM1 1ZZ

*If you wish to complete the NOP
questionnaire electronically and return it by
e-mail you may do so via the website*

**Responses to questions in this
consultation document:**

Future Development of
Air Transport – South East
Department for Transport
Zone 1/28C
FREEPOST LON 17806
London SW1P 4YS

*If you wish to reply by e-mail
please write to air.consult@dft.gsi.gov.uk*

All responses must be received no later than 30 June 2003.

Disclosure of Responses

In due course, the Department may wish, or be asked, to copy, or disclose responses to others. Please make it clear if you would object to us copying or disclosing your response. We will make your response publicly available unless you ask us not to.

All responses will be included in any statistical summary of results, although individuals will not be identified. Names and addresses may be held in an electronic database of interested parties for the purpose of distributing future consultation documents on similar issues. However, any such details on a database will not be given to any third party.

If you wish to view individual responses after the consultation period has ended, these will be available for public viewing for a period of 6 months at the Ashdown House Library and Information Centre. The address is Ashdown House, 123 Victoria Street, London SW1E 6DE. An appointment can be made by telephoning the enquiry desk on 0207 944 3039.

ANNEX H

Code of Practice

This consultation has been carried out in accordance with the Government's Code of Practice on Written Consultation. The Code of Practice requires that:

1. Timing of consultation should be built into the planning process for a policy (including legislation) or service from the start, so that it has the best prospect of improving the proposals concerned, and so that sufficient time is left for it at each stage;
2. It should be clear who is being consulted, about what questions, in what timescale and for what purpose;
3. A consultation document should be as simple and concise as possible. It should include a summary, in two pages at most, of the main questions it seeks views on. It should make it as easy as possible for readers to respond, make contact or complain;
4. Documents should be made widely available, with the fullest use of electronic means (though not to the exclusion of others), and effectively drawn to the attention of all interested groups and individuals;
5. Sufficient time should be allowed for considered responses from all groups with an interest. Twelve weeks should be the standard minimum period for a consultation;
6. Responses should be carefully and open-mindedly analysed, and the results made widely available, with an account of the views expressed, and reasons for decisions finally taken;
7. Departments should monitor and evaluate consultations, designating a consultation coordinator who will ensure the lessons are disseminated.

A full version of the code can be found at:

<http://www.cabinet-office.gov.uk/servicefirst/index/consultation.htm>

If you have any complaints about this consultation process please contact:

Rosa Estevez
Corporate Policy & Secretariat Division
Zone 4/12
Great Minster House
76 Marsham Street
London SW1P 4DR

ANNEX J

This annex provides the text that has been deleted from the July 2002 version of the consultation document. In some cases, for example tables, where there are a number of small changes, we have reproduced the original table in its entirety.

Page and paragraph numbers refer to this document unless otherwise indicated.

Title page

References to July 2002 changed to February 2003.

Product code for the July document replaced with a new reference.

Contents

Annex F – the title has been deleted. The information about Gatwick (as revised) is now contained in Chapter 8. The full text of this annex is reproduced below.

Foreword

‘We’ in line 1 of the final paragraph replaces ‘I’.

Change of date.

Chapter 1

After paragraph 1.12 – the following text (paragraph 1.13 in the July version) has been deleted.

“GATWICK

1.13 A legal agreement between the then British Airports Authority (now BAA plc) and West Sussex County Council, signed in 1979, prevents construction of another runway at Gatwick before 2019. The Government does not intend to overturn that agreement and so a second runway could not be built before the mid-2020s. **The Government will not, therefore, include in the White Paper any options for new runways at Gatwick.** Information about the options considered in the later stages of the SERAS study at Gatwick is presented for information only in **Annex F.**”

NB: In relation to the 2019 agreement at Gatwick (see Chapter 8), the word ‘legal’ has been deleted before ‘agreement’ in this document.

Paragraph 1.14 – the following text in square brackets has been deleted:

“...three or four new runways [excluding any new runways at Gatwick, as explained in paragraph 1.13].”

Paragraph 1.15 – in the second line, new text ‘could’ replaces ‘will’.

Chapter 3

Paragraph 3.4 – in line 4, new text ‘[£]18 [billion]’ replaces ‘15’.

Paragraph 3.10 – After ‘additional’ in line 6, ‘55,000 –’ deleted.

Table 3.1 – numbers updated to take account of Gatwick options and because traffic at Southampton and Norwich were incorrectly included in South East airports column – this was inconsistent with presentation elsewhere in the document. Table 3.1 in the July version was as follows:

Table 3.1: Passenger traffic in 2030 (mppa)				
Scale of development at SE airports	National demand	Main South East airports	Other airports	Lost to UK system
Maximum Use (no new runways)	501	198	230	73
1 new runway	501	216–225	222–223	53–63
2 new runways	501	243–250	222–228	29–32
3/4 new runways	501	258–274	205–215	22–28
Source: DfT Air Passenger Forecasting Model. Different combinations of runway developments generate different throughputs at individual airports. The figures for South East airports, regional airports and those lost to the UK system show the range of demand forecasts for different combinations of airport development at Heathrow, Stansted, Luton and the possible new airport at Cliffe.				

Chapter 4

Paragraph 4.3, first bullet – ‘35 [per cent]’ replaces ‘65’ (typographical error).

Paragraph 4.19 – new text replaces original final sentence:

“In practice, this means a choice between Cliffe and Stansted as the Government is not proposing any new runways at Gatwick (see **Chapter 8**).”

Chapter 5

Paragraph 5.5 – ‘**Annex B**’ in the last line replaces ‘**Annex A**’ (typographical error).

Chapter 6

Paragraph 6.11 – ‘**Annex B**’ in line 3 replaces ‘**Annex A**’ (typographical error). ‘**Annex C**’ in line 4 replaces ‘**Annex B**’ (typographical error).

Chapter 7

Figure 7B – “scale 1:50,000” deleted (typographical error)

Paragraph 7.18 – change of contact details in footnote 9.

Figure 7C – “scale 1: 150,000” deleted (typographical error)

Chapter 8

The full text of Chapter 8 in the July version was:

“In 1979, the then British Airports Authority (now BAA plc) signed an agreement with West Sussex County Council under which the airport operator undertook not to construct a second runway at Gatwick before 2019. The SERAS Study was conducted on the basis that nothing was ruled out and nothing was ruled in. It therefore included various options for one or two additional runways at Gatwick, and the Government has considered these carefully. The Government has decided that it does not intend to take action to overturn the 1979 Agreement. On that basis, a new runway at Gatwick would not be open before about 2024. The Government has concluded that an option for a new runway that could not be available until very late in the 30-year period of the forthcoming White Paper would create unnecessary blight and anxiety.

The Government will not, therefore, include in the White Paper any options for new runways at Gatwick. We present in Annex F details of the options considered in the later stages the SERAS Study, for information only.”

Chapter 9

Figures 9B, 9C and 9D – “scale 1: 50,000” deleted (typographical error)

Paragraph 9.19 – change of contact details in footnote 10.

Figures 9E, 9F and 9G – “scale 1:150,000 deleted (typographical error)

Chapter 10

Paragraph 10.6 – in the first line, “SERAS considered” replaces “There are”.

Figures 10B and 10C – “scale 1:50,000” deleted (typographical error)

Figures 10D and 10E – “scale 1:150,000” deleted (typographical error)

Chapter 11

Figure 11A – “Five runways” and “scale 1: 100,000” deleted (typographical error)

Figure 11B – “scale 1: 150,000” deleted (typographical error)

Paragraph 11.26 – the following words in square brackets have been deleted from the first sentence: “...in accordance with these regeneration policies [thereby reinforcing rather than replacing] and with existing strategic objectives...”.

Chapter 12

Paragraph 12.6, bullet point on “Southampton” – new text ‘D’ replaces ‘C’ (typographical error).

Paragraph 12.20 – date corrected in footnote 20 (typographical error).

Figure 12B – “scale 1:50,000” deleted (typographical error)

Paragraph 12.24 – in footnote 21 “Hullavington” replaces “Huntingdon” (typographical error).

Figure 12C – “scale 1:75,000” deleted (typographical error)

Chapter 14

Preamble – in line 2 ‘is based on options for’ replaces ‘assumes’.

Preamble – in line 5 ‘...the various potential...’ was previously ‘...these nine potential...’.

Paragraph 14.7 – after ‘SERAS study’ in line 2, text was previously ‘excluding those with development at Gatwick because we have decided not to propose any new runways at the airport.’

Subheading before paragraph 14.8 – ‘INCREASE IN THE NUMBER OF’ replaces ‘ADDITIONAL’.

Paragraph 14.8 – in line 2 ‘are assumed’ has been deleted after ‘parallel taxiway’.

Paragraph 14.8 – new text ‘15[mppa]’ replaces ‘10[mppa]’.

Table 14.2 – new figure ‘201.5’ as total for Maximum Use capacity replaces ‘198’ (typographical error).

Paragraph 14.16 – in line 3, ‘could be’ replaces ‘is’.

Table 14.3 – replaced. The original table is reproduced below:

Table 14.3: Capacity/Forecast demand in 2030 (mppa)							
		Heathrow	Gatwick	Stansted	Luton	Cliffe	Total
Base Case	Capacity	89	40	15	10	–	154
	Traffic	89	45	15	10	–	159
Maximum Use	Capacity	89	46.5	35	31	–	201.5
	Traffic	89	41	26	29	–	185
Heathrow+1	Capacity	116	46.5	35	31	–	228.5
	Traffic	116	48	26	27	–	217
Stansted +1	Capacity	89	46.5	82	31	–	248.5
	Traffic	84	38	74	29	–	225
Stansted +2	Capacity	89	46.5	102	31	–	268.5
	Traffic	82	40	98	23	–	243
Heathrow + 1 Stansted +1	Capacity	116	46.5	82	31	–	275.5
	Traffic	116	41	76	16	–	249
Heathrow + 1 Stansted +2	Capacity	116	46.5	102	31	–	295.5
	Traffic	116	42	96	12	–	266
Stansted +3	Capacity	89	46.5	129	31	–	292.5
	Traffic	81	41	122	15	–	258
Cliffe (4 runways)	Capacity	89	46.5	35	31	113	311.5
	Traffic	87	40	26	9	110	272

Table 14.4 – replaced. the original table is reproduced below:

Table 14.4: Forecast traffic at the main South East and other UK airports in 2030 (mppa)				
	SE Airports	Other UK Airports	National demand	Lost to the UK system
Maximum Use of existing runways only	189	239	501	73
Heathrow: one new runway	220	218	501	63
Stansted: one new runway	230	217	501	54
Stansted: two new runways	248	221	501	32
Heathrow and Stansted: one new runway each	255	216	501	30
Stansted: three new runways	263	210	501	28
Heathrow: one new runway and Stansted: two new runways	271	204	501	26
Cliffe: four runways	273	203	501	25
Source: DfT Air Passenger Forecasting Model South East airports are Heathrow, Gatwick, Stansted, Luton and London City and, where relevant, the proposed new airport at Cliffe				

Table 14.5 – in the first row, ‘of Existing Runways’ has been deleted after ‘Maximum Use’.

Paragraph 14.23 – ‘possible’ deleted after ‘each of the’ in line 1.

Table 14.6 – replaced. The original table is reproduced below:

Table 14.6: Economic benefits and costs (£billion, present value discounted at 6 per cent in real terms)			
Principal Components	Total benefits	Costs	Net benefits
Maximum use of existing runways only	6.7	1.8	4.9
Heathrow: one new runway	12.0	4.2	7.8
Stansted: one new runway	11.0	3.9	7.1
Stansted: two new runways	14.0	4.6	9.4
Heathrow and Stansted: one new runway each	17.8	5.5	12.3
Stansted: three new runways	17.8	5.2	12.6
Heathrow: one new runway and Stansted: two new runways	20.9	6.2	14.7
Cliffe: four runways	17.3	8.9	8.4

Paragraph 14.29 – ‘the three’ deleted after ‘An assessment of...’ in line 3.

Paragraph 14.37 – new text ‘tourist’ in line 7 replaces ‘overall’.

Table 14.7 – replaced. The original table is reproduced below:

Table 14.7: Forecasts of trips through South East airports in 2030 (mppa)				
Package	Foreign Business Trips via SE Airports (millions)	UK Business Trips via SE Airports (millions)	Foreign Leisure Trips via SE Airports (millions)	UK Leisure Trips via SE Airports (millions)
2000	11.4	12.5	22.0	39.0
Unconstrained	38.8	40.6	59.9	67.6
Maximum use of existing runways only	33.8	32.5	37.3	41.3
Heathrow: one new runway	35.6	35.8	45.5	51.2
Stansted: one new runway	35.7	35.7	47.4	53.2
Stansted: two new runways	36.8	37.2	52.3	57.6
Heathrow and Stansted: one new runway each	37.6	38.5	53.9	59.6
Stansted: three new runways	37.7	38.6	55.3	60.9
Heathrow: one new runway and Stansted: two new runways	38.4	39.9	57.2	59.6
Cliffe: four runways	38.3	39.6	58.0	66.1
Source: DfT Air Passenger Forecasting Model. South East airports are Heathrow, Gatwick, Stansted, Luton and London City and, where relevant, the proposed new airport at Cliffe. Excludes international transfer passengers and passengers on internal domestic end-to-end flights.				

Chapter 16

Paragraph 16.15 – the end of the third sentence in line 7 was originally: “...245 MtC per year by 2015 (a 75 per cent to 80 per cent increase).”

Paragraph 16.31 – ‘or with maximum use of the existing Gatwick runway’ has been deleted from the end of the sentence.

Paragraph 16.41 – ‘propose’ replaces ‘want’.

Paragraph 16.44 – ‘five’ deleted from before ‘options’ in line 2.

Chapter 17

Paragraph 17.12 ‘from’ replaces ‘form’ in line 2 (typographical error).

Chapter 18

Paragraph 18.5, footnote 27 – deleted. The text was as follows:

“The Government does not now intend to propose any new runways at Gatwick in the White Paper.”

Chapter 19

Paragraph 19.11 – in footnote 28, contact details have been amended.

Annex B

Surface Access, page 167 – in the first bullet new text ‘Orbit’ replaces ‘ORBIT’.

Annex C

Contact details revised.

SERAS documents – the titles of the following documents have been corrected: 4, 6, 7, 9, 16, 17, 19, 20, 22, 24, 28, 29, 50, 53, 61, 63, 66 and 67.

Footnote 32 deleted from document 29 (typographical error).

Annex F

This annex has been deleted as options at Gatwick are now contained in Chapter 8. The full text of Annex F is reproduced below.

ANNEX F

Gatwick

The Government will not be including in the White Paper any options for new runways at Gatwick. This annex provides details of the options considered in the later stages of the SERAS study, for information only.

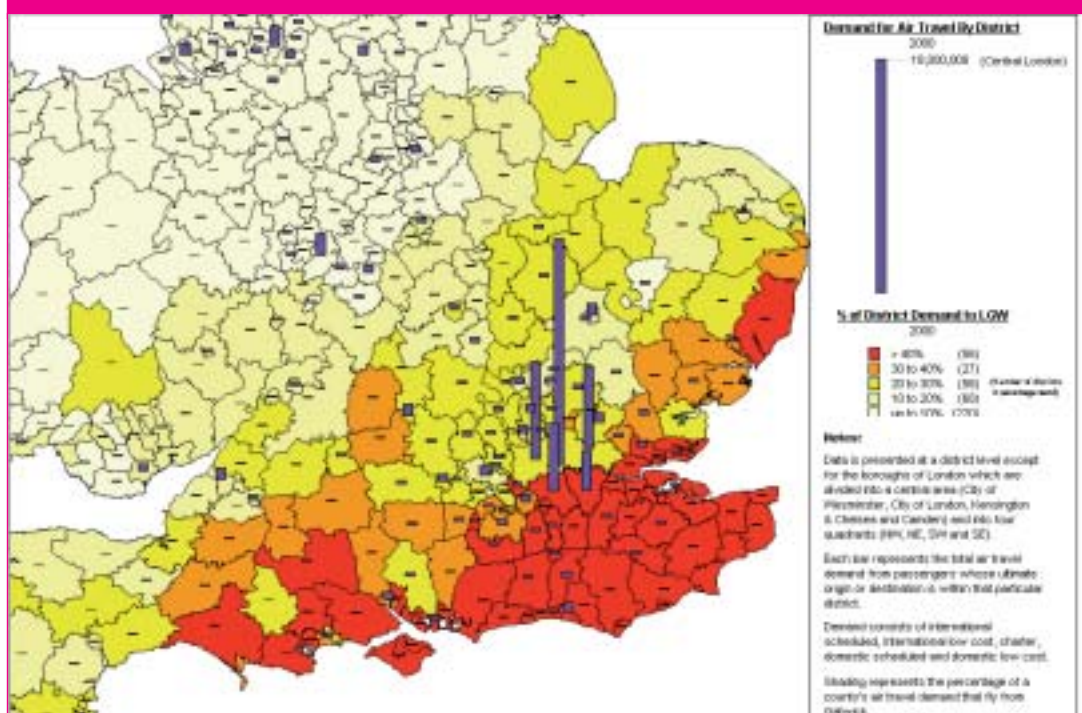
Current situation

Gatwick airport is owned by a subsidiary of BAA plc. It has a single runway and two terminals. In 2000 Gatwick handled nearly 32 million passengers and around 250,000 air transport movements (ATM), making it the second busiest airport in the UK. In addition the airport handled 320,000 tonnes of freight and 3,400 freight aircraft movements.

In 2001 the airport and surrounding local authorities signed an agreement under section 106 of the Town and Country Planning Act 1990, that allows Gatwick to move over time towards a terminal capacity of 40 million passengers per year (mppa) based on a single runway, two terminal airport with development remaining within the current boundaries.

Of the current air travel demand of 40 mppa from the Greater London area, 27 per cent fly from Gatwick. The figure below shows that Gatwick's demand comes mainly from the southern half of the London metropolitan area, and the area to the south and south east of London throughout Surrey, Sussex and Kent. Greater London accounts for 40 per cent of passengers at Gatwick.

Figure F.1: Total air travel demand by district, and percentage of this demand at Gatwick



Description of options

Options for one and two extra runways were considered as part of the SERAS study. Information on the two single new runway alternatives is provided below, in order to inform consultees' consideration of options at other locations. In the base case, Gatwick is assumed to have a capacity of 40mppa, in line with the planning agreement signed in 2001.

Maximum Use

This option assumes no further development of Gatwick beyond that envisaged in the section 106 agreement signed in 2001. It has been assumed that a small increase in capacity over the period to 2030 to meet rising demand could be achieved by an increase in the average size of aircraft using the airport (and hence in passengers per ATM) and more intensive use in off-peak hours of terminal and other facilities.

One additional runway

Two options were considered and were appraised on the basis that a new runway would not open until 2024:

Close parallel – a new full-length runway would be built to the south of and parallel to the existing runway. The two runways would be separated by 385 metres and operate in segregated mode with alternation; that is aircraft using one runway for departures and the other for arrivals. A full-length taxiway would be provided between the runways. All supporting facilities would be provided to the north of the existing runway. The terminal capacity of this option is 62mppa. See **Figure F2**.

Wide-spaced – a new full-length parallel runway would be built 1035 metres south of the existing runway. This additional separation allows for independent, mixed mode operation on the two runways; that is aircraft arriving and departing from the same runway (as is the case for the current runway). Aircraft stands would be situated between the two runways, which would also increase capacity by reducing the need for taxiing movements across the existing runway. The terminal capacity of this option is 83mppa. See **Figure F3**.

Figure F.2: Gatwick airport – close parallel runway

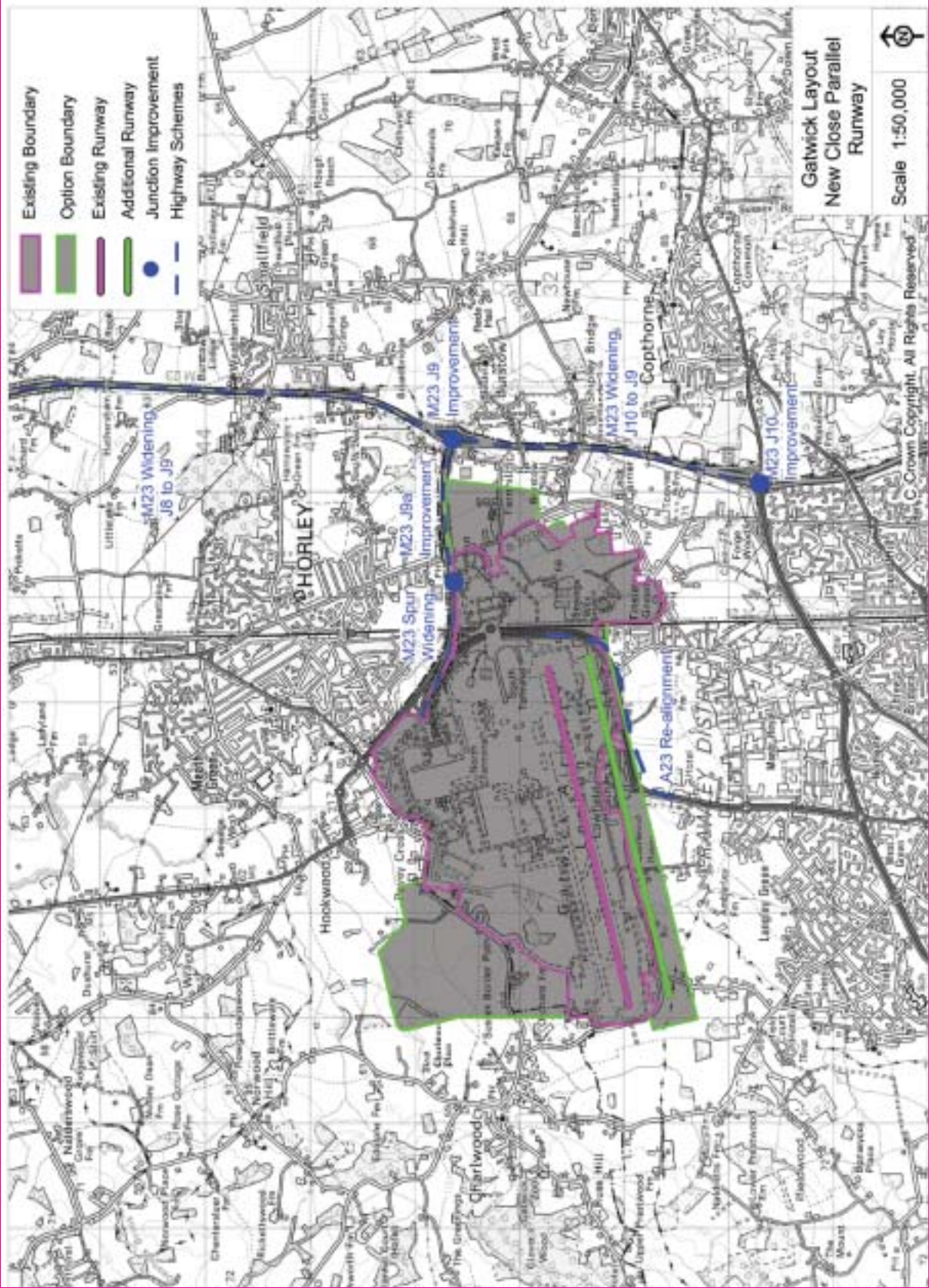


Figure F.3: Gatwick airport – wide-spaced runway

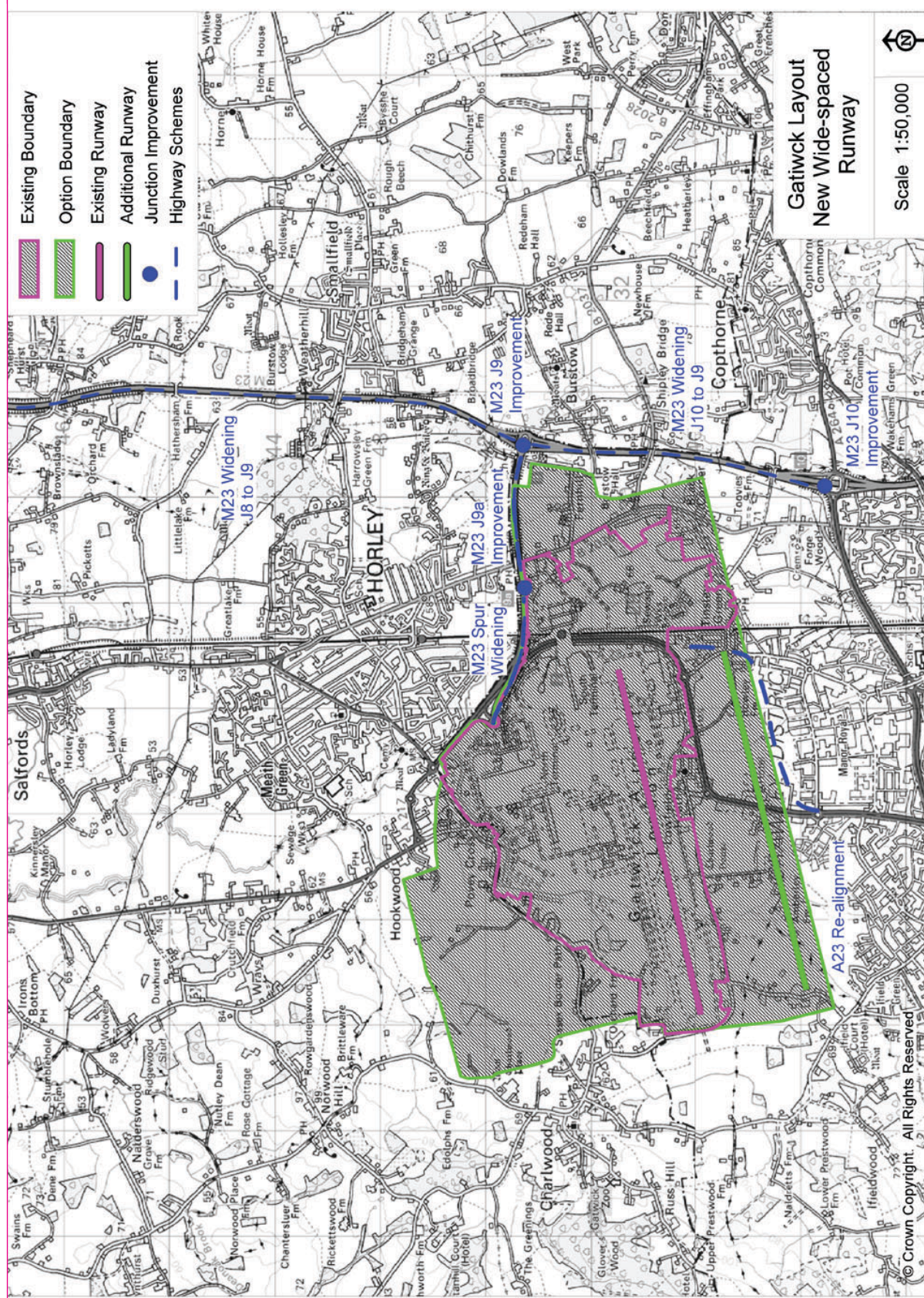


Table F4 summarises the capacity of various options and forecasts of air traffic.

Table F.4: Forecasts of demand for Gatwick			
GATWICK		Terminal passengers (mppa)	Air transport movements (Annual ATMs)
Use of the airport in 2000		32	250,000
Base Case	Capacity	40	260,000
	Forecast use in 2015	36	260,000
	Forecast use in 2030	40	260,000
Maximum Use	Capacity	46.5	260,000
	Forecast use in 2015	37	263,000
	Forecast use in 2030	41	257,000
Close parallel runway	Capacity	62	378,000
	Forecast use in 2015	N/A	N/A
	Forecast use in 2030	61	373,000
Wide-spaced runway	Capacity	83	486,000
	Forecast use in 2015	N/A	N/A
	Forecast use in 2030	76	484,000

Impacts on rail and road networks

RAIL

Enhancements are already planned to the South Central, Thameslink and CrossCountry rail services to Gatwick. No further additions in the scale and scope of rail services were assumed for the addition of the close parallel runway.

With a wide-spaced runway additional, accelerated airport expresses were assumed in order to attract airport demand and some commuters thereby relieving peak period crowding on services via London Bridge. To accommodate these non-stop trains additional infrastructure works at East Croydon, possibly including a long, tunnelled underpass, would be needed to by-pass this pinch-point on the congested London-Brighton main line.

ROADS

The addition of a new runway would require some local road closures and the widening of both the M23 airport spur and the A23 access road to the airport.

Strategic road improvements needed

Construction of a new runway would require the diversion of the A23 to the south of the airport (at-grade for the close parallel runway option, in tunnel for the wide-spaced runway option). The new runway would require no further enhancement of capacity on the strategic road network to provide for airport-related traffic beyond what would in any case be required to cater for 'background' demand by 2030.

Impacts on people and the environment

LAND AND PROPERTY

Construction of a new runway would result in the following:

- the area of the airport would increase from 7.7 km² today to 11 km² (close parallel) or 15 km² (wide spaced);
- around 50 (close parallel) or 300 (wide-spaced) residential properties would need to be physically taken;
- the loss of 130ha (close parallel) or 200 ha (wide-spaced) of high grade agricultural land;
- the loss of 120ha (close parallel) and around 400ha (wide spaced runway option) of Green Belt.

HERITAGE

Three Grade II* and four Grade II listed buildings would be lost as a result of construction of the close parallel runway, rising to five Grade II* and 12 Grade II building with the wide-spaced option.

ECOLOGY

No impacts were assessed as High* or High adverse.

WATER

Both runway options would require engineering work, diverting or culverting, to several rivers. The Environment Agency is generally opposed to culverting and such works are seen as a significant impact.

DAYTIME NOISE

Tables F5 and F6 show the areas and numbers of people exposed to different amounts of aircraft noise based on an average 16 hour day (0700–2300). See also Figures F7 and F8. The results assume that a new runway would open in 2024.

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Table F5: Size of area affected (Km ²)								
2000			2015			2030		
Level of Noise Leq (dBA)		Base Case	Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway
>54	118	87	88	n/a	n/a	110	145	172
>57	72	52	52			63	82	102
>60	44	31	31			37	48	64
>63	27	18	18			22	29	41
>66	16	10	10			13	17	25
>69	9	5	6			7	10	14
>72	5	3	3			4	6	7

Table F6: Numbers of people affected ('000s)								
2000			2015			2030		
Level of Noise Leq (dBA)		Base Case	Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway
>54	21	9	11	n/a	n/a	14	23	40
>57	9	4	4			6	9	21
>60	3	1	1			2	3	8
>63	1	0.7	0.7			1	1	3
>66	0.5	0.3	0.3			0.3	0.5	1
>69	0.2	0.1	0.1			0.2	0.3	0.2
>72	<0.1	<0.1	<0.1			<0.1	0.1	<0.1

Figure F.7: 57 dBA noise contours: 2000, maximum use (2030), new close parallel runway (2030)

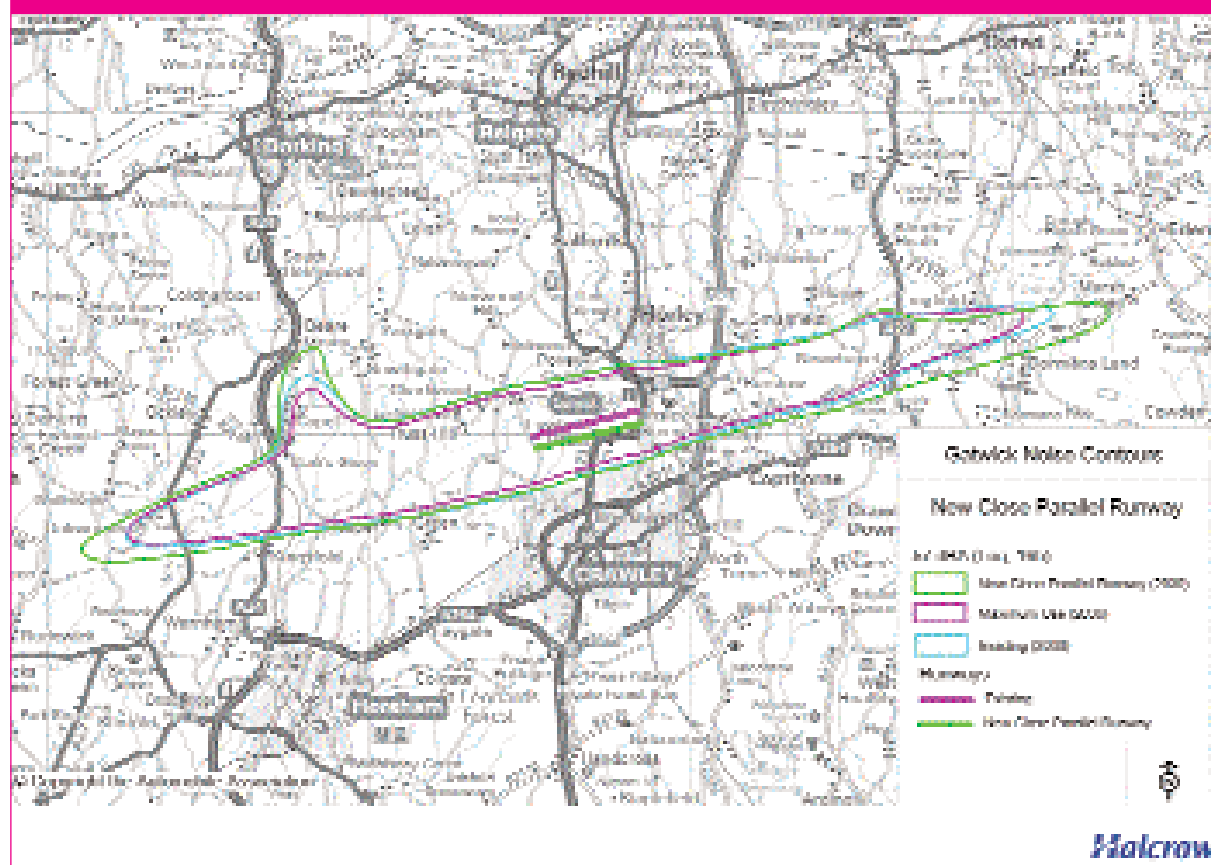
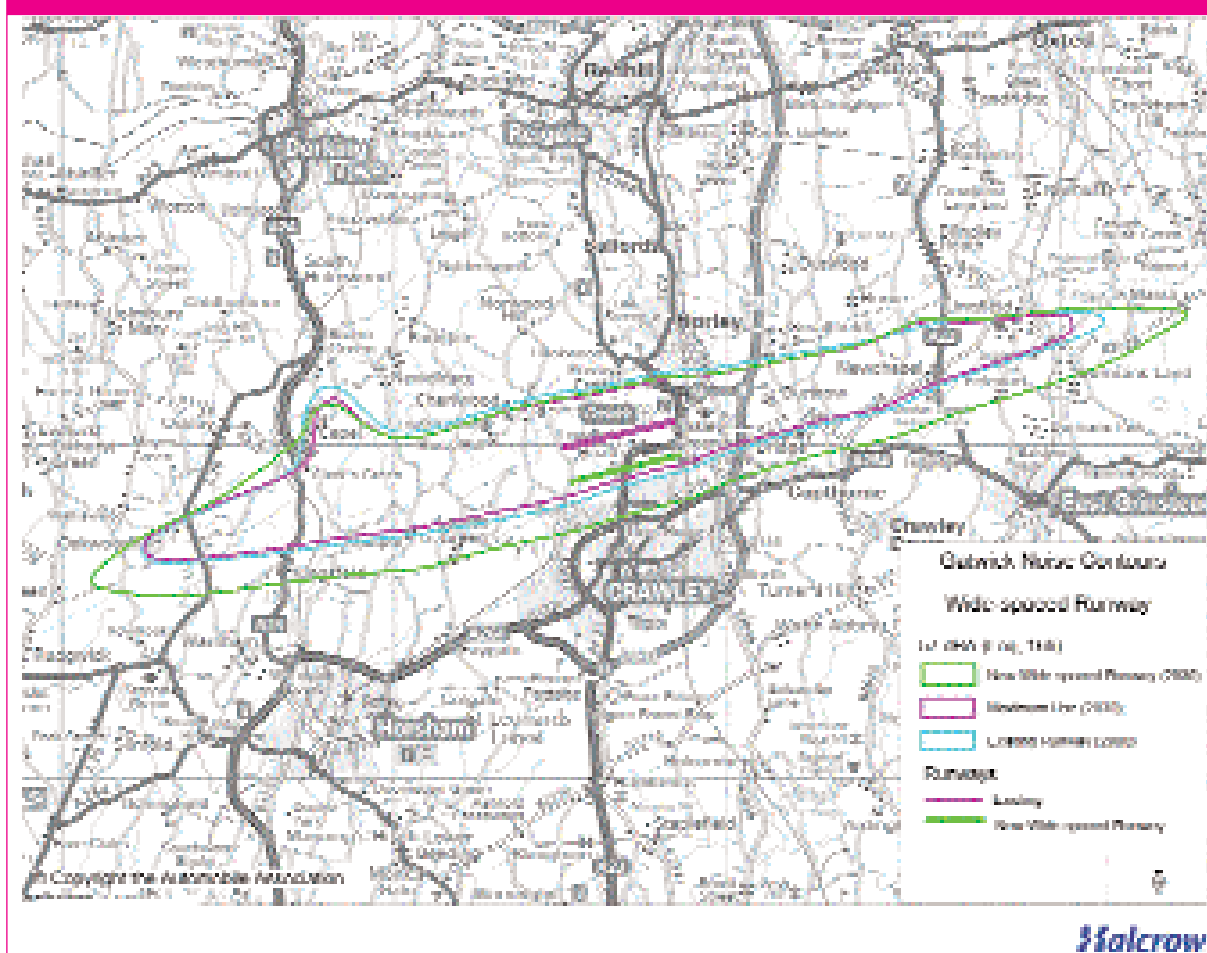


Figure F.8: 57 dBA noise contours: 2000, maximum use (2030), new wide-spaced runway (2030)



AIR QUALITY

Population exposed to an exceedence of EU limits:

PM₁₀ – nil for both options.

NO₂ – The modelling predicts that by 2015 about 600 people could be exposed if maximum use is made of the existing runway. In 2030 around 4000 people could be exposed with either the close parallel or the wide-spaced option. It is likely that in practice such impacts could be mitigated.

Impacts on regional planning

The area to the west and south of London is referred to as the Western Policy Area in Regional Planning Guidance for the South East (RPG9). This is identified as an economically very buoyant area where the policy is to ensure that the economy continues to grow in a sustainable way with the minimum additional pressure on the limited labour or land resources. Gatwick is identified as being within this area, although RPG does also suggest that growth at Gatwick airport could have economic benefits for Brighton and other coastal towns in need of regeneration.

EMPLOYMENT

Without a new runway, continuing improvements in labour productivity are likely to drive down airport-related employment. With a new runway, airport-related employment in 2030 might be 8,000 higher than in 1998 (close parallel runway) or 21,000 higher (wide spaced runway).

Table F9: Forecast of employment ('000s)

	1998	2015			2030		
		Maximum use	Close parallel runway	Wide spaced runway	Maximum use	Close parallel runway	Wide spaced runway
Direct on-site	26	25	n/a	n/a	22	33	42
Direct off-site	4	4			4	6	7
Indirect	13	9			8	12	15
TOTAL	43	38			34	51	64

LAND USE AND URBANISATION

The additional employment at Gatwick with an additional runway would represent an increase in core catchment area (Crawley, Reigate and Banstead, Mid Sussex) jobs from the current 13.8 per cent to 15 per cent (close parallel runway) or 18 per cent (wide spaced runway).

The core and wider catchment areas for Gatwick (the wider catchment area includes the boroughs of Sutton and Croydon, Mole Valley, the West Sussex districts of Horsham and Worthing, Brighton and Hove, and the East Sussex districts of Lewes and Wealden) are areas with a potential housing shortfall. The RPG provision of additional housing in these areas, extended to 2030, amounts to 145,000 dwellings, a shortfall of around 60,000 on the number needed to satisfy total employment requirements. The close parallel and wide spaced runway options would account for around 6 per cent and 15 per cent respectively of employment growth in these areas, and so can be said to be responsible for around 3,000 or 9,000 of that additional housing requirement.

Providing additional houses in the core catchment area would require Green Belt releases, which would be difficult to achieve in areas said to be approaching their environmental capacity. There may be scope for meeting some employment requirements by locating off-airport employment in areas such as Brighton, within the designated Priority Area for Economic Regeneration.

Annex G

The closing date for consultation has been revised.

The postal address for ordering technical reports has changed.

Contact information for email responses has been amended.

Annex H

Contact details for complaints have been amended.