
The Heathrow Terminal Five and Associated Public Inquiries

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To the Secretary of State for the Environment,
Transport and the Regions

MAIN REPORT:
Chapters 21 - 35

21 AIR NOISE

21.1 INTRODUCTION

- 21.1.1 In keeping with the approach adopted during the inquiry I have divided the noise topic into 3 elements; air noise, ground noise and road noise. I shall examine each of these elements in my next 3 Chapters before setting out my overall conclusions on this fundamental topic. I should make it clear at the outset that I include under Air Noise all noise generated by aircraft from the time that they start their take off (start of roll) to when they touch down (including the use of reverse thrust to slow down). I have not included noise generated by the construction of Terminal 5 or its associated developments in this part of my report. This noise will be covered in the Construction Chapter.
- 21.1.2 The overwhelming bulk of objections from members of the public concerned the noise likely to be generated as a result of the operations of Terminal 5 and this formed a substantial part of the cases put forward by most of the objectors. I start my consideration of this topic by accepting that aircraft noise has caused great concern and indeed serious distress and anxiety to large numbers of residents around Heathrow. I do not need to go into detail since the situation at the time of both their inquiries has been described powerfully by both Sir Iain Glidewell and Sir Graham Eyre. Although both BAA and the Department argued that the position has improved since the last inquiry, this view was not shared by many of those appearing at the inquiry. My attention was drawn in particular to the substantial increase in the number of aircraft movements which meant that residents felt that they were now subject to unremitting aircraft noise for much of the time, relieved only by runway alternation.
- 21.1.3 This conflict between the attempts to produce objective evidence and the actual experience of people immediately highlights one of the greatest problems facing me in judging the impact of aircraft noise. The Government uses $LA_{eq\ 16hour}$ as its measure of the aircraft noise climate. This takes no account of movements outside the 16 hour period covered and so cannot measure changes during some critical times of the day. In particular it cannot reflect the experience of local residents during the early morning hours when many of them told me that they are woken and are unable to get back to sleep. It was also urged on me that the $LA_{eq\ 16hour}$ primarily reflected the noise of individual aircraft and did not give proper weight to increased numbers of movements. I shall need to resolve these and other criticisms before reaching my conclusions.
- 21.1.4 There are many uncertainties which affect the forecasts of noise levels around Heathrow with and without Terminal 5. I have already covered some of the most important of these including the likely number of movements but I shall need to look more closely at other factors. Bearing in mind the widespread concern over early morning flights I shall be paying close attention to the probable effect of Terminal 5 on the number of movements likely to take place between 04.00 and 07.00 hours. I shall also be returning to the subject of the mode of runway operation since this has a fundamental impact on the noise climate.
- 21.1.5 As I have already explained in Chapter 8, Heathrow currently operates a segregated system for most of the day. This system involves one runway being used for departures while the other is used for arrivals. In mid-afternoon the runways are

switched so that arrivals use the runway which had been handling departures and vice versa. In order to ensure that the effects are shared as fairly as possible the pattern is changed each week so that the runway used for departures in the mornings one week is used for arrivals in the next and so on. This system is well established and is understood by all residents many of whom plan their activities around the probability that certain periods of the day will be relatively quiet.

- 21.1.6 The system is, however, subject to a number of uncertainties. It works well when the airport is operating on westerlies i.e. normally when the wind is from the west (but see para 21.1.9). Since aircraft normally land and take-off into the wind westerly operations mean that landing aircraft approach Heathrow from the east passing over central and west London. Departing aircraft on westerlies climb to the west towards Windsor. When, however, Heathrow is operating on easterlies, landing aircraft approach from over Windsor while departing aircraft climb to the east over west London. Because the end of the northern runway (09 Left) is very close to housing in Cranford, there is a long-standing arrangement that this runway will not be used for departures to the east. This arrangement known as the Cranford Agreement does not appear to exist in any written form but is none the less real and is greatly valued by those who benefit from it. Nevertheless, it is fair to point out that it arose at a time when the noise generated by departing aircraft was seen as the most substantial problem around Heathrow. This is no longer the case.
- 21.1.7 The result of the Cranford Agreement is that runway alternation cannot operate when the airport is on easterlies. In that case the southern runway (09 Right) is used throughout the day for departures and the northern one for arrivals.
- 21.1.8 There is one other point which needs to be made at this stage about runway alternation. While it applies for most of the day, alternation does not come into operation until 07.00 hours. This is in part due to the fact that there are few if any departures before that time but it means that the early morning arrivals which cause substantial disturbance to local residents are not subject to alternation. Since the majority of these arrivals are bound for Terminals 3 and 4 which lie close to the southern runway, they normally use that runway if possible. This increases still further the number of movements on the southern glidepath in the period between 04.00 and 07.00 hours.
- 21.1.9 Finally by way of setting the scene I should point out that Heathrow has traditionally operated a system under which there is a westerly preference. This means that whenever possible aircraft approach from the east and depart to the west. The original justification for this was that the noise of departing aircraft was more disturbing than that of those arriving at the airport. Since fewer people live immediately to the west of the runways than to the east, it made very good sense to concentrate departures in that direction. There is no dispute that recent improvements in engine technology and aircraft performance have resulted in significant reductions in the area affected by departing aircraft. On the other hand the reductions in noise from arrivals have been less significant. As a result the concentration of landing aircraft approaching Heathrow over the built up and heavily populated areas of west London is now the matter of greatest concern. It was suggested by several objectors that the time might have come for a review of the westerly preference even though this would also call into question the Cranford Agreement which significantly constrains easterly operations.
- 21.1.10 Overshadowing all of these considerations of the effect of runway operations on the noise climate is the possibility of the introduction of mixed mode operations under

which each runway would be used by both arriving and departing aircraft. Although BAA made it clear that they were firmly opposed to the introduction of mixed mode (para 8.2.5), the provision of Terminal 5 would increase the runway capacity of Heathrow.

- 21.1.11 I have gone into some detail on the mode of operations at Heathrow partly because I believe that it is helpful to a full understanding of the arguments which follow and partly to illustrate the uncertainties which are central to the debate about the noise climate. I am fully aware that changes in the operation of the runways are not specifically before me and that the successful operation of Terminal 5 does not, in the view of BAA require any changes. Nevertheless, I consider that I would be failing in my duty to local residents and to the Secretary of State if I did not acknowledge and investigate all of the significant implications of Terminal 5. Equally I shall need to consider whether possible changes in the manner in which Heathrow is operated could reduce any harmful effects of Terminal 5 and if so whether such changes could and should be secured by means of the imposition of planning conditions.
- 21.1.12 Turning to the main issues which were debated in relation to air noise I should say immediately that I found some difficulty in establishing with any clarity what is the current Government policy on this subject. As I have already pointed out matters have moved on in some respects since the publication of the 1985 White Paper and I need to set out my understanding of the current position.
- 21.1.13 Having set out my understanding of Government policy in relation to air noise, I shall turn to the impact Terminal 5 would have on noise around Heathrow. Here BAA argued that the proper test of the proposed development should be a comparison of the position with Terminal 5 with that of Heathrow with only the existing 4 terminals. They also placed considerable weight on the fact that the forecasts of $LA_{eq\ 16hour}$ showed that whether or not Terminal 5 were built noise levels in 2016 would be lower than those at present. They did, of course, accept that noise levels with Terminal 5 would be greater than those with only 4 terminals and that any reduction in the potential improvement in the noise climate would be relevant to the decision on the planning merits of the Terminal 5 proposal.
- 21.1.14 The starting point for the main objectors, on the other hand, was that current levels of noise around Heathrow was intolerable and that the noise climate had deteriorated in recent years whatever apparent improvement might be showed by the $LA_{eq\ 16hour}$ measure. Substantial improvements were essential and anything which reduced the scale of potential improvements would be unacceptable. They also argued that the proper test should be whether the absolute noise levels with Terminal 5 would be acceptable.
- 21.1.15 Whatever the overall effect of Terminal 5 might be, my attention was drawn specifically to the impact on noise around Heathrow at night and in the early morning. As I have already noted there are particular problems at such times and there was some dispute as to whether Terminal 5 would make these worse or, as British Airways argued, relieve them.
- 21.1.16 Finally I shall need to consider ways in which it might be possible to reduce the impact of Terminal 5 in terms of air noise if planning permission were to be granted. I shall not be assessing possible planning conditions in detail at this point since I shall be turning to these later. However, assuming that noise is a factor counting in the balance against Terminal 5, I need to reach a view on the possibility

of exercising effective control over aircraft noise before reaching any final conclusions on the extent of the harm it would cause in terms of air noise.

21.1.7 The main issues in relation to air noise around Heathrow are, therefore, as follows; The current national policy on aircraft noise;

- The impact of Terminal 5 on the overall noise climate;
- The impact of Terminal 5 on noise at night and in the early morning, and;
- Possible means of reducing and/or containing the impact of noise

21.2 NATIONAL POLICY ON AIR NOISE

The Department's Case

- 21.2.1 As in the earlier Chapter on National Aviation Policy, I shall begin by setting out the position of the Department. They accepted that residents near Heathrow experienced more severe noise problems than at any other airport in the UK or Europe. The 1985 White Paper at paragraph 5.18 said that the Government was committed to doing everything practicable to ensure that the noise climate improved. The Department told me that that policy had not changed and applied to both a four terminal and a five terminal airport. The Government would continue to do everything practicable to ensure that the noise climate did not deteriorate even after the noisier, Chapter 2, aircraft had been phased out in 2002 as required by the International Civil Aviation organisation (ICAO)²⁰⁴⁶.
- 21.2.2 They said that policy on night noise was firmly based on research and on a balance between environmental and aviation interests. Paragraph 5.6 of the White Paper had been overtaken by the night restrictions now in force at Heathrow, Gatwick and Stansted but the Government accepted that sleep disturbance continued to be a problem²⁰⁴⁷. The general policy did not, however, exclude the possibility that noise might get worse during any particular period. It would be permissible for the noise climate to get worse at night as long as excessive levels were not reached, although the Government had not defined what was an excessive noise level²⁰⁴⁸.
- 21.2.3 Under international agreements the noisier, Chapter 2, aircraft were to be phased out but, after this had been completed in 2002, no further significant improvements in engine noise were expected²⁰⁴⁹. Approach noise was particularly dependent on the mass of the aircraft and its height. This meant that, if there were more use of larger aircraft, people under the approach path would be disturbed more often, even though any new aircraft would have to meet the Chapter 3 standards set by ICAO²⁰⁵⁰. The Government took the view that the first and most effective means of controlling aircraft noise was reductions at source which was achieved through international agreement²⁰⁵¹. Secondly, restrictions could be imposed such as those limiting the number of movements at night. These arrangements sought to maintain

²⁰⁴⁶ 5-1.2.1

²⁰⁴⁷ 5-1.2.2

²⁰⁴⁸ 5-1.2.3

²⁰⁴⁹ 5-1.2.4

²⁰⁵⁰ 5-1.2.5

²⁰⁵¹ 5-1.2.6

a fair balance between social and environmental interests and the needs of the airline industry and its customers²⁰⁵².

- 21.2.4 Other noise protection measures were also in place at Heathrow. These included limits on the noise levels of departing aircraft and the use of Noise Preferential Routes which concentrated departing aircraft on specific routes leading to the Standard Instrument Departure routes. There was also a firm commitment to introduce more advanced area navigation techniques which would increase the capacity of the controlled airspace and allow aircraft to keep to their intended track more closely²⁰⁵³. There had been little improvement in noise from landing aircraft although the possibility of introducing noise limits for them was being studied²⁰⁵⁴.
- 21.2.5 Any changes to the current air traffic control arrangements which would affect the environment would have to be approved by the Secretary of State but the Government recognised that the Terminal 5 proposal was based on the assumption that existing arrangements would remain unchanged²⁰⁵⁵. Although the Government had originally accepted Sir Iain Glidewell's recommendation that there should be a limit on the number of aircraft movements at Heathrow it had subsequently been advised by Sir Graham Eyre that this would not be effective in controlling air noise. The decision not to impose a limit had been taken on the basis of the CAA's estimates that runway capacity would not exceed 300,000 patms which had been broadly in line with Sir Graham's assessment of runway capacity. These assessments had proved to be mistaken. Although the Government had the power to impose a limit on the number of aircraft movements, it considered that the rationale underlying the rejection of such a limit still applied. Neither had the Government thought it appropriate to impose a total ban on night flights as had been suggested by Sir Graham²⁰⁵⁶.
- 21.2.6 The westerly preference meant that operations took place in that direction as long as the easterly component in the wind did not exceed 5 knots and provided the runway was dry. In spite of the normal segregation of landing and departing aircraft, the southern runway sometimes handled a mixture of movements when there was severe congestion for arrivals. As a result some 1-3% of westerly landings were handled in mixed mode. The Government supported, in principle, the introduction of runway alternation at night which had been tested in 1996/97²⁰⁵⁷.
- 21.2.7 PPG 24 explained why the noise exposure categories it defined could not be used where a new noise was introduced into an existing community. Since the Government had been aware of the 1993 World Health Organisation (WHO) noise proposals when PPG 24 was being prepared it was premature to assume that the PPG should be revised in the light of these proposals²⁰⁵⁸. The Government acknowledged the WHO guideline figures of 55dB as the level above which significant annoyance might be expected during the day and 35dB as the level recommended to preserve restorative sleep processes. However the 55dB figure was assumed to be free field and should be increased by 2dB to take account of the way aircraft noise was measured²⁰⁵⁹.

²⁰⁵² 5-1.2.7

²⁰⁵³ 5-1.2.8

²⁰⁵⁴ 5-1.2.9

²⁰⁵⁵ 5-1.2.10

²⁰⁵⁶ 5-1.2.11

²⁰⁵⁷ 5-1.2.12

²⁰⁵⁸ 5-1.2.13

²⁰⁵⁹ 5-1.2.15

- 21.2.8 The 1998 White Paper stated that stress caused by noise might increase the risk of chronic heart disease and psychiatric disorder. However, the Government's view was that there was no clear cut evidence on this point²⁰⁶⁰.

BAA's Case

- 21.2.9 BAA stated that it remained Government policy to take all practicable steps to improve the overall noise climate. This might, however, be more difficult to achieve after the Chapter 2 aircraft had been phased out in 2002²⁰⁶¹.

British Airways' Case

- 21.2.10 In presenting their case on air noise, British Airways concentrated on night noise. They pointed out that the periodic review of the night flying restrictions by the Government, based on research, was the most appropriate method of balancing improvements in the night noise climate and other environmental considerations against the interests of air passengers and the economic benefits to the aviation industry²⁰⁶².

LAHT5's Case

- 21.2.11 LAHT5 argued that national and international policies placed an ever-increasing emphasis on the importance of preserving and enhancing the quality of life²⁰⁶³. The main goal of "The UK Strategy" on sustainable development was to protect human health and this was supported by the 1998 White Paper²⁰⁶⁴ and the European Union Environmental Action Programme of 1993²⁰⁶⁵. This meant that development which would have an adverse effect on health should not be permitted. LAHT5 were also concerned about sleep disturbance and interference with speech even if health was not endangered²⁰⁶⁶.
- 21.2.12 LAHT5 believed that the assurances in the 1985 White Paper were now being diluted and that the Department had been unable to demonstrate that presently there was a coherent policy on aircraft noise. Increases in the size of aircraft and in the number of movements might mean that the benefits of phasing out Chapter 2 aircraft would be short-lived²⁰⁶⁷.
- 21.2.13 The World Health Organisation's (WHO) report on "Community Noise" published in 1993 was intended to become the basis for a global document protecting the general population and vulnerable groups. LAHT5 placed considerable emphasis on the recommended guideline figures of 55dB for the day and 35dB for night and the Government had acknowledged that significant community annoyance might be expected above these levels²⁰⁶⁸. The precautionary principle should be applied in relation to noise around Heathrow²⁰⁶⁹. There had been no specific studies relating to the health effects of aircraft noise in the area for a number of years, although the

²⁰⁶⁰ 5-1.2.20

²⁰⁶¹ 5-1.3.1

²⁰⁶² 5-1.4.1

²⁰⁶³ 5-1.5.1

²⁰⁶⁴ 5-1.5.2

²⁰⁶⁵ 5-1.5.4

²⁰⁶⁶ 5-1.5.3

²⁰⁶⁷ 5-1.5.5

²⁰⁶⁸ 5-1.5.6

²⁰⁶⁹ 5-1.5.7

increasing incidence of complaints showed people were becoming less tolerant about noise intrusion²⁰⁷⁰. The maximum levels advised by WHO should be adopted. These were 30dB LA_{eq} for steady state continuous noise, 45dB LA_{max} in bedrooms and 55dB LA_{eq} for outdoor living areas, balconies and terraces²⁰⁷¹.

- 21.2.14 Predictions of noise levels at Heathrow had been consistently optimistic according to LAHT5 who also pointed out that the Inspector at the 1978 inquiry into Terminal 4 had described the level of noise at that time as unacceptable in a civilised country. Since then the number of aircraft movements had increased by 56% up to 1995. One of the major problems with the Terminal 5 proposals was the number of uncertainties involved²⁰⁷².

Hillingdon's Case

- 21.2.15 Hillingdon generally adopted the noise case put by LAHT5 and argued that development which would reinforce an existing unsatisfactory situation could itself be harmful. Around Heathrow noise levels were already in excess of the limits in the European Union Green Paper on "Future Noise Policy" published in 1996 and the potential benefits of using quieter aircraft were being lost by the increasing number of movements²⁰⁷³.

HACAN's Case

- 21.2.16 HACAN argued that the incessant noise from aircraft using Heathrow was an oppressive burden for large numbers of people²⁰⁷⁴. The 1998 White Paper contained an explicit commitment by the Government "to do everything practicable to improve the noise climate over time"²⁰⁷⁵. It was also Government policy to reduce health risks and studies had shown that excessive aircraft noise was associated with adverse effects on mental and physical health²⁰⁷⁶.

The Local Authorities' Aircraft Noise Council's Case (LAANC)

- 21.2.17 LAANC argued that there had been a marked deterioration in the noise climate around Heathrow over the last 10 years. This was against the background that the Department had conceded that Heathrow was the greatest source of noise disturbance to the community in Europe as a whole²⁰⁷⁷. Although the Government claimed that the night noise climate had improved over the last 20 years there was no means of measuring it and the Consultation Paper on night flying restrictions published in 1998 had said that the noise climate between 23.00 and 07.00 hours had deteriorated. The night period should be defined as 23.00 to 07.00 hours rather than the 23.30 to 06.00 period covered by the existing night quota period²⁰⁷⁸.

²⁰⁷⁰ 5-1.5.9

²⁰⁷¹ 5-1.5.10

²⁰⁷² 5-1.5.11

²⁰⁷³ 5-1.6.1

²⁰⁷⁴ 5-1.7.1

²⁰⁷⁵ 5-1.7.2

²⁰⁷⁶ 5-1.7.3

²⁰⁷⁷ 5-1.8.11

²⁰⁷⁸ 5-1.8.13

My Conclusions

- 21.2.18 As I have already said I had some difficulty in establishing current Government policy towards aircraft noise. This difficulty was not one that I suffered alone and on a number of occasions the Department felt the need to clarify their evidence in this area. I was, for example told originally that paragraph 5.18 of the 1985 policy applied only to a four terminal Heathrow²⁰⁷⁹ but subsequently the Department said that the policy applied to Heathrow whether it had four or five terminals. I was also told that the policy in paragraph 5.18 of the White Paper that the Government was committed to doing everything practicable to ensure that the noise climate improves applied only until 2002 by which time Chapter 2 aircraft would have been phased out. After that date the policy objective would be to take all practicable steps to avoid a subsequent deterioration in the aircraft noise climate around the airport²⁰⁸⁰. A little later I was told again by the Department that the commitment to do everything practicable to ensure that the noise climate improved still stood. The reference to avoiding a deterioration after 2002 was said merely to reflect the increasing difficulties in obtaining improvements after Chapter 2 aircraft had been phased out²⁰⁸¹.
- 21.2.19 During the inquiry, I expressed my concern over the apparent inconsistencies in the evidence about the policy after 2002 and this concern remains, in spite of the Department's efforts to clarify the position both in evidence and in their final submissions. For my part, I have decided to proceed on the basis that Government policy is as stated in the Department's closing submissions. This means that the Government remains committed to doing everything practicable to ensure that the noise climate around Heathrow continues to improve even after the phasing out of Chapter 2 aircraft is completed in 2002. However the Department and the Government recognise that there must be some doubt as to whether it will be possible to translate this commitment into continued improvements. The Government has, therefore, given a further commitment that it will "take all practicable steps to avoid a subsequent deterioration in the aircraft noise climate around the airport"²⁰⁸².
- 21.2.20 Although the Department argued in its final submissions that this phrase strengthened the policy²⁰⁸³, I am far from convinced that this is the case. The new commitment is only to take all practicable steps to avoid a subsequent deterioration in the noise climate and cannot offer any guarantee that this will be achieved. In my view, the additional commitment adds little to the policy. Whilst the main objective is still to improve the noise climate, the addition to the policy now seems to recognise that this is less likely to be achieved. To this extent the policy for the period beyond 2002 now seems to have been weakened without offering any added security for local residents. It may well be argued that the policy has become more realistic but this is unlikely to be much consolation to local residents.
- 21.2.21 This apparent weakening of national policy seems at odds with the increasing awareness of the principles of sustainable development. LAHT5 and others pointed to the work of WHO in setting guidelines for noise which attempt to take into account its effects on health as well as its potential to cause annoyance. I shall consider the likely impact of noise around Heathrow with and without Terminal 5 in

²⁰⁷⁹ Day 338 p156

²⁰⁸⁰ Day 338 p148

²⁰⁸¹ Day 341 pp13-15

²⁰⁸² DOT/2000 para 2.2

²⁰⁸³ Day 451 p192

the next part of this Chapter and so do not intend to comment in detail on the guidelines published by WHO at this stage save to point out that the Government accepts, in principle, the guideline figures of 55dB LA_{eq} in the day and 35 LA_{eq} at night. The relevant policy guidance for the Terminal 5 proposals remains that contained in PPG 24 and I accept that the Government was aware of the WHO report when it was preparing this guidance. There is, therefore, no reason to believe that PPG 24 needs to be revised in the light of the WHO report. I also note that the noise exposure categories in PPG 24 apply only to the introduction of residential development into an area with an existing noise source rather than the reverse²⁰⁸⁴.

- 21.2.22 I have taken careful note of the evidence regarding international work on the effects of noise. I accept that this is symptomatic of a growing awareness of the impact of noise which is reflected in the 1998 White Paper. I was, however, told that the Government takes the view that there is no clear cut evidence on the effects of noise on health. The White Paper includes a reference to further work on the health and related effects of noise²⁰⁸⁵. While I would expect the intended review of airports policy to take account of all of the evidence available, I do not find any reason to change my interpretation of national policy as it now stands.
- 21.2.23 Having set out the overall policy approach on aircraft noise at Heathrow, I do need to comment on the position in relation to the policy towards noise at night. Here the Department accepted that the policy was to protect local communities from excessive noise levels at night. I was told that this was not intended to be a different policy but that it was, in effect, a subset of the overall commitment to seek an improvement in the noise climate which I have already covered. It does, however, represent an acceptance that the noise climate might deteriorate in any discrete part of the day or night.
- 21.2.24 I can understand the distinction which the Department sought to draw between the overall noise climate and what might happen in a particular part of the day. Nevertheless, I find it unfortunate that they would be prepared to accept a deterioration in noise at night in any circumstances. Furthermore, the Department accepted that no measure of what constituted an excessive level of noise at night had been defined. Although the Government said in 1993 that the restrictions imposed on night operations at the London airports protected local people from excessive aircraft noise at night²⁰⁸⁶, this view did not emerge from a clear and coherent assessment leading to a specific definition of excessive noise levels. I find it very hard to understand how the policy can be implemented fairly and openly in the absence of a measure or definition of what is an excessive noise level.
- 21.2.25 The efforts of the Department to reconcile the limited objectives of its policy objective for night noise with its overall policy commitment ignores the importance attached by local residents their concerns about noise at night. I readily accept that an increase in noise over a short period during the day might be outweighed by improvements for the rest of the day. The position with noise at night is very different. The noise generated by aircraft using Heathrow at night was probably the greatest single cause for concern by local residents. I find it very difficult to believe that any increase in noise levels at night could be outweighed by improvements during daylight hours.

²⁰⁸⁴ PPG 24 Annex 1 para 4

²⁰⁸⁵ CD/258 para 4.212

²⁰⁸⁶ CD/59 para 9

- 21.2.26 In applying its policy on noise at night the Department told me that the main priority was to ensure that excessive levels were not reached. However, the true position does not seem to be as simple as this. Government policy has consistently stressed the need to preserve a balance between aviation and environmental interests. Even in 1993 the restrictions on aircraft movements at night took into account not only the need to protect local communities from excessive noise at night but also competitive influences affecting UK airports and wider employment and economic implications²⁰⁸⁷. More recently in its Second Stage Consultation on Night Restrictions at Heathrow, Gatwick and Stansted published in November 1998, the Government said that it sought to strike a balance between the need to protect local communities from excessive aircraft noise at night and to provide for air services to operate at night where they are of benefit to the local, regional and national economy. It also recognised the significance of competitive factors and the wider employment and economic implications in the operation of restrictions on night flying as well as the need to take into account research on the effects of aircraft noise on sleep disturbance and health²⁰⁸⁸.
- 21.2.27 If I am right in my interpretation of current policy, noise at night could be allowed to become excessive if it was considered that the harm caused by such noise levels were outweighed by the benefits to the competitive position of Heathrow and the airlines and the wider employment and economic implications. However, the confusion that surrounded the policy on noise at the inquiry does emphasise the need for a clear statement which can be readily understood by people living around Heathrow as well as the operators and users of the airport.
- 21.2.28 I believe that the approach to national policy as explained to me involves 2 distinct elements. The overall policy is to do everything practicable to ensure that the noise climate around Heathrow continues to improve although after 2002 that objective will be supplemented by a further, less ambitious, commitment to do everything practicable to avoid a subsequent deterioration in the aircraft noise climate around the airport. At night, however, the policy objective is to balance the need to protect local communities from (undefined) excessive noise levels against the need to provide for air services to operate at night.
- 21.2.29 It is in the context set by these policies that I now turn to examine the impacts of Terminal 5 on the noise climate around Heathrow. I shall first consider the general noise climate and then examine the implications of Terminal 5 on noise at night.

21.3 THE IMPACT OF TERMINAL 5 ON THE OVERALL NOISE CLIMATE AROUND HEATHROW

The Department's Case

- 21.3.1 Once more I shall begin by setting out the evidence of the Department since this sets the context within which the assessment of the effects of Terminal 5 was carried out by the various parties. In doing this I should emphasise that the Department here, as elsewhere in the aviation topics, adopted a neutral position. It did not support Terminal 5 but sought to assist the inquiry in setting out the background to an examination of its impact.

²⁰⁸⁷ CD/59 para 4

²⁰⁸⁸ CD/260 (iii) para 1.27

- 21.3.2 The Department explained that noise indices needed to be reliable, robust, realistic and sensitive. They were widely used to average events over a particular duration although the relationships between exposure levels and disturbance were weak in a statistical sense²⁰⁸⁹. The impact of noise in terms of community annoyance was best measured through social surveys. The 1982 Aircraft Noise Index Study (ANIS) had included social surveys and it would have been useful if there had been further surveys since then. Even though the ANIS report had been comprehensive it had only just been able statistically to provide an answer to the question posed²⁰⁹⁰.
- 21.3.3 The Department's evidence was that research had guided the choice of noise indices in the UK since 1967²⁰⁹¹. The $LA_{eq\ 16hour}$ index was the measure which had been used to test whether there had been an improvement in the noise climate around Heathrow²⁰⁹². It had been introduced in 1990 in an attempt to reflect community annoyance more effectively than had been the case with the previous Noise and Number Index. The $LA_{eq\ 16hour}$ covered the 92 day summer period for the 16 hours between 07.00 and 23.00 hours. It produced results that were little different from a 24 hour index although any substantial change in the split of traffic between night and day might alter that²⁰⁹³. Forecasts of future noise levels used the ANCON 1 model which incorporated measurements of the performance of a number of aircraft types²⁰⁹⁴. This model used actual measurements of individual aircraft made at London airports²⁰⁹⁵.
- 21.3.4 It was Government policy to test the effect of aircraft noise by use of the LA_{eq} system and the noise contours could not be ignored. However, the Department accepted that the system was not faultless and that it would be appropriate to take other factors and evidence into account in considering the noise implications of Terminal 5. In particular, there was no suggestion that the night-time situation was tested by contours²⁰⁹⁶.
- 21.3.5 Although LA_{eq} attempted to combine the noise of individual aircraft events with the number of events, the Department recognised that it was very difficult to discover the true underlying relationship. In its present form the addition of 400 light Chapter 3 aircraft to 100 flights by 747-400's would increase the $LA_{eq\ 16hour}$ by only 1dB. On the other hand, the Department conceded that there would be no improvement in the $LA_{eq\ 16hour}$ between now and 2016 if the effect of ceasing operations by Concorde were ignored²⁰⁹⁷. $LA_{eq\ 16hour}$ and the noise contours produced from it were averages. Those people affected by runway alternation actually experienced a noise level 3dB higher than that shown by the $LA_{eq\ 16hour}$ when aircraft were flying overhead. Conversely they experienced a noise level 3dB lower than the contour would suggest when aircraft were not flying overhead as a result of runway alternation. It was therefore accepted that $LA_{eq\ 16hour}$ did not reflect the relief obtained from measures such as runway alternation. This meant that it would not be the best means of assessing the differences which the introduction of mixed mode would produce²⁰⁹⁸.

²⁰⁸⁹ 5-1.2.19

²⁰⁹⁰ 5-1.2.20

²⁰⁹¹ 5-1.2.23

²⁰⁹² 5-1.2.24

²⁰⁹³ 5-1.2.24

²⁰⁹⁴ 5-1.2.23

²⁰⁹⁵ 5-1.2.25

²⁰⁹⁶ Day 492 pp8-14

²⁰⁹⁷ 5-1.2.26

²⁰⁹⁸ 5-1.2.27

- 21.3.6 The contours for 57, 63 and 69dB LA_{eq} were said to denote the onset of low, moderate and high levels of annoyance²⁰⁹⁹. The figures in the ANIS report had been tentative and had not found a step indicating a rapid increase in disturbance at 57 LA_{eq} as the press notice had stated. That notice had not been written by the author of the report who told the inquiry that he did not support the strength of its expression. The press notice did not point out that ANIS had only just provided a statistical fit²¹⁰⁰.
- 21.3.7 The Department's evidence was that most people would be able to detect a difference of 3dB between aircraft passing overhead and a change of 2dB was discernible²¹⁰¹. Aircraft close to the airport were likely to exceed background noise levels outdoors by 20dB or more²¹⁰². The WHO research had confirmed that few people were seriously annoyed by noise levels of less than 55dB although many complaints about Heathrow came from people living outside that contour²¹⁰³. Even a difference of half a decibel could be significant and the area enclosed by a contour would be increased by 15-20% for every 1dB increase in the LA_{eq} level²¹⁰⁴.

BAA's Case

- 21.3.8 BAA argued that surcharges applied to noisier aircraft at Heathrow while landing charges favoured quieter types²¹⁰⁵. The company supported the introduction of lower noise limits for departing aircraft at night but such limits were independent of Terminal 5. New monitors were being introduced to improve efficiency and new take-off procedures were being investigated to minimise noise²¹⁰⁶. Noise levels had already fallen by a factor of 3.3 for comparable aircraft types and more attention was now being paid to approach noise. Procedures to minimise the impact of landing aircraft were already in place but it would be unsafe to introduce steeper approach angles than the 3° glide path now in use²¹⁰⁷. BAA would like to introduce a permanent monitoring system for landing aircraft²¹⁰⁸.
- 21.3.9 BAA supported the use of LA_{eq 16hour} as the best index for measuring annoyance from environmental noise and as a very good proxy for a 24 hour LA_{eq}. Nevertheless they accepted that it might have to be supplemented with other measures²¹⁰⁹. Although no index was ideal, LA_{eq} was in use in other countries and had been adopted by the local authorities here as a basis for local plan policies²¹¹⁰. The current ANCON 1 model used to calculate future LA_{eq} levels had been specifically designed to estimate noise exposures around the London airports using existing aircraft types in use at the time the modelling had been carried out. It therefore excluded actual measurements of the noise generated by aircraft such as the Boeing 777. Some 74% of movements at Heathrow would be using new aircraft types if Terminal 5 were built as compared with 65% if it were not. A revision of ANCON 1 known as ANCON 2 was now being produced. This would take into

²⁰⁹⁹ 5-1.2.29

²¹⁰⁰ 5-1.2.30

²¹⁰¹ 5-1.2.21

²¹⁰² 5-1.2.22

²¹⁰³ 5-1.2.28

²¹⁰⁴ 5-1.2.28

²¹⁰⁵ 5-1.3.2

²¹⁰⁶ 5-1.3.3

²¹⁰⁷ 5-1.3.4

²¹⁰⁸ 5-1.3.5

²¹⁰⁹ 5-1.3.6

²¹¹⁰ 5-1.3.7

account the performance of new aircraft types but it was unlikely to change the forecasts materially²¹¹¹.

- 21.3.10 The forecasts of future noise levels had been produced on the basis of the estimated performance of new aircraft such as the Boeing 777 and the NGLA. The 777 had now been introduced into service and actual experience had shown that the assumptions built into the model had been pessimistic. The same might apply to the NGLA. Nevertheless, even with these pessimistic assumptions, the areas enclosed by each of the resulting contours would be smaller than at present. Even in those limited areas which would experience an increase in noise, that increase would mostly be 2dB or less which was not significant²¹¹².
- 21.3.11 BAA's work showed that in 1994 the 57dB LA_{eq 16hour} contour had covered 175.5 sq km with a population of 319,000 people²¹¹³. Assuming that Terminal 5 were not built, a throughput of 50 mppa and 425,000 movements a year would result in a reduction in that area to 95 sq km in 2016. With Terminal 5 and a throughput of 80 mppa and 458,000 movements, the 57dB LA_{eq 16hour} contour would enclose an area of 128.5 sq km. If, however, it were assumed that Concorde remained in service the area of the 57dB LA_{eq 16hour} would be 182.8 sq km²¹¹⁴. For departures, Concorde's contribution to the LA_{eq 16hour} was almost equivalent to that of the rest of the fleet put together²¹¹⁵.
- 21.3.12 BAA would be willing to accept a "contour cap" limiting the area enclosed by the 57dB contour to the 1994 figure of 175.5 sq km. This would apply whether Concorde was flying or not and regardless of any changes to operating procedures. The cap could be imposed under Section 78(6) of the Civil Aviation Act 1982. However, any contour cap which prevented Heathrow from handling 80 mppa would not be acceptable²¹¹⁶.

British Airways' Case

- 21.3.13 The contour cap based on the 1994 area was also supported by British Airways who pointed to the progress which had been made in reducing the area affected. The introduction of new aircraft had played a substantial part in this²¹¹⁷.

LAHT5's Case

- 21.3.14 LAHT5 pointed out that the ANIS report had been produced at a time when Heathrow had been handling only 221,513 movements a year. The report had used the 57dB level tentatively but a much stronger statement than the report justified had been included in PPG 24²¹¹⁸. LA_{eq} was not an appropriate measure of the effect of the tonal frequency of noise which might make small differences in decibel level noticeable. The 57dB contour alone did not provide a sufficiently detailed representation of how the noise climate was changing or the effects of Terminal 5²¹¹⁹. Averaging the noise climate did not adequately describe the impact since

²¹¹¹ 5-1.3.8

²¹¹² 5-1.3.10

²¹¹³ 5-1.3.9

²¹¹⁴ 5-1.3.12

²¹¹⁵ 5-1.3.11

²¹¹⁶ 5-1.3.13

²¹¹⁷ 5-1.4.3

²¹¹⁸ 5-1.5.14

²¹¹⁹ 5-1.5.15

people responded to the number of events and maximum noise levels²¹²⁰. Furthermore there could be swings of over 11dB between easterly and westerly operations²¹²¹.

- 21.3.15 PPG 24 did not rule out the use of other measures and the local authorities had explored the effects of Terminal 5 on the basis of dB differences, contours and the criteria for different uses. They had adopted criteria of 45dB LA_{eq} and 55dB LA_{max} for living rooms, and for bedrooms at night they had adopted criteria of 35dB LA_{eq} and 45dB LA_{max}²¹²². Unlike BAA, LAHT5 had made detailed assessments of 18 sites at various times of the day²¹²³. Seven of these currently experienced noise levels which were unacceptable on the basis of the European Union Green Paper, while 16 experienced levels which could give rise to serious annoyance²¹²⁴. The impact of noise below 57dB LA_{eq 16hour} should be taken into account since some 10% of those exposed to between 54 and 57dB would be very annoyed²¹²⁵. Many complaints came from areas outside the 57dB contour²¹²⁶.
- 21.3.16 LAHT5 did not dispute BAA's contours but these should be seen as only one possible outcome. Even BAA's own forecasts showed that 106,800 more people would be within the 57dB LA_{eq} contour with Terminal 5 than in the four terminal case. Moreover, some of the benefits claimed by BAA for 2016 would arise only if Concorde ceased flying²¹²⁷.
- 21.3.17 The public's enjoyment of open spaces such as Kew Gardens, Bushy Park and Richmond Park was seriously impaired by aircraft noise²¹²⁸, while some 65% of the population of Hounslow were affected by a level of aircraft noise which would require conditions to be placed on any planning permission granted. Residents in areas such as Waye Avenue and Beavers Lane were unable to enjoy their gardens. Some 144,500 residents in Hounslow were exposed to noise levels of at least 57dB LA_{eq 16hour}. Although this number might fall to 92,500 if Terminal 5 were not built, it would rise again to 103,000-106,000 if it were constructed²¹²⁹. If Terminal 5 were built there would also be a lengthening of the contours to the east by 5 km²¹³⁰. Some 35% of the residents of Windsor and Maidenhead were currently annoyed to some extent. To many people the frequency of flights was more irritating than the noise level²¹³¹. The position would improve if Terminal 5 were not provided²¹³² but, if it were, there would be a general worsening of the noise climate especially between 22.00 hours and 07.00 hours²¹³³.
- 21.3.18 LAHT5 also argued that an increase in the number of flights at sensitive times of the day would be particularly detrimental to health²¹³⁴. While there was insufficient knowledge of the impact of noise on health to enable accurate predictions to be made it was clear that demonstrable harm would be caused²¹³⁵. Terminal 5 would

²¹²⁰ 5-1.5.22

²¹²¹ 5-1.5.30

²¹²² 5-1.5.17

²¹²³ 5-1.5.18

²¹²⁴ 5-1.5.19

²¹²⁵ 5-1.5.32

²¹²⁶ 5-1.5.21

²¹²⁷ 5-1.5.23

²¹²⁸ 5-1.5.24

²¹²⁹ 5-1.5.25

²¹³⁰ 5-1.5.32

²¹³¹ 5-1.5.26

²¹³² 5-1.5.27

²¹³³ 5-1.5.28

²¹³⁴ 5-1.5.33

²¹³⁵ 5-1.5.34

cause further sleep disturbance, speech interference and teaching difficulties as well as interfering with working environments and the quiet enjoyment of housing and recreational areas²¹³⁶. The disruptive effect of aircraft on schools had been demonstrated 20 years ago and PPG 24 implied that there should be no schools within the 60dB contour²¹³⁷. A survey had shown that schools in and beyond the 57dB LA_{eq 16hour} contour were affected by Heathrow²¹³⁸. Studies had shown reading ability and long term memory had been lower in children around Los Angeles and Munich airports²¹³⁹.

- 21.3.19 LAHT5 had commissioned a study which confirmed that chronic aircraft noise impaired reading comprehension although its results were not wholly consistent internally. This report had not, however, considered the impact of Terminal 5 specifically²¹⁴⁰. All the research demonstrated particular problems with speech, drama and music and for individuals who were hard of hearing, very young or learning a foreign language. There was an urgent need for further research but it was likely that Terminal 5 would result in repeated interruptions to teaching and long term consequences for children²¹⁴¹.

Hillingdon's Case

- 21.3.20 In adopting the case put by LAHT5, Hillingdon pointed out that the area between Longford and Cranford was exposed to noise levels above the European Union Green Paper limits and often greater than 72dB²¹⁴². Seven sites had been assessed all of which experienced levels above the Green Paper limits and the WHO criterion of 55dB. Sound insulation was needed at all sites and it was doubtful if satisfactory conditions could be achieved internally at some sites even with that insulation²¹⁴³. Fortunately there were few schools in the south of Hillingdon and they were insulated. Nevertheless, outside activities were frequently interrupted²¹⁴⁴.
- 21.3.21 Without Terminal 5 a reduction of between 2 and 2.3dB could be expected by 2016 assuming that Concorde ceased flying. However, this reduction masked a worsening in some respects particularly the noise from landing aircraft as a result of the increased number of aircraft movements²¹⁴⁵. On the same basis BAA's case suggested that there would be some improvements over the existing position even with Terminal 5 but there would be virtually no improvement in arrivals noise during the day and an increase in the late evening. Most sites would still experience noise levels above the Green Paper limits. At 100 mppa and 475,000 atms there would be an overall worsening of the existing noise climate with significantly more movements in the early morning and at night²¹⁴⁶. If mixed mode were introduced as assumed in the test with 500,000 atms, the effect on Longford and Harmondsworth could be greater than the increase in LA_{eq} would imply but by far the greatest impact would be on Cranford where the existing agreement effectively provided 11-13dB protection²¹⁴⁷.

²¹³⁶ 5-1.5.33
²¹³⁷ 5-1.5.35
²¹³⁸ 5-1.5.36
²¹³⁹ 5-1.5.37
²¹⁴⁰ 5-1.5.38
²¹⁴¹ 5-1.5.39
²¹⁴² 5-1.6.1
²¹⁴³ 5-1.6.2
²¹⁴⁴ 5-1.6.4
²¹⁴⁵ 5-1.6.5
²¹⁴⁶ 5-1.6.6
²¹⁴⁷ 5-1.6.7

HACAN's Case

- 21.3.22 HACAN, among others, argued that community noise had not declined, it had become strongly correlated with the frequency of flights. 40-50% of people canvassed by HACAN had said aircraft noise had got worse in the last 5 years²¹⁴⁸. About 650,000 people now lived under landing paths and a million people were affected by aircraft noise if take-off paths were also included²¹⁴⁹. Reports of noise annoyance came from as far east as the Globe Theatre, 24 km from touchdown²¹⁵⁰ and Terminal 5 would lead to a worse noise climate with more flights by bigger aircraft. BAA's forecasts of future flight numbers had always been unreliable²¹⁵¹.
- 21.3.23 HACAN said that the pressure of flight numbers was already causing a breakdown of runway alternation because there were now intervals of only 60 seconds between flights. Terminal 5 would lead to the abandonment of alternation and the few remaining measures to protect the environment²¹⁵². LA_{eq} was almost totally insensitive to the frequency of flights; the introduction of mixed mode would be devastating but the $LA_{eq\ 16hour}$ contours would hardly be affected²¹⁵³. The Department had conceded that the LA_{eq} contours had only a weak correlation with annoyance in particular locations and the results of ANIS were now being extrapolated far beyond the range covered by the study. The 54dB $LA_{eq\ 16hour}$ contour would be a more reliable indicator of the onset of community annoyance than the 57dB contour²¹⁵⁴. There was a need for surveys at regular intervals²¹⁵⁵. Concorde produced as much noise energy as 120 Boeing 757's or thirty-five 747-400's. If it were kept in service the contour in 2016 would be increased by 30%²¹⁵⁶.
- 21.3.24 HACAN argued that Terminal 5 would inevitably lead to 24 hour operations at Heathrow and to a third main runway since it would be impossible to double the capacity of the airport if there were only a few extra flights a year²¹⁵⁷.

Other Objectors' Cases

- 21.3.25 EANAG supported the call for further surveys and agreed with HACAN that 57 dB did not represent the onset of annoyance. Moreover, LA_{eq} did not reflect the problem of more frequent flights²¹⁵⁸. They doubted that the NGLA would be no more noisy than the 747-400²¹⁵⁹. FANG also criticised LA_{eq} which was open to manipulation and had not been adopted throughout the world²¹⁶⁰. As an average, it masked the effect of take-offs on communities to the east of the airport²¹⁶¹. People did not respond to averages²¹⁶² and head teachers and a playgroup leader had given compelling evidence of actual experience. Noise constantly disrupted school life throughout the year but particularly in summer²¹⁶³.

²¹⁴⁸ 5-1.7.4

²¹⁴⁹ 5-1.7.5

²¹⁵⁰ 5-1.7.6

²¹⁵¹ 5-1.7.7

²¹⁵² 5-1.7.8

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²¹⁵⁴ 5-1.7.10

²¹⁵⁵ 5-1.7.11

²¹⁵⁶ 5-1.7.12

²¹⁵⁷ 5-1.7.21

²¹⁵⁸ 5-1.8.1

²¹⁵⁹ 5-1.8.2

²¹⁶⁰ 5-1.8.5

²¹⁶¹ 5-1.8.6

²¹⁶² 5-1.8.7

²¹⁶³ 5-1.8.8

- 21.3.26 All of these concerns were reflected in the comments of organisations and individuals appearing at the inquiry and submitting written representations. Objectors felt that the noise climate was already unacceptable and that, contrary to the view of the Government, it had grown worse over the last 10 years or so. One of the main concerns was that, as the frequency of flights had increased, the separation between aircraft had been reduced and the noise had become relentless. Terminal 5 would make it worse and would increase the pressure for another runway. There should be an absolute limit on the number of movements handled by Heathrow.
- 21.3.27 Much of the evidence from individuals whether in person or in writing concerned the impact of aircraft noise on particular locations including Horton, Hampton Hill, Slough, Richmond, Twickenham, Barnes, East Sheen and Teddington as well as more distant points like Watlington and Henley-on-Thames. There was concern over the impact on the enjoyment of parks and open spaces as well as schools.

Other Supporters' Cases

- 21.3.28 In contrast some supporters of Terminal 5 argued that the noise of aircraft was a small price to pay for economic growth and pointed out that education results in Richmond, for example, were excellent despite the noise. Terminal 5 should be approved subject to more demanding environmental limits including a contour cap. Noise levels in Putney and Hampton were said to be obvious but reducing, while noise was not an issue in Maidenhead, Richmond or Chiswick. It was suggested that the effect of Terminal 5 would not be distinguished in Kew, Battersea, Lambeth or Teddington.

My Conclusions

- 21.3.29 In assessing the effect of Terminal 5 on the overall noise climate I must first consider the manner in which that climate is measured. I accept the Department's view that any noise index must be reliable, robust, realistic and sensitive. However, I am not convinced that the $LA_{eq\ 16hour}$ index used by the Department meets all of those criteria. It was criticised by all the main parties opposing Terminal 5 as failing to reflect the actual experience of those living around Heathrow. To some degree such criticisms would be inevitable whatever the form of index adopted. The evidence of those individuals who appeared at the inquiry or made written representations confirms responses to noise vary widely. Consequently any index which attempts to translate this into an average representation of annoyance across the community as a whole must by definition fail to reflect the extremes at either end.
- 21.3.30 The criticisms of $LA_{eq\ 16hour}$ go further and deeper than this, however. Although the ANCOM 1 model which is used to generate the $LA_{eq\ 16hour}$ contours attempts to reflect actual experience in that it uses noise measurements taken from aircraft operating at the London airports, it cannot take into account the effect of different weather conditions. More significantly it was accepted that it does not reflect the use of runway alternation. Since it is based on average conditions, those affected by runway alternation experience noise levels some 3dB higher while the flight path they live under is in use and 3dB lower when it is not. This is such a fundamental feature of operations at Heathrow that I believe any index which fails to reflect it must be open to question.

- 21.3.31 Equally $LA_{eq\ 16hour}$ does not indicate the maximum noise of individual events so that it cannot indicate how many times conversation is interrupted in a particular location whether it be a school, a major public space such as Kew Gardens or a private house or garden. Since these are the very factors which cause annoyance, I can understand why many argued that $LA_{eq\ 16hour}$ failed to reflect the concerns felt by local residents. I shall consider the impact of Terminal 5 on noise at night in the next part of this Chapter but I should note at this point that the $LA_{eq\ 16hour}$ measure by definition excludes the night period. Although the Department and BAA argued that it was a good proxy for a 24 hour LA_{eq} , the Department also accepted that this could change if there were a substantial shift in the balance of traffic between night and day.
- 21.3.32 The expert witness for the Department did not attempt to hide the deficiencies of LA_{eq} measures in general and the $LA_{eq\ 16hour}$ in particular. He accepted that the relationship between LA_{eq} and community annoyance was statistically weak and that the ANIS report had not found a rapid increase in disturbance at 57dB LA_{eq} as the press notice issued at the time had suggested. I am in no position to investigate the events which took place in 1982 but, on the evidence placed before me, it does seem likely that the weight attached to the 57dB LA_{eq} by the Department as the measure of the overall noise climate is greater than the original research would support.
- 21.3.33 The greatest single criticism of the LA_{eq} approach was that it failed to give adequate weight to the number of aircraft movements. As the Department accepted, the addition of a further 400 movements by light Chapter 3 aircraft would increase the $LA_{eq\ 16hour}$ by only 1dB. As the Department acknowledged even a difference of half a decibel could be significant and the area enclosed by a contour would increase by 15-20% for each 1dB increase in the LA_{eq} level. To this extent the LA_{eq} is influenced by the number of events. The issue is whether that influence is sufficient to reflect the experience of those affected. In this context I am concerned by the evidence that for departures, Concorde's contribution to the $LA_{eq\ 16hour}$ was almost equivalent to that of the rest of the fleet put together. This reflects the claim that Concorde produces as much noise energy as 120 Boeing 757's or 35 Boeing 747-400's.
- 21.3.34 In fact, many of those appearing at the inquiry told me that the noise climate had deteriorated and that this was largely due to the increase in the number of movements. They were unconvinced by claims based on $LA_{eq\ 16hour}$ that the noise climate had improved. While I recognise that the sample of people canvassed by HACAN might not be representative I do accept that many of those living around the airport believe that the noise climate has got worse over the last 5-10 years. A substantial number genuinely find the existing noise levels distressing and unacceptable. Since there is no dispute that individual aircraft have become quieter in that period (by a factor of 3.3 according to BAA) I am satisfied that their perceptions must be based on the substantial increase in the number of movements. I also conclude that this is not truly reflected in the $LA_{eq\ 16hour}$ index.
- 21.3.35 This brings me on to another criticism of LA_{eq} . It was pointed out that the original study which led to its adoption had taken place in 1982 at a time when Heathrow had been handling some 220,000 movements a year. It is now handling over 440,000 movements (para 8.2.56) and people's perceptions of noise may well have changed in the 18 years since the ANIS report was produced. The Department recognised that it was very difficult to establish the true underlying relationship between the noise of individual events and their number and accepted that it would have been useful if further social surveys had been carried out. I strongly endorse

this view. If parties are to have confidence on the indices used to measure the noise climate they need to be founded on a sound basis of up-to-date research. Unfortunately the Department's own evidence suggests that this does not apply to the use of LA_{eq} , in spite of their argument that research had guided the choice of noise indices since 1967.

- 21.3.36 Having identified and accepted many of the criticisms of the LA_{eq} system in general and the $LA_{eq\ 16hour}$ index in particular, it is fair to record that it was presented to the inquiry only as a means of indicating those areas in which various levels of annoyance were likely to occur. There was no suggestion either that everybody within the 57dB $LA_{eq\ 16hour}$ contour would be annoyed or that nobody outside it would be annoyed by aircraft noise. Indeed the Department accepted that many complaints came from people living outside the area exposed to 55 dB.
- 21.3.37 With all its limitations the LA_{eq} system remains the means adopted by the Department to measure changes in noise exposures and to forecast the degree of community annoyance likely to result. It is used throughout PPG 24 the most recent policy advice on the subject and is specifically applied to aircraft noise in that guidance. On that basis, it should be applied as part of the test of the effects to Terminal 5 although not in the form of the noise exposure categories in PPG 24 since these do not apply to new noise sources such as Terminal 5.
- 21.3.38 I do not, however, believe that it is right to rely entirely upon the single measure of $LA_{eq\ 16hour}$. As I have already pointed out this suffers from a number of deficiencies which, in my judgement, limit its value as a true and complete reflection of the impact of aircraft noise on those living around Heathrow. Consequently, I have some sympathy with the approach adopted by LAHT5 and Hillingdon in examining the impact of Terminal 5 on particular locations and under different headings. I believe that this work illustrates the importance of a more detailed assessment than that provided simply by the $LA_{eq\ 16hour}$ contours. I have recorded the Department's view that it would be wrong of me to judge the effects of Terminal 5 solely by use of the $LA_{eq\ 16hour}$ contour alone (para 21.3.4). That is a view to which I would have come in any event on the basis of the evidence I heard. I am, however, grateful that the Department made such a concession particularly against the background of a number of assertions by Government that the noise climate around Heathrow was improving based purely on the $LA_{eq\ 16hour}$ contour. The evidence confirms the Department's view that the contours are not faultless, and that other factors can and must be taken into account. More specifically, although Annex 1 to PPG 24 refers to the use of an LA_{eq} for the 8 hour period from 23.00 to 07.00 hours in relation to aircraft noise, I was also told that the night-time position was not tested by any contours.
- 21.3.39 I do not go as far as LAHT5, however, in adopting the recommendations in the WHO report as the main measure of the impact of Terminal 5. As I have already pointed out, PPG 24 uses a different approach and I have accepted that the Government was aware of the WHO report when preparing this advice (para 21.2.21). I do, however, accept the need to consider the impact of maximum noise levels on particular activities and in particular locations in order to give a fuller picture of the likely impact of Terminal 5. I also note that the Government has acknowledged the WHO guidelines of 55dB as the level above which significant annoyance might be expected during the day and 35dB as the level recommended to preserve restorative sleep processes. However, the Department believed that the 55dB figure should be increased by 2dB to take account of the way aircraft noise is measured (para 21.2.7). On this basis, it would coincide with the 57dB used by the

Department to indicate the onset of annoyance and to measure changes in the noise climate around Heathrow.

21.3.40 In the light of all these factors, my starting point is the effect Terminal 5 would have on the areas enclosed by the relevant $LA_{eq\ 16hour}$ contours. The assessment concentrated on the 57dB $LA_{eq\ 16hour}$ contour which enclosed an area of 175.5 sq km in 1994. BAA forecast that this would fall to 95 sq km by 2016 if Terminal 5 were not built and Heathrow had a throughput of 50 mppa and 450,000 atms. On BAA's figures the provision of Terminal 5 (raising the throughput to 80 mppa and 458,000 atms) would increase the area within the 57dB contour to 128.5 sq km. These figures assume that Concorde would have ceased operations by 2016. If it remained in service, the contour area with Terminal 5 would increase to 182.8 sq km.

21.3.41 The position on BAA's figures is therefore, that the noise climate as measured by the $LA_{eq\ 16hour}$ would improve substantially if Terminal 5 were not built. Improvement would still take place if Terminal 5 were constructed but would be significantly reduced. The extent of the improvement is almost entirely due to the removal of Concorde from the fleet. If it remains in operation BAA's own figures show a larger area within the 57dB contour than at 1994. This would reverse the improvements claimed over the previous 5-10 years and would be contrary to the objective of Government policy to do everything possible to improve the noise climate and to prevent any deterioration. Even BAA's offer of a contour cap would not guarantee any improvement over the 1994 position.

21.3.42 As I have already said I believe that Heathrow would handle more passengers and aircraft movements than BAA have assumed either with or without Terminal 5. I have concluded that the most likely capacity of Heathrow at 2016 would be 60 mppa and 440,000 atms if Terminal 5 is not built and 90 mppa with 480,000 atms if it is constructed, although higher figures might be achieved. No forecasts were produced on these bases but BAA estimated that a throughput of 60 mppa and 437,000 atms would give a contour of 103.7 sq km. They also forecast that 475,000 atms would give a contour of 126.4 sq km with a throughput of 80 mppa and 138.5 sq km with a throughput of 100 mppa. This suggests an area of some 130-135 sq km for a passenger throughput of 90 mppa. All of these figures assume that Concorde would no longer be flying.

21.3.43 On the basis of my own assumptions as to the capacity of Heathrow the position is that the area enclosed by the 57 d $LA_{eq\ 16hour}$ would be as follows;

1994	175.5 sq km
2016 – 4 Terminals	105 sq km
2016 – 5 Terminals	130-135 sq km.

21.3.44 This suggests that the area exposed to 57dB $LA_{eq\ 16hour}$ or more would be reduced by some 70 sq km or 40% if Terminal 5 were not built but by only 40-45 sq km or 23-27% if it were. Put another way, Terminal 5 would increase the area enclosed by the 57dB contour by 25-30 sq km or 24-29%. I have expressed these impacts in terms of areas since they are more reliable than population estimates which depend on assumptions about future population densities but the figures produced by BAA suggest that in 1994 some 320,000 people lived within the 57dB contour. In the absence of Terminal 5 that figure might fall to about 210,000 but if it were built

between 290,000 and 303,000 would be affected²¹⁶⁴. This means that Terminal 5 would result in the exposure of a further 80-90,000 people to noise levels of 57dB or more, although the total affected would remain lower than that in 1994.

- 21.3.45 This alone must be a factor counting against Terminal 5 although I recognise that, when measured in terms of $LA_{eq\ 16hour}$, the position in 2016 even with Terminal 5 would be better than it was in 1994. From that very limited viewpoint, Terminal 5 would not be contrary to Government policy on air noise. On the other hand, the Department accepted that the impact of Terminal 5 should not be assessed solely on this basis. The evidence clearly shows that the noise climate with Terminal 5 would be worse than it would be with only four terminals. I regard this with considerable concern. Furthermore, the position would be very different if Concorde continued to fly. In that case Terminal 5 would result in deterioration in the noise climate as measured by $LA_{eq\ 16hour}$ in 1994 which would clearly be in conflict with the aims of Government policy.
- 21.3.46 I also accept that in many locations noise levels are already unacceptable to many residents, although others do not find them to be so. As LAHT5 and Hillingdon demonstrated noise levels are above the guidelines set out in the WHO report and the European Union Green Paper. The local authorities also showed that levels would continue to exceed the Green Paper limits in the future. I do not question Hillingdon's suggestion that satisfactory conditions might not be achieved at some sites even with sound insulation. Furthermore, I wholly accept that no form of insulation can enable people to enjoy their own gardens or public open spaces exposed to the levels of noise which is all too common around Heathrow. I visited a number of parks and public spaces including Kew Gardens, Bushy Park and Richmond Park and am satisfied that aircraft noise does detract from the quiet enjoyment of these attractive and historic areas.
- 21.3.47 I also accept that there is a particular problem for schools around Heathrow. I visited a very wide range of nurseries and schools - old and new, primary and secondary – and it was apparent that many of them do have significant problems particularly when the children are working outside. In some cases conditions indoors were eased significantly by sound insulation although that was rarely available throughout the building. Even where areas were insulated there were sometimes problems of ventilation which meant that window had to be opened thus negating the effect of the insulation.
- 21.3.48 Although LAHT5 acknowledged that the schools study carried out for them did not specifically address the potential effect of Terminal 5, it did identify some possible effects of aircraft noise on the achievements of children. This would appear to confirm the results of other studies abroad. However, I do not consider the evidence to be conclusive. Nevertheless, my own experience of conditions in local schools suggests that educational standards may well be detrimentally affected by aircraft noise in those schools close to Heathrow and under the flight paths. Even if they are not, conditions for both teachers and children so affected are undoubtedly made more difficult by the noise of aircraft.
- 21.3.49 I accept that the Government and BAA are trying to reduce the noise generated by aircraft and that they have had considerable success in reducing the impact of individual movements. Some of these improvements have been the result of improved engines but the potential for further substantial benefits from this source

²¹⁶⁴ BAA/66 Figure 24

appears to be limited. I do, however, accept that the evidence of the Boeing 777 suggests that some of BAA's assumptions regarding the noise levels of new aircraft might be pessimistic and that this could reduce the forecasts of future noise levels both with and without Terminal 5.

- 21.3.50 Other improvements have been the result of changes to operational procedures including the introduction of restrictions on the manner in which landing aircraft are flown. BAA said that they supported the introduction of stricter limits for departing aircraft and they are instituting more efficient monitoring and investigating new take-off procedures. I welcome all of these efforts but, as BAA pointed out, they are all independent of Terminal 5 and will not affect its impact when measured against the position in 2016 if it were not built.
- 21.3.51 Assuming Concorde is no longer flying by that time, I accept that noise levels as measured by the $LA_{eq\ 16hour}$ index would be significantly better in 2016 than they were in 1994. As I have already said, from that very limited viewpoint, the objectives of Government policy on aircraft noise would be met even if Terminal 5 were built. However it is, in my view, much more significant that Terminal 5 would significantly reduce the improvement in the overall noise climate which would otherwise occur if there were only 4 terminals even when measured solely in terms of the $LA_{eq\ 16hour}$ levels. Bearing in mind that, in my judgement, aircraft noise associated with Heathrow already causes substantial harm, the fact that Terminal 5 would prevent the achievement of all the potential improvement in the noise climate must weigh heavily against it.
- 21.3.52 The comments in the previous paragraph do not, of course, take into account any factors other than $LA_{eq\ 16hour}$. As both BAA and the Department accepted, and as I am firmly convinced, other factors must be taken into account. The most important of these, in my view, is the increase in the number of aircraft movements which will result if Terminal 5 is built. I do not believe that the increase in the number of movements has been adequately reflected in the $LA_{eq\ 16hour}$ measure. There is ample evidence that many people living around Heathrow find the number of flights deeply objectionable in their own right and Terminal 5 would inevitably increase the disturbance and annoyance caused to them.
- 21.3.53 My conclusions in this part of the report are based on the assumption that Heathrow would handle some 480,000 movements with Terminal 5. As I have noted previously this is based on current evidence as to the capacity of the existing runways in segregated mode but I do not rule out the possibility of there being more than 480,000 movements a year (para 8.2.46). If this did happen the impact on the noise climate would rapidly become significantly greater particularly since local residents attach very considerable importance to the harm caused by more frequent flights.
- 21.3.54 In any event, the most significant increases are likely to be in the number of aircraft landing in the early morning and I now turn to consider the impact of these and of night flights in general.

21.4 THE IMPACT OF TERMINAL 5 ON NOISE AT NIGHT

The Department's Case

- 21.4.1 The Department said that the LA_{eq} index was not used to measure noise at night defined as the period between 23.00 and 07.00 hours since it was not designed for situations where noise events varied substantially and were irregular. They also accepted that they had not defined what an excessive noise level would be at night, although they argued that the policy on night restrictions was firmly based on research²¹⁶⁵. These restrictions imposed a Quota Count limit and an absolute limit on movements between 23.30 hours and 06.00 hours, known as the night quota period. The Quota Count classified aircraft according to their noise performance and a limit was imposed on the total Quota Count score each season²¹⁶⁶.
- 21.4.2 Other restrictions were imposed on movements during the night period. The noisiest aircraft classified as Quota Count 16 were not normally permitted to depart between the hours of 23.00-0700 hours and Quota Count 8 aircraft were similarly restricted from 23.00 to 06.00 hours. As landing aircraft were about 10 dB(A) noisier than the departure level for the same footprint area (because the noise certification points in relation to the runway were different), a 9 EPNdB deduction was made. This 9 EPNdB deduction was theoretical, and the landing noise heard by people underneath the aircraft was the factual absolute level. The reduction in theory allowed 8 times as many aircraft to fly within the overall QC limit, and individual aircraft to exceed the Government's night time limits for departures²¹⁶⁷. Although the noise climate in the 1970's had been significantly worse, there was no evidence that it had caused long term harm. A review of scientific research suggested that outdoor noise levels of 77-92dB LA_{max} would not disturb most sleepers. Any given level of aircraft noise was 37% more likely to cause disturbance between 04.00 and 05.30 hours²¹⁶⁸.
- 21.4.3 The Department recognised that sleep deprivation led to daytime tiredness with consequent effects on the ability to function normally but said that there was no clear-cut evidence in relation to its chronic long term effects on health²¹⁶⁹. A major study of sleep disturbance had been carried out at 4 major airports in the UK, including Heathrow, in 1992. The study had not excluded people who worked at, or had connections with, Heathrow nor had the occupations of those other than the head of the household been recorded²¹⁷⁰. The study had used established methods including actimetry which related sleep disturbance to limb movements and was a cost-effective alternative to electro-encephalography. It revealed an average of 18 awakenings a night of which few were associated with aircraft noise²¹⁷¹. Actimetry could not, however, determine whether aircraft noise delayed the onset of sleep either at the beginning of the night or after an awakening. Nor could it identify whether aircraft noise caused premature awakening at the end of a night's sleep²¹⁷².
- 21.4.4 The study had confirmed that noise events below about 80dB LA_{max} were most unlikely to cause measurable increases in overall disturbance rates²¹⁷³.

²¹⁶⁵ 5-1.2.31

²¹⁶⁶ 5-1.2.32

²¹⁶⁷ 5-1.2.33

²¹⁶⁸ 5-1.2.34

²¹⁶⁹ 5-1.2.35

²¹⁷⁰ 5-1.2.36

²¹⁷¹ 5-1.2.37

²¹⁷² 5-1.2.39

²¹⁷³ 5-1.2.38

Nevertheless, the Government was aware that early morning arrivals were a source of great concern²¹⁷⁴. Measurements made of sleep disturbance were distinct from the annoyance that perceived sleep disturbance might cause. There was a tremendous amount of evidence that night noise caused high levels of annoyance but it was difficult to identify sleep disturbance itself as the best measure of this²¹⁷⁵. The need for further research was accepted but any study which sought to establish a relationship between aircraft noise and sleep problems at the beginning or end of the night would need large electro-encephalography data samples²¹⁷⁶. The Department argued that the HACAN survey in Chelsea and Camberwell appeared to have posed questions which invited very negative responses²¹⁷⁷.

BAA's Case

21.4.5 BAA accepted that it would not be inconsistent with Government policy to permit increased noise levels at night as long as it did not become excessive. They also argued that an 8 hour LA_{eq} contour covering the night period would not be helpful²¹⁷⁸. Although Terminal 5 would not involve any increase in the number of movements in the night quota period, flights between 06.00 and 07.00 hours had increased by 63% between 1991 and 1996 and Terminal 5 would produce further increases. Furthermore the provision of Terminal 5 would be likely to mean that larger aircraft would land in the night quota period²¹⁷⁹. The information given by British Airways regarding the arrival time of aircraft related to the time at which they reached the terminal whereas the Department and BAA times related to touchdown. The British Airways' times had to be advanced by fifteen minutes to make them comparable with touchdown times²¹⁸⁰.

21.4.6 BAA asserted that Terminal 5 would not have a significant effect on night noise. The majority of people did not complain about noise from the airport and complaints themselves were not a reliable indication of the extent or severity of noise problems²¹⁸¹. The absolute limit on the number of movements permitted in the night quota period had led to some use of larger aircraft but the noisiest aircraft had been excluded by agreement including all scheduled movements by Quota Count 4 aircraft. BAA would not support a total night ban. The Government had accepted that a small number of night flights was essential²¹⁸².

British Airways' Case

21.4.7 British Airways argued that the existing system of night flying restrictions was the most appropriate method of balancing improvements in the noise climate against the interests of air passengers and the economic benefits to the aviation industry²¹⁸³. The number of night flights had changed very little since 1978 and currently represented less than 1.5% of all movements at Heathrow²¹⁸⁴. The levels of annoyance and of complaints at night were not high. No parties suggested that there would be a significant increase in movements in the night quota period if Terminal

²¹⁷⁴ 5-1.2.39
²¹⁷⁵ 5-1.2.40
²¹⁷⁶ 5-1.2.41
²¹⁷⁷ 5-1.2.41
²¹⁷⁸ 5-1.3.17
²¹⁷⁹ 5-1.3.18
²¹⁸⁰ 5-1.3.18
²¹⁸¹ 5-1.3.19
²¹⁸² 5-1.3.20
²¹⁸³ 5-1.4.1
²¹⁸⁴ 5-1.4.2

5 were approved and, for their part, British Airways accepted that there should be no increase in that period. They also supported the introduction of an easterly preference at night as long as it ceased at 06.00 hours. They were neutral on the question of night-time runway alternation but again this should not apply between 06.00 and 07.00 hours because of the danger that it would lead to an overspill of delayed landings during the peak period immediately after 07.00 hours. British Airways did not accept LAHT5's forecasts of movements for the hour 06.00-07.00 since they were based on unrealistic passenger loads that could not be handled within the existing and proposed terminals²¹⁸⁵.

- 21.4.8 British Airways stated that they needed a minimal number of movements between 23.30 and 06.00 hours to maintain Heathrow's role as the world's leading international airport. These were largely long haul arrivals using quieter aircraft and arriving after 04.30 hours²¹⁸⁶. There was international acceptance of the detrimental impact of night curfews at international airports and Charles de Gaulle, Schiphol and Frankfurt all had less restrictive regimes than Heathrow. A true comparison which took into account chartered as well as scheduled flights showed that those airports had more night movements than Heathrow. They also had the advantage of operating in the Central European time zone which was an hour ahead of Heathrow²¹⁸⁷.
- 21.4.9 Current restrictions on terminal capacity caused difficulties especially in accommodating larger aircraft early in the morning. The additional capacity provided by Terminal 5 together with the use of larger aircraft could double the capacity on South-East Asian services, so British Airways' current projections showed they would operate 8 fewer flights in the night quota period if Terminal 5 were built. The current terminal capacity problems had resulted in the transfer of some services to Gatwick even though that weakened Heathrow's route network²¹⁸⁸.

LAHT5's Case

- 21.4.10 LAHT5 were concerned that Terminal 5 could worsen the noise impact of Heathrow in the late evening at night and in the early morning. In the absence of any definition of excessive noise it was difficult to see the basis for the decision not to impose a ban on night flights²¹⁸⁹. The number of night movements had increased by 2.4 times between 1982 and 1994 and now accounted for 4% of all movements. As a result the pattern of movements had changed since the publication of the ANIS report²¹⁹⁰.
- 21.4.11 They argued that the Sleep Disturbance Study had not explored the link between sleep disturbance and annoyance and provided no information on the effects of aircraft noise on those trying to get to sleep in the evening or to return to sleep in the mornings after being woken by aircraft. Although the Government now recognised the need for further research no one knew when the results would be available²¹⁹¹. The Sleep Disturbance Study had not taken into account employment although ANIS and other studies had shown this to be significant. In some cases the proportion of people working, or having business at an airport had reduced the

²¹⁸⁵ 5-1.4.4

²¹⁸⁶ 5-1.4.5

²¹⁸⁷ 5-1.4.6

²¹⁸⁸ 5-1.4.7

²¹⁸⁹ 5-1.5.40

²¹⁹⁰ 5-1.5.41

²¹⁹¹ 5-1.5.44

number of those finding aircraft noise unacceptable by 25%²¹⁹². In most areas around the airport sleep could be disturbed by nearly every aircraft if bedroom windows were kept open²¹⁹³. Terminal 5 would create a considerable increase in the number of flights between 06.00 and 07.00 hours and, whatever happened during the day, significant increases in noise levels would occur in the late evenings, at night and in the early mornings²¹⁹⁴.

Hillingdon's Case

- 21.4.12 Hillingdon pointed out that for the periods 06.00-07.00 hours and 22.00-23.00 hours noise levels on westerly operations were some 6-8dB higher than they would have been if the limit on movements proposed in 1978 had been imposed²¹⁹⁵. Using an 8 hour LAeq, the position in 2016 without Terminal 5 would not seem to be very different but this was a result of the averaging process. In fact BAA's figures showed a 3 fold increase in movements in the early morning and a nearly 4 fold increase during the night. Thus, even without Terminal 5, there would be a worsening in the noise climate which was already unacceptable. Terminal 5 would exacerbate this²¹⁹⁶.

HACAN's Case

- 21.4.13 HACAN argued that the community was particularly sensitive to noise at night although this was ignored in the LA_{eq 16hour} index²¹⁹⁷. The Department had accepted that the Sleep Disturbance Study had not been concerned with health or annoyance and the Department had been wrong in basing their policy on that one piece of research which conflicted with other evidence. Although the ANIS report had shown that employment at the airport could have a significant effect on the reliability of the results, this had been ignored in the Sleep Disturbance Study²¹⁹⁸. The initial draft of the Study had said that 75% of the population was disturbed by aircraft noise and it had been accepted at this inquiry that there was a high level of disturbance. Between 50% and 60% of the population could be awakened every night²¹⁹⁹.
- 21.4.14 According to HACAN, there had been a dramatic increase in noise in the late evening and early morning and these times would become as busy as the current peak hours if Terminal 5 were approved. The Department was biased in favour of the aviation industry even though aircraft noise was the most common cause of sleep disturbance. Many people had to sleep with their windows closed and Terminal 5 would increase the adverse effects²²⁰⁰.

LAANC

- 21.4.15 LAANC said that the Sleep Disturbance Study took little if any account of disturbance preventing people going to sleep or preventing them getting back to sleep if they were woken early²²⁰¹. This was a marked flaw in the Study. The

²¹⁹² 5-1.5.45

²¹⁹³ 5-1.5.46

²¹⁹⁴ 5-1.5.47

²¹⁹⁵ 5-1.6.9

²¹⁹⁶ 5-1.6.10

²¹⁹⁷ 5-1.7.14

²¹⁹⁸ 5-1.7.15

²¹⁹⁹ 5-1.7.16

²²⁰⁰ 5-1.7.17

²²⁰¹ 5-1.8.12

Government had now conceded that the noise climate had deteriorated between 23.00 and 07.00 hours. The night quota period should be extended to cover the whole of this period as the European Union had proposed since the current system meant that it would be impossible to prevent an increase in movements between 06.00 and 07.00 hours²²⁰². Terminal 5 would bring in more large aircraft in the shoulder hours and the night quota period and without a limit on the number of movements there could be no confidence that additional night flying would be controlled. The 9 EPNdB adjustment for landing aircraft meant that aircraft were already landing with noise levels higher than the departure limit and Heathrow already had more scheduled night flights than Charles de Gaulle, Schiphol or Frankfurt where the populations affected were far smaller²²⁰³. The current night flying restrictions at Heathrow took no account of the effects on health and a new social survey was needed to assess the effects on residents both in the day and at night²²⁰⁴.

Other Objectors' Cases

- 21.4.16 EANAG said that the sites selected for the Sleep Disturbance Study had not been well located. The Hounslow site was affected only by noise from runway 27 Left while the Stanwell site would not have been affected by movements on the northern runway or landings from the east on the southern runway²²⁰⁵. Even the newest aircraft caused significant annoyance in Ealing and the cluster of departures just before 23.00 hours would be increased if Terminal 5 were approved²²⁰⁶. FANG objected most strongly to night flying which would be increased if Terminal 5 were provided²²⁰⁷.
- 21.4.17 The Staines Town Society and WAR both pointed to the disturbance caused by night flights and argued that Terminal 5 would increase this problem²²⁰⁸ as did many individuals appearing at the inquiry and making written representations. It was suggested that the Sleep Disturbance Study ignored all the practical problems that affected people and that there should be a total night curfew.

My Conclusions

- 21.4.18 There is no doubt in my mind that the single greatest cause for complaint by people living around Heathrow is the disturbance caused by night flights and, in particular, arrivals in the early morning. In the absence of clear and objective measurements of the noise climate at night it is not easy to say how far the complaints are justified or what proportion of local residents are actually disturbed, although HACAN argued that this could be as high as 50-60%. I did, however, spend several nights in hotels directly under the flight path in order to experience at first hand conditions in the early hours of the morning. During these visits I took care to avoid hotels with double-glazed windows which could not be opened and slept with the windows both closed and open to various degrees. Based on these visits I have every sympathy with those who argued that their sleep was interrupted regularly and that it was very difficult to get back to sleep. Consequently, I have reached the clear conclusion that noise from aircraft landing in the early hours of the morning does cause substantial

²²⁰² 5-1.8.13

²²⁰³ 5-1.8.14

²²⁰⁴ 5-1.8.15

²²⁰⁵ 5-1.8.3

²²⁰⁶ 5-1.8.4

²²⁰⁷ 5-1.8.10

²²⁰⁸ 5-1.8.16-17

disturbance over a wide area and that this, in turn, leads to significant annoyance. Indeed I accept that, for many people, it causes genuine disturbance and very serious distress.

- 21.4.19 Having spent so much time experiencing the actual noise of landing aircraft, I am less concerned about the relevance of the 9 EPNdB adjustment over which LAANC in particular had serious reservations. As the Department argued, this adjustment is theoretical and is needed only because the noise certification points in relation to the runway were different for landing and departing aircraft. There was no challenge to the assertion that it is the actual noise heard by people that matters. Accordingly, my conclusions are concerned with what people actually hear rather than how measurements are made. I have also paid particular attention to the fact that the use of westerly preference and the operational advantages of using the southern runway combine together to concentrate the impact of early morning flights on a relatively narrow but heavily built up swathe of west London.
- 21.4.20 Although the 1985 White Paper argued that policy on night noise is firmly based on research, the 1992 Sleep Disturbance Study was the focus of considerable criticism during the inquiry. In considering these criticisms it is important to bear in mind the limited scope of this study. It was not designed to assess difficulties in getting to sleep nor the problems faced by those who had been woken when trying to get back to sleep. This latter point is particularly significant given that the study showed that aircraft noise was 37% more likely to cause disturbance between 04.00 and 05.30 hours. This is entirely consistent with the experiences of local residents as recounted to me and its effect is reinforced by the fact that it is at this time that the level of arrivals begins to become significant as I found myself. Finally the Sleep Disturbance Study did not attempt to measure annoyance. The Department accepted that night noise caused high levels of annoyance but argued that it was difficult to identify sleep disturbance itself as the best measure of this.
- 21.4.21 Although there was some criticism of the use of actimetry I accept that this was a cost-effective alternative to electro-encephalography and find no reason to doubt the measurements which resulted from its use. These showed that noise events below 80dB LA_{max} are unlikely to cause measurable increases in overall disturbance rates. Bearing in mind the fact that many local residents found this (and other results from the study) unbelievable, it is important to remember that this does not mean that nobody will be woken by events below that level. There is no dispute that the effect of noise on individuals varies very widely and I recognise that many people are woken by noise events through which others sleep undisturbed.
- 21.4.22 I am more concerned by the fact that the Sleep Disturbance Study did not exclude those who had connections with the airport either because the subjects themselves worked there or because members of their families did so. As LAHT5 pointed out the ANIS report had already shown this to be significant. This must raise a question over the validity of the conclusions reached in the Sleep Disturbance Study although it is impossible to define the size of that question as the occupations of those household members other than the head of the household were not recorded.
- 21.4.23 All in all, I believe that the Sleep Disturbance Study made a valuable contribution to our understanding of the impact of aircraft noise on sleep but that it cannot be treated as the conclusive answer in the context of Heathrow for all of the reasons I have set out above. Indeed the Government has now accepted the need for additional research. If this is to answer the questions raised at this inquiry particularly those about the relationship between aircraft noise and sleep disturbance

at the beginning and end of the night, it will need a large sample and may well have to use more expensive electro-encephalography techniques. Its results will clearly not be available in time to help in the decision on Terminal 5.

- 21.4.24 In my judgement, the limited scope of the Sleep Disturbance Study means that I can place less weight on it. This compounds the difficulties stemming from the fact that the Government has failed or been unable to define the excessive noise level which is at the centre of its night noise policy. Consequently, it is not possible to base my judgement on the noise climate around Heathrow at night on any objective measurements.
- 21.4.25 My concern over the impact of aircraft noise is not meant to suggest that the Government, BAA or the airlines are doing nothing. On the contrary, the Government has introduced a complex system of controls over aircraft movements at night for all of the London airports. These controls limit the number of movements and attempt to encourage the use of quieter aircraft by the use of Quota Counts, although as BAA recognised this has not always been successful. This system is reviewed regularly and is seen by the Government as the most effective means of controlling noise at night. Although Annex 1 of PPG 24 specifically refers to the use of the $LA_{eq\ 8\ hour}$ to measure the impact of aircraft noise between 23.00 and 07.00 hours, I accept that, in this case, this would be very difficult and could be misleading in view of the irregular pattern of movements at night.
- 21.4.26 I also accept that the existing controls on night operations at Heathrow are more stringent than that at other European airports. My own visits to these confirmed however, LAANC's assertion that the levels of population around these are significantly lower than those around Heathrow. I therefore, place little weight on this factor. Heathrow must be judged on its own merits and as I have already concluded it is beyond question that the airport causes substantial sleep disturbance and annoyance particular in west London.
- 21.4.27 The real issue for me, however, is the impact that Terminal 5 would have on the noise climate at night. I start by considering its effect on the night quota period of 23.30-06.00 hours. I accept that Government policy is that the need for air services at night and their implications in terms of competition and wider economic considerations must be taken into account. I am in little doubt that the need for night flights is real but limited. Although some argued that the proposed terminal would inevitably result in an increase in the number of aircraft movements during this period, I found no convincing evidence that this would be so.
- 21.4.28 BAA and the local authorities each forecast that the provision of Terminal 5 would lead to only 1 additional flight in the night quota period as compared with both the existing position and that in 2016 with only 4 terminals. British Airways argued that the number of flights in the night quota period had changed very little since 1978. Even if the need grows, British Airways demonstrated that they could double the number of seats available on their own South-East Asian services by the use of larger aircraft if Terminal 5 were built. On that basis they would need 8 fewer flights in the night quota period. They are also willing to give an undertaking that there should be no increase in their movements during the night quota period. I see no reason why similar considerations should not apply to other airlines (para 21.5.15) and therefore accept that the number of aircraft likely to arrive during the night quota period would probably not increase significantly as a result of Terminal 5.

- 21.4.29 We should not ignore, however, BAA's view that these aircraft would be likely to be larger. Since landing noise is related to the size of aircraft, this would increase the potential for sleep disturbance and annoyance. While I accept that BAA may have been pessimistic in the assumptions they made of the noise levels of new types of aircraft, Terminal 5 would probably result in more use of larger aircraft. On the other hand, if British Airways are right in their argument that Terminal 5 would reduce the number of movements in the night quota period as compared with the position with only 4 terminals, it could produce result in noise levels lower than those with 4 terminals. Of course if traffic grew to 90 mppa or more rather than the 80 mppa than BAA have assumed there could be greater pressure for night or early morning flights, although I consider that this additional demand could and should be accommodated during the day.
- 21.4.30 Bearing in mind that the number of movements in this period would be subject to control by the Government, I do not accept that the increase forecast by British Airways if Heathrow has only 4 terminals would be inevitable. I have therefore proceeded on the basis that the current number of movements in the night quota period would continue to operate whether there were 4 or 5 terminals. On the other hand, the increased potential for sleep disturbance and annoyance resulting from the increased use of large aircraft with Terminal 5 must be a factor counting against its approval.
- 21.4.31 In my judgement, the real issue concerns the position just before the start of the night quota period and immediately after it ends. Taking the position in the early hours of the morning first, there is currently no restriction on the number of aircraft touching down at Heathrow after 06.00 although the noisiest, Quota Count 16, aircraft are not permitted to depart between 06.00 and 07.00 hours. Movements in that hour increased by 63% from 1991 to 1996 and further increases would take place if Terminal 5 were built. Indeed British Airways argued that the ability to increase flights at this time would be a virtue of Terminal 5. They claimed that the existing constraints on terminal capacity were so great that they would have to increase their movements before 06.00 hours unless Terminal 5 were built. If Terminal 5 provided more terminal capacity they would be able to delay these additional movements and bring in more aircraft between 06.00 and 07.00 hours.
- 21.4.32 The scale of the potential increases in this critical hour was, however, disputed. BAA forecast 15 arrivals in the period 23.00-06.00 hours without Terminal 5 and 30 between 06.00 and 07.00 hours. With Terminal 5 they forecast 16 arrivals between 23.00 hours and 06.00 hours and 38 in the following hour, an overall increase of 9 arrivals. British Airways forecast 23 arrivals between 23.00 hours and 06.00 hours without Terminal 5 and 34 in the 06.00-07.00 hour period. If Terminal 5 were built the arrivals in the 23.00-06.00 period would fall back to the 1997 figure of 15 movements while the following hour would increase to 42. In contrast LAHT5 and Hillingdon assumed the same figures as BAA for the 23.00-06.00 hour period but stated that in the 06.00-07.00 hour there would be 45 arrivals without Terminal 5 and 52 with it²²⁰⁹. The local authority figures actually show an overall increase of 8, one less than the 9 assumed by BAA. These forecasts do not, of course, take into account the fact that the Government could refuse to permit any increase in movements during the night quota period either with or without Terminal 5. Nevertheless, British Airways' figures do suggest that the provision of Terminal 5 would relieve the pressure for additional flights in the night quota period albeit at the expense of more flights between 06.00 and 07.00 hours.

²²⁰⁹ BA/2070 Table 3

- 21.4.33 The forecasts on which the local authorities rely raise some practical difficulties. Their predictions for the critical 06.00-07.00 hour are very much higher than those of British Airways and BAA both with and without Terminal 5 and appear to ignore the very real constraints on the capacity of the existing terminals. In my judgement it would be almost impossible to reach the level of movements assumed by the local authorities between 06.00 and 07.00 hours in either the 4 or 5 terminal cases. Nevertheless, even on British Airways' own figures there would be 8 additional aircraft arriving at the terminals in that period if Terminal 5 were built. Bearing in mind that these aircraft would touchdown some 15 minutes earlier and would approach the airport before then, it is clear that Terminal 5 would increase the number of potentially disturbing noise events affecting those living below the approach paths after about 05.30. The picture is broadly the same if BAA's forecasts are used.
- 21.4.34 This would clearly cause a deterioration in the noise climate just before 06.00 hours and in the following hour – a time when the potential disturbance of any given noise level is particularly high. This must weigh substantially against Terminal 5.
- 21.4.35 Finally I turn to the position in the late evening before the start of the night quota period. I have spent little time considering the impact of Terminal 5 at this time. This is largely because late night noise was the cause of much less complaint. The position could, however, change if Terminal 5 resulted in a significant increase in the number of departures at about 23.00 hours and both LAHT5 and Hillingdon drew attention to potential problems late at night, as did EANAG.
- 21.4.36 There are means by which the impact of noise at night could be reduced and I shall consider these in a little more detail in the next part of this chapter. Most of these are, however, independent of Terminal 5 and would not reduce its impact in terms of the difference it would make to the position with only 4 terminals. On the other hand, they would affect any comparison with the present position and any judgements about whether noise at night with Terminal 5 would be excessive or not.
- 21.4.37 For the moment, however, I conclude that the existing level of operations at night at Heathrow causes substantial sleep disturbance and significant annoyance. The provision of Terminal 5 would be unlikely to increase significantly the number of movements during the night quota period but would lead to an increase in the average size of aircraft used. Although the use of more large aircraft would be likely to cause some additional disturbance, I do not believe that the impact of Terminal 5 during the night quota period would be significant. On the other hand Terminal 5 would increase the number of movements arriving in the hour following the night quota period. Some of these would pass over west London before 06.00 hours.
- 21.4.38 In these circumstances, Terminal 5 would cause a deterioration in the noise climate in the sensitive early morning period. This applies whether the comparison is with the existing position or that likely to apply in 2016 with only 4 terminals. In line with Government policy, as I have already noted, the need to protect local communities from excessive aircraft noise at night has to be balanced against the need to provide for air services to operate at night where they are of benefit to the local, regional and national economy. The impact of restrictions on the number of flights in the night quota period on the competitive position of Heathrow and UK airlines operating from it must also be taken into account. This is, of course, part of the overall balance which has to be drawn after considering all of the factors involved. Nevertheless, there is no doubt in my mind that Terminal 5's impact on

night noise both within and outside the present night quota period must weigh significantly against its approval in that balance.

- 21.4.39 On the other hand, I accept that there is a real need for a restricted number of night flights which contribute to the competitive position of both Heathrow and British Airways. I am, however, satisfied that, over time, the Government should seek to reduce as far as possible the number of flights at night (including those just outside the current night quota period). I return to this point later (para 21.5.15).
- 21.4.40 As I have already pointed out there is no definition of excessive aircraft noise at night. It must, however, be reasonable to assume that the Government has judged that the level of noise resulting from its existing restrictions on night movements at Heathrow is not excessive. The Government does, however, recognise that since October 1993 there has probably been a deterioration over the full night period between 23.00 hours and 07.00 hours as a result of the growth in traffic between 06.00 and 07.00 hours²²¹⁰. There is no dispute that this growth will continue if Terminal 5 is approved and this must mean that noise levels at that sensitive time may well become excessive.
- 21.4.41 This does not, however, mean that the noise levels at night would not comply with Government policy since this policy specifically recognises the need to balance the objective of protecting local communities from excessive noise at night with the need to provide air services at night, competitive factors affecting UK airports and the wider employment and economic implications. I shall not attempt to strike this balance in this Chapter since it involves many other factors which I can draw together only in my overall conclusions.
- 21.4.42 In accordance with my general approach of examining the implications of all realistic forecasts, I intend to approach the overall balance on the basis that Terminal 5 could indeed cause an excessive noise level in the early morning period from just before 06.00 hours. Before that time I believe it would make little difference to the number of flights in comparison with either the existing situation or that in 2016 with only 4 terminals. The increased size of aircraft associated with Terminal 5 would, however, be likely to increase the potential for sleep disturbance and annoyance even during the night quota period. Moreover, I am in no doubt that, whatever the Government view, for many people living around Heathrow noise levels particularly at night are already excessive.

21.5 REDUCING THE IMPACT OF NOISE

- 21.5.1 I shall consider possible conditions and other means of controlling noise around Heathrow if Terminal 5 is permitted later in this report, but the impact of aircraft noise is so significant that I propose to examine the potential for reducing it before reaching my conclusions on this topic.

BAA's Case

- 21.5.2 BAA basically relied on the existing night flight restrictions combined with their voluntary agreement to exclude Boeing 747 freighters and Quota Count 4 operations

²²¹⁰ CD/260 (iii) para 1.29

at night. They would not support a night ban²²¹¹. They did however offer to accept a contour cap under which the area affected by the 57dB LA_{eq 16hour} contour would not exceed the 175.5 sq km covered in 1997. They would not accept any contour cap which prevented Heathrow from handling at least 80 mppa²²¹².

British Airways' Case

- 21.5.3 British Airways supported BAA's contour cap²²¹³. They opposed any conditions to regulate night flights but offered an undertaking that the number of their own flights in the night quota period would not exceed the number in 1997 if Terminal 5 were approved²²¹⁴. Both BAA and British Airways were willing to accept an extension of the night quota period to include the period from 23.00 hours to 23.30 hours but if this were done the quotas should be changed to include movements already scheduled in that period²²¹⁵. British Airways would also support a change to easterly preference at night up to 06.00 hours to reduce the environmental impact of noise but argued that its use from 06.00 hours to 07.00 hours would cause delays in the busiest time of the day assuming that a westerly preference was retained during the day²²¹⁶.

The Department's Case

- 21.5.4 The Department pointed out that restrictions designed to limit the impact of noise had been in place for many years. These arrangements sought to maintain a fair balance between social and environmental interests and those of the airline industry including its customers²²¹⁷. The implications of changes to the way in which the runways operated had been considered in the Runway Capacity Enhancement Study but the Government recognised that the Terminal 5 application was based on an assumption that the present procedures would remain unchanged²²¹⁸. There was not a valid basis for the imposition of a limit on the number of movements at Heathrow and night flying had never been banned there²²¹⁹.

The Objectors' Cases

- 21.5.5 LAHT5 argued that the only equitable answer was to phase out night flights²²²⁰, while Hillingdon said that, if Terminal 5 were approved, the opportunity should be taken to compensate to some extent for the damage caused by the uncontrolled growth of Heathrow over the years. This meant that the compensation provided should exceed the harm done by the additional terminal²²²¹. HACAN said they were not prepared to suggest any conditions because any permission for Terminal 5 would itself breach the conditions attached to previous permissions. Nevertheless, they argued that the number of aircraft movements should be limited immediately to a maximum of 450,000 a year and that there should be a ban on night flights²²²². The demand for a ban on night flights was widely supported by other organisations

²²¹¹ 5-1.3.20

²²¹² 5-1.3.13

²²¹³ 5-1.4.3

²²¹⁴ 5-1.4.4

²²¹⁵ 5-1.3.18

²²¹⁶ 5-1.4.4

²²¹⁷ 5-1.2.7

²²¹⁸ 5-1.2.10 and 5-1.2.12

²²¹⁹ 5-1.2.11

²²²⁰ 5-1.5.45

²²²¹ 5-1.6.11

²²²² 5-1.7.20

and individuals while LAANC, among others, said that, in any event, the night quota period should be extended to cover the period from 23.00 hours to 07.00 hours²²²³.

My Conclusions

- 21.5.6 In considering measures which might reduce the impact of noise in the context of this report it is essential to draw a distinction between those which are directly related to Terminal 5 and those which are not. There is no doubt that there has been a significant change in circumstances since westerly preference was introduced. Whereas noise from departing aircraft was the greatest problem at that time it is now noise from arrivals which causes the greatest concern. I am in no doubt that the introduction of easterly preference at night and possibly throughout the day would benefit more people than it harmed and that this was an important consideration if not the most important one in terms of noise impact. This point was very fairly accepted by the witness for Windsor and Maidenhead²²²⁴. Such a change would clearly make matters worse for some people living to the east of the airport but population levels are much lower there than in the areas in west London which are currently suffering the worst effects of landing aircraft.
- 21.5.7 However, a change to easterly preference is already under consideration and is clearly independent of any decision on the future of Terminal 5. On the other hand it is important to recognise that the noise climate around Heathrow could be less damaging both with and without Terminal 5 if an easterly preference were introduced at night. While on this point I should perhaps comment that I am not entirely convinced by British Airways' suggestion that an easterly preference should not operate between 06.00 and 07.00 hours. In my view, any problems caused by the 42 arrivals they forecast in that hour should be capable of being resolved without causing subsequent delays. If Terminal 5 were built there would be a substantial increase in flights in this period and this would affect those living under the approaches to the airport before 06.00 hours. My conclusion that this would lead to a material increase in noise would be less significant if the impact of these movements was no longer concentrated on the heavily populated areas of west London.
- 21.5.8 I appreciate that any change to the present system of westerly preference would require public consultation but I also believe that the evidence placed before this inquiry should be taken into account. I heard from a wide range of people and organisations and have been able to consider this issue in considerable depth. On this basis, I have reached the firm view that the continued operation of a westerly preference is not in the best interest of the overall population living around Heathrow and that there is a strong case for the introduction of an easterly preference at night. This would result in a fairer distribution of the impact of landing aircraft which is now the greatest single noise problem around Heathrow.
- 21.5.9 Any change from westerly preference during the day would raise questions about the role of runway alternation and the future of the Cranford Agreement which effectively precludes alternation on easterly operations. Consequently, the time may well have also come for a fundamental re-examination of the overall value of the Cranford Agreement.

²²²³ 5-1.8.13

²²²⁴ Day 358 pp183-4

- 21.5.10 British Airways pointed out that other European airports had an advantage in operating under Central European Time which is 1 hour ahead of British time throughout the year. I accept this and can see some benefit in introducing Central European Time in this limited context, although the wider issues involved go well beyond my remit. In particular, it would reduce sleep disturbance in the early morning and would mean that passengers would not arrive at such an early hour. On the other hand the introduction of Central European Time might well increase the problems caused by departures late at night. At present these are not significant although it was argued that Terminal 5 would increase them in any event.
- 21.5.11 I turn now to the issue of the imposition of a limit on the number of aircraft movements. I do not accept that the decision as to whether to impose an overall limit on the number of aircraft movements is independent of Terminal 5. As I have already said Terminal 5 is seen as a means of increasing the degree to which potential runway capacity can be realised. By providing more terminal capacity it would enable more movements to be accommodated and could well lead to pressure for even more than 480,000 atms. I cannot comment in detail on the noise impact of this since the evidence placed before me suggests that it would involve the use of mixed mode and I was told that the $LA_{eq\ 16hour}$ contours were not the best measure of the effect of the introduction of this. However, I do not need to have detailed objective evidence on this precise point to form the judgement in the light of all the noise evidence placed before me that any increase above 480,000 movements would lead to a further deterioration in the noise climate. While the evidence placed before me suggested that this would be the capacity of the existing runways in segregated mode, the history of Heathrow suggests that it would be unwise to rely on this.
- 21.5.12 Although I accept that the Government does not presently believe there is a valid basis for a limit on movements at Heathrow, that view was reached before studying the evidence submitted to this inquiry. I have already said that I believe it would be unwise to rely entirely on the evidence that no more than 480,000 movements could be accommodated without moving away from the present segregated mode of runway operation. In these circumstances, and bearing in mind the consequences of an increase beyond 480,000 movements, I am satisfied that, if Terminal 5 were approved, a limit on aircraft movements would be justified in principle. This would take into account the precautionary principle to which I have already referred and avoid any further harm in terms of noise or any other factors.
- 21.5.13 The relationship between such a limit on aircraft movements and the contour cap proposed by BAA is a point to which I shall return, but I do not consider them to be mutually exclusive. There is a role for both, although the level at which they should be set must be a matter for careful consideration. As I have already indicated the 175.5 sq km cap proposed by BAA does not offer any improvement in the noise climate as compared with 1994 (para 21.3.41). As such it might well be considered inadequate.
- 21.5.14 I recognise that it is Government policy not to impose a total ban on night movements. This goes back to the 1985 White Paper and has been reaffirmed on several occasions. Again the Government may wish to reconsider its position in the light of the evidence of the Terminal 5 inquiry but I do not consider the case for a night ban at present to be as clear as that for a limit on overall aircraft movements. The Government's approach has been to seek to maintain a fair balance between social and environmental interests and those of the airline industry including its customers. Any ban on night movements would pose genuine difficulties for the airlines and would, in my view, weaken Heathrow's competitive position.

- 21.5.15 Consequently, while I would welcome the end of all night movements, I do not believe that this is a realistic aim at least in the short term. In my view, it would be better to work towards that as a long term objective while continuing to use the existing system of restrictions to achieve improvements in the night noise climate. In reaching that conclusion I have relied in particular on the assurance by British Airways that they would operate no more night flights in the night quota period than they did in 1997 if Terminal 5 were constructed. I see no reason why this approach should not be applied to other airlines using the airport. I accept that further restrictions on night operations at Heathrow could have the effect of moving some flights to other airports but if these were in areas of lower population fewer people would be affected. It is also possible that in the case of airports such as Gatwick night movements by scheduled services could simply replace some existing charter flights so that there would be no increase in noise levels. These charter flights would, of course, be likely to move to other airports such as Stansted where they might cause higher noise levels at night than there are at present.
- 21.5.16 I do, however, believe that there is a case for re-examining the period covered by the night quota. At present neither the LAeq 16hour nor the night quotas cover the periods of 23.00-23.30 hours and 06.00-07.00 hours. Both BAA and British Airways would accept the inclusion of the 23.00-23.30 period in the night quota subject to the appropriate adjustments to the quota and I believe that serious consideration should be given to an equivalent change in relation to the 06.00-07.00 hour period. This would be largely independent of Terminal 5 but the justification for such an adjustment would be stronger if Terminal 5 were to proceed since that would increase the number of early morning movements.
- 21.5.17 In short, I consider that there is scope for the introduction of new or revised controls which could improve the noise climate around Heathrow. Some of these should be taken forward regardless of Terminal 5 while others should accompany any permission it might receive. In both cases the net effect would be to make the environment for those living around Heathrow more acceptable.

21.6 OVERALL CONCLUSIONS ON AIR NOISE

- 21.6.1 Although I had some difficulty in establishing what are the national policies on air noise, I have concluded that they comprise 2 distinct elements. The overall policy is to do everything practicable to ensure that the noise climate around Heathrow continues to improve although after 2002 that objective will be supplemented by a further, less ambitious, commitment to do everything practicable to avoid a subsequent deterioration in the aircraft noise climate around the airport. At night, however, the policy is still unclear. Although the Department gave evidence on their interpretation of policy, I believe that I should act on the basis of the more recently published Second Stage Consultation on Night Restrictions at Heathrow, Gatwick and Stansted. If my interpretation is correct the objective is merely to balance the need to protect local communities from (undefined) excessive noise levels against the need to provide for air services to operate at night and other economic benefits. Consequently it would appear to be possible for noise at night to become excessive if the harm caused by such noise levels were outweighed by the benefits to the competitive position of Heathrow and the airlines and wider employment and economic implications.
- 21.6.2 As far as the overall noise climate is concerned and on the basis of the LAeq 16hour contours supplemented by other evidence, I am satisfied that Terminal 5 would significantly reduce the improvement in the overall noise climate which would

otherwise occur. In my judgement, aircraft noise associated with Heathrow already causes substantial harm. I accept the Department's view that residents near Heathrow experience more severe noise problems than those living near any other airport in the UK or Europe. In this context, the fact that Terminal 5 would prevent the achievement of all the potential improvement in the noise climate must weigh heavily against its approval. On the other hand, assuming Concorde is no longer flying by that time, I accept that noise levels as measured by the $LA_{eq\ 16hour}$ index would be significantly better in 2016 than they were in 1994. From that very limited viewpoint, the objectives of Government policy on aircraft noise would be met even if Terminal 5 were built.

- 21.6.3 It is however necessary to look beyond the picture painted by the $LA_{eq\ 16hour}$ contours as the Department accepted. On the basis of other considerations, primarily the potential increase in the number of aircraft movements, I conclude that Terminal 5 would cause substantial harm to the noise climate. This conclusion is based on an expectation that the number of aircraft movements would not exceed 480,000. Although that reflects the evidence as to the maximum capacity of the existing runways in segregated mode history suggests that this cannot be relied on in the absence of a firm control on the number of movements.

- 21.6.4 In terms of noise at night, my conclusion is that the existing level of operations at night at Heathrow causes substantial sleep disturbance and significant annoyance. The provision of Terminal 5 would be unlikely to increase the number of movements during the night quota period but would lead to a growth in the average size of aircraft. This would increase the potential for sleep disturbance and annoyance in the night quota period and must weigh against the approval of Terminal 5.

- 21.6.5 Furthermore, Terminal 5 would increase the number of movements arriving in the hour following the night quota period and approaching the airport shortly before 06.00 hours. In these circumstances, Terminal 5 would cause a deterioration in the noise climate in the sensitive early morning period. This applies whether the comparison is with the existing position or that likely to apply in 2016 with only 4 terminals. In line with Government policy, the need to protect local communities from excessive aircraft noise at night has to be balanced against the need to provide for air services to operate at night where they are of benefit to the local, regional and national economy. Its impact on the competitive position of Heathrow and UK airlines operating from it must also be taken into account. This is, of course, part of the overall balance which has to be drawn after considering all of the factors involved but there is no doubt in my mind that Terminal 5's impact on night noise must weigh significantly against its approval in that balance.

- 21.6.6 Finally I consider that there is scope for the introduction of new or revised controls which could improve the noise climate around Heathrow. Some of these should be taken forward regardless of Terminal 5 while others should accompany any permission it might receive, including a limit on the number of movements permitted. In both cases the net effect would be to make the environment for those living around Heathrow more acceptable.

- 21.6.7 Even if these additional controls were introduced, however, Terminal 5 would result in a noise climate which would be worse overall than that which would exist if it were not built. Although the position with Terminal 5 is likely to be better than that which exists at present when measured solely in terms of $LA_{eq\ 16hour}$, it would cause harm even on this basis simply by reducing the improvement which would

otherwise have been experienced. Furthermore, it would cause an increase in noise events overall and particularly during the sensitive early morning period as compared both with the existing position and that in 2016 assuming only 4 terminals. I believe that noise levels in the early morning would become excessive unless the existing concentration of movements over west London was dispersed.

- 21.6.8 In overall terms I consider that Terminal 5 would result in a material deterioration in the noise climate around Heathrow as compared with the position with only 4 terminals and that this must carry substantial weight in the final decision.

22 GROUND NOISE

22.1 INTRODUCTION

- 22.1.1 The potential sources of ground noise at Heathrow include engine running on stands, aircraft taxiing to and from the runways, queuing before departure, engine testing and the use of mobile or fixed ground equipment. It is clear that the location of Terminal 5 at the western end of the airport would bring many of these noise sources closer to some communities. As with air noise, uncertainties about the number of movements at Heathrow and the types of aircraft to be used make it difficult to assess potential levels of engine noise. However, as I have already said, there is no doubt that the introduction of Terminal 5 is likely to increase the size of aircraft used.
- 22.1.2 Queues of aircraft waiting to depart often cause the highest ground noise impacts but there was also concern over the impact of the new Ground Running Pen proposed as part of the Forward Maintenance Unit at Terminal 5. The impact of this would depend on its location as well as on its design and the material used in its construction. In assessing the overall impact of engine testing, it is also necessary to take into account the potential reduction in testing which might take place in the existing Ground Running Pens on the East and West Maintenance Bases after the development of the Forward Maintenance Unit.
- 22.1.3 The impact of ground noise is affected by factors such as the duration of the noise, time of day, ambient noise levels, distance, intervening topography, ground conditions, built structures and the effects of the weather including wind direction and strength, temperature and humidity. There were particular disputes in this case about the effects of weather conditions and barriers on noise propagation. As a result, Hillingdon's forecasts were higher than those of BAA and British Airways at 22 out of the 29 test sites. As with air noise, the parties also applied different tests to the impact of ground noise. While BAA and British Airways argued that the correct comparison was with the position with four terminals, the local authorities and others said the ground noise generated by Terminal 5 should be compared with an acceptable level in environmental terms.
- 22.1.4 While I deal with all of these points the main issue is;
- The impact of ground noise generated by Terminal 5 on the noise climate around Heathrow.

22.2 THE IMPACT OF GROUND NOISE

The Department's Case

- 22.2.1 The Department reported that the initial results of a study of the London airports had found that the most significant sources of ground noise at night around Heathrow were intermittent running of aircraft engines, aircraft taxiing, loading and unloading in the cargo area and the operation of auxiliary power units on aircraft and ground power units in the Maintenance Areas and around Terminal 4²²²⁵.

²²²⁵ 5-3.2.2

BAA's Case

22.2.2 BAA said that a regime to control ground noise was already in place²²²⁶. As there was no accepted approach to assessing the impact of ground noise, they had developed a new method to compare noise levels at 2016 with and without Terminal 5. The only issues between the principal parties appeared to be the effect of meteorological fluctuations and attenuation rates²²²⁷. BAA were mainly concerned with noise from taxiing, auxiliary power units and low power engine tests on the stands. Taxiing was normally done at idle thrust with higher power being used only when moving off and at corners. Taxiing distances were minimised to reduce fuel costs and queuing occurred only when necessary to ensure a consistent flow of departures²²²⁸.

22.2.3 Only aircraft parked on stands overnight required extended running of auxiliary power units to carry out checks prior to departure. The main characteristic of noise from these units was a continuous drone which was often masked by other airport noise²²²⁹. Engine testing was essential for airlines based at Heathrow, it was carried out for safety reasons after maintenance. In order to limit noise from such tests, the duration, timing and location of engine runs, particularly those at high settings, was carefully controlled. They should be no more frequent as a result of the provision of Terminal 5 and the airport was committed to the introduction of further controls if it were built²²³⁰.

22.2.4 BAA's assessments assumed neutral meteorological conditions. On this basis there were some times when ground noise levels with Terminal 5 would;

- exceed levels without it,
- exceed background levels after making a 5dB allowance for tonal content and/or
- exceed 55dB LA_{eq} during the day and 45dB LA_{eq} and 65dB LA_{max} at night.

Even these levels were not necessarily unacceptable when compared to the advice in PPG 24 and the WHO community annoyance thresholds²²³¹.

22.2.5 There was an issue with Hillingdon about attenuation rates. Although attenuation due to spherical spreading was agreed to be 6dB for every doubling of distance, BAA assumed a further 2dB per 100m excess attenuation, as compared with the 1.35dB adopted by Hillingdon. The 2dB had been used by BAA after queuing trials had shown an over-prediction of noise levels at short range sites such as Bedfont Court²²³². The approach used by Hillingdon produced similar results in neutral meteorological conditions especially at short range but increasingly higher noise levels at sites further from the airport. However, there were few sites where the difference was greater than 3dB²²³³.

²²²⁶ 5-3.3.1

²²²⁷ 5-3.3.2

²²²⁸ 5-3.3.3

²²²⁹ 5-3.3.4

²²³⁰ 5-3.3.5

²²³¹ 5-3.3.6

²²³² 5-3.3.7

²²³³ 5-3.3.8

- 22.2.6 It was unlikely that any new aircraft would generate more ground noise than the current Boeing 747-400's²²³⁴. The new aprons stands and taxiways would, however, be much closer to the residential areas around the western end of the airport than those associated with the existing terminals. Ground noise levels would exceed background levels and the night noise criteria in some of these residential areas. To the south-west and west noise levels at times might be 25dB higher than at present at some times but the increases in Longford would be significant for a greater proportion of the time, because of the effect of the Cranford agreement²²³⁵. Except for Stanwell, all of those areas in which all 3 of the tests were failed were already in the area covered by the airport's Noise Insulation Scheme. BAA would extend the area covered by the scheme if necessary²²³⁶.
- 22.2.7 BAA claimed that the differences between noise levels with and without Terminal 5 were relatively small. When they were not dominated by queuing, noise increases generated on the new apron area at Terminal 5 could become important, but at lower levels than those generated by queuing aircraft²²³⁷.
- 22.2.8 They acknowledged that the local authorities' approach was based on generally accepted principles but an acoustically neutral baseline had been used. This was not related to actual measurements and, at greater distances, was based on extrapolation beyond the distance used for the test data. In any case ground noise did not carry very far outside the airport perimeter before it fell to or below background levels²²³⁸. BAA had assessed ground noise in isolation to ensure it was not submerged beneath other noise sources. A 25% increase in ground operations would increase LA_{eq} by only 1dB and a doubling of movements would be needed to produce an increase of 3dB²²³⁹.
- 22.2.9 The Sleep Disturbance Study had found that people were unlikely to be disturbed by aircraft noise events below 80dB LA_{max} ²²⁴⁰. Complaints about ground noise were relatively infrequent although high power engine runs could cause disturbance. The airport was committed to control such runs and had regularly reviewed its regime for reducing the periods of engine testing at night. The proposed Forward Maintenance Unit and Ground Running Pen would allow the closure of the existing pen for Boeing 747's on the East Maintenance Base and thereby contribute to a reduction in engine testing on the east side of the airport²²⁴¹.

British Airways' Case

- 22.2.10 British Airways emphasised the need for a limited amount of engine running at night to ensure that they had aircraft available for morning services. Such runs took place on terminal or remote stands or at the British Airways Maintenance Base on the eastern side of the airport. When the Forward Maintenance Unit was provided at Terminal 5 high power engine runs would take place there with an average of less than 0.58 tests a night²²⁴².

²²³⁴ 5-3.3.9

²²³⁵ 5-3.3.10

²²³⁶ 5-3.3.11

²²³⁷ 5-3.3.13

²²³⁸ 5-3.3.14

²²³⁹ 5-3.3.15

²²⁴⁰ 5-3.3.16

²²⁴¹ 5-3.3.17

²²⁴² 5-3.4.1

- 22.2.11 The technical issue in dispute with Hillingdon was the loss of ground attenuation in the presence of a barrier. British Airways had used established attenuation theory with a factor of 2dB instead of 1.35dB attenuation for every 100m beyond 150m from source to receiver since this gave a good correlation between calculated and measured noise levels at the nearest residential properties²²⁴³. A conventional Ground Running Pen could achieve an attenuation of 20dB so that a maximum noise level of 51dB LA_{max} would be produced at the most exposed properties. The day-time criterion of 55dB LA_{eq 12 min} would not be exceeded in any position²²⁴⁴. British Airways asserted that the performance of the pen would meet Hillingdon's proposed criteria for meteorologically neutral conditions and British Airways would accept a criterion of 65dB LA_{eq 1 min} at the nearest and most exposed property. Even with partly open windows that would give an internal level of 50dB LA_{max}. No allowance had been made for the airport's Noise Insulation Scheme for which all the most exposed properties would be eligible²²⁴⁵.
- 22.2.12 British Airways argued that Hillingdon had used standards that had not yet been adopted by WHO. Their calculations did not make sufficient allowance for the loss of ground attenuation and assumed a combination of multiple worst cases²²⁴⁶. Even in adverse weather conditions the predicted noise levels would be within the 65dB LA_{max} criterion for sleep disturbance with a partly open window. In practice engine testing was unlikely to take place in adverse meteorological conditions which occurred for less than 5% of the time²²⁴⁷.
- 22.2.13 The Ground Running Pen was located in the optimum position. British Airways also intended to replace the existing Boeing 767 Ground Running Pen on the West Maintenance Base with 2 pens one of which would be able to accommodate an NGLA. When all 3 new pens had been built, British Airways would be able to relinquish the use of the Boeing 747 pen on the East Maintenance Base, which had 360 dwellings inside its 65dB LA_{max} contour. None would be affected by more than 65 dB LA_{max} as a result of noise generated in the proposed pen at Terminal 5. The closure of the East Base Ground Running Pen could not, however, be guaranteed²²⁴⁸.

Hillingdon's Case

- 22.2.14 Hillingdon supported by Hounslow pointed out that there were no standard forms of assessment for ground noise and that it had not been possible to reach agreement on attenuation rates and screening allowances²²⁴⁹. Research suggested that annoyance increased where there were changes in circumstances and was related more to absolute noise levels than to the degree to which events exceeded background levels²²⁵⁰. Hillingdon had used the WHO guidelines of 55dB LA_{eq 1 hour} during the day and 45dB LA_{eq 1 hour} and 60dB LA_{max} during the night²²⁵¹. They had developed a more complete model than the over-simplified method used by BAA and British Airways²²⁵². Hillingdon had modified a standard method known as the CONCAWE method to accord with actual conditions at Heathrow. Their model had been used to

²²⁴³ 5-3.4.2

²²⁴⁴ 5-3.4.3

²²⁴⁵ 5-3.4.4

²²⁴⁶ 5-3.4.5

²²⁴⁷ 5-3.4.6

²²⁴⁸ 5-3.4.7

²²⁴⁹ 5-3.5.1

²²⁵⁰ 5-3.5.2

²²⁵¹ 5-3.5.3

²²⁵² 5-3.5.4

predict both LA_{eq} and LA_{max} at 33 representative sites in acoustically neutral conditions, for mild downwind/temperature inversion conditions and for the reduction of barrier effect under downwind conditions²²⁵³.

- 22.2.15 The predictions showed a widespread impact in acoustically neutral conditions even before taking account of factors such as increased noise levels at bedroom height²²⁵⁴. Ground noise 6dB below background levels could increase overall noise levels by 1dB while ground noise similar to existing background levels could raise overall levels by 2-3dB²²⁵⁵. The BAA model was inconsistent with methods approved by the Department of the Environment Transport and the Regions and the three step assessment they had adopted prevented fair comparisons. The local authorities' use of 1.35dB per 100m for excess attenuation accorded better with data from tests at Hucknall²²⁵⁶.
- 22.2.16 Hillingdon argued that the BAA approach using meteorologically neutral conditions did not account sufficiently for variable weather, ground conditions or source spectrum. At nearly a third of the sites BAA had predicted freefield levels for facades facing away from the airport thus reducing noise levels by about 5dB²²⁵⁷. Furthermore BAA's attenuation rate was derived limited data from taxiing aircraft which had different frequency spectra from engine tests²²⁵⁸.
- 22.2.17 At 7 sites there were substantial differences between the local authorities' predictions and those of BAA ranging between 5 and 26dB. These were agreed to be the result of differences in attenuation rates and screening allowances. Four of the sites exceeded the local authority criteria in acoustically neutral conditions²²⁵⁹. Local factors at Heathrow could lead to even lower attenuation rates than those used by the local authorities²²⁶⁰. Sites to the north-west and east of the airport currently received some respite from taxiing noise when the airport operated on easterlies and by virtue of alternation on westerlies. If mixed mode were introduced they would suffer from continuous noise throughout the day with an increase of 10dB as compared with segregated mode²²⁶¹. Auxiliary power units were inherently quieter than taxiing or engine testing but the location of Terminal 5 meant that they would cause large increases in noise to the west of the airport²²⁶².
- 22.2.18 Hillingdon argued that BAA had agreed that noise from engine testing had distinct characteristics which could increase disturbance particularly at night²²⁶³. However, in assessing its impact, British Airways had not taken this factor into account and had failed to follow reasoned scientific approaches to account for physical effects other than barrier performance. They had predicted lower levels of noise from engine tests beyond 1 km than the local authority model²²⁶⁴. Engine testing generated the largest number of complaints about ground noise and the proposed new Ground Running Pen would cause disturbance up to 3 km away and for up to 3 high power tests a night²²⁶⁵.

²²⁵³ 5-3.5.5

²²⁵⁴ 5-3.5.6

²²⁵⁵ 5-3.5.7

²²⁵⁶ 5-3.5.8

²²⁵⁷ 5-3.5.9

²²⁵⁸ 5-3.5.10

²²⁵⁹ 5-3.5.12

²²⁶⁰ 5-3.5.13

²²⁶¹ 5-3.5.14

²²⁶² 5-3.5.16

²²⁶³ 5-3.5.15

²²⁶⁴ 5-3.5.11

²²⁶⁵ 5-3.5.13

Other Objectors' Cases

- 22.2.19 Other objectors argued that ground noise could be heard as far away as Ealing, Osterley, Whitton and Hampton. Longford Residents' Association said they were already severely affected on westerly operations only relieved by runway alternation. Ground noise had increased as the airport had expanded and would increase still more if Terminal 5 were built. The Forward Maintenance Unit would bring engine testing closer to Longford.

My Conclusions

- 22.2.20 I start my assessment of the impact of Terminal 5 on ground noise by concluding that it would introduce significant new noise sources at the western end of the airport. These sources would include not only new stands and taxiways but also a new Forward Maintenance Unit, which itself would include a Ground Running Pen in which high power engine tests would take place. Since the number of aircraft movements at Heathrow would increase as a direct result of the provision of Terminal 5, it becomes apparent that the new terminal would have a potentially significant impact on ground noise levels at the western end of the airport.
- 22.2.21 There is no standard approach to the assessment of ground noise impacts so it was inevitable that there would be disagreements between the parties as to how the impact of Terminal 5 should be measured. While I accept that I should concentrate on the difference Terminal 5 would make as compared to the position with only 4 terminals, I also accept the need to compare the forecast noise levels with appropriate criteria where possible. In doing so I am not attracted to the approach adopted by BAA in which noise levels were tested against 3 criteria. On the other hand, the criteria used by Hillingdon have not been adopted by WHO.
- 22.2.22 Although I accept the need to compare predicted noise levels with appropriate criteria, I do not believe that these should be applied rigidly in this case. The impact of ground noise must be judged in its full context. BAA made the point that they had ignored background noise levels in order to concentrate on changes in ground noise. This is clearly an over-simplification since some of the changes in ground noise would be masked by the background noise in this generally busy part of west London. Equally I acknowledge the point made by Hillingdon that increases in ground noise could contribute to increases in the overall noise level even where they are lower than the background level.
- 22.2.23 There are differences between the parties in the actual forecasting methods. While BAA used meteorologically neutral conditions Hillingdon used acoustically neutral conditions. Assumed attenuation rates varied and different assumptions were made about the loss of ground attenuation for engine testing in the presence of a barrier and about the effect of noise spectra. In general, however, the picture is clear and not disputed.
- 22.2.24 Areas closest to the boundaries of the western part of the airport would experience a significant increase in ground noise. In particular, properties in the Bedfont Court Estate, parts of Longford and in Stanwell would be subjected to ground noise from the 60 new stands at Terminal 5 and from increased numbers of aircraft queuing at the western end of the southern runway when the airport is on easterly operations. If mixed mode were introduced and the Cranford Agreement abandoned, there would also be queuing at the western end of the northern runway close to Longford

although the volume of queuing at the southern runway would be reduced. Such a change is not, of course, part of the Terminal 5 proposals as put forward by BAA.

- 22.2.25 I accept that the impact of these and other changes could be reduced by the improved insulation offered under the airport's Noise Insulation Scheme and acknowledge that BAA indicated that it would extend this if necessary. Unfortunately this would not solve the problem of disturbance outside buildings. The offer by BAA, which I report elsewhere, to purchase the worst affected houses would be more helpful. Even if these properties were re-occupied those people moving in would presumably do so in the knowledge of likely noise levels.
- 22.2.26 I now turn to the issue of engine testing which is the cause of most complaints about ground noise. In considering this aspect I have taken into account my own experience of hearing a high power engine run at night from a position outdoors in Waye Avenue. Whatever the detailed debates about the effects of attenuation beyond the pen itself, I am satisfied that the proposed Ground Running Pen could be constructed in such a manner as to achieve an attenuation of 20dB. On British Airways' own forecasts (about which I have some reservations) this would mean that the LA_{max} would not exceed 51dB at the nearest exposed property. However, I accept British Airways' estimate that there would be an average of 0.58 high power runs a night.
- 22.2.27 British Airways have also indicated that they would be willing to accept a requirement that noise from such tests should not exceed 65dB $LA_{eq 1 min}$ at the nearest exposed property. Although I accept that some people might be woken at that level, it is significantly quieter than the 80dB LA_{max} level below which the Sleep Disturbance Study found people were unlikely to be disturbed. This conclusion takes no account of the effects of the different noise spectra associated with engine tests and I accept that the combination of these tonal qualities and adverse weather conditions could extend the effects over a wider area than that predicted by British Airways.
- 22.2.28 On the other hand, I recognise that adverse weather conditions are likely to apply to only some 5% of engine tests. I also accept BAA's view that the larger aircraft likely to be in operation with Terminal 5 would probably not generate any more ground noise than existing Boeing 747's. Finally I note that Heathrow operates a number of controls on activities which generate ground noise including engine testing. Under the current regime there have been reductions in the permitted periods for engine testing at night.
- 22.2.29 Taking all of these factors into consideration, I consider that the proposed Ground Running Pen would result in more disturbance to those living close to it. However, actual sleep disturbance would be limited as long as noise at the nearest exposed property did not exceed 65dB $LA_{eq 1 min}$. The harm caused by this increase in disturbance around the new Ground Running Pen has to be set against the improved environment for those living close to the Boeing 747 pen on the East Maintenance Base. There is no dispute that this affects more dwellings than the new pen would and, having heard a test in that location, I would strongly support efforts to close pen at the East Maintenance Base. I shall return to this point when dealing with conditions but, for the moment, I accept that the provision of the proposed Ground Running Pen at Terminal 5 would provide an opportunity to contribute to an improvement in the noise climate around Waye Avenue.

- 22.2.30 Taken overall Terminal 5 would increase the level of ground noise around the western end of the airport. In itself, that increase would be significant but it would be masked to some extent by background noise levels. The new Ground Running Pen would be particularly significant. However, I do not believe it would cause substantial problems as long as it were to be subjected to an appropriate regime such as that currently operated by the airport together with a requirement that noise levels at the nearest exposed property did not exceed 65dB LA_{eq 1 min}. In any event, the impact of the new pen on areas to the north and west of the airport must be set in the context of potential improvements in the impact of engines tests around Waye Avenue.
- 22.2.31 Thus, while Terminal 5 would increase ground noise levels in some areas, I do not consider these to be as potentially harmful as its effects on air noise. Nevertheless, they must weigh in the balance against Terminal 5.

23 ROAD NOISE

23.1 INTRODUCTION

- 23.1.1 In assessing the impact of Terminal 5 on road noise, attention was focussed on the effect of the new roads and those which would be significantly improved as a direct result of the building of the new terminal. The Department concentrated on the effects attributable to the widening of the M4 and the provision of the M25 Spur Road while BAA took into account the improved Western Perimeter Road and the Dedicated Car Park Access Road. This Access Road runs close to the Perimeter Road between the main Terminal 5 access point and the long stay and staff car parking to be provided to the north of the airport and close to Longford.
- 23.1.2 As with ground noise there was a dispute about the methods which should be used to evaluate the impact of road noise bearing in mind that in many of the areas affected noise levels are often dominated by noise from aircraft. These areas include the Bedfont Court Estate and the Bath Road area of Longford. The locations for measurements were not agreed, nor was the basis on which they should be taken. There was no common view on the criteria to be used or on what level of noise it is reasonable to expect the public to accept.
- 23.1.3 While I shall consider each of these points the main issue is;
- The impact of road noise generated as a result of Terminal 5 on the surrounding areas.

23.2 THE IMPACT OF ROAD NOISE

The Highways Agency's Case

- 23.2.1 The Highways Agency said it was Government policy to reduce or mitigate the adverse consequences of road noise but there were no target levels nor was there a requirement to take a stricter approach where residents were already affected by road noise. Currently around 10% of the population of England and Wales were believed to be exposed to day-time traffic noise levels above 65dB LA_{eq} and about 5% to levels above 60dB LA_{eq} at night²²⁶⁶. The most up-to-date policy was set out in the 1998 White Paper²²⁶⁷.
- 23.2.2 Research suggested that people might be sensitive to changes of less than 3dB related to changes in traffic flows but it was not always clear to what people were responding²²⁶⁸. The noise appraisal methodology in the Design Manual on Roads and Bridges (DMRB) did not envisage a situation like that at Heathrow with aircraft noise dominating for most of the time. The methods in the DMRB had, therefore been adapted to predict changes in traffic noise and in ambient noise and to assess the consequent level of nuisance using L_{A10 18 hour}. The use of this index had been agreed with Hillingdon with respect to the M4²²⁶⁹. It had been correlated with the degree of disturbance and was the best predictor for night-time nuisance. There was no justification for Hillingdon's use of different correction factors for

²²⁶⁶ 5-5.2.1

²²⁶⁷ 5-5.2.2

²²⁶⁸ 5-5.2.3

²²⁶⁹ 5-5.2.4

day and night based on unreliable data²²⁷⁰. As L_{A10} levels increased from 50 to 70dB, the percentage of people significantly bothered rose from 5% to about 30%. However, the DMRB did not allow for changes of less than 1dB, since there was substantial evidence that people could not distinguish between noise levels so close together²²⁷¹.

- 23.2.3 The Agency had made traffic noise predictions for over 300 points along the M4. These predictions had taken into account the proposed noise barriers and the fact that the M4 was to be subject to a speed limit of 80 kph (50 mph) in this area in any event. The effect of both factors would be to produce worthwhile and meaningful reductions in noise levels as compared with present levels²²⁷². If the speed limit were to be imposed before 2002 the improvements due to Terminal 5 would appear smaller²²⁷³.
- 23.2.4 Properties between Junctions 4 and 3, currently exposed to the highest road noise levels, would experience the greatest improvements²²⁷⁴ but there would also be slight reductions in noise for properties between Junctions 4 and 4b mostly due to the reduction in the speed limit. If the effect of the speed limit was removed there would be some increases in noise levels but those for properties between Junctions 4 and 4b would generally be less than 1dB $L_{A10\ 18\ hour}$ ²²⁷⁵. With the proposed improvements to the M4 a total of 1861 properties would experience reduced noise levels although that figure would fall to 465 if the effects of the reduced speed limit were discounted. No properties would experience increases of more than 1dB²²⁷⁶.
- 23.2.5 The Agency suggested that Hillingdon's evidence appeared to depend on an unreliable survey, on the WHO guidelines and on the use of correction factors which were not in PPG 24. Nevertheless Hillingdon appeared to have conceded that a noise level not exceeding 67-68dB was acceptable which meant that the M4 scheme would be acceptable. Although some properties close to the motorway would continue to experience noise levels which were higher than was desirable, the proportion would be similar to many urban roads²²⁷⁷.
- 23.2.6 The DMRB approach was not appropriate in relation to the M25 Spur Road since noise levels in the Bedfont Court area were dominated by aircraft noise for 15-20% of the time²²⁷⁸. In 2016 the increases attributable to the Terminal 5 related road proposals would be between 1.6 and 3.5dB $L_{A10\ 18\ hour}$ at the 4 closest properties and between 1.0 and 1.7dB $L_{A10\ 18\ hour}$ in the remainder of the Estate. While road noise levels would exceed the WHO guidelines the extensive mitigation measures meant that they would have an insignificant effect on the ambient noise environment. Traffic noise levels would be low by urban standards²²⁷⁹.

BAA's case

- 23.2.7 BAA argued that there was no indication in PPG 24 or the DMRB that absolute noise criteria should be used when considering a development generating noise or

²²⁷⁰ 5-5.2.6
²²⁷¹ 5-5.2.5
²²⁷² 5-5.2.7
²²⁷³ 5-5.2.8
²²⁷⁴ 5-5.2.9
²²⁷⁵ 5-5.2.10
²²⁷⁶ 5-5.2.11
²²⁷⁷ 5-5.2.13
²²⁷⁸ 5-5.2.14
²²⁷⁹ 5-5.2.16

traffic²²⁸⁰. They had looked at road traffic noise alone in terms of $L_{A10\ 18\ hour}$ and for those levels converted to $LA_{eq\ 18\ hour}$ and combined with noise generated by the airport in each of its three main operating modes²²⁸¹. The proposed road improvements would have no effect on the wider road network in noise terms²²⁸².

- 23.2.8 BAA believed that the application of the WHO guidelines to the urban area around Heathrow was inappropriate. While the internal road traffic noise guideline of 30dB $LA_{eq\ 8\ hour}$ might be exceeded the same could be said for about 63% of the UK population²²⁸³. BAA had used criteria which corresponded to Categories B and C of PPG 24 which were more appropriate in an urban area²²⁸⁴. Noise levels in the Bedfont Court Estate and Bath Road, Longford were not high compared with other non-motorway roads in the area²²⁸⁵.
- 23.2.9 In BAA's view it was unrealistic to consider only the changes in road traffic noise as that ignored the presence of the airport. This meant that none of the approaches in the DMRB was appropriate. BAA had used 3dB as the threshold above which changes would be generally noticeable²²⁸⁶. Ambient noise levels in the Bedfont Court Estate and the Bath Road area of Longford were in the mid 70's to low 80's dB $L_{Aeq\ 18\ hour}$, and traffic noise was clearly audible between aircraft events. The Western Perimeter Road was a minor contributor to this ambient level when compared with the M25 and A3044²²⁸⁷.
- 23.2.10 In 2016 ambient noise levels in both areas would be minimally affected by the Western Perimeter Road and the Dedicated Car Park Access road²²⁸⁸. Properties in Bedfont Court would experience traffic noise increases in the early morning but these would be smaller than the day to day variations. With Terminal 5, traffic noise in that area would increase by 1.0-3.0dB $L_{A10\ 18\ hour}$ as compared with the position with only 4 terminals²²⁸⁹. Noise levels in the Bath Road area with Terminal 5, the road improvements and the provision of effective noise barriers would fall by about 0.3dB $L_{A10\ 18\ hour}$ at some properties. They would, however, increase by up to 1.5dB $L_{A10\ 18\ hour}$ at others when compared with the position without Terminal 5. Ambient noise levels would increase by no more than 0.1dB $L_{A10\ 18\ hour}$ when compared with the position before construction²²⁹⁰. Unlike Hillingdon BAA had assumed that the existing fence behind properties in Bath Road had no acoustic benefit and that it would be replaced by an acoustic barrier if Terminal 5 were built²²⁹¹.
- 23.2.11 BAA argued that the differences due to Terminal 5 were small. About 40% of the UK population was exposed to day-time noise levels above those predicted here which were also below the level at which properties might qualify for insulation against road traffic noise under the 1975 Noise Insulation Regulations²²⁹².

2280 5-5.3.1
 2281 5-5.3.2
 2282 5-5.3.3
 2283 5-5.3.5
 2284 5-5.3.6
 2285 5-5.3.7
 2286 5-5.3.9
 2287 5-5.3.10
 2288 5-5.3.12
 2289 5-5.3.13
 2290 5-5.3.16
 2291 5-5.3.14
 2292 5-5.3.17

Hillingdon's Case

- 23.2.12 Hillingdon submitted, in contrast, that changed noise levels provoked a more than proportionate response and related more to absolute noise levels than to any excess over the steady background level²²⁹³. They argued that it was Government policy that a failure to improve an unacceptable situation would be grounds for refusal of planning permission²²⁹⁴. Road traffic noise was unacceptable above 67-68dB L_{A10 18 hour} at the façade where a road was improved or where traffic generating development was proposed. The comparable criterion at night would be 60dB_{Leq 8 hour}²²⁹⁵.
- 23.2.13 Traffic noise from the M4 was significantly more regular than aircraft noise and was already unacceptable. With Terminal 5, everybody within 300m of the motorway would be exposed to levels higher than the WHO guideline of 55dB²²⁹⁶. Hillingdon accepted the Department's figures for the M4 in the day provided their limitations were recognised. The Department's analysis ignored absolute levels and was largely confined to comparing the position before widening and with a 70 mph speed limit with a widened M4 subject to a reduced, 50 mph, speed limit²²⁹⁷. In contrast, Hillingdon had followed the advice in the DMRB. On that basis 178 properties would experience an increase of between 10% and 30% with Terminal 5 whereas 465 properties would experience a decrease in noise nuisance of less than 10%. The 2dB benefit of the reduced speed limit would be eroded, if not cancelled, by the widening²²⁹⁸. Even with the proposed barriers noise levels between Junctions 3 and 4b would give rise to serious community annoyance and sleep disturbance and some properties would have worse noise levels because they would not benefit significantly from the changes to the barriers²²⁹⁹.
- 23.2.14 Hillingdon did not accept that L_{A10 18 hour} was a good predictor of annoyance at night. However, they were able to agree that the distribution of noise levels over the 24 hour period at locations affected by traffic on the M4 would be little affected by Terminal 5²³⁰⁰.
- 23.2.15 The assessments by the Department and BAA for the M25 Spur Road, airport roads and local roads were inconsistent, ignored relevant guidance and masked the impact of road noise²³⁰¹. Day-time levels in Bedfont Court would exceed WHO guidelines at all residential properties. Although not wholly unacceptable, there would be a serious reduction in the quality of life. At night noise levels would be acceptable only if the windows were closed²³⁰². Although properties in the Bath Road area would be largely protected during the day by the proposed barriers, noise levels at night would be above the WHO guidelines at several properties²³⁰³.

²²⁹³ 5-5.4.1
²²⁹⁴ 5-5.4.2
²²⁹⁵ 5-5.4.3
²²⁹⁶ 5-5.4.4
²²⁹⁷ 5-5.4.5
²²⁹⁸ 5-5.4.6
²²⁹⁹ 5-5.4.7
²³⁰⁰ 5-5.4.8
²³⁰¹ 5-5.4.9
²³⁰² 5-5.4.10
²³⁰³ 5-5.4.11

Other Objectors' Cases

- 23.2.16 Objections related to traffic noise were also raised by organisations such as EANAG, Staines Town Society and WAR and by individuals either in person or in writing. These did not, however, raise any significant issues not already covered by others.

My Conclusions

- 23.2.17 While I accept that noise levels generated by road traffic in the areas around Heathrow are not unlike those in many other urban areas, that does not mean to say that they are desirable. Still less does this simple statement of fact acknowledge the extent to which the area is already affected by noise from aircraft both in the air and on the ground. I shall be considering the cumulative impact of all these noise sources in my next Chapter but the complexity of the position around Heathrow makes it very difficult to apply normal methods to assess the impact of road noise as all parties acknowledged. In these circumstances it is not surprising that they did not agree on the correct approach.
- 23.2.18 As far as the criteria for acceptability are concerned, Hillingdon argued for the use of the WHO guidelines which I have already discussed. However, I was told that the night-time guideline of 30dB $L_{eq\ 8\ hour}$ was exceeded for about 63 % of the UK population and that 10% are exposed to day-time noise levels of 65dB L_{Aeq} , some 10dB above the WHO guideline. While I do not suggest that these levels of noise are desirable, it seems unrealistic to adopt limits as a test in this case, which are not met for much of the population.
- 23.2.19 Hillingdon themselves appeared to recognise this in conceding that road noise would be unacceptable above about 67-68dB $L_{A10\ 18\ hour}$. I take this as implying that a level below 67dB $L_{A10\ 18\ hour}$ would not be unacceptable. I also note that some 28% of the population would be bothered by noise at 67-68dB as compared with only 13% who would be bothered by noise at the WHO guideline of 55dB. This may reflect an acceptance on the part of most people that levels above 55dB are not unusual which would reinforce my doubts as to the feasibility of enforcing the WHO guidelines.
- 23.2.20 There was some dispute as to the extent to which people are sensitive to changes in noise levels. While I accept that 3dB is generally seen as the smallest change likely to be noticeable, I have some sympathy with Hillingdon when they argue that changes in noise levels can provoke a more than proportionate response. It would be unwise, in my view to assume that people living close to a road would fail to notice a relatively small increase in noise (of 1-3dB) particularly when this was associated with an increase in actual traffic flows. Indeed I believe that, in this case, people would be conscious of and affected by the more persistent traffic flows.
- 23.2.21 As far as the M4 is concerned, I am satisfied that some properties would be exposed to noise levels which would be higher than desirable even if they fell below the 67-68dB level above which Hillingdon said they would be unacceptable. Although Hillingdon argued that noise would remain above the level that causes serious community annoyance and sleep disturbance, the Department pointed out that noise levels would be improved. However, some 2dB of this improvement would be the result of the imposition of a reduced speed limit. I do not believe that it is right to

include this as part of the package associated with Terminal 5 since it was made clear by the Agency that the reduced speed limit would be imposed in any event.

- 23.2.22 Even Hillingdon recognised that the effect of the widening with the associated improvements to the noise barriers would lead to a lowering of noise levels at 465 properties. On the other hand 178 properties would experience increased noise levels. It seems unlikely that any increases would be greater than 1dB. Overall, I accept that the M4 widening is likely to result in a marginal improvement in the noise climate. Some properties will however, suffer more noise and even those which experience an improvement will remain subject to high levels of road noise. These should be further reduced where possible.
- 23.2.23 As far as the M25 Spur and other airport related roads is concerned, Hillingdon argued that day-time levels at Bedfont Court would exceed the WHO guidelines but acknowledged that they would not be wholly unacceptable. At night they would be acceptable only if windows were closed. Given the fact that the WHO guidelines are widely exceeded across the UK and about 40% of the UK population experience noise levels in excess of those predicted here, I find no reason to conclude that road traffic noise in itself would be unacceptable. On the other hand, as I have already noted the Bedfont Court area is also likely to be subjected to increased aircraft noise. This is again a point to which I shall return in the next Chapter.
- 23.2.24 The Bath Road area of Longford would be affected by the improvements to the Western Perimeter Road and the new Dedicated Car Park Road. Hillingdon accepted that properties here would be largely protected during the day but argued that, for several properties, noise at night would exceed WHO guidelines. As I have already indicated I do not consider this to be unacceptable in itself. The effects of traffic on the Perimeter Road and Car Park Road appear to be relatively small, after making allowance for the improved fence at the back of the properties concerned. As for Bedfont Court, however, I acknowledge that they would also suffer from increase aircraft noise if Terminal 5 were built.
- 23.2.25 While the increased road traffic associated with Terminal 5 and its related road proposals would inevitably increase noise levels in some locations the overall picture is that these increases would be relatively small. Some properties would actually experience an improvement in noise levels largely due to improved protection measures. I do not believe that the impact of road noise is likely to be significant in the overall balance because Terminal 5 would not result in substantial increases. Nevertheless noise associated with the M4 would remain high and I would support measures to reduce it regardless of Terminal 5. I shall return to this point later.

24 OVERALL NOISE EFFECTS

- 24.1.1 I have now examined the potential impact of Terminal 5 in terms of air noise, ground noise and road noise. Government policy in relation to air noise is not entirely clear but appears to recognise that there is a real prospect that further improvements in the noise climate cannot be relied on after 2002. At night the policy is to protect local communities against excessive aircraft noise but this has to be weighed against the need for night flights and the wider employment and economic implications, including the benefits that night flights bring to the competitive position of Heathrow and the airlines. Although the Government has decided that the effects of noise should be assessed by means of the LA_{eq} system, the Department accepted that, to consider the noise issue fully, I could not rely entirely on the $LA_{eq\ 16hour}$ contours. Other factors must be taken into account.
- 24.1.2 Even if it were judged purely in terms of the $LA_{eq\ 16hour}$ contour, I have concluded that Terminal 5 would significantly reduce the improvement in the air noise climate around Heathrow which would occur if it were not built. However, assuming Concorde were no longer flying, the overall noise climate would still be better in 2016 with Terminal 5 than it was in 1994. From this very limited viewpoint, the objectives of Government policy would be met. On the other hand, aircraft movements would be more frequent if Terminal 5 were approved and I do not believe that the LA_{eq} index takes full account of this factor. Furthermore, people living around Heathrow experience more severe noise problems than at any other airport in the UK or Europe as a consequence of the number of aircraft movements most of which approach the airport over the heavily populated areas of west London.
- 24.1.3 Bearing in mind the need to take other factors into account, I am particularly concerned about noise at night. I have found that the existing operations cause substantial sleep disturbance and significant annoyance. Terminal 5 would be likely to cause a deterioration in the noise climate at night. While the number of flights in the night quota period would probably not increase significantly as a result of Terminal 5, the increased size of aircraft associated with it would increase the potential for sleep disturbance and annoyance. The provision of Terminal 5 would also cause particular problems in the sensitive early morning period. This would exacerbate existing problems and must be a material factor of substantial weight in the final decision. There is, however, some scope to control the impact of aircraft noise by changing the current westerly preference and by limiting movements both in overall terms and in the critical early morning period.
- 24.1.4 As far as ground noise is concerned Terminal 5 would increase the level of noise around the western end of the airport. The impact of that increase would, however, be limited by background noise levels. The new Ground Running Pen would be particularly significant as a noise source although its impact could be limited by appropriate operating procedures and planning conditions. Overall the impact of ground noise would be less significant than that of air noise.
- 24.1.5 Road noise is likely to be less significant than either air or ground noise. While some increases are likely they should be relatively small.

- 24.1.6 I now need to consider the relevance of the cumulative impact of all of these factors. **The Department** argued that noise sources needed to be considered separately as there was no established method for determining their combined effects²³⁰⁴. **BAA** pointed to the difficulties in interpreting noise surveys. Annoyance appeared to be largely independent of combined exposure and much more closely related to the type of noise and its specific level²³⁰⁵. A focus on aggregate noise environments was, therefore, somewhat unnatural²³⁰⁶. Where one noise masked another separate assessments were likely to exaggerate the true effect and other sources unrelated to the airport contributed to the overall noise climate around Heathrow²³⁰⁷.
- 24.1.7 On the other hand, **Hillingdon** argued that it would be wrong to continue to assess noise impacts on the basis that one noise hid or masked another. A proper assessment should be made of the total noise climate²³⁰⁸. The 3 main modes of runway operation (westerly departures on runway 27 Left, westerly departures on runway 27 Right and easterly departures on runway 09 Right) should be taken into account²³⁰⁹. At particular times road traffic noise and engine testing noise could not be masked by air noise; they would be heard between aircraft events²³¹⁰. Detailed assessments of 3 sites had shown that air, ground and road noise were additive with reasons for particular concern between 23.00 and 07.00 hours. Overall Terminal 5 would cause a significant worsening in comparison with the forecasts for only 4 terminals. If levels exceeded 67-68dB(A) there would be adverse effects on health which would be a reason for refusal of planning permission. The effect on health could not be outweighed by other considerations²³¹¹.
- 24.1.8 In assessing the effects of each element of noise likely to be generated as a result of the construction of Terminal 5, the parties concerned have for the most part attempted to isolate the specific component concerned. Air noise has been examined independently of ground noise, ground noise independently of road noise and each has been assessed separately from road noise. While I have noted that some of the effects of ground and road noise would be masked by background levels, my conclusions on each element are based on the specific and separate impacts they would have. In taking this approach, I consider that the total effect of air, ground and road noise is likely to have been exaggerated to some extent.
- 24.1.9 On the other hand, I appreciate that people living close to Heathrow may well be affected by all 3 sources. For much of the time the effects of ground and road noise may well be minimal since they are masked by air noise. However, air noise consists of a series of discrete noise events and it is beyond dispute that ground or road noise would be heard between these discrete events. Consequently those people will get less relief from noise than they would if they were not also exposed to these other noise sources. I have noted the additional comments Hillingdon made in relation to the effects of noise on health. I have, however, already dealt with this point and have nothing to add to my earlier conclusions.
- 24.1.10 It is impossible to draw a precise balance between the over-estimates inherent in assessing each noise source separately and the added annoyance resulting from ground or road noise filling the gaps between air noise events. As both the

²³⁰⁴ 5-7.2.1

²³⁰⁵ 5-7.3.1

²³⁰⁶ 5-7.3.3

²³⁰⁷ 5-7.3.4

²³⁰⁸ 5-7.4.2

²³⁰⁹ 5-7.4.3

²³¹⁰ 5-7.4.4

²³¹¹ 5-7.4.5

Department and BAA noted there is no method which can do this effectively. I shall, therefore, proceed on the basis of my separate conclusions on each of the air, ground and road noise aspects of this proposal whilst noting that for some people who are exposed to more than one of them the potential annoyance could be greater. I shall take this cautious approach in reaching my final conclusions.

- 24.1.11 Taking noise as a whole I therefore find that the adverse impact of Terminal 5 in terms of ground and road noise is unlikely to be significant. However, each could increase overall annoyance in areas close to the airport where they would increase noise levels between air noise events. The harm Terminal 5 would cause in terms of air noise is likely to be substantial. At best it would reduce the potential improvement in noise levels during the day as measured by the $LA_{eq\ 16hour}$. The increased number of movements likely to result from the provision of Terminal 5 (which experience might well show to be capable of exceeding the 480,000 on which I have based my conclusions) could prove to be more disturbing than the LA_{eq} system would suggest. Furthermore the size of aircraft is also likely to increase. Terminal 5 is likely to have a particularly significant impact in relation to the increase in the number of aircraft arriving in the sensitive early morning period. In overall terms, Terminal 5 would cause a material deterioration in the noise climate as compared with the position with only 4 terminals.

25 AIR QUALITY

25.1 INTRODUCTION

- 25.1.1 The analysis of the impact of development on air quality is a comparatively new subject. My consideration of it at the Terminal 5 inquiry was greatly assisted by the UK National Air Quality Strategy (CD/240) and Circular 15/97 on Local Air Quality Management with its accompanying guidance notes (CD/248). Although proposals to amend the Strategy were published for consultation during the course of the inquiry the parties were not able to consider the implications of any actual changes to the Strategy since these had not emerged before the close of the inquiry.
- 25.1.2 As with other topics, my task on air quality was eased by the work of the Joint Data Group which narrowed the areas of disagreement on data and modelling. As a result I was able to concentrate on the key issues. Nevertheless, some disagreements remained. This means that in dealing with the main issues I shall have to resolve a number of technical matters such as the accuracy of the modelling process and the ability to identify those areas likely to be subjected to concentrations of pollutants exceeding the national objectives.
- 25.1.3 Modelling was used to calculate the potential for emissions and their dispersion to give an indication of the concentrations of particular pollutants at chosen points or receptors. The impact of those concentrations was then assessed in relation to the national policies to which I have just referred. Evidence was also presented on the impact of air travel on climate change.
- 25.1.4 The 3 main issues which need to be addressed are;
- The effect of increased aircraft movements and road traffic associated with Terminal 5 on air quality and, in particular, on the objectives of the National Air Quality Strategy;
 - The effect of any breaches of these objectives on human health and the quality of life, and;
 - The effect of Terminal 5 on international obligations to limit emissions of greenhouse gases

25.2 THE EFFECT ON THE OBJECTIVES OF THE NATIONAL AIR QUALITY STRATEGY

BAA's Case

- 25.2.1 BAA argued that while the impact of development on air quality was important it must be weighed against other material considerations. To be a potential ground for the refusal of planning permission the impact would have to be significant²³¹². The only significant pollutants in this case were nitrogen dioxide (NO₂), particulates (PM₁₀) and ozone²³¹³. The parties had agreed on the standards against which air quality should be assessed. The standards in the National Air Quality Strategy

²³¹² 6-2.1.1

²³¹³ 6-2.2.1

represented a level of zero risk to health, whereas the objectives had been set having regard to costs, benefits and the feasibility of reaching those standards²³¹⁴.

25.2.2 Monitoring of air quality around Heathrow had revealed that NO₂ levels were similar to or better than those in central and west London although the National Air Quality Strategy objectives were exceeded at most sites²³¹⁵. Whilst the objective for PM₁₀ would be exceeded at all monitoring sites around Heathrow the same would be true of many roadside and urban sites²³¹⁶. Concentrations of ozone would have exceeded the objective west of the M25 and possibly around the airport but not in the more urban areas of Hillingdon and Hounslow²³¹⁷.

25.2.3 Except when modelling road traffic sources of pollution, the local authorities and BAA had adopted the same modelling method. The authorities had accepted that the work on Terminal 5 had been particularly impressive²³¹⁸. There were, however, 5 areas of dispute;

- Forecasts of air and road traffic;
- The location of receptors;
- The extent and implications of uncertainty;
- The account to be taken of ozone, and;
- The account to be taken of greenhouse gases²³¹⁹.

25.2.4 The forecasts of air and road traffic had been debated in other topics but BAA asserted that those used by the authorities were inappropriate²³²⁰. However, both sides accepted that the sites on the perimeter of the airport represented the maximum likely exposures to members of the public²³²¹. Although the local authorities contended that there was considerable uncertainty about the modelling, BAA argued that future concentrations were as likely to have been over-estimated as under-estimated²³²². It had been agreed that the uncertainties associated with the long period of the forecasts were likely to be greater than those associated with the differences Terminal 5 would make²³²³. Comparisons with the monitoring data had shown that the model over-estimated concentrations of each pollutant. There was a particular over-estimate in relation to NO_x and the Joint Data Group had agreed that an adjustment factor of 2.76 should be applied to this²³²⁴.

25.2.5 Monitoring of short period concentrations showed variations which could not be modelled but it appeared that NO₂, PM₁₀ and sulphur dioxide concentrations had been over-estimated while those for carbon monoxide had been under-estimated²³²⁵.

²³¹⁴ 6-2.2.2
²³¹⁵ 6-2.2.3
²³¹⁶ 6-2.2.4
²³¹⁷ 6-2.2.5
²³¹⁸ 6-2.3.1
²³¹⁹ 6-2.3.3
²³²⁰ 6-2.3.7
²³²¹ 6-2.3.8
²³²² 6-2.3.9
²³²³ 6-2.3.10
²³²⁴ 6-2.3.11
²³²⁵ 6-2.3.13

However, BAA argued that the best available data had been used. They believed that their forecasts of concentrations represented a cautious best estimate²³²⁶.

- 25.2.6 BAA argued that no evidence had been put forward to support the local authorities' contention that flow breakdown on motorways would be greater with Terminal 5 than in the four terminal case²³²⁷. Nor was there evidence to show whether flow breakdown would increase or decrease emissions. It was therefore impossible to make a reliable judgement on the extent to which this contributed to uncertainty²³²⁸. Although the authorities had argued that the disturbance of dust by passing vehicles (resuspension) had been significantly under-estimated, they had relied upon data from the United States. BAA argued that this was inappropriate given the much wetter climate in this country as the Quality of Urban Air Review group had found²³²⁹. In any event, the authorities had not quantified the effect on the difference Terminal 5 would make²³³⁰. Similarly, no evidence had been produced to support a higher level of failure for catalytic converters than that agreed by the Joint Data Group²³³¹.
- 25.2.7 Although BAA accepted that there was uncertainty about future legislation on emission controls, they said that the assumptions they had adopted had been agreed between the main parties. The assumption made for PM₁₀ had been appropriate and that adopted for NO_x had been cautious²³³². BAA also argued that the differences between the earlier forecasts and those now relied upon had been very small after allowing for the use of the agreed correction factor for NO_x²³³³. These differences reflected improvements in modelling and did not help in forming a view about the uncertainties of that modelling²³³⁴.
- 25.2.8 The forecasts of concentrations over shorter periods were affected by the fact that detailed information on variations in weather, topography and local emission sources was not available. The local authorities had argued that future concentrations were as likely to have been under-estimated as over-estimated, but BAA argued that this was contrary to the evidence that the Heathrow results fell below the regression curves derived from monitoring throughout the country²³³⁵.
- 25.2.9 With regard to the authorities' argument that the correction factor applied to the NO_x prediction had eliminated any conservatism in the model²³³⁶ BAA pointed out that the authorities had accepted that aircraft emissions were particularly important for receptors close to the airport perimeter. Aircraft emissions were also related to 3 of the 4 reasons for the over- estimates of NO_x in the model²³³⁷. Since aircraft emissions would be more important in 2016, the correction factor of 2.76 would not be as effective in the future as it had been in the past. As a result the forecasts were likely to have over-estimated concentrations of NO_x²³³⁸.

²³²⁶ 6-2.3.14

²³²⁷ 6-2.3.18

²³²⁸ 6-2.3.19

²³²⁹ 6-2.3.20

²³³⁰ 6-2.3.21

²³³¹ 6-2.3.22

²³³² 6-2.3.23-25

²³³³ 6-2.3.26

²³³⁴ 6-2.3.27

²³³⁵ 6-2.3.28-29

²³³⁶ 6-2.3.30

²³³⁷ 6-2.3.31

²³³⁸ 6-2.3.32

- 25.2.10 Having examined all of the local authorities' arguments BAA did not accept their assertion that the models were likely to under-estimate future concentrations²³³⁹.
- 25.2.11 BAA also argued that it was difficult to forecast ozone concentrations but the work they had carried out did not indicate any distinguishable difference due to Terminal 5²³⁴⁰. Although the authorities suggested that Terminal 5 would increase downwind ozone concentrations, their method was flawed. BAA's judgement that, within the scope of the modelling, the differences would be indistinguishable had not been challenged²³⁴¹.
- 25.2.12 The assessment made by West London Friends of the Earth was also flawed. It relied on the assumption that ground level concentrations were related to emissions in a linear manner and that Heathrow could operate 500,000 atms in segregated mode. They had also used a factor based on the difference between percentage increases in passenger numbers and atms. BAA argued that the approach adopted by West London Friends of the Earth could not be used in the assessment of the impact of Terminal 5²³⁴².
- 25.2.13 BAA had assessed the impact of Terminal 5 by looking at the differences between the position with 4 terminals and that with 5. They had also considered 4 sensitivity cases²³⁴³. In broad terms the following effects had been identified;
- If Terminal 5 were not built, air quality would be better in 2016 than it had been in 1993;
 - If it were built there would be a slight deterioration compared with the position with only 4 terminals but air quality would remain largely better than in 1993;
 - A few of the National Air Quality Strategy objectives would be breached in the 4 terminal case and slightly more with Terminal 5, and;
 - The airport's contribution to concentrations in both cases would be the result of more aircraft movements and a falling contribution from road traffic²³⁴⁴.
- 25.2.14 The annual mean and peak hour objectives for NO₂ and the 99th percentile daily mean objective for PM₁₀ would be breached in both cases but more often if Terminal 5 were built²³⁴⁵. While the sensitivity tests showed only small differences, these were greater in the cases assuming 100 mppa. The number of breaches was not increased but the margins by which the objectives were breached increased²³⁴⁶. Concentrations of benzene were well within the National Air Quality Strategy objectives²³⁴⁷.

²³³⁹ 6-2.3.34

²³⁴⁰ 6-2.4.1

²³⁴¹ 6-2.4.4

²³⁴² 6-2.6.1-5

²³⁴³ 6-2.7.1

²³⁴⁴ 6-2.7.3

²³⁴⁵ 6-2.7.4

²³⁴⁶ 6-2.7.5

²³⁴⁷ 6-2.7.6

- 25.2.15 The Guidance note LAQM G4(97) which accompanied Circular 15/97 said that a significant impact on air quality could justify refusal of planning permission but a significant impact must, in BAA's view, be one that caused demonstrable harm to an interest of acknowledged importance. That should be judged in health terms²³⁴⁸. The Guidance Note did not suggest that an increase in emissions would be objectionable in planning terms²³⁴⁹ and where concentrations were below the National Air Quality Strategy objectives it would be proper to conclude that the impact of Terminal 5 would not be significant²³⁵⁰. It could be significant if a development caused objectives to be exceeded or if it resulted in an increase in the margin of any breach²³⁵¹.
- 25.2.16 The only basis for the assessment of future impacts was the standards and objectives in the National Air Quality Strategy. These had not changed much in the past and they were not expected to change much in the future²³⁵².
- 25.2.17 Heathrow was playing its part in meeting the national objectives for example by taking measures to reduce the use of auxiliary power units by aircraft, by the use of electric vehicles and by the provision of alternative fuels for ground vehicles and encouraging the use of public transport²³⁵³.
- 25.2.18 BAA said that the National Air Quality Strategy objectives related to the year 2005 and there was no basis for believing that the date for compliance would be either brought forward or deferred. The impact of Terminal 5 should be assessed against these objectives and the degree of significance attached to the differences in concentrations could only be assessed in terms of the effect on health²³⁵⁴. They were relevant to a judgement as to whether a development would be harmful but were not intended to be criteria by which acceptability could be decisively determined²³⁵⁵. If the approach favoured by the local authorities were correct the National Air Quality Strategy would prevent development in areas where air quality was close to or above the objectives. This was manifestly not the intention of the Strategy or Government policy generally²³⁵⁶.
- 25.2.19 There would be considerable difficulties in meeting the objectives in urban areas but the Government wished to increase development on sites in these areas. The Strategy recognised that it might not be cost-effective to bridge the gap of 5-10% to meet the objectives²³⁵⁷. BAA accepted that an Air Quality Management Area would probably have to be designated around Heathrow. Terminal 5 would make it harder to meet the objectives but would not affect the ability of the local authorities to fulfil their duties²³⁵⁸.
- 25.2.20 Although the authorities had referred to an appeal decision to support their view that a development which would reinforce or perpetuate an existing unsatisfactory situation could in itself be harmful, BAA pointed out that this had been an enforcement decision which had been determined on legal grounds. It was,

²³⁴⁸ 6-2.8.1

²³⁴⁹ 6-2.8.2

²³⁵⁰ 6-2.8.3

²³⁵¹ 6-2.8.4

²³⁵² 6-2.8.7

²³⁵³ 6-2.8.5

²³⁵⁴ 6-2.9.2

²³⁵⁵ 6-2.9.3

²³⁵⁶ 6-2.9.4

²³⁵⁷ 6-2.9.5

²³⁵⁸ 6-2.9.6

therefore, not known whether the Secretary of State had adopted this view. It seemed unlikely that the Inspector had been referring to air quality and there was no reference to weighing economic benefits against the environmental impacts²³⁵⁹.

- 25.2.21 BAA disputed the authorities' contention that there was pollution "hot spot" around Heathrow. This contention was based on data from the Highways Agency which were inconsistent with local authority data²³⁶⁰. In any event the "hot spot" should be assessed in the light of BAA's study of the health effects of pollution. This showed either that levels of pollution were the same in the study area around Heathrow and in BAA's control area (i.e. that there was no "hot spot") or that differences in pollution levels did not manifest themselves in diseases related to pollution in the study area. Since the local authorities did not accept the first conclusion they must accept the second²³⁶¹.
- 25.2.22 BAA suggested that the review of the National Air Quality Strategy indicated the way in which Government policy was moving²³⁶². The Review suggested that the hourly objective for PM₁₀ should be eased²³⁶³ and continued the emphasis on the need to balance costs and benefits in setting the objectives. It concluded that action in London to meet the National Air Quality Strategy objectives for PM₁₀ and NO₂ would be costly in relation to the relatively small benefits to be obtained. As a result, measures to meet the NO₂ annual mean objective were found to be unjustifiable. The Review also said that authorities should not take extreme measures which could cause serious disruption to their local economies²³⁶⁴.
- 25.2.23 In BAA's view, the impact of Terminal 5 on air quality should be weighed in the overall balance. Where the National Air Quality Strategy objectives were breached, a judgement had to be made as to the significance of those breaches based on the extent to which they were caused by the development and the implications for health²³⁶⁵. In this case the changes in NO₂ resulting from the construction of Terminal 5 would not be large²³⁶⁶ and those in PM₁₀ would be small²³⁶⁷.

The Department's Case

- 25.2.24 The Department of the Environment, Transport and the Regions explained the position of neutrality that it had adopted with regard to aviation matters generally applied also to the air quality impact of Terminal 5 from aviation sources. There could be no doubt as to the importance placed by the Government on air quality²³⁶⁸. The Government sought improvements in aircraft emissions through international agreements and supported research into the effects of aircraft emissions²³⁶⁹. The Department recognised that aircraft emissions contributed to long range pollution, acid rain and eutrophication problems. They were responsible for 2-3% of man-made CO₂ emissions and for NO_x which was a greenhouse gas when emitted at higher altitudes²³⁷⁰.

²³⁵⁹ 6-2.9.8

²³⁶⁰ 6-2.11.2

²³⁶¹ 6-2.11.3-4

²³⁶² 6-2.13.1

²³⁶³ 6-2.13.2

²³⁶⁴ 6-2.13.3

²³⁶⁵ 6-2.14.1

²³⁶⁶ 6-2.14.3

²³⁶⁷ 6-2.14.4

²³⁶⁸ 6-3.1.1

²³⁶⁹ 6-3.1.2

²³⁷⁰ 6-3.1.3

- 25.2.25 Greater fuel efficiency and airframe use had lead to a doubling of passenger distance flown per unit of fuel in the last 20 years with significant falls in levels of smoke, CO and hydrocarbons. Traffic was likely to grow by 5-6% a year but fuel consumption would grow by only 3-4% a year²³⁷¹. Venting of unburned fuel was prohibited except in an emergency; it was unlikely to be the source of kerosene odours²³⁷².
- 25.2.26 The Department argued that airports should work within the National Air Quality Strategy but international studies indicated that emissions within airports were unlikely to exceed air quality limits. In 1987 and 1989 studies had shown that air quality standards were met near Terminal 4 except for CO where the excess had been due to road traffic²³⁷³. The totality of information available had led the Government to the view that in general air traffic was unlikely to be a major contributor to breaches of air quality standards around airports. In future however, the relative contribution from aircraft was likely to increase as that from road traffic declined²³⁷⁴. The Department had not compared the assumptions made by BAA in this case with those in use internationally²³⁷⁵.

The Highways Agency's Case

- 25.2.27 The Highways Agency had assessed the effect of the M4 improvements and the M25 Spur Road in the context of Government policy²³⁷⁶. The Agency had no doubt about the importance placed by the Government on air quality²³⁷⁷. The standards in the National Air Quality Strategy were based on health effects and would avoid significant risk. The objectives were, however, policy targets which took into account the feasibility, costs and benefits of achieving the standards²³⁷⁸. The recently published Review of the Strategy was a consultative document but indicated Government thinking²³⁷⁹.
- 25.2.28 The Agency argued that the Strategy assumed that national policies would be sufficient to achieve the objectives in most areas but that local air quality management would be needed where existing policies were insufficient to meet the targets. Air quality plans would be produced where there were breaches of the objectives²³⁸⁰. In the planning field there was no requirement that a proposal which would lead to the breach of the objectives should be refused planning permission²³⁸¹.
- 25.2.29 The indicative standards of the European Union for 2005 covering vehicle emissions included further tightening of standards²³⁸². It was likely that emissions would continue to fall in the period up to 2010 but begin to rise again after that date as growth in road traffic offset reductions in emissions from individual vehicles. Government policy was, however, to secure its air quality objectives by 2005 and sustain those levels once they had been achieved²³⁸³.

²³⁷¹ 6-3.1.6
²³⁷² 6-3.1.7
²³⁷³ 6-3.1.12
²³⁷⁴ 6-3.1.14
²³⁷⁵ 6-3.1.15
²³⁷⁶ 6-4.1.1
²³⁷⁷ 6-4.1.4
²³⁷⁸ 6-4.1.5
²³⁷⁹ 6-4.1.7
²³⁸⁰ 6-4.1.9
²³⁸¹ 6-4.1.10
²³⁸² 6-4.1.12
²³⁸³ 6-1.13

- 25.2.30 The assessment carried out by the Agency in this case had followed the procedures set out in the Design Manual for Roads and Bridges²³⁸⁴. The final detailed study had been based on assessment criteria agreed between the main parties and taking into account the most up to date advice²³⁸⁵. Discussions prior to the inquiry had enabled a large measure of agreement to be reached, including the fact that the principal concerns related to NO₂ and PM₁₀. Modelling results had been presented as contours which showed areas where specific concentrations were exceeded²³⁸⁶.
- 25.2.31 It had been necessary to convert the predictions for NO_x into those for NO₂ since it was the latter which was the cause for concern. The Agency had done this using an approach known as the “Probability of Exceedance Method”²³⁸⁷. This had not been accepted by the local authorities who had adopted the approach used by BAA, known as the “Short Term Method” to calculate short period concentrations²³⁸⁸.
- 25.2.32 By 2016 in the areas affected by the M4 improvements the NO₂ annual objective would be exceeded at a small number of properties whether the improvements were carried out or not. Using the Agency’s own method the areas affected would be marginally larger if the scheme were built but if legislation expected to lead to the reduction of emissions were taken into account the objective was unlikely to be breached at any site²³⁸⁹. There was a possibility that one of the PM₁₀ objectives might be breached in 2016 both with and without the M4 improvements but the concentrations by then would be lower than in 2003 and the differences caused by the improvements were small²³⁹⁰.
- 25.2.33 As far as the Spur Road was concerned, the Agency’s predictions showed that the annual objective for NO₂ would be exceeded on the Colne industrial Estate in 2016 with and without the new road although the areas covered would be marginally larger with the scheme²³⁹¹. The difference resulting from the new road in terms of PM₁₀ would be negligible²³⁹².
- 25.2.34 Areas close to roads other than the M4 and the Spur Road had also been examined. There was very little difference between the forecasts made by the Agency and those of the local authorities for the significant receptors²³⁹³. There would be consistent improvements on the 1993 position and the Agency took the view that the road proposals would have a negligible impact²³⁹⁴.
- 25.2.35 The Agency also argued that the local authorities had been inconsistent in their approach to traffic forecasts. They had adopted a throughput of 100 mppa for the airport and a 70 mph speed limit on the M4 although the Agency had assumed a 50 mph speed limit which Hounslow clearly wished to see²³⁹⁵. Although the authorities had criticised the lack of more distant receptors, the methodology the Agency had used had shown that the changes at many of the authorities’ receptors would be small²³⁹⁶. There was no reason to depart from the principle that if no problem was

²³⁸⁴ 6-4.2.1

²³⁸⁵ 6-4.2.2

²³⁸⁶ 6-4.3.3

²³⁸⁷ 6-4.3.4

²³⁸⁸ 6-4.3.5

²³⁸⁹ 6-4.3.6

²³⁹⁰ 6-4.3.7

²³⁹¹ 6-4.3.9

²³⁹² 6-4.3.10

²³⁹³ 6-4.3.13

²³⁹⁴ 6-4.3.15

²³⁹⁵ 6-4.4.1 and Day 419 p13

²³⁹⁶ 6-4.4.4

identified in areas close to the road it was reasonable to assume that there would be none elsewhere²³⁹⁷.

- 25.2.36 Criticisms by the local authorities of the Probability of Exceedance Method used by the Agency to calculate hourly mean concentrations of NO₂ were not justified. The method had been derived from observations at 3 motorway sites and had over-estimated the number of hours when the concentrations were above the hourly objective at 2 sites and under-estimated by one hour at the third. It had produced good agreement for the annual mean concentration at one site and under-estimated at the other 2²³⁹⁸. The method adopted by BAA had not used any motorway sites and by its nature would over-estimate concentrations near the M4²³⁹⁹. The 2 methods were complementary; both should be considered as the Agency had done²⁴⁰⁰.
- 25.2.37 The Agency accepted that there were many uncertainties which might affect the predicted concentrations but argued that most would have an impact of less than 10%²⁴⁰¹. Since these uncertainties would affect the predictions both with and without the road schemes the differences between the cases would remain about the same. Greater confidence should be attached to the differences between the cases than to the predictions of absolute concentrations²⁴⁰². There was no basis for an objective assessment of the potential effect of flow breakdown²⁴⁰³. There was no indication of when flows might break down or for how long²⁴⁰⁴ but it was likely that the effect would be small compared with the uncertainties in the agreed emission factors²⁴⁰⁵. The Agency accepted that there was uncertainty about resuspension of road dust but suggested that it was a factor in the overall uncertainty inherent in modelling²⁴⁰⁶.
- 25.2.38 In the view of the Agency, the effect of legislation expected to take effect in 2000 and 2005 would be to reduce the predicted concentrations of NO_x. Although this factor had not been included in the modelling, the expected legislation should be taken into account. Sensitivity tests had suggested that, if this were done, the National Air Quality Strategy annual objective for NO₂ might just be exceeded in a narrow band along the M4 but that the peak hour objective would be met²⁴⁰⁷.
- 25.2.39 The recently published Review of the National Air Quality Strategy showed advances in research and Government thinking. It concluded that annual mean concentrations of NO₂ would exceed the objectives at many locations in London. There would also be widespread breaches of the PM₁₀ objectives²⁴⁰⁸. While the annual objective for NO₂ would be retained, the cost of achieving it would be high in relation to the benefits and in some cases could not be justified in cost-benefit terms. The objective would be reconsidered and in doing so the Government would ensure that local authorities did not have to take extreme action which would lead to severe disruption or damage to their local economies²⁴⁰⁹.

²³⁹⁷ 6-4.4.5

²³⁹⁸ 6-4.4.7

²³⁹⁹ 6-4.4.8

²⁴⁰⁰ 6-4.4.9

²⁴⁰¹ 6-4.5.1

²⁴⁰² 6-4.5.2

²⁴⁰³ 6-4.5.3

²⁴⁰⁴ 6-4.5.4

²⁴⁰⁵ 6-4.5.5

²⁴⁰⁶ 6-4.5.7

²⁴⁰⁷ 6-4.5.9

²⁴⁰⁸ 6-4.7.1

²⁴⁰⁹ 6-4.7.2

- 25.2.40 The predicted concentrations associated with both schemes had been reassessed in the light of the proposed new objectives set out in the Review. Concentrations of PM₁₀ would be within the 24 hour objectives both with and without the scheme on the method adopted by the Agency and would be within the range expected for the objective when converted from the European Union to the UK system of measurement. Concentrations of NO₂ would satisfy the revised one-hour objective²⁴¹⁰.
- 25.2.41 The Agency did not accept that the modelling had been misleading due to a failure to model coarse particles. The model accurately represented measurements in the base case. Furthermore, additional legislation to restrict emissions of particles from heavy goods vehicles had been agreed; this would reduce emissions to a greater extent than suggested by the authorities²⁴¹¹.

Hillingdon and Hounslow's Case

- 25.2.42 In presenting a joint case Hillingdon and Hounslow (the local authorities) argued that the understanding of the harmful effects of air pollutants had advanced significantly in recent years²⁴¹². The National Air Quality Strategy was a watershed in the history of measures to control and improve the quality of air in the UK. A more comprehensive framework for the management of air quality was now considered to be both necessary and feasible²⁴¹³. The standards in the Strategy were those at which scientific evidence indicated there was a zero or minimal risk to health. Policy was directed towards getting air quality as close to those standards as was reasonable and justifiable taking into account both costs and benefits²⁴¹⁴.
- 25.2.43 The Strategy required that local authorities should declare Air Quality Management areas where the objectives were unlikely to be achieved and to produce action plans for improvements. Even without Terminal 5 it was almost certain that a Management Area would have to be declared around Heathrow. Where the impact of a development was likely to be significant in air quality terms, planning permission might be refused²⁴¹⁵.
- 25.2.44 Since the base date for the Terminal 5 Environmental Statement standards had been made more stringent, illustrating the tendency of standards to tighten over time²⁴¹⁶. Nevertheless no changes had been made to the proposals to take account of these changes²⁴¹⁷. Levels of NO₂ around Heathrow were similar to the highest of central London sites and must be reduced to the objectives set in the National Air Quality Strategy by 2005. The authorities argued that it was Government policy that emissions should be reduced at sources and that this might involve the refusal of planning permissions in some cases²⁴¹⁸.
- 25.2.45 In the view of the local authorities, the Government was firm in its resolve to eliminate "hot spots". It estimated that the gap to be closed was some 5-10% for both NO₂ and PM₁₀. When other hot spots had been removed, Heathrow would stand out and it would stand out by a greater amount if Terminal 5 were approved.

²⁴¹⁰ 6-4.7.4

²⁴¹¹ 6-4.7.5

²⁴¹² 6-5.1.1

²⁴¹³ 6-5.1.3

²⁴¹⁴ 6-5.1.4

²⁴¹⁵ 6-5.1.6

²⁴¹⁶ 6-5.1.8

²⁴¹⁷ 6-5.1.12

²⁴¹⁸ 6-5.1.9

BAA had accepted that the strategy would have failed if its objectives were not met²⁴¹⁹.

- 25.2.46 In relation to Heathrow, the authorities argued that the only effective means of control was through the planning system. This meant that the choice was between pursuit of the Strategy and the construction of Terminal 5²⁴²⁰. Nearly 90% of aircraft NO_x emissions were not amenable to control and in total some 84% of airport emissions at 2016 would be uncontrollable²⁴²¹. The net additional emissions as a result of Terminal 5 would be comparable with the total emissions of Reading or Huddersfield²⁴²². Neither BAA nor the Highways Agency had acted in accordance with the National Air Quality Strategy which encouraged all bodies to play a part in improving air quality²⁴²³. The Department did not appear to take any account of the impact on air quality of increases in the number of aircraft movements²⁴²⁴. Although they had argued that emissions from aircraft were only a small part of pollution around airports, they had ignored the fact that aircraft were not the only source of pollution around the airport. In any event the authorities argued that there was increasing concern over aircraft emissions.
- 25.2.47 Terminal 5 was likely to increase the contribution of the airport itself by some 20%²⁴²⁵. Aircraft would contribute 73% of total NO_x emissions in the area near to the airport by 2016 even without Terminal 5; with Terminal 5 that would rise to 78%²⁴²⁶.
- 25.2.48 The authorities had carried out further interpretation of the data submitted by BAA. This demonstrated that the contour corresponding to the National Air Quality Strategy annual objective for NO₂ would be more extensive if Terminal 5 were built²⁴²⁷. A broad band some 200m wide north of the M4, including residential areas, would experience levels of NO₂ above the annual mean. Residential properties on the Bath Rd and in Longford would also be exposed to levels above the objective²⁴²⁸. A similar picture emerged in relation to PM₁₀ where the objective would be exceeded for 200m north of the M4 and in Bedfont Court²⁴²⁹.
- 25.2.49 The modelling carried out for the authorities gave results comparable to those produced for BAA²⁴³⁰. It had, however, highlighted deficiencies in the assessments carried out by the Highways Agency for the Environmental Statements²⁴³¹. The only remaining disagreements regarding the modelling related to the effects of flow breakdown, resuspension of road dust, failure rates for catalytic converters and the impact of future legislation. The authorities were simply underlining uncertainty by referring to these factors and illustrating the fact that no party had used assumptions which would lead to unrealistically high predictions of concentrations²⁴³².

²⁴¹⁹ 6-5.2.3

²⁴²⁰ 6-5.1.10

²⁴²¹ 6-5.1.18

²⁴²² 6-5.1.11

²⁴²³ 6-5.1.13

²⁴²⁴ 6-5.1.14

²⁴²⁵ 6-5.1.15

²⁴²⁶ 6-5.1.16

²⁴²⁷ 6-5.4.1

²⁴²⁸ 6-5.4.3

²⁴²⁹ 6-5.4.4

²⁴³⁰ 6-5.5.1

²⁴³¹ 6-5.5.2

²⁴³² 6-5.5.3

- 25.2.50 It was not possible to tell whether the adjustment made to the predicted NO_x concentrations would apply in the future²⁴³³. Similarly it was not easy to test the conclusion that the two methods of calculating short term concentrations were sufficiently close for any difference to be explained by uncertainty²⁴³⁴. The conclusions of the Agency regarding these concentrations should be set aside²⁴³⁵. The contention that the fact that the locally measured data fell below the regression line indicated that the Short Period Methodology over-estimated concentrations was not accepted by the local authorities. By definition observations would be scattered around the best fit regression line and the National Air Quality Strategy dealt with absolute figures recorded from day to day or year to year²⁴³⁶.
- 25.2.51 The authorities also believed that Terminal 5 would lead to a significant increase in ozone concentrations with the National Air Quality Strategy standard being exceeded²⁴³⁷.
- 25.2.52 Although the differences due to Terminal 5 were important, the authorities argued that the relationship between future concentrations and the National Air Quality Strategy were of greatest importance²⁴³⁸. The Government expected the airport to play its part in meeting these objectives but, where appropriate, to go further. To permit a development which would lead to breaches of the objectives would essentially negate the whole purpose of the Strategy²⁴³⁹. Terminal 5 would be a major challenge to the Strategy and would signal that it did not really matter if the air quality objectives were not met²⁴⁴⁰.
- 25.2.53 The local authorities argued that, even on BAA's own figures, NO₂ concentrations would be increased so that an average breach of 8% over the objective for all 6 receptors around the airport would rise to an exceedance of 21%²⁴⁴¹. Similarly the average breach for PM₁₀ would be increased from 10% to 17%²⁴⁴². Concentrations around the road schemes would either be increased above the objectives or the margin of the breach would be increased²⁴⁴³. Although the authorities accepted that the overall differences due to Terminal 5, including its associated road schemes, were small they were similar to the 5-10% gap which the Secretary of State had identified as warranting special attention²⁴⁴⁴.
- 25.2.54 In air quality terms, the authorities said that the whole impact would be negative. Heathrow was in an area which already experienced the highest levels of NO₂ and PM₁₀ in the country and similar to those in central London. Air quality in the area would exceed the objectives set in the National Air Quality Strategy and would become an Air Quality Management Area. Terminal 5 would make these objectives virtually impossible to secure and a 5 terminal airport would be the biggest single reason why they could not be met²⁴⁴⁵. The choice before the Secretary of State was

²⁴³³ 6-5.5.4

²⁴³⁴ 6-5.5.5-6

²⁴³⁵ 6-5.5.8

²⁴³⁶ 6-5.5.9

²⁴³⁷ 6-5.5.10

²⁴³⁸ 6-5.6.2

²⁴³⁹ 6-5.6.3

²⁴⁴⁰ 6-5.6.4

²⁴⁴¹ 6-5.6.6

²⁴⁴² 6-5.6.7

²⁴⁴³ 6-5.6.9

²⁴⁴⁴ 6-5.6.10

²⁴⁴⁵ 6-5.6.12

to have either Terminal 5 or the National Air Quality Strategy. If the Strategy did not bite on a proposal of this scale it would be lost²⁴⁴⁶.

- 25.2.55 The Review of the Strategy did not change these conclusions. It raised concerns about the inclusion of coarse particles and referred to the importance of resuspension²⁴⁴⁷. The proposed new objective for PM₁₀ could not be directly compared to the model results as it used a different measurement, while the proposed changes to NO₂ objectives did not have material implications for the inquiry²⁴⁴⁸.

Other Objectors' Cases

- 25.2.56 The Federation of Airport Noise Groups argued that BAA's predictions were optimistic but demonstrated that Terminal 5 would increase pollution when national policy was to reduce it²⁴⁴⁹. Present rates of pollution were 70 times greater than the national average²⁴⁵⁰. Very large volumes of Volatile Organic Compounds were being released at the airport from the use of jet fuel²⁴⁵¹ and it was highly unlikely that benzene emissions would fall by 50% as predicted²⁴⁵². Expansion of the airport would increase levels of ozone²⁴⁵³ while emissions of NO₂ would rise substantially²⁴⁵⁴.
- 25.2.57 West London Friends of the Earth (FOE) were concerned that increases in car parking, taxi and coach operations and freight handling would all contribute to a reduction in air quality with widespread effects²⁴⁵⁵. They argued that BAA had ignored the principle that the protection of the environment and the creation of wealth and jobs were complementary rather than alternatives and pointed out that Government was committed to improving air quality²⁴⁵⁶. All of the air quality standards must be met and pollution should be reduced as much as possible irrespective of the standards²⁴⁵⁷. The lack of discussion of ozone or the protection of vegetation meant that the case had not been fully examined²⁴⁵⁸.
- 25.2.58 Emissions from Heathrow were already huge²⁴⁵⁹ and Terminal 5 would increase them by 11% to 48%. Its impact should be assessed on the basis of 60 mppa without Terminal 5 and 100 mppa with it. FOE had made some adjustments to BAA's estimates to reflect deficiencies in them. Even if some of their adjustments were unjustified they showed how sensitive the forecasts were²⁴⁶⁰. The forecast concentrations for NO₂, PM₁₀ and SO₂ would all breach the standards even without Terminal 5²⁴⁶¹. Pollution had an economic cost which FOE had calculated as £61m

²⁴⁴⁶ 6-5.6.12

²⁴⁴⁷ 6-5.6.13

²⁴⁴⁸ 6-5.6.15

²⁴⁴⁹ 6-7.1.2

²⁴⁵⁰ 6-7.1.3

²⁴⁵¹ 6-7.1.6

²⁴⁵² 6-7.1.7

²⁴⁵³ 6-7.1.8

²⁴⁵⁴ 6-7.1.9

²⁴⁵⁵ 6-8.1.1

²⁴⁵⁶ 6-8.1.3

²⁴⁵⁷ 6-8.1.6

²⁴⁵⁸ 6-8.1.7

²⁴⁵⁹ 6-8.1.8

²⁴⁶⁰ 6-8.1.9

²⁴⁶¹ 6-8.1.11

for Heathrow without Terminal 5 and handling 60 mppa and £77m with Terminal 5 and handling 100 mppa²⁴⁶².

25.2.59 They argued that the principal issue was whether the National Air Quality Strategy was a serious policy or should be set aside in favour of development²⁴⁶³.

25.2.60 Heston Residents Association were very concerned over air quality and argued that monitoring should be extended to cover Heston. A survey in 1994 had revealed pollution caused by aircraft exhausts or the dumping of fuel as well as concerns about health²⁴⁶⁴. Similar concerns were raised in a number of written representations with anxiety about pollution from both road traffic and aircraft.

My Conclusions

25.2.61 While most of the debate over the impact of Terminal 5 on air quality was related to the National Air Quality Strategy, Policy OE1 of the Hillingdon UDP says that planning permission will not normally be granted for development which would be detrimental to the amenities of the surroundings due to the emission of smell, dust or other pollutants unless measures are taken to ensure it remains acceptable. This clearly applies to Terminal 5.

25.2.62 As I have already said there was considerable discussion prior to the inquiry as a result of which it was generally agreed that the principal pollutants of concern were NO₂, PM₁₀ and ozone. It was also agreed that the modelling of concentrations was of a high standard and the best approach for this case. There were, however, some concerns about the modelling which I need to address before considering the likely effects of Terminal 5.

25.2.63 The first of these relates to the forecasts of air and road traffic used by BAA in their work. Their primary case was based on the assumption that Heathrow without Terminal 5 would handle 50 mppa and that Terminal 5 would increase this to 80 mppa. As I have already said I believe that even with its existing four terminals the airport will continue to handle 60 mppa while throughput with Terminal 5 would increase to 90 mppa or possibly more (para 8.2.55).

25.2.64 These higher figures would also affect all of the associated activities including road traffic although here as I have already said I consider that significantly greater use could be made of public transport. Moreover, if the Secretary of State accepts the limits I have proposed on the provision of car parking for staff this would reduce traffic related to the airport below that assumed by BAA during the peak hours. To this extent the impact of road traffic on air quality may have been over-estimated.

25.2.65 While BAA did not carry out a test based on the levels of air traffic I now consider most likely to emerge, they did carry out a series of sensitivity tests including ones assuming a passenger throughput of 100 mppa. Bearing in mind the levels of uncertainty which all parties agree are implicit in the modelling output, I do not consider that the results of these sensitivity tests are such as to change my overall conclusions concerning air quality. The probability that air traffic would be higher than assumed by BAA must however imply that it is more likely that their base case

²⁴⁶² 6-8.1.12

²⁴⁶³ 6-8.1.14

²⁴⁶⁴ 6-9.1.3

has under-estimated the level of pollution to some degree. On the other hand, the concentrations associated with road traffic may have been over-estimated.

- 25.2.66 In my view, the modelling was of a high standard, as the authorities accepted, and its results show that the differences resulting from the construction of Terminal 5 are likely to be small. While BAA argued that comparisons with actual measurements in the base year suggested that the model over-estimates concentrations they did not suggest that this effect was substantial. Since any over-estimates need to be seen in the light of my conclusion that air traffic levels are likely to exceed those assumed by BAA, I am satisfied that no further adjustment needs to be made to the model results and that they should be used to assess the impact of Terminal 5.
- 25.2.67 The local authorities were concerned that there was no indication of the areas affected by particular levels of pollution or the population living within such areas. They therefore produced contours of concentrations. All of these were based on the conversion of the model results and all contours require a degree of interpolation. Consequently I do not consider that material weight should be placed on these maps.
- 25.2.68 The local authorities pointed to 4 factors which illustrated the uncertainties inherent in the modelling process: - flow breakdown, resuspension of road dust, the failure rate for catalytic converters and the impact of future legislation. Although there was some debate about these factors, the authorities emphasised that, in drawing attention to them, they were simply underlining uncertainty and demonstrating that no party had used assumptions which would lead to unrealistically high forecasts of concentrations. Since I wholly accept both of these points I need take these examples of uncertainty no further.
- 25.2.69 I have also considered the possible corrections proposed by West London Friends of the Earth. I have already indicated my conclusions concerning the traffic likely to be generated by Terminal 5 and find no reason to introduce the other adjustments suggested bearing in mind the widespread acceptance that BAA's modelling had been carried out to a high professional standard.
- 25.2.70 There was a particular concern over the prediction of concentrations of NO_x where a factor of 2.76 has had to be used to correct an apparent over-estimate. BAA argued that this over-estimate was likely to increase in the future since it was largely due to the effect of aircraft emissions which would become more significant as the contribution from road traffic declined. However, the reasons for the over-estimate are not clear and are not confined to aircraft emissions. Consequently I do not accept BAA's argument on this point. I see no reason to incorporate any additional allowance for an over-estimate of NO_x concentrations. It remains one of a series of uncertainties inherent in the modelling process.
- 25.2.71 The difficulties in predicting concentrations of particular pollutants become greater when dealing with short period concentrations which are inevitably influenced by factors such as weather conditions. This was reflected in this case by the use of 2 separate methods which came to be known as the "Probability of Exceedance Method" and the "Short Period Method". There were arguments about the relative merits of each of these but I am content to adopt the approach recommended by the Highways Agency. They argued that the 2 methods were complementary. I have, therefore, taken both into account. The fact remains that the overall picture is not affected to any material extent whichever approach is used.

- 25.2.72 Finally the local authorities were concerned that predictions had not been made for a full range of receptors. On the other hand, the Highways Agency pointed out that the approach they had taken which was derived from the recommendations of the Design Manual on Roads and Bridges involved a preliminary assessment. This identifies the areas in which problems are likely to occur so that a more detailed assessment can be concentrated on these areas. I accept that the principles underlying the recommendations of the Design Manual in this instance are reasonable. As BAA and the Agency pointed out, the greatest impacts are likely to be felt in those areas close to the airport perimeter or the proposed road schemes. I find it difficult to believe that substantial problems are likely to occur in areas not represented in their assessments.
- 25.2.73 Having considered all of the issues related to the prediction of concentrations, I am satisfied that the model does provide an acceptable basis for the assessment of the effects of Terminal 5 and its associated road schemes. It is subject to a range of uncertainties but I find no reason to believe that these are more likely to produce over-estimates than under-estimates. I also accept BAA's suggestion that the uncertainties are more closely associated with the long period covered by the forecasts than with the differences arising from Terminal 5. This is consistent with the Agency's view that greater confidence should be attached to the differences between the cases than to the absolute predictions. It means that I shall attach greater weight to the differences between the four and five terminal cases than to the absolute levels of concentrations predicted.
- 25.2.74 The assessment made by BAA concentrated on NO₂ and PM₁₀ since it found no distinguishable difference in ozone levels due to Terminal 5. On the other hand, the authorities and other objectors argued that the proposed new terminal would result in significant increases in ozone levels. However, no detailed evidence was put forward to support this contention perhaps because, as BAA suggested, it is difficult to forecast ozone concentrations. Bearing in mind the high standard of BAA's work on modelling I find no reason to question their conclusion that Terminal 5 was unlikely to have a significant impact in terms of ozone.
- 25.2.75 There was general acceptance that air quality around Heathrow would be better in 2016 than it was in 1993 whether Terminal 5 were or were not built. If it were built, however, air quality would deteriorate slightly as compared to the position without it. While a few of the objectives of the National Air Quality Strategy would be exceeded even without Terminal 5 more would be breached if it were provided. In overall terms, the effect of Terminal 5 would be to increase the number of breaches of the National Air Quality Strategy objectives and to increase the scale of those breaches which would have occurred in any event.
- 25.2.76 The authorities acknowledged that the differences due to Terminal 5 were small but suggested that they were similar to the 5-10% gap which, according to the Secretary of State, had to be met if the objectives of the National Air Quality Strategy were to be achieved. They illustrated this effect by pointing out that, on BAA's own figures, average NO₂ concentrations would exceed the Strategy objectives by 8% without Terminal 5 but by 21% with it. The average breach for PM₁₀ would rise from 10% without Terminal 5 to 17% with it.
- 25.2.77 I accept these illustrative figures and conclude that the differences due to Terminal 5 are likely to be small but significant. They would be in conflict with Policy OE1 of the Hillingdon UDP and would increase the number and scale of the breaches of the National Air Quality Strategy objectives. The local authorities and others placed

great weight on the effect on these objectives and went so far as to suggest that granting planning permission for Terminal 5 would be a major challenge to the Strategy and would signal that it did not really matter if its objectives were not met.

- 25.2.78 I do not share this view. I do not question the importance the Government attaches to improving air quality and the National Air Quality Strategy. I also accept that the publication of the Strategy represents a major change in attitudes towards air quality. On the other hand, all parties recognised that the objectives in it are policy objectives which take into account the costs and benefits of their achievement. This point emerges clearly in the recently published review of the Strategy which concludes, as BAA pointed out, that achieving the objectives for NO₂ and PM₁₀ in London would be costly in relation to the relatively small benefits to be achieved. It also says that in some areas achieving the annual objective for NO₂ could not be justified in cost-benefit terms.
- 25.2.79 This clearly means that the Government accepts a balance has to be struck in setting the objectives. Furthermore the Review says that authorities should not feel forced to take extreme measures in order to meet air quality objectives which would cause serious disruption to their local economies. In this context, I have already concluded that refusing permission for Terminal 5 would damage the national and regional economies as well as the local economy.
- 25.2.80 I do not believe that granting planning permission for Terminal 5 would damage the National Air Quality Strategy fundamentally as the authorities suggested. Its impact on air quality in general and the objectives of the Strategy must be a factor weighing against its approval but would not necessarily outweigh the benefits of the proposed development. Indeed the Strategy itself recognises the need for a balance between costs and benefits and the need to avoid harm to the local economy. The most important point is that proper weight must be given to the breaches of the Government's air quality objectives in the light of the National Air Quality Strategy.
- 25.2.81 In any event, the Strategy is only one of a whole range of Government policies which applies to Terminal 5. The undisputed fact that it would not meet the objectives of that Strategy must count against this proposal but it cannot mean that planning permission must be refused. As the Highways Agency pointed out there is no requirement in planning terms that a proposal which led to the breach of the Strategy objectives should be refused planning permission.
- 25.2.82 On a similar point, I do not attach material weight to the appeal decision referred to by the local authorities concerning development which perpetuated or reinforced a situation which was already unsatisfactory. As BAA pointed out, this was an enforcement appeal which was determined on legal grounds rather than its planning merits. Consequently the Secretary of State did not express a view on this part of the Inspector's report. This does not, of course mean that there is no merit in the approach he took and I have taken into account the existing nature of the environment around Heathrow in a number of respects including noise and air quality.
- 25.2.83 I accept that there are particular difficulties in the Heathrow area with pollution levels in some respects as high as those in central London. Whether this constitutes a pollution "hot spot" is of less significance than the acceptance that it means that an Air Quality Management area will have to be declared. If Terminal 5 is built the difficulties in meeting the objectives of the Strategy will be increased and, in some cases, they may well become virtually impossible to achieve as the local authorities

argued. While this increases the weight of the objections to Terminal 5 in terms of air quality, I do not consider that it changes the fundamental position. These objections weigh against Terminal 5 but do not rule it out.

- 25.2.84 In reaching this conclusion I have taken into account the argument of the local authorities that Terminal 5 would result in emissions comparable with those of Reading or Huddersfield. The real issue is, however, the effect these emissions would have on concentrations in areas close to the airport and the associated road schemes. I have already covered this issue.
- 25.2.85 Bearing in mind the fact that the standards in the National Air Quality Strategy are intended to represent a zero risk to health, the effect of Terminal 5 in terms of increased emissions must be considered in terms of their potential impact on health. I now turn to this.

25.3 THE EFFECT ON HEALTH AND QUALITY OF LIFE

BAA's Case

- 25.3.1 BAA argued that the significance of any breach of the air quality objectives could be assessed only by someone who was properly qualified; they had provided the only such witness²⁴⁶⁵. The only pollutants which had to be considered were NO₂ and PM₁₀²⁴⁶⁶. The Expert Panel on Air Quality Standards had considered the threshold for adverse health effects for healthy individuals in relation to NO₂. That level had been found to be far in excess of the concentrations subsequently predicted around Heathrow. A margin of safety had been introduced into the National Air Quality Strategy for those with asthma to give the recommended standard and objective of 150ppb hourly mean. The evidence could not be read to indicate that there would be any effect at levels below 200ppb²⁴⁶⁷. In no case would levels with Terminal 5 exceed 200ppb, so no significant effect would be expected upon asthma sufferers²⁴⁶⁸.
- 25.3.2 The annual standard for NO₂ of 21ppb had been derived from the most recent World Health Organisation guideline for which the rationale had not been published. There would be no significant health risk at concentrations 50% above 21ppb²⁴⁶⁹. Consequently, BAA argued that Terminal 5 would not cause a significant impact on health in terms of NO₂²⁴⁷⁰.
- 25.3.3 They pointed out that there were few experimental studies which supported or explained the association of PM₁₀ with general respiratory disease although the Expert Panel had supported a causative link between exposure to PM₁₀ and certain indices of ill health²⁴⁷¹. The Panel had assumed a linear relationship between dose and response²⁴⁷². Substantial reductions in PM₁₀ were likely in the future, but the National Air Quality Strategy objective was likely to be exceeded in 2016 in any event and Terminal 5 would make very little difference to concentrations. Although there would be some health effects, BAA suggested that they would not be such as

²⁴⁶⁵ 6-2.12.1

²⁴⁶⁶ 6-2.12.2

²⁴⁶⁷ 6-2.12.3

²⁴⁶⁸ 6-2.12.12

²⁴⁶⁹ 6-2.12.4

²⁴⁷⁰ 6-2.12.5

²⁴⁷¹ 6-2.12.6

²⁴⁷² 6-2.12.7

to cause significant concern and Terminal 5 would have no significant impact on health²⁴⁷³. On the evidence of the Expert Panel on Air Quality Standards the additional emissions of PM₁₀ due to Terminal 5 would be less than that which would cause 5% of asthmatics to use their inhalers more frequently even if they were exposed for 24 hours a day²⁴⁷⁴. Ozone emissions would not be affected significantly by Terminal 5 and the health effects would not be materially different²⁴⁷⁵.

- 25.3.4 According to BAA, the public perception of a link between air pollution and asthma was not supported by scientific evidence. Very recent research indicated that there was no relationship between levels of pollution and the prevalence of asthma and showed that there was significantly less asthma and inhaler use in metropolitan than in non-metropolitan areas. The health study carried out for BAA did not indicate any significant difference between the study area and the control area²⁴⁷⁶. Nevertheless NO₂ and PM₁₀ could exacerbate asthma although epidemiological studies had produced conflicting results as to the level at which adverse effects might occur²⁴⁷⁷.
- 25.3.5 BAA pointed out that the assessment of potential health effects had been based on locations close to the perimeter of the airport. Since there would be no significant impacts at these locations there could not be any such impacts at points further from the airport²⁴⁷⁸. Even if some health effects were found, it would be right to take into account the benefits of Terminal 5 to the local economy. Deprivation was a significant risk factor for health and improvements to prosperity would improve health. This could outweigh the impact of pollution²⁴⁷⁹.

The Highways Agency's Case

- 25.3.6 The Highways Agency examined the effect of the road schemes associated with Terminal 5 on Cranford Park School, Fuller Way and Paynes Farm. They argued that levels of NO₂ would be very substantially reduced by 2016 and that the road schemes would make only very small differences. There was no evidence that they would have an adverse effect on health²⁴⁸⁰. Similarly concentrations of PM₁₀ would be reduced very substantially but would remain above the Strategy objectives. Again the differences resulting from the road scheme would be very small²⁴⁸¹. Even based on very cautious estimates the health impact of such small changes was likely to be low although uncertainty remained²⁴⁸².
- 25.3.7 The Agency also argued that carbon monoxide levels would not cause any adverse health effects²⁴⁸³, while suggesting that increases in benzene would be very small and insignificant in health terms²⁴⁸⁴.

²⁴⁷³ 6-2.12.8

²⁴⁷⁴ 6-2.12.13

²⁴⁷⁵ 6-2.12.9

²⁴⁷⁶ 6-2.12.10

²⁴⁷⁷ 6-2.12.11

²⁴⁷⁸ 6-2.12.14

²⁴⁷⁹ 6-2.12.15

²⁴⁸⁰ 6-4.6.1-4

²⁴⁸¹ 6-4.6.5

²⁴⁸² 6-4.6.6

²⁴⁸³ 6-4.6.7

²⁴⁸⁴ 6-4.6.8

Hillingdon and Hounslow's Case

- 25.3.8 The local authorities were critical of the health study, which formed the basis of BAA's case. They argued that the evidence had been published with substantial errors in the units used and there were basic errors in the study itself which had been neither published nor subjected to a peer review. There had been confusion between NO₂ and NO_x and contours had been chosen wrongly²⁴⁸⁵. The report invited a conclusion which could not be reasonably drawn²⁴⁸⁶. It sought to compare the health of the population around the airport with that in a control area for which there was no evidence as to levels of pollution. In fact the control area included central London where concentrations were similar to those around Heathrow²⁴⁸⁷. The conclusion of the report was contrary to the findings of numerous studies and was aimed at undermining the judgement and policy of the Government²⁴⁸⁸.
- 25.3.9 The issue was not whether Terminal 5 would have a significant impact on health because the National Air Quality Strategy sought to achieve zero risk. The Government would be satisfied by nothing less than this wherever it could be identified. Where the zero risk level could not be identified as with PM₁₀, the aim was to minimise risk²⁴⁸⁹. The level of concentrations of NO₂ said to be acceptable in terms of health effects would have to be the result of emissions 17 times greater than those predicted with Terminal 5. To achieve such a result would require the development of something like 10 terminals with 6 more pairs of runways and three to four M4 motorways. Furthermore the study said nothing about the quality of life and made no allowance for any beneficial effects of the National Air Quality Strategy in the control area²⁴⁹⁰.

Hillingdon Community Health Council's Case

- 25.3.10 Hillingdon Community Health Council said that it had carried out 2 surveys in the locality covering 1456 people. Of these, 258 were reported as having breathing difficulties of which 60 had been children²⁴⁹¹. The Council had been surprised at the level of comment about the effect of aviation fuel and pollution from the M4 on air quality. They had decided to appear at the inquiry as a result of this response²⁴⁹². A recent Green Paper on health had stated that action should be taken to ensure that air pollution was not harming health. If Terminal 5 caused deterioration in air quality it would put both the quality of life and health at risk²⁴⁹³. Although the Council accepted that scientific evidence did not necessarily confirm that increases in asthma were due to increased pollution, there was evidence that particulate matter contributed to wheeziness in children²⁴⁹⁴.
- 25.3.11 Evidence from a local GP showed that the incidence of asthma was anything up to twice the expected level²⁴⁹⁵. People around the airport stayed indoors and kept their houses closed up because of the smell. There was something about urban life which was bad for respiration²⁴⁹⁶. If it took 2 decades to confirm that people's perceptions

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²⁴⁹⁶ 6-6.2.2

about asthma were correct that would be too late. Waiting until there was certainty would put health at risk²⁴⁹⁷.

- 25.3.12 As part of its evidence the Community Health Council pointed out that the Hillingdon Breathe Easy Group set up in 1991 now had 60 members. Poor air quality contributed to their problems and the Chairman of the Committee on the Medical Effects of Air Pollution had said that the true overall effects of air pollution had clearly been under-estimated²⁴⁹⁸. Often over 100 aircraft engines would be running at the airport and aircraft could be kept waiting for an hour before taking off²⁴⁹⁹. Fumes from the airport could be tasted as well as smelt in Longford and Stanwell Moor and minor illnesses quickly developed into more serious ones. Terminal 5 would lead to increased pollution and further sacrifices in the quality of life²⁵⁰⁰.

Other Objectors' Cases

- 25.3.13 These concerns about health were shared by the Federation of Airport Noise Groups, West London Friends of the Earth and Mr Murphy who referred to a survey of 150 people in Lower Feltham which had shown a high incidence of asthma²⁵⁰¹. Written representations also pointed to the effect of poor air quality on asthma, bronchitis, hay fever, sinusitis and other respiratory diseases.

My Conclusions

- 25.3.14 It is beyond doubt that there is widespread concern about the effects of Heathrow on the health of those living in the area as expressed by the Community Health Council and others. Most of this concern is based on the perception that air pollution contributes to the incidence of respiratory diseases particularly asthma. This perception is not borne out by scientific research although BAA accepted that NO₂ and PM₁₀ could exacerbate asthma and that epidemiological studies had produced conflicting results. In these circumstances I have some sympathy with the concern of the Community Health Council that public perception might be confirmed in 2 decades. Clearly it is important not to under-estimate the effects of air pollution on health.
- 25.3.15 I do not, however, totally accept the argument by the local authorities that the National Air Quality Strategy seeks to achieve zero risk. As I have already noted the standards in the Strategy are set at a zero risk level but the objectives take into account feasibility and the balance between costs and benefits. While the long term aim must be to get as close as possible to zero risk, the Strategy does not go that far. I accept that any concentration above the Strategy objectives must involve some possible risk to human health and is, as such, undesirable. Nevertheless, the harm that any such breach would cause must depend, as BAA argued, on the significance of the risk it would pose.
- 25.3.16 Terminal 5 would result in more and greater breaches of the objectives. BAA argued that the scientific evidence showed that the risks associated with these would be very small. Nevertheless, the objectives have been set by the Government in the

²⁴⁹⁷ 6-6.2.3

²⁴⁹⁸ 6-6.3.1

²⁴⁹⁹ 6-6.3.2

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²⁵⁰¹ 6-11.1.2

light of their understanding of the scientific evidence and I see no reason to set them aside in favour of another interpretation by BAA. In particular I do not accept that the decision on Terminal 5 should be based on the argument that asthma sufferers would experience no significant effect as long as the hourly mean for NO₂ does not exceed 200ppb. This level is well above the objective of 150ppb set in the Strategy. Nor do I accept that it should be assumed that an annual concentration 50% higher than the objective of 21ppb would pose no significant risk to health.

- 25.3.17 In my view, the only acceptable approach is to apply the objectives of the National Air Quality Strategy directly and to conclude that where these are breached there is harm and specifically that will be an increased risk to human health. On this basis Terminal 5 is likely to cause harm and to have an adverse impact on health as a result of the concentrations of both NO₂ and PM₁₀.
- 25.3.18 This is not to say however, that the increased risk is likely to be substantial. As I have already noted the local authorities recognised that the increased concentrations caused by Terminal 5 would be small. I also accept that there are likely to be substantial reductions in concentrations of both NO₂ and PM₁₀ by 2016 as compared with 1993 even if Terminal 5 is built so that the risk to health is likely to be less than at present.
- 25.3.19 I have already concluded that I should not rely on BAA's view of the risks involved in higher concentrations but I have also taken into account the strong criticisms of the local authorities on the study which supported their evidence. I am not convinced that it would be feasible to require all studies carried out for planning inquiries to be the subject of peer review but this does not answer the criticisms of the study. While the study attempted to compare the health of those living around the airport with those in a control area some distance away, the levels of concentrations in the control area were not known. In these circumstances I find it hard to understand how a realistic assessment could be made. In fact the control area included central London, an area with levels of pollution comparable with those around the airport. In such circumstances I do not find the absence of any differences in health to be surprising.
- 25.3.20 In short I do not believe that a limited study such as this is sufficient to explore the highly complex issues involved in assessment of the effects of air pollution on health. I do note, however, that its conclusion is consistent with another study quoted by BAA which found that there was no relationship between levels of pollution and the prevalence of asthma and that there was significantly more asthma in metropolitan areas than in non-metropolitan areas.
- 25.3.21 Having considered all of the evidence I conclude that if Terminal 5 were built increased concentrations of both NO₂ and PM₁₀ would increase the risk to human health by a small degree. This must have material weight in the balance against the proposed development although that weight should also take into account the fact that concentrations of both pollutants are likely to be substantially lower in 2016 than they were in 1993. For the purposes of this assessment I have not considered ozone since I do not find that there is any real evidence that Terminal 5 would have a significant effect on this.
- 25.3.22 While I recognise that many people find the poor air quality including unpleasant smells affects their quality of life, the substantial reductions in concentrations of the main pollutants that are likely to be achieved by 2016 suggest that these problems should also decrease. Bearing in mind the relatively small differences Terminal 5

and its associated road schemes would make, I do not believe that it would have such a material impact on the quality of life around the airport as to justify adding to the weight I have already attached to the effects on human health. This conclusion, of course, relates only to the effects of air quality. I have covered other impacts such as noise elsewhere.

25.4 THE EFFECT ON GREENHOUSE GASES

BAA's Case

- 25.4.1 BAA argued that the demand for air travel would be met at other airports if Terminal 5 were not permitted and that there was no evidence the Terminal 5 would lead to an increase in emissions of greenhouse gases which would not otherwise take place²⁵⁰². The then Secretary of State had stated in 1995 that this was an international issue which was not relevant to the expansion of a particular airport²⁵⁰³.

The Department's Case

- 25.4.2 The Department argued that the UK could not take unilateral action on the global impacts of aviation without severe penalties to the country's aviation industry²⁵⁰⁴. The 1997 Transport White Paper said that the Government would seek international agreement to improve aircraft engine standards for the emission of NO_x and would continue to press the potential for environmental levies and the removal of tax exemptions on aviation fuel. The White Paper did not, however, indicate any change in the view expressed by the then Secretary of State in 1995 that the global impacts of air travel were of very limited relevance to decisions on capacity at UK airports²⁵⁰⁵.
- 25.4.3 Further measures were under consideration internationally and the European Union was considering adopting a 16% reduction in NO_x for new additions to European fleets. The government had set a voluntary aim of reducing CO₂ to 20% below 1990 levels by 2010 as compared with the 8% reduction to which it was committed by the Kyoto agreement²⁵⁰⁶. Any new tax on aviation fuel would have to be introduced internationally²⁵⁰⁷ but the Government was supporting studies by the European Union on the subject. It was also involved in international studies on aircraft emissions through the International Civil Aviation Organisation, the Intergovernmental Panel on Climate Change and the Committee on Aviation Environmental Protection²⁵⁰⁸.

Dr Hillman's Case

- 25.4.4 Dr Hillman from the Policy Studies Institute argued that the Intergovernmental Panel on Climate Change had said that a reduction of 50-70% in CO₂ concentrations was needed²⁵⁰⁹. Aircraft emissions contributed disproportionately to the thinning of the ozone layer and only a reduction in demand could produce the required cuts in

²⁵⁰² 6-2.5.1
²⁵⁰³ 6-2.5.2
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²⁵⁰⁵ 6-3.1.5
²⁵⁰⁶ 6-3.1.8
²⁵⁰⁷ 6-3.1.9
²⁵⁰⁸ 6-3.1.10
²⁵⁰⁹ 6-10.1.1

CO₂²⁵¹⁰. There was no prospect of reaching the international agreement necessary to avoid severe climate change except in a context of international equity²⁵¹¹. If the developed world did not deliver its fair share of reductions in emissions, others would have to be treated unfairly or we would have to bear the costs of climate change²⁵¹².

- 25.4.5 He said that there were strong grounds for a managed contraction of air travel and it was almost certain that action would have to be taken to dramatically curtail it in the next few decades. Consequently Terminal 5 could become redundant²⁵¹³. The Secretary of State's statement in 1995 had to be seen against this background. This had indicated the Government's wish to expand airport capacity and it was assumed that the reason for not addressing global impacts was that these would be addressed at an international level and had little relevance to decisions on UK airports²⁵¹⁴.
- 25.4.6 Dr Hillman suggested that BAA's assumption that the demand would be met elsewhere if Terminal 5 were not built would be less tenable if other countries adopted policies which led to limitations in aviation. This meant that they could no longer rely on the Secretary of State's statement²⁵¹⁵. Events had moved on and that statement had been ill informed. In March 1998 the Prime Minister had said that climate change was the greatest threat to future prosperity and that the Kyoto protocol was an historic turning point in efforts to reduce greenhouse emissions²⁵¹⁶. The Terminal 5 proposal flew in the face of ecological reason²⁵¹⁷.

My Conclusions

- 25.4.7 The debate on the effect of Terminal 5 on greenhouse gases and climate change bore strong echoes of those concerning national aviation policies. I concluded then that the wish to meet the demand for air travel where and when it arises is still at the centre of Government policy. I also found that there had been no change in the Government's view that global warming is of very limited relevance to decisions on the capacity of UK airports (para 3.6.2).
- 25.4.8 This approach came under very strong attack from Dr Hillman who pointed to a series of factors which had come into play recently and, in his view, meant that international policy should now be leading to a managed contraction of air travel. I do not doubt the significance of the growing international concern over climate change but the Government has made its position clear. Although it has made a voluntary commitment to reduce CO₂ emissions by 20% rather than 8%, it believes that action on emissions arising from air travel must be taken at an international level. To this end it is supporting studies by a variety of international bodies; it is also supporting steps to remove tax exemptions which currently apply to aviation fuel.
- 25.4.9 It would be wrong to ignore the evidence of possible changes in attitudes to air travel, but the planning application for Terminal 5 inquiry is not the vehicle by which international aviation policies could or should be decided. I have already

²⁵¹⁰ 6-10.1.2
²⁵¹¹ 6-10.1.3
²⁵¹² 6-10.1.4
²⁵¹³ 6-10.1.5
²⁵¹⁴ 6-10.1.7
²⁵¹⁵ 6-10.1.8
²⁵¹⁶ 6-10.1.9
²⁵¹⁷ 6-10.1.10

pointed to the difficulty of attempting to restrain the demand for air travel by pricing and concluded that restricting the capacity of Heathrow would not necessarily reduce the overall demand (para 3.2.12). Nothing said in the course of the air quality topic changes those conclusions.

25.5 OVERALL CONCLUSIONS ON AIR QUALITY

- 25.5.1 In the Introduction to this Chapter, I identified 3 main issues. In relation to the first of these I find that there are problems in terms of air quality in the area around Heathrow which mean that it is likely to be declared an Air Quality Management Area under the National Air Quality Strategy. If Terminal 5 were built it would exacerbate the difficulties in meeting the objectives of the Strategy and could make them virtually impossible to achieve. This must count against Terminal 5 but the failure to meet the objectives of the National Air Quality Strategy does not mean that planning permission must be refused for it.
- 25.5.2 As far as the health effects of Terminal 5 including its associated road schemes are concerned, I conclude that it would result in increases in both NO₂ and PM₁₀. These increases would in turn increase the risk to human health by a small degree as compared to the position in 2016 with only 4 terminals. Again this must weigh against Terminal 5, although the fact that concentrations of both substances are likely to be substantially lower than in 1993 must also be taken into account.
- 25.5.3 Finally I recognise the growing concern about the effect of air travel on greenhouse gases and global warming but find no reason to change the conclusions I have already set out in relation to national aviation policy. In the absence of international agreement, there is no reason to believe that restricting capacity of Heathrow would reduce the overall demand for air travel and consequently global aircraft emissions to any material degree.

26 PUBLIC SAFETY

26.1 INTRODUCTION

- 26.1.1 This Chapter is concerned with the possibility that the development of Terminal 5 would lead to a material increase in risk to individual members of the public. There are substantial controls on activities within the airport and indeed in the air and the planning system normally assumes that such controls will be effective as PPG 23 makes clear in the context of pollution control. The objective of these controls is the maintenance and improvement of aviation safety whilst seeking to ensure the efficient operation of air traffic. Nevertheless, all parties accepted that an element of risk remained and it is this residual risk which I shall cover in the Chapter.
- 26.1.2 The analysis of public risk posed by major installations is a relatively new subject and the number of examples of its application is limited. Recently a study of “Third Party Risk and Public Safety Zone Policy” on behalf of the Department reviewed the means of assessing third party risks near airports and developed a method which was supported by the Department at the inquiry. This had led to the policy on public safety zones announced in Parliament in July 1998²⁵¹⁸. That policy is that public safety zones should correspond to areas expected to experience an individual risk of death of 1 in 100,000 (10^{-5}) per year or greater. Existing development will be removed from areas with a risk of 1 in 10,000 (10^{-4}) or greater.
- 26.1.3 There was also concern about what is referred to as societal risk. This is defined in the study of Third Party Risk and Public Safety Zone Policy, in this context, as the risk of a widespread or large-scale detriment from the realisation of a defined hazard, the implication being that the consequence would be on such a scale as to provoke a socio-political response²⁵¹⁹. It was argued that there was a particular societal risk at Heathrow because of the possibility of an aircraft crash on London. I shall deal with this as well as the question of whether the subject of public safety should include the safety of the public while they are within the airport. Finally I shall cover the subject of the impact of Terminal 5 on vortices trailing from landing aircraft which cause damage to buildings around Heathrow and could pose a risk of injury to people.
- 26.1.4 The main issue in relation to public safety is, however:
- The effect of Terminal 5 on the risk to public safety.

26.2 THE EFFECT OF TERMINAL 5 ON PUBLIC SAFETY

BAA's Case

- 26.2.1 BAA said that the Joint Data Group on this topic had agreed that public safety was concerned with the safety of people on the ground outside the airport boundary. Hillingdon had not been a party to the Data Group or to this agreement²⁵²⁰. Flying was very safe; there had been only one accident related to Heathrow in the last 30 years and only 3 fatal airport related accidents in the UK since 1979²⁵²¹. Safety

²⁵¹⁸ CD/244(b)

²⁵¹⁹ CD/244(b) p7

²⁵²⁰ 7-2.1.1

²⁵²¹ 7-2.1.2

regulation in this country was amongst the best in the world and BAA monitored foreign carriers to ensure that they held the necessary permits to operate at UK airports²⁵²². They pointed out that the Government operated a public safety zone policy which was consistent with the approach of the Health and Safety Executive to public safety²⁵²³.

26.2.2 BAA had commissioned National Air Traffic Services (NATS) to use the method employed by the Department to assess third party risk to individuals related to Heathrow. This involved estimates of;

- The likely frequency of crashes around an airport,
- The variation in the probability of a crash occurring at different locations around the airport, and;
- The area likely to be affected by a crash and the proportion of people on the ground within that area who would be killed²⁵²⁴.

26.2.3 They said that estimates of crash frequency were based on historic data applied to the mix of aircraft and number of movements likely to take place. In this case these had been taken from the evidence given earlier in the inquiry. The estimates had been based on western jets and turbo-props operating at First World airports since these covered 95% of all movements at Heathrow. A crash frequency of about 1 in 14 years was forecast both with and without Terminal 5²⁵²⁵. Crash locations had been derived from historic data for accidents around airports²⁵²⁶ while the estimates of the consequences of a crash were based on data from 56 accidents. The area likely to be destroyed was related to the weight of the aircraft and was likely to increase from 0.48 ha in 1994 to 0.50 ha in 2016 without Terminal 5 and 0.66 ha with it²⁵²⁷.

26.2.4 BAA acknowledged that the infrequency of accidents meant that it was difficult to validate the models used although there was less uncertainty about the difference in the risk level due to Terminal 5. The NATS estimate of the area likely to be destroyed was larger than that derived from other models²⁵²⁸. In overall terms Terminal 5 would increase the area exposed to a risk greater than 1 in 100,000 (10^{-5}) by 94 ha or some 1,900 people. The area exposed to a risk of 1 in 1,000,000 (10^{-6}) would be increased by some 578 ha or 15,000 people. As an example, a risk of death which was 1 in 100,000 years (10^{-5}) without Terminal 5 would become 1 in 77,000 years (1.3×10^{-5}) with it. These changes were largely due to increases in aircraft weight²⁵²⁹.

26.2.5 BAA argued that the Government's public safety zone policy assumed that the maximum tolerable risk was 1 in 10,000 (10^{-4}) and pointed out that they supported the policy under which dwelling exposed to a risk greater than this would be bought out. They argued that risks of less than 10^{-6} were consistent with normal background risk and that between these 2 levels the increased risk due to Terminal 5

²⁵²² 7-2.1.3

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²⁵²⁷ 7-2.1.8

²⁵²⁸ 7-2.1.9

²⁵²⁹ 7-2.1.10

was small. It should be considered as part of the overall planning balance²⁵³⁰. It certainly could not justify its refusal²⁵³¹. The maximum level of risk in the sensitivity tests carried out for BAA would be the same as in other cases since the same policy of buying dwelling subject to a risk greater than 10^{-4} would apply²⁵³². The UK proposals for public safety zones were consistent with practice in other fields in this country, although it was accepted that safety policies here tended to be more strict than they were in the Netherlands,²⁵³³.

- 26.2.6 Although BAA accepted that it had been assumed that there would be more turbo-props in the four terminal case, their higher crash rates were offset by the smaller areas destroyed. Fewer people would be overflowed if fewer landings were from the east but the difference in measured individual risk would be very small²⁵³⁴. The priority of NATS was safety and they would introduce delays if necessary to avoid congestion in the air²⁵³⁵.
- 26.2.7 If permission were refused for Terminal 5, BAA argued that more use would be made of Gatwick and Stansted. Although risks around those airports would be increased, the effect would be slight due to the low density of development in those areas. Nevertheless, this should be offset against any difference in the overall risk between the 4 terminal and 5 terminal cases at Heathrow²⁵³⁶.
- 26.2.8 BAA understood the concept of societal risk but argued that the criteria for its assessment were difficult to define. The Health and Safety Executive had found that too many factors were involved and that many of them involved qualitative judgements²⁵³⁷. BAA did not believe that an assessment of societal risk would help in determining the application for Terminal 5²⁵³⁸. It was also impossible to quantify the effect on anxiety in the surrounding population. The survey in Richmond had been beyond the area exposed to a risk of 10^{-6} ²⁵³⁹. They also argued that Terminal 5 would not make any material difference to the risk to individuals from objects falling from aircraft²⁵⁴⁰.
- 26.2.9 BAA had held detailed discussions with the CAA regarding the design of Terminal 5 and it had been found that the changes to the airport would, in principle, meet the necessary requirements for aircraft safety²⁵⁴¹.

The Department's Case

- 26.2.10 The Department said that public safety could best be achieved by ensuring the safe operation of civil aviation using international obligations under the International Civil Aviation Organisation²⁵⁴². Within the UK, the CAA regulated civil aviation initiating changes to legislation and enforcing safety regulations²⁵⁴³. Although the Secretary of State already had, or would be likely to obtain, the power to limit air

²⁵³⁰ 7-2.1.11

²⁵³¹ 7-2.1.17

²⁵³² 7-2.1.14

²⁵³³ 7-2.1.12

²⁵³⁴ 7-2.1.15

²⁵³⁵ 7-2.1.16

²⁵³⁶ 7-2.1.17

²⁵³⁷ 7-2.1.18

²⁵³⁸ 7-2.1.19

²⁵³⁹ 7-2.1.21

²⁵⁴⁰ 7-2.1.20

²⁵⁴¹ 7-2.1.23

²⁵⁴² 7-3.1.1

²⁵⁴³ 7-3.1.2

traffic for safety reasons, he had said in 1996 that he did not intend to interfere with the duty of the CAA to oversee safety²⁵⁴⁴.

- 26.2.11 Notwithstanding the agreement in the Joint Data Group that the definition of public safety for the purposes of this inquiry should cover only the safety of people on the ground outside the airport boundary, the Department emphasised that they were not seeking to restrict the area the Public Safety topic should cover²⁵⁴⁵. The Department's and the CAA's responsibilities for of public safety went wider than the definition accepted by the Joint Data Group²⁵⁴⁶. Their responsibilities included not only people within the airport boundary but also those in the air²⁵⁴⁷.
- 26.2.12 Public safety zones were intended to minimise risks in those areas in which accidents were most likely to occur. They had been operated at major airports since 1958²⁵⁴⁸ but a major study had been initiated in 1994²⁵⁴⁹. As a result of this the proposed policy would be to reduce individual risk to a tolerable level whatever the cost but further reductions would take place only if the benefits of so doing exceeded the costs²⁵⁵⁰. The study had found that public safety zones should be based on individual risk and that their boundaries should follow the 10^{-5} risk contour. New development should be inhibited in the public safety zones, while the Department had proposed that any existing housing and other development occupied by third parties for a high proportion of the day should be removed from within the 10^{-4} individual risk contours²⁵⁵¹. This had been confirmed by the Minister in July 1998²⁵⁵².
- 26.2.13 The Department had not reached a formal view on the impact of Terminal 5 in terms of public safety zones²⁵⁵³. It was however the provisional view of the Department's expert witness that there would be no grounds based on third party risk to refuse Terminal 5 because the public safety zone policy could cater for it. That view had been reached without regard to the evidence of BAA or any other party to the inquiry²⁵⁵⁴. The regulatory framework was such that any issue of public safety within or outside the airport could be properly taken into account. Controls were available which it was believed would ensure that any consequences of the proposed development could be accommodated in safety terms. However, it was accepted that risk could not be entirely eliminated and that it was necessary to consider whether Terminal 5 would increase risk materially²⁵⁵⁵. A large increase in the number of people exposed to a risk greater than 10^{-5} might tip the balance against a proposal where other considerations were finely balanced²⁵⁵⁶.
- 26.2.14 The Department made a number of points in response to criticisms raised by Mr Glass and Mr Green about the approach to public safety. They argued that the Department's approach was statistically valid and realistic and they had avoided making assumptions that could not be fully supported. The model had been realistic in reflecting that 2.5 times as many crashes took place on landings as on departure

²⁵⁴⁴ 7-3.1.3

²⁵⁴⁵ Day 425 p27

²⁵⁴⁶ Day 425 p21

²⁵⁴⁷ Day 425 pp123-124

²⁵⁴⁸ 7-3.1.4

²⁵⁴⁹ 7-3.1.5

²⁵⁵⁰ 7-3.1.6

²⁵⁵¹ CD/244a para 5.7

²⁵⁵² DOT/270

²⁵⁵³ 7-3.1.9

²⁵⁵⁴ DOT/257

²⁵⁵⁵ 7-3.1.11

²⁵⁵⁶ 7-3.1.10

and that landings tended to follow a straight approach. Models which would reproduce the causes of risk from aircraft were unknown and it would not be possible to develop such a model which would have any statistical validity. While it was impossible to calculate the proportion of people killed in the vicinity of a crash, the NATS model assumed that all those in the destroyed area would be killed but nobody outside that area would be²⁵⁵⁷.

The Civil Aviation Authority's Case

- 26.2.15 The Civil Aviation Authority (CAA) said it was responsible for all aspects of planning, design, approval and monitoring of airspace arrangements within the UK²⁵⁵⁸. Any changes in air traffic control were subject to a formal safety analysis through the CAA's Safety Regulation Group²⁵⁵⁹. As part of the CAA, NATS had the duty of securing the highest standards of safety and to maintain the most expeditious flow of air traffic. They provided the air traffic control service at Heathrow. If there were a safety problem, they would keep aircraft on the ground²⁵⁶⁰ and reduce activities in the skies to a level at which safe operation could be maintained²⁵⁶¹.
- 26.2.16 Internally NATS employed a safety management system, which gave warning if any part of the system was approaching the point when defined levels of safety might no longer be met. This was widely regarded as being among the best in the world and was being adopted across Europe²⁵⁶². NATS was also responsible for the assessment of runway capacity. More efficient procedures and equipment had permitted scheduled rates of 84 movements an hour. At the same time flows were constrained to ensure that the system was not overloaded²⁵⁶³.
- 26.2.17 The Safety Regulation Group was responsible for the safety regulation of aircraft, crew and maintenance personnel, applying safety regulations to flight operations and aircraft maintenance. They issued Certificates of Airworthiness and monitored the condition of aircraft²⁵⁶⁴. Mechanisms were in place to ensure that hazardous occurrences were investigated and the results used to enhance safety²⁵⁶⁵. If Terminal 5 were to cause turbulence similar to that experienced at the eastern end of the airport, the same traffic control procedures could be used²⁵⁶⁶.

Hillingdon's Case

- 26.2.18 Hillingdon were concerned that increases in the capacity of Heathrow had been obtained by tightening procedures. Approach separations had been reduced while other procedures had been used to reduce delays on departure²⁵⁶⁷. There was nothing to stop airlines using larger aircraft, which occupied the runway longer and required greater separation distances. Additional movements would increase the risk and reduce the ability to manage risk by regulating the number of

²⁵⁵⁷ 7-3.1.12-21

²⁵⁵⁸ 7-4.1.1

²⁵⁵⁹ 7-4.1.3

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²⁵⁶¹ 7-4.1.4

²⁵⁶² 7-4.1.5

²⁵⁶³ 7-4.1.7

²⁵⁶⁴ 7-4.1.9

²⁵⁶⁵ 7-4.1.10

²⁵⁶⁶ 7-1.4.11

²⁵⁶⁷ 7-5.1.1

movements²⁵⁶⁸. A House of Commons Select Committee had raised concerns over air traffic control, which called into question the case presented by BAA and the Department²⁵⁶⁹.

- 26.2.19 Hillingdon also argued that it was difficult to identify who had direct responsibility for public safety. The duties of the CAA did not include the quantification or assessment of risk and the Government had not addressed the risk to people on the ground outside the public safety zones. Terminal 5 would breach the environmental capacity of Heathrow and pressurise the limits on its safety capacity²⁵⁷⁰. The surveys carried out to assess attitudes to risk had not included anybody living close to Manchester or Heathrow²⁵⁷¹. The individual risk contours said nothing about the population that could be affected by a single crash. If an analysis of societal risk had been made for Terminal 5, evidence from studies of Schiphol suggested that the airport might have been prevented from expanding²⁵⁷².
- 26.2.20 There was no convincing evidence, in Hillingdon's view, that Terminal 5 would not cause turbulence problems which could then lead to the abandonment of the Cranford Agreement. It could also lead to reduced separations and increased risk²⁵⁷³. New landing systems could increase the risk of collisions and spread the risk more widely while the use of larger aircraft would increase the consequences of a crash. The NATS model predicted a significantly smaller destroyed area than other models²⁵⁷⁴.

Mr Glass' Case

- 26.2.21 Mr Glass said there were sound reasons to doubt the safety of current operations at Heathrow. The increasing threat of an aircraft disaster led to fear and anxiety and the risk of 1 accident in a million movements seemed too high to those living below some 200,000 movements a year²⁵⁷⁵. Although the responsibility for third party risk had been passed to the CAA, they did not appear to accept it as a duty while NATS did not consider the safety of people on the ground when routing aircraft. Consequently it appeared that the safety of people outside the public safety zones was nobody's responsibility. Mr Glass argued that there was a fundamental need for the Government to define a benchmark for a tolerable risk²⁵⁷⁶.
- 26.2.22 He said that nobody could control all the causes of accidents; 80% were due to either aircraft deficiencies or error by the flight crew²⁵⁷⁷. It was simply a matter of time before there was a major crash on London²⁵⁷⁸. Traffic to the world's largest international airport flew low over one of the world's largest cities and the increasing use of twin engined aircraft increased the risk of a crash due to engine failure²⁵⁷⁹. It was possible to calculate a probability of one crash every 6 years in the Heathrow related area and 2 or 3 crashes would put the future of the airport into question²⁵⁸⁰.

²⁵⁶⁸ 7-5.1.2

²⁵⁶⁹ 7-5.1.3

²⁵⁷⁰ 7-5.1.5

²⁵⁷¹ 7-5.1.6

²⁵⁷² 7-5.1.7

²⁵⁷³ 7-5.1.8

²⁵⁷⁴ 7-5.1.9

²⁵⁷⁵ 7-6.1.1

²⁵⁷⁶ 7-6.1.2

²⁵⁷⁷ 7-6.1.3

²⁵⁷⁸ 7-6.1.4

²⁵⁷⁹ 7-6.1.5

²⁵⁸⁰ 7-6.1.6

- 26.2.23 Increasing use of Heathrow made historic data misleading, in Mr Glass's view, and the risk analysis ignored the public reaction to an actual accident²⁵⁸¹. It failed to address societal risk and in particular the repercussions of an accident involving large numbers of people on the ground²⁵⁸². A more appropriate model would look at the causes of accidents rather than historic crash data²⁵⁸³. The risk assessment should not be confined to the differences between Heathrow with and without Terminal 5 but should start from a consideration of whether the current situation was acceptable. It should also take into account the maximum number of movements if Terminal 5 were approved²⁵⁸⁴.
- 26.2.24 Mr Glass argued that if world-wide crash rates had been used the predicted frequency would have been one crash every 5.3 years rather than 13.9 years²⁵⁸⁵ but even a crash rate of one in 13.9 years was unacceptable²⁵⁸⁶. The use of larger aircraft as a result of Terminal 5 would increase the consequences of a crash²⁵⁸⁷ and the fleet mix used in the assessment had been manipulated by the inclusion of a tenfold increase in the use of turboprop aircraft if Terminal 5 were not built²⁵⁸⁸.
- 26.2.25 He said that the surveys to assess tolerability had not attempted to demonstrate the lower limits of tolerability although the analysis suggested that a risk of 5×10^{-7} would be regarded as negligible. They showed that an individual risk of 10^{-6} was unacceptable to 40% of the affected population²⁵⁸⁹. There was no evidence that the surveys had covered people with experience of living with the risks present at Heathrow but if the results were applied to Heathrow the cost of exposure to current levels of individual risk would be at least £3.7bn²⁵⁹⁰.
- 26.2.26 Based on the approach adopted by the Health and Safety Executive, Mr Glass suggested that the maximum risk to be tolerated would be much less than 10^{-4} while a risk of 10^{-6} was defined as that which "provided there was a benefit to be gained and proper precautions taken, does not worry us." That had been treated in this case as if a risk of 10^{-6} was trivial²⁵⁹¹. Cost benefit analysis was not acceptable as a means of weighing the risks of Terminal 5 since it ignored the fact that the benefits accrued to one section of society while the costs were borne by another. The benchmark would be acceptability to those receiving no benefit. The current risk was too high and should be reduced²⁵⁹².
- 26.2.27 He also argued that the acceptance of risk was linked in most cases to the receipt of some benefits by the person taking the risk and most of those concerned were able to control, to some degree, the level of risk to which they were exposed. Neither of these factor applied to those living around Heathrow²⁵⁹³. The public safety zones did not represent a cautious approach. If no benefit was being received, new development should be limited to areas beyond the 10^{-6} contour²⁵⁹⁴.

²⁵⁸¹ 7-6.1.7
²⁵⁸² 7-6.1.8
²⁵⁸³ 7-6.1.9
²⁵⁸⁴ 7-6.1.10
²⁵⁸⁵ 7-6.1.11
²⁵⁸⁶ 7-6.1.12
²⁵⁸⁷ 7-6.1.13
²⁵⁸⁸ 7-6.1.13
²⁵⁸⁹ 7-6.1.14
²⁵⁹⁰ 7-6.1.15
²⁵⁹¹ 7-6.1.16
²⁵⁹² 7-6.1.17
²⁵⁹³ 7-6.1.18
²⁵⁹⁴ 7-6.1.19

- 26.2.28 Finally Mr Glass said that the location of Terminal 5 would be unsafe; it would cause aircraft to be affected by wind shear in the critical moments just before touchdown. It would also be vulnerable to aircraft veering off the runway²⁵⁹⁵.

Mr Green's case

- 26.2.29 Mr Green said that many of his original concerns had been met but argued that the failure to address societal risk was the principal reason to oppose Terminal 5²⁵⁹⁶. He pointed to the changes in the forecast number of aircraft movements associated with Terminal 5 and suggested that there should be an agreement not to exceed the forecasts²⁵⁹⁷. It was logical to assume a greater accident rate as the number of movements rose. On BAA's figures there would be one crash in a built-up area outside the airport every 40 years if Terminal 5 were not built and every 37 years if it were compared with the current rate of one every 42.5 years. These rates would result in a prediction that there would be 3.1 deaths a year without Terminal 5 and 4.4 with it.
- 26.2.30 Mr Green said there could be no objection to the crash frequency and crash location aspects of the NATS model as long as the data had been handled properly but there should be grave reservations as to the numbers killed on the ground. Such figures as there were, suggested that the numbers killed on the ground would be about the same as the numbers of passengers and crew killed²⁵⁹⁸. It was nonsense to limit consideration to the area covered by a specified risk. Furthermore, some of the assumptions in the model appeared to be erroneous and the population exposed to a risk of 10^{-7} should have been assessed as had been done at both Manchester and Schiphol²⁵⁹⁹. Societal risk was not assessed by the NATS model and the increased risk for those beneath the stacking area would be far greater than the model implied²⁶⁰⁰.

Other cases

- 26.2.31 **Heston Residents Association** had carried out a survey, which showed that people were concerned about the risk from aircraft. The possibility of hi-jacking and the smuggling of explosives on to aircraft heightened the risk²⁶⁰¹. Air traffic controllers were working under too great a pressure and using out of date equipment and there were other hazards for local residents. The present risks were obvious and would be increased by Terminal 5²⁶⁰². A survey in Brentford carried out and submitted by **Brentford Community Council** also identified widespread concern about public safety²⁶⁰³.
- 26.2.32 **LAHT5** made written submissions on public safety but also dealt with the subject in their final submissions. They argued that there was no policy guidance on how risk due to a proposed airport development should be considered. The proposed public safety zone policy would be about half as stringent as that in the Netherlands²⁶⁰⁴. Even though societal risk was difficult to quantify, a crash on an urban area related

²⁵⁹⁵ 7-6.1.20

²⁵⁹⁶ 7-7.1.1

²⁵⁹⁷ 7-7.1.2

²⁵⁹⁸ 7-7.1.4

²⁵⁹⁹ 7-7.1.5

²⁶⁰⁰ 7-7.1.6

²⁶⁰¹ 7-8.1.1

²⁶⁰² 7-8.1.2

²⁶⁰³ 7-10.1.1

²⁶⁰⁴ 7-9.1.1

to Heathrow would render individual risk calculations of limited relevance and raise fundamental concerns. The growth in air traffic meant that an accident could shortly be expected once a week, world-wide²⁶⁰⁵.

26.2.33 It was recognised that safety was taken very seriously but LAHT5 argued that there were limits to what could be achieved particularly where human error played such a large part²⁶⁰⁶. It was possible that up to a million people could be exposed to an individual risk of between 10^{-6} and 10^{-7} and the number of people overflown by departures from Heathrow was about 12 times that at Gatwick or Stansted. As far as could be determined Heathrow exposed more people to material levels of third party risk than any other airport in the world. Terminal 5 was the equivalent of a new airport but its location would be in contrast to others being built where flights over urban areas were being minimised²⁶⁰⁷.

26.2.34 Fear and anxiety were a relevant consideration and a survey in Richmond had shown significant concern over the risk from aircraft²⁶⁰⁸. Different assumptions would increase the estimated numbers of people exposed to risk. For example, use of the Dutch crash consequences model would increase the population within the 10^{-6} contour by 43% and the use of world-wide crash rates would increase the population subject to significant levels of individual risk by 171%²⁶⁰⁹. The correct policy was to make the risk as low as reasonably possible. This could be done by imposing a limit on the number of aircraft movements. The limit of 430,000 movements suggested by LAHT5 to mitigate noise would also reduce risk²⁶¹⁰.

26.2.35 In their written representations **West London Friends of the Earth** were also concerned about societal risk. They suggested that it would be proper to consider whether accommodating increased air travel at other airports would lead to a lower overall risk as seemed likely²⁶¹¹. They also pointed to the possibility of limiting risk through an agreement not to exceed the forecast level of traffic²⁶¹². Other written representations raised concerns over terrorist activities and the possibility that emergency services would be overloaded by a major accident. They argued that Terminal 5 would increase the pressure on air traffic control and suggested that the increased risk to public safety would be significant. Similar concerns were expressed by members of the public appearing at the inquiry.

My Conclusions

26.2.36 It was suggested by Hillingdon and by Mr Glass that the responsibility for public safety related to aviation was not clearly defined. However the evidence placed before me was that the Government's approach is that the safety of people and property on the ground is best secured by ensuring the safe operation of civil aviation. I am in no doubt that the civil aviation industry in this country operates under a system of controls and regulations which have safety as a primary objective. Indeed I was told that the safety management system operated by NATS was widely regarded as being among the best in the world and was being adopted across Europe. For my own part I have no difficulty in accepting that they provide the public with a high quality of service and pay the greatest attention to matters of

²⁶⁰⁵ 7-9.1.2

²⁶⁰⁶ 7-9.1.3

²⁶⁰⁷ 7-9.1.5

²⁶⁰⁸ 7-9.1.6

²⁶⁰⁹ 7-9.1.7

²⁶¹⁰ 7-9.1.8

²⁶¹¹ 7-11.1.1

²⁶¹² 7-11.1.2

safety. I also note the evidence that NATS would reduce the number of movements if a safety problems emerged.

- 26.2.37 I recognise that nothing can prevent accidents and many individuals expressed their concern that air traffic control systems at Heathrow were already under great pressure. Nevertheless, I believe that the current system of regulation is designed to ensure, as far as possible, the safe operation of civil aviation at Heathrow. This does not necessarily mean that concerns about the current position regarding the risk to local residents posed by aircraft using Heathrow are not justified. This is a point to which I shall return.
- 26.2.38 It was also suggested that there is no Government guidance about the way in which the risk associated with proposed airport developments should be treated. On the other hand, the approach adopted by the Department suggests that they rely on the effectiveness of their overall controls to ensure that public safety does not become an issue in the consideration of planning applications. They told me that they believe the regulatory framework is such that any issue of public safety could properly be taken into account and would ensure that any consequences of the proposed development could be accommodated in safety terms. Inevitably they accepted that it was not possible to eliminate all the risks. They also accepted that it was necessary to consider whether Terminal 5 would increase risk materially.
- 26.2.39 One witness for the Department said he had reached the provisional view that there were no grounds based on third party risk to refuse Terminal 5 because the public safety zone policy could cater for it. This is not a view that I accept. There can be no doubt that the public safety zone policy ensures that nobody outside the airport is exposed to a risk greater than 10^{-4} which is assumed to be the maximum tolerable risk. It also ensures that development is restricted in areas exposed to a risk greater than 10^{-5} . However, it has no effect on areas subject to a risk of less than 10^{-5} even though even BAA accepted that a risk of more than 10^{-6} is greater than normal background risk. Consequently there is a clear need to consider the safety implications of Terminal 5 in a wider context than that of the public safety zones.
- 26.2.40 Before I go on to do this I need to deal with criticisms of the model used by NATS on behalf of BAA. The model can be divided into 3 main elements, crash frequency, crash location and crash consequences. As far as crash frequency was concerned the main criticism was that world-wide crash rates should have been used. This would have led to very much higher crash frequencies. However the use of world-wide crash rates would not reflect the fact that 95% of all movements at Heathrow are by western jets and turbo-props or the stringent standards imposed by the CAA and would not, in my view, be appropriate. I consider that the model embodies the most appropriate assumptions regarding crash rates.
- 26.2.41 There was no significant criticism of the crash location element of the model, but the assumptions regarding crash consequences raised some substantial concerns. It was suggested that NATS had under-estimated the number of people on the ground likely to be killed and that the Dutch model would increase the population exposed to a risk greater than by 43%. However, the assumptions about the consequences of a crash are, in my view, soundly based. I accept that the relative infrequency of crashes limits the availability of data but the model uses the results of 56 crashes and produces estimates of destroyed areas which are greater than those derived from other models. There must be uncertainty about this aspect of the model but I find no reason to suggest that NATS has under-estimated the consequences of a crash.

Indeed I accept their evidence to the effect that their estimates of the area destroyed in a crash is larger than that derived from other models.

- 26.2.42 On a more fundamental point, Mr Glass sought a model which was based on the causes of crashes. He did not provide any examples of the use of such a model and the Department's expert witness was not aware of any such model did not believe such a model could be developed with statistical validity. I do not need to express a view on the desirability of the type of model advocated by Mr Glass since I am satisfied there is no realistic prospect of its being made available in time to aid the decision on Terminal 5 if at all.
- 26.2.43 The use of a high proportion of turbo-prop movements at Heathrow without Terminal 5 was also criticised but as BAA pointed out, and as I find to be the case, the higher crash rate of such aircraft is offset by their smaller size. This reduces the area destroyed and means that the overall effect of this assumption is limited.
- 26.2.44 I, therefore, conclude that the model used by NATS on behalf of BAA to assess the risk to public safety is appropriate and produces acceptable results. Like any model it is subject to uncertainty but I accept that it is likely to be more reliable in comparing the position with and without Terminal 5 than in producing absolute estimates of risk.
- 26.2.45 All parties accepted that an individual risk of 10^{-4} is intolerable and that action should be taken to mitigate that risk. In relation to airport operations this has led to the policy that houses should be removed from areas exposed to a risk greater than 10^{-4} . Public safety zone policy also requires that development be restricted in those areas exposed to a risk of between 10^{-5} and 10^{-4} . One of the most important issues is the extent to which the risk to public safety is material beyond a level of 10^{-5} . BAA argued that a risk below 10^{-6} was consistent with normal background levels but others argued strongly that the assessment should include those areas exposed to a risk of over 10^{-7} .
- 26.2.46 While comparisons can be made with the level of risk accepted in other activities, such as travelling by road, I do not find these very helpful in this case. As was pointed out by Mr Glass and others, the normal approach of weighing the benefits of an activity against the risks involved is difficult if not impossible to apply in relation to Terminal 5. There can, in my view, be no argument but that there are clear and substantial benefits to be derived from air travel in general and the provision of Terminal 5 in particular. However, I recognise that these benefits are for the most part enjoyed by people who do not live under the flight paths of aircraft using Heathrow. Many local residents experience all the risks without any of the benefits. Furthermore, as many of them told me they suffer from constant reminders of the potential dangers through the noise of aircraft passing overhead. I can, therefore, understand why there is widespread concern about public safety around Heathrow and a feeling that Terminal 5 would make matters substantially worse.
- 26.2.47 In the absence of comprehensive and objective survey information it is impossible to quantify this concern. In absolute numbers those expressing concern about public safety at the inquiry were undoubtedly a minority of those actually living under the flight paths but they clearly felt very deeply about this issue. Further evidence of concern emerges from the surveys of residents in Heston, Brentford and Richmond. The surveys carried out as part of the Department's study of public safety zone policy did not include residents around Heathrow so they can shed little light on the local implications of this point. They did however find that 40% of respondents

would require compensation or relocation at a risk of 10^{-6} . Consequently the Study suggested that, if the risks were real rather than hypothetical, the boundary point below which the risk is too small to worry about might be closer to 10^{-7} than the conventionally accepted 10^{-6} ²⁶¹³. Bearing in mind the tentative nature of this comment, I find no reason to justify adopting a limit below the normally accepted 10^{-6} . This is not to say that the risk beyond that contour could or should be ignored. The building of Terminal 5 would increase the individual risk in this wider area but its significance would be less.

- 26.2.48 Although the area exposed to a risk greater than 10^{-4} would increase if Terminal 5 were permitted, there would be no increase in the number of people exposed to that level of risk if the proposed policy to buy and remove any existing housing and other development occupied by third parties for a high proportion of the day within the 10^{-4} individual risk contour were implemented. BAA's figures show that some 1,900 more would be exposed to a risk of greater than 10^{-5} while about 15,000 more people would be affected by a risk of more than 10^{-6} . A person exposed to a risk of 10^{-5} or 1 in 100,000 in the absence of Terminal 5 would experience an increase of some 30% to a risk of 1 in 77,000. While these figures confirm that the individual risk of death for those living around Heathrow is very low they also demonstrate that Terminal 5 would increase that risk to a significant degree.
- 26.2.49 In my view, the relatively low level of individual risk does not however, tell the whole story. All parties recognised that wider issues were relevant. These were referred to under the broad heading of societal risk. While all parties recognised societal risk nobody was able to quantify its impact on Heathrow in general or the Terminal 5 proposal in particular. BAA argued that the Health and Safety Executive had found that too many factors were involved and that many of these involved qualitative judgements. They went so far as to argue that its assessment would not help in this case.
- 26.2.50 While I accept that it is not possible to quantify the effect of Terminal 5 on societal risk, there can be no doubt that the crash of a large aircraft on west London while approaching or leaving the airport could result in a very large number of deaths and that this would raise questions about the future role of Heathrow. Such an accident could happen whether Terminal 5 were built or not but it must be reasonable to assume in the absence of specific evidence that the societal risk associated with Terminal 5 would rise in line with the increase in individual risk.
- 26.2.51 While the risk of a crash at other airports would be similar to that at Heathrow in terms of frequency, the fact that aircraft approaching Gatwick or Stansted do not pass over extensive built-up areas must reduce the number of people on the ground who would be exposed to the risk of a crash. Equally the scale of societal risk would be lower at Gatwick or Stansted. In this context there would, in my view, be benefits in development at either of these airports rather than at Heathrow.
- 26.2.52 If additional capacity is to be provided at Heathrow I accept that the increase in risk to public safety would be contained if a limit were to be placed on the number of aircraft movements to be handled as long as this did not lead to a significant increase in the size of aircraft. This provides further support for the imposition of a condition on any planning permission for Terminal 5 limiting the number of aircraft movements. Similarly I believe that the number of people exposed to the risk of a crash could be reduced if more aircraft approached from the west rather than over

²⁶¹³ CD/244(b) para 10.16

west London particularly since the evidence shows that some 2.5 times as many crashes are associated with landings compared with departures.

- 26.2.53 The weight to be attached to the public safety objections must also reflect the judgement as to current situation. I am in no doubt that many people believe that Heathrow is unsafe at present so that any increase in movements would be wholly unacceptable. On the other hand, the Government has entrusted the responsibility for safety to the CAA and the evidence placed before me is that both the Government and the CAA believe that the current procedures ensure that Heathrow and other UK airports operate safely. I have already accepted that the safety management systems in the UK are widely recognised as being among the best in the world and that individual risk levels are low.
- 26.2.54 On a statistical basis, I accept that the current position at Heathrow does not raise material concerns in terms of public safety based on an individual risk assessment. I have already commented on the consequences if an aircraft were to crash on the densely populated areas of London. Although the chances of that happening are very low, the consequences would be such that they point to a very real problem in terms of the location of Heathrow. As I have already pointed out a reduction in the number of aircraft flying over West London on their approach could only improve the existing situation. Such a change could not, however, be prayed in aid of Terminal 5 since it could be achieved whether the proposed new terminal were permitted or not. It would nevertheless, make the position with Terminal 5 better than that predicted by the model. It would also reduce the anxiety caused to local residents by what they described as the relentless passage of aircraft above their heads with its constant reminder of the risk that one will crash.
- 26.2.55 Terminal 5 would result in increases in individual and societal risk. Although the increased risk as a result of Terminal 5 would be marginal, they would clearly represent a material objection to Terminal 5 which would have to be weighed in the balance with all of its other costs and benefits.
- 26.2.56 It was also argued that Terminal 5 would increase risks to the public on the airport by causing turbulence in the critical moments before touch down and by reason of its location close to the end of the runways. I accept that this could, in theory, constitute a threat to public safety which ought to be taken into account in the planning process. In this case, however, BAA have held detailed discussion with the CAA regarding the design of Terminal 5 and the proposed changes to the airport have been found to be acceptable in principle. The CAA told me that air traffic control procedures could be applied if the new terminal caused turbulence. Consequently I find no reason to suggest that Terminal 5 would pose a threat to public safety within the airport.

26.3 VORTICES

The Cases

- 26.3.1 **BAA** explained that aircraft created circulating currents of air which could make contact with buildings dislodging roof slates or tiles. Although the responsibility for such damage lay with the airline concerned, BAA had operated a voluntary insurance scheme since 1974 and a Vortex Protection Scheme since 1993²⁶¹⁴.

²⁶¹⁴ 7-13.1.1

Under this scheme every residential property, school or hospital damaged by a vortex strike was re-roofed. Furthermore, if 65% of houses in a street suffered damage every house in that street was re-roofed²⁶¹⁵. Tests had found that older tiled roofs were susceptible to damage but those which had tile clips would resist the pressure differences experienced during vortex strikes²⁶¹⁶. BAA had now re-roofed 1743 properties at a total cost of some £6.5m and no damage had been recorded at any re-roofed property²⁶¹⁷.

- 26.3.2 The rate of damage was declining rapidly with 61 properties having been re-roofed in 1997 as compared with 305 in 1993. There was no evidence that it would increase as a result of the introduction of the NGLA. Considerable efforts were being made to ensure that the vortices caused by these did not exceed those caused by the current Boeing 747-400²⁶¹⁸. Hounslow sought conditions to secure the continuance of the existing voluntary Vortex Protection Scheme and to repair damage to any roof, which had been damaged previously. BAA resisted the imposition of such conditions but were willing to give an assurance that the existing scheme would continue and that any residential property, school or hospital which was damaged would be re-roofed. They were also prepared, if necessary, to put this assurance on a formal footing²⁶¹⁹.
- 26.3.3 **Hounslow** pointed out that there had been 2055 vortex strikes in the borough between 1987 and 1997. The council was concerned that the introduction of the NGLA would cause stronger vortices extending the area within which damage was caused and causing further damage to roofs which had been repaired previously²⁶²⁰. They believed that BAA should be bound by conditions to continue the present scheme and to repair to roofs whether they had been repaired previously or not²⁶²¹.
- 26.3.4 **HACAN** believed that the problem of vortex strikes was increasing with reported strikes increasing from 40 in 1978 to 195 in 1997 and were concerned that the are affected would extend²⁶²². The problem was not being treated seriously and BAA's scheme provided no reassurance for people living below the flight paths. There could be serious problems including the risk of injury or death from falling roof debris²⁶²³. The problem of damage caused by vortex strikes was also referred to in several written representations. It was suggested that Terminal 5 would increase this problem.

My Conclusions

- 26.3.5 There can be no doubt that vortex strikes cause damage to properties below the flight path as landing aircraft approach the airport and I understand the concern felt by those living in areas affected. I accept that the number of strikes seems likely to increase as the number of aircraft movements increases. To this extent Terminal 5 would cause an increase in the number of strikes. On the other hand the evidence suggests that damage is concentrated on older roofs and that it is unlikely to affect properties which have been re-roofed by BAA. There must be a risk that people would be injured or even killed by debris falling from a roof but there is no

²⁶¹⁵ Day 434 pp9-10

²⁶¹⁶ 7-13.1.2

²⁶¹⁷ 7-13.1.3

²⁶¹⁸ 7-13.1.4

²⁶¹⁹ 7-13.1.5

²⁶²⁰ 7-13.2.1

²⁶²¹ 7-13.2.2

²⁶²² 13.3.1

²⁶²³ 13.3.2

evidence that this has happened in the past or that the risk is sufficiently great as to be a material factor in this case.

- 26.3.6 There must also be a real risk that the NGLA would cause stronger vortices which could cause more damage over a wider area. Efforts are being made to minimise the impact of the NGLA on vortices. While it is too early to say whether these efforts will be successful, I believe that there is a realistic prospect that they will be. This is not, however, a problem which is directly related to Terminal 5 in that the NGLA would operate at Heathrow whether or not the new terminal were built. On the other hand, the number of movements by such aircraft would be greater with Terminal 5 than without it.
- 26.3.7 When all of these factors are taken together, I conclude that Terminal 5 would increase the risk of vortex strikes by a small but material degree. At the same time BAA have given a clear indication that they will continue their current Vortex Protection Scheme. In my view this scheme makes reasonable provision for the repair of roofs directly affected by strikes and for the re-roofing of whole streets where 65% of the properties have been affected. Even if the incidence of strikes increases as a result of Terminal 5 the continued re-roofing programme must mean that the actual number of roofs damaged is likely to reduce.
- 26.3.8 Bearing in mind the fact that the legal responsibility for vortex strikes rests on the airlines and the limited impact that Terminal 5 is likely to have on them, I do not believe that it would be right to impose a condition dealing with this point on any planning permission for it. BAA have indicated a willingness to give an undertaking that the existing scheme will be maintained and I consider this to be sufficient.
- 26.3.9 In these circumstances I do not consider that the additional risk of vortex strikes is a material factor against Terminal 5.

27 ASSOCIATED APPLICATIONS AND ORDERS

27.1 INTRODUCTION

27.1.1 The scale and complexity of the Terminal 5 project is reflected in the number of planning applications and Orders associated with the main proposal. These were identified by BAA in a comprehensive schedule which included 14 planning applications and 15 Orders as well as 2 unopposed Orders²⁶²⁴. Many of these such as the Orders for the M25 Spur Road and M4 widening have already been covered in the relevant topics but some do not fall naturally into any particular topic. The latter are covered in this section of the report.

27.1.2 The planning applications (using BAA's references) covered here are;

- A1 – Services under the A3044;
- A2 – Airside Road between Terminal 5 and the Central Terminal Area;
- A3 – Airside Road between Terminal 5 and the World Cargo Centre;
- A4 – Underground Stormwater Outfall Sewer;
- A5 – Transfer Baggage System, and;
- A8 – Fuel Farm.

27.1.3 The Orders (again using BAA's references) covered here are;

- B9 – Heathrow Airport - Terminal 5 Compulsory Purchase (No.1) Order 1995;
- B10 - Heathrow Airport – Terminal 5 Compulsory Purchase (No.2) Order 1996;
- B11 - Heathrow Airport – Terminal 5 Compulsory Purchase (No.3) Order 1997;
- B13 – Application under Section 44 of the Civil Aviation Act 1982 12 January 1998;
- B14 – Application under Section 44 of the Civil Aviation Act 1982 24 February 1998, and;
- B15 – Application under Section 44 of the Civil Aviation Act 1982 1 April 1998.

27.1.4 The 2 unopposed Orders referred to above related in one instance to a Scheduled Monument (although it was described by BAA as an Order it was in fact an application for consent). The other Order related to the proposed stopping up of Burrows Hill Lane. The application for Scheduled Monument

²⁶²⁴ BAA/1982

Consent in respect of Monument 61 was unopposed and the Department of National Heritage recommended that it be approved subject to conditions²⁶²⁵. In the absence of any evidence to the contrary and bearing in mind that it is required if Terminal 5 is to proceed, I shall recommend that the consent be granted if Terminal 5 is approved. I am not asked to report in relation to the stopping up of Burrows Hill Lane although I assume that that will be dealt with as appropriate. It would appear however, that the Order would need to be confirmed if Terminal 5 was to go ahead.

27.1.5 Although the range of these applications and Orders is very wide the issue to be decided is the same in each case;

- Should planning permission be granted or the Orders be confirmed if it is decided that Terminal 5 should proceed.

27.1.6 In all but 2 of the applications considered here BAA asserts that the development or consent involved is essential if Terminal 5 is granted planning permission. In some cases objections have been made and the validity of these must be assessed against the need assuming that Terminal 5 is to proceed. In line with BAA's overall approach, I have assumed that none of these applications should be permitted and no Orders made if Terminal 5 itself is not permitted.

27.2 THE PLANNING APPLICATIONS

27.2.1 No specific objections, other than those raised by Hillingdon, remain outstanding in relation to applications A1 – A5. I understand Hillingdon's concerns that they had not been the subject of separate consideration earlier in the inquiry²⁶²⁶. In an inquiry of such range and complexity there is inevitably a danger that the impact of some proposals may be minimised and I have sought to avoid this at all times. Accordingly I have given very careful consideration to Hillingdon's overall concerns about the associated application covered in this Chapter and elsewhere.

27.2.2 There is undoubtedly a degree of overlap between various applications as Hillingdon argued²⁶²⁷ but the nature of the developments involved is distinctive. Consequently, I see no problem in maintaining the necessary controls over each of them particularly as BAA have suggested a condition which would involve notification of the start of each development separately²⁶²⁸.

27.2.3 Although Hillingdon claimed that they had had insufficient information on which to judge the impact of these applications²⁶²⁹, there was little evidence to demonstrate how this had hindered their consideration of the applications. Indeed it was not a point raised by officers who presumably felt that they had sufficient information available to them to support their recommendation that each of these applications should be approved if Terminal 5 were permitted²⁶³⁰. In these circumstances it is not surprising that officers did not seek further details from the applicants before placing the applications before their members. On the other hand it is less easy to understand why they did not seek more information after members had met if they felt that this was a significant objection to the various proposals²⁶³¹.

²⁶²⁵ 8-2.3.11

²⁶²⁶ 8-3.1.1

²⁶²⁷ 8-3.1.1

²⁶²⁸ 8-2.2.9

²⁶²⁹ 8-3.1.2

²⁶³⁰ 8-2.2.1

²⁶³¹ 8-2.2.1

- 27.2.4 Hillingdon also raised concerns over the way in which archaeological matters were to be dealt with²⁶³². However, English Heritage has commended the approach taken by BAA in this respect²⁶³³. Although I shall return to this point when dealing with conditions, I find no evidence that archaeological interests would not be properly protected during the works proposed by BAA.
- 27.2.5 Having examined all of the objections raised by Hillingdon in relation to applications A1 – A5, I find no reason to justify refusing planning permission for any of them assuming the Terminal 5 is to proceed. Although the sites of applications A1 and A4 are in the Green Belt, there was no dispute that both developments concerned, the services under the A3044 and the underground stormwater outfall sewer, would be appropriate²⁶³⁴.
- 27.2.6 My conclusions do not however, mean that these applications should be approved if Terminal 5 is not to proceed. Each of them is directly related to Terminal 5 and I commend the approach adopted by BAA who argued that none should be permitted if Terminal 5 itself was found to be unacceptable²⁶³⁵.
- 27.2.7 The position of the proposed fuel farm (application A8) is different in that Hillingdon raised a number of specific objections. I am not convinced that the fuel farm would be appropriate development in the Green Belt and have treated it as if it were inappropriate. Nevertheless, I accept that its location adjacent to the existing airport and sludge works means that very little harm would result if the development were permitted²⁶³⁶. It would be an integral component of Terminal 5 and assuming that my conclusions regarding the need for the new terminal are accepted there would clearly be very special circumstances to justify the construction of the fuel farm.
- 27.2.8 Although Hillingdon referred to objections from others, I note that these were subsequently withdrawn. In particular the CAA withdrew its objections on safety grounds²⁶³⁷. As Hillingdon offered no evidence on safety I have no basis for concluding that the fuel farm would affect safety at Heathrow. Indeed my own view is that safety would not be affected.
- 27.2.9 I can understand Hillingdon's concerns over the limited guidance offered by the plans submitted by BAA²⁶³⁸ but I do not consider this to be a fundamental failure. Hillingdon had every opportunity to seek more detailed plans but did not do so²⁶³⁹. I accept that any permission issued in relation to the fuel farm should reserve detailed matters for subsequent approval but I do not accept that the council could not judge the impact of the proposal on the information supplied. Indeed they did so and came to the conclusion that the impact would be unacceptable²⁶⁴⁰.
- 27.2.10 I do not share this view. Although the fuel farm would be isolated during Phase 1 of the development²⁶⁴¹ it would ultimately be seen in the context of Terminal 5 and

²⁶³² 8-3.1.2

²⁶³³ 8-2.2.4

²⁶³⁴ 8-2.2.2 and 5

²⁶³⁵ 8-2.1.4

²⁶³⁶ 8-2.2.7

²⁶³⁷ 8-2.2.7

²⁶³⁸ 8-3.2.3

²⁶³⁹ 8-3.2.5

²⁶⁴⁰ 8-3.2.5

²⁶⁴¹ 8-3.2.4

the Forward Maintenance Unit²⁶⁴². Having visited the site, the existing fuel farm and the nearest viewpoints, I consider that this would be seen as a normal element of a major airport. It would be some 1,000m from Longford²⁶⁴³. I also note that, in spite of their concerns, Hillingdon had carried out no visual impact assessment of the proposed fuel farm²⁶⁴⁴.

- 27.2.11 As I have already said, the fuel farm would be seen as a normal element of the airport and I found no reason to suppose that, when seen from any public viewpoint, it would look out of place in the context of Terminal 5 and its associated buildings.
- 27.2.12 Consequently I believe that the fuel farm as proposed in application A8 should be granted planning permission subject to conditions which, amongst others, would require approval of more detailed plans before construction began.

27.3 THE ORDERS

- 27.3.1 BAA devoted a great deal of effort to negotiations aimed at overcoming the objections to the various Orders and this effort was successful for the most part. The Environment Agency maintained its objections to CPO No 1 and No 3 and to the Section 44 Order related to the Stormwater Outfall Sewer (Order B14)²⁶⁴⁵. I have covered the evidence regarding the value of the river diversion scheme now proposed by BAA earlier in this report and have concluded that it does meet the objective set out by the Agency. That removes the first objection by the Agency. I agree with BAA that there is no statutory basis to support the contention that the Agency should be exempt from compulsory purchase procedures and that any confusion over the ownership of the Duke of Northumberland's River can only reinforce the need for the CPO. Finally the evidence on the nature of the river diversion now proposed confirms that there is no reason to believe that the Agency's responsibilities to riparian owners downstream would be prejudiced. Accordingly I do not support the objections by the Agency to the CPO's or the Section 44 Order.
- 27.3.2 The objection by Smiths Industries plc is clearly intended to draw attention to their case for suitable compensation²⁶⁴⁶. There is no suggestion that suitable premises could not be provided and I do not consider this to be an objection which should be supported.
- 27.3.3 Finally I turn to the objections by Hillingdon concerning CPO No 1. As they accepted, the primary objection is simply a reflection of the Council's fundamental objection to Terminal 5 and this must fall if Terminal 5 itself is found to be acceptable²⁶⁴⁷. Apart from this only 2 objections remain since those related to Plots 134 and 155 have been withdrawn²⁶⁴⁸. While I have some sympathy with Hillingdon's suggestion that access could be provided to BAA by agreement²⁶⁴⁹, I place substantial weight on the need for comprehensive landscaping if Terminal 5 is to proceed. I, therefore, believe that BAA should be permitted to acquire these plots in order to achieve this very important planning objective.

²⁶⁴² 8-2.2.8

²⁶⁴³ 8-3.2.4

²⁶⁴⁴ 8-2.2.8 and 3.2.4

²⁶⁴⁵ 8-4.1.1

²⁶⁴⁶ 8-4.1.2

²⁶⁴⁷ 8-3.3.2

²⁶⁴⁸ 8-3.3.1

²⁶⁴⁹ 8-3.3.1

- 27.3.4 Having considered all of the outstanding objections I consider that each of the CPO's and section 44 Orders should be confirmed (subject to the modifications proposed by BAA as set out in BAA/1982) if Terminal 5 is to proceed.
- 27.3.5 I also recommend that the application for Scheduled Monument Consent in respect of Monument 61 be approved subject to the appropriate conditions which are dealt with in Chapter 32.

28 THE ENVIRONMENTAL IMPACTS OF CONSTRUCTION

28.1 INTRODUCTION

- 28.1.1 Throughout the report I have emphasised the scale of the whole Terminal 5 project. The purpose of this Chapter is to explore the implications of the construction programme that would be involved if it were to be built. This programme would affect substantial areas around the airport and last for several years. It can, therefore, be compared with a major minerals extraction project in terms of its potential impact on the environment. Indeed the effects are likely to spread over a much wider area and be much greater than would be the case with mineral workings.
- 28.1.2 Although there was some debate under the Construction topic of the forms of analysis adopted, most of these followed the pattern established in earlier topics. Therefore I shall not spend much time reiterating arguments about matters such as traffic modelling, noise and air quality except where they raise issues specifically related to construction.
- 28.1.3 The main arguments in this topic focussed on 2 points. First, Hillingdon argued that the impacts of the construction programme would be so substantial that they, of themselves, constituted a potential reason for refusal of planning permission for Terminal 5. Secondly Hillingdon, Spelthorne and others sought strict controls to reduce the effect of the construction activities which would follow from the programme put forward by BAA.
- 28.1.4 Both Hillingdon and Spelthorne also argued that the scale of the Terminal 5 construction project was so great that it should be supported by a comprehensive strategy which clearly identified the sources of the minerals to be used and the approach to waste minimisation and disposal. Furthermore, a number of specific proposals were put forward for temporary developments associated with the construction of Terminal 5, including the proposed spoil deposition in the Colne Valley, the Colnbrook Logistics Centre, the Forward Lorry Park and the construction of 2 Bailey bridges. Since most of these would be in the Green Belt, the justification for them was central to the debate on construction. I shall deal with the minerals and waste and these temporary developments in the following Chapters
- 28.1.5 The main issue to be addressed in this Chapter are, therefore:
- The effect of construction if Terminal 5 were to be permitted on the environment of the surrounding area in terms of traffic, noise and air quality and the extent to which its impact could be reduced by changes to the proposed programme or the removal of some of its elements.
- 28.1.6 I do not intend setting out the main features of the Construction process in any detail since these are largely factual and are described in detail in Chapter 2 of the Construction Topic Report. It involves development on the principal site itself, some permanent developments nearby on the subsidiary sites, some temporary developments and the works associated with the road schemes – the M25 Spur Road and the M4 improvements. BAA intends to open Phase 1 of the project as soon as

possible while minimising the effects on the local population and the environment as far as reasonable practicable²⁶⁵⁰.

- 28.1.7 The timetable submitted to the inquiry envisaged construction starting in 2000. Since that is no longer attainable I shall simply refer to Years 1, 2, 3 etc of the construction process. On that basis, the roadworks, other than those on the M4, would be likely to start at the beginning of Year 2, as would construction of above ground structures for the Core Terminal and Satellite 1. By the end of Year 5 most of the major buildings would have been completed including the Core Terminal, Satellite 1, the Underground Baggage Facility and the rail links. Phase 2 would cover Years 6 to 8 and involve the construction of Satellite 2 and its associated roads and aprons while work after Phase 2 would cover Satellite 3, which now seems likely to be built, and the completion of the multi-storey car parks²⁶⁵¹.
- 28.1.8 The Colnbrook Logistics Centre would be a key element in the Construction process proposed by BAA. It would occupy a site of some 30 ha north of the A4 and immediately west of the M25 and would serve as a railhead where materials would be delivered, stored and pre-fabricated before being moved to the Principal Site²⁶⁵². The Forward Lorry Park would cover some 1.75 ha on Robbs Nursery in the angle between the A3044 and Airport Way (A311) and would be a marshalling yard where lorries would be held before despatch to the principal site²⁶⁵³. The use of these sites would enable deliveries to the Principal Site to be confined to the periods between 0900 and 1700 hours and 1900 to 2300 hours thus avoiding deliveries in peak traffic hours or at night²⁶⁵⁴.
- 28.1.9 BAA would provide the spoil to be used in the construction of the Spur Road from the Principal Site. This would be taken to the Spur Road site by 2 temporary bailey bridges one over the A3044 (and Western Perimeter Road) and the other over the River Colne²⁶⁵⁵. Some 860,000 m³ of spoil would be used in the construction of the Spur Road embankment and a further 800,000 m³ would have to be deposited in the Colne Valley on Plots 1 and 9²⁶⁵⁶. Some 2.8 million tonnes of sand and gravel would be needed for the construction on the principal site together with 0.8 million tonnes of crushed rock. While the rock together with steel and cement would be delivered by rail, the sand and gravel would be transported by road from local sources²⁶⁵⁷.
- 28.1.10 I was told by BAA that the project would be run in accordance with all relevant legislation and regulations and would be managed under a Code of Construction Practice which was placed before the inquiry in a draft form²⁶⁵⁸. Under this the core working hours would be 07.00-19.00 hours on Mondays to Fridays and 07.00-16.00 hours on Saturdays. Sundays and Bank holidays would be reserved for maintenance and other essential work. There would however be exceptions to this pattern with, for example, the movement of materials for earthworks being permitted up to 21.00 hours in the summer and tunnelling taking place 24 hours a day. Work within

²⁶⁵⁰ 9-2.1.1-4

²⁶⁵¹ 9-2.2.1-5

²⁶⁵² 9-2.3.1

²⁶⁵³ 9-2.3.2

²⁶⁵⁴ 9-2.3.3

²⁶⁵⁵ 9-2.3.5

²⁶⁵⁶ 9-2.4.1

²⁶⁵⁷ 9-2.4.2

²⁶⁵⁸ 9-2.6.1

buildings on the Principal Site would continue 7 days a week from the beginning of Year 4 until Terminal 5 opened²⁶⁵⁹.

- 28.1.11 The Highways Agency said that many of the measures for environmental protection associated with the roadworks would be similar to those in BAA's Code of Construction Practice. Working hours would be based on a normal Monday to Saturday working week, although there would be some working on Sundays and at night²⁶⁶⁰. The Spur Road was likely to involve a maximum labour force of about 200 compared with a maximum of 180 employed on the M4 works²⁶⁶¹.

28.2 THE EFFECT OF CONSTRUCTION TRAFFIC

- 28.2.1 The traffic data related to construction were derived from the Heathrow Road Traffic Model (HRTM) which I have already discussed in detail in the Surface Access Chapter. In considering construction the main parties accepted for the most part the results of the model but not necessarily the conclusions drawn from those results²⁶⁶².

BAA's Case

- 28.2.2 The analysis assumed the completion of some road improvements around the airport before the peak construction periods and BAA pointed to the extensive network of public transport services connecting the airport with central London and local centres. They also said that construction workers could use several established pedestrian and cycle routes and that they would encourage car sharing²⁶⁶³. Few national or local policies had been written with construction traffic in mind but BAA did not dispute that it was national policy to reduce reliance on the private car. On the other hand, policy did not support the levels of constraint or the recruitment strategy proposed by Spelthorne. BAA's proposals went well beyond almost any other large scale project in discouraging the use of the car and encouraging use of public transport²⁶⁶⁴.
- 28.2.3 The strategy included 2 temporary Bailey bridges to allow lorries to travel between the principal site, the Spur Road and the Colne Valley spoil deposition sites without using public roads and a new access from the Longford Roundabout which would minimise the use of the A3044²⁶⁶⁵. BAA would, among other measures, restrict lorry movements to motorways and trunk roads, establish "no-go" areas for construction vehicles and provide sufficient car parking. At the same time they would reduce demand for parking by measures including the provision of shuttle bus services to and from local rail and underground stations. They would also minimise lorry movements at peak times²⁶⁶⁶. Permits would restrict car parking to 60% of all workers a level slightly below the 62.5% who seemed likely to want to use their cars based on surveys of those working on the Heathrow Express and Waterside (then known as Prospect Park)²⁶⁶⁷.

²⁶⁵⁹ 9-2.6.3

²⁶⁶⁰ 9-2.7.1-4

²⁶⁶¹ 9-2.7.6

²⁶⁶² 9-3.1.2

²⁶⁶³ 9-3.2.1-2

²⁶⁶⁴ 9-3.2.3

²⁶⁶⁵ 9-3.2.4

²⁶⁶⁶ 9-3.2.5

²⁶⁶⁷ 9-3.2.7 and 9-3.2.15

- 28.2.4 Traffic flows had been modelled for Years 3 and 4 when movements were likely to be greatest during Phase 1 and for Year 8, the busiest year in Phase 2. In each case 2 hours had been modelled; 07.00-08.00 hours as the peak for the arrival of workers and 11.00-12.00 hours to represent the worst impact of lorry movements²⁶⁶⁸. The methods used had been similar to those used in the Surface Access topic although the approach to capping assumed that the short-term nature of the roadworks meant that drivers would be more likely to change their routes than to stop travelling²⁶⁶⁹.
- 28.2.5 BAA argued that suggestions that existing flows were already greater than the predicted flows were nearly all anecdotal and they did not accept that the model assumed drivers had an up-to-date and perfect knowledge of the network. HRTM acknowledged the imperfections of driver knowledge²⁶⁷⁰. It had been assumed that 60% of workers would arrive between 07.00 and 08.00 hours although it was likely that many would arrive earlier than this²⁶⁷¹. BAA has also assumed that only 5% of lorries would arrive before 09.00 hours. All lorry trips between the logistic sites and the Principal Site would use the fixed routes prescribed in BAA's strategy²⁶⁷².
- 28.2.6 They said that the impact of Terminal 5 construction traffic had been assessed both in comparison with the position if Terminal 5 had been refused permission and with that if Terminal 5 had been approved so that the specific impact of construction traffic could be identified. The increases in traffic on local roads were generally slight²⁶⁷³. During the morning peak hour construction traffic would displace only a small amount of background traffic and increased queuing and delays would occur at only a few locations, notably at Junction 13 of the M25. In the off-peak hour construction operations would have little effect²⁶⁷⁴.
- 28.2.7 BAA argued that both Hillingdon and Spelthorne accepted that displacement and increases in average journey times would be small. Although some total flows would be greater than forecast between 08.00 and 09.00 hours, the contribution from construction traffic would be much less in that hour. Furthermore, there would be as many or more occasions when peak flows would be less than predicted because of the cautious assumptions built into the forecasts²⁶⁷⁵. While BAA accepted that flow breakdown increased as roads reached their capacity and that this could make conditions worse than had been forecast, construction traffic would not alter the position on those parts of the M25 where links were already running at capacity. There was no evidence to support the concerns expressed about conditions on the "village roads" (Hatch Lane, Sipson Road and Harlington High St)²⁶⁷⁶. The effect on Colnbrook would be much less than the Parish Council feared²⁶⁷⁷.
- 28.2.8 BAA would police the "no-go" areas and give an undertaking not to take minerals from sites between the A4 and the M4 which would involve vehicles taking access via the A4. This undertaking could, however, be relaxed if a mineral site in this

²⁶⁶⁸ 9-3.2.9

²⁶⁶⁹ 9-3.2.10-12

²⁶⁷⁰ 9-3.2.13-14

²⁶⁷¹ 9-3.2.16

²⁶⁷² 9-3.2.18

²⁶⁷³ 9-3.2.22

²⁶⁷⁴ 9-3.2.23

²⁶⁷⁵ 9-3.2.24

²⁶⁷⁶ 9-3.2.25

²⁶⁷⁷ 9-3.2.26

area already had a planning permission which meant that lorries would be travelling through a “no-go” area in any event²⁶⁷⁸.

- 28.2.9 Finally, BAA argued that the public transport system would easily accommodate the extra passengers associated with the construction of Terminal 5²⁶⁷⁹.

The Highway Agency’s Case

- 28.2.10 The Highways Agency had modelled Years 3 and 4. In Year 3 it was likely that the Spur Road would be under construction as would work on the widening of the M25. By Year 4 these works would have been completed but the widening of the M4 between Junctions 3 and 4b would be taking place²⁶⁸⁰. Like BAA the Agency had modelled 07.00-08.00 hours as the peak hour adapting HRTM for this purpose²⁶⁸¹. They had made the same assumptions about the proportion of workers arriving by car but had assumed that 20% of the labour force would live on the site²⁶⁸².
- 28.2.11 The assumed lane capacity of 2,000 pcu/hr on the M25 during the roadworks was appropriate given that there should be ample space for a contractor plus 4 reasonably wide lanes. The high proportion of commuters in the morning peak and the low gradients were also relevant factors in the assumed lane capacity²⁶⁸³. Unlike the assessment in the general Surface Access topic, no allowance had been made for travellers to change job or house location due to the roadworks since these were seen as temporary. The reduced lane capacity meant however, that some motorway users would be delayed or would seek alternative routes. Furthermore only high growth forecasts had been modelled to give a worst case position²⁶⁸⁴.
- 28.2.12 Construction traffic would make a relatively small contribution to the overall traffic flows, increasing morning peak flows by about 3% and inter-peak flows by only 0.2%²⁶⁸⁵. Although Year 1 had not been modelled, the only work carried out in that year would be at Junctions 3 and 4 on the M4. The works at Junction 4 were unlikely to cause major problems but those at Junction 3 would be more extensive. Some trips might be displaced to the A4 but the long-term benefits outweighed the short-term inconvenience²⁶⁸⁶.
- 28.2.13 The Agency argued that peak hour construction traffic in Year 3 would be considerably less than the additional traffic due to increased activity at the airport except on the A3044 and some of the roads approaching the car parks for construction workers²⁶⁸⁷. Some junctions would have flows within 10% of those predicted for 2016. Allowing for differences in turning traffic greater problems could be experienced at these junctions during construction than in 2016. Of these, Junction 13 of the M25 would see a queue of 77 vehicles spread over 4 lanes on the northbound A30 approach which was almost exactly the same as in the absence of construction traffic. No significant queues would develop at Junction 3 of the M4 while the A4/Newport Rd junction would be improved and operate successfully.

²⁶⁷⁸ 9-3.2.27

²⁶⁷⁹ 9-3.2.29

²⁶⁸⁰ 9-3.3.1

²⁶⁸¹ 9-3.3.2-3

²⁶⁸² 9-3.3.4

²⁶⁸³ 9-3.3.6

²⁶⁸⁴ 9-3.3.7

²⁶⁸⁵ 9-3.3.8

²⁶⁸⁶ 9-3.3.9

²⁶⁸⁷ 9-3.3.10

The A4/Hatch Lane junction had recently been improved and should be operating well within its capacity in Year 3²⁶⁸⁸.

- 28.2.14 Other junctions considered by the Agency in Year 3 had included Junction 14 of the M25 and the Stanwell Moor Roundabout. The latter was to have been improved as part of the Waterside development but the solution envisaged at that time had proved unsatisfactory. The junction had been found to be capable of operating effectively even with only short-term improvements. Any longer term works would emerge in the light of the decision on Terminal 5 and continued monitoring²⁶⁸⁹.
- 28.2.15 As far as Year 4 was concerned the Agency said that the flows on most roads would be slightly smaller than those in Year 3 the main exceptions being on sections of the airport road system. Flows on some parts of the A4 would exceed the levels predicted for 2016 but these problems would ease once the M4 works were completed²⁶⁹⁰. No intolerable difficulties were envisaged in the peak hours²⁶⁹¹. In the inter-peak periods the maximum impact according to the Agency would be on the Western Perimeter Road but the increased flows would be within the capacity of all links and junctions in both Years 3 and 4²⁶⁹².
- 28.2.16 The Agency accepted that there would be some hours in which flows would exceed those modelled but these would comprise less than 1% of all hours and the additional flows would not exceed the modelled flows by more than 5%²⁶⁹³. The review of the trunk road programme published in 1998 had introduced some significant changes to the network around Heathrow but their impact would be very local and would not undermine the Agency's case²⁶⁹⁴. The Agency agreed with BAA that construction traffic was unlikely to increase the occurrence of flow breakdown on the M25 in the morning peak since some parts were already at capacity. At most, the period when flow breakdown might occur would be extended²⁶⁹⁵.
- 28.2.17 It was common ground that the road network around Heathrow was severely stretched. The proposed road schemes were intended to remedy this situation. They were reasonable and beneficial in terms of limiting construction impacts²⁶⁹⁶. Even though construction related traffic would add relatively little to the total flows, the fact that the network was close to its capacity in the morning peak meant that even this small increase could have a significant effect. Nevertheless, the predicted conditions were substantially better than those forecast for 2016 with Terminal 5 fully operational²⁶⁹⁷. In some locations flows in Years 3 and 4 would be greater than those in 2016 but serious congestion would occur at a very few locations and almost all of these junctions would carry less morning peak hour traffic during the construction period than that predicted for 2016²⁶⁹⁸.

²⁶⁸⁸ 9-3.3.11
²⁶⁸⁹ 9-3.3.12
²⁶⁹⁰ 9-3.3.14
²⁶⁹¹ 9-3.3.15
²⁶⁹² 9-3.3.16
²⁶⁹³ 9-3.3.17
²⁶⁹⁴ 9-3.3.18
²⁶⁹⁵ 9-3.3.19
²⁶⁹⁶ 9-3.3.20
²⁶⁹⁷ 9-3.3.21
²⁶⁹⁸ 9-3.3.22

Hillingdon's Case

- 28.2.18 Hillingdon, who took the view that the impact of construction alone was sufficient to justify refusal of Terminal 5, argued that traffic made a major contribution to that impact²⁶⁹⁹. They suggested that the assumptions made by BAA about the proportion of workers using their cars was reasonable only if the shuttle bus passengers in the Heathrow Express and Waterside surveys were not included as part of those employed²⁷⁰⁰. BAA should not only provide shuttle buses but also enforce reductions in the demand for car parking by a combination of contractual requirements and the provision of much less parking. The possible contribution of a construction camp had also been ignored²⁷⁰¹.
- 28.2.19 A condition on the start of work had proved to have little effect on the arrival times of workers at the Waterside site. A similar spread of arrival times at Terminal 5 would mean considerable extra traffic between 0800 and 0900 hours which would exacerbate existing congestion²⁷⁰². BAA had been forced to revise its estimates of the impact of construction traffic because of the revised schedule for motorway works. While further displacement because of construction traffic would be relatively small the network was already at or above capacity so it could not readily absorb extra demand during the peak periods. Even BAA's figures showed that construction traffic would cause serious inconvenience to local traffic and these were likely to be optimistic since the present situation was a good deal worse than the prediction showed²⁷⁰³.
- 28.2.20 Morning peak hour construction traffic would be some 2,100 vehicles an hour in Year 3 which was equivalent to the capacity of a motorway lane and would be even more in Year 4. Although construction flows would be lower in Year 8, Terminal 5 would be generating traffic itself by then. In all of these years construction traffic would result in additional queuing and delays²⁷⁰⁴.
- 28.2.21 Hillingdon had serious reservations about the HRTM which had been expressed in the Surface Access topic and they had not been able to check its results concerning construction traffic. Even on the basis of the flows predicted by HRTM, congestion on many roads would increase²⁷⁰⁵. All of the village roads were at or close to their capacities and any increase in their use was undesirable. Similar considerations applied to other local roads approaching the A4 Bath Rd. Even where increases were not great they were sufficient to cause serious peak hour problems²⁷⁰⁶.
- 28.2.22 The model predicted only minimal queues west of Heathrow but this was at odds with the actual position. Even at present, lengthy queues were experienced regularly at the Stanwell Moor roundabout with queues on Airport Way stretching back to the M25 junction. Increased flows could only worsen the position²⁷⁰⁷. The position to the south of the airport was less acute but was again at odds with the predictions of the model. Several junctions were ill-equipped to accommodate more

²⁶⁹⁹ 9-3.4.1

²⁷⁰⁰ 9-3.4.2

²⁷⁰¹ 9-3.4.3

²⁷⁰² 9-3.4.4

²⁷⁰³ 9-3.4.5

²⁷⁰⁴ 9-3.4.5-6

²⁷⁰⁵ 9-3.4.7

²⁷⁰⁶ 9-3.4.8

²⁷⁰⁷ 9-3.4.9

traffic and were difficult to improve. Even small increases could cause disproportionately large impacts²⁷⁰⁸.

28.2.23 Hillingdon accepted that the flows resulting from the addition of extra lorries were unlikely to cause the capacity of the roads to be exceeded although there were uncertainties in BAA's assumption that all goods would be carried by heavy vehicles. In this context the number of lorries would be noticeable in terms of noise and vibration especially in the evenings²⁷⁰⁹.

28.2.24 Overall, Hillingdon argued that the impact of construction traffic in the morning peak hour would be severe. The network was already overloaded and the additional demand would make the situation much worse. They doubted BAA's ability to prevent workforce traffic spreading into the hour between 08.00 and 09.00 and early arrivals by lorries would add to the load. The impact would last for up to 10 years and contributed to the Council's view that Terminal 5 should be refused planning permission²⁷¹⁰.

Spelthorne's Case

28.2.25 Spelthorne argued that BAA should have identified potential problems and changed their strategy to ensure that they did not arise²⁷¹¹. The construction of Terminal 5 would have severe effects against a background of national and local policies which sought to diminish the impact of road traffic²⁷¹². Policy MT7 in the Surrey Structure Plan bore directly on construction traffic and sought to keep heavy goods vehicles as far as possible on the trunk and primary road network²⁷¹³. Furthermore, there was no reason why, except for parking standards, the transport policies in the Spelthorne Draft Local plan should not apply to construction as they did to completed developments²⁷¹⁴.

28.2.26 Although there were fewer policies specifically related to freight, PPG 13 stated that the proportion of minerals carried by rail or water should be maximised. BAA's commitment to use rail applied to only 22% of the total and would need to be increased if unacceptable harm to the environment were to be avoided. While it was difficult to produce a detailed strategy at this stage, this could be covered by conditions or an agreement with the local authorities²⁷¹⁵. The 1998 White Paper and trunk road review represented a logical extension of existing trends in transport policy and supported increased use of public transport, less transport of minerals by road and restraints on parking²⁷¹⁶.

28.2.27 Spelthorne had a number of criticisms of the modelling which when taken together demonstrated significant uncertainty about its results and suggested that it had probably under-estimated the potential impacts of construction traffic²⁷¹⁷. The potential impact of the widening work on the M25 in year 3 had been under-estimated; the motorway was already very congested and any further decrease in its capacity would have severe consequences including more frequent flow breakdowns

²⁷⁰⁸ 9-3.4.11

²⁷⁰⁹ 9-3.4.12-13

²⁷¹⁰ 9-3.4.14

²⁷¹¹ 9-3.5.1

²⁷¹² 9-3.5.2

²⁷¹³ 9-3.5.3

²⁷¹⁴ 9-3.5.4

²⁷¹⁵ 9-3.5.5

²⁷¹⁶ 9-3.5.6

²⁷¹⁷ 9-3.5.8-10

and severe queuing²⁷¹⁸. The M25 northbound would be virtually at capacity and trips would be diverted to other roads during the morning peak. This would cause problems on other roads disseminating the impact of construction traffic more widely throughout the area²⁷¹⁹.

- 28.2.28 They were most concerned about Junction 13 on the M25 where congestion was already severe. Queues might prove to be much greater than those predicted by BAA on a significant number of days²⁷²⁰. There were also concerns about the Glanty roundabout and Stanwell Moor Roundabout neither of which featured in BAA's analysis²⁷²¹.
- 28.2.29 As far as Year 4 was concerned, work on the M25 widening would have been completed and Spelthorne accepted that the effects on junctions would be less marked than in Year 3²⁷²². While the number of construction trips would be less in Year 8, Terminal 5 would be open by then. As a result problems similar to those in Years 3 and 4 would occur with the greatest effects being experienced at the Glanty Roundabout²⁷²³.
- 28.2.30 In Spelthorne's view, BAA should limit the number of car parking spaces for construction workers more strictly. These limits should be made known to potential workers so that they could make appropriate arrangements. Heathrow was particularly well suited to the use of public transport²⁷²⁴. Controls could be imposed to prevent parking around the airport and there was no justification for the argument that controls on parking for construction workers would discriminate unfairly against Terminal 5²⁷²⁵. A limit of 1,000 spaces should be imposed as compared with the 4,000 spaces proposed by BAA. This should be supplemented by measures to prevent workers from parking in Stanwell Moor or other residential areas and the submission of a comprehensive public transport scheme²⁷²⁶.
- 28.2.31 Spelthorne also argued that BAA should be required to provide a conveyor to carry materials between the Colnbrook Logistics Centre and the principal site in order to reduce lorry traffic. They did not accept BAA's argument that the lorry trips could be accommodated on the roads and noted that BAA had not claimed that there would be insuperable problems in providing such a conveyor²⁷²⁷.

Willowslea Kennels

- 28.2.32 Willowslea Kennels, a quarantine kennel business immediately west of the airport, were concerned that lorries would increase congestion at the junction of airport Way and Spout Lane leading to inconvenience and loss of trade. Surveys in 1998 had shown an average queue length of 200m in the morning peak. The access into Spout Lane was not good. The proposed operations at Spout Lane and the Forward Lorry Park at Robbs Nursery could and should be located elsewhere²⁷²⁸.

²⁷¹⁸ 9-3.5.12

²⁷¹⁹ 9-3.5.13

²⁷²⁰ 9-3.5.14

²⁷²¹ 9-3.5.15

²⁷²² 9-3.5.16

²⁷²³ 9-3.5.17

²⁷²⁴ 9-3.5.18

²⁷²⁵ 9-3.5.19

²⁷²⁶ 9-3.5.20-21

²⁷²⁷ 9-3.5.22

²⁷²⁸ 9-3.7.1-2

Other Objectors' Cases

- 28.2.33 Stanwell Moor Residents association was very concerned about the impact of construction traffic. Lorries might use roads through the village while workers would park in and around Stanwell Moor²⁷²⁹.
- 28.2.34 The Royal Borough of Windsor and Maidenhead made written representations. They recognised that BAA had claimed to have reduced worst case figure but drew attention to a number of factors which reduced the reliability of the figures BAA had used such as the effect of bad weather²⁷³⁰. They also questioned the assumption that 60% of the workforce would arrive between 07.00 and 08.00 hours. In practice more would arrive between 08.00 and 09.00 hours when background traffic levels would be higher. BAA also seemed reluctant to take measures which would reduce reliance on the private car²⁷³¹. Finally the assessment did not cover a sufficiently wide area²⁷³².

My Conclusions

- 28.2.35 Before setting out my conclusions on the traffic impact of the proposed construction programme I need to deal with the outstanding criticisms of the traffic model. The model used in the analysis of traffic flows generated by the construction operations was essentially the same as that used in Topic 4. Some of the criticisms of the model were dealt with in that Topic, but others, considered here, related mainly to the modelling of construction traffic. One of these was the effect of flow breakdown on the M25 and the M4. Several objectors contended that the HRTM did not reflect this phenomenon accurately and underestimated problems when such conditions prevailed.
- 28.2.36 The evidence is, however, that the maximum additional flows due to construction traffic would be during the morning peak when flows on the motorways are already at or close to full capacity. Consequently flow breakdown is a daily feature at that time and I accept that construction traffic would be unlikely to do more than extend the period during which it would occur. In my view the effect of construction traffic on flow breakdown would be relatively minor in the overall pattern of traffic flow in the motorways.
- 28.2.37 Objectors also questioned the assumption, during the assignment stage of the modelling, that lane capacities on the M25 would be 2,000 pcu/hr for stretches subject to road works. They argued that this did not reflect the actual reductions in capacity on such congested roads, bearing in mind the difficulty of dealing with accidents or breakdowns. However, this assumption was taken from the Design Manual for Roads and Bridges, itself based on actual research, and there has been no evidence to persuade me that it would not be applicable in this instance. The section of the M25 close to Heathrow has relatively generous lane widths and hard shoulders and should allow adequate room for construction works. I do not consider that this factor is likely to distort significantly the results of modelling.
- 28.2.38 A more specific concern related to Stanwell Moor Roundabout. The effect of traffic associated with Terminal 5 construction, particularly lorries, would be to increase

²⁷²⁹ 9-3.8.1

²⁷³⁰ 9-3.6.1

²⁷³¹ 9-3.6.2

²⁷³² 9-3.6.3

substantially the level of traffic at the junction, which is already a source of considerable traffic problems. However, I am prepared to accept that model predictions give a reasonable indication that, so long as the projected improvements go ahead, queuing at the roundabout should not significantly increase, and on some approaches may even decrease.

- 28.2.39 As in the Surface Access topic, there was some debate as to the extent to which traffic patterns would be affected by congestion in this case resulting from activity associated with construction. Few individual elements would last for more than two years and I accept that few people would change their job or house purely on the basis of temporary, albeit long lasting, traffic problems. A further criticism was the argument that the model assumed drivers would have the benefit of full information on the road system. I accept that the model does not assume this and therefore reject this criticism.
- 28.2.40 There were suggestions that queues at some junctions are, even at present, longer than the HRTM predicts they would be with the addition of construction traffic. These mainly related to Stanwell Moor Roundabout and the junctions between the "Village Roads" and Bath Road. I do not doubt the accuracy of these reports but two factors may account for some of the discrepancy. In respect of Stanwell Moor the modelling has been carried out on the basis of considerable improvements to the junction, and it may be that the consequence of such improvements would exceed the effects of increased traffic in terms of queue length. Moreover, there will always be variations in traffic conditions and associated queues, whereas the modelling projections are mainly in the form of some kind of average. A comparison between specific observations and an average is not comparing like with like. I do not find the anecdotal evidence sufficient, in itself, to undermine the model projections in this case.
- 28.2.41 Other criticisms were made as to the predicted origins of the work force, which are based on a fairly coarse-grained set of assumptions. However, there is very little information on such matters available at present and a more detailed analysis would have been of very limited value. I do not consider that the factor would, in any event, make more than a minor difference to the projected traffic flows. Wherever they originated those driving to work would be bound to converge on a relatively small number of roads and the numbers travelling on those roads would be unlikely to be very sensitive to the origin of the journeys.
- 28.2.42 No traffic model can ever be a more than an approximate reflection of reality and my view is that the overall predictions relating to construction traffic would be affected to only a minor extent by inaccuracies of the kind claimed by detractors of the process. Whilst I do not consider that too much reliance should be placed upon the actual figures predicted, I believe that the projections of the HRTM are helpful in assessing construction traffic impact in general terms. I consider that if the figures are regarded as giving an idea of the order of increase rather than its actual extent, they provide results of relevance and value.
- 28.2.43 I accept that the assessment of the effects of construction traffic was based on BAA's assumptions of the capacity of Heathrow with and without Terminal 5. As I have already explained, I believe that the number of passengers handled would be higher than BAA assumed. To this extent the assessment may under-estimate the impact of construction traffic in absolute terms. On the other hand, the most significant increases in the number of passengers would take place after the completion of Phase 1 of the construction programme. I have also concluded that it

would be right to restrict the ability of those working at the airport to use their cars and that the use of public transport by both workers and passengers should be encouraged. Taking all of these factors into account find no reason to doubt that the assessment carried out by BAA is a reasonable basis on which to judge the overall impact of construction traffic.

- 28.2.44 I am satisfied that the results of the modelling carried out by BAA and the Agency give a reasonable idea of the order of the effects of construction traffic. The worst years would be Years 3 and 4 of the programme, but even in those years the overall effect on the flow of traffic through the road network around Heathrow is likely to be relatively minor. Bearing in mind the general variability of traffic flows, traffic changes due to Terminal 5 construction would be unlikely to be significant on most links. On a small number of links the effects would be noticeable but even there they would be largely restricted to the morning peak.
- 28.2.45 The objectors expressed concern about the traffic generated by construction employees. It is BAA's intention to require most of their employees to arrive before 08.00 hours, to avoid the busiest hour of 08.00 – 09.00. I see no reason to assume that more than a very small proportion would arrive at work later than 08.00 hours. In consequence I doubt that the effects upon traffic between 08.00 and 09.00 would be more than very minor. Background traffic flows between morning and evening peaks are much less than either and I consider that the addition of Terminal 5 construction traffic would not cause more than minor and occasional problems at such times.
- 28.2.46 It is difficult to produce global summaries of the effects of construction traffic on road junctions, and BAA concentrated on analysing individual junctions where problems are predicted. Whilst construction traffic would be likely to increase flows at some of these by up to 20%, the figures broadly suggest that in very few cases would the increases lead to flows beyond the capacity of the junctions to accommodate the traffic. One of the exceptions to this is Stanwell Moor Roundabout in its current configuration. However, I have already expressed my opinion that the proposed improvements would reduce any problems to tolerable levels.
- 28.2.47 Other junctions, of particular concern to Hillingdon, are those between the village roads and Bath Road. Here the model predicts increases in queue length during the morning peak and I have no doubt that there would be some increases. This part of the network is already close to capacity and even relatively small increases in traffic flow would lead to increased congestion at junctions and other bottlenecks. The same applies to one or two other busy junctions in the vicinity of the airport. Apart from the instances I have discussed I am satisfied that other junctions in the area would not suffer serious problems, even at peak times in the busiest years.
- 28.2.48 The Highways Agency used the same basic model as BAA but analysed the results in a somewhat different manner. The results have been accepted, in numerical terms, by most objectors, and I see no reason to question them insofar as they relate to construction. They indicate that on most road links traffic flows would not be increased by more than about 3%. There may be significant increases in queues at some junctions, mainly the ones I have already identified. These would extend over Years 3 and 4 although there would also be localised traffic difficulties during Year 1 whilst works were taking place to Junction 3 of the M4. In overall terms I am satisfied that conditions at any time during construction would not be worse than when Terminal 5 is in full operation in 2016. I have already concluded that the

levels in that year would be acceptable in the light of current policies even if the M4 is not widened.

- 28.2.49 In summary, I consider that in general the increases in traffic due to Terminal 5 construction would not go beyond the capacity of the road network to accommodate them if the improvements assumed in the traffic model are carried out. Even if some of these improvements do not go ahead, I think it unlikely that the position would be materially altered. In either event, there would be an increase in delays at a few junctions on a regular basis but these would not be intolerable. However, many of the roads in the Heathrow area are already congested and subject to serious delay or disruption due to unpredictable elements such as weather conditions, accidents, or local events. I accept that the construction of Terminal 5 would increase the likelihood that such events would lead to problems.
- 28.2.50 In order to minimise the risk of failing to attract the large number of skilled workers needed to construct Terminal 5, BAA intend to provide car parking for virtually all of those construction workers who would wish to drive to work by private car. I accept that this would also reduce the risk of car parking problems in the residential areas close to the construction sites. Whilst I have some sympathy with BAA's approach, I do not believe that sufficient weight has been given to the national aim, reflected in local planning objectives, of reducing reliance on the private car, particularly in journeys to and from work.
- 28.2.51 Heathrow is well served by a public transport system which would be convenient for construction employees so long as the shuttle bus arrangements promised by BAA work effectively. As well as these buses, BAA intend to encourage the use of car sharing and cycling and I see no reason to doubt that these intentions are genuine. However, it is hard to see how employees could be compelled to use such facilities, and if they were aware that parking spaces were as freely available as BAA propose, there would be little incentive for them to respond to any initiatives of this kind.
- 28.2.52 I consider that a project of this scale and public profile must be seen to be following national and local policies with respect to the private car. Intentions to encourage alternatives should be reinforced by some pressure upon employees to relinquish cars. I do not consider that the 2.5% shortfall of spaces proposed by BAA would apply enough pressure in this regard. On the other hand, I do not consider that the evidence before justifies the provision of only 1000 parking spaces, as suggested by Spelthorne. Such a small figure is unrealistic and would incur a serious risk of recruitment problems and troublesome street parking. In my judgement a provision of 50% (rather than the 60% proposed by BAA) would be a more appropriate figure. I do not believe that this would lead to insuperable recruitment problems if it formed part of a coherent workforce transport strategy. Any local parking problems could be overcome by efficient policing.
- 28.2.53 In summary, the road network around Heathrow is already very busy and congested at certain times of day and localised problems can occur at any time. The extra traffic due to construction operations would tend to increase the number, duration and frequency of such problems. It is likely that local drivers would blame Terminal 5 construction work for traffic congestion and the resulting irritation would add to the harm resulting from the construction operations. Furthermore, the effects of increased traffic and congestion would begin within a few months of the start of construction operations and this would bring forward some of the problems likely to be caused by Terminal 5.

- 28.2.54 I am satisfied that construction operations would not lead to overuse of the existing public transport system. I consider, however, that BAA's existing proposals do not sufficiently deter employees from using private cars and I have indicated that the car parking proposed by BAA should be reduced to a provision equating to spaces for 50% of the workforce to remedy this.
- 28.2.55 My overall conclusion on the impact of construction traffic is that the problems it would cause are unlikely to be so great as to weigh against Terminal 5 to any material degree, particularly if car parking for construction workers is reduced as I propose.

28.3 THE EFFECT OF CONSTRUCTION NOISE

BAA's Case

- 28.3.1 BAA said that they had assessed the impact of noise associated with the construction of both Terminal 5 and the Spur Road. They had predicted noise levels at representative sites and compared those predictions with criteria of acceptability²⁷³³. The British Standard "Noise and Vibration Control on Construction and Open Sites" (BS 5228) did not provide absolute criteria but listed factors which had to be taken into account. Having considered all of these factors BAA had defined some specific criteria. Those for long-term activity had been agreed by the Construction Joint Data Group and were 55dB LA_{eq} for daytime and 45dB LA_{eq} at night. The criteria for short-term activities (65dB LA_{eq} during the day and 45dB LA_{eq} at night) and for non-sensitive sites (65dB LA_{eq} for long term activities and 75dB LA_{eq} for short-term activities) had not been agreed²⁷³⁴.
- 28.3.2 There was also disagreement over the criteria to be applied in the evening. BAA took the view that daytime criteria should apply but with due account being taken of increased sensitivities in the evening in deciding whether mitigation measures should be applied. This was said to be consistent with the advice in PPG 24 and the practice of the Highways Agency²⁷³⁵. The LA_{eq} criteria represented thresholds below which construction noise need not be considered rather than tests of acceptability. Where it was not possible to prevent breaches of the thresholds, the Environmental Liaison Officer to be appointed by BAA would seek a solution acceptable to residents and the local authority²⁷³⁶.
- 28.3.3 The basis for the noise assessment adopted by BAA had followed the principles set out in BS 5228 except that the distribution of plant across the construction sites had been more precise and a different attenuation formula had been used. The BAA formula gave results which were only slightly different from those in BS 5228 up to a distance of 300m, although the differences increased beyond that point²⁷³⁷. The approach used by BAA was consistent with the BS 5228 assumptions for soft ground up to 300m and was consistent with comments in the Standard which clearly recognised the deficiencies of the recommended formulae at distances greater than 300m²⁷³⁸.

²⁷³³ 9-4.2.1

²⁷³⁴ 9-4.2.2-5

²⁷³⁵ 9-4.2.6

²⁷³⁶ 9-4.2.8

²⁷³⁷ 9-4.2.9-11

²⁷³⁸ 9-4.2.12

- 28.3.4 BAA argued that its approach had been shown to be accurate for aircraft taxiing and that as the average frequency spectrum of construction noise was similar to that of taxiing it was reasonable to take the same approach²⁷³⁹. BS 5228 gave little guidance on the effect of different meteorological conditions so BAA had used neutral conditions²⁷⁴⁰. An additional attenuation of 5dB had been assumed where rows of houses stood between the operating areas and the receiving site and 10dB where there was a purpose-built noise barrier²⁷⁴¹. The results had then been expressed as outdoor free-field values over the relevant time periods²⁷⁴².
- 28.3.5 Long-term exceedances of the 55dB LA_{eq} day time criterion in residential areas were, in general, limited to those closest to Terminal 5 including 3 sites in Stanwell and Stanwell Moor, 1 site in Poyle, 4 in Longford and 1 in the Bath Rd area. In areas with few houses, the area most affected was Bedfont Court where there would be numerous breaches of the criterion some of which would be by up to 14dB²⁷⁴³. The only breaches of the night-time criterion were associated with the diversion of the Twin Rivers, the construction of the Cargo Road and the installation of the Bailey bridges. The bridges would be installed at night to avoid traffic problems while the other 2 operations had to be carried out at night to avoid infringing aircraft safety regulations²⁷⁴⁴.
- 28.3.6 BAA claimed that the more serious breaches of criteria would be limited to the Spout Lane and Bedfont Court areas. However these could be avoided only by not carrying out the work or by introducing measures which would be as harmful as the noise. Willowslea Kennels, which were in the Bedfont Court area, would be subjected to considerable breaches. The only way to avoid these would be by the erection of noise barriers around the site or around Robbs Nursery²⁷⁴⁵. There would be other breaches in the evenings, although only a limited range of operations would be carried out at that time. These breaches of the criteria were not considered to be unacceptable²⁷⁴⁶.
- 28.3.7 They argued that it would be difficult if not impossible to identify the precise contribution of particular elements of the construction process to overall noise levels. This meant that fixed boundary noise limits would be of little value²⁷⁴⁷. The most effective control probably related to hours of work but any shortening of these would increase the time taken to complete the project. Work at night that would cause disturbance had been kept to the absolute minimum. While some evening work would be necessary it was unlikely to cause more than occasional and localised disturbance²⁷⁴⁸.
- 28.3.8 Road noise caused by construction traffic had been assessed following the official, Government, method²⁷⁴⁹. It had been assessed for the 07.00-08.00 and 11.00-12.00 hours²⁷⁵⁰. When compared with the position with Terminal 5, only 4 locations would experience an increase of more than 3dB which was the recognised limit of perception and none would experience an increase of more than 4dB. Even in

²⁷³⁹ 9-4.2.13

²⁷⁴⁰ 9-4.2.14

²⁷⁴¹ 9-4.2.15

²⁷⁴² 9-4.2.16

²⁷⁴³ 9-4.2.17

²⁷⁴⁴ 9-4.2.18

²⁷⁴⁵ 9-4.2.20

²⁷⁴⁶ 9-4.2.21

²⁷⁴⁷ 9-4.2.22

²⁷⁴⁸ 9-4.2.23

²⁷⁴⁹ 9-4.2.24

²⁷⁵⁰ 9-4.2.25

comparison with the position in which permission had been refused for Terminal 5, the largest increase was 4.0dB²⁷⁵¹.

The Highway Agency's Case

- 28.3.9 The Highways Agency dealt with the noise impact of the construction of the M4 improvements²⁷⁵². They argued that their approach was based on BS 5228 and procedures set out in that Standard to reduce noise levels would be included in contract documents. It was normal practice to offer insulation when road construction noise levels exceeded road traffic noise by more than 3dB for a period of more than 3-6 months²⁷⁵³.
- 28.3.10 They had made predictions for 12 locations along the M4 based on specific assumptions²⁷⁵⁴. These predictions were for Years 1 and 4 since these were the only ones in which road works would be in progress on the M4. During Year 1 all locations would experience noise levels either the same as or less than those currently experienced from motorway traffic²⁷⁵⁵. A similar position would apply in Year 4 except for a period of 2-3 months when noise levels in some parts of Keats Way and Vine Close might exceed present levels by up to about 3dB²⁷⁵⁶.
- 28.3.11 The Agency pointed out that although Hillingdon had argued that it was the absolute level of noise which was important rather than any comparisons, they had also accepted that people's reaction to noise depended on many more factors than its absolute level. In fact a comparison with existing noise levels on the M4 was in accord with established guidelines. Even if it were assumed that noise barriers would be in place in both cases, the relative noise levels would not be significantly different²⁷⁵⁷.
- 28.3.12 Whilst construction noise would be higher than present traffic noise levels for a few short periods, for substantial periods it was likely to be virtually inaudible. The periods of exceedances tabulated by Hillingdon were at best unhelpful and at worst misleading²⁷⁵⁸.

Hillingdon's Case

- 28.3.13 Hillingdon had concentrated on Phase 1 of the construction period but they pointed out that excess noise would continue throughout Phase 2 as well²⁷⁵⁹. They referred to the guidelines in the WHO report on "Community Noise" that noise on balconies terraces and in outdoor living areas should not exceed 55 LA_{eq} in the day and 45 LA_{eq} at night²⁷⁶⁰. They also pointed to the advice in BS 5228 including the suggestion that noise limits in the evening might have to be as much as 10dB below daytime levels and that levels at the façade of sensitive properties might need to be as low as 40dB to avoid sleep disturbance²⁷⁶¹.

²⁷⁵¹ 9-4.2.26

²⁷⁵² 9-4.3.1

²⁷⁵³ 9-4.3.2-3

²⁷⁵⁴ 9-4.3.4

²⁷⁵⁵ 9-4.3.5

²⁷⁵⁶ 9-4.3.6

²⁷⁵⁷ 9-4.3.7

²⁷⁵⁸ 9-4.3.8

²⁷⁵⁹ 9-4.4.1

²⁷⁶⁰ 9-4.4.2

²⁷⁶¹ 9-4.4.3

- 28.3.14 Hillingdon accepted that to some extent the method used by BAA for producing their predictions had been based on BS 5228 but drew attention to the different attenuation rates adopted. BAA's attenuation rates were not valid. They had accepted that there were differences between the frequency spectra of taxiing and construction noise and BS 5228 did not say that its formula was invalid beyond 300m only that it needed to be treated with caution. It gave examples extending out to 1 km. BAA's assumption of meteorologically neutral conditions removed wind direction and other meteorological variations from the calculation²⁷⁶².
- 28.3.15 Using the attenuation rates assumed in BS 5228 rather than those produced by the BAA formula produced considerable differences with the BAA approach giving lower noise levels²⁷⁶³. BAA's rate gave an attenuation some 13dB more than the comparable BS 5228 formula. As meteorological effects had been taken out and ground attenuation had been allowed for it was hard to account for this difference. This, in Hillingdon's view, threw BAA's formula into doubt²⁷⁶⁴.
- 28.3.16 They argued that, on any basis, virtually all properties in Bedfont Court would suffer noise levels above the 55dB LA_{eq} threshold. Properties in Longford and Harmondsworth would suffer similar levels on the basis of the prediction method used in BS 5228²⁷⁶⁵. While BAA predicted very few exceedances at night, the BS 5228 method predicted a number in the Longford and Bedfont Court areas with some exceeding the threshold by more than 5dB²⁷⁶⁶. Bearing in mind the advice in BS 5228 and the WHO report, Hillingdon believed that the most appropriate criterion for the evening would be 45-50dB LA_{eq}²⁷⁶⁷. At 45dB LA_{eq} virtually all sites in Hillingdon would suffer substantial exceedances and even at 50dB LA_{eq} the exceedances would be widespread including all sites in Bedfont Court²⁷⁶⁸.
- 28.3.17 Construction would cause serious noise effects for substantial period. Given that the predictions were averages, Hillingdon pointed out that there were certain to be episodes when they were exceeded by a considerable degree. Trains to the Colnbrook Logistics Centre would cause disturbance at night on a regular basis²⁷⁶⁹.
- 28.3.18 Turning to consider the impact of noise from construction traffic Hillingdon argued that significant impacts would be felt in Longford in the morning peak hour. They claimed that the sites selected for assessment in Bedfont Court did not include any in the Spout Lane area which was likely to be most badly affected²⁷⁷⁰. As background noise would be reduced the increase due to construction traffic in the evening would be relatively greater. There was convincing evidence that an increase of 1dB could cause annoyance and at some locations the increase in traffic noise in the evening would exceed 3dB. Such differences would add to the disturbance caused by construction²⁷⁷¹.
- 28.3.19 As far as the M4 was concerned, the Highways Agency had been wrong to compare the noise of construction with existing traffic noise since the disturbance caused by a new and different noise might well be independent of ambient noise levels. They

²⁷⁶² 9-4.4.4-5

²⁷⁶³ 9-4.4.6

²⁷⁶⁴ 9-4.4.7

²⁷⁶⁵ 9-4.4.8

²⁷⁶⁶ 9-4.4.9

²⁷⁶⁷ 9-4.4.10

²⁷⁶⁸ 9-4.4.11

²⁷⁶⁹ 9-4.4.12

²⁷⁷⁰ 9-4.4.14

²⁷⁷¹ 9-4.4.15

had also assumed a traffic speed of up to 70 mph rather than the 50 mph which would apply with the proposed new speed limit. It was not clear whether they had made any allowance for noise barriers in calculating the noise from normal M4 traffic²⁷⁷².

28.3.20 Noise levels would exceed the 55dB LA_{eq} daytime threshold at 6 sites in Year 1 and at all 12 sites in Year 4 while short-term night working would probably cause disturbance. Although the areas affected would be smaller and the length of the works shorter than those associated with the construction of Terminal 5 itself, the M4 works would still be a source of serious community annoyance²⁷⁷³.

28.3.21 Hillingdon argued that the impact of construction noise could be limited by treating both nights and evenings as sensitive periods; work should not start before 08.00 hours or continue after 18.00 hours; there should be no Sunday working and lorry movements should be limited after 18.00 hours. Furthermore, lorry movements through or close to villages should be avoided wherever possible; noise should be minimised at source and adequate complaint and compensation procedures should be introduced²⁷⁷⁴. Even with all these measures in place construction would cause serious disturbance to those living in many areas²⁷⁷⁵.

Willowslea Kennels' Case

28.3.22 Willowslea Kennels argued that BAA had accepted that construction noise levels at Spout Lane North would be at least 64dB. Traffic was likely to increase that by 3dB. While there was some evidence that mammals quickly became used to noise these levels might be perceived as a problem by clients and the effect on the business could be serious. The effect of noise on birds was not known. Relocation of the kennels would be difficult because it must be close to the airport and there were few suitable sites²⁷⁷⁶.

My Conclusions

28.3.23 I turn to my conclusions recognising that the construction of Terminal 5 and its associated developments would cause substantial and long lasting noise. Predictions of the actual levels of that noise on a systematic basis were carried out only by BAA and the Highways Agency. Objectors did not make alternative predictions but, in the main, sought to criticise the suggested levels of acceptability, the modelling methods and assumptions, and the interpretation of modelled results.

28.3.24 The noise levels that have been chosen by BAA and the Highways Agency were generally referred to as the noise criteria but they both argued that these should not be treated as limits or tests of acceptability. They were put forward as thresholds below which construction noise is not expected to cause problems, so that remedies need not be considered. A number of different values for these thresholds have been suggested distinguishing between different types of receptor sites, day and night levels, and activities of short and long duration. All of these are values for LA_{eq}. As I have already said I believe that the LA_{eq} system is not perfect but it is the

²⁷⁷² 9-4.4.16

²⁷⁷³ 9-4.4.17

²⁷⁷⁴ 9-4.4.18

²⁷⁷⁵ 9-4.4.19

²⁷⁷⁶ 9-4.5.1

measure used in PPG 24 and I accept that it is the most appropriate index to use when assessing the impact of construction noise.

- 28.3.25 The criteria to be applied to long-term activities were agreed at 55dB LA_{eq} in the day and 45dB LA_{eq} at night and I see no reason to question them. The main area of dispute concerns the criteria to be applied during the evening period, between about 19.00 and 23.00 hours. BAA's used the daytime value, but took into account the increased sensitivity of the evening period when deciding whether it was necessary to introduce mitigation measures. It seems to me that this involves too loose a control. I recognise that evening periods are not especially allowed for in PPG 24, but, in my view, the scale and nature of the operations involved in constructing Terminal 5 and its adjuncts merits special treatment. Noise from aircraft pervades the area for most of the day, and construction work would add to this in many areas. To those living in the vicinity a quieter period during the evening must be of particular value, particularly in summer. In my opinion 55dB LA_{eq} is too high for the evening period. I prefer a threshold of 50dB LA_{eq} for the hours 19.00 – 21.00 and 45dB thereafter.
- 28.3.26 The above refers mainly to noise from the operational aspects of Terminal 5 construction rather than construction traffic since BAA used a different technique to predict noise levels from the latter. They did not seek to set absolute noise thresholds, but tried to identify sites where noise would increase by more than 3dB as a result of construction traffic. Hillingdon did not agree that there should be concern only when there was an increase of 3dB. They argued that a change of 1dB LA_{eq} could give rise to some annoyance. I note that the Glossary to PPG 24 states that a change of 3dB is the minimum perceptible under normal conditions and this is generally accepted in assessing planning noise. I realise that LA_{eq} is a form of averaging sound from a lengthy period but an increase of 3 dBA in LA_{eq} is still taken frequently as the acceptability threshold for changes in noise level. I have seen no evidence to persuade me to take a different view in this case.
- 28.3.27 A second area of concern was that there would be some areas where increases in noise would be greater than at the chosen receiver sites. This might be so in a few cases, notably in parts of Bedfont Court, but for the most part I consider that the chosen receptors are a good representation of the areas in which they are located. I do not consider that areas subject to higher noise levels would be large in extent, or that more than a few people would experience these higher levels. I am content, therefore, to rely in general on results from the chosen receptor sites except for one or two cases to which I shall make special mention. I do not believe that this factor significantly distorts the predictions of the noise level modelling.
- 28.3.28 The British Standard for noise from construction sites is BS 5228, and Annex D deals with estimating construction noise. Section D2 states that the recommended estimation procedure takes into account the sound output and periods of operation of processes and plant, the distance between source and receiver, whether there are screening barriers and the reflection of sound and attenuation because of soft ground. Other factors such as meteorological conditions and atmospheric absorption are said to be "beyond the scope of this standard". It also states that "in general, at short distances (say up to 50m), the size of any effects arising from these factors will be small whereas at longer distances there will be a tendency towards an increase in sound attenuation". Finally, in D.3.3.2.2 the Standard advises that for distances greater than 300m a cautious approach should be taken, especially in applying the soft ground curves, because of the increasing importance of meteorological effects.

- 28.3.29 Bearing these matters in mind, I conclude that the formulae set out in BS 5228 are not applicable where the effects of atmospheric absorption and meteorological effects become significant. The distance at which such effects become significant could be regarded as 50m or 300m according to how the advice is construed, but I am content to accept the larger of these figures as suggested by BAA and most objectors. Since the power sound levels involved in Terminal 5 construction are high enough to imply that they would be perceptible at distances considerably greater than 300m, the advice in BS 5228 as to its scope comes into play. It follows that the formulae in the Standard should not be used in calculating sound levels in this case, and this is so whether the formulae use soft ground correction, hard ground correction or a combination of the two. It may be that for some ranges overestimates of ground effects might balance underestimates of atmospheric effects to give an approximately "accurate" prediction. However, these ranges will be limited and unreliable, and such coincidences do not justify use of an incorrect formula.
- 28.3.30 I am satisfied, therefore, that BAA were justified in using an alternative to the BS 5228 formulae. However the formula they devised has itself been subject to criticism. It was originally devised to examine noise from taxiing aircraft and has been modified to deal with construction noise. The first point raised is whether the spectral differences between construction plant and taxiing aircraft throw doubt on the validity of applying the formula here. It is generally accepted that there are differences, but from the information placed before me, I do not consider them to be radical. Moreover, the wide variety of vehicles and plant used in large-scale construction is reflected in differences of spectral characteristics. Any formula applying to them in general must include broad approximations. I have also taken into account the fact that the differences in attenuation purely attributable to spectral characteristics becomes progressively smaller as distances increase beyond 300m. On balance, I take the view that the application of the formula to construction noise is acceptable, although it must be borne in mind that its findings are subject to a degree of variability due to spectral differences.
- 28.3.31 The second, and central, question is whether BAA's formula gives accurate results. Up to about 300m the results predicted by it and by BS 5228 do not differ significantly, and there is no serious dispute as to the predictions made for receiver sites within that distance. As the distance increases the differences between the formulae predictions increase to a substantial level. However, whilst aircraft noise is still important at these larger distances, the noise from the relatively quieter construction sources drops to almost negligible proportions. At such low levels, and in an area with mostly high ambient noise, even if there are divergences between formulae the practical effect on the predictions that matter here is hardly significant. My overall conclusion is that, so long as it is remembered that predicted noise levels must necessarily be subject to approximation, the formula and assumptions used by BAA in predicting construction noise are reasonable.
- 28.3.32 In relation to the Terminal 5 construction works themselves, breaches of the selected night-time criteria would apply, in the main, to only limited areas and brief periods when unavoidable night-time work was carried out. These might well cause disturbance but the duration would be so short that I regard them as tolerable, subject to such precautions as are feasible being taken. Breaches of the day-time criteria would be more widespread and long lasting. The areas of the greatest breaches such as Bedfont Court have few residential properties, but that does not alter the fact that residents would suffer substantial disturbance for many months. Such areas are so close to the construction sites that there is little prospect of

effective mitigation measures. Whilst BAA have offered to purchase such properties this offer has not been fully taken up and the effects of noise in this area must still be taken into account.

- 28.3.33 Other than these instances, the modelling predicts that a small number of larger residential areas would suffer exceedances for several months, albeit to a lesser degree. If the noise were to be a steady drone throughout the day, I doubt that the increase would be very noticeable. However, it actually reflects the noise from numerous activities from different machines and locations and it is likely that some of the peaks of such activity would attract comment and concern. It would be impossible to be unaware of work on Terminal 5, and particular noise sources are unlikely to be ignored. I believe that frequent complaints of disturbance would be likely. Whilst it might be possible to introduce some mitigation measures they are unlikely to be wholly effective.
- 28.3.34 BAA intend to restrict the use of the later evening, in general, to a limited range of operations such as the delivery of materials, the use of the logistics sites and, at the height of summer, the movement of earthworks materials. This would help to reduce both the volume and duration of noise from construction activity and traffic. It would, however, be offset by the increased sensitivity at such times, particularly on summer evenings when people use their gardens much more. I believe that the enjoyment of such evenings would be substantially diminished for many people by construction activities and traffic, even if reduced in scope as intended.
- 28.3.35 Certain types of work of limited duration such as heavy piling can produce an unusually loud noise, irritating to many people, but BAA intend to apply particular sound mitigation measures when such work is being carried out. It would be unduly optimistic to imagine that such measures would remove the problem entirely, but applied with sensitivity I believe that they would make it acceptable for limited periods.
- 28.3.36 In respect of noise from Terminal 5 construction traffic the predictions indicate that noise levels would increase by more than 3dB at only a few sites, and even there for only a brief period. These would all be during morning peak hours, and even then there are no predicted increases of more than 4dB. During the inter-peak hours no increases are predicted at any modelled location of more than 3dB. Bearing in mind the existing background noise levels during the day, I do not consider that the vast majority of local residents would notice increases of this scale.
- 28.3.37 In assessing construction noise from the M4 improvements the Highways Agency applied a different test of acceptability, i.e. whether the predicted noise levels at various receptor sites would be greater than the prevailing level of background noise when the road was fully operational. Whilst Hillingdon conceded that this comparison has some relevance, they advocated a comparison with the thresholds used by BAA in respect of Terminal 5 construction. On that basis, the daytime criterion would be exceeded in several instances. However, I take the view that whilst the figures which Hillingdon have prepared have some relevance, they are of less value than the comparisons which the Agency have made. I believe that most residents would welcome the fall in noise levels that would occur at most locations during road construction works. I think it unlikely that it would matter very much to most people whether or not that fall was to below a threshold that might be relevant elsewhere, especially as that would scarcely apply in the noise shadow of a major motorway.

- 28.3.38 I accept that the character of construction noise differs considerably from traffic noise, but I do not consider that the difference would be sufficient to significantly outweigh the reduction in noise levels which would take place at most locations where the M4 improvements are to take place. Hillingdon also suggested that the Highways Agency were wrong to assume an average speed of 70 mph when comparing road noise with construction noise levels. A better comparison, they suggested, would be on the basis of an average speed of 50 mph which would add about 2dB to the comparisons made by the Agency. I accept that a 50 mph limit may well be in place on the M4 before construction work begins. Whilst I have reservations as to the validity of long term comparisons based on this lesser speed, I find arguments advocating such a comparison in the short term more persuasive. However, even if the comparison were on the basis of an average speed of 50 mph, I do not consider that noise levels would be a source of serious harm although I do accept that minor harm may occur at a few locations during the periods of construction.
- 28.3.39 In summary, noise from the M4 improvements would only rarely be greater than the noise from traffic on the existing motorway. Even then the exceedances would be marginal and brief. For much of the time noise levels would be substantially less than those from the motorway in full operation. Consequently, I do not consider that many people would be troubled by noise created by the improvement work. However I acknowledge that, in a noisy environment such as that prevailing around Heathrow, the addition of further noise during quiet periods may cause annoyance or distress to a number of people.
- 28.3.40 Willowslea Boarding Kennels would be one of the locations most affected by construction noise. There is little evidence that animals and birds are particularly sensitive to noise, and some that animals rapidly become accustomed to it. On the other hand, I can readily believe that customers might be discouraged from leaving animals or birds in an area where noise might be perceived as affecting the environment. This could harm Willowslea Kennels' business which is, in my view, a material consideration attracting some weight.
- 28.3.41 I also accept that noise from trains could cause disturbance. Construction activities would probably only involve one or two trains per week, but it only takes one incident to disturb some people's sleep. The line to the Colnbrook Logistics Centre goes close to a number of residential properties, and I anticipate that some families would suffer intermittent disturbance from this source. It is hard to see that much could be done to mitigate this problem but it could occur, even without Terminal 5, should the railhead be developed. Nonetheless this is a factor which weighs against the Terminal 5 proposals to a minor extent.
- 28.3.42 Noise predictions of the kind involved here must necessarily involve a degree of uncertainty. So long as this is borne in mind, I consider that the noise predictions made by BAA and the Highways Agency offer a reasonably realistic prediction of average noise levels. On that basis I am satisfied that the construction of Terminal 5, and the other developments associated with it, would be a source of disturbance due to noise. The number of people most affected would be limited in the main to those living close to the main construction areas. Nevertheless, a small number of properties would be seriously affected for lengthy periods. Overall noise levels in a wider area would also be increased, and some people would notice, and perhaps be disturbed by, the noisier elements of the construction process. Measures to mitigate this disturbance would reduce, but would not remove, these effects. I am less

concerned with the noise from construction traffic except insofar as it stems from late working during the summer months.

- 28.3.43 Noise disturbance would last for a number of years, but would diminish considerably after the completion of Phase I. Nonetheless disturbance in some areas would last for many months, even years, and I do not believe that those affected would become accustomed to it and less sensitive to its impact. I believe that in many instances the opposite would be more likely, i.e. that people's tolerance of the noise would be steadily eroded, and the fact that it would eventually cease would be of little consolation when the cessation was so distant. Moreover, when the main construction ended it would then be succeeded by what most people fear would be increased levels of aircraft noise.
- 28.3.44 On the other hand I believe that most people recognise and accept that a construction project of this scale cannot be implemented without some noise. Overall, I conclude that the effects of construction noise, in the widest sense, would add materially to the case against the Terminal 5 proposals. Where mitigation measures are feasible they should be applied but their effects, whilst welcome, would be limited.

28.4 THE EFFECT OF CONSTRUCTION ON AIR QUALITY

- 28.4.1 BAA and Hillingdon submitted a Position Statement about monitoring air quality which identified several areas of agreement but left some disagreements, a number of which I have already covered in the earlier Chapter on Air Quality²⁷⁷⁷.

BAA's Case

- 28.4.2 It was argued by BAA that the construction works might cause dust nuisance close to the sites and a deterioration in the ambient air quality around Heathrow. The principal factors modelled had been dust deposition and airborne concentrations of NO₂ and PM₁₀. The difficulties in modelling construction work meant that there was greater uncertainty about these results than was the case with those used in the main assessment of the impact of Terminal 5 on air quality²⁷⁷⁸. Impacts had been considered for Years 1-4 and 8 and related to 22 sites. A guideline of 200 mg/sm a day had been agreed for nuisance caused by dust deposition, while the threshold values for NO₂ and PM₁₀ had been taken from the National Air Quality Strategy²⁷⁷⁹. Although the programme for the construction of Terminal 5 had slipped, as had that for the widening of the M25, these changes would have scarcely any effect on the assessments²⁷⁸⁰.
- 28.4.3 BAA said that they would take all necessary and practicable measures to control dust emissions with additional measures being taken in certain circumstances such as when there were particularly difficult weather conditions. These could include stopping work. An Environmental Liaison Officer would be appointed and Liaison Committees would be established to assist in achieving this aim²⁷⁸¹. Dust deposition depended on many factors and was difficult to predict but the most effective controls were based on sensitive and efficient site management. Problems were

²⁷⁷⁷ 9-5.1.1-2

²⁷⁷⁸ 9-5.2.1

²⁷⁷⁹ 9-5.2.2

²⁷⁸⁰ 9-5.2.4

²⁷⁸¹ 9-5.2.3

unlikely to occur more than 250m from the site. The agreed threshold of 200 mg/sm a day assumed a background level of 40 mg/sm a day which meant that nuisance would be caused if the construction activities produced deposition rates of more than 160 mg/sm a day²⁷⁸².

- 28.4.4 The assessment had been carried out in accordance with the approach agreed in the Construction Joint Data Group and gave predictions based on two scenarios. The first assumed “typical” measures to minimise dust while the second incorporated “additional” measures such as more frequent water spraying²⁷⁸³. A series of four contour plans had been produced with the first three being superseded by the fourth. This incorporated the cumulative effect of various changes to the assumptions²⁷⁸⁴. The predictions did not allow for dust deposits lifted a second time by wind and assumed average speeds of 10 kph on site and 25 kph on haul roads²⁷⁸⁵.
- 28.4.5 BAA also said that the area affected by more than 160 mg/sm a day in Year 1 had been reduced significantly by the cumulative changes but still covered most of the locations affected in the original estimates such as Longford, Bedfont Court and industrial areas in Poyle. The introduction of the additional measures would result in the exclusion from the affected area of locations south of Airport Way, much of Longford and some properties in Bedfont Court. In Year 2 the affected area would be extended to include land to the east of the principal site and areas close to Junction 14. In some areas deposition would be considerably greater than 300 mg/sm a day. The affected area would however, be much smaller if the additional measures were adopted.
- 28.4.6 By Year 4 the areas affected would be confined to land within the airport and a small area around the Colnbrook Logistics Centre. It was unlikely that dust would be a source of complaint except possibly in some industrial properties. The position in Year 8 would be very similar to that in Year 4²⁷⁸⁶.
- 28.4.7 The same methods had been used to forecast concentrations of NO₂ and PM₁₀ in relation to construction as had been used in the general air quality assessment earlier in the inquiry²⁷⁸⁷. Emissions had been calculated from estimates of the number of vehicles to be used, their various emission factors and their work schedules. It had been assumed that they would operate at maximum load for 70% of the period in use and no account had been taken of European Union proposals to reduce emissions. Both of these assumptions built safety factors into the predictions²⁷⁸⁸. Cautious assumptions had also been built into the predictions of PM₁₀²⁷⁸⁹.
- 28.4.8 The predicted concentrations had been compared with measured values at sites near the airport. BAA pointed out that this had shown a range of under and over-estimation of 10-20% for both NO₂ and PM₁₀ although the ranges had been much larger for short period concentrations of NO₂. There was some evidence that the model produced over-estimates of both pollutants. A further safety factor was built in as BAA had assumed that the maximum quarterly activity applied throughout the year²⁷⁹⁰.

²⁷⁸² 9-5.2.5

²⁷⁸³ 9-5.2.6

²⁷⁸⁴ 9-5.2.7

²⁷⁸⁵ 9-5.2.8

²⁷⁸⁶ 9-5.2.8

²⁷⁸⁷ 9-5.2.9

²⁷⁸⁸ 9-5.2.10

²⁷⁸⁹ 9-5.2.11

²⁷⁹⁰ 9-5.2.14

- 28.4.9 As with dust deposition, BAA had presented the original results as well as those with the cumulative changes. They had also prepared predictions based on typical and additional measures for both NO₂ and PM₁₀ but in the latter case a further refinement had been introduced. Emissions had been reduced by factors of 2 and 10 in an attempt to take into account the different weather conditions in the USA and this country²⁷⁹¹.
- 28.4.10 As far as NO₂ was concerned BAA accepted that construction would substantially increase the area within which the National Air Quality Strategy annual objective would be exceeded, although the effects would be substantially less in Year 8²⁷⁹². In each year assessed, the number of sites at which the annual and 1 hour objective would be exceeded would be increased by construction activities²⁷⁹³. Taking 4 representative sites the more realistic predictions incorporating the cumulative changes showed that most of the exceedances above the annual objective would not be very much greater than they would have been without construction²⁷⁹⁴.
- 28.4.11 In terms of PM₁₀, BAA accepted that construction operations would lead to very substantial increases although they would start to diminish in Year 3. While the additional measures would reduce PM₁₀ levels, the effect would not be as great as in relation to dust deposition²⁷⁹⁵. Levels at all sites and in all years would be above the National Air Quality Strategy objective even if Terminal 5 were not permitted. The differences predicted to be caused by construction would not be very great if the additional measures were implemented and realistic assumptions were made about the differences in climate between this country and the USA²⁷⁹⁶.
- 28.4.12 The Quality of Urban Air Review Group had suggested that emissions of construction dust in the UK should be no more than half of those in the USA where the climate was drier and experience suggested to BAA that the conversion factor should be between 2 and 10²⁷⁹⁷. Ground moisture levels were different in the USA and the ground would dry much faster in those states used in preparing the advice on emission factors. BAA's modelling had not included any allowance for the damping down effect of rainfall and it was clear that the use of the factors derived from the USA would give rise to a substantial over-estimation²⁷⁹⁸.
- 28.4.13 The modelling had also assumed a 50% efficiency in controlling dust from site traffic although a government publication suggested that a rate of 96% could be achieved²⁷⁹⁹. The average speed assumptions were realistic and based on experience of other major construction sites²⁸⁰⁰. BAA had assumed that 20% of dust would be PM₁₀. Although a new formula gave a figure of 30% it produced a lower emission rate than BAA's original calculations. Their continued use of 20% introduced a cautious element into their estimates of dust deposition²⁸⁰¹. Increasing the proportion from 20% to 45% as suggested by Hillingdon would increase the annual mean concentration of PM₁₀ by 47-67% in the typical measures case and by 26-44% in the additional measures case²⁸⁰². Sensitivity tests had illustrated the

²⁷⁹¹ 9-5.2.15

²⁷⁹² 9-5.2.16

²⁷⁹³ 9-5.2.17 Table 6

²⁷⁹⁴ 9-5.2.18

²⁷⁹⁵ 9-5.2.19

²⁷⁹⁶ 9-5.2.21

²⁷⁹⁷ 9-5.2.22

²⁷⁹⁸ 9-5.2.23

²⁷⁹⁹ 9-5.2.24

²⁸⁰⁰ 9-5.2.25

²⁸⁰¹ 9-5.2.26

²⁸⁰² 9-5.2.27

uncertainties in forecasting dust deposition. The same uncertainties affected predictions of PM_{10} ²⁸⁰³.

- 28.4.14 Although it had been suggested that predictions should have been made of $PM_{2.5}$, BAA argued that there were no UK standards and no published emission factors relating to this. The Government had stated that incorporating European Union values for PM_{10} would provide sufficient protection for now. In any event it would be reasonable to assume that relative changes in $PM_{2.5}$ would be proportionate to those in PM_{10} . On that basis there was no indication that construction would cause unacceptable increases in $PM_{2.5}$ ²⁸⁰⁴.
- 28.4.15 BAA accepted the need for a dust monitoring programme with a response that would be sufficiently rapid to allow effective management. The programme would measure soiling at 16 sites and PM_{10} at 4 fixed and 1 mobile site. Additional soiling measurements would be introduced for specific activities²⁸⁰⁵. Soiling rates would be measured on a weekly basis but PM_{10} measurements would be virtually continuous and should give an indication of serious dust incidents²⁸⁰⁶. PM_{10} concentrations were subject to seasonal variations and there were no criteria to relate action to concentrations but thresholds would be set at twice the highest hourly rates and 24 hour concentrations in the year prior to the start of construction. The monitoring programme would be under the supervision of the Environmental Liaison Officer and represented a considerable improvement over any other construction project²⁸⁰⁷.
- 28.4.16 Hillingdon had suggested that BAA had under-estimated PM_{10} levels because the recently published Report of the Airborne Particles Expert Group on Source Apportionment of Airborne Particulate Matter in the UK said that reductions in background levels would not be as great as those assumed in the modelling. However, BAA argued that this assertion was not supported either by the Report or by any other evidence submitted by objectors²⁸⁰⁸.
- 28.4.17 They recognised that dust deposition could cause discoloration of vegetation but argued that it was unlikely to cause long-term damage and did not pose a danger to the ecologically significant areas close to the principal site and Spur Road²⁸⁰⁹.
- 28.4.18 BAA also claimed that the risk to human health from NO_2 would be negligible²⁸¹⁰. Although the evidence was not clear-cut, there appeared to be some links between health and PM_{10} levels, particularly where individuals already suffered from lung or cardio-vascular diseases. A study had found that an increase of 10 in the average daily PM_{10} level was associated with an additional 1 admission to hospital every other day in a population of about 1 million²⁸¹¹. On the basis of such findings there would be a risk to health in areas such as Longford, Poyle, Stanwell and Stanwell Moor in the original typical measures case. This risk would remain but be reduced if the cumulative changes were adopted and further reduced if the additional measures were invoked to the extent that it would become very small in Phase 1 and virtually negligible in Phase 2²⁸¹².

²⁸⁰³ 9-5.2.28

²⁸⁰⁴ 9-5.2.29

²⁸⁰⁵ 9-5.2.30

²⁸⁰⁶ 9-5.2.31

²⁸⁰⁷ 9-5.2.32

²⁸⁰⁸ 9-5.2.33-34

²⁸⁰⁹ 9-5.2.36

²⁸¹⁰ 9-5.2.39

²⁸¹¹ 9-5.2.40

²⁸¹² 9-5.2.41

The Highway Agency's Case

- 28.4.19 The Highways Agency argued that very few vehicles would travel on unpaved surfaces during the M4 works and that there would be a speed limit of 16 kph (10 mph) within the construction site²⁸¹³. As with the assessment carried out by BAA the assessment had concentrated on NO₂ and PM₁₀ using the National Air Quality Strategy objectives. The agreed threshold of 200 mg/sm a day had been used for dust²⁸¹⁴.
- 28.4.20 The dust emission rates derived from experience in the USA had been used although they were likely to lead to a fairly large over-estimate and dust control efficiency had been assumed to be 80% which was a cautious estimate bearing in mind that it was recommended for use on unpaved roads. As with BAA it had been assumed that PM₁₀ would constitute 20% of dust²⁸¹⁵. Predicted figures for dust deposition at the nearest properties were only about 55% of the 200 mg/sm a day threshold²⁸¹⁶. It was unlikely that the European limit would be breached for total suspended particles which included all particles that remained suspended in the air since the predicted increases were only about 10% of that limit²⁸¹⁷.
- 28.4.21 Increases in the gaseous pollutants due to construction that were studied would be negligible and concentrations of NO₂, CO₂, benzene and particulate matter would not exceed the relevant criteria. Although the maximum PM₁₀ concentration exceeded the National Air Quality Strategy objective at all the sites there was little difference between the figures with or without construction. In both Years 3 and 4 the impact of construction traffic on concentrations would be very small²⁸¹⁸.
- 28.4.22 Construction plant would increase PM₁₀ levels by 12 microgrammes/m³ at a distance of 15m and by 3 microgrammes/m³ at a distance of 100m in Year 4 while emissions from on-site vehicles would add a further 5 microgrammes/m³ at 15 m and 1 microgrammes/m³ at 100m. Since BAA construction activities would add 3 microgrammes/m³ and 2 microgrammes/m³ respectively the total impact of construction would be to increase PM₁₀ levels along the M4 by 20 microgrammes/m³ at 15m and by 6 microgrammes/m³ at a distance of 100m. This would give total levels of 84 microgrammes/m³ at a distance of 15m from the motorway and 65 microgrammes/m³ at a distance of 100m²⁸¹⁹. Consequently, the Agency accepted that the exceedance of the National Air Quality Strategy objective would be increased from 14 to 34 at 15m and from 9 to 15 at 100m²⁸²⁰.
- 28.4.23 As far as NO₂ was concerned the total increases would be from 26.9 to 29 ppb at 15 m and from 22.6 to 23.3 ppb at 100m after taking into account all factors. It was, therefore, likely that annual mean concentration would exceed the National Air Quality Strategy objective of 21 ppb²⁸²¹.
- 28.4.24 The Consultation Document on the Review of the National Air Quality Strategy published shortly before the end of the inquiry suggested altered objectives for NO₂ and PM₁₀. The Agency said that the predicted levels would meet these new

²⁸¹³ 9-5.3.2

²⁸¹⁴ 9-5.3.2

²⁸¹⁵ 9-5.3.4

²⁸¹⁶ 9-5.3.5

²⁸¹⁷ 9-5.3.6

²⁸¹⁸ 9-5.3.9

²⁸¹⁹ 9-5.3.11

²⁸²⁰ 9-5.3.10

²⁸²¹ 9-5.3.11 and Table 9

objectives. Even though the model did not account for all sources of coarse particles the uncertainties tended to cancel each other out²⁸²². It was accepted that some recalibration of the PM₁₀ data would be needed to make comparisons with the proposed new objectives. However both used annual mean concentrations so that meaningful comparisons were possible. The Agency agreed with Hillingdon that the proposed changes to the NO₂ objective did not significantly change the arguments²⁸²³.

Hillingdon's Case

- 28.4.25 Hillingdon argued that the publication of national advice since the main debate on air quality earlier in the inquiry had reinforced the importance of improving air quality²⁸²⁴. Evidence from the Second Severn crossing and another study had indicated that locations within 500m of major sites should be considered vulnerable to dust deposition rather than the 250m assumed by BAA²⁸²⁵.
- 28.4.26 Based on BAA's original figures significant areas would experience deposition above the agreed threshold for concern²⁸²⁶. Hillingdon did not accept that the assumed rates of dust suppression could be achieved in all circumstances particularly in hot weather. The rate assumed in the additional measures case might possibly be achieved in ideal conditions but was unlikely to be achieved in practice²⁸²⁷. The assumed speeds were unrealistic and BAA had not allowed sufficiently for windblown secondary dust²⁸²⁸. The introduction of further reduction by a factor of 2 or 10 in the dust creation rates represented double counting since the formula included a factor to allow for more wet days. The Report of the Quality of Urban Air Review Group was not accepted by Hillingdon²⁸²⁹.
- 28.4.27 The Heathrow area already had some of the highest PM₁₀ concentrations in the country and with BAA's typical measures the PM₁₀ emissions from the whole of the Heathrow Region would be 4.7 times as great as those without Terminal 5²⁸³⁰. Hillingdon argued that PM₁₀ should be assumed to represent 45% of dust which would increase BAA's predicted concentrations by 26-44%²⁸³¹. Contour maps prepared by Hillingdon showed that, in the Terminal 5 case, the area subjected to concentrations 20% above the National Air Quality Strategy objective in BAA's typical measures case would be double the area affected if Terminal 5 were refused. Even with the additional measures the increases would be substantial²⁸³². BAA's estimates could well prove to be under-estimates. The method they had used to predict short period concentrations was based on observations which did not cover the much higher concentrations found here. In Hillingdon's view, the under-estimate might be 30% at an annual mean of 70 microgrammes/m³ rising to 50% at a mean of 100 microgrammes/m³²⁸³³.

²⁸²² 9-5.3.12

²⁸²³ 9-5.3.13

²⁸²⁴ 9-5.4.1

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²⁸²⁹ 9-5.4.6

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²⁸³³ 9-5.4.10

- 28.4.28 Even without Terminal 5 it was unlikely that the National Air Quality Strategy objective for NO₂ could be met around Heathrow and construction work would worsen the situation substantially even on BAA's most recent figures²⁸³⁴. These latest figures suggested that the objective might be met at a number of sites if Terminal 5 were refused while at others construction would increase the degree by which the objective was breached²⁸³⁵.
- 28.4.29 The need for monitoring was agreed but there were disputes about the trigger points for action and choice of the monitoring sites. Hillingdon argued that concentrations should be kept well below the levels predicted by BAA²⁸³⁶.
- 28.4.30 It was not possible to make direct comparisons between the PM₁₀ objective proposed in the Review of the National Air Quality Strategy because they were based on a different form of measurement. Although the proposed limits were less stringent they would still be exceeded around Heathrow²⁸³⁷. Changes to the NO₂ objectives would not alter Hillingdon's arguments²⁸³⁸. The Report of the Airborne Particles Expert Group drew important conclusions relevant to Terminal 5. It concluded that the reduction in PM₁₀ levels would not be as great as that used in the inquiry mainly because the model had not dealt adequately with coarse particles. Very little reliance could be placed on the actual values predicted by BAA. The report had also supported Hillingdon's argument by recognising the importance of resuspended road dust²⁸³⁹.

Willowslea Kennels' Case

- 28.4.31 Willowslea Kennels pointed out that BAA had accepted that construction works would seriously affect the kennels in terms of dust deposition and air quality. These effects could result in death or ill health for animals at the Kennels deterring potential clients and possibly leading to the loss of the licence. BAA's predictions under-estimated the effects on the Kennels by assuming that the worst conditions would occur when winds were from the west²⁸⁴⁰. They were particularly concerned about PM_{2.5} which were more damaging since they lodged in the lungs. Their concentrations could not be reliably estimated from levels of PM₁₀ and were unlikely to be controlled effectively by BAA's proposed dust control measures²⁸⁴¹.
- 28.4.32 Although there was less evidence on the effect of pollution on domestic animals, patterns of deposition and clearance appeared to be similar to those in man. This meant that thresholds for man might have some relevance to animals. BAA's failure to deal with PM_{2.5} meant that their assessment was seriously incomplete. There was a real risk that concentrations of PM_{2.5} at Willowslea would from time to time exceed threshold limit values. They should be monitored on a 24-hour basis since their effects were cumulative and long-term²⁸⁴².
- 28.4.33 In addition the predicted levels of NO₂ gave cause for concern particularly as its effects might be exacerbated by simultaneous exposure to dust. It was possible that

²⁸³⁴ 9-5.4.11

²⁸³⁵ 9-5.4.12

²⁸³⁶ 9-5.4.13

²⁸³⁷ 9-5.4.14

²⁸³⁸ 9-5.4.15

²⁸³⁹ 9-5.4.16

²⁸⁴⁰ 9-5.5.2

²⁸⁴¹ 9-5.5.4

²⁸⁴² 9-5.5.6

people and animals at the Kennels might suffer respiratory distress²⁸⁴³. BAA's own evidence showed there was a substantial risk of harm to the health and well being of animals. Matters could be improved to a degree by withdrawing the proposals for the Spout Lane Triangle and Robbs Nursery²⁸⁴⁴. The existing situation should not be used to justify the continuance of, or increase in, levels that were already unacceptable. Once thresholds had been set they should not be exceeded even if this meant that it was necessary to cease construction work²⁸⁴⁵.

- 28.4.34 Willowslea Kennels also argued that BAA had ignored the national policy to improve air quality. Terminal 5 construction would cause air quality to deteriorate further or, at best, improve more slowly than would otherwise have been the case²⁸⁴⁶.

My Conclusions

- 28.4.35 I have no doubt that the construction operations and associated traffic would give rise to a number of emissions but BAA and the Highways Agency concentrated on three, namely deposited dust, PM₁₀ and NO₂. This was accepted by most objectors, but Willowslea Kennels suggested strongly that they ought also to have considered PM_{2.5}. Since no objector carried out separate modelling, the predictions produced by BAA and the Highways Agency provide the only quantitative projections before me. The main differences between various parties were over the reliability of these projections, and their interpretation.
- 28.4.36 The most appropriate threshold level for deposited dust was agreed by most parties to be 200 mg/sm a day. It was also common ground that 40 mg/sm a day was a suitable assumption as to the background levels of dust in the Heathrow area. In addition BAA assumed that dust would not travel, in significant amounts, more than 250m, a figure frequently used in dust modelling. Hillingdon, however, referred to research into dust from mineral workings which records substantial levels of dust deposition at distances between 350m and 1 Km from the source. They suggested that for major generators such as the Principal Site dust should be assumed to travel up to 500m. There is no doubt that in some circumstances dust, and even sand, can be carried many miles, and I accept that dust from Terminal 5 construction will sometimes travel considerably further than 250m. Whilst it is very hard to predict reliably what will happen I take the view that the frequency of such occurrences and the levels involved would be significant.
- 28.4.37 I do so for two main reasons, the first being the possibility of re-suspension. On a project of this scale and duration, dust would be deposited faster than it is washed away or absorbed into the soil structure, and a layer of deposits would build up over time. Such deposits are often found in the vicinity of mineral workings and, whilst this would not be a minerals site, it would share many features of one and I consider that secondary dust deposits are likely to occur. Such deposits are then prone to re-suspension by wind or other disturbance and are not easy to suppress. Whilst BAA's model makes some allowance for re-suspended dust, it does not take account of the above factor and, in my estimation, does not allow sufficiently for its effect in increasing the distance that dust would travel.

²⁸⁴³ 9-5.5.7

²⁸⁴⁴ 9-5.5.8

²⁸⁴⁵ 9-5.5.9

²⁸⁴⁶ 9-5.5.10

- 28.4.38 Secondly, local people readily notice deposited dust of any kind. Even relatively small quantities on cars, household surfaces or washing can be detected without instruments and this is invariably a source of annoyance and concern. Even though the actual source can rarely be established, there is little doubt in the present case that some would be due to Terminal 5 construction activities. Whilst such levels of dust may objectively be low, so long as they are perceptible they can affect living conditions. Whilst the evidence before me provides no basis for quantifying this effect, I believe that it should be taken into account.
- 28.4.39 BAA assumed that vehicles on the construction sites would travel on haul roads at an average speed of 25 kph, and on other site roads at 10 kph. Hillingdon consider these to be unrealistically low. However, BAA intend to set speed limits of 25 kph and 15 kph on haul roads and other roads respectively and to enforce these limits strictly. Their efficiency in this respect would be open to scrutiny by local authorities. Under such circumstances the assumptions made as to average vehicle speeds seems to me to be justifiable as a reasonably accurate reflection of the likely situation. No significant evidence has been advanced to support objectors' concerns in this regard, or to provide support for the adoption of alternative assumptions.
- 28.4.40 For modelling purposes, the "typical measures" of dust suppression specified by BAA were assumed to achieve 50% suppression efficiency and the "additional measures" 80%. Hillingdon, whilst acknowledging that 80% was possible in some circumstances, suggested that 50% is more realistic averaged over the site as a whole, even with the additional measures, and particularly in hot and/or dry weather. They referred to a "users Guide" to the Fugitive Dust Model which suggests control efficiencies of between 5 and 55%. However, these figures refer solely to unsurfaced roads, which limits their applicability in the present case. A Government publication on mineral workings suggests a maximum of about 96% efficiency under ideal circumstances. I accept that the figure of 80% will not always be achieved, and general compliance will demand diligent and regular control, but I see no reason why such control should be unattainable. The monitoring system proposed is likely to reveal any serious failures in this regard. On balance I consider that the assumptions made by BAA as to suppression efficiency are acceptable.
- 28.4.41 There was also a dispute about the formula used for dust emission rates which was derived from a study of construction traffic travelling on unpaved roads in parts of the USA with a dry hot climate. In my view both the volume and evaporation rate must differ considerably between Heathrow and the southern states of the USA. Consequently, I consider that use of the basic formula at Heathrow would lead to overestimation of dust emission rates and I believe that the introduction of a correction factor is justified. To allow for the climate differences BAA have produced alternative predictions on the basis of a "Factor of 2" and a "Factor of 10" reduction in emissions. In view of the uncertainties surrounding the modelling procedures as a whole I believe that it would be prudent to rely on predictions based on the former.
- 28.4.42 It was also suggested that the dust model failed to take into account four significant factors. The first is windblown dust from areas such as stockpiles, haul roads and bare ground generally. The second is the re-suspension of dust previously emitted from the construction site. The third is dust raised from the public highways near to site entrances, and the fourth is unusually dusty operations such as demolition. The importance of these factors is increased by the fact that, as well as normal windy conditions, there may be vortices caused by aircraft. I consider that, in the context

of an operation of this scale, the first, third and fourth would be very minor and controllable by the proposed suppression measures. I have already set out my view with regard to re-suspended dust but I have not seen sufficient evidence to allow any quantification of this factor.

- 28.4.43 In the methods and assumptions employed by BAA to assess dust levels there are some factors which, by common assent, introduce elements of over estimation into the results. These include the use of the worst quarter to represent the whole year, ignoring any improvements in machinery or technology likely to occur during the course of the project, and the possibility of further dust suppression measures. Against this should be set a degree of under-estimation because re-suspended dust has not been allowed for. The sensitivity of people to deposited dust should also be taken into account. Moreover, the construction of Terminal 5 would involve huge numbers of people working under time pressure for lengthy periods. It would be unprecedented if, from time to time standards did not fall below the levels aimed at by BAA. In my view, these varied factors illustrate the uncertainties involved in modelling but do not all point towards either over-estimation or under-estimation.
- 28.4.44 All predictions of future dust levels are prone to error, and open to considerable variation due to weather conditions and other factors. To select the assumptions to be made in modelling is a matter of judgement but mine, on balance, is that of the options before the inquiry those most likely to produce reasonably accurate predictions are the "additional measures", "cumulative assumptions" and a "Factor of 2" reduction.
- 28.4.45 On the basis of these assumptions the model predictions indicate that there are few areas where deposited dust is likely to be a substantial problem. I do not wholly disagree with that conclusion but I have some reservations. I have already explained my view that dust effects would extend over a wider area than modelled by BAA, and my perception that the sensitivity of most people to dust would be accentuated by the duration, scale and high public profile of the Terminal 5 project. I am also concerned that there may be a build-up of dust in the Heathrow area generally because, in some meteorological conditions, it might accumulate faster than natural processes could disperse it. I have no information that might be used to quantify such a phenomenon but I believe that it should be taken into account as a potential source of harm.
- 28.4.46 Turning to particulates, those of less than 10 microns in diameter (PM_{10}) are a form of dust but they are excluded from the term deposited dust. However, since processes that generate dust also generate PM_{10} particles, a number of the matters discussed under the heading of deposited dust also apply to PM_{10} generation. However, one of the matters at issue at the inquiry relates to the assumption to be made as to the proportion of PM_{10} in airborne dust.
- 28.4.47 The original assumption made by BAA was that PM_{10} comprised about 20% of airborne dust. Hillingdon suggested a figure of 45%, based upon earlier American experience. In 1998 a revision of the earlier work was published and recommended a modified formula and an assumption for PM_{10} content of 30%. I note that using the new formula and assumption gives lower dust deposition rates than the calculations carried out on behalf of BAA. Although Hillingdon argued that BAA had not applied the new formula correctly, even if the calculations are carried out on the basis of the formula which excludes the effect of the number of rain days, the emissions predicted are less than those based on BAA's original assumptions. I, therefore, conclude that BAA's decision to retain the assumption of 20% PM_{10} for

the modelling of dust deposition is reasonable. I am satisfied, too, that its use introduces a conservative element in that the projections derived from it are less than those obtained using the more up-to-date assumptions and formulae.

- 28.4.48 Another point at issue was whether the method used by BAA to derive short period concentrations of PM_{10} (and NO_2) from annual means gave reliable and reasonably accurate results. The statistical technique used has been criticised on the grounds that the higher percentile concentrations cannot be reliably derived from the data set used to produce the graphical prediction curve. Hillingdon suggest that, for values beyond this data, a straight line projection, would be just as applicable as that assumed by BAA and would produce much higher results. In my view little of the evidence presented supports the use of any curve much beyond the range of data actually measured, and a considerable degree of uncertainty surrounds predictions based upon the higher values. This does not invalidate much of the analysis by BAA that deals with lower levels.
- 28.4.49 Bearing in mind the above conclusions I have formed the view that whilst the modelled values of PM_{10} should be approached with caution they do provide a reasonable indication of the approximate levels of PM_{10} to be expected whilst Terminal 5 and ancillary development are being constructed. On that basis, it is clear that, for much of the Heathrow area, background levels of PM_{10} should, by Year 4, be dropping below the 2005 objective levels. The construction operations would reverse this trend, increasing the levels of PM_{10} in the vicinity of the airport and extending the area within which levels would exceed the objective. For large areas the effect of construction would not be great but in some areas close to the Principal Site (such as Bedfont Court) levels of PM_{10} are predicted to be well above the objective throughout most of the construction period. The worst of these effects in all areas would be over by Year 4 after which the fall in PM_{10} levels should resume in almost all areas.
- 28.4.50 Although much analysis has been carried out regarding the effects of PM_{10} there was been little or none in regard to $PM_{2.5}$. I do not consider this to be deserving of criticism because the subject has only emerged recently and very little data on levels or emission factors exist for $PM_{2.5}$. BAA suggested that, as it is a fraction of PM_{10} , predictions regarding the latter might be used to some extent as a proxy for the former. There may be something in this, but it seems to me that any predictions made on such a basis would necessarily be speculative. The proportion of $PM_{2.5}$ to PM_{10} in vehicle emissions may vary greatly from machine to machine and process to process. It is generally accepted that particles in the $PM_{2.5}$ range can be appreciably harmful to people and animals. Furthermore, since relatively little of the total $PM_{2.5}$ comes from construction dust suppression measures would not be very effective.
- 28.4.51 On the basis of the evidence submitted I consider that $PM_{2.5}$ is a source of potential harm, a view which appears to be reflected in emerging national guidelines. However, there is no reliable evidence before me from which to do more than guess at future levels of $PM_{2.5}$ or the extent to which the construction of Terminal 5 would affect those levels. Nevertheless, I consider that the possibility of harm being caused by these very small particles should be taken into account as one of the risks of Terminal 5 construction. Moreover, although the government does not yet require or advocate monitoring levels of $PM_{2.5}$, evidence submitted to this inquiry indicates to me that it would be prudent to carry out such monitoring from the outset.

- 28.4.52 Of the three main pollutants produced by construction operations NO₂ was the one which caused least concern to objectors. I saw no evidence to suggest that the results of modelling were unreliable as a general indicator of levels. On that basis it is clear that, whilst in sizeable areas NO₂ levels would otherwise decline to within national objectives, the effects of construction would be to delay the achievement of those objectives, in some instances by several years. In other areas the objectives would not be met with or without the construction of Terminal 5 but, in the latter case, the extent of the failure would be greater. Again the worst areas would probably be those closest to the Principal Site but even there the degree of exceedance would not be great subject to good working practice. In no areas would the difference between NO₂ levels with and without construction be very marked.
- 28.4.53 The methodology used by the Highways Agency in assessing the effect of road construction on air quality was somewhat different from those preferred by BAA. However, since the principles underlying it, and the criteria for acceptability were very similar to those used by BAA, I do not believe that the difference matters. The predictions were not seriously challenged by any of the main objectors and indicated that, except for brief periods at locations very close to the construction sites, the effects on air quality would be very minor, and would largely be subsumed within the effects of Terminal 5 construction. I see no reason to doubt that conclusion.
- 28.4.54 The effects on human health mainly stem from increases in PM₁₀ and NO₂ levels. There are recognised epidemiological links between both of these and respiratory health problems that indicate increased levels of hospital admissions and even mortality rates for large increases in levels of these pollutants. So long as suitable mitigation measures were taken only a very small number of people would be affected by decreases in air quality of a degree likely to cause such problems at Heathrow. The evidence seems to indicate that if problems occurred they would mainly be limited to those who were particularly vulnerable. Nonetheless I am satisfied that the construction of Terminal 5 would, in itself, result in a small but not negligible risk to human health. I also share the concern of several objectors that particles smaller than 2.5 microns in diameter could pose a particular problem, although insufficient analysis has been carried out to assess the level of risk from this source.
- 28.4.55 The animal boarding establishment at Willowslea Kennels lies in an area where construction would cause the one of the highest increases in pollution. The evidence as to how this would affect birds and animals on the premises is by no means conclusive but I believe there is a possibility that they would be harmed during adverse meteorological conditions. This is a factor to be weighed in the balance against the grant of planning permission for Terminal 5. If Terminal 5 is permitted, mitigation measures should be taken where possible.
- 28.4.56 In summary, reliable predictions as to the effects of construction on air quality are, if anything, harder to achieve than predictions as to noise and traffic flows. In consequence, I do not consider that the projections presented to the inquiry should be treated as better than general indications. Even on that basis it seems clear that construction will adversely affect air quality by leading to air conditions worse than if Terminal 5 were not to go ahead. In some locations this would mean that national objectives which would otherwise be met would not be achieved. In others, perhaps more widespread, Terminal 5 would result in additional delays in meeting air quality objectives. As a result there would be some direct impact on public health. Although this would probably be limited to a small number of people who were

particularly sensitive to air changes, this does not mean that the effects on health should be ignored.

- 28.4.57 The average person would probably not perceive the effects of NO₂ and PM₁₀ but the deposition of dust certainly would be noticed. Past experience indicates that most people find dust irksome and I consider that dust over a period of many years could cause real concern in some areas, particularly as the end of the main period of construction would signal the opening of the new terminal. Responsible working practice and other measures could reduce the problem but not eliminate it. Overall, I conclude that the effects of construction upon air quality would add materially to the case against the Terminal 5 proposals.

28.5 OVERALL CONCLUSIONS ON THE ENVIRONMENTAL IMPACTS OF CONSTRUCTION

- 28.5.1 Construction of Terminal 5 and its associated developments would have potentially widespread impacts. These could affect traffic levels and add to the harmful effects of the airport on noise levels and air quality over several years. The road network around Heathrow is already very busy and congested at certain times of day and localised problems can occur at any time. The extra traffic due to construction operations would tend to increase these problems. Furthermore, the effects of increased traffic and congestion would inevitably begin within a few months of the start of construction operations and this would bring forward some of the problems likely to be caused by Terminal 5. Nonetheless, the problems during construction are unlikely to be any greater than those which would occur after Terminal 5 opens. I found no reason to believe that they would be so great as to carry substantial weight even bearing in mind the fact that work on Terminal 5 is likely to coincide to some degree with the unrelated widening of the M25.
- 28.5.2 This does not mean that nothing should be done to minimise the impact of additional construction traffic. In particular, I consider that BAA's existing proposals do not sufficiently deter employees from using private cars and I have indicated that the car parking provision proposed by BAA should be reduced so that it equates to 50% of the workforce to remedy this. This would have a significant impact on flows during the peak hours and would be consistent with my recommendations concerning parking for workers at the airport after Terminal 5 opens.
- 28.5.3 The construction of Terminal 5, and the other developments associated with it, would be a source of disturbance due to noise. The people most affected would be limited in the main to those living close to the main construction areas. Nevertheless, a small number of properties would be seriously affected for lengthy periods. Overall noise levels in a wider area would also be increased, and some people would notice, and perhaps be disturbed by, the noisier elements of the construction process. Measures to mitigate this disturbance would reduce, but would not remove, these effects. I am less concerned with the noise from construction traffic except insofar as it stems from late working during the summer months when it could affect the enjoyment of people using their gardens in the evening.
- 28.5.4 Noise disturbance would last for a number of years, but would diminish considerably after the completion of Phase I. Nonetheless disturbance in some areas would last for many months, even years, and I do not believe that those affected

would become accustomed to it and less sensitive to its impact. On the other hand, many people recognise and accept that a construction project of this scale cannot be implemented without some noise. Overall, I conclude that the effects of construction noise, in the widest sense, would add materially to the case against the Terminal 5 proposals. Where mitigation measures are feasible they should be applied but I recognise that their effects, whilst welcome, would be limited.

- 28.5.5 Reliable predictions as to the effects of construction on air quality are, if anything, even harder to achieve than those for noise and traffic flows. In consequence I do not consider that the projections presented to the inquiry should be treated as better than general indications. Even on that basis, it seems clear that construction will adversely affect air quality. In some locations this would mean that national objectives which would otherwise be met would not be achieved. In others, perhaps more widespread, Terminal 5 would result in further delays in meeting air quality objectives. As a result there would be some direct impact on public health although this would probably be limited to a small number of people who were particularly sensitive to air changes.
- 28.5.6 The average person would probably not perceive the effects of NO₂ and PM₁₀ but the deposition of dust certainly would be noticed. Past experience indicates that most people find dust irksome and I consider that dust over a period of many years could cause real concern in some areas, particularly as the end of the main period of construction would signal the opening of the new terminal. Responsible working practice and other measures could reduce the problem but not eliminate it. Overall, I conclude that the effects of construction upon air quality would add materially to the case against the Terminal 5 proposals.
- 28.5.7 The overall environmental impact of the construction programme must be a factor which weighs against its approval, even though I do not believe that it would be as great as suggested by Hillingdon and other objectors. I do not accept that the environmental impact of the construction programme would be so great as to justify refusing permission for Terminal 5. Nevertheless, I recognise the potential harm construction of Terminal 5 could cause and I accept the need for effective controls if widespread complaints are to be avoided. BAA proposed a number of measures intended to reduce its impact which I shall deal with in detail when considering conditions.

29 THE NEED FOR A MINERALS AND WASTE STRATEGY

29.1 INTRODUCTION

- 29.1.1 As part of their case concerning the impact of construction, the local authorities argued that BAA should have submitted a more specific set of proposals showing where they would obtain the sand, gravel and crushed rock they needed. They also suggested that BAA had failed to demonstrate that they had minimised the volume of waste to be produced and the means of disposal of such waste. In the absence of this information the authorities argued that BAA should be required to submit for their approval a comprehensive minerals and waste strategy before any construction started.
- 29.1.2 Part of the argument about waste disposal was directly related to BAA's proposals for the deposition of spoil in the Colne Valley and I shall deal with this separately in the next Chapter. I shall, however, deal with some other specific points such as the possible provision of a conveyor between the Colnbrook Logistics Centre and the Principal Site and the extraction of sand and gravel from the Bedfont Court area in this Chapter.
- 29.1.3 The main issue to be resolved is;
- The need for a minerals and waste strategy to be approved before construction work commences.

29.2 THE NEED FOR A STRATEGY

BAA's Case

- 29.2.1 BAA argued that their proposals had been based on the European Union's Environmental Assessment Directive and that sufficient information had been supplied to enable the Secretary of State to reach a proper decision on the applications before him in compliance with the requirements of the Directive²⁸⁴⁷. The Directive had been enacted in UK law via the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988 which set out what an environmental statement must include and what it may contain. There was no express requirement to specify how construction waste would be handled²⁸⁴⁸.
- 29.2.2 The only applications affected by subsequent amendments to the Directive were those for the logistic sites and the deposition of spoil which were covered by a requirement that information should be provided on the significant effects of the use of natural resources. The inference was that information on waste disposal should be provided if it was likely to have a significant effect on the environment. However, as a matter of law there was no requirement to provide information on alternative means of construction, alternative mitigation measures or the means of disposal of construction waste under the original or the amended Directive²⁸⁴⁹.

²⁸⁴⁷ 9-6.2.2

²⁸⁴⁸ 9-6.2.3

²⁸⁴⁹ 9-6.2.4

- 29.2.3 The principles of sustainable development were incorporated in the Planning and the Minerals Policy Guidance Notes and local development plans²⁸⁵⁰ and mineral workings associated with Terminal 5 would have no significant effects on natural resources. Minerals would be purchased from a variety of sources with planning permission and would have been produced whether used for Terminal 5 or not. BAA had provided as much information as could reasonable be expected at this stage. Detailed information produced so far in advance of the actual work could not be relied upon and would be likely to fall foul of European Union procurement rules. Sir Graham Eyre's views on the need for a minerals strategy had been expressed under markedly different circumstances²⁸⁵¹.
- 29.2.4 The total requirement for sand and gravel would be some 2.8m tonnes which was only a small proportion of the resources agreed to be available in the area²⁸⁵². Conditions requiring the submission of a minerals strategy were neither necessary nor practicable. The need for minerals and waste disposal facilities would not arise for some time and it was impossible to predict the situation at that time. BAA had demonstrated that adequate supplies and facilities existed and that they could be delivered without unacceptable environmental impacts. A condition controlling the disposal of contaminated waste would, however, be acceptable²⁸⁵³.
- 29.2.5 A conveyor between the Colnbrook Logistics Centre and the Principal Site could only be used to move the 800,000 tonnes of crushed rock. While this would save some 90,000 lorry movements over a 2 year period these could easily be accommodated on the roads²⁸⁵⁴. Its provision would involve difficulties of land ownership, construction and security against vandalism. These difficulties meant that a Grampian condition requiring the provision of the conveyor would be ill advised. Nevertheless, BAA would be prepared to accept such a condition if the Secretary of State considered a conveyor to be essential²⁸⁵⁵.
- 29.2.6 The Bedfont Court area would yield between 1 and 2m tonnes of sand and gravel according to BAA and the resultant void would be a potential receptor for surplus spoil. There was, however, considerable uncertainty as to when it would come forward and the grant of planning permission could not be taken as a foregone conclusion²⁸⁵⁶. Although BAA did not promote Bedfont Court as a source for minerals it would co-operate if Surrey County Council wished to do so. In such circumstances it would probably not be able to continue with its proposals to deposit spoil in the Colne Valley²⁸⁵⁷. Both Spelthorne and Hillingdon wished to see some deposition on Plots 1 and 9 to screen the Spur Road and the M25²⁸⁵⁸.

The Highway Agency's Case

- 29.2.7 The Highways Agency argued that they were only marginally involved in the minerals and waste issue. They had, however, established that there were sufficient reserves to meet the needs of the Terminal 5 road works as well as the widening of the M25. There was no intention to use local borrow pits²⁸⁵⁹.

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²⁸⁵⁶ 9-6.2.11

²⁸⁵⁷ 9-6.2.12

²⁸⁵⁸ 9-6.2.13

²⁸⁵⁹ 9-6.3.1

Hillingdon's Case

- 29.2.8 Hillingdon argued that BAA should minimise the environmental impact of construction and remedy deficiencies in their minerals and waste strategy. They should seek a materials balance, use methods which incorporated the principles and practices of sustainability, and secure further use of rail for the delivery of minerals and the disposal of waste²⁸⁶⁰. BAA's approach was driven by their need to complete Terminal 5 as soon as possible and failed to take into account the sustained periods when the environmental impact of construction was close to its peak levels²⁸⁶¹.
- 29.2.9 The proper consideration of sustainability was a central feature of national regional and local policy and the exceptional scale of the Terminal 5 project imposed a particular responsibility on BAA to provide an example in this respect. Although there had been a belated movement towards sustainability goals, BAA had not demonstrated that other possibilities had been considered still less that those put forward were the least bad²⁸⁶².
- 29.2.10 In Hillingdon's view BAA should increase the volume of minerals to be brought to the site by rail but even then the final stage of transport from the Colnbrook Logistics Centre to the Principal Site would be by road. This, combined with the movement of sand and gravel, would place a very large load on an already busy local network²⁸⁶³. In the absence of detailed information on sources of sand and gravel it was impossible to assess the impact of lorry movements. The use of local sources could lead to the use of local roads causing considerable disturbance to small communities²⁸⁶⁴.
- 29.2.11 In the absence of any planning constraints, decisions on the supply of sand and gravel would be made principally on operational and financial grounds. There should be a comprehensive materials strategy as suggested by Sir Graham Eyre following the previous inquiry. This should be required by condition and should cover the identification of sources, the means of working, lorry routes and environmental safeguards²⁸⁶⁵. The failure of BAA to put forward such a strategy placed at risk the objectives of the minerals policies in the Hillingdon UDP which paid due heed to sustainability and sought to husband finite resources²⁸⁶⁶.
- 29.2.12 The requirements of Terminal 5 and its associated developments were equivalent to 4 years of London's total production. BAA had not given sufficient thought to the use of secondary and recycled aggregates²⁸⁶⁷. The void left by the extraction of these quantities of sand and gravel would be only half filled by the surplus spoil created by Terminal 5 and this would add to the problems of restoring mineral sites in the area²⁸⁶⁸. More thought should be given to bringing in sand and gravel and exporting waste by rail and to the provision of a conveyor between the Colnbrook Logistics Centre and the Principal Site. This would save some 90,000 lorry movements which would be a significant benefit even if the roads were able to cope with these trips²⁸⁶⁹.

²⁸⁶⁰ 9-6.4.1

²⁸⁶¹ 9-6.4.2

²⁸⁶² 9-6.4.3

²⁸⁶³ 9-6.4.4

²⁸⁶⁴ 9-6.4.5

²⁸⁶⁵ 9-6.4.7

²⁸⁶⁶ 9-6.4.8

²⁸⁶⁷ 9-6.4.9

²⁸⁶⁸ 9-6.4.10

²⁸⁶⁹ 9-6.4.11

- 29.2.13 The project would generate some 800,000 m³ of surplus spoil which demonstrated that it had become too big for its limited site and the proposed timetable. There appeared to have been little or no attempt to explore other ways of disposing of this spoil, such as the filling of other voids in the area²⁸⁷⁰. Hillingdon were unhappy at the current materials balance and argued that BAA should be required to submit either an amended balance or a detailed justification for the current one²⁸⁷¹. Contaminated waste should be controlled by a condition as should the commitments BAA had given regarding the minimisation, re-use or re-cycling of materials²⁸⁷².
- 29.2.14 Terminal 5 should be refused planning permission amongst other reasons because of the lack of adequate information on minerals and waste but, if planning permission were granted, a condition should be imposed requiring the submission of a detailed strategy before the start of development²⁸⁷³. There should be a co-ordinated approach to the work of the Highways Agency (including the widening of the M25) and BAA. The position of the Agency that such issues were for their contractors was not satisfactory. Until the sources for minerals had been established lorry routing arrangements could not be secure²⁸⁷⁴. There should be a binding agreement to which BAA, the Agency and the local authorities were parties. This agreement should cover all of the points raised by Hillingdon²⁸⁷⁵.
- 29.2.15 Bedfont Court was now covered by the Hillingdon UDP but the authority was prepared to accept that there could be environmental benefits in using minerals from there in the construction of Terminal 5. There could also be disadvantages, however, and there should be a proper investigation in the context of a comprehensive minerals strategy²⁸⁷⁶.

Spelthorne's Case

- 29.2.16 Spelthorne supported Hillingdon's call for such a strategy without repeating all of the arguments²⁸⁷⁷. They argued that the use of minerals from Bedfont Court would confer substantial benefits, reducing lorry movements avoiding future disruption, providing a site for the disposal of waste and enabling restoration to be integrated with the enhancement proposals in the Colne Valley. There might be local opposition but the main problem was of timing. Although it could not be brought forward before the end of the inquiry there should be a condition requiring its investigation and compelling its use if it became available²⁸⁷⁸. Surrey County Council did not require their land at Bedfont Court for operational purposes and were prepared to discuss the use of its minerals with BAA²⁸⁷⁹.

Other Objectors' Cases

- 29.2.17 In their written representations Windsor and Maidenhead supported the case put by Hillingdon but also argued that, if approved, Terminal 5 should make use of minerals stockpiled during the construction of the Maidenhead, Windsor and Eton Flood alleviation Scheme. They also drew attention to the policies of the local plan,

²⁸⁷⁰ 9-6.4.12

²⁸⁷¹ 9-6.4.13

²⁸⁷² 9-6.4.14

²⁸⁷³ 9-6.4.15

²⁸⁷⁴ 9-6.4.16

²⁸⁷⁵ 9-6.4.18

²⁸⁷⁶ 9-6.4.18

²⁸⁷⁷ 9-6.5.1

²⁸⁷⁸ 9-6.5.2

²⁸⁷⁹ 9-6.5.3

the Replacement Minerals Local Plan for Berkshire and the SERPLAN Revised Waste Planning Advice²⁸⁸⁰.

- 29.2.18 Buckinghamshire County Council made written representations in which they pointed to other large projects both related to Terminal 5 and independent of it. The deficiencies in BAA's plans were so marked and important that they added significantly to the reasons why permission should be refused for Terminal 5. If, however, permission were granted conditions should be imposed requiring the submission of details of BAA's minerals and waste strategy. The same point applied to the Orders required for the rail links to Terminal 5²⁸⁸¹.

My Conclusions

- 29.2.19 In this Chapter I am considering a number of issues relating to minerals and waste. In the main they involve BAA rather than the Highways Agency. Given the assurance by the latter that there is no intention to open local borrow pits, the main criticism of their proposals was in respect of their intention to leave decisions as to the source of materials and the destination of waste to their contractors. However, since the amounts involved in both regards would be relatively small in relation to Terminal 5 construction, I do not consider that the issue is a critical one. The Agency's intentions are normal practice in regard to road schemes, even those considerably larger than those involved here, and I do not consider that the decision not to depart from normal practice is, in itself, sufficient justification for opposing the proposals. The remaining matters, discussed below, relate primarily to BAA's proposals. I shall deal with a number of disparate points before turning to the overall issue of the need for a minerals and waste strategy.
- 29.2.20 Most parties agreed that there are between 1m and 2m tonnes of usable sand and gravel at Bedfont Court. It was also common ground that its removal was envisaged by, and would not be inconsistent with, local planning policies so long as relevant environmental requirements and criteria were met. This remains the case in respect of Hillingdon UDP, which has only been formally adopted since the evidence on this subject was given. The resulting void could be suitable for the kinds of spoil likely to be generated in quantity by the construction of Terminal 5. The land is very close to the Principal Site and, subject to it being brought forward at the appropriate time, hardly any of the lorries travelling between the two would have to use the public road system.
- 29.2.21 However, no planning application has been submitted for the extraction of minerals from this site and I am in no position to make a specific recommendation regarding the grant of planning permission. Any application submitted would be likely to meet with significant opposition, and its approval could not be regarded as a foregone conclusion. Moreover the land is in multiple ownership and occupation, and to bring it forward for mineral extraction would not be straightforward. Under such circumstances it could not, realistically, have figured in BAA's plans. In my view the difficulties which need to be resolved, including environmental implications and possible conflict with European Union procurement rules, make it impossible to impose a condition requiring the use of sand and gravel from Bedfont Court even in the form suggested by Spelthorne.

²⁸⁸⁰ 9-6.6.1-3

²⁸⁸¹ 9-6.7.1

- 29.2.22 BAA, who gave the matter serious consideration in the early stages, accepted that a conveyor between the Principal Site and the CLC could have appreciable benefits. The advantages in terms of reduction in lorry traffic would be considerable, but its use would be limited to certain materials and there could be noise problems as well as an adverse visual impact. I believe that most of the technical and administrative problems could be overcome, although some might prove costly. On the other hand, I am not convinced that it would be possible to use a conveyor for the wider range of materials suggested by some objectors. Even if it were physically possible to use it to carry waste to the Logistics Centre, this would be justified only if the waste could then be carried by rail to suitable reception sites which were themselves close to a railhead. I saw no evidence to suggest that this was likely.
- 29.2.23 Nor do I think that it would be practicable to provide reliable security for a piece of vulnerable machinery about 1.5 km long. There has been evidence in recent years that major projects have been subjected to disruption and I am sure that the high public profile of Terminal 5 could make it an attractive target for such tactics. With a project based on "just-in-time" deliveries and tight programming, failure of the conveyor could have severe and long-lasting disruptive effects. BAA have said that they could provide a conveyor if forced to do so, and opportunities to reduce traffic should not lightly be discarded. However, I do not consider that the benefits to be obtained in this instance are sufficient to outweigh the very real difficulties which would have to be overcome if a conveyor were to be provided. I, therefore, conclude that a conveyor should not be a requirement of any permission granted.
- 29.2.24 Criticism regarding the source of minerals and the means of disposing of waste fell into two main areas. The first was criticism of BAA's published proposals, and the second was concern over the lack of details. In respect of the first a number of specific issues emerged. I have already set out my conclusions on two of these, i.e. the use of a conveyor between the CLC and the Principal Site, and the exploitation of sand and gravel reserves at Bedfont Court.
- 29.2.25 Another contention was that the spoil proposed to be deposited on Plots 1 and 9 should, instead, be used to fill voids left by the sand and gravel extraction. I can see that this would mean that local residents would not have to contend with the environmental consequences of depositing such materials on Plots 1 and 9. On the other hand the voids on the sand and gravel sites would not be available for waste from other sources and this could exacerbate the widely recognised problems of waste disposal in the London region.
- 29.2.26 It would probably be possible to use part of the spoil to provide a more modest landform to screen the Spur Road, and the remainder as a smaller contribution to filling some of the voids. I shall consider BAA's proposals for the deposition of spoil in the Colne Valley in more detail in the next Chapter but merely note here that a compromise which significantly reduced the amount of spoil deposited in the Valley could leave the Spur Road as a more prominent feature and reduce the screening of the M25. Whilst I do not consider that the possibility of using some spoil to fill extraction voids should be ruled out, I do not consider that it has clear-cut advantages sufficient to merit insistence that it be done.
- 29.2.27 The second strand of the objections assumes that BAA do not have a minerals and waste strategy, but I do not accept that to be a true assessment of the situation. Their proposals include assessments of the amounts of various kinds of minerals needed and identify the general areas from which they are to be obtained. They also contain a fairly detailed outline of the means of transport and the routes to be used

in the vicinity of Heathrow, the definition of "no-go" areas for lorries and detailed proposals for the management of transportation using the Colnbrook Logistics Centre and the Forward Lorry Park. A number of environmental protection measures are included within the proposals for construction and BAA accept that others could be applied by means of conditions should permission be granted.

- 29.2.28 In my opinion, the only significant feature missing from the strategy planned is an indication of the actual sites from where the materials would come, or waste would be deposited. However I do not believe that it would be reasonable for commitments for such to be given at least two years and probably more before work would have to begin. No major party contested BAA's suggestion that to make such commitments would be contrary to the European Union's procurement rules for projects of this kind. Equally, I believe that the information that has been presented to the inquiry was sufficient to comply with relevant European directives.
- 29.2.29 I am also satisfied that there would be sufficient sources of sand and gravel available in the area around Heathrow to meet the needs of Terminal 5 and its associated developments. This would apply, in my view, even without the supplies stock-piled during the construction of the Maidenhead, Windsor and Eton Flood Alleviation Scheme drawn to my attention by Windsor and Maidenhead. Overall, I am satisfied that there are no grounds for refusing the Terminal 5 applications on the basis that no adequate waste and minerals strategy has been submitted.
- 29.2.30 Objectors suggested, as an alternative, that if permission were to be granted it should be dependant upon the submission of a minerals and waste strategy approved by the appropriate planning authorities. However, there is a substantial risk that agreement between the parties on the details of a strategy would not be forthcoming. In the absence of agreement, the delays associated with negotiations and possibly even a further inquiry could substantially delay the construction of Terminal 5. This could be a very substantial disadvantage if it were decided that Terminal 5 were needed and should be permitted.
- 29.2.31 As I have indicated, much of the information concerning the effects of transporting materials has already been provided. Since BAA intend to use sites which already have planning permission when construction commences, the additional information to be derived from a condition such as that suggested would not greatly increase knowledge of the impact of the proposals. The environmental effects of extraction would have been fully considered before planning permission was granted for each site to be worked. Similarly the environmental impact of proposals to deposit the waste generated by Terminal 5 in the Colne Valley was fully covered by evidence submitted to me. Consequently I do not believe that anything would be gained by the imposition of a condition requiring the approval of a minerals and waste strategy before construction starts.
- 29.2.32 It has been suggested that the proposals for the construction of Terminal 5 pay insufficient regard to the principles of sustainability. As I have already said the application of sustainability to planning is incorporated in local and national planning policies. I am satisfied that BAA have adopted an approach to the construction of Terminal 5 which takes due account of the Government's policies on sustainability, and have taken reasonable measures to minimise areas where principles of sustainability may not be fully met.

30 DEPOSITION OF SPOIL IN THE COLNE VALLEY

30.1 INTRODUCTION

- 30.1.1 The original proposals for Terminal 5 maintained a balance between the voids created and the spoil used to fill them. Subsequently the need for an Underground Baggage Facility was identified and this led to an increase in the volume of spoil with the result that BAA argued that substantial volumes would have to be removed from the site. Consequently, BAA submitted applications to deposit spoil on areas known as Plots 1 and 9 immediately to the west of the Principal Site and in the Colne Valley.
- 30.1.2 Plot 1 lies to the north of the old Bath Road while Plot 9 lies to the south between the old Bath Road and Airport Way and is subdivided into 2 by the Spur Road. The proposals involve the deposition of 70,000 m³ on Plot 1, 100,000 m³ on Plot 9 (North) and 630,000 m³ on Plot 9 (South). Some 400,000 m³ of spoil would also be deposited on a temporary basis on Plot 9 during Phase 1 of the development.
- 30.1.3 Lorries moving the spoil would use the Bailey bridges where possible but those taking spoil to Plot 9 would have to use the Western Perimeter Road, the A3113 and Poyle roundabout until Month 6 of the programme. During Phase 2 access to both Plots would be via the old Bath Road.
- 30.1.4 While BAA argued that these proposals would enhance the Colne Valley and help screen the Spur Road and the M25 the local authorities were concerned at the scale of the mounding involved and suggested that this would not reflect the character of the Colne Valley.
- 30.1.5 The main issue is therefore;
- The need for the proposed spoil deposition and its impact on the Colne Valley.

30.2 THE NEED FOR AND IMPACT OF THE SPOIL DEPOSITION

BAA's Case

- 30.2.1 BAA argued that they had already justified the Underground Baggage Facility and had demonstrated why the layout and ground levels in the landside area should not be changed. They were prepared to commit themselves to a limit of 800,000 m³ of spoil to be disposed of permanently off-site. The need to store a further 400,000 m³ temporarily now appeared to be uncontroversial²⁸⁸². The 800,000 m³ did not include any spoil which might have to be removed as a result of any extension of the Underground Baggage Facility to Satellite 3. A scheme for the disposal of this additional spoil (which could be as much as 335,000 m³) would have to be agreed with the local planning authority²⁸⁸³.

²⁸⁸² 9-7.2.1-2

²⁸⁸³ 9-7.2.3

- 30.2.2 The only disputes appeared to relate to the quantity of material needed on Plots 1 and 9 to screen the Spur Road and the final landform. While spoil could be taken to other sites, that would generate additional lorry traffic and it was impossible to predict what sites would be available²⁸⁸⁴.
- 30.2.3 Both plots lay within a Comprehensive Rehabilitation Area as defined in the Hillingdon UDP which meant that they were subject to Policy OL20D. This required restoration of land affected by a proposal to a standard suitable for public access, landscape improvements by remodelling and replanting and improvements to footpath bridleway and cycleway networks. The reference to remodelling implied the import of material and both Spelthorne and Hillingdon accepted that a planning permission for spoil deposition was the mechanism for the achievement of this policy²⁸⁸⁵.
- 30.2.4 The plots were in the Green Belt. Although the spoil deposition would involve periods of activity, the openness of the Green Belt would be maintained once the sites were restored and the development would not conflict with the purposes of including land within the Green Belt²⁸⁸⁶. It would become inappropriate development in the Green Belt only if the spoil to be deposited went beyond that needed for enhancement purposes and the result was harmful to the landscape and the purposes of the Green Belt. That was not the case here²⁸⁸⁷.
- 30.2.5 Even if it were found to be inappropriate development the harm caused would be limited. Inappropriate development was, by definition, harmful but openness would not be harmed and the eventual remodelling would be a definite enhancement of the Green Belt²⁸⁸⁸. The sites had been proposed for enhancement in the Colne Valley Park Enhancement Group's proposals and BAA's proposals would achieve all of the suggested improvements²⁸⁸⁹. In its final form the proposed scheme would contribute to all the objectives for the Green Belt set out in paragraph 1.6 of PPG 2. There would be contributions in the form of landscape improvements, nature conservation and the restoration of damaged and derelict land²⁸⁹⁰.
- 30.2.6 In the agreed proposals of the Colne Valley Park Enhancement Group, Plots 1 and 9 lay with a zone in which the aim was to introduce ground modelling, open woodland planting and access for the public. The proposal for Plot 1 included mounding and planting alongside the M25 while those for Plot 9 would create wooded slopes drawing out the Spur Road embankments and limiting views of the motorway. Overall the proposals would meet the enhancement objectives, comply with the character of the area and accommodate 800,000 m³ of spoil²⁸⁹¹.
- 30.2.7 The scheme would have the benefits of capping poorly restored landfill sites, enhancing the landscape, screening the M25 and the Spur Road, providing for public access by the introduction of a footpath/bridleway/cycleway route and enhancing nature conservation interests²⁸⁹². The original flat landscape of the Colne Valley had been changed significantly by past engineering and construction works

²⁸⁸⁴ 9-7.2.4

²⁸⁸⁵ 9-7.2.5

²⁸⁸⁶ 9-7.2.6

²⁸⁸⁷ 9-7.2.7

²⁸⁸⁸ 9-7.2.8

²⁸⁸⁹ 9-7.2.9

²⁸⁹⁰ 9-7.2.10

²⁸⁹¹ 9-7.2.11

²⁸⁹² 9-7.2.12

combined with mineral workings and landfill. Some of the recent landfill had been contoured with minimum slopes of around 1 in 25²⁸⁹³.

- 30.2.8 The main aim of BAA's proposals was to create a barrier between the motorway and the river while retaining an open character. Constraints such as the danger of bird strikes had been respected and 7 design criteria had been derived. Hillingdon had not disagreed with these criteria²⁸⁹⁴. Most parties including the Environment Agency and the Highways Agency preferred the option which integrated BAA's proposals with the Spur Road embankments so the original option was no longer being pursued²⁸⁹⁵. The final proposals involved an irregular mound on Plot 1 rising to a height of 5m. Plot 9 (North) had a 12m mound with a spur running to the north-east. In both cases there would be substantial flat areas. Plot 9 (South) would have a 13m mound and a 5m dome in the south-eastern corner to help drainage²⁸⁹⁶.
- 30.2.9 There was no dispute about the proposals on Plot 9 (North) but the option favoured by Spelthorne on Plot 9 (South) would mean that only 250,000 m³ could be deposited there compared with the 630,000 m³ proposed by BAA. This meant that only 420,000 m³ could be deposited in total. Hillingdon's overall proposals would accommodate a total of 630,000 m³²⁸⁹⁷. BAA's revised proposals were about the maximum that could reasonably be accommodated on Plots 1 and 9 and were more attractive and effective than those involving lesser amounts of spoil. They sought in some respects to reflect the successful landscaping at Waterside although comparisons between the two were of only limited validity because of differences in scale and surroundings²⁸⁹⁸.
- 30.2.10 BAA argued that their proposals would not produce alien features in a flat river valley. The proposals which had been agreed by the Colne Valley Park Enhancement Group had specifically excluded Plots 1 and 9 from the area in which the aim was to conserve the floodplain. Furthermore most authorities accepted the need for substantial mounding to screen the motorway²⁸⁹⁹. BAA had retained a narrow strip on the eastern edge of Plot 9 in their revised proposals as the Group had suggested, but the emphasis of planning advice for this area was on landscape change and enhancement rather than restoration and conservation²⁹⁰⁰.
- 30.2.11 The proposals put forward by both Hillingdon and Spelthorne would not succeed in screening traffic on the M25, at least until the trees grew, and the differences in visual impact between BAA's proposals and those of Hillingdon would not be very great²⁹⁰¹. The phasing of the work had been amended to ensure early completion of those parts closest to the motorway with the majority of the work in Plot 9 (South) being completed by the end of month 28²⁹⁰². There had been criticism of the proposed tree planting but this had to reflect the need to avoid the risk of bird strike by aircraft²⁹⁰³.

²⁸⁹³ 9-7.2.13

²⁸⁹⁴ 9-7.2.14

²⁸⁹⁵ 9-7.2.15

²⁸⁹⁶ 9-7.2.16

²⁸⁹⁷ 9-7.2.17

²⁸⁹⁸ 9-7.2.18

²⁸⁹⁹ 9-7.2.19

²⁹⁰⁰ 9-7.2.20

²⁹⁰¹ 9-7.2.21

²⁹⁰² 9-7.2.22

²⁹⁰³ 9-7.2.23

- 30.2.12 The moulding would avoid the 100 year flood plain and met the Environment Agency's requirement for a 15m zone free of obstruction along the river²⁹⁰⁴. Provision would be made to deal with leachate and gases such as methane²⁹⁰⁵. BAA's proposal for a mound in the south-eastern corner of Plot 9 (South) was better than Spelthorne's suggestions in both engineering and design terms²⁹⁰⁶. Hillingdon's proposal to lower the proposed mound on Plot 1 would reduce the amount of spoil to be deposited from 70,000 m³ to 40,000 m³. In visual terms this would make little difference. In any event, the costs associated with the deposition of spoil on Plot 1 would be such that the deposition of less than 60,000 m³ would not be justified in financial terms²⁹⁰⁷.
- 30.2.13 The use of the route via the Western Perimeter Road in the first 6 months was necessary to avoid delay to the programme. The "no-go" area covering Horton Road through Stanwell Moor would be diligently enforced and BAA would accept conditions to limit queues of lorries. There was no evidence that use of this route would cause noise problems²⁹⁰⁸.

Hillingdon's Case

- 30.2.14 Hillingdon re-affirmed their view that the Spur Road would harm the Colne Valley and should not be permitted. They accepted the need for mounding to screen the Spur Road although they believed that the mounding itself would harm the landscape²⁹⁰⁹. Nevertheless they were not happy with BAA's proposals which involved much greater amounts of material than those developed by Hillingdon from the Colne Valley Park Enhancement Group schemes²⁹¹⁰.
- 30.2.15 Hillingdon's proposals would follow the grain of the valley while screening the road and would increase the amount of flat land to the east. In total they would permit the deposition of 630,000 m³ as compared with the 800,000 m³ in BAA's scheme²⁹¹¹. The latter would push closer to the river and run across the valley. Its steep slopes would be alien to the generally flat landscape and would interrupt the continuity of the Valley as BAA had accepted. Although the photomontages did not show marked differences between BAA's and Hillingdon's schemes, this was because the vantage point was not one from which the differences would be apparent²⁹¹². The Council did not object in principle to mounding on Plot 1 but considered that BAA's proposals were too high, covered too great an area and sloped too steeply because BAA were trying to put more material on the site than was needed to screen the M25²⁹¹³.

Spelthorne's Case

- 30.2.16 Spelthorne were concerned that BAA had not given sufficient weight to the need to minimise waste. The reduction in the level of the landside area by 3m had led to the need to deposit an additional 300,000 m³ of spoil as they had pointed out

²⁹⁰⁴ 9-7.2.24

²⁹⁰⁵ 9-7.2.25

²⁹⁰⁶ 9-7.2.26

²⁹⁰⁷ 9-7.2.27

²⁹⁰⁸ 9-7.2.28

²⁹⁰⁹ 9-7.3.1

²⁹¹⁰ 9-7.3.2

²⁹¹¹ 9-7.3.3

²⁹¹² 9-7.3.4

²⁹¹³ 9-7.3.5

previously²⁹¹⁴. They accepted that some surplus material could be used to enhance the Colne Valley but the amount to be used should be that needed to improve the landscape rather than the amount which BAA needed to deposit. The enhancement proposals should improve the site, integrate the Spur Road into the landscape, provide a viable long-term use including public access and be implemented early in the Terminal 5 construction programme²⁹¹⁵.

- 30.2.17 Spelthorne's own proposals struck a balance between the need for some mounding and the need to respect the flat riverside setting of Plot 9. They would permit the deposition of some 250,000 m³ of spoil on Plot 9 (South). Since the Council did not object to BAA's proposals for 100,000 m³ on Plot 9 (North) and 70,000 m³ on Plot 1, a total of 420,000 m³ could be accommodated. If the level of the landside area were also increased by 3m the surplus spoil would be only 80,000 m³ which should not pose significant difficulties²⁹¹⁶. BAA's proposals were excessive and at odds with their earlier evidence that enhancement of the Valley could be achieved without large-scale remodelling²⁹¹⁷.
- 30.2.18 All material should be moved by the off-road haul route which could be established in about 3 months. Until then spoil should be taken to other waste disposal sites in the area²⁹¹⁸.
- 30.2.19 The whole deposition site lay within the Green Belt, the Colne Valley Park and a Landscape Improvement Area. Deposition would include intensive and relentless activity and the site would look raw and artificial for many years. Even in its finished form it would be intrusive and incongruous. The proposals, therefore, represented inappropriate development in the Green Belt²⁹¹⁹. Although there would be some benefits, these would be outweighed if BAA's proposal were permitted²⁹²⁰.

Other Objectors' Cases

- 30.2.20 In their written representations Windsor and Maidenhead objected to the traffic and environmental impact of the spoil deposition proposals and argued that there was no evidence that BAA had properly explored ways of obviating the need for waste disposal or co-ordinating its re-use with the Highways Agency²⁹²¹. The Environment Agency also submitted written representations but did not object to BAA's proposals. They said that there was sufficient information available to allow proper consideration of appropriate conditions²⁹²². Stanwell Moor Residents Association were concerned about possible dust and traffic problems and the risk to ground water²⁹²³. Their concern over ground water was shared by West End Residents who argued that BAA did not seem to have investigated the implications of past tipping or the effect their proposals would have on the drainage of the Spur Road. They also objected to the effect on the character of the Green Belt and on local flora and fauna²⁹²⁴.

²⁹¹⁴ 9-7.4.1

²⁹¹⁵ 9-7.4.2

²⁹¹⁶ 9-7.4.3

²⁹¹⁷ 9-7.4.4

²⁹¹⁸ 9-7.4.6

²⁹¹⁹ 9-7.4.7

²⁹²⁰ 9-7.4.8

²⁹²¹ 9-7.5.1

²⁹²² 9-7.6.1

²⁹²³ 9-7.7.1

²⁹²⁴ 9-7.8.1

- 30.2.21 West London Friends of the Earth accepted the need for some gentle mounding but said that BAA's proposals were unnecessary and unacceptable. The southern half of Plot 9 should be retained as it was, while Plot 1 had the potential to become a species rich meadow sward²⁹²⁵. In landscape terms both plots had more value as flat open fields than as artificial mounds blocking views and making access by foot or on bicycles more difficult²⁹²⁶.

My Conclusions

- 30.2.22 The need to deposit 800,000 m³ on Plots 1 and 9 stems from the need for the Underground Baggage Facility. I considered the need for that in Chapter 3, along with the most appropriate level for the landside area. In the light of my conclusions on these points, I start my consideration of this issue on the basis that, if Terminal 5 is permitted, the need for the deposition of this quantity of spoil has been established. This Chapter is, therefore, concerned with the implications of its deposition on Plots 1 and 9. Both plots lie within the Metropolitan Green Belt and the first question to consider is whether the proposals constitute appropriate development within the Green Belt.
- 30.2.23 Paragraph 3.12 of PPG2 states that engineering or other operations are inappropriate within Green Belts unless they maintain openness and do not conflict with the purposes of including land in the Green Belt. The third such purpose is "to assist in safeguarding the countryside from encroachment". Although fragmented and close to major roads I believe the deposition sites to be part of the countryside, albeit not in current agricultural use. During deposition works the operations on the site would be intensive and visually obtrusive, and would have some environmental impact such as noise and dust. Whilst some of the operations are akin to some agricultural processes they are at so different a scale as to be of a wholly different character. On the other hand, this part of the development would be only temporary, would rarely affect the whole site and would not affect the openness of the area. On balance, and despite some reservations on the matter, I conclude that during operational periods the use of the site would not, in principle, be inappropriate development within the Green Belt.
- 30.2.24 On completion the development would be rounded mounds or ridges covered partly with grass and partly with trees. I agree with BAA that its completed form would not affect the openness of the area. Nor, once the planting and landscaping was mature would it amount to encroachment into the countryside. In summary, I am satisfied that the development would not constitute inappropriate development within the Green Belt either during construction or when completed.
- 30.2.25 There are also local plan policies relevant to this development. Both Plots 1 and 9 are within Colne Valley Park and also within a Comprehensive Rehabilitation Area designated in the Hillingdon UDP. The Colne Valley Park Enhancement Group was set up to advise on the enhancement of the Colne Valley and included representatives from BAA and the Local Authorities. This group issued a position statement (PS/16.1) prior to the submission of BAA's proposals to deposit spoil in the valley. Plot 9 (South) is almost identical to Area 2c which is designated by Hillingdon on the plan attached to Appendix A of the position statement as an area for "Restoration and Creation of Woodland"²⁹²⁷.

²⁹²⁵ 9-7.9.1

²⁹²⁶ 9-7.9.2

²⁹²⁷ PS 16.1 p 14

- 30.2.26 Earlier explanatory text states Hillingdon's view that the area would benefit from open woodland planting, but that "This is only ... feasible ... at the very least by the provision of extra soil or soil improvement. Ideally the landform should be integrated into the motorway embankment profiles, providing longer gentler slopes towards the floodplain. ... This strategy would ... provide further scope for vegetation to screen the roads rather than emphasising them". Based upon this guidance Hillingdon developed a plan for the area which includes gentle wooded slopes running downwards to the east from the motorway embankments and "easing" to the flat area of floodplain beside the river. The drawing (CVD 6) is clearly intended to be diagrammatic and contains no heights or contours²⁹²⁸.
- 30.2.27 BAA's most up-to-date proposals include all of these features and, in my judgement, generally comply with Hillingdon's criteria for Area 2c which subsequently was designated as Plot 9 (South). The slopes cover a wider area than that shown on CVD 6 and BAA's proposals include, in the south-eastern corner, a 5m high mound which is not part of the latter. Both show an integrated public access link. I consider that the differences between the proposals and CVD 6 are in degree rather than kind and I consider that the former satisfactorily meets the objectives of the Colne Valley Park Enhancement Group.
- 30.2.28 Plots 9 (North) and Plot 1 are shown as Areas 2d and 2e in the Position Statement and both are, for the most part, designated for the restoration and creation of woodland. Neither Hillingdon nor Spelthorne deny that BAA's proposals for those sites meet this objective and, overall, it seems to me that the proposed deposition on Plots 1 and 9 complies with these aspects of the Enhancement Group's objectives.
- 30.2.29 I have also considered whether the relevant objectives of the Group to secure adequate landscape improvement and screening of the adjacent roads on Plots 1 and 9 could be achieved by deposition on a lesser scale than that proposed by BAA. Whilst these objectives would be met by BAA's proposals, the proposals put forward as an example by Hillingdon could also meet them. It is at least arguable that additional planting alone could screen the Spur Road. It follows that the relevant objectives of Colne Valley Park Enhancement Group could be achieved by deposition on a lesser scale than that proposed by BAA.
- 30.2.30 On the other hand Hillingdon accepted the principle of mounding if the Spur Road went ahead and specifically accepted the need for mounding on Plot 1 even though they considered that BAA's proposals were too large. Both Hillingdon and Spelthorne put forward proposals which embodied substantial mounding on each of the plots and I am satisfied that substantial quantities of spoil should be used if the M25 and the Spur Road are to be screened effectively. The proposals put forward by the authorities involved lower mounds and would depend on the tree planting to be truly effective in screening the motorway. Consequently BAA's proposals would provide a more effective screen in the early stages. They would also have the clear advantage of accommodating all of the spoil generated by the construction of Terminal 5. I accept that this would not include waste arising from the possible extension of the Underground Baggage Facility to Satellite 3 but BAA proposed an additional condition to cover this.
- 30.2.31 The Colne Valley is an area of landscape potential but it is very fragmented by roads and other development and its landform is neither strong nor well defined. The Colne Valley Park Enhancement Group proposals already envisage some

²⁹²⁸ PS 16.1 p 22 CVD 6

mounding integrated with the adjacent motorways and whilst BAA's scheme is on a greater scale than that originally envisaged it is not significantly different in character. Because of the amorphous landform I do not consider that it matters very much whether the ridges are aligned along or across the predominant river line of the rivers because the valley is so shallow as to be almost indeterminable and the landscape is very fragmented. When the landscaping is mature the area will look attractive, even if it takes many decades before it appears entirely natural.

- 30.2.32 The visit I made to see the landscaping carried out by British Airways at Waterside confirmed my view that major earthworks can be accommodated in this part of the Colne Valley without destroying its character. Experience at Waterside demonstrates that mounds can be very beneficial in improving the landscape and screening the motorway. Indeed earlier in the inquiry Hillingdon commended the improvements achieved by the work at Waterside. While I accept that there are differences, I do not consider that these affect the fundamental point that Waterside shows it is possible to introduce substantial mounds into the Valley to the benefit of the landscape. Given that BAA's proposals make proper provision to protect the floodplain, I believe that they would enhance the landscape while also screening the M25 and Spur Road.
- 30.2.33 I recognise that the implementation would be disruptive in terms of noise, traffic and possibly dust, and that for several years it would look raw and incongruous. On the other hand its use would mean fewer lorry trips on the public highway, as the transport of spoil from the Principal Site would, for the most part, be on a private haul road rather than public highways. This advantage would not apply in the early stages since the main haul road to the site would not be ready until month 6 and there would be a need to deposit spoil from month 3 onwards. BAA identified a route using the Western Perimeter Road and the A3113 which could affect residents of Stanwell Moor for use in this early period. The additional traffic would probably last for a maximum of about 3 months and no vehicles delivering spoil would be on the road before 0700 or after 2100 hours. Consequently, I do not consider that this additional use of the public roads would cause significant harm, and certainly not enough to justify delays and disruption to the construction programme.
- 30.2.34 If there were serious queuing on the A3113 some lorry drivers would be tempted to use alternative routes such as Horton Rd through Stanwell Moor. I agree this would be a source of concern. However, Horton Rd is a "no-go" route and I see no reason to doubt BAA's intention and ability to enforce this restriction. I doubt that more than a handful of drivers would risk penalties by ignoring the restriction. I do not consider that such a possibility is sufficient to justify delaying the use of the soil deposition sites.
- 30.2.35 Having considered all aspects of BAA's proposals for the deposition of spoil in the Colne Valley, I have concluded that they would be appropriate development in the Green Belt. I believe that they constitute a reasonable and acceptable means of disposing of the waste generated by the construction of Terminal 5 and that they would enhance rather than damage the landscape of the Colne Valley while providing an effective screen for the M25 and the Spur Road. Even if the view were taken that the scale of the proposals made them inappropriate development in the Green Belt I believe that the benefits of these proposals, in combination with an acceptance of the need for Terminal 5, would constitute very special circumstances that would justify their approval.

31 TEMPORARY DEVELOPMENTS ASSOCIATED WITH CONSTRUCTION

31.1 INTRODUCTION

- 31.1.1 BAA put forward planning applications for 4 temporary developments which, they argued, would assist in the construction of Terminal 5. These were
- The Colnbrook Logistics Centre;
 - The Forward Lorry Park;
 - The erection of a Bailey bridge over the Western Perimeter Road and the A3044, and;
 - The deposition of spoil to form the Spur Road embankment.
- 31.1.2 The Highways Agency also put forward proposals for a Bailey bridge across the River Colne and alterations to the Longford roundabout which do not require planning permission but are intended to assist the construction programme.
- 31.1.3 None of these proposals would be required if Terminal 5 were not to be constructed. I have therefore considered each of them on the assumption that permission is granted for the proposed terminal. I have also started from the assumption that the construction programme proceeds broadly as put forward by BAA and the Highways Agency.

31.2 COLNBROOK LOGISTICS CENTRE

- 31.2.1 This would occupy a site west of the M25 and straddling the A4. It would be served by a railway line and would be used to receive rail deliveries of materials and to store these prior to delivery by road to the Principal Site. Permission is sought for a 10 year period after which the site would be restored to grassland supplemented by trees. Permission was granted in 1987 to Foster Yeoman for a rail aggregate depot on the northern part of the site although the current status of that permission was in dispute²⁹²⁹.

BAA's Case

- 31.2.2 BAA argued that land was not available for a logistics centre within or adjacent to the Principal Site²⁹³⁰. While they would try to use the proposed Foster Yeoman railhead for the import of aggregates they could not guarantee success and would not be able to meet all of their objectives by using that site. They needed to import other materials although it would make no sense to bring sand and gravel in by rail given the availability of local sources. Equally it would not be possible to use rail to dispose of waste because of the very large quantities involved and the difficulties of handling materials such as clay²⁹³¹.

²⁹²⁹ 9-8.2.1

²⁹³⁰ 9-8.2.2

²⁹³¹ 9-8.2.3

- 31.2.3 Policy T8 of the Berkshire Structure Plan encouraged development which facilitated the transfer of freight from road to rail while Policy 26 of the Replacement Minerals Plan sought to safeguard sites with permission for rail aggregates depots. The first of these policies positively supported the Colnbrook Logistics Centre while the second either provided further support or was neutral depending on the status of the Foster Yeoman permission²⁹³².
- 31.2.4 The site was in the Green Belt and BAA accepted that the proposal represented inappropriate development. It would cause harm because it was inappropriate and by virtue of visual intrusion and loss of Green Belt amenity. The harm was, however, limited by the temporary nature of the development and the possibility that part of the site might be developed as an aggregates railhead in any event. The very special circumstances which justified its development were the need for Terminal 5 itself, the ability to make use of rail transport, the suitability of the site and the absence of a feasible alternative²⁹³³.
- 31.2.5 Even though the status of the Foster Yeoman permission was in dispute, BAA argued that the likelihood of its implementation being prevented was minimal, particularly as the only party capable of taking action to prevent its implementation, Slough BC, had given no indication that they would do so. Nevertheless BAA accepted that the correct approach would be to assume that the Foster Yeoman permission was no longer extant. Nevertheless the fact that it had been considered proper to grant permission at one time was a material consideration²⁹³⁴.
- 31.2.6 BAA also argued that no feasible alternative site had been found²⁹³⁵. Hillingdon's argument that part of the Principal Site could be used ignored the need for a long rail frontage²⁹³⁶. The site suggested by representatives of the companies on the Lakeside Estate (NRS) was also within the Green Belt and was less suitable in terms of size and shape. Feltham Goods Yard was also in the Green Belt, was too far away and had appalling access²⁹³⁷. Both Slough as the local planning authority and Spelthorne were prepared to accept the proposal subject to the imposition of appropriate conditions²⁹³⁸.
- 31.2.7 Proper consideration had been taken of traffic considerations²⁹³⁹ and BAA had given a commitment to minimise noise from trains at night²⁹⁴⁰. It was unlikely that the Colnbrook Logistics Centre would significantly affect noise levels or air quality in the Lakeside Estate. None of the processes carried out on the Estate appeared to be sensitive to dust or air pollution²⁹⁴¹. The proposed access to the site had been the subject of a safety audit and BAA had accepted all of the recommendations emerging from this. The amended proposals were considered acceptable by the appropriate highway authority²⁹⁴².

²⁹³² 9-8.2.4
²⁹³³ 9-8.2.5
²⁹³⁴ 9-8.2.6
²⁹³⁵ 9-8.2.7
²⁹³⁶ 9-8.2.8
²⁹³⁷ 9-8.2.9
²⁹³⁸ 9-8.2.10
²⁹³⁹ 9-8.2.10
²⁹⁴⁰ 9-8.2.12
²⁹⁴¹ 9-8.2.13
²⁹⁴² 9-8.2.14

Slough's Case

- 31.2.8 As the local planning authority for the Colnbrook Logistics Centre application, Slough supported it in principle and said that most of their earlier detailed concerns had been resolved. Their final position was that the proposal was acceptable subject to appropriate conditions, the assurances given by BAA and the approval of the Environment Agency of the means of dealing with existing landfill on the site²⁹⁴³.

Hillingdon's Case

- 31.2.9 Hillingdon argued that the Foster Yeoman permission added little weight to BAA's case. It had been granted for a different proposal and in different circumstances²⁹⁴⁴. While the Colnbrook Logistics Centre would be temporary it would last for 10 years and would have an enormous impact. The need for Terminal 5 did not have much relevance because the need for the Logistics Centre arose only out of the scale of Terminal 5 and the self-imposed aim to complete it as soon as possible. While the use of rail had some validity as a very special circumstance the commitments for its use should be more specific and wide ranging. There were no reasons other than its proximity to the railway which made this site more suitable than any other while its location in the Green Belt made it unsuitable²⁹⁴⁵.
- 31.2.10 The Centre would cause visual harm, add to the urbanisation of this narrow section of the Green Belt and generate noise at night. BAA had failed to demonstrate that such a centre could not be accommodated on the Principal Site or another external site²⁹⁴⁶.

Spelthorne's Case

- 31.2.11 Spelthorne, on the other hand, accepted the need for a substantial rail-based facility and that there was no suitable alternative site outside the Green Belt²⁹⁴⁷. They would not object to the Colnbrook Logistics Centre if Terminal 5 were approved as long as the rail facilities were used to their full potential. Nevertheless, it represented a substantial intrusion into the Green Belt and, as such, was a negative factor in the overall assessment of Terminal 5²⁹⁴⁸.

Colnbrook with Poyle Parish Council's Case

- 31.2.12 Colnbrook with Poyle Parish Council supported the Green Belt objections to the proposal. The rail link could be taken into the Principal Site or existing railheads could be used. They also pointed to the application which had been submitted for the London International Freight Exchange on land to the west of the proposed Colnbrook Logistics Centre. Traffic from this combined with that arising from the construction of Terminal 5 would cause immense problems²⁹⁴⁹. The Foster Yeoman permission included a condition that the area around its site be left as grazing pasture. BAA's proposals were contrary to this²⁹⁵⁰.

²⁹⁴³ 9-8.2.15

²⁹⁴⁴ 9-8.2.16

²⁹⁴⁵ 9-8.2.17

²⁹⁴⁶ 9-8.2.18

²⁹⁴⁷ 9-8.2.19

²⁹⁴⁸ 9-8.2.20

²⁹⁴⁹ 9-8.2.24

²⁹⁵⁰ 9-8.2.25

NRS's Case

- 31.2.13 NRS comprised a group of companies on the Lakeside Estate who objected to the Colnbrook Logistics Centre on primarily on Green Belt grounds²⁹⁵¹. They argued that the Centre must be justified in its own right unless it could be shown that Terminal 5 could not be effectively implemented without it. The presence of the railway line could not alone constitute very special circumstances outweighing the harm to the Green Belt, while only limited weight should be given to the Foster Yeoman permission since it could no longer be implemented. Similarly the suitability of the site did not constitute very special circumstances justifying development in the Green Belt²⁹⁵².
- 31.2.14 They said that BAA had accepted it did not need the whole site and there was no evidence that alternative solutions or sites had been properly considered²⁹⁵³. The Colnbrook Logistics Centre would prejudice the objectives of the Green Belt and cause harm in terms of noise, dust, disturbance and visual impact. It would also detract from the aims of the Colne Valley Park. A 10 year use was virtually equivalent to a permanent development and planning permission should be refused since the circumstances did not justify inappropriate development in the Green Belt²⁹⁵⁴.

Other Cases

- 31.2.15 Windsor and Maidenhead objected in writing primarily on the grounds of traffic and environmental impacts. They raised particular concerns over the impact of minerals traffic on Horton and Wraysbury²⁹⁵⁵. Buckinghamshire CC opposed the proposed Centre because of its impact on the Colne Valley Park in its narrowest and most vulnerable part. They also argued that there was no evidence that alternatives had been properly explored. There was no evidence that the Foster Yeoman proposal would proceed but in any event it would not be as large as the present proposal²⁹⁵⁶.
- 31.2.16 The Environment Agency did not object to the proposed development. They could control the area to the south of the A4 and BAA had agreed that a condition was required relating to the need to identify and implement remedial measures on the land to the north²⁹⁵⁷.

My Conclusions

- 31.2.17 I start by acknowledging that this site lies within the Metropolitan Green Belt and all parties accepted that the proposed development constitutes inappropriate development within the Green Belt. As PPG 2 states inappropriate development is, by definition, harmful to the Green Belt and very special circumstances to justify such development will not exist unless the harm by reason of inappropriateness and any other harm is clearly outweighed by other considerations.
- 31.2.18 I have no doubt that the Colnbrook Logistics Centre would be an extremely large and visually intrusive element in the landscape. The size of the buildings and

²⁹⁵¹ 9-8.2.26

²⁹⁵² 9-8.2.27

²⁹⁵³ 9-8.2.28

²⁹⁵⁴ 9-8.2.29

²⁹⁵⁵ 9-8.2.30

²⁹⁵⁶ 9-8.2.31-33

²⁹⁵⁷ 9-8.2.21

structures involved and its proximity to major roads, many elevated above it, would make it a prominent feature visible to most people passing through the area. It would also be visible from some homes though at a much greater distance and in most cases partially screened. It would contribute very substantially to the urbanisation of a narrow and vulnerable part of the Green Belt, and would be a major encroachment into the countryside. The site is within the Colne Valley Park and the Centre would be contrary to the aims of the local development plan in regard to that Park, and could delay improvements to its landscape.

- 31.2.19 On the other hand, the area as a whole has little current landscape merit. It is fragmented by major and minor roads and contains many areas of industrial and commercial development, one adjacent to the Colnbrook Logistics Centre site. The site itself is restored land and although from a distance it appears as pasture, from nearby the landform appears raw and artificial. Development of the Centre would, in theory, delay any improvement for about 10 years although I saw no evidence that any significant landscape improvements were likely to be carried out in the foreseeable future.
- 31.2.20 In any event BAA's proposals would, subject to appropriate conditions and controls, result in an ultimate landscape restoration that would be better and more comprehensive than anything likely to be achieved otherwise. Moreover, the works necessary prior to development of the Centre would include much needed measures to protect the area from drainage problems and ground water pollution. At present these constitute a potential threat because the area has been used for waste disposal. I conclude, on balance, that the proposal would be a source of harm in visual terms in the short term but that the harm would be considerably mitigated by the factors I have discussed. In any event, I believe that the harm to the appearance of the site would be replaced in the long term by a benefit as a result of the restoration proposals.
- 31.2.21 I have no doubt that the operations on the site and lorry traffic operating on or near it would be a source of noise, and a degree of dust and air pollution. However, as I saw on my site inspection, there are few houses close to the site and these effects would be perceived mainly at commercial or industrial premises. In my experience, industrial areas in general are not very sensitive to noise and air pollution. There was no evidence that any of the premises close to the site were put to a use which might be unusually sensitive in these regards even though there is a cold store on the industrial estate. This area already has a high background noise level and I do not anticipate that the Colnbrook Logistics Centre operations would add greatly to existing levels. There might be specific or short-term processes that could lead to temporary problems but BAA have procedures in place to deal with most such matters. An exception is the noise from trains running at night but I have already covered this point in Chapter 28.
- 31.2.22 Nearly all of the materials brought into the Colnbrook Logistics Centre would travel to the Principal or Subsidiary Sites by lorry and the total number of trips would be very high. However, the roads and junctions which BAA intend to use are modern and generally of high capacity, and peak hour travel would be avoided unless absolutely necessary. I have already dealt with the impact of construction traffic on roads in the area in Chapter 28.
- 31.2.23 At a more detailed level, I believe that access arrangements at the Centre would be acceptable and that the transport of materials would be capable of effective supervision by BAA and ultimately by local authorities. Moreover, the use of rail

and the presence of the Logistics Centre so close to the Principal Site would help to reduce, or at worst control, Terminal 5 traffic in the Heathrow area.

- 31.2.24 The requirements of a logistics site in this case are for a very large site, with a long frontage to a railhead, reasonably close to the centre of Terminal 5 construction. The present site meets these requirements very well. Several possible alternatives have been suggested by objectors but, in my view, none of them meet the requirements as well as does the proposed site and nearly all of them are either in the Green Belt or unacceptably far from the Principal Site. Moreover local planning policies reflect national guidelines in encouraging the use of rail wherever possible, and I do not consider that sites without an adequate rail access merit consideration.
- 31.2.25 Even if it were physically possible to accommodate a logistics centre within an enlarged Principal Site, which I do not believe to be the case, I do not accept the argument that the rail line could be extended into Perry Oaks in time to support the construction programme. I have already indicated some of the problems involved in agreeing a route for a conveyor and I believe that these would be even greater for a rail line. Without a direct rail link, I do not consider that a logistics centre on the Principal Site would be able to perform its functions adequately.
- 31.2.26 I do not doubt that some operations intended for the Colnbrook Logistics Centre could be carried out elsewhere, but not the essential ones such as the use of the railhead. I note too that whilst Hillingdon and others object to the Colnbrook Logistics Centre, the planning authority, Slough, supports it and Spelthorne was prepared to accept it on the grounds that Terminal 5 was to go ahead and the rail facility was to be used to its full potential. I believe that it would. My final conclusion is that, should Terminal 5 proceed, then the circumstances surrounding the development of the Colnbrook Logistics Centre would be sufficient to justify its development in the Green Belt even without the limited additional support offered by the previous permission for a rail depot on part of the site. I do not believe that the harm caused by this proposal should be treated as an objection which should carry substantial weight in the overall assessment of Terminal 5.

31.3 THE FORWARD LORRY PARK

- 31.3.1 Permission was also sought for the use of part of the Robbs Nursery site as a Forward Lorry Park for a period of 10 years. It would be used to organise “just in time” lorry deliveries to the Principal Site and to hold large loads which needed police escorts. The site has an area of about 1.75 ha and would be served by a new access from the A3113 (Airport Way)²⁹⁵⁸. The original application was amended to provide for an improved access, the restoration of the roadside ditch and a noise barrier for the benefit of Willowslea Kennels²⁹⁵⁹.

BAA’s Case

- 31.3.2 BAA argued that there had been no dispute as to the need for a site to control the flow of lorries, receive abnormal loads and deal with arrivals outside the proposed hours of working or movement. Robbs Nursery was well placed for this role being adjacent to a trunk road, close to a motorway junction and close to the Principal Site and subsidiary sites²⁹⁶⁰. They had considered a number of other sites including the

²⁹⁵⁸ 9-8.3.1

²⁹⁵⁹ 9-8.3.2

²⁹⁶⁰ 9-8.3.3

Spout Lane Triangle but all of the others would have been harder for drivers to find and none of them would have enabled lorries to be intercepted shortly after leaving the M25. None would have been acceptable for these and other reasons.

- 31.3.3 Spout Lane Triangle was now needed for another purpose that had to be provided early in the construction programme. While a car park off the Northern Perimeter road was not in the Green Belt, it was needed as a car park during the construction programme. Consequently neither of these sites could be used as a forward lorry park. If permission were not granted for the Forward Lorry Park at Robbs Nursery, BAA would have to try to use part of the Principal Site but this would be difficult and less effective in managing lorry traffic²⁹⁶¹. A location on the Principal Site would limit the room for construction work and would remove the ability to cope with unplanned incidents such as a serious road accident²⁹⁶².
- 31.3.4 BAA accepted that the Forward Lorry Park would be inappropriate development in the Green Belt and would affect the openness of the site. The removal of an existing building would, however, improve the site in accordance with a defined objective of the Green Belt – to improve damaged and derelict land around towns²⁹⁶³. The visual impact of the development would be reduced by the tree screen which would be reinforced and by the fact that the Forward Lorry Park would be seen against the background of the adjoining concrete crushing plant. While this plant was due to be removed by 2001, Spelthorne had accepted that the temporary nature of the Forward Lorry Park would provide an opportunity for a restoration scheme enhancing the whole of the Robbs Nursery site²⁹⁶⁴.
- 31.3.5 Since the site made only a very minor contribution to the Green Belt, the damage caused by this temporary development would be minor²⁹⁶⁵. Nevertheless, BAA accepted the need to demonstrate that there were very special circumstances to justify the development. In this case these circumstances included the need for Terminal 5, the benefits from improved management of lorry flows and the opportunity to secure long-term improvements to the area which could be achieved by the imposition of a suitable condition²⁹⁶⁶.
- 31.3.6 The proposed access had been the subject of a safety audit and BAA had amended their proposals to reflect this. As a result potential weaving movements on the A3113 had been reduced. A further amendment had been produced in the light of a supplementary note to the audit and the final form of the improvements would be decided after the Terminal 5 applications had been determined²⁹⁶⁷.

Hillingdon's Case

- 31.3.7 Hillingdon objected to the Forward Lorry Park on the grounds that it would be inappropriate development in the Green Belt. It would cause visual harm and add to the urbanisation of the Colne Valley Park as well as causing noise and disturbance for nearby residents. There would be additional lighting at night and some loss of vegetation²⁹⁶⁸. BAA's acceptance that the same function could be carried out on the

²⁹⁶¹ 9-8.3.4

²⁹⁶² 9-8.3.5

²⁹⁶³ 9-8.3.6

²⁹⁶⁴ 9-8.3.7

²⁹⁶⁵ 9-8.3.8

²⁹⁶⁶ 9-8.3.9

²⁹⁶⁷ 9-8.3.10-11

²⁹⁶⁸ 9-8.3.12

Principal Site undermined their case that it was essential to provide the Forward Lorry Park at Robbs Nursery²⁹⁶⁹. The established vehicle repair use on part of the application site would shortly cease to exist while the Council could take legal action to ensure that land occupied by the concrete crushing plant was restored²⁹⁷⁰.

- 31.3.8 In their view, the temporary nature of the proposed development did not amount to special circumstances, while Terminal 5 could proceed without the Forward Lorry Park. Its contribution to managing construction traffic would be small and little weight could be given to the proximity of the site to the M25 in the absence of a minerals strategy²⁹⁷¹.

Spelthorne's Case

- 31.3.9 Spelthorne also drew attention to the harm the proposal would do to the Green Belt and the Colne Valley Park²⁹⁷². Like Hillingdon they argued that the temporary nature of the proposal did not constitute special circumstances and that there was nothing in the history of the site that could justify it. They argued that BAA had accepted that the Lorry Park on Robbs Nursery was not essential. Its loss would not compromise the ability to construct Terminal 5²⁹⁷³. Spout Lane Triangle had been proposed by BAA for an equivalent purpose at an earlier stage. This would be a preferable site since it was not in the Green Belt and could be linked directly to the Principal Site by a Bailey bridge. Although Robbs Nursery was in poor condition improvements could be secured in the near future²⁹⁷⁴.
- 31.3.10 BAA's proposals would perpetuate and intensify the commercial use of the site for another 10 years. Spelthorne recognised, however, that BAA had agreed a condition on any permission for Terminal 5 requiring the restoration of the whole of Robbs Nursery even if permission were refused for the Forward Lorry Park²⁹⁷⁵.

Willowslea Kennels' Case

- 31.3.11 Willowslea Kennels sought the refusal of permission for the Lorry Park on Green Belt grounds²⁹⁷⁶. They argued in addition that the forecasts given by BAA for lorry movements were inconsistent and that the proposed use would result in lorries queuing on the road as far back as Airport Way. The area was always congested in the morning peak and this proposal would make matters worse. There was no reason why lorries should not be routed directly to the Principal Site²⁹⁷⁷.

My Conclusions

- 31.3.12 Robbs Nursery lies within the Metropolitan Green Belt and BAA acknowledge that the Forward Lorry Park would be inappropriate development. Consequently the acceptability of the development depends, as it does for the Colnbrook Logistics Centre, on whether there are special circumstances sufficient to justify it.

²⁹⁶⁹ 9-8.3.13

²⁹⁷⁰ 9-8.3.14

²⁹⁷¹ 9-8.3.15

²⁹⁷² 9-8.3.16

²⁹⁷³ 9-8.3.17

²⁹⁷⁴ 9-8.3.18

²⁹⁷⁵ 9-8.3.19

²⁹⁷⁶ 9-8.3.20

²⁹⁷⁷ 9-8.3.21

- 31.3.13 The site lies not only within the Green Belt but also the Colne Valley Park within which the objective of local policies is to improve the appearance of the area. BAA accept that the Forward Lorry Park would affect openness of the site. Having inspected the site, I acknowledge that this would be offset to some extent by the removal of an existing building, the cessation of the use for vehicle parking, and the tidying of the fringes of the site. Nevertheless, I believe that the overall effect would be to reduce openness and to contribute to the urbanisation of the area as a whole.
- 31.3.14 There would also be additional lighting at night and some loss of vegetation although that would be offset by the proposed reinforcement of the tree screen. The site is not particularly prominent and as it is adjacent to an area with large, unsightly piles of waste materials and crushed rock, I take the view that the Forward Lorry Park would not appear particularly intrusive. The scope for improving the appearance of the site was the subject of some debate but I consider that the change in its appearance and the reduction in openness would be a source of harm.
- 31.3.15 The main source of environmental harm would be noise from lorries, and a certain amount of dust and fumes from large numbers of lorries visiting the site. As I saw on my site inspection, not many people live close to the site but the few that do could be disturbed by noise, particularly during the evenings when summer working schedules were operating. One particular example is Willowslea Kennels which is very close to the site. However, because only one property is involved it should be possible to take specific precautions and limit the extent and duration of problems caused by the use of the Lorry Park. Indeed BAA amended the application to include a noise barrier to protect the Kennels.
- 31.3.16 The owners of the Kennels were also concerned that queues of lorries would develop increasing existing problems of congestion. However, there is little evidence that this is likely to be a significant problem and BAA have shown that they are willing to undertake improvements to overcome potential problems on the A3113 (Airport Way) by their response to the findings of the safety audit. Overall I do not consider that there would be major traffic or environmental problems stemming from the use of the Forward Lorry Park.
- 31.3.17 BAA examined the possibility of alternative sites. However, most were in the Green Belt, and only one was as well located as Robbs Nursery, which lies beside a trunk road, between the Principal Site and a motorway exit, and close to both. Spout Lane Triangle, shares many of these advantages, and whilst the present access to it is not good it could be improved. Moreover the site could be reached directly from the Principal Site so that vehicles between the two would not have to use the public road system. However, whilst I believe it would have been a good site for a Forward Lorry Park, it is needed for another function of the Terminal 5 development early in the construction programme. Its use as a Forward Lorry Park, therefore, would have far-reaching implications. In my view, it is not now a realistic alternative.
- 31.3.18 BAA argued that the same applies to another suggestion concerning an existing car park off the Northern Perimeter Road. I find their arguments in this instance less convincing since it is hard to see why a car park should be irreplaceable, particularly as I believe that parking should be more restricted than BAA propose. I can see, however, that a site off the Northern Perimeter Road would not be well placed to intercept or receive traffic coming from the M25. It could entail lorries leaving the M25 driving past the Principal Site to reach the Lorry Park and then having to

retrace their route. Therefore, a site on the Northern Perimeter Road would not fulfil the objective of a forward lorry park as well as the proposed site would.

- 31.3.19 The final alternative raised was to use the Principal Site, and BAA conceded that they would take this option if they were left with no alternative. However, during the early stages of construction, space within the Principal site would be at a premium and I accept that it would be very hard to find an appropriate area. During Phase 2, Terminal 5 would be open and the site would be in use by the general public. Again, it would be hard to find a suitable area to use as a Forward Lorry Park. I also consider that a Forward Lorry Park situated on the Principal Site would be less effective than the one at Robbs Nursery. Nonetheless, I would not rule out this possibility entirely should the use of Robbs Nursery be found to be unacceptable.
- 31.3.20 The special circumstances claimed by BAA begin with the need for Terminal 5 to be constructed quickly and their perception that Robbs Nursery is the only wholly suitable site available for use as a Forward Lorry Park. I accept the first point and, for the reasons set out above, agree that there would be considerable difficulties in finding a reasonable alternative site. The third point raised by BAA concerns the restoration of Robbs Nursery as a whole. Whilst the legal situation is somewhat complicated, I accept that the use of the Forward Lorry Park would delay the restoration of the whole of Robbs Nursery for a number of years. On the other hand, the final restoration scheme would probably be better and more comprehensive. Since these 2 factors pull in opposite directions I do not accept that the restoration constitutes special circumstances which could justify the proposed inappropriate development in the Green Belt.
- 31.3.21 Finally BAA pointed to the benefits the proposed Lorry Park would offer in improving the management of lorry traffic. Given the widespread acceptance that the roads around Heathrow already suffer from serious congestion, I attach material weight to this as an advantage of the current proposal.
- 31.3.22 In summary I consider that the arguments for and against allowing a Forward Lorry Park at Robbs Nursery are finely balanced. The harm it would cause to the objectives of the Colne Valley Park and the Green Belt would be relatively minor in extent, but then the proposal does not appear to be as essential to the construction programme as the Colnbrook Logistics Centre would be. I would not rule out entirely the possibility of finding an alternative, even at this late stage, but consider that the identification of an acceptable alternative would inevitably cause a delay in the construction of Terminal 5. Given my conclusions regarding the need for the terminal my conclusion is that the Forward Lorry Park should be permitted at Robbs Nursery. Nevertheless it would cause some harm and this should be taken into account as a factor weighing against Terminal 5.

31.4 THE BAILEY BRIDGES

- 31.4.1 As I have already said, the Bailey bridge over the River Colne proposed by the Highways Agency does not require planning permission. However, it is associated with the construction of the Spur Road as is the Bailey bridge over the Western Perimeter Road and A3044 which is the subject of a planning application by BAA. I, therefore, intend to deal with these 2 bridges together.

- 31.4.2 They would both form part of the haul road linking the Principal Site with the Spur Road and the spoil deposition site on Plot 9. They would be built within the first 6 months of the construction programme and would remain in position until deposition on Plot 9 was completed. The bridge over the 2 roads would entail intermediate supports on the central reservation of the A3044 and between that road and the Western Perimeter Road. Its construction would involve the imposition of lane restrictions for 2 weeks and road closures for 2 weekends²⁹⁷⁸.
- 31.4.3 The bridges would both be sited within the Green Belt but they would be temporary structures and would in my view represent appropriate development if Terminal 5 and the Spur Road were to proceed. Even if they were not viewed as appropriate development the fact that they are a necessary part of the construction programme would constitute very special circumstances assuming that Terminal 5 and the Spur Road were to be built.
- 31.4.4 Although Hillingdon originally expressed some concern about the design of the bridge over the roads, these were resolved when BAA agreed to submit details of the proposed design for approval by the local planning authority. Otherwise it was agreed that if Terminal 5 were approved the bridges would help reduce traffic on the public roads and their early provision was welcomed²⁹⁷⁹.
- 31.4.5 I agree and believe that both should be provided as quickly as possible assuming that Terminal 5 is approved and the Spur Road is to be constructed as proposed by the Highways Agency. Clearly, if significant changes were to be made to the line of the Spur Road, the case for these bridges would have to be re-examined as would the spoil deposition proposals on Plot 9 since these are integrated with the Spur Road embankments.

31.5 DEPOSITION OF SPOIL TO FORM THE SPUR ROAD EMBANKMENT

- 31.5.1 This planning application was submitted by BAA to minimise the possibility of disruption to the construction programme on the Principal Site. It would permit them to deposit spoil to be used in the Spur Road embankment on the site of that embankment even if the Highways Agency had not formally taken control of the site. Again the site is within the Green Belt but, even if my view that it would be appropriate development were not accepted, the contribution this proposal would make to the speedy completion of Terminal 5 would, in my view, constitute very special circumstances.
- 31.5.2 Hillingdon objected to the application in principle as part of their objection to the Spur Road itself. However, they also raised some more detailed points. In particular they were concerned that problems could occur because the respective roles of BAA and the Highways Agency were not clearly defined. This would make it more difficult for them to exercise effective control. They suggested the imposition of conditions to deal with this point²⁹⁸⁰.
- 31.5.3 These problems would not occur if the Highways Agency obtained access to the Spur Road site as planned but BAA's proposal represents a worthwhile approach which would avoid possible disruption of the main construction programme if

²⁹⁷⁸ 89-8.4.1

²⁹⁷⁹ 9-8.4.2

²⁹⁸⁰ 9-8.6.1

problems arise. At the same time I support Hillingdon's view that clarity is needed to ensure that proper control is exercised. BAA proposed a condition to cover this point which I believe should be imposed. Subject to the imposition of appropriate conditions, I consider that permission should be granted for this application if both Terminal 5 and the Spur Road proceed as proposed.

31.6 ALTERATIONS TO THE LONGFORD ROUNDABOUT

- 31.6.1 These alterations which would be carried out under highway powers would permit the provision of a new access from the roundabout to the Principal Site by means of a one-way link to the Western Perimeter Road and ultimately the Dedicated Car Park Access Road. The link would reduce the distance from the Colnbrook Logistics Centre to the Principal Site from 4.5 km to 1.5 km and would be used by up to 40 lorries an hour. It would be removed when construction was completed²⁹⁸¹.
- 31.6.2 BAA had accepted all of the recommendations arising from a road safety audit and introduced appropriate changes to the design²⁹⁸². Hillingdon had a number of objections to the original scheme and argued that closer control would be needed to prevent abuse of the link. They did, however, accept that the deficiencies in its design had been mainly remedied and that the amended proposals seemed to be acceptable subject to appropriate conditions²⁹⁸³. BAA clarified that only lorries and buses from 3 origins would be permitted to use the link and security would prevent its abuse.
- 31.6.3 I find no reason to question the advantages of this proposal which would shorten the distance for vehicles travelling from the Colnbrook Logistics Centre to the Principal Site and take heavy traffic off the A3044.

²⁹⁸¹ 9-8.5.1

²⁹⁸² 9-8.5.2

²⁹⁸³ 9-8.5.3

32 CONDITIONS AND ASSURANCES

32.1 INTRODUCTION

- 32.1.1 The fact that any planning permission for Terminal 5 would have to be limited by a number of controls was not disputed. There was, however, much debate as to the extent of the controls that should be imposed and whether they be in the form of planning conditions or otherwise. Particular concern was expressed about BAA's proposed reliance on assurances that had no legal force. Opponents of the proposed terminal started from the thesis that previous controls on Heathrow had been totally ineffective and that promises made by the airport operator and the Government had been consistently broken. Indeed HACAN refused to make any suggestions regarding possible conditions since they believed that the history of Heathrow showed them to be worthless, although they did seek a limit on the number of aircraft movements regardless of whether or not Terminal 5 were approved²⁹⁸⁴.
- 32.1.2 Hillingdon also expressed great concern over the incremental and uncontrolled growth of the airport. However if such growth could be controlled by conditions attached to a grant of planning permission for Terminal 5, they would see that as providing some benefit as against the existing uncontrolled situation²⁹⁸⁵. That acceptance, however, must be seen in the context of Hillingdon's main priority which was to secure environmental improvements for those living around Heathrow and to see permission refused for Terminal 5. I have already dealt with their argument that Terminal 5 should be approved only if it brings with it environmental improvements (para 3.3.36). Nevertheless, I am convinced that it should be granted planning permission only if the form of that permission gives sufficient protection against the risk of further damage to the living conditions of the residents of West London and beyond that which I have taken into account in reaching my conclusions.
- 32.1.3 Hillingdon went further than this, however, and argued that the planning application for Terminal 5 was so broadly drawn as to be almost impossible to control²⁹⁸⁶. They suggested that the scope of any permission granted should be limited to those elements where sufficient material had been submitted to allow an informed decision to be made and that nothing should be approved unless sufficient indication had been given to allow such a decision to be made²⁹⁸⁷. This implies that even if Terminal 5 were approved in principle a range of subsequent detailed planning applications would have to be submitted and approved before it could be constructed.
- 32.1.4 BAA unsurprisingly resisted this approach pointing to the level of detail submitted to the inquiry and the need for construction to commence as soon as possible after the grant of permission²⁹⁸⁸. This conflict emphasises the requirement for a careful balance to be struck between the need to define any permission for Terminal 5 and the desire to see that permission implemented quickly and efficiently.

²⁹⁸⁴ Day 494 pp106-107

²⁹⁸⁵ Day 98 pp129-130

²⁹⁸⁶ Day 477 p81

²⁹⁸⁷ HIL/679 para 6

²⁹⁸⁸ Day 477 p53

- 32.1.5 This is the main issue in relation to the overall form and content of the proposed development. I now turn to consider the issues which arise in respect of other aspects of Terminal 5 and its associated applications.
- 32.1.6 Although there was a wide measure of agreement concerning the need to protect land likely to be required for airport-related development, there were some outstanding issues over the question of what were the most appropriate conditions. The area of disagreement was, however, much greater in relation to surface access. The local authorities sought to control the volume of road traffic generated by Heathrow as a whole if Terminal 5 were built as well as the number of car parking spaces to be provided. BAA considered controls on traffic volumes to be unworkable but did put forward a car parking limit albeit one which was substantially higher than that sought by the local authorities.
- 32.1.7 Hillingdon also argued that the road works the subject of the Highway Orders should be controlled in a manner analogous to the imposition of planning conditions. The Highways Agency submitted that there were no powers available to do this and that the authorities could rely on the Secretary of State to ensure that any recommendations I might put forward in relation to the Highway Orders received appropriate consideration. There was also a difference of opinion between the Agency and BAA over the need for a planning condition requiring that the M4 works be completed before Terminal 5 opened.
- 32.1.8 The local authorities and other objectors sought conditions which would require that Terminal 5 did not open until additional rail services had been introduced. The points at issue here concern the need for such services and whether it is reasonable to make them a requirement for the opening of the new terminal when their introduction would not be under the control of BAA.
- 32.1.9 The gap between the parties on the issue of noise was so wide as to be unbridgeable. BAA argued that the only substantial effect of Terminal 5 would be to reduce the potential improvement in the overall noise climate and that, even with the new terminal, noise would be less of a problem than it is now. They relied on a noise contour cap expressed in $LA_{eq 16 \text{ hour}}$ as the only control (to be imposed by way of an Air Noise Direction rather than a planning condition).
- 32.1.10 I found the evidence of the Department concerning noise policy as it applies to Heathrow confusing and, in some respects, unhelpful (para 21.2.18). In particular, it failed to provide any criteria against which to define what would be an excessive level of noise at night. The key issue here is whether there is a need to introduce other controls over noise. These additional controls could include an overall limit on the number of aircraft movements. Such a limit should be considered against the background of the considerable increase in movements which has occurred in recent years and notwithstanding previous Government decisions upon this matter. Similarly a ban on night flights would run counter to existing policy. Nevertheless, the concerns over noise are so substantial that I believe it right to reconsider these fundamental issues before deciding whether to permit such a large increase in the capacity of Heathrow as that represented by Terminal 5. My view on the need for such a reconsideration is increased by the apparent confusions over the existing noise policy.

- 32.1.11 While concerns were also expressed over ground noise and road noise, these were relatively small in comparison with those related to air noise. There will be a need to control ground noise but BAA and BA offered a package of conditions and undertakings which goes some way towards an effective solution. As far as road noise is concerned, the main issues relate to the M4 and the willingness of the Highways Agency to provide additional protection if required. The position if the M4 Orders are not confirmed also needs careful consideration.
- 32.1.12 While BAA did not consider conditions to be appropriate for the control of air quality, Hillingdon proposed a complex set of conditions aimed at defining levels of pollution which would be used to trigger action. There is a straightforward issue here as to whether air quality can or should be controlled by planning conditions.
- 32.1.13 Turning to public safety, LAHT5 suggested conditions dealing with compensation. Furthermore, they suggested that the limit on the number of aircraft movements that they advocated for environmental reasons would have the additional benefit of limiting the increase in the risk of a crash.
- 32.1.14 BAA proposed a range of conditions related to construction matters but suggested that these should be supported by a number of assurances which would oblige them to conform to best practice in building Terminal 5 and all associated projects. The local authorities took the view that almost all of the assurances could and should be the subject of enforceable planning conditions. Bearing in mind the scale of the entire project which could take 10 years to complete, the local authorities' concerns to control its impact are entirely understandable and I regard it as essential that effective controls are put in place. In this context the extent to which BAA's assurances can be relied upon is a key issue.
- 32.1.15 Each of the applications associated with Terminal 5 carries with it the need to identify appropriate conditions although, perhaps inevitably, these assumed less significance during the inquiry when viewed against the background of Terminal 5 itself.
- 32.1.16 Having briefly examined the issues related to each of the main areas to be covered by conditions or other forms of control, I should emphasise some more general points which have influenced my approach to measures designed to minimise the impacts of Terminal 5 should it proceed. I have obviously been guided by the normal advice concerning planning conditions particularly that in Circular 11/95. Nevertheless, the scale and complexity of this proposal is so great that it is not possible to adopt slavishly the same approach as would be appropriate to normal planning applications. As an illustration, any permission granted for the principal Terminal 5 application alone is likely to be subject to some hundreds of conditions many of which would interlock with others. This must mean it would be impossible to argue that each and every one of these was so important in its own right that planning permission would have to be refused if it were not imposed.
- 32.1.17 On the other hand I consider that the conditions I put forward would limit the impact of the proposed development and that in total they would enable it to proceed. Consequently they are in accordance with the advice in Circular 11/95²⁹⁸⁹. Furthermore

²⁹⁸⁹ Circular 11/95 para 2

the conditions related to noise are consistent with paragraph 2 of PPG 24 which states that local authorities should consider whether it is practicable to control or reduce noise levels or to mitigate the impact of noise through the use of planning conditions or obligations. I see no reason why the same principle should not apply equally to other impacts of this particular development.

- 32.1.18 My approach to conditions has been governed by the view that, even if planning permission were granted for Terminal 5, it would not be acceptable without a package of conditions and other controls designed to limit its overall impact on the environment. This means that any approval of the new terminal should, in my view, be subject to the whole package of controls which I identify. I recognise that some of the controls I advocate may be unpalatable to BAA or even to the Government and that the final decision is for the Secretary of State. Nevertheless, I regard it as essential that I put my own position beyond doubt. It is my judgement that any substantial reduction in the package I shall be identifying would render Terminal 5 unacceptable in spite of the economic benefits it would bring.
- 32.1.19 In each of the sections that follow I shall take as my starting point the conditions and other controls proposed by BAA. I shall consider whether these offer sufficient protection in the light of the arguments advanced by the other parties and, if necessary go on to consider additional measures. I shall deal with the main application before going on to other applications and orders before the inquiry. I shall also consider the role of the undertakings and assurances put forward by BAA. Several agreements were referred to during the course of the inquiry. I have dealt with these at the appropriate points in the report and do not go over the same ground here.

32.2 THE PHYSICAL FORM OF THE BUILDINGS

Layout

- 32.2.1 The approach taken by BAA in their suggested conditions was to seek approval to some details of the development while reserving other matters particularly the external appearance of the buildings for later approval by Hillingdon. This assumed that sufficient evidence had been placed before the inquiry to enable an informed decision to be taken on matters such as the siting of the main buildings and their maximum dimensions.
- 32.2.2 BAA's proposals define the area within which the Core Terminal Building, the Satellites and the aprons, taxi lanes and taxiways would be sited and set out the limits of deviation for the main buildings²⁹⁹⁰. They go on to set out the maximum dimensions of the buildings. The floorplate of the Core Building would be no more than 414m long and 158m wide with a maximum ridge height of 64.36m above ordnance datum (AoD) which represents a height of 40m above ground level which is taken to be 24.36m AoD. The eaves height would be 19.8m above ground level. While Satellites 1 and 2 would be longer than the Core Building each of the Satellites would be only 60m wide and no more than 20.50m high. There would be provision for some projections beyond the floorplates.

²⁹⁹⁰ BAA/404R Conditions A2-A12

- 32.2.3 The maximum floorspace of the buildings would also be controlled by condition with the Core Building being permitted a gross floorspace of 204,200m² while Satellites 1 and 2 would each be limited to 67,700m² and Satellite 3 to 33,500m². Although atria and voids within the buildings would not count against the floorspace limits, provision would be made for their permanent retention so that they could not be converted subsequently into active accommodation which might increase the passenger capacity of the terminal.
- 32.2.4 The multi-storey car parks, the hotel and the office block on the Principal Site would also be the subject of conditions defining their locations and maximum dimensions²⁹⁹¹. The office block would have a maximum gross floorspace of 10,000m², while the hotel would be limited to no more than 600 bedrooms.
- 32.2.5 Hillingdon argued that even if the principle of Terminal 5 were accepted the overall layout and design concept for this Green Belt site needed to be reconsidered. They suggested that this should apply even if it resulted in a reduction in the size and capacity of the proposed development²⁹⁹². I have already considered the arguments of both Hillingdon and Spelthorne that some elements of the BAA proposals on the Principal Site could be reduced in scale or even omitted. I concluded that some marginal adjustments might be possible and even desirable but that with the exception of the car parking provision, to which I shall return later, the basic structure and scale of the development should be endorsed. I have also already dealt with Spelthorne's argument that the finished ground level within the landside area should be a minimum of 23m AoD. Although I can see the benefits of this, I do not consider it to be a realistic requirement given the complexity of the issues involved. Similarly I doubt that the road layout within the landside area could be reduced in scale as Spelthorne suggested.
- 32.2.6 Hillingdon were concerned that BAA's floorspace figures had changed markedly over time and that the limits proposed would permit a throughput of more than 30 mppa. Even if Terminal 5 were to be approved, they sought conditions which would ensure that no more than 30 mppa could be handled²⁹⁹³. They also sought limits on specific uses within a total floorspace provision which should not exceed 300,000m²²⁹⁹⁴. BAA argued that 300,00m² would be insufficient for either 2 or 3 channel processing and that they needed to retain flexibility in the use of the available floorspace²⁹⁹⁵. They did, however, respond to my concern over the impact of the late introduction of the Underground Baggage Facility by submitting revised plans for the terminal buildings²⁹⁹⁶. While these are to be treated as illustrative material, I am satisfied that they give the best possible impression of how the space within the buildings is likely to be used. I also note that BAA proposed a condition which would have the effect of removing their rights under the General Permitted Development Order to increase the gross floorspace of the terminal buildings as long as the permission that they were granted permitted the floorspace they sought²⁹⁹⁷. On that basis, I accept that the maximum dimensions and floorspace limits proposed by BAA are reasonable and should be adopted.

²⁹⁹¹ BAA/404R Conditions A27-A39

²⁹⁹² HIL/679 para 8

²⁹⁹³ HIL/679 pp45-46

²⁹⁹⁴ HIL/679 pp47-54

²⁹⁹⁵ BAA/1984

²⁹⁹⁶ BAA/1985

²⁹⁹⁷ BAA/404R Condition A10

- 32.2.7 Further conditions proposed by BAA would define the uses to be accommodated on the Northern and Southern Ancillary Areas and require the submission and approval of detailed plans for each building within them²⁹⁹⁸. Others would define the developments to take place on the various subsidiary sites such as the Spout Lane Triangle, Longford Bridge and Staff West and require the submission and approval of detailed plans before any buildings were started. There was a dispute between Spelthorne and BAA over the conditions to be applied to the Spout Lane Triangle²⁹⁹⁹. This largely concerned the proposed retention of limited General Permitted Development Order rights. Bearing in mind the fact that the site would be well screened and only minor works would be permitted, I see no reason why all permitted development rights on this site should be withdrawn. I have already dealt in Chapter 28 with Willowslea Kennels' arguments that the development proposed by BAA on the Triangle should not be permitted.
- 32.2.8 BAA put forward a number of other conditions concerning landscaping, cycling and pedestrian facilities, fencing, lighting, archaeology and unspecified buildings³⁰⁰⁰. I consider these to be both sensible and necessary and accept them all. There was some debate about the time limits for the approval of any reserved matters. While the 20 years proposed by BAA is extremely long, I can understand their argument that it is not excessive given the scale of the development involved³⁰⁰¹. On the other hand, BAA argued strongly that they needed to complete the whole development as quickly as possible. Having accepted that argument, I do not believe that it would be right to allow 20 years for the approval of reserved matters. Accordingly I suggest that Condition A79 be amended to refer to 10 years.
- 32.2.9 The location of the Forward Maintenance Unit including the Ground Running Pen would be defined by Condition A22 proposed by BAA as the position used for all of the assessments of ground noise. While Hillingdon suggested that this was not the ideal location, I am satisfied that, in this position, the Ground Running Pen would not have a significant impact on local residents. The proposed location is probably the best possible given the constraints imposed by the other elements of the whole development. I, therefore, consider that the conditions proposed by BAA on this point should be accepted.
- 32.2.10 It would also be appropriate while dealing with the layout of the development to touch upon retailing. I have already indicated that I consider it unlikely that Terminal 5 would become a shopping destination in its own right given its relative inaccessibility in retailing terms and the probable cost of parking. In these circumstances I do not believe that a condition limiting the amount of landside shopping could be justified. The limit of 500m² (net) on the size of any individual landside shopping unit proposed by BAA³⁰⁰² appears to be generous but I note that Spelthorne propose the same limit on any shop unit to be provided in the petrol filling station³⁰⁰³. In the absence of any specific evidence as to harm likely to be caused by the size of a single unit at any level below 500m², I am prepared to accept that limit. There appears to be no specific justification for the much lower limit of 365m² (gross) proposed by Hillingdon³⁰⁰⁴.

²⁹⁹⁸ BAA/404R Conditions A47-A52

²⁹⁹⁹ BAA/404R Conditions A53-A57 and SBC/203 pp10-11

³⁰⁰⁰ BAA/404R Conditions A69-76 and A81

³⁰⁰¹ BAA/404R Condition A79

³⁰⁰² BAA/404R Condition A77

³⁰⁰³ SBC/203 Condition C1

³⁰⁰⁴ HIL/679 p49

- 32.2.11 Airside shopping has become an inevitable part of modern airports and produces a significant income for BAA. Despite suggestions to the contrary, I am satisfied that placing restrictions on the amount of airside shopping would do little to reduce the size of the Core Terminal or the Satellites. Nor would it serve any useful purpose in reducing the impact on centres outside the airport. As Government policy recognises, it must be for BAA to decide how to make the best use of the space within the terminal buildings. Furthermore, I found no reason to believe that the provision of retail floorspace would be given a higher priority than efficiency in handling passengers as they pass through the terminals.

Design and Visual Impact

- 32.2.12 As I have already pointed out a wealth of detailed evidence was presented to the inquiry concerning the form of the proposed new terminal. This included plans and elevations for the Core Building and Satellites. Although these were always intended to be treated as illustrative, there can be no doubt that they were also intended to be an accurate representation of Terminal 5 and they were used as such in assessing the visual impact of the development. Furthermore I believe that it would have been difficult to resist a request by the applicants to treat the material they provided as being a detailed submission.
- 32.2.13 It is also worth noting that there were few if any criticisms of the design proposed for Terminal 5 itself although there were many criticisms of the manner in which it had been placed in what was said to be a sensitive site on the edge of the Colne Valley. I have already addressed these criticisms in detail earlier in my report and indicated that I have some sympathy with the argument that the whole development would dominate views from the west. I have also indicated that I believe that views of the Core Building would be obscured to an unfortunate extent by the presence of the multi-storey car parks placed before it.
- 32.2.14 I have given serious consideration to the possibility of recommending the imposition of a condition requiring that the height of the Core Building be reduced in order to lessen its impact on the Colne Valley. However, as I have already concluded, I believe that there is relatively little scope for a material reduction in its size (para 11.4.58). I have also concluded that any reduction in the height of the Core Terminal could lose the advantages of its floating roof (para 11.5.43). In these circumstances I do not consider that a condition requiring the height of the Core Building to be lowered by say 2m would serve any useful purpose. Unless it were accompanied by a reduction in the height of the multi-storey car parks, lowering the Core Building would inevitably mean that it would be almost entirely obscured by these structures. Consequently any benefits from the design of the main building would be lost in views from the Colne Valley. Nevertheless, if a reduction in the height of the Core Building (or the Satellites) could be achieved without affecting their capacity or design qualities that would be welcome.
- 32.2.15 I do, however, believe that the height of the multi-storey car parks could and should be reduced. I set out the reasons for a significantly lower limit on the number of car parking spaces to be provided in dealing with Public Transport and suggested that this should be achieved by reducing the number of spaces on the Principal Site. This would not only serve a valuable purpose in terms of traffic generation and support for public

transport but would also enable the Core Building to be set in a more open context so that it could be viewed as something more than just a floating roof.

- 32.2.16 The manner in which this is achieved must be for BAA to consider when submitting detailed plans for the landside area of the Principal Site. I have already indicated that the number of spaces on the Principal Site should be reduced significantly. It also emerged during the debate on the diversion of the Twin Rivers through the Principal Site that, contrary to earlier indications, the car parks could be partially sunk into the ground. I have no quarrel with BAA's general approach of a stepped profile of buildings leading up to the Core Building. On the other hand I am in no doubt that a lowering of Car Park 1 (that adjacent to the Core Building) would make the Arrivals forecourt lighter and thus more attractive. This is of great value bearing in mind that Terminal 5 would be the first point at which many people would enter the country. If it is to provide a major gateway to the country, that gateway should be as attractive as possible within the inevitable constraints on the design of major airports.
- 32.2.17 BAA argued that a reduction in the height of the car parks would be at best a mixed blessing since it would expose the access decks across the front of the Core Building. I doubt, however, whether any realistic reduction in height would do more than expose the Departures deck which is already shown to be above the upper level of Car Park 1³⁰⁰⁵. I would consider this to be no more than a minor disadvantage to be set against the very significant benefits which would flow from lowering the car parks. In any event this is a matter that could be taken into account in the final detailed design.
- 32.2.18 There is a practical difficulty in revising BAA's condition A30 to meet the objectives I have set out above since the dimensions for Car Park 1 are combined with those for the hotel and office block. I am less concerned about the visual impact of these since they are not as long as the car park although I do not doubt that some reduction in their height would be advantageous. If the height of the whole of this group of buildings were to be reduced by 3m from 20m to 17m, this would represent the loss of only 1 of the 5 proposed levels of parking (based on the cross-section submitted as Figure 6 of BAA/83). Bearing in mind that I have also recommended a reduction in the total car parking provision, I believe that there would still be sufficient flexibility to permit the construction of a 600 bed hotel and a 10,000m² office block. Similarly the maximum heights of Car Parks 2 and 3 should also be reduced by 3m or one level. I accept that these reductions would entail some adjustments to BAA's proposals but do not believe that these would be difficult to achieve. The loss of a single level from each car park could not prejudice their ability to provide an appropriate level of car parking for the airport as a whole. Nor would it result in an insufficient supply of parking convenient to Terminal 5 given the proximity of the Northside car parks, linked as they would be to the terminal by the Dedicated Car Park Access Road.
- 32.2.19 Although I consider that the visual impact of Terminal 5 would be acceptable, any reduction in the bulk of the landside buildings would provide an opportunity to make a real improvement in the setting of the Core Building and improve the environment for those using it, particularly arriving passengers. Even with the loss of one level of parking, I believe that the size of the car parks could be reduced without prejudicing the provision of the 42,000 parking spaces which I consider to be appropriate. If this could

³⁰⁰⁵ BAA/1985 Figure 1

be done it would decrease the density of development and increase the space available for landscaping within the landside area.

- 32.2.20 I now turn to the Visual Control Room the height of which would be limited to 111.36m AoD³⁰⁰⁶. This would have to be constructed in accordance with the design concept submitted to the inquiry unless otherwise approved³⁰⁰⁷. Although detailed plans were not placed before me I did have the benefit of seeing a preliminary concept and a model based on that concept. The material placed before me illustrates an elegant structure with much to commend it. Although high, its slender form would minimise its impact when seen from the open land to the east. I, therefore, endorse the conditions proposed by BAA, which are intended to ensure as far as possible that the Visual Control Room would be built in the form put before me.

32.3 AIRPORT RELATED DEVELOPMENT

- 32.3.1 The parties worked hard outside the inquiry to minimise the disagreements between them and those efforts were particularly successful in this field. In fact BAA and Spelthorne reached agreement on conditions concerning airport related development except for some detailed (albeit important) points. There were wider differences between the applicants and Hillingdon to which I will turn later.
- 32.3.2 BAA were ready to accept a condition reserving identified sites for airport related development subject to their being able to make appropriate substitutions should the need arise. In addition they would provide information to the local planning authority on available land and accommodation together with an assessment of the requirements for airport related development every 5 years until 2016³⁰⁰⁸.
- 32.3.3 Spelthorne sought to exclude hotels from the list of uses which might be accommodated on the identified sites if a hotel was permitted as part of Terminal 5³⁰⁰⁹. They based this argument on the contention that BAA's own evidence showed there would be no need for an additional hotel whereas BAA claimed that their evidence was simply that it would be difficult to justify an additional hotel in the Green Belt if one were provided with Terminal 5. In my view the evidence showed that there could be a shortage of land on the airport for some airport related uses. I accept that an additional hotel might prove to be viable even if one is built at Terminal 5, but this does not seem to me to be sufficient justification for using scarce land resources which would be better devoted to other uses such as transit sheds or freight forwarding. I, therefore, consider that hotels should be removed from the definition of airport related development in Condition A84.
- 32.3.4 Spelthorne, together with Hillingdon and Hounslow, sought to include a reference to a Memorandum of Understanding in BAA's second condition concerning the provision of information³⁰¹⁰. This Memorandum sets out in detail the manner in which the relevant information is to be provided and used in the preparation and review of a Heathrow Development Strategy. It is agreed except for a few details and represents a welcome step forward in co-operation by all concerned with it. I warmly applaud this

³⁰⁰⁶ BAA/404R Condition A67

³⁰⁰⁷ BAA/132 Figure 34

³⁰⁰⁸ BAA/404R Conditions A84-A85

³⁰⁰⁹ SBC/201 p7

³⁰¹⁰ SBC/201 p8

contribution to the planning of development at Heathrow but prefer the approach to it suggested by BAA. They have given an assurance (Assurance No 1) that they will abide by the Memorandum which I consider to be appropriate given that the Memorandum itself is not legally binding.

- 32.3.5 Although I understand BAA's view that the Heathrow Development Strategy would not be needed if Terminal 5 does not proceed that is not a matter for me. On the other hand, I agree with the local authorities that the need for the strategy cannot end at 2016. That was a convenient date used for the assessment of the effects of Terminal 5 but no more than that. In my view, there should be an open-ended commitment by BAA and the authorities to work together in the manner set out in the Memorandum of Understanding.
- 32.3.6 The local authorities invited BAA to include in the Memorandum a commitment to oppose future proposals for airport related development in the Green Belt³⁰¹¹. This invitation was, unsurprisingly, resisted and I accept BAA's reluctance to bind themselves in such a way. Nevertheless, they gave clear evidence at this inquiry that Terminal 5 would not generate a need for airport related development in the Green Belt. I would expect the local authorities to rely on that evidence in any relevant local inquiry and would be surprised if BAA did anything other than to confirm the evidence they had given at the Terminal 5 inquiry. That being the case I find it difficult to envisage circumstances in which a developer could justify airport related development in the Green Belt in the foreseeable future. Nevertheless, I have great sympathy with the authorities' desire that the Secretary of State should formally endorse his continued commitment to the Green Belt in this area if he approves Terminal 5.
- 32.3.7 Spelthorne, at the request of Hillingdon, also proposed a condition that land within the airport boundary would not be used for any purpose other than operational or airport related development without the written consent of the local planning authority³⁰¹². Since this is not intended to restrict BAA's general permitted development rights and any other form of development would require planning permission, I do not consider that such a condition would serve any useful purpose.
- 32.3.8 Hillingdon drew a distinction between airport related development and directly related/operational development in accordance with their very recently adopted Unitary Development Plan (UDP). The latter category includes all operational development together with other activities that are considered essential for the running of the airport³⁰¹³. They argued that only uses within this category should be accommodated on the airport and steps should be taken to ensure that such uses were not crowded out by airport related uses which had less demanding locational requirements.
- 32.3.9 In the normal course of events planning conditions should reflect the policies of the statutory development plan – in this instance the Hillingdon UDP. In this case, however, I have already pointed to the very considerable efforts made by BAA and the local authorities to agree basic information and conditions concerning airport related development. This involved agreeing appropriate definitions for airport related

³⁰¹¹ SBC/201 p9

³⁰¹² SBC/201 pp8-9

³⁰¹³ HIL/677 pp3-6

development and I do not feel that the results of this work should be lightly set aside. I, therefore, endorse the conditions proposed by BAA in this area subject to the deletion of the reference to hotels in Condition A84. I also support BAA's approach to the Memorandum of Understanding subject to the deletion of any suggestion that this would expire in 2016.

32.4 SURFACE ACCESS

Public Transport

- 32.4.1 I have already set out my approach to conditions concerning public transport in Chapter 15. In short I consider that BAA could and should do more than they are proposing. Apart from some safeguarding measures, their conditions merely require that all reasonably practicable steps be taken to ensure that the Heathrow Express is extended to Terminal 5³⁰¹⁴. On the evidence placed before me I have no doubt that there is a reasonable prospect that the extension would be completed by the time the new terminal was ready to be opened. It goes without saying that the prospects would be improved if opening of the terminal were made conditional on the provision of the extension. This should be done. In these circumstances BAA's Assurance 3 would no longer be relevant.
- 32.4.2 Condition Q1 which restricts the number of passengers carried on the Heathrow Express to 12.9 mppa without the approval of the local planning authority should be imposed. In this case, however, it should be made clear that the relevant local planning authority is Westminster CC rather than Hillingdon who took no part in the debate on the Paddington issues.
- 32.4.3 I have also already concluded that there is a reasonable prospect that the Piccadilly Line could be extended to Terminal 5 in time for its opening. Indeed the only problems appear to relate to its financing (paras 15.4.24-25). In both the Heathrow Express and Piccadilly Line extensions, I suggest that a similar provision be made to that agreed by the Highways Agency and BAA in relation to the M25 Spur Road³⁰¹⁵. This would not allow the Core Terminal to operate but would permit passengers to be transported by bus from the existing terminals to the Satellites and stands if the rail extensions had not been completed.
- 32.4.4 The position in relation to the St Pancras link is less certain but Railtrack has said that it expects to have a 2 train an hour service to the existing terminals in place by 2002 and a 4 train an hour service by 2006 (para 15.4.10). Given the problems which are involved in the provision of such a service, I accept that it should not become a prerequisite of Terminal 5. Nevertheless, the St Pancras service would be a very important element in the public transport provision for Heathrow with 5 terminals. Consequently, I believe it would be right to impose a condition requiring BAA to make their best endeavours to provide a 4 train an hour service linking Terminal 5 to St Pancras prior to the opening of the Terminal 5 Core Building. As I have pointed out previously the provision of the Gateway North station is another significant factor which should be pursued actively (para 15.4.20). It is closely related to the St Pancras service and again a condition

³⁰¹⁴ BAA/404R Conditions A86-A90

³⁰¹⁵ BAA/404R Conditions A91-A93

should be imposed requiring BAA to use their best endeavours to secure the opening of the Gateway North station before the Core Terminal opens (para 15.4.27).

- 32.4.5 For the reasons which I have already explained I consider that the steps proposed by BAA to safeguard future services to the airport are both necessary and reasonable. I, therefore, endorse the relevant conditions (A87, A88 and A89). As I have also explained I do not consider any other conditions requiring the provision of additional public transport services to be appropriate although BAA should be encouraged to do everything in its power to promote and secure such links. In this regard I would hope that the Government would do their best to ensure that BAA's ability to invest in public transport is not inhibited by unnecessary regulatory controls.
- 32.4.6 I do not believe that the other measures promoted by the local authorities particularly those concerned with fare levels and service frequencies should be the subject of either planning conditions or agreements. These are matters which should be left in the hands of the operators to respond to circumstances as they emerge.
- 32.4.7 As far as the Transport and Works Act Orders are concerned I have already set out the modifications which I believe should be incorporated and explained why I do not believe other modifications promoted at the inquiry or in writing should be accepted (Chapter 15.7).

Car Parking

- 32.4.8 I now turn to car parking measures. In dealing with public transport, I have already explained why I believe that a demanding limit should be placed on the provision of staff car parking but that I would not go as far as the local authorities would like. I have suggested that no more than 17,500 spaces be provided for staff parking and indicated that this would reduce the overall parking provision by 4,000 to 42,000 spaces. I also concluded that, in spite of BAA's desire to retain flexibility, there should be a specific limit on the parking provision for staff (para 15.6.11).
- 32.4.9 I accept that the limit I propose would become a more demanding constraint if passenger throughput grows above 80 mppa. Nevertheless, if BAA and the airlines wish to see such levels attained, they must also accept a responsibility for ensuring that the impact on the roads is minimised and greater use is made of public transport. In the absence of a demanding constraint it is almost inevitable that there will continue to be a reliance on private transport with all that entails in terms of congestion and environmental damage for local residents. In view of the proximity of the Northside car parks and the fact that these would be linked directly to Terminal 5 by the Dedicated Car Park Access Road, I do not believe that passengers would be unduly inconvenienced by a reduction in the parking provision on the Principal Site.
- 32.4.10 I therefore recommend that a parking limit of 42,000 spaces be substituted for the 46,000 in BAA's condition A94 with an additional reference to the fact that no more than 17,500 of these should be for employees.

Roads

- 32.4.11 BAA's position in relation to highway conditions was very simple – they were prepared to be committed to the completion of certain road improvements and to a car parking limit of 46,000 spaces but did not accept the approach embodied in LAHT5's proposed conditions which would limit traffic generated by Heathrow with Terminal 5 to the levels actually recorded in 1991. Furthermore they did not accept the need for a condition requiring the M4 to be improved before Terminal 5 opened.
- 32.4.12 As far as the M25 Spur Road is concerned, the Highways Agency agreed with BAA conditions which would prevent the use by the public of the Terminal 5 Core Building or any of the development in the landside area before the Spur Road and the associated Welcome Roundabout and landside roads were opened³⁰¹⁶. The agreed conditions make provision however, for the Satellite buildings and the stands associated with Terminal 5 to be used by passengers who would be transported by bus to the Central Terminal Area or Terminal 4 prior to the opening of the Spur Road. While I am slightly concerned that this could increase congestion on the approach to the Central Terminal Area, I accept that it would be on a temporary basis and would occur only if there were a delay in completion of the Spur Road. Consequently I consider that the conditions proposed by BAA and endorsed by the Highways Agency on this issue should be accepted.
- 32.4.13 BAA also put forward conditions agreed with the Agency in respect of improvements to the 3 entrances to the airport from the A4 Bath Road and to the Stanwell Moor Junction (A3113/A3004)³⁰¹⁷. I accept that these are reasonable and necessary.
- 32.4.14 As I have already concluded, the case for the widening of the M4 has not been made when all the relevant considerations are taken into account (paras 18.4.19-26). If the M4 is not to be widened the argument for a condition does not arise but even if the Orders are confirmed and the widening is to be carried out I do not consider that it should be made a prerequisite of Terminal 5. In my view the new terminal could operate perfectly well without widening the M4 and the prospects and pressures for improved rail access would be all the greater if it were not improved.
- 32.4.15 LAHT5 proposed 2 sets of conditions, their preferred list being based on the proposition that traffic should be controlled so it did not exceed 1991 levels³⁰¹⁸. Their suggestions included a condition simply requiring that the daily traffic flows of air passengers and employees into and out of Heathrow should not exceed 129,400 vehicles including taxis³⁰¹⁹. A further condition would limit peak hour flows to 11,150 vehicles an hour³⁰²⁰. Whatever the merits of such an approach I have fundamental doubts as to its realism. Monitoring traffic flows would be extremely difficult in such a large and complex operation as Heathrow. Comparisons were made with employers such as Surrey County Council who have introduced company transport plans³⁰²¹ but such comparisons are of limited assistance here. BAA does not have the same influence over

³⁰¹⁶ BAA/404R Conditions A91-A93

³⁰¹⁷ BAA/404R Conditions A95-A96

³⁰¹⁸ LAH/4161R

³⁰¹⁹ LAH/4161R Condition A25

³⁰²⁰ LAH/4161R Condition A26

³⁰²¹ Day 264 pp38-42

its passengers as employers do over their staff. Moreover many of those working at Heathrow are not employed by BAA.

- 32.4.16 I accept that BAA has a responsibility to encourage those working on the airport to use public transport but believe that the most effective way of doing this is by improving that public transport and imposing limits on staff parking. I have already covered these points but I would not support the imposition of conditions as sought by LAHT5 which seek to impose limits on traffic entering and leaving the airport whatever those limits might be. More specifically I reject the idea of attempting to restrict traffic to the level last seen in 1991.
- 32.4.17 It follows that I would also advise against the imposition of conditions requiring BAA to institute feasibility schemes for charging traffic travelling to the terminals and to prevent the opening of Terminal 5 until such charges are in place³⁰²². While this may conceivably be an option which BAA would wish to consider in the longer term, I do not consider that it can be sensibly linked to Terminal 5. Nor am I convinced that there is a reasonable prospect that a charging scheme could be instituted before Terminal 5 opened bearing in mind the complex traffic flows in and around Heathrow.
- 32.4.18 LAHT5 also suggested an agreement leading to the establishment of a Heathrow Transportation Monitoring Group and the appointment of a Ground Transportation Manager³⁰²³. There is, of course, already a similar body in the form of the Heathrow Area Transport Forum. While the local authorities may feel that this is not ideal, it has been referred to in the White Paper “A New Deal for Transport”³⁰²⁴ apparently as an example of good practice. BAA has offered an assurance that it would continue to support the Heathrow Area Transport Forum until at least 5 years after Terminal 5 opens³⁰²⁵ and LAHT5 itself supports its continuation³⁰²⁶. I see no justification for the introduction of an additional body which might well lead to duplication and confusion which would prejudice the objectives sought by LAHT5.
- 32.4.19 There may well be a role for a Heathrow Transport Plan as proposed by LAHT5³⁰²⁷ although I doubt whether it would be necessary to review such a plan every year. Nevertheless the best way to achieve this is likely to be through the type of informal discussion which led to the Memorandum of Understanding regarding airport related development. I have already suggested that this should not be incorporated in formal planning conditions and I take the same view of the proposed Transport Plan. The same approach should be taken to the issue of monitoring Heathrow traffic which LAHT5 seek; this should be seen as an integral part of the preparation of a Transport Plan.
- 32.4.20 Assuming that the traffic generated by Heathrow is not to be limited to 1991 levels, LAHT5 proposed a condition which would require BAA to set aside specific cash sums to fund studies of local traffic problems and environmental solutions³⁰²⁸. In the absence of specific problems identified at the inquiry as needing to be tackled, I do not accept

³⁰²² LAH/4161R Conditions A37-A38

³⁰²³ LAH/4161R Conditions A40-A41

³⁰²⁴ CD/258 p80

³⁰²⁵ BAA/404R Assurance 5

³⁰²⁶ LAH/4161R Condition A43

³⁰²⁷ LAH/4161R Condition A44

³⁰²⁸ LAH/4161R Condition B25

that this is justified. Nor do I support the imposition of a condition requiring BAA to commission a study into methods of restraining trips to and from Heathrow to 1991 levels partly because of the doubts I have already expressed regarding the feasibility of this approach. In any event, I do not feel this to be an appropriate measure for a planning condition.

32.5 NOISE

Air Noise

- 32.5.1 The full case for each of the parties is set out in Chapter 2 of the Noise Topic Report so I merely summarise these cases here before setting out my conclusions. **The Department** pointed out that Heathrow was a designated airport for the purposes of Sections 78 and 79 of the Civil Aviation Act 1982 which gave the Secretary of State the power to specify measures to limit or mitigate the effect of noise and vibration connected with aircraft taking off or landing³⁰²⁹. While these powers should be borne in mind they did not necessarily prevent matters such as night flying, runway alternation, westerly preference and the Cranford agreement being controlled by planning conditions³⁰³⁰. The starting point for Government consideration of future restrictions on night flying would be the current restrictions. Any changes to these would require public consultation³⁰³¹. The same applied to any changes in other operational procedures³⁰³².
- 32.5.2 The Department accepted that one of the reasons for the original decision not to impose a ban had been Sir Grahame Eyre's view that the number of movements could not go much above 275,000 a year. The Government started from the position that artificial constraints on the number of movements at Heathrow would not be in the national interest but nothing precluded a change in policy if new developments, which might include new information or a change in circumstances arising from the current inquiry, warranted it. It was open to me to make whatever judgement was appropriate in the light of the evidence and to recommend accordingly³⁰³³.
- 32.5.3 They pointed out that the Secretary of State was committed to a further review of monitoring efficiency and maximum permitted noise levels for departures and arrivals³⁰³⁴ although recent changes to the monitoring arrangements should achieve a 50% efficiency³⁰³⁵. The maximum fine for noise infringements was £1,000³⁰³⁶. The Government saw no need for a further statutory noise insulation scheme³⁰³⁷. Although no contour cap had ever been imposed on Heathrow, there appeared to be the power to do so in the manner suggested by BAA³⁰³⁸.

³⁰²⁹ 5-2.2.1

³⁰³⁰ 5-2.2.2

³⁰³¹ 5-2.2.5

³⁰³² 5-2.2.8

³⁰³³ 5-2.2.7

³⁰³⁴ 5-2.2.9

³⁰³⁵ 5-2.2.10

³⁰³⁶ 5-2.2.11

³⁰³⁷ 5-2.2.14

³⁰³⁸ 5-2.2.13

- 32.5.4 **BAA** argued that the existing system of noise controls should continue with the addition of a contour cap³⁰³⁹. Airspace was outside their control, and LAHT5 had not identified the mechanism for imposing the measures they suggested³⁰⁴⁰. Very little of the scheme proposed by the authorities related to the difference Terminal 5 would make³⁰⁴¹. Some of Hillingdon's proposed mitigation measures were uncertain and there was doubt as to how much was being sought whether or not Terminal 5 was permitted³⁰⁴².
- 32.5.5 Heathrow Airport Limited had developed a noise management strategy which went beyond legislative requirements. This included the establishment of consultative bodies, a new noise and track-monitoring system, testing new approach procedures and a new noise insulation scheme³⁰⁴³.
- 32.5.6 BAA would support alternation at night if a net benefit could be shown but any change to westerly preference ought to be the subject of further studies and consultation³⁰⁴⁴. They opposed a relaxation of night restrictions but were not in favour of a night ban which had a minimal connection with the proposals for Terminal 5. They would not object to the extension of the night quota period to start at 23.00 hours provided that the movements needed to achieve 80 mppa could be included³⁰⁴⁵.
- 32.5.7 They did not support a limit on movements. Although such a limit could not be imposed under sections 32 or 33 of the Airports Act 1986, the number of movements could be controlled under the powers in Section 78 of the Civil Aviation Act. A planning condition imposing a limit on movements would, however, duplicate those powers³⁰⁴⁶. A limit on movements would not address the noise impact of Heathrow³⁰⁴⁷. It would not control aircraft size, noise levels, emissions or passenger capacity and would encourage the use of larger aircraft if it were set below the 458,000 atms which represented the stand capacity of Heathrow with Terminal 5³⁰⁴⁸. BAA were not proposing any changes to the existing system of runway operation³⁰⁴⁹ and were opposed to the introduction of mixed mode³⁰⁵⁰.
- 32.5.8 They argued that the LAHT5 proposals related to monitoring departures and arrivals were not clear³⁰⁵¹. Furthermore, it would not be useful to have the conditions they suggested in relation to noise contours or limits on aircraft weights³⁰⁵². Nevertheless, BAA would agree to a 57 LA_{eq 16 hour} contour cap imposed by a direction under Section 78(6) of the Civil Aviation Act 1982 limiting the area in 2016 to that affected in 1994. This offer would apply whether Concorde was still flying or not and assumed the

³⁰³⁹ 5-2.3.1

³⁰⁴⁰ 5-2.3.2

³⁰⁴¹ 5-2.3.3 and 5-2.3.27

³⁰⁴² 5-2.3.28

³⁰⁴³ 5-2.3.4

³⁰⁴⁴ 5-2.3.5

³⁰⁴⁵ 5-2.3.6

³⁰⁴⁶ 5-2.3.7

³⁰⁴⁷ 5-2.3.8

³⁰⁴⁸ 5-2.3.9

³⁰⁴⁹ 5-2.3.11

³⁰⁵⁰ 5-2.3.9

³⁰⁵¹ 5-2.3.12

³⁰⁵² 5-2.3.13

continuation of the existing general night regime³⁰⁵³. Similar caps had been agreed for the expansion of Manchester and Schiphol airports³⁰⁵⁴.

32.5.9 BAA argued that Terminal 5 was unlikely to affect the existing noise insulation scheme which had recently been extended. There would be considerable difficulties in insulating schools³⁰⁵⁵, although the costs would be similar to those of insulating a similar sized room in a house as long as there were no special features involved³⁰⁵⁶. A scheme for O'Hare Airport at Chicago for an area within a contour roughly equivalent to 65 LA_{eq 24 hour} had resulted in the insulation of 47 schools between 1982 and 1995 with the schools paying 10% of the cost. Since then the full cost had been borne by federal and local funds³⁰⁵⁷.

32.5.10 There was no evidence that a house purchase scheme was necessary³⁰⁵⁸. New social surveys would be independent of Terminal 5³⁰⁵⁹. Similarly track-keeping was independent of the proposals for Terminal 5³⁰⁶⁰. There was no need to change the existing consultation arrangements because of Terminal 5³⁰⁶¹.

32.5.11 **British Airways** argued that the conditions proposed by Hillingdon and LAHT5 were unreasonable and did not relate to the impact of Terminal 5³⁰⁶². In contrast, British Airways were offering assurances which, although not legally binding, should be taken into account by the Secretary of State³⁰⁶³. They supported the principles underlying the Government's restrictions on night flights³⁰⁶⁴ and were not aware of any precedent for a ban on night flights to offset any other kind of harm³⁰⁶⁵. Any reduction in night flights would cascade demand into daylight hours where capacity was already very limited seriously affecting the network of services and the ability of passengers to transfer to other services. As Heathrow was British Airways' principal hub, they would be especially affected as the Government had recognised³⁰⁶⁶. A night ban was not feasible³⁰⁶⁷.

32.5.12 They would support a change to easterly preference at night but only up to 06.00 hours since a delay to 07.00 hours would reduce the number of slots available. This could mean that some flights would have to be rescheduled to times before 06.00 hours³⁰⁶⁸. Terminal capacity constraints meant that British Airways would support an easing of restrictions on the number of flights at night until Terminal 5 opened while retaining the quota³⁰⁶⁹. From the opening of Terminal 5, British Airways would not operate more than its current nominal allocation of 2757 night quota period movements provided

³⁰⁵³ 5-2.3.14
³⁰⁵⁴ 5-2.3.15
³⁰⁵⁵ 5-2.3.16
³⁰⁵⁶ 5-2.3.18
³⁰⁵⁷ 5-2.3.19
³⁰⁵⁸ 5-2.3.20
³⁰⁵⁹ 5-2.3.21
³⁰⁶⁰ 5-2.3.22
³⁰⁶¹ 5-2.3.23-24
³⁰⁶² 5-2.4.1
³⁰⁶³ 5-2.4.2
³⁰⁶⁴ 5-2.4.3
³⁰⁶⁵ 5-2.4.4
³⁰⁶⁶ 5-2.4.5
³⁰⁶⁷ 5-2.4.7
³⁰⁶⁸ 5-2.4.6
³⁰⁶⁹ 5-2.4.7

other parameters were not changed³⁰⁷⁰. They would also continue to abstain from scheduling departures between 23.00 and 23.30 hours. That period should become part of the night quota period and flights currently scheduled in those 30 minutes by other airlines should be added to the permitted quota³⁰⁷¹. British Airways would not purchase or use the NGLA at any time unless it met the noise standards currently achieved by the Boeing 747-400³⁰⁷².

- 32.5.13 A limit on annual aircraft movements would be contrary to the national interest as stated in the 1985 White Paper³⁰⁷³, while it would be inappropriate to seek to control operational procedures by planning conditions or obligations³⁰⁷⁴. British Airways would not wish to see the prospect of an additional runway at Heathrow ruled out as a result of this inquiry³⁰⁷⁵.
- 32.5.14 **LAHT5** sought clear limits for the future operation of Heathrow³⁰⁷⁶. They proposed a condition preventing the construction of a new runway³⁰⁷⁷. In addition, they put forward what they submitted to be a practical and integrated package each element of which had merit on its own account³⁰⁷⁸. Terminal 5 would result in an increase in flights before 07.00 and the need for the phased introduction of a ban on night flights was clear. The impact of such flights was out of all proportion to the benefit claimed by British Airways³⁰⁷⁹. The restriction on flights between 21.00 and 23.00 hours proposed by Hillingdon should also be imposed and the night quota period should be extended to cover the whole time between 23.00 and 07.00 hours and up to 08.00 on Sundays³⁰⁸⁰. Night noise contours should be made available as they were at other airports with particular contours being produced for the period from 04.00 to 07.00 hours³⁰⁸¹.
- 32.5.15 An annual limit on movements should be imposed as a planning condition since there were doubts as to whether it could be imposed under Section 78 of the Civil Aviation Act³⁰⁸². The limit should be set at 430,000 atms with a further 15,000 non-atms and should operate in addition to a contour cap³⁰⁸³. If no atm limit were imposed the total number of passengers passing through Heathrow (including transfer passengers) should be limited to 80 mppa³⁰⁸⁴. Current operational procedures should be retained until detailed assessments and consultations had been carried out³⁰⁸⁵.
- 32.5.16 In LAHT5's view, monitoring of departures and arrivals should be improved to a standard of 70% and the local authorities should have real-time access to the data³⁰⁸⁶.

³⁰⁷⁰ 5-2.4.9

³⁰⁷¹ 5-2.4.7

³⁰⁷² 5-2.4.9

³⁰⁷³ 5-2.4.12

³⁰⁷⁴ 5-2.4.13

³⁰⁷⁵ 5-2.4.13

³⁰⁷⁶ 5-2.5.1

³⁰⁷⁷ LAH/145

³⁰⁷⁸ 5-2.5.2

³⁰⁷⁹ 5-2.5.3

³⁰⁸⁰ 5-2.5.4

³⁰⁸¹ 5-2.5.5

³⁰⁸² 5-2.5.7

³⁰⁸³ 5-2.5.8

³⁰⁸⁴ 5-2.5.9

³⁰⁸⁵ 5-2.5.10-11

³⁰⁸⁶ 5-2.5.12

There should be noise limits for landing aircraft³⁰⁸⁷. Fines for infringements of noise limits should be increased and the limits should be kept under review³⁰⁸⁸.

- 32.5.17 A range of contours including 54 LA_{eq} should be provided on a regular basis coupled with monitoring. The objective should be a steady reduction in the area covered by the contours³⁰⁸⁹. The contour cap proposed by BAA covered an area almost 50 km² larger than that predicted for their base case giving them a substantial degree of flexibility. There should be a limit on movements combined with a 57 LA_{eq 16hour} contour limit of 135 km² or in the absence of a limit on movements the contour limit should be reduced to an area of 128.5 km² as predicted by BAA for 80 mppa³⁰⁹⁰.
- 32.5.18 LAHT5 also argued that BAA should introduce a new and generous noise insulation scheme that covered certain premises within the 60 LA_{eq} day-time contour³⁰⁹¹. In spite of an undertaking in the 1985 White Paper, no grants had been provided for schools or hospitals and special measures were now needed, including re-building mobile classrooms³⁰⁹². Detailed conditions had been put forward by LAHT5 to secure adequate insulation for dwellings, residential care centres, nursing homes and schools³⁰⁹³. They also proposed a new house purchase scheme for all properties within the 72 LA_{eq} contour or the 69 LA_{eq} contour if no atm limit were imposed³⁰⁹⁴.
- 32.5.19 They submitted that new and regular social surveys were needed and proposed a condition requiring BAA or Heathrow Airport Limited to carry these out³⁰⁹⁵. They also suggested changes to the existing Heathrow Air Noise Monitoring Group to monitor compliance with the proposed noise mitigation measures³⁰⁹⁶.
- 32.5.20 **Spelthorne** supported LAHT5's noise mitigation proposals³⁰⁹⁷.
- 32.5.21 **Hillingdon** pointed to frequent changes in air noise regulation at Heathrow and argued that administrative controls were of less value than physical measures which must be part of any package³⁰⁹⁸. While account should be taken of discretionary powers under the Airports Acts and the Civil Aviation Act, there was no certainty that they would be exercised. Consequently there was a compelling case for the imposition of planning conditions as envisaged in PPG 1, Circular 11/95 and PPG 24³⁰⁹⁹.
- 32.5.22 Hillingdon supported the thrust of LAHT5's proposals but preferred conditions to be expressed in a prohibitive form³¹⁰⁰. If Terminal 5 were to go ahead it should only be on the basis that there was some compensation for the damage already done by the

³⁰⁸⁷ 5-2.5.13

³⁰⁸⁸ 5-2.5.14

³⁰⁸⁹ 5-2.5.16

³⁰⁹⁰ 5-2.5.18

³⁰⁹¹ 5-2.5.20

³⁰⁹² 5-2.5.21-22

³⁰⁹³ 5-2.5.23-26

³⁰⁹⁴ 5-2.5.27-28

³⁰⁹⁵ 5-2.5.29-32

³⁰⁹⁶ 5-2.5.34-35

³⁰⁹⁷ 5-2.6.1

³⁰⁹⁸ 5-2.7.1

³⁰⁹⁹ 5-2.7.2-3

³¹⁰⁰ 5-2.7.3

unplanned growth of Heathrow and controls over air noise could be regarded as some compensation for other harm caused by Terminal 5³¹⁰¹.

- 32.5.23 In Hillingdon's view it was wrong to say that there was a Government policy to have no night ban; there were only decisions which were current at a particular time³¹⁰². A total ban on night flights should be introduced over a phased period³¹⁰³. The night period should be extended to cover the whole period from 23.00 to 07.00 hours with further controls on flights between 07.00 and 09.00 hours and from 21.00 to 23.00 hours³¹⁰⁴. If a complete night ban were not imposed, measures should be taken to control and reduce the number of movements and associated activities³¹⁰⁵. A contour cap during the day would not improve the situation at night³¹⁰⁶.
- 32.5.24 Hillingdon supported the imposition of an atm limit which had been left open as a possibility in the 1985 White Paper. This had said that further regulatory measures might be needed for a four-terminal airport and that a planning condition might be the most appropriate method³¹⁰⁷. They sought a limit of about 410,000 atms, the number handled in 1994 which had been used as the "current year" for the inquiry³¹⁰⁸.
- 32.5.25 They also supported, in general, LAHT5's attitude to controls over operational procedures and the monitoring of departures and arrivals. The existing operational procedures should be kept in place and noise limits and monitoring arrangements should be tightened. There was insufficient evidence to support the use of easterly preference in the early morning and mixed mode would have severe environmental consequences³¹⁰⁹.
- 32.5.26 Hillingdon argued that the LA_{eq} contours did not show the real effect of noise. The present controls appeared to have developed because of the inadequacies of the planning processes in relation to Heathrow and the Department had confirmed that differences of half a decibel could be significant³¹¹⁰. A contour cap was completely indifferent to the shape of the contour, although Hillingdon could envisage having such a cap plus spot points³¹¹¹. BAA's cap would mean that reductions in the noise of individual aircraft would be used to increase the number of movements. The cap should be set at BAA's base case predictions for 2016 rather than the 1994 figure³¹¹². If Concorde were still flying at that time it should be specifically provided for³¹¹³.
- 32.5.27 They proposed a variation to LAHT5's noise insulation scheme using the 60 LA_{eq 16hour} contour to define the area covered³¹¹⁴ and supported their proposals in relation to a

³¹⁰¹ 5-2.7.4

³¹⁰² 5-2.7.5

³¹⁰³ 5-2.7.6

³¹⁰⁴ 5-2.7.7

³¹⁰⁵ 5-2.7.8

³¹⁰⁶ 5-2.7.9

³¹⁰⁷ 5-2.7.10-11

³¹⁰⁸ 5-2.7.12

³¹⁰⁹ 5-2.7.14-15

³¹¹⁰ 5-2.7.17

³¹¹¹ 5-2.7.18

³¹¹² 5-2.7.19

³¹¹³ 5-2.7.20

³¹¹⁴ 5-2.7.21

house purchase scheme, social surveys, track-keeping and the Heathrow Air Noise Monitoring Group³¹¹⁵.

- 32.5.28 **HACAN** argued that the history of Heathrow demonstrated that no reliance could be placed on any conditions or agreements that might be linked to Terminal 5³¹¹⁶. Nevertheless, there should be a limit on the number of movements at Heathrow whether or not Terminal 5 were approved. This should be at the lower end of the range from 450,000 to 475,000 atms. There should also be a ban on night flights³¹¹⁷. **EANAG** took a similar line but argued for conditions preventing the construction of any additional runway or future helicopter services. They also supported the proposals put forward by Hillingdon and LAHT5 while suggesting some specific amendments³¹¹⁸. **FANG** supported a night ban but did not support a contour cap³¹¹⁹.
- 32.5.29 **LAANC** broadly endorsed LAHT5's proposals but argued that until a curfew was imposed night flights should not exceed 102 dB with a weighting penalty of 10 dB at night³¹²⁰. Other objectors also supported the introduction of a night ban as well as other measures designed to reduce the noise impact of the airport³¹²¹. On the other hand, supporters of Terminal 5 argued that it should be permitted subject to controls such as a contour cap, the continuation of alternation and no further increase in night flights³¹²².

My Conclusions on Air Noise Conditions

- 32.5.30 Nobody hearing evidence from people living around Heathrow as I have done could fail to appreciate the profound feeling that noise generated by aircraft using the airport has not been controlled in any effective manner. There was particular anger at the Government's failure to impose the limit on aircraft movements proposed by Sir Iain Glidewell which had permitted the subsequent dramatic increase in the number of movements. This led HACAN to conclude that no useful purpose would be served by proposing any planning conditions or obligations. Such a situation does not reflect well on our planning system. Indeed it is in direct conflict with the aims of PPG 24 which states in paragraph 2 that, where it is not possible to separate development involving noisy activities from noise sensitive uses such as housing hospitals and schools, "local authorities should consider whether it is practicable to control or reduce noise levels, or to mitigate the effect of noise, through the use of planning conditions or planning obligations."
- 32.5.31 As I have already said, I appreciate that operations at Heathrow are subject to a wide range of controls operated under other legislation. I also accept that it is not the purpose of the planning system to tackle existing noise problems for which, as Annex 7 to PPG 24 says, other means are available. Nevertheless, Terminal 5 would generate a substantial level of noise and PPG 24 requires me to consider how the impact of this noise might be controlled, reduced or mitigated by the use of planning conditions or obligations.

³¹¹⁵ 5-2.7.22-26

³¹¹⁶ 5-2.8.1

³¹¹⁷ 5-2.8.3

³¹¹⁸ 5-2.8.4-13

³¹¹⁹ 5-2.8.14

³¹²⁰ 5-2.8.15

³¹²¹ 5-2.8.16-20

³¹²² 5-2.9.1

- 32.5.32 In doing this I have taken account of the other powers available to the Secretary of State but, as the Department said, this does not necessarily prevent the use of planning conditions. Furthermore, I have a great deal of sympathy with Hillingdon's argument that there can be no certainty over the exercise of discretionary powers. I believe that if Terminal 5 is to be approved that approval should be set in the framework of clear and precise controls expressed where possible in the form of planning conditions. As a matter of principle and within the constraints of Government policy, I consider that it must be preferable to control development permitted by the grant of planning permission through the imposition of planning conditions on that permission. To do so in this case would increase public confidence that activities at Heathrow would be subject to clear and open controls and would clarify the role of the local planning authority in that process.
- 32.5.33 My comments on the history of noise controls at Heathrow should not be read as an indication that I believe an approval for Terminal 5 should be used as the occasion for existing problems to be overcome. I have already pointed to the advice of Annex 7 to PPG 24 in this regard. This reinforces my view that conditions imposed on a permission for Terminal 5 should be directly related to the impact it would have and not become a comprehensive compensation package for past growth of Heathrow in general. I have reached this conclusion notwithstanding my sympathy for all those who have suffered and continue to suffer from noise associated with Heathrow.
- 32.5.34 On that basis, I now turn to consider the various proposals for the control of the airport with Terminal 5 in place. I have already explained why I do not believe a planning condition would be effective in preventing the construction of a new runway (para 8.5.20). BAA argued that the most effective control on the impact of noise (and the only one needed) was a contour cap limiting the area subjected to 57 $LA_{eq\ 16hour}$ to 175.5 km^2 , the same area as that covered by this contour in 1994. I have already indicated my own reservations regarding the value of the $LA_{eq\ 16hour}$ contour as a measure of the impact of aircraft noise. These reservations are such that I do not accept that a contour cap in the form suggested by BAA could be effective alone in controlling the impact of Terminal 5. It would have to be supplemented by other measures to which I shall turn in a moment. This view is, of course, consistent with the acceptance of the Department that the noise impact of Terminal 5 should not be assessed solely in terms of the $LA_{eq\ 16hour}$ contour (para 21.3.4).
- 32.5.35 Nevertheless, I do accept that a contour cap would have some value and should be imposed. Its effectiveness would, however, depend on the level at which it was set. While I understand LAHT5's desire to use a range of contours, I consider that clarity demands the adoption of a single contour for use as a cap. I also conclude that the area enclosed by 57 $LA_{eq\ 16hour}$ contour would be the most appropriate measure to use for the reasons I set out in the Air Noise topic.
- 32.5.36 My conclusions (as set out in paragraph 15.3.42) are that the area enclosed by the 57 $LA_{eq\ 16hour}$ would fall from 175.5 km^2 in 1994 to 105 km^2 by 2016 if Terminal 5 were not built and Concorde were no longer flying. If Terminal 5 were built it is likely to increase to 130-135 km^2 . This figure, while greater than BAA's base case estimate of 128.5 km^2 , is substantially smaller than the cap of 175.5 km^2 proposed by BAA. I consider that the BAA proposal is so far above the likely outcome that it would impose no realistic constraint on operations at Heathrow with Terminal 5. In my view the

contour cap should be set at a level close to the most likely prediction but with a reasonable allowance to reflect the inevitable uncertainties in forecasting aircraft noise. On that basis I would favour a contour cap set at 145 km² which would allow some flexibility since it is some 10-15 km² greater than the area I believe is likely to be affected. This cap should come into operation at 2016 although BAA should be encouraged to achieve it as soon as possible before that date.

32.5.37 I have reached this conclusion on the basis that Concorde would no longer be flying at 2016, which is the assumption adopted by BAA. Subsequently I was told that it was possible that Concorde would still be flying at that time. This would make a very substantial difference to the area enclosed by the 57 LA_{eq 16hour} contour. I do not believe it would be right to set a contour cap on the basis that Concorde would be flying since this would inevitably be too large if it ceased operations. Instead I favour the approach suggested by Hillingdon that specific provision should be made if Concorde was still flying. This would mean that, unless it could be accommodated within the contour cap, BAA and British Airways would have to secure some form of dispensation for retaining Concorde in service, for example by disregarding its contribution to the contour cap.

32.5.38 As I emphasised in the Air Noise topic my main concern over the reliance on the LA_{eq} index is that it fails to give sufficient weight to the increased number of aircraft movements around Heathrow. As I said there is ample evidence that many people find the sheer number of flights deeply objectionable and there is no doubt that Terminal 5 would result in an increase in that number. Taking these 2 factors together I am in no doubt that a limit should be imposed on the number of aircraft movements as a condition of any planning permission for Terminal 5 in spite of the natural opposition of both BAA and British Airways.

32.5.39 I appreciate that the Department said that it was Government policy not to have a limit on the number of aircraft movements since they believed that there were more effective ways of achieving noise reductions. However, they also pointed out that one of the reasons for that view was that Sir Grahame Eyre had found that there was little scope for the number of atms to go above 275,000 and that, as a result, a limit would not make a perceptible difference to the noise climate. This conclusion has been shown to be totally wrong. The evidence presented to me was very different. It now seems likely on the evidence placed before me that the existing runways at Heathrow could accommodate up to 480,000 atms in their present segregated mode and I have concluded that this capacity would be used to the full if Terminal 5 were built.

32.5.40 In the light of past experience I do not suggest that this is an absolute limit. I cannot rule out the possibility that improvements in technology might permit more than 480,000 movements a year to be handled even in segregated mode. There must also be a possibility the more use would be made of mixed mode in order to increase the capacity of the existing runways or even that a further runway might be provided. While I consider that the noise impact of 480,000 movements could be made acceptable, I am firmly of the view that any such further increase in flights, however it might be achieved, would rapidly become intolerable. The proper application of the precautionary principle demands the imposition of a planning condition to prevent this and to restore public confidence that Heathrow would be properly controlled. I do not believe that the Government should repeat the mistake of an earlier Government. My view that the number of aircraft movements that can be achieved in segregated mode is

not likely to exceed 480,000 a year should not be treated as infallible in the way Sir Graham's appears to have been. The people living around Heathrow deserve better than to be told some years hence that hindsight has proved me also to be wrong if the number of movements by then far exceeds my forecast.

- 32.5.41 Consequently, I conclude that a limit of 480,000 atms should be imposed if Terminal 5 is approved. This limit would be justified simply in terms of noise but would have wider benefits in terms of other factors such as surface access, air quality and public safety. Furthermore it would represent a clear signal that the capacity of Heathrow was to be limited to that of its existing runways operating in segregated mode. I have considered the case for a limit as low as the 410,00-430,000 atms suggested by Hillingdon and LAHT5 but such a limit would be impracticable. It would be lower than the present level and would negate any permission granted for Terminal 5.
- 32.5.42 Since the need for both the contour cap and the overall limit on atms arises directly from Terminal 5, I consider that they should be imposed as planning conditions attached to that permission. Although BAA argued that the contour cap could and should be imposed in the form of a direction under the Civil Aviation Act, the availability of other powers which would permit the imposition of a limit on aircraft movements is less clear. In any event, I consider that the use of planning conditions would be consistent with the general principles underlying the Government's advice on Planning and Noise set out in paragraph 2 of PPG 24. As I have already pointed out, this states that authorities should consider whether it is practicable to control or reduce noise levels or to mitigate the impact of noise through the use of conditions or planning obligations.
- 32.5.43 I now turn to the issue of the control of noise at night. Here I am less convinced that it would be right to use planning conditions since there is already a well-established system of night restrictions. On the other hand, Terminal 5 would introduce new factors which point to the need to make some changes to the existing system. As I have already said I do not believe that Terminal 5 would lead to a general increase in flights at night. Indeed British Airways offered an undertaking not to increase their flights during the current night quota period (23.30-06.00 hours). I welcome this together with the acceptance of both BAA and British Airways that the night quota period could begin at 23.00 hours as long as the flights currently scheduled between 23.00 and 23.30 hours were added to the quota. This would be a useful measure which would prevent any significant increase in movements at a sensitive time and I commend it to the Secretary of State.
- 32.5.44 I am, however, concerned about the period between 06.00 and 07.00 hours when Terminal 5 would produce a significant increase in arrivals. Some of these would pass over properties below the approach path before 06.00 hours and would add to the existing disturbance. While I accept that the impact of this would be reduced if an easterly preference were introduced in the early morning the benefit of this would be reduced if such a move were restricted to the period before 06.00 as British Airways proposed. In any event, I consider that there is a strong argument for extending the night quota period up to 06.30 hours, if not to 07.00 hours. At present the whole of this hour lies outside the night quota period and the $LA_{eq\ 16hour}$. I do not believe that this can be right for a time when many people are still sleeping.

- 32.5.45 I appreciate that even an extension of the night quota period would not meet the aspirations of many who believe that the only solution is to ban all night flights except for emergencies. I have already considered this point and concluded that it is not a realistic approach at least in the short-term. In my view, a progressive improvement in the night noise climate could be achieved through the existing system working towards a long-term objective of removing the need for night flights.
- 32.5.46 There was some debate as to the need for measures to ensure existing operational procedures would not be changed. As I have already said I believe that there is a strong case for the introduction of an easterly preference in the early morning and possibly throughout the day. Other changes could also prove to have environmental benefits. Consequently I consider that no conditions intended to maintain the current operational procedures should be imposed. The monitoring of track-keeping and of departures and arrivals is part of the normal operations of Heathrow. While I accept the need for such monitoring to be made more effective, I do not believe that this is an issue which is so closely related to Terminal 5 as to justify the imposition of planning conditions.
- 32.5.47 In the same way, while I accept the need for further work, including social surveys, to bring up to date previous findings regarding the relationship between aircraft noise and annoyance, I do not believe that this could be required as a condition of any approval of Terminal 5. BAA have recently extended their noise insulation scheme and I do not believe that further provisions in relation to residential properties would be necessary to deal with the issues raised by Terminal 5. However, I do consider that there are real problems in relation to the insulation of schools which are not being dealt with at present. My visit to Chicago in particular demonstrated that others are taking more positive steps and, in my view, BAA should do likewise. I do not suggest that the imposition of a condition is the most appropriate way forward in this case but the Secretary of State should strongly encourage those responsible for Heathrow to adopt the best practicable means to address the very real problems of noise disturbance within schools. There is also evidence of a similar need in some hospitals although I believe further study would be appropriate to identify the nature and extent of this problem.
- 32.5.48 Similarly I doubt that an effective noise blight scheme could be imposed by condition. BAA's offer to buy all freehold properties in the Bedfont Court area at full market value and to provide help with re-locating residential tenants should, however, be welcomed. This offer had already been taken up in relation to 2 of the 4 properties concerned by June 1997³¹²³.
- 32.5.49 Finally I do not believe it would be appropriate to impose a conditions requiring changes to the Heathrow Air Noise Monitoring Group. There may well be merit in such changes but it would be wrong to link these with Terminal 5.

Ground Noise

- 32.5.50 Since the full case for each party is set out in chapter 4 of the Noise Topic Report, I merely summarise these cases here before moving on to my conclusions. **BAA** proposed a series of conditions covering engine running, the use of fixed electrical ground power and pre-conditioned air, the preferential use of stands at night and taxiing

³¹²³ BAA/191 para 4.2.5

at night in addition to one requiring the provision of a noise barrier before construction of the Twin Rivers diversion. A condition related to the Forward Maintenance Unit was also put forward with a reference to the fact that British Airways had proposed conditions dealing with the Ground Running Pen. BAA also submitted a series of detailed assurances³¹²⁴.

- 32.5.51 They argued that Heathrow Airport Limited had a successful history of management and control³¹²⁵. Their management scheme would provide operational controls for ground noise including the use of stands and taxiways at night³¹²⁶ and they had already offered to purchase all the freehold properties in the Bedfont Court Estate at full market value and to help relocate residential tenants³¹²⁷.
- 32.5.52 They submitted that Hillingdon's proposed scheme to control ground noise was unworkable. It would require detailed monitoring of noise levels, weather conditions and noise sources at any or all hours of the day and night. Monitoring noise levels which were below the prevailing background would be very difficult³¹²⁸. So much subjectivity would be involved that the results would not be reliable³¹²⁹. Some of their suggested conditions appeared to have no basis in the evidence³¹³⁰. Hillingdon seemed to wish to control operating procedures at the airport which they were not competent to do³¹³¹.
- 32.5.53 BAA's assessment of the impact of ground noise had taken no account of the current noise insulation scheme which was possibly the most effective means of mitigation. They had also agreed that a noise barrier would be provided at the south west corner of the airport if tests showed that the existing bund, which was to be removed, had provided a significant noise reduction³¹³². If that noise barrier to the east of the existing bund were not provided, the area covered by the noise insulation scheme would be extended and BAA were willing to do both if the Secretary of State considered it necessary³¹³³. It was not clear that a barrier to the west of the existing bund would be acceptable in terms of safety since no barrier robust enough to provide noise attenuation would be regarded as frangible. This effectively meant that no barrier should be required at this point³¹³⁴.
- 32.5.54 **British Airways** dealt with the Forward Maintenance Unit and put forward 11 conditions, which they argued complied with Circular 11/95 and PPG 24. There should be a condition preventing the testing of tail mounted engines because the noise of such an engine could not be contained, while Concorde would continue to be tested in the East Base³¹³⁵. They argued that noise measurements should be taken at the airport boundary to avoid traffic effects from the A4 with the results being adjusted to the most

³¹²⁴ BAA/404R

³¹²⁵ 5-4.2.1

³¹²⁶ 5-4.2.2

³¹²⁷ 5-4.2.3

³¹²⁸ 5-4.2.4

³¹²⁹ 5-4.2.5

³¹³⁰ 5-4.2.6

³¹³¹ 5-4.2.7

³¹³² 5-4.2.8

³¹³³ 5-4.2.9

³¹³⁴ 5-4.2.10

³¹³⁵ 5-4.3.2

exposed situations³¹³⁶. Their proposed criterion of 65dB LA_{eq} (1 minute) (freefield) should not be exceeded in any location in reasonably adverse weather conditions³¹³⁷.

- 32.5.55 British Airways argued that Hillingdon had produced no evidence to justify their suggestion that the Forward Maintenance Unit should be the subject of a separate application or that its location should be left for later consideration³¹³⁸. Their own conditions were more straightforward and workable than those suggested by Hillingdon some of which were too detailed and more extensive than were necessary³¹³⁹. The criteria proposed by Hillingdon had not been relied on in evidence and L_{Amax} was not compatible with LA_{eq 12 minutes}³¹⁴⁰. Hillingdon sought to impose limits which would be below background levels and appeared to use limits which represented the worst case³¹⁴¹.
- 32.5.56 It was neither necessary nor reasonable to require the closure of the East Base Ground Running Pen which depended partly on the action of other parties. However, they intended to close this pen if possible and, if they did so, this would achieve a significant environmental benefit. The fact that the proposed development could help in achieving this could properly be taken into account by the Secretary of State in assessing Terminal 5³¹⁴².
- 32.5.57 **Hillingdon** reiterated their view that Terminal 5 should be approved only if it achieved positive benefits and pointed out that there were few means of controlling ground noise apart from the use of planning powers³¹⁴³. Firm and permanent controls, based on the advice in BS 4142 and BS 7445/ISO 1996, were needed to cover the absolute levels of noise³¹⁴⁴. Hillingdon's primary intention was to limit ground noise at sensitive premises to 55dB LA_{eq} in the day and 45dB LA_{eq} and 60dB L_{Amax} at night³¹⁴⁵. British Airways' suggested controls would operate only during the night quota period and not in the evenings³¹⁴⁶.
- 32.5.58 There should be barriers at the ends of stands, between taxiways and between taxiways and runways as well as fencing, bunding, mounding and planting³¹⁴⁷. At the very least BAA should be limited to the noise levels they had predicted as adjusted by the local authority model and there should be progressive reductions as new technology permitted and allowance should be made for the frequency spectrum of taxiing. None of this could be dealt with adequately by assurances since proper control was needed to prevent the "creeping incrementalism" that had happened in the past³¹⁴⁸.
- 32.5.59 There should be a ground noise control scheme with warning levels and triggers which would require action, including the prevention of increases in the number of aircraft

³¹³⁶ 5-4.3.4

³¹³⁷ 5-4.3.5

³¹³⁸ 5-4.3.7

³¹³⁹ 5-4.3.10 and 5-4.3.12

³¹⁴⁰ 5-4.3.11

³¹⁴¹ 5-4.3.12

³¹⁴² 5-4.3.13

³¹⁴³ 5-4.4.1

³¹⁴⁴ 5-4.4.2

³¹⁴⁵ 5-4.4.3

³¹⁴⁶ 5-4.4.4

³¹⁴⁷ 5-4.4.5

³¹⁴⁸ 5-4.4.6

movements, to be taken if they were exceeded³¹⁴⁹. The locations for noise measurements would need to vary depending on wind direction. Conditions would be needed for the proposed energy centre and other plant³¹⁵⁰.

32.5.60 Hillingdon argued that British Airways had made no enforceable commitment to their ground run strategy and said that they were not happy with the proposed location for the Forward Maintenance Unit. A fresh planning application should be submitted closer to the time when it would be built and the details of its construction should need prior approval from the local authority³¹⁵¹. Ideally engine tests above a certain level should be banned at night but, in the absence of this, Hillingdon proposed a limit of 45dB LA_{eq} 12 minutes at night. A limit of 55dB LA_{eq} 12 minutes should be imposed during the day³¹⁵². They also set out other criteria for engine testing expressed in the form of LA_{eq} 1 hour, LA_{eq} 12 minutes and L_{Amax} including a limit of 60dB L_{Amax} at night. They argued that, if these were not included in planning conditions, the extent and duration of engine testing should be limited to the demand anticipated by BAA³¹⁵³. The controls needed to ensure that the appropriate levels were not exceeded whatever the weather conditions³¹⁵⁴. Residential occupiers should be better protected than they were at present and, if British Airways' predictions were to be relied on, ground running of engines should be limited to no more than an average of 43 minutes a night. The conditions should apply to the whole airport so that pens with less stringent controls could not be used³¹⁵⁵.

32.5.61 **Spelthorne** also sought effective controls³¹⁵⁶ and the introduction of barriers to mitigate the impact of ground noise on Stanwell and Stanwell Moor when wind conditions were neutral or upwind³¹⁵⁷. These should be located to the east and west of the existing bund and have a minimum height of 4m. Safety concerns could be met by a frangible barrier to the west of the bund which would still offer a worthwhile noise reduction³¹⁵⁸. A second condition or agreement should ensure that the situation was kept under review with the possibility that the height of the barriers might be increased. An extension of the noise insulation scheme would be an inferior solution as it offered benefits only within buildings³¹⁵⁹.

32.5.62 They had agreed with BAA that the existing bund should be removed and detailed measurements made to establish what benefits it had provided. If these showed that a 4m eastern barrier would afford significant benefits BAA would be willing to provide this³¹⁶⁰.

My Conclusions on Ground Noise Conditions

32.5.63 I agree with Hillingdon that measures to reduce the impact of ground noise should include, where possible, physical barriers including bunds, fencing mounding and

³¹⁴⁹ 5-4.4.7

³¹⁵⁰ 5-4.4.8

³¹⁵¹ 5-4.4.9

³¹⁵² 5-4.4.10

³¹⁵³ 5-4.4.11

³¹⁵⁴ 5-4.4.12

³¹⁵⁵ 5-4.4.13

³¹⁵⁶ 5-4.5.1

³¹⁵⁷ 5-4.5.2

³¹⁵⁸ 5-4.5.3

³¹⁵⁹ 5-4.5.4

³¹⁶⁰ 5-4.5.6

planting. That being the case I support the provision of the maximum protection for the residents of Stanwell and Stanwell Moor and welcome the agreement reached between Spelthorne and BAA in this respect. While I accept that an extension of the noise insulation scheme would be less desirable than the construction of effective noise barriers I believe that the scheme should be extended in any event to give the best possible protection to these areas.

- 32.5.64 BAA have offered to purchase freehold properties on the Bedfont Court estate and to help relocate residential tenants. I strongly support these initiatives which should go a long way towards reducing the impact of all forms of noise in this area which is very close to the end of the runways.
- 32.5.65 As far as other areas are concerned the scope for physical barriers is less obvious and residents are likely to have to depend on effective controls. Here I find the scheme proposed by Hillingdon to be unrealistic in some respects. It would require extensive monitoring including the monitoring of noise below prevailing background levels. Effectively it would also involve Hillingdon in controlling some operating procedures at the airport which, in my view, no local authority would be able to do. The responsibility for controlling noise on the airport rests with the operator and should remain there.
- 32.5.66 In fact, I consider that the ground noise management plan put forward by BAA is both reasonable and workable. The location and duration of engine running and the use of taxiways and stands would be controlled at night by a combination of planning conditions and assurances. I, therefore, endorse without amendment the conditions and assurances proposed by BAA in relation to ground noise.
- 32.5.67 The Forward Maintenance Unit raised particular concerns for Hillingdon but I do not believe that any useful purpose would be served by requiring a separate planning application for this. Nothing I heard suggested that there is a better location for the Unit and its Ground Running Pen. The design, construction and use of the Forward Maintenance Unit should however be the subject of detailed conditions. British Airways put forward clear and specific proposals which attempt to avoid disturbance to residents at night. Having listened to an engine test in the East Base from a location at Waye Avenue, I wholly accept the need for such conditions.
- 32.5.68 The fundamental issue is the noise level which should be adopted. While British Airways proposed a limit of 65 dB $LA_{eq\ 1\ minute}$, Hillingdon sought lower criteria including a limit of 60 dB L_{Amax} at night. I have already concluded that a level of 65 dB $LA_{eq\ 1\ minute}$ would be significantly below the level at which sleep disturbance would be likely (para 22.2.27). On that basis, I accept that this would be an appropriate limit to use in the condition. Bearing in mind the high ambient noise levels close to the airport at that time, I do not consider that further controls would be necessary to limit engine testing during the day. I also accept that the airport boundary would be the most appropriate point at which to measure noise levels.
- 32.5.69 While I share Hillingdon's concern over the difficulty they would face in taking action to enforce compliance with British Airways' strategy, they would have one effective sanction if the noise limits were exceeded. They would ultimately be in a position to seek to prevent the use of the Ground Running Pen. I do not suggest that this should be

done lightly since it could prevent aircraft flying, but the presence of this sanction should ensure that British Airways and BAA do everything in their powers to prevent breaches of the noise limits on the Ground Running Pen.

- 32.5.70 Success in avoiding disturbance from the Forward Maintenance Unit would depend on the efficient operation of BAA's controls over the number and duration of engine tests. They gave evidence on this point in the Ground Noise topic and told me that they were committed to the introduction of further controls when Terminal 5 was built (para 22.2.3). As I have already said I believe that BAA's proposals to control ground noise are reasonable and I believe that they would be operated in such a manner as to avoid breaches of the conditions governing the use of the Ground Running Pen.
- 32.5.71 As I pointed out previously (paragraph 22.2.29), if the new Forward Maintenance Unit at Terminal 5 led to the closure of the existing Boeing 747 Ground Running Pen on the East Base, that would be a further factor in its favour. While I believe that this is likely to be the case, I accept that the closure of the existing pen also depends on action by other parties. In all the circumstances, I do not consider that a condition requiring its closure should be imposed.
- 32.5.72 I also doubt the need for a condition covering the whole airport in relation to ground running. The towing distances to the other pens from Terminal 5 are so great that I doubt if British Airways would contemplate this except in emergency.
- 32.5.73 In conclusion, I support the conditions and assurances related to ground noise proposed by BAA and British Airways with the proviso that the Noise Insulation Scheme should be extended in the Stanwell and Stanwell Moor areas even if a replacement noise barrier were provided.

Road Noise

- 32.5.74 Again I simply summarise the cases in relation to Road Noise since these are set out fully in Chapter 6 of the Noise Topic Report. **The Highways Agency** argued that conditions could not be attached to Highway orders as Hillingdon were suggesting. The Agency had, however, sought to ignore the procedural difficulties in an attempt to give undertakings, which would set the mind of the local authority at rest³¹⁶¹. In assessing appropriate mitigation, they had taken into account the existing ambient noise levels, technical feasibility and cost of alternatives, the noise benefits and site specific matters³¹⁶². Such mitigation should be considered as part of an overall package designed to reduce the impact of a scheme. Barriers would provide significant benefits on the M4 while on the M25 Spur Road a bund would be the principal mitigation measures³¹⁶³.
- 32.5.75 Porous asphalt reduced noise by 3dB, which was the equivalent in noise terms of halving the volume of traffic. It was, however, subject to wear at junctions³¹⁶⁴. A study of additional mitigation measures on both highway schemes had been carried out but

³¹⁶¹ 5-6.2.1 and Day 482 p13

³¹⁶² 5-6.2.2

³¹⁶³ 5-6.2.4

³¹⁶⁴ 5-6.2.5

there was no requirement that a road scheme should improve the noise climate; most schemes would fail such a test³¹⁶⁵. Nevertheless, the Agency now considered that it might be possible to use a quieter road surface across the entire width of the carriageway between Junctions 4 and 4b of the M4 if the Orders were confirmed. Should the length between Junctions 3 and 4 require re-surfacing, a similar finish might be used there. The position would be different if the Orders were not confirmed³¹⁶⁶.

- 32.5.76 The 1998 White Paper and Trunk Road Review had indicated that the Government was considering the scope for noise mitigation measures on trunk roads to deal with some of the most serious and pressing cases. No resources had been approved for such work, however, and it would be logical to assume that priority would be given to cases where a particular problem had been drawn to Ministers' attention. The Agency had no record of complaints relating to this section of the M4³¹⁶⁷.
- 32.5.77 The cost of using porous asphalt would be high but other surfaces, which might perform better, were now available. A choice could be made when the scheme was finalised and no condition requiring the use of a particular surface should be imposed³¹⁶⁸. It was now Government policy to seek to take advantage of quieter surfacing whenever a road had to be resurfaced. The alternative mitigation measures proposed by Hillingdon had been considered but all of them would represent poor value for money. With the introduction of the 80 kph speed limit, noise levels alongside the M4 would be better than at any time since the motorway opened³¹⁶⁹. This speed limit would allow higher barriers to be built and the Agency would consider the introduction of a central barrier if the scheme were built³¹⁷⁰.
- 32.5.78 **BAA** proposed a condition which required the provision of a new 3m noise barrier at the rear of properties on the Bath Road in Longford to replace an existing fence. They argued that other conditions sought by Hillingdon were dependent on matters beyond BAA's control and consequently would be inconsistent with Circular 11/95³¹⁷¹.
- 32.5.79 **Hillingdon** said that they had concentrated on mitigation at sources through the measures such as the control of traffic generation, the use of porous asphalt, barriers and operational controls. Remote barriers and building insulation were also needed³¹⁷². The conditions they had suggested in relation to the Highway Orders would not leave the Agency as the arbiter. They would require the submission of details so that the local planning authority could approve the details of what was in effect an outline application³¹⁷³.
- 32.5.80 Substantial measures would be necessary on the M4 while the Spur Road and the Perimeter Road should be considered together. None of the works should be allowed to proceed until the noise mitigation scheme had been approved by the local planning

³¹⁶⁵ 5-6.2.6

³¹⁶⁶ 5-6.2.7

³¹⁶⁷ Day 470 pp45-47

³¹⁶⁸ 5-6.2.8

³¹⁶⁹ 5-6.2.9

³¹⁷⁰ 5-6.2.10

³¹⁷¹ 5-6.3.2

³¹⁷² 5-6.4.1

³¹⁷³ 5-6.4.2

authority³¹⁷⁴. On the M4 the Agency were relying on the benefit derived from the introduction of the 80 kph speed limit. If this were imposed it appeared that a 5m noise fence could be provided together with a 3m central barrier³¹⁷⁵. Porous asphalt had been used on the M40 and the M25 and its use on the M4 would produce a noise reduction of 4-5 dB. The additional cost of some £1.6m was justified³¹⁷⁶.

- 32.5.81 The use of porous asphalt on the Spur Road was less justified but it should be Hillingdon's decision as to what surface was used. They should be consulted formally on the detailed location, design, construction, appearance and materials for the noise mitigation measures there³¹⁷⁷. Neither the Agency nor BAA had considered all practicable mitigation measures. They should provide insulation for buildings whether or not Terminal 5 went ahead³¹⁷⁸.

My Conclusions on Road Noise Conditions

- 32.5.82 I understand Hillingdon's desire to be responsible for approval of the mitigation measures associated with the Highway Orders but such an approach would be inconsistent with the normal approach in such cases. I do not believe that the road noise issues in this case are so unusual as to justify a departure from normal practice although I would, of course hope that the Agency would consult the appropriate local authorities when preparing their detailed proposals.
- 32.5.83 I have more sympathy with Hillingdon's argument that all practicable measures should be taken to mitigate the effects of noise on those living beside the M4. While the Agency suggested that noise levels would actually improve, this is due to the introduction of the proposed 80 kph speed limit which has nothing to do with Terminal 5. Its introduction would, however, permit the construction of higher noise barrier beside the motorway and a central barrier. I believe that both of these should be provided if the M4 is widened.
- 32.5.84 While I acknowledge that the use of porous asphalt would cost some £1.6m, the use of a quieter road surface would be consistent with the approach set out in the 1998 White Paper. Bearing in mind the volume of traffic already carried by the M4 and the increases associated with the growth of Heathrow in general and Terminal 5 in particular, I consider that a quieter surface should be used throughout if it is to be widened. I do, however, accept that the choice of material should be left to be decided in the light of the best information available at the time the work would be done.
- 32.5.85 I have already said that I do not believe the M4 should be widened. I note, however, that the Government is now considering mitigation measures on existing trunk roads. I appreciate that resources for such work are likely to be limited and priorities will have to be set. Even though I was told that the Agency had no record of complaints related to this part of the M4, traffic related to Heathrow in general and Terminal 5 in particular would increase even if the M4 were not widened. In these circumstances, I would urge

³¹⁷⁴ 5-6.4.3

³¹⁷⁵ 5-6.4.4

³¹⁷⁶ 5-6.4.5

³¹⁷⁷ 5-6.4.7

³¹⁷⁸ 5-6.4.8

the Secretary of State to give very serious consideration to providing noise mitigation measures in any event.

- 32.5.86 I am not, however, convinced of the need for additional measures along the Spur Road. Here I consider that it would be right to rely on the normal approach to the design of the detailed proposals with the proviso that the Agency should consult Hillingdon at that time.
- 32.5.87 As far as BAA is concerned I believe that they may well have under-estimated the effect of the existing fence behind the Bath Road properties in Longford but I have already concluded that the impact of road noise appears likely to be relatively small (para 23.2.25). Consequently I do not consider that additional measures would be necessary, although I support the imposition of Condition A119 (b) proposed by BAA which provides for the provision of a new noise barrier behind these properties. I do not support the conditions proposed by Hillingdon for all of the reasons I have given above.

32.6 AIR QUALITY

- 32.6.1 Since the cases for and against the imposition of conditions related to air quality have already been set out in the Air Quality Topic Report, I merely summarise them here. **BAA** proposed no conditions dealing with Air Quality and argued that those proposed by the authorities were not appropriate. Furthermore there was no national standard for PM_{2.5}³¹⁷⁹. The authorities' proposals did not deal with the proposed development since they related to emissions from the whole of Heathrow rather than those from Terminal 5. Conditions requiring the monitoring of air quality would be needed only if the conditions requiring the control of air quality could be justified³¹⁸⁰. In any event it was not clear how the information sought by the authorities could be produced by means of the proposed conditions³¹⁸¹.
- 32.6.2 Since there was no evidence that significant effects on health would occur, BAA argued that no conditions were necessary. Furthermore they had no control over many sources of pollutants³¹⁸². Government policy required that reductions in emissions should be sought from the most cost effective quarter. Since there had been no evidence that reductions in emissions from Heathrow would be the most cost effective quarter, the proposed conditions would be contrary to policy³¹⁸³.
- 32.6.3 They also suggested that there would be practical difficulties in taking action if the measured concentrations exceeded the levels set in the conditions. This could involve the diversion of aircraft or the prevention of departures which would affect international obligations and have economic consequences³¹⁸⁴. Such conditions were unworkable and it would be absurd to impose a year long restriction on aircraft movements based on

³¹⁷⁹ 6-13.1.1

³¹⁸⁰ 6-13.1.2

³¹⁸¹ 6-13.1.4

³¹⁸² 6-13.1.5

³¹⁸³ 6-13.1.6

³¹⁸⁴ 6-13.1.7

a breach of a limit based on short period measurements. The number of movements or their engine numbers did not correlate with concentrations of pollutants³¹⁸⁵.

- 32.6.4 There was, in BAA's view, no evidence that a condition requiring the production of an action plan for the minimisation of emissions from the airport was justified or that the material and documentation sought by the authorities was necessary³¹⁸⁶. They were also opposed to the conditions proposed by Councillor Murphy. Three of these were not justified while the fourth would require a change in primary legislation³¹⁸⁷.
- 32.6.5 **Hillingdon and Hounslow** jointly argued that Terminal 5 would result in an increased burden of pollutants³¹⁸⁸. They would have to declare Air Quality Management Areas and would need to know what pollutants were coming from Heathrow³¹⁸⁹. They proposed conditions that would ensure that air quality around the airport was monitored and that would set a framework for controlling those emissions attributable to Heathrow. If these proposals were not acceptable a condition should be imposed to require the operators of Heathrow to produce an action plan for the minimisation of pollutants from the airport³¹⁹⁰.
- 32.6.6 The authorities claimed that BAA had resisted every form of control even though Terminal 5 would produce emissions roughly equivalent to those of an average London borough. The Secretary of State expected conditions to be suggested and it was up to BAA to find and offer controls or risk refusal of planning permission for Terminal 5³¹⁹¹.
- 32.6.7 **Councillor Murphy** proposed 4 conditions to ensure that any expansion of the airport would not worsen air quality, to permit the authorities to restrict road and air traffic, to require the airport operators to fund air quality monitoring and research into health effects and to make them liable for any damage to health³¹⁹².

My Conclusions on Air Quality Conditions

- 32.6.8 BAA's opposition to the imposition of any conditions which seek to control air quality around Heathrow is based on their view that there is no evidence that the concentrations of pollutants resulting from Terminal 5 would have any significant effects on health. I have already concluded that Terminal 5 would result in a small increase in the risk to health as compared with the position in 2016 with only 4 terminals. This must mean that there is a case for the imposition of appropriate conditions if they would limit that increase in risk. On the other hand, concentrations of both PM₁₀ and NO₂ are likely to be substantially lower than they were in 1993 even with Terminal 5 (para 25.5.2).
- 32.6.9 I have more sympathy with BAA's argument that the conditions proposed by the authorities were unworkable. While I believe that it would be possible to establish a comprehensive air quality monitoring system around the airport, it would be very

³¹⁸⁵ 6-13.1.8

³¹⁸⁶ 6-13.1.9

³¹⁸⁷ 6-13.1.10

³¹⁸⁸ 6-13.2.1

³¹⁸⁹ 6-13.2.2

³¹⁹⁰ 6-13.2.3

³¹⁹¹ 6-13.2.4

³¹⁹² 6-13.3.1

difficult to identify the contribution made by Terminal 5 alone. Effectively the controls proposed by the authorities would have to bear on the operations of Heathrow as a whole. I see no objection to this in principle and have proposed similar controls in other areas such as aircraft noise but, in my view, the difficulties in this field would be substantially greater.

- 32.6.10 I do not accept that it would be appropriate to impose controls on annual aircraft movements in response to breaches of air quality limits over short periods. Nor do I believe that a limit on the number of aircraft engines used to power departing aircraft would serve any useful purpose. Bearing in mind the improvements in engine technology that have already been achieved and are still being pursued, I believe it would be wrong to assume that the emissions from an aircraft would necessarily be determined by the number of its engines.
- 32.6.11 In addition to the very real problems arising from these technical issues, I accept that the uncertainty implicit in the possible imposition of limits on aircraft movements could involve difficulties in terms of international obligations. While I agree that the capacity of Heathrow can and should be limited, I believe that this should be done in a more certain manner by the imposition of a long term limit on the number of aircraft movements as I have already proposed. This in itself would help control the impact of the airport on air quality.
- 32.6.12 In view of all these points, I cannot support the very detailed proposals put forward by Hillingdon and Hounslow for the monitoring and control of air quality around Heathrow. They are, in my view unlikely to be effective in reducing the impact of Terminal 5 on air quality. On the other hand, I do not accept BAA's argument that no conditions would be justified. As I have already concluded the publication of the National Air Quality Strategy represents a major change in attitudes to air quality (para 25.2.78).
- 32.6.13 I recognise that BAA and Heathrow Airport Limited are already taking steps to reduce emissions from the airport but there is no dispute that Terminal 5 would result in significant increases in those emissions. I, therefore, support the suggestion from the authorities that BAA should produce an action plan showing how they intend to minimise emissions from and attributable to Heathrow. I believe that this plan should cover a 5 year period and be reviewed before the end of that period. A condition should be imposed to ensure such a plan is produced and kept under review.

32.7 PUBLIC SAFETY

- 32.7.1 **LAHTS** argued that the only effective way of minimising the public safety risk of Terminal 5 would be to impose a limit on the number of aircraft movements. This supported the limit of 430,000 movements they had suggested on noise grounds³¹⁹³. They also argued that BAA should be required to purchase residential properties within the 10⁻⁴ risk contour and to compensate owners of properties in the area between the 10⁻⁴ and 10⁻⁵ contours where a proposed development was refused permission due to public safety restrictions resulting from Terminal 5. Finally they sought a condition

³¹⁹³ LAH/7000 para 7.2

requiring assessments of the effects of fear and anxiety to be included in the social surveys they had proposed as part of the package of air noise conditions³¹⁹⁴.

- 32.7.2 **Hounslow** proposed a condition requiring BAA to fund an independent study of the impact of Terminal 5 on emergency planning to bear any increased costs identified by this study³¹⁹⁵.
- 32.7.3 **BAA** argued in response to LAHT5's proposals that their approach to compensation would be guided by Government policy and that the question of surveys was also for the Government not for them³¹⁹⁶. In response to Hounslow, they argued that there was no evidence that the cost of planning for an aircraft crash would be materially different if Terminal 5 were developed³¹⁹⁷.
- 32.7.4 I agree that BAA should be guided by Government policy in matters of compensation so that a condition would not be appropriate. In any event current Government policy already achieves the objectives set out by LAHT5 regarding properties within the 10⁻⁴ contour (para 26.2.12). I have already concluded that a condition requiring them to undertake social surveys would not be appropriate (para 32.5.47). As BAA pointed out there is no evidence that the development of Terminal 5 would increase the costs of emergency planning so I see no justification for the condition sought by Hounslow.
- 32.7.5 I have already concluded that a limit should be imposed on the number of aircraft movements if Terminal 5 is approved. I accept that this is the only effective means of controlling the risk to public safety but do not believe that the limit of 430,000 movements a year proposed by LAHT5 would be the right level. As I have already said this is below the present level and I consider that a limit of 480,000 movements would be correct. This would be justified in terms of air noise alone but would also control and limit the risk to public safety.
- 32.7.6 I have already dealt with the issue of vortices and concluded that a condition dealing with this should not be imposed (para 26.3.8).

32.8 CONSTRUCTION

Introduction

- 32.8.1 The construction topic differs somewhat from others in that the implications of construction extend into areas dealt with as single topics in the remainder of this report. This affects the way the subject of conditions is approached. First, I shall look at conditions such as those dealing with hours of working which are relevant to the construction of virtually all of Terminal 5 and the developments associated with it, and which have environmental implications in more than one way. I shall then turn to conditions relating to the various kinds of environmental impact, for instance noise and air pollution, which would stem from construction operations. Finally I shall deal, in turn, with conditions needed to control the construction of the various, temporary

³¹⁹⁴ LAH/7001

³¹⁹⁵ HOU/11/1 Supplementary

³¹⁹⁶ BAA/2301

³¹⁹⁷ BAA/2304

developments intended to facilitate construction operations. Some conditions fall within more than one of the above categories and in such cases they are dealt with in the section which seems to me most appropriate.

32.8.2 As well as conditions there are a number of areas where legal obligations have been proposed via agreements under Section 106 of the Town and Country Planning Act, or other legislation. I comment, where appropriate, on those obligations relating to construction in the same order as planning conditions, as outlined above. I shall, however, deal with BAA's proposed Assurances more fully in a separate section at the end of this Chapter.

32.8.3 There have been extensive discussions between BAA, the Highways Agency and various objectors, particularly the appropriate local authorities, on the subject of conditions and agreements. This has resulted in considerable areas of consensus and, where this is the case, I record that consensus and keep my comments to a minimum. This Chapter does not attempt an exhaustive analysis of all of the many conditions suggested, and in some minor or non-controversial areas no comments are made at all. In areas where no consensus exists I briefly summarise the parties' positions and give my views on the points.

Matters of General Application to Construction

32.8.4 All of the main parties accepted the need to regulate hours of working and BAA devised a condition that would be of general application³¹⁹⁸. Its main feature would be the designation of core working hours of 07.00-19.00 hours on Monday to Friday, and 07.00-16.00 hours on Saturdays, with no working on Sundays or Bank Holidays. There would be specified exceptions to this general restriction. The main ones would be;

- That the transport of spoil for deposition should be allowed to take place until 21.00 hours during Monday to Friday in the months May to September inclusive;
- That maintenance work should be permitted on Mondays to Fridays between 19.00-23.00 hours and on Sundays between 09.00-17.00 hours;
- That works affecting public service facilities should, in addition, be permitted between 09.00-17.00 hours on Sundays.
- That the loading and unloading of lorries should, in addition, be permitted from 19.00-23.00 hours on Monday to Friday;
- That preparing for and taking delivery of abnormal loads should be permitted at any time.

32.8.5 In addition to these generalised exceptions there would, from time to time, be the need for brief periods of operations during the night, for example to install the Bailey

³¹⁹⁸ BAA/404R No A117

Bridges. It is anticipated that these would be agreed with the local authorities on their individual merits.

- 32.8.6 Hillingdon's counter suggestion involved working hours limited to 08.00-18.00 hours on Mondays to Fridays and 08.30-16.00 hours on Saturdays³¹⁹⁹. They did not favour any generalised exceptions but recognised the need for occasional special cases. Willowslea Kennels took a similar view.
- 32.8.7 In this instance, as in some others, the decision rests to a large extent upon balancing the merits of a less intrusive, but longer, period of operations against a shorter, more intensive programme. It seems to me that the most obtrusive differences between the two options would be in terms of noise impact. I am concerned in particular that an area that necessarily suffers high noise level from the operation of the airport would lose a proportion of the hitherto quieter periods of respite. On the other hand, I doubt that the difference in impact between the two regimes in terms of air pollution and traffic congestion would be very significant, and the more intense programme would mean that construction would be over more quickly. On balance I prefer the more intense regime suggested by BAA.
- 32.8.8 Hillingdon suggested a condition requiring that no element of the overall project should commence without the Local Planning Authority being given notice in writing a month earlier³²⁰⁰. As I noted in paragraph 27.2.2, BAA agreed to the imposition of a condition requiring them to give advance notice in writing before work began on any of the 8 associated applications dealt with in Chapter 27. I believe that this would address the concerns expressed by Hillingdon. This condition would not be imposed on any permission for the diversion and enhancements of the Twin Rivers, the Forward Lorry Park, the Colnbrook Logistics Centre or the deposition of spoil on Plots 1 and 9 (Applications A9-A14). However, these are distinct developments which would not raise problems of overlap with the Principal Site.
- 32.8.9 Spelthorne supported by others suggested that, should Terminal 5 go ahead, an independent "ombudsman" should be appointed. They argued that the person concerned would have to be acceptable to all main parties and his or her responsibility would be to ensure that BAA's undertaking to respond to all complaints promptly and effectively would be carried out. They recognised that BAA intended to respond to complaints in any event, and the presence of an ombudsman should not be seen as casting doubt on their good faith. However, there were bound to be disputes over interpretation of conditions and discontent over remedies, and the presence of an independent third party would increase public confidence. It would be necessary for BAA and the Highways Agency to acknowledge the role of such a person and give a commitment to accept the ombudsman's findings and recommendations. The presence of such a person would also act as an incentive to ensure complaints were dealt with effectively in the first instance. An ombudsman had been appointed for the Channel Tunnel Rail Link³²⁰¹.

³¹⁹⁹ HIL/695 No 1

³²⁰⁰ HIL/699 Para 1.10

³²⁰¹ SBC/206 and Day 497 pp108-109

- 32.8.10 BAA recognised the importance of winning and maintaining public confidence and dealing with complaints swiftly and effectively. They did not, however, believe that the appointment of an ombudsman would help in achieving such an aim. They believed it to be more important for the community to be able to go directly to someone who had a willingness to listen and the power to deal with any complaints made. They cited the success of such a system at the Second Severn Crossing, a recent project that they argued was of a scale not much smaller than Terminal 5³²⁰².
- 32.8.11 I can see both points of view in this issue but I believe that unless all parties were to endorse such an appointment willingly, it would not be worth proceeding. On the other hand, the strong feelings engendered by these proposals demand unusual measures. Whilst the intentions of BAA are to be welcomed, an ombudsman would, in my judgement, provide a useful last resort to deal with the inevitable disputes. I do not consider that this matter should be dealt with by a formal planning condition but I hope that the Secretary of State would urge BAA to appoint such a person should Terminal 5 be permitted.
- 32.8.12 There was almost general agreement as to the need for a condition or conditions to safeguard any archaeological features that are known about or may emerge during construction operations. The measures proposed by BAA, supported by the Highways Agency, involve a written scheme of archaeological investigation and while there was some dispute with Hillingdon, BAA's proposals are in general accordance with national guidelines on such matters³²⁰³. They seem to me appropriate. They are reinforced by assurances such as BAA's intention to appoint an Archaeological Liaison Officer³²⁰⁴.
- 32.8.13 In their Code of Construction Practice, BAA set out in some detail how they intend to operate the construction of Terminal 5. A number of the matters mentioned there are reflected in assurances given by them³²⁰⁵. One group of these covers the construction management structure and the allocation of responsibilities within that structure. Another relates to the relationship between BAA and the local community during construction. In neither case would formal planning conditions be appropriate and the assurances given, whilst not enforceable, seem to me to provide, at the least, a framework for public guidance.
- 32.8.14 One particular assurance, not to provide a "construction camp", reflects local concern on the subject³²⁰⁶. However, BAA agreed that should pressure arise for such from the local authorities or community in favour of a construction camp, they would fund the establishment (and subsequent restoration) of a managed caravan site³²⁰⁷. The Highways Agency, in contrast, assumed that a camp would be established to accommodate some of the workers on the road schemes³²⁰⁸. I do not consider that such provision is an appropriate subject for a condition.

³²⁰² Day 441 pp141-145 and Day 445 p165

³²⁰³ BAA/454

³²⁰⁴ BAA/404R Assurances 13 & 24

³²⁰⁵ BAA/404R Assurances 13-19, 21, 23-25

³²⁰⁶ BAA/404R Assurance 21

³²⁰⁷ BAA/1486 para 8.18

³²⁰⁸ DOT/7010 para 5.2.1

Surface Access as Related to Construction

- 32.8.15 I deal with relatively few conditions or agreements in this section because many conditions with highway aspects are considered elsewhere, for instance in the sections dealing with the temporary developments. Furthermore, relatively few conditions dealing with access are specific to construction.
- 32.8.16 One of the areas which suggested conditions aim to deal with is the encouragement of construction workers to use public transport rather than private cars. One obvious way to achieve this would be to restrict the number of parking spaces available for construction workers. BAA suggested a parking provision of 60% of the predicted number of construction workers (para 28.2.3). Spelthorne, with some general support from other objectors, suggested a maximum of 1000 spaces (para 28.2.30). I accept that a condition governing the provision of this type of parking is necessary, but my recommendation is for a figure different from either of the above suggestions. For reasons I explained in my conclusions (paras 28.2.50-52), I consider that parking provision should be provided for 50% rather than 60% of construction workers. I agree that this should be supplemented by arrangements for the control of street parking in the residential areas close to construction sites (para 28.2.52).
- 32.8.17 On balance I consider that the need to control construction workers traffic is such that the matters covered by BAA's proposed Assurance 29 should be the subject of a planning condition with the substitution of 50% for 60%.
- 32.8.18 Another suggestion made was that there should be a condition requiring the submission and approval of a recruitment strategy incorporating an agreement by potential employees not to bring their car to work, although Spelthorne subsequently accepted that a recruitment strategy would not be an appropriate subject for a planning condition³²⁰⁹. I believe that to expect BAA to be tied to such a condition in changing economic conditions would run the risk of their failing to attract enough of the right quality of employees or contractors. In a project of this size and sensitivity to time constraints such a risk would not, in my view, be justified. I accept the importance of encouraging the use of public transport but I consider this would be done by a combination of the parking restraint referred to above and the provision of adequate and convenient public transport. A key feature of the latter would be the provision, by BAA, of shuttle buses linking car parks and bus and rail stations with construction sites. I therefore agree with the need for a condition requiring the submission and approval of a scheme for such provision as proposed by Spelthorne³²¹⁰.
- 32.8.19 Turning now to suggestions related to lorry traffic, several main areas of control were suggested. The first was a requirement for BAA and the Highways Agency to seek agreement with the local authorities over the routes taken by most of the lorries used in the construction operations³²¹¹. I accept that there is a need for such vehicles to use routes which are not only commercially efficient, but which minimise as far as practicable the environmental impact of large fleets of vehicles travelling regularly over the same roads. To this end BAA proposed "No-go" areas and dedicated off-road

³²⁰⁹ 9-3.5.20

³²¹⁰ 9-3.5.21

³²¹¹ HIL/702 and SBC/206 Condition 12

haulage routes, and would control hours of operation³²¹². Despite such measures it is inevitable that construction lorries would have a noticeable impact upon the area. However, the main routes to be used were examined in detail during the inquiry and I have concluded that the environmental impact of the traffic along them would not be unacceptable.

- 32.8.20 To a large extent the routes chosen were dictated by the capacity and alignment of the various roads, and the projections indicate that the intended routes have the capacity to accommodate predicted traffic levels. Because of the lack of realistic alternatives I doubt that, in practice, more than minor alternatives to the proposed routes would be practicable. A condition or agreement demanding approval of the routes would involve assent from at least three local authorities and there is every chance that disputes would arise, raising anew issues already dealt with at length during the inquiry. I can understand the wish of local authorities to have means to prevent or punish breaches of the undertakings given in this respect by BAA. In the final analysis, however, I believe that it would be both extremely difficult and time-consuming to identify and prove breaches of formal conditions or agreements via normal planning remedies. Given the undertakings by BAA, and the measures they intend to put in place, it would be better to rely upon them to police their own contractors and their drivers.

The Control of Construction Noise

- 32.8.21 **The Highways Agency** said that they had developed proven methodology (based on BS 5228) to control noise from construction, relating the audibility of construction noise to the noise levels existing in the area³²¹³. The approach set out in Circular 18/84 appeared to be the basis for Hillingdon seeking to impose conditions on the draft highway orders³²¹⁴ but conditions could not be attached to highway orders³²¹⁵.
- 32.8.22 The Agency suggested that recent construction contracts provided a possible model for the control of noise levels and working hours³²¹⁶. They added that 07.00 to 19.00 hours Monday to Friday were usual hours for trunk road works³²¹⁷, with some 24 hour working where that was in the public interest, to minimise disruption for traffic on the strategic network. These matters would be discussed and agreed with the local authority. However, control of vehicular movements was not appropriate; any noise from the site works which might exceed the ambient levels and cause an undesirable impact if not properly controlled, was the matter to be considered³²¹⁸.
- 32.8.23 The Agency argued that the planning conditions proposed by Hillingdon were not capable of being used for the purpose intended, as traffic noise from the M4, M25 and A3044 was greater than the noise likely to be generated by construction, and would make the warning and trigger levels totally inaudible. Existing total noise levels were typically about 70dB LA_{eq} 12 hour (freefield) under westerly operations. They proposed an alternative approach, using measured LA_{eq} levels from the M4 traffic as a

³²¹² BAA/404R Assurance 27

³²¹³ DOT/535

³²¹⁴ DOT/551

³²¹⁵ DOT/542 pp28-32

³²¹⁶ Day 511 pp9-10, DOT/535 and DOT/551

³²¹⁷ DOT/535 and Day 511 p96

³²¹⁸ DOT/551

benchmark. Construction noise should not increase this by more than 3dB. This was the lowest extra noise level that could be reliably measured.

- 32.8.24 The Highways Agency would co-operate with Hillingdon to identify receptor sites before the works commenced. However, it was not necessary, sensible, or workable to control the road works by comparing modelled noise predictions very frequently or, as many road construction processes were repetitive, to have data produced on a monthly cycle. The use of $L_{A_{eq} 1 \text{ hour}}$ and $L_{A_{max}}$ for trunk road contracts was established, although measurements of the latter were not reliable due to the effects of other noise sources³²¹⁹. However, construction noise could not be measured independently of other noise sources, even at the action levels suggested by Hillingdon.
- 32.8.25 Except for noisier evening and night operations, such as bridge construction, a monthly informative construction and noise protection plan would not be necessary or justified. The local planning authority would be consulted on such matters in the normal way.
- 32.8.26 The Agency agreed in principle that environmental health protection was appropriate for nuisance arising from road construction noise, and said that agreement could be reached with Hillingdon on this for the works to the M4, and to the Spur Road from the M25. The local authority might be involved if there were consistent breaches, in addition to action being taken by the Agency. However, a requirement to cease all the road works was unlikely, action normally being directed to the particular operations causing the problem. Weekly monitoring reports could be provided by the contractor, although these might often be only of academic interest bearing in mind the high background noise levels in the area now.
- 32.8.27 **BAA** proposed conditions to control construction working hours³²²⁰, the means of access to the various sites³²²¹, deliveries, and parking for construction workers³²²². Rail transport would be used in appropriate cases³²²³. There would be a wide role for assurances in relation to the routing of vehicles, parking for workers, and the provision of monitoring information³²²⁴. Noise barriers would be erected at an early stage³²²⁵. The predicted construction noise levels³²²⁶ assumed that the proposed barrier along the Northern Perimeter Road (West) would be in place throughout the construction programme.
- 32.8.28 They recognised that the long term criteria for construction noise - 55dB $L_{A_{eq}}$ for day-time and 45dB for night-time would be exceeded in some cases. In general, these would be limited to the nearest residential areas. The highest levels during the day were likely to be in the Spout Lane and Bedfont Court areas³²²⁷. Weather variations were unlikely to increase significantly the BAA construction noise predictions because of the distances involved. The predictions were based on neutral conditions³²²⁸.

³²¹⁹ DOT/551

³²²⁰ BAA/1968, and BAA/404R

³²²¹ BAA/404R

³²²² BAA/404R

³²²³ BAA/404R

³²²⁴ BAA/404R

³²²⁵ BAA/404R

³²²⁶ BAA/1416 Addendum, as amended by BAA/1417

³²²⁷ BAA/1416 pp19-23

³²²⁸ BAA/1416

- 32.8.29 BAA also recognised that the night-time criteria would be exceeded as a result of the construction of roads and the Bailey Bridge over the A3044 and the Western Perimeter Road. A noise barrier for the Twin Rivers Diversion had been specified in a proposed condition³²²⁹, and that would limit any breaches of the criteria in Bath Road, Longford to 8dB. It was anticipated that there would be one train travelling to or from the Colnbrook Logistics Centre each night and that would cause significant short term noise levels of up to 96dB in Yiewsley, although the noise level would be less if the train travelled more slowly as seemed likely³²³⁰.
- 32.8.30 Mainly because of noise from the vehicles of construction workers coming onto the sites, there would be maximum noise increases of $L_{A10\ 1\ hour}$ at properties in Bath Road, Longford, the largest (3.6dB) being at No. 615. Apart from one very small increase at Kings Arms SE, other increases would not be perceptible³²³¹, and there would be an overall reduction in road traffic noise levels at all the other receiver sites because of the proposed noise barrier.
- 32.8.31 During evidence to the inquiry, Hillingdon had said that the focus should be on controls under the Control of Pollution Act 1974, observing the concept of best practicable means³²³². Most of the planning conditions now proposed by Hillingdon were contrary to the advice in PPG 24, would be impracticable and unjustified³²³³, and the relationship between them and controls under the Control of Pollution Act was not clear³²³⁴. The reasons for Hillingdon's proposed condition 15 were unknown. The advice in MPG 11 was not relevant to a construction project³²³⁵.
- 32.8.32 The criterion levels put forward by BAA were never proposed as limits for 1 hour measurements, but as long term LA_{eq} . LA_{max} as a criterion had been rejected by BAA and had not been referred to by Hillingdon in evidence³²³⁶. Warning levels so close to agreed generic background levels would be exceeded frequently, and would be very difficult to monitor³²³⁷.
- 32.8.33 Controls on working hours as suggested by Hillingdon must lengthen the construction period, and were more restrictive than those proposed by BAA. They would relate to all vehicles, not just lorries (although lorries would be allowed to arrive and depart in 2 of the peak hours), with no specific exemptions, and more restrictions on abnormal loads³²³⁸.
- 32.8.34 An effective construction programme could not be planned if a new scheme had to be proposed for each period of 3 months every 3 months, with a consequent effect on costs. It would be necessary to make modelled predictions for every possible site in order to decide whether construction noise was likely to be audible there, which would be an immense task.

³²²⁹ BAA/2317, BAA/1416, BAA/4031, and Transcript Day 482 p149

³²³⁰ Day 524 p109

³²³¹ BAA/1416 addendum

³²³² Day 524 p110, and HIL/300

³²³³ BAA/2326

³²³⁴ HIL/300 and BAA/2326

³²³⁵ Day 482 pp194-195

³²³⁶ BAA/1416 pp10-11

³²³⁷ BAA/2326

³²³⁸ BAA/404R

- 32.8.35 The only remedy available to BAA if Hillingdon rejected a scheme would be an appeal to the Secretary of State, with the consequent delays. Meanwhile, under the authority's scheme construction would have to stop for 8 weeks. There appeared to be no control over the powers proposed for Hillingdon to require compensating reductions in noise levels for exceedances, and they were also effectively requiring that monitoring should be undertaken in person rather than automatically. There would be the same difficulties with that as with monitoring ground noise³²³⁹.
- 32.8.36 BAA suggested that noise barriers should be provided around Willowslea Kennels or Robbs Nursery³²⁴⁰. They were also willing to accept a condition saying that "No lorries leaving Robbs Nurseries should turn left into Spout Lane North"³²⁴¹.
- 32.8.37 **Hillingdon** argued that the construction of Terminal 5 would last for a considerable time and extend over a large area. The impact would be comparable to a substantial minerals operation, where MPG 11 gave some guidance on noise levels. The Guidance also said that primacy should be given to planning controls over other procedures, such as control over statutory nuisances under the Environmental Protection Act 1990, where the planning issues were clear³²⁴².
- 32.8.38 The construction noise implications had not been assessed properly by BAA³²⁴³, and at present the effects for shorter periods than a 3 month Leq and a 1 month LA_{eq} could not be predicted because they were too far into the future. However, LA_{eq} covering long periods could mask noise impacts to a considerable extent³²⁴⁴. The use of different averaging periods alone could mean differences of 2dB to 3dB.
- 32.8.39 There should be a Construction Noise Monitoring and Protection Scheme, under which BAA and the Highways Agency should provide modelled noise predictions for each quarter or month ahead for the development, and for each month in the case of the M4 works. These should be for LA_{eq 1 hour} and LA_{max} levels for a programme of works at locations (to be established from time to time) where noise levels were expected to be audible over the next relevant period. The permitted noise levels should not exceed any measurements presented to the inquiry by BAA and the Agency.
- 32.8.40 The scheme for construction noise control should have "warning noise levels" which would trigger avoidance of repeat occurrences where the measured levels exceeded predicted levels. Weekly monitoring reports would be provided by BAA and the Highways Agency (at no cost to the local authorities). There should be a second "action trigger" where the predicted levels which exceeded the criterion levels in the planning conditions were themselves exceeded, and required positive curative or compensatory action to be taken. This would include halting construction work after repeated excesses until revised working practices had been approved by the local planning authority.
- 32.8.41 Conditions could and should be attached to the Highway Orders relating to construction noise. Whilst paragraph 5 of Part IV of Circular 18/84 said that road schemes had a

³²³⁹ BAA/2326

³²⁴⁰ WKL/13, BAA/404R and Day 482 p143

³²⁴¹ Day 482 p143

³²⁴² Day 482 pp154-157

³²⁴³ HIL/695

³²⁴⁴ HIL/695 p3

procedure of their own, there was no prohibition on the imposition of conditions. These road schemes were part of a privately funded development, and the Highways Agency should act in every respect as if it were a private developer³²⁴⁵. Conditions for construction noise in the terms supported by Circular 18/84 should be used and include, but not be confined to, matters such as hours of work and movement for vehicles; a simple scheme for monitoring test levels and preventing excessive noise in worst case situations; a comprehensive Method Statement; a works programme, noise predictions and monitoring; physical measures and operating practices; modelling procedures; trigger levels and action for breaches; a weekly monitoring report; measuring conventions; and use of information and documents³²⁴⁶.

- 32.8.42 The monitoring scheme would allow the operator to choose between curbing the offending activities, or taking action to avoid infringing the trigger levels. The Highways Agency had agreed that contractors needed to be controlled, in conjunction with the local authority, and had said that a framework could be talked about, although the need for it was not agreed by them. The Highways Agency was using 12 hour LA_{eq} criteria, not 1 hour³²⁴⁷.
- 32.8.43 Representative samples would be used for modelling and monitoring. Advice was available in a number of British Standards. The criteria should be 55dB(A) in the day, 50dB(A) in the evening and 45dB(A) at night, and 60dB LA_{max}³²⁴⁸. In these respects, the scheme would be similar to that proposed for ground noise.
- 32.8.44 The whole purpose of BAA's response appeared to be to avoid controls of any kind over their construction activities; the noise arising from them had not been considered by BAA when formulating their proposals. Access hours, abnormal loads and types of vehicle were all matters in contention between BAA and Hillingdon. The local authority suggested that half an hour after the last entry could be the exit limit³²⁴⁹.
- 32.8.45 **Spelthorne Borough Council** supported the measures proposed by Hillingdon³²⁵⁰.
- 32.8.46 **Willowslea Kennels** argued that on BAA's own admission, various standards for noise would be breached³²⁵¹. It would be important before work started to find out what current noise levels were. Acoustic fencing was needed around areas of activity, and noise barriers around the principal site. Continuous monitoring was needed for construction noise although there would be great difficulties in identifying sources. It would be important for proper resources to be available to the local authority to enforce those conditions which were imposed³²⁵².

My Conclusions on Construction Noise Conditions

- 32.8.47 As far as the road works are concerned, I understand Hillingdon's desire to make use of planning conditions since this is the only way in which they can control the operations

³²⁴⁵ HIL/679

³²⁴⁶ HIL/695

³²⁴⁷ DOT/551 and Day 482 pp182-193

³²⁴⁸ Day 482 p181

³²⁴⁹ Day 482 pp160-168

³²⁵⁰ Day 497 p107

³²⁵¹ Day 486 p106 and Day 447 pp189-190

³²⁵² Day 482 pp123-124, 126-127, 134-135, 141-142

themselves. Nevertheless, these works are being promoted by the Highways Agency through Highway Orders and, as such, are subject to different procedures from those applying to planning applications. There are well-established procedures used to control the environmental impact of road works and I found no evidence to indicate that the scale or nature of these proposals are so unusual as to suggest that a departure from the normal approach would be justified. The Highways Agency should be relied upon to consult the local authorities fully as they told me they would and to ensure that appropriate controls are included in the contracts under which the work would be carried out.

- 32.8.48 I now turn to the works to be carried out by BAA. They put forward a wide range of conditions including those covering hours of work to which I have already referred. As I concluded earlier, I prefer BAA's proposed hours of work partly because any more restrictive controls would inevitably extend the construction period (para 32.8.7). Hillingdon sought a more comprehensive system of conditions based on the production of a scheme of working and the use of noise criteria. While I recognise that this would have some merit, I have grave doubts as to its practicality. Essentially Hillingdon's approach depends on an ability to measure the impact of construction noise separately. However, there is no dispute but that background noise levels in this area are already high and I foresee real difficulties in identifying the specific impact of construction noise.
- 32.8.49 I also have some concern over the practical implications of the production every 3 months of the noise monitoring and protection scheme sought by Hillingdon. This would inevitably constrain BAA's ability to plan an effective construction programme while the delay involved in any appeal against the rejection of any such scheme would again lengthen the construction period to the detriment of local residents.
- 32.8.50 This does not mean that BAA should be free to pursue their construction programme without regard to the noise it would cause. As I have already pointed out they have proposed a number of conditions themselves. These include requirements to put in place noise barriers at sensitive locations. They have also given an assurance that they would appoint an Environmental Liaison Officer who would be responsible for reporting regularly to local residents and responding to complaints from them (Assurances 13 and 17). I would anticipate that this process would include the provision of regular monitoring reports on construction noise levels and discussions on remedies for problems that may have arisen. A further assurance (Assurance 19) states that BAA would respond to every complaint within 24 hours. Assuming that BAA follow my recommendation that an ombudsman be appointed, this would provide a further means by which local residents could seek redress.
- 32.8.51 I have therefore concluded that the combination of conditions and assurances proposed by BAA would provide the most effective means of controlling construction noise. Their proposals would, however, be strengthened by the appointment of an independent ombudsman.

The Control of Construction Air Quality

- 32.8.52 Whereas in most other categories of condition there was a measure of agreement between the parties, there was relatively little agreement as to how to approach the

subject of air quality conditions. **BAA's** approach was based upon a large number of assurances allied to relatively few formal conditions. The latter mainly dealt with easily defined and readily controlled aspects of operational methods, and included such matters as the provision of wheel washing facilities and the avoidance of open fires³²⁵³. The assurances related to a much wider range of factors, but mainly concentrated on two areas. The first of these was the monitoring of Dust, PM₁₀ and meteorological factors. BAA did not propose to monitor NO₂ which was seen as a secondary pollutant. The second was a series of operational controls designed to minimise the creation and/or emission of exhaust gases and dust in all its forms³²⁵⁴.

32.8.53 **The Highways Agency** adopted a stance similar to BAA in that, whilst acknowledging the importance of protecting air quality, they sought to rely upon a series of undertakings similar in scope to those suggested by BAA. They argued that these would be reflected in contract documents and a number of the suggested conditions were a relatively normal feature of such contracts³²⁵⁵.

32.8.54 **Hillingdon** adopted a markedly different stance. They devised a complex array of interlocking and detailed conditions which extended over a wide range including the designation of monitoring locations, the means of monitoring, threshold or trigger values and the consequences of exceeding such values. Other areas of proposed conditions covered the design and use of various accesses and haul roads and the operational conditions under which construction would take place, with a particular emphasis on those factors affecting the creation of dust and exhaust emissions³²⁵⁶.

32.8.55 **Willowslea Kennels** also supported the principle of conditions requiring the monitoring of air quality, but emphasised the need for monitoring locations in the vicinity of their premises. They also suggested the inclusion of PM_{2.5} in the list of substances to be monitored. Other conditions relating to air quality were similar in scope to those suggested by Hillingdon but again, understandably focussed upon the area around Willowslea Kennels³²⁵⁷.

My Conclusions on Construction Air Quality Conditions

32.8.56 I accept entirely the importance of protecting air quality and the need to monitor, throughout the construction period, levels of dust, PM₁₀, PM_{2.5}, and, despite BAA's reservations, NO₂. However, I do not consider that, in general, threshold levels should be used to trigger specific responses. It is almost impossible, in most circumstances, to identify the source of changes in air quality, particularly where the identification of such changes might lag days, weeks, or even months behind the change itself. I reject the suggestion that the response to breaches of the thresholds should be the cessation of part or all of the construction process. Such a response could well be an over reaction to circumstances which might have been only temporary and which would, in any event, have changed since the time that the threshold had been breached. The system of assurances given by BAA is an imperfect solution to this problem but it is, in my view,

³²⁵³ BAA/404R Conditions A115 and A120

³²⁵⁴ BAA/404R Assurances 31-73

³²⁵⁵ DOT/558 Appendix 3

³²⁵⁶ HIL/684, HIL/685 and HIL/685A

³²⁵⁷ WKL/13

something which would assist in helping to minimise the effect of construction on air quality without unduly hindering the construction process.

- 32.8.57 I do not support BAA's position in respect of many of the other areas of suggested assurances. In particular, many of the assurances relating to working practices, for instance speed limits, dust regulation measures and the like, could readily be couched as formal conditions and meet the tests of such conditions posed in national guidelines. Many similar conditions are often applied in mineral working operations, a type of development which bears some similarity to a construction project of the size of Terminal 5. I recognise that this would not apply to all of the suggested matters but I believe that assurances in this category should be assessed on an individual basis. Those that could not be transformed to conditions should remain as assurances. I return to this point later (paras 32.10.1-5).

Waste and Minerals Strategy

- 32.8.58 BAA did not prepare a list of conditions specific to this subject, although some of relevance appear under other headings. Some of the main objectors made suggestions and these can be summarised under 4 main headings. The first is that BAA and the Highways Agency should be required to prepare and submit for approval comprehensive and detailed strategies as to how and where they intended to obtain minerals for the construction of Terminal 5 and related development. The second is that a similar procedure should apply to the disposal of all spoil and other waste arising from the development. The issues arising from these suggestions are similar and I consider them together.
- 32.8.59 I explained in my conclusions (para 29.2.31) why I considered that the information provided to the Inquiry by BAA and the Highways Agency amounted to a valid and useable strategy in respect of both of these factors. It would, in my view, be impracticable and pointless to include conditions that would require major areas of evidence, already exhaustively discussed at the inquiry, to be reopened following the granting of permission. I doubt that the achievement of new waste or minerals strategies would result in significant gains in environmental terms and the potentially enormous delays involved in devising and negotiating such strategies could actually increase such problems, as well as making previous predictions unreliable. I see no justification for including conditions such as those suggested.
- 32.8.60 The third suggestion was that BAA should be required to provide a conveyor between the Colnbrook Logistics Centre and the Principal Site. I reject this for the reasons I have already given (para 29.2.23).
- 32.8.61 The final suggested condition would require that sand and gravel be obtained from the reserves in the Bedfont Court area. I accept that there are real and substantial benefits to be obtained from this suggestion and I would not rule out the possibility. However, there are problems to be overcome before Bedfont Court could act as a source for minerals and at the end of the inquiry the resolution of such problems could not be guaranteed. I do not consider that a condition such as that suggested would be justified for the reasons I have already given (para 29.2.21).

- 32.8.62 Turning to somewhat less central matters a condition has also been suggested by the Environment Agency to ensure that no works shall be carried out until provision has been made to fund suitable qualified local authority staff to exercise development control on the sites³²⁵⁸. In my experience, such a requirement would be unprecedented and unjustified under existing policies. So far the “polluter pays” principle has not been extended into this area.
- 32.8.63 Finally, there have been suggestions from more than one source that a condition should be imposed specifying in detail the type and tonnage of materials which would have to be brought in by rail³²⁵⁹. In my view BAA have gone as far as they reasonably could do at this stage of project planning and the volumes of materials to be imported by rail are considerably more generous than in most previous large-scale projects. The information currently available would not allow analysis to be much more detailed than it currently is and in the absence of such analysis it would be impossible to impose meaningful conditions regarding levels of use of the railway for the import of materials. To impose a condition requiring the submission of a future scheme for approval would merit similar criticisms to those that I have applied to the need for a more detailed minerals strategy.

Plots 1 and 9

- 32.8.64 Although the parties prepared separate lists of conditions for Plots 1 and 9, a number of the matters involved were common to both. Many of the conditions in this category were not, in principle, in dispute although opinions differed as to their actual wording. Conditions falling under this heading included those to protect existing trees and landscape features, to agree schemes for the restoration and landscaping of the site on completion, to put in place measures to protect surface water, to avoid increasing the risk of flooding, to prohibit fires on site, and to deal appropriately with any archaeological discoveries. There is also the question of the hours of working to be employed, which I have dealt with earlier in this chapter, and measures to control dust, which I have dealt with when considering air quality. In all of these cases I support the conditions in the form proposed by BAA³²⁶⁰.
- 32.8.65 This left two matters common to Plots 1 and 9 upon which consensus had not been established. The first of these related to pipelines. Hillingdon proposed a number of conditions whose aim was to protect pipelines running through the areas for spoil deposition from the effects of that deposition³²⁶¹. BAA proposed no such conditions and Elf Oil Aviation Ltd, which owns the pipeline running through Plot 1, withdrew its original objection and suggestions for conditions to safeguard that pipeline. I have not been made aware of any other pipelines involved on either site and I therefore see no reason to include conditions safeguarding them.
- 32.8.66 The second matter related to what BAA has entitled “Boundary Zones”. This is an area alongside the River Wray and other watercourses, which should be protected from spoil deposition or other development. BAA suggested conditions relating to both Plots 1 and 9 to achieve such protection³²⁶². Hillingdon did not dispute that such a condition would be appropriate but considered that considerably greater width (up to 50m) was

³²⁵⁸ NRA/13 Condition 3.5

³²⁵⁹ HIL/702, SBC/206 Condition 4 and SBC/206A

needed at some boundaries of Plot 9³²⁶³. I accept the need for such a condition in principle but 50m seems to me to be somewhat excessive. On balance I accept BAA's proposed conditions related to boundary zones.

- 32.8.67 Among conditions specific to Plot 9 perhaps the most fundamental were those relating to the amount of spoil and the final landform. In regard to the former BAA suggested a limit of 730,000 m³, Hillingdon 570,000m³, and Spelthorne 350,000m³³²⁶⁴. In my view BAA's limit is to be preferred for reasons explained in my conclusions (para 30.2.35). These are essentially that the landform that would result would be acceptable in landscape terms and that it would be, on balance, the least environmentally harmful way of disposing of spoil. Spelthorne would wish to see a condition requiring the submission for approval of landform details³²⁶⁵ but I consider that the plans already submitted are adequate for the purpose. The need for further detailed submissions might lead to barren dispute and damaging delays and I see no reason to impose such a requirement. The same applies to landscaping. If, however, the level of spoil were to be restricted to a significantly lesser volume, then conditions requiring approval of amended details of both landform and landscaping would be necessary.
- 32.8.68 These figures do not include the spoil deposited on a temporary basis. In relation to this there is no dispute over a condition limiting the temporary deposition on Plot 9 to 400,000 m³, and requiring its removal, but the parties disagree over the time it should be allowed to remain. Spelthorne suggest 25 months³²⁶⁶ whilst BAA ask for 30 months³²⁶⁷, 5 months longer than their timetable allows. I do not consider that the difference is substantial relative to the overall scale of operations but BAA have not provided any persuasive evidence as to why the extra 5 months is necessary and I prefer the shorter period. Given the temporary nature of this spoil I see no reason for a condition requiring the details of location and landform to be approved prior to deposition. The general location is known and I do not think that the landform of a temporary mound is critical. The need to gain agreement could lead to damaging delays.
- 32.8.69 Whilst all parties accepted the need for conditions relating to access matters, their suggestions varied considerably in detail. BAA's central condition would require the Bailey Bridge route to be taken into use as soon as possible, and at the latest two months after the gaining of the necessary permissions and thereafter to be used for all spoil deposition haulage vehicles³²⁶⁸. Prior to that route being available, access would be from Horton Road, and after its closure access would be solely via Old Bath Road. A separate group of conditions would secure approval of the alterations to and subsequent restoration of the former, and limit the number of vehicles using it to 45 per hour³²⁶⁹.

³²⁶⁰ BAA/404R Conditions D1-D24 and E1-E32

³²⁶¹ HIL/699 Plot 1 Conditions 22-27 and Plot 9 Conditions 30-35

³²⁶² BAA/404R Conditions D7-D10 and E11-E14

³²⁶³ HIL/699 Plot 9 Condition 7

³²⁶⁴ BAA/404R Condition E2

³²⁶⁵ SBC/206 Condition 6

³²⁶⁶ SBC/205 Condition C.3

³²⁶⁷ BAA/404R Condition E7

³²⁶⁸ BAA/404R Condition E8

³²⁶⁹ BAA/404R Conditions E17-E19

- 32.8.70 Hillingdon and Spelthorne both opposed the use of the Horton Road access for spoil deposition³²⁷⁰. In the event that it did go ahead, Spelthorne suggested conditions were broadly similar to those suggested by BAA³²⁷¹. I do not consider that it would serve any useful purpose to prevent any deposition prior to the haul route over the Bailey Bridges being established, and it might well lead to avoidable delays in the project as a whole. At worst the Horton Road access would only be in use for two months which in my view would be tolerable. I accept the need for conditions regarding its provision, configuration and subsequent restoration and I agree with Spelthorne that a condition requiring the cessation of use of the Horton Road access as soon as, or very shortly after, the off-road haul route becomes available for use should also be imposed.
- 32.8.71 There are relatively few conditions which relate only to Plot 1 and most of those are parallel to the Plot 9 conditions I have discussed above. On Plot 1 BAA wished to deposit 70,000 m³ of spoil but Hillingdon suggested a limit of 40,000 m³³²⁷². For reasons explained earlier (para 30.2.35) I consider that the final landform on Plot 1 would be acceptable, and I therefore prefer a condition including the figure suggested by BAA. It should, however, be remembered that Plot 1 is owned by Hillingdon who could use their position to limit the volume of spoil deposited regardless of any planning condition³²⁷³. A condition suggested by BAA specifying that access to the site is to be solely from the Old Bath Road attracted no opposition from objectors and seems to me appropriate³²⁷⁴. Finally BAA suggested a condition providing that spoil deposited on Plot 1 should be limited to that obtained from the Principal Site³²⁷⁵. Hillingdon suggested a similar condition³²⁷⁶ and I see no reason to dissent from BAA's proposal.

Colnbrook Logistics Centre

- 32.8.72 The Colnbrook Logistics Centre would be needed for virtually the whole of the construction period of Terminal 5 and related development, and the condition suggested by BAA is for permission lasting no more than 10 years³²⁷⁷. The Planning Authority, Slough Borough Council, did not object to this development and agreed, in general, with the draft conditions and assurances for it suggested by BAA³²⁷⁸. Spelthorne suggested a modification requiring the use to cease, and all buildings, equipment and hard surfacing to be removed, no later than 10 years after the grant of permission, or within 3 months of the completion of Phase 2 of the Terminal 5 project, whichever is earlier³²⁷⁹. The latter seems to me to better cover all eventualities and I prefer it to BAA's more limited suggestion. Such a condition should, of course, also apply to the access to the site.
- 32.8.73 BAA suggested conditions requiring landscaping and subsequent restoration of the site to agriculture and this seems to me appropriate. I also agree with BAA's proposal for

³²⁷⁰ HIL/699 Plot 9 Condition 4 and SBC/205 Plot 9 Condition 1

³²⁷¹ SBC/205 Annex p10

³²⁷² BAA/404R Condition D2 and HIL/699 Plot 1 Condition 8

³²⁷³ Day 481 p121

³²⁷⁴ BAA/404R Condition D15

³²⁷⁵ BAA/404R Condition D20

³²⁷⁶ HIL/699 Plot 1 Condition 9

³²⁷⁷ BAA/404R Condition B1

³²⁷⁸ Day 487 p42

³²⁷⁹ SBC/205 CLC Condition 1

landscaping to be implemented shortly after the use of the Colnbrook Logistics Centre begins, so as to screen and soften its appearance during operation³²⁸⁰. It has been suggested that these matters, because of their complexity and importance, should be the subject of a Section 106 agreement rather than a condition. I see no reason why an agreement should be more effective than a condition in this context. I do not think it would be necessary to require submission of landscaping schemes prior to the start of development on the site. In the overall timetable of this project requiring the submission of a landscaping scheme within two months and its implementation within 6 months of development beginning seems to me reasonable.

- 32.8.74 Conditions requiring the access to be provided, in accordance with approved details, before the Colnbrook Logistics Centre comes into use are appropriate and were generally uncontroversial³²⁸¹. So, too, was the need for conditions requiring the submission for approval of the details of all buildings and structures, the limitation of parking for employee's cars to 200 and the prohibition of fires on the site³²⁸². There was no agreement as to the details of the hours of working but I have discussed this subject earlier in dealing with matters of general application (para 32.8.7). Spelthorne suggested that a conveyor link between the Colnbrook Logistics Centre and the Principal Site should be provided but, as I have already explained, I do not consider that a condition or agreement requiring such a link would be appropriate.
- 32.8.75 The consortium NRS made a number of suggested amendments to conditions proposed by BAA but, in the main, these related to details of wording and provisions rather than a radically different approach³²⁸³. They made suggestions for new conditions relating to noise and dust but these have been taken into account in my reporting of conditions on those subjects³²⁸⁴. There is one matter specific to the Colnbrook Logistics Centre which has not been covered elsewhere. This is the request that the landscaping scheme for the Centre should be submitted prior to the commencement of development³²⁸⁵. BAA rejected this on the grounds that it was important for the whole Terminal 5 project that the Logistics Centre should be in operation as soon as possible³²⁸⁶. I agree with BAA on this point since the Centre is, in my view, crucial to the construction operations. Landscaping is plainly necessary but its details could be resolved at a slightly later stage with no lasting harm.
- 32.8.76 One area of discussion stemmed from the fact that a considerable part of the Colnbrook Logistics Centre site lies over areas where waste materials have been deposited. Such areas have mainly been restored but there is very little information as to the adequacy of measures taken during these earlier operations to prevent air and water pollution. It is therefore important that adequate measures are put in place to deal with any leachate and gases emanating from the site, to protect ground water, and to limit flooding. The conditions suggested by BAA are generally in accordance with the requirements of the Environment Agency and involve the former gaining approval for schemes to control all of these factors³²⁸⁷. I do not, however, consider that it is necessary for these

³²⁸⁰ BAA/404R Conditions B5-B8

³²⁸¹ BAA/404R Condition B10

³²⁸² BAA/404R Conditions B4, B9 and B13

³²⁸³ NRS/6

³²⁸⁴ NRS/7

³²⁸⁵ NRS/7 Condition CLC/4

³²⁸⁶ BAA/2327

³²⁸⁷ BAA/404R Conditions B14 –B17

conditions to refer specifically to the need for the Environment Agency to approve the proposed schemes. In saying this I rely on the local planning authority to consult all appropriate bodies including the Environment Agency before approving any detailed schemes.

Robbs Nursery Forward Lorry Park

- 32.8.77 There was a large measure of agreement between BAA, Hillingdon and Spelthorne, in principle if not in precise wording, as to the conditions that ought to be imposed on any permission for this development³²⁸⁸. All three parties accepted that permission should be for 10 years and that the site should subsequently be restored. This restoration should include reinstating the verge to Airport Way, de-culverting the watercourse alongside the site, removing buildings and hard surfacing and restoring the site to grazing land. As well as landscaping the site once its use as a lorry park had ceased, BAA intended to carry out landscaping, particularly on the Airport Way frontage, to screen the development whilst in use. I find nothing to criticise in any of these suggestions. Nor do I see any need to comment further upon conditions suggested by both sides such as those dealing with surface water and contaminated waste. There are also a number of suggested conditions such as those dealing with archaeology, hours of working etc upon which I have already commented.
- 32.8.78 The development would involve the creation of a new access to the site from Airport Way. The parties agreed as to the need for conditions requiring approval of the details of that access, the timing of its provision, and the prohibition of lorries turning into Spout Lane North. There was also agreement that the Forward Lorry Park should not be brought into operation until improvements to Stanwell Moor Junction had been carried out, and that the access should be removed when the use of the site ceased. All of these conditions are accepted by the Highways Agency acting as the highway authority and I agree that they are necessary.
- 32.8.79 In the absence of details in the planning application there is a need for the conditions proposed by BAA requiring the submission for approval of details of fencing, lighting and buildings on the Robbs Nursery Site. It was also agreed between the parties that a condition should be applied limiting the use of the site to use as a Forward Lorry Park as described in submissions to the Inquiry.
- 32.8.80 Willowslea Kennels are located close to the proposed site for the Forward Lorry Park and evinced particular concern over its effects. They considered that the conditions proposed by BAA did not go far enough and suggested further ones in several areas of concern³²⁸⁹. A number of the suggested conditions relate to air quality and I have referred to them in the section dealing with that subject. Another suggestion was that BAA should enter into a binding guarantee that Willowslea Kennels would not suffer damage or loss as a result of the construction of Terminal 5 or related development³²⁹⁰. Such a requirement could not and should not, in my view, be the subject of a planning condition. Willowslea Kennels also sought controls over the operations at the Forward Lorry Park. A number of these were accepted by BAA but the others appear to me to

³²⁸⁸ BAA/404R Conditions C1-C23

³²⁸⁹ WKL/13

³²⁹⁰ WKL/13 Undertaking 4.1

be either impracticable or unnecessary. In particular I see no reason for major alterations to the Spout Lane site or the access to it.

- 32.8.81 There remained only a few matters suggested by objectors which are not included in BAA's list of suggested conditions. I do not agree with Hillingdon as to the need for a condition stating that the Forward Lorry Park should not go ahead unless Terminal 5 is permitted since I have assumed that planning permission would not be granted for this development in the Green Belt unless Terminal 5 is approved³²⁹¹. The requirements for a dust management scheme and (specifically) wheel-washers have been dealt with under conditions relating to air quality. The question of lorry routes has been dealt with under traffic conditions (paras 32.8.19-20).

The Bailey Bridge over the A3044 and the Western Perimeter Road

- 32.8.82 BAA's application is for a temporary bridge over the A3044 and the Western Perimeter Road to carry the haul road between the principal site and sites for spoil deposition or the M25/Terminal 5 Spur. BAA suggested, or were prepared to accept, a list of conditions³²⁹². Hillingdon prepared a similar list³²⁹³ and there was considerable overlap between the two lists. Both included suggestions for a condition relating to hours of working, albeit on differing bases, but I have already dealt with that (para 32.8.7). Hillingdon were also concerned that the elevated bridge might be a source of dust in dry conditions but this concern was incorporated within their suggestions for conditions under the heading of Air Quality and need not be specifically considered under this heading.
- 32.8.83 Hillingdon and BAA both included a group of conditions relating to trees, hedges and shrubs close to the site of the bridge. BAA's suggestions provided for matters such as the identification of valuable existing trees, hedges and shrubs, measures for their protection during the construction and use of the bridge, and any necessary replacement³²⁹⁴. Hillingdon's suggestions included similar provisions but added a requirement for a scheme of new landscaping to be carried out within 8 months of the commencement of the development³²⁹⁵. I accept the need for conditions relating to BAA's landscape suggestions but I do not consider that there is justification for new landscaping at an early stage to screen what is only temporary development. In my view, new landscaping would be necessary only to conceal or repair any scars which might be left following removal of the bridge. BAA's suggested condition requiring the safeguarding of the original topsoil for later reinstatement is consistent with this aim and, in my view, appropriate.
- 32.8.84 A second group of conditions suggested by BAA provided for the approval and implementation of schemes for the protection of surface water, the treatment and means of disposal of contaminated materials, and the provision of appropriate flood protection measures³²⁹⁶. Hillingdon suggested conditions relating to the first two but not the last. I think that measures relating to all three matters are necessary and appropriate. The

³²⁹¹ HIL/699 Robbs Nurseries Condition 1

³²⁹² BAA/404R Conditions F1-F16

³²⁹³ HIL/699 Bailey Bridge Conditions

³²⁹⁴ BAA/404R Conditions F13-F16

³²⁹⁵ HIL/699 Bailey Bridge Condition 4

³²⁹⁶ BAA/404R Conditions F7-F11

same applies to conditions suggested by both BAA and Hillingdon relating to measures to protect archaeological features.

- 32.8.85 Conditions providing that any permission granted should run for 5 years, and requiring the submission of design details were uncontroversial³²⁹⁷. Hillingdon suggested, in addition, a condition providing, in essence, that the permission for the Bailey Bridge shall not be implemented unless permission is forthcoming for both Terminal 5 and the M25/Terminal 5 Spur Road³²⁹⁸. As the bridge would not be required unless permission had been given for the main development I see no reason for permission to be granted for it if Terminal 5 were not to be developed. In these circumstances Hillingdon's suggestion condition appears superfluous. The suggested condition requiring the bridge to be removed within three months of its ceasing to be needed seems to me both necessary and appropriate³²⁹⁹.

Deposition to Form the Spur Embankment

- 32.8.86 The only purpose of this permission would be to allow BAA to deposit material should they be in a position to do so before the Highways Agency were able to begin construction of the Spur Road. This leads to the need for conditions designed to avoid the duplication of permissions and confusion as to who is responsible for the implementation of the works. BAA suggested two conditions in addition to a standard condition restricting the life of the permission to 5 years³³⁰⁰. The first of these provided that the deposition of materials should only take place following confirmation of the Spur Road Orders. The second provided that BAA's permission would cease to be effective on the date notified to Hillingdon by the Agency as being the start of their operations to construct the Spur Road.
- 32.8.87 Hillingdon did not raise any significant objections to such conditions and, indeed, suggested a condition similar to the first of BAA's suggestions³³⁰¹. It seems to me that conditions along the lines suggested by BAA would be appropriate and meet Hillingdon's understandable concerns as to who is responsible when development begins. I agree, too, that conditions should be imposed ensuing that the deposition is consistent with the approved form of the Spur Road. I do not, however, consider that Hillingdon's suggested conditions requiring approval of such details prior to work beginning are necessary. Such details should already have been resolved in terms of conditions or undertakings relating to the Spur Road Order. I do, however, find a need for a condition limiting deposition to spoil arising from the Terminal 5 project³³⁰². BAA suggested that this could be achieved by a condition limiting access for vehicles carrying spoil to a route using the Bailey Bridge³³⁰³. Such a condition is justifiable as a means of restricting access to an acceptable route, but seems to me to be an unnecessarily oblique and rather unreliable way of achieving a limitation of the source of the spoil to be deposited.

³²⁹⁷ BAA/404R Conditions F1 and F2

³²⁹⁸ HIL/699 Bailey Bridge Condition 1

³²⁹⁹ BAA/404R Condition F4

³³⁰⁰ BAA/404R Conditions G2 and 3

³³⁰¹ HIL/699 Spur Road Embankment Condition 1

³³⁰² HIL/699 Spur Road Embankment Condition 15

³³⁰³ Day 525 p68

- 32.8.88 I have already commented on general conditions such as those restricting hours of working, and the protection of archaeological interests. Conditions prohibiting fires on the site, ensuring that the translocation of surface grassland is adequately provided for, and requiring schemes for the disposal of water and the treatment of contaminated waste were uncontroversial in principle. So was the requirement for measures to protect trees and hedges during operations. However, the conditions suggested by Hillingdon requiring landscaping on completion are neither necessary nor appropriate to this permission³³⁰⁴. Landscaping should, instead, be dealt with in the context of the Spur Road Order.

32.9 ASSOCIATED APPLICATIONS

- 32.9.1 In Chapter 25 I dealt with various associated applications (identified by BAA as Applications A1-5 and A8). BAA proposed a number of conditions related to these including one requiring that advance notice of the commencement of development be given to the local planning authority³³⁰⁵. There was a dispute about the form of the condition dealing with archaeology but I accept that the wording proposed by BAA is based on the model in Circular 11/95 and PPG 16³³⁰⁶. I see no reason to depart from their proposal.
- 32.9.2 The only other substantial dispute in relation to these applications concerned the fuel farm. I have already concluded that more detailed plans for this development should be submitted (para 27.2.12) and that a condition should be imposed in order to achieve this. With this addition, I endorse the conditions proposed by BAA in relation to applications A1-5 and A8.
- 32.9.3 I have already dealt with applications A6 (the deposition of spoil to form the Spur Road embankment) and A7 (the Bailey Bridge over the Western Perimeter Road and the A3044) under the Construction heading. Application A9 and A10 are for the enhancements of the Twin Rivers downstream of the airport. BAA proposed appropriate conditions to cover these and I have already considered Hounslow's position with regard to a possible financial commitment by BAA (para 13.2.15). I see no reason to change BAA's proposed conditions regarding these works. In particular I have concluded that it would not be appropriate to impose a condition requiring that these enhancements be carried out as a prerequisite of the development of Terminal 5. I do, however, very much hope that BAA would implement them particularly if Terminal 5 proceeds (para 13.2.17).
- 32.9.4 Applications A11 (the Forward Lorry Park), A12 (the Colnbrook Logistics Centre) and A13 (the deposition of spoil on Plots 1 and 9) have also been covered under Construction. The final application (A14) concerns the works needed to carry out the diversion of the Twin Rivers. Again BAA proposed an extensive set of conditions, which should, in my view, be imposed on any permission granted.

³³⁰⁴ HIL/699 Spur Road embankment Conditions 5-10

³³⁰⁵ BAA/404R Conditions G14, H9, I11, J6, K12, L19, M8, N15, O13 and P4

³³⁰⁶ Day 519 p86

- 32.9.5 BAA also proposed a condition to be imposed on the Heathrow Express Extension Order. This requires the approval in writing of the local planning authority for any more than 12.9 mppa to be carried in any calendar year. I have already said that I support this condition subject to an amendment to make it clear that the local planning authority referred to in this context is Westminster City Council (para 32.4.2).

32.10 ASSURANCES

- 32.10.1 I have already referred on a number of occasions to the assurances proposed by BAA. A total of 83 assurances were proposed³³⁰⁷. While I welcome many of these as a means of setting out the intentions of the company they are clearly less effective than planning conditions as a means of controlling the proposed development. Indeed I believe that some of the proposed assurances, particularly those concerned with construction, should be imposed as formal planning conditions.
- 32.10.2 I have already indicated that I consider that the provision of the Heathrow Express Extension should be the subject of a planning condition which would remove the need for Assurance 3.
- 32.10.3 I also believe that Assurances 31-35 dealing with dust monitoring during construction should be imposed as planning conditions in the form proposed by BAA. Although Assurance 36 is not specific it does indicate the approach to be taken if dust becomes a problem and should, in my view also be imposed as a condition. Assurances 37-41 and 43 dealing with PM₁₀ monitoring during construction should also become planning conditions, although I accept that Assurance 42 would not be appropriate as a condition. The monitoring of meteorological conditions during construction as covered by Assurance 44 should be the subject of a planning condition. Assurance 48 should become a planning condition, as should Assurances 49-55 subject to the deletion of the references to BAA's discretion. I also believe that the matters covered by Assurances 56, 57 and 62 should be covered by planning conditions.
- 32.10.4 Turning to the storage of materials, I consider that the matters covered by Assurances 64-68 should be translated into conditions deleting references to BAA's discretion. The same applies to Assurances 74 and 75 which deal with the maintenance of log books recording specific matters in the construction process and to Assurances 76 and 77 which cover the submission of method statements to the local planning authority.
- 32.10.5 I appreciate that the imposition of these additional conditions would go well beyond the normal approach to the control of construction through planning conditions. However, I consider that the evidence clearly demonstrates that the impact of the construction of Terminal 5 and all its associated developments would be so great as to justify exceptional controls. I do not believe that the conditions I have proposed would be an unreasonable burden particularly since BAA have already indicated, through their proposed Assurances, their intention to comply with them.

³³⁰⁷ BAA/404R pp97-114

32.10.6 Finally I endorse the need for the conditions proposed by BAA on the Scheduled Monument Consent sought in relation to Monument No. 61³³⁰⁸.

³³⁰⁸ BAA/404R p 116

33 IVER SOUTH

33.1 INTRODUCTION

- 33.1.1 The planning applications and associated Compulsory Purchase Order for a sludge dewatering plant at Iver South are components of a self-contained proposal submitted by Thames Water Utilities Ltd (Thames Water) and not BAA. The application and associated orders were however considered during the overall Terminal 5 inquiry since the Iver South proposal stemmed from the need to release Perry Oaks for Terminal 5. In practice the proposed terminal cannot be fully developed until a replacement sludge dewatering plant has been commissioned.
- 33.1.2 Although I shall be dealing with the Iver South proposals separately, they are effectively an integral part of the whole Terminal 5 project and I was told by BAA that a decision to refuse permission for Iver South while permitting Terminal 5 would cause substantial problems. Some parties did, however, argue that there were ways of dealing with the sludge currently handled at Perry Oaks other than by permitting the proposed plant at Iver South. In their view, refusal of permission for Iver South would not damage the prospects for Terminal 5, although some accepted that it could cause delay.
- 33.1.3 The proposed site for the replacement sludge works is in the Green Belt. All parties accepted that the proposal represented inappropriate development in the Green Belt so that very special circumstances would be required to justify granting planning permission for it. Thames Water argued that the very special circumstances were derived from the need for Terminal 5 and the need for the whole of the Perry Oaks site to be occupied by Terminal 5 and its associated facilities. They relied upon the evidence of BAA to demonstrate both of these points. Whilst BAA's overall case on the need for Terminal 5 is covered in Chapters 7, 8 and 9 of this Report, their case on their claimed inability to accommodate a replacement sludge plant on Perry Oaks is dealt with in this Chapter. This point would not, of course, come into play unless Terminal 5 were permitted.
- 33.1.4 The availability of an alternative site at Perry Oaks, Mogden or elsewhere was the subject of debate. Buckinghamshire and Berkshire who presented a joint case in this topic suggested a number of other sites, as did local residents. Thames Water pointed to the extensive searches that had been carried out and argued that none of the suggested sites were suitable.
- 33.1.5 Iver South is also in the Colne Valley Park and there was a dispute as to the impact of the proposed development on the Park and on those living in the area.
- 33.1.6 Having considered the evidence and arguments presented to me I have concluded that the main issues in this topic are:
- The impact on the Green Belt;
 - The impact of the proposed works on the surrounding area including that on Colne Valley Park;
 - Whether the sludge works could be accommodated on the Perry Oaks site even if Terminal 5 proceeds;

- Whether the works could be accommodated on another site outside the Green Belt or on one which would be less damaging to the Green Belt, and;
- The question as to whether there are very special circumstances which would justify this inappropriate development.

33.1.7 I shall begin by setting out the background to the proposal much of which was not disputed. I shall then turn to the main issues identified above before setting out my overall conclusions on this proposal.

33.2 BACKGROUND

33.2.1 The Perry Oaks Sludge Dewatering works occupies a site of some 105 hectares between the 2 main runways and at the western end of Heathrow airport. It handles sewage sludge pumped from the Mogden Sewage Works which serve an area of west London with a population of about 1.8 million³³⁰⁹. It was promoted as a possible site for Terminal 4 at Sir Iain Glidewell's inquiry but the Secretary of State agreed with him that the delays involved in decommissioning the sludge works outweighed the advantages of the site³³¹⁰.

33.2.2 These delays were again found to be significant by Sir Graham Eyre after his inquiry into a fifth terminal at Heathrow when the site was promoted as an alternative to development at Stansted. Sir Graham concluded that, although Perry Oaks was in the Green Belt, its development would represent no more than a minimal loss to the Green Belt. He also found that its use as a sludge works was a "grossly profligate waste of land and resources"³³¹¹. Subsequently as I have already explained the 1985 White Paper advocated the removal of the works and the release of Perry Oaks for airport related development³³¹². As a result BAA and Thames Water commissioned a study of the clearance and relocation of the sludge works. This recommended that a maximum of 5 hectares should be retained at Perry Oaks for sludge treatment subject to that being totally consistent with future development of the airport. Otherwise the alternative location should be at Iver South³³¹³.

33.2.3 A subsequent study found that Iver South was the preferred site for a mechanical dewatering plant while both Iver South and Mogden itself would be acceptable for the incineration of sludge. This study accepted as a third option that the possible retention of a small site at Perry Oaks for treatment would be a matter for negotiation between Thames Water and BAA³³¹⁴. Clearance of Perry Oaks began in 1989 and was scheduled to be completed by the end of 1998 with a centrifugal dewatering plant being installed for use until a permanent replacement was available³³¹⁵.

³³⁰⁹ 10-1.2.1

³³¹⁰ 10-1.2.2

³³¹¹ 10-1.2.3

³³¹² 10-1.2.4

³³¹³ 10-1.2.5

³³¹⁴ 10-1.2.6

³³¹⁵ 10-1.2.7

- 33.2.4 The Iver South site lies immediately south of the M4 motorway and west of the M25. Part of the site, which covers in total 13.74 hectares, is occupied by an existing sewage treatment works, most of the rest being used for rough grazing³³¹⁶. At the time of the inquiry consideration was being given by the local planning authority, Slough Borough Council, to its designation as a Wildlife Heritage Site although Thames Water had objected to such a designation. Its former designation as a Site of Special Scientific Interest was removed in 1980³³¹⁷.
- 33.2.5 Buckinghamshire County Council refused permission for an earlier application arising for a sludge dewatering works on a 76.6 hectares site including the present application site in 1982. This had arisen from the proposal for a fifth terminal at Heathrow put forward as an alternative to the development of Stansted³³¹⁸.
- 33.2.6 As a result of an earlier procedural dispute, there were 2 identical planning applications for the sludge works before the inquiry³³¹⁹. Both were supported by a voluntary Environmental Statement with an Addendum³³²⁰. The proposed works would provide for the dewatering of some 1 million m³ of digested sludge a year pumped from Mogden along an extended pipeline to be constructed under Thames Water's general development powers. Although the pipeline does not require planning permission its environmental implications would be material to the decision on the proposed sludge works³³²¹.
- 33.2.7 The sludge would be discharged into 1 of 4 buffer tanks which would provide a capacity of about 2 days to enable emergency works to be carried out without affecting Mogden. Further emergency storage capacity of about 16 days would be provided in 2 lagoons at Iver South in addition to a 3 day capacity at Mogden³³²². The sludge would be compressed in a Press House, the final product having a consistency of 25% dry solids. The filtrate would then be returned to Mogden for further treatment³³²³. The sludge cake would be stored in concrete bays on an area of some 3.1 hectares with a capacity equivalent to about 7 months output from the plant. These would be bounded by 3m high walls and surmounted by gantries 7.5m high³³²⁴. The sludge cake would be used on farmland and in some cases would be stockpiled on the farms³³²⁵.
- 33.2.8 Access to the works would be from the A4 to the south via Lakeside Rd which would be widened to provide a 7.3m carriageway. The junction with the A4 would be improved and an enlarged causeway would be constructed across Orlitts Lake³³²⁶.
- 33.2.9 The Compulsory Purchase Order comprises an area of 12.54 hectares including some land already in Thames Water's ownership which was included to ensure their right to acquire certain outstanding interests³³²⁷. There were originally 7 statutory objectors to the order but 3 of these were withdrawn before the Iver South topic

³³¹⁶ 10-1.3.1
³³¹⁷ 10-1.3.2
³³¹⁸ 10-1.3.4
³³¹⁹ 10-1.3.7 and 8
³³²⁰ 10-1.3.9
³³²¹ 10-1.3.10
³³²² 10-1.3.11
³³²³ 10-1.3.12
³³²⁴ 10-1.3.13
³³²⁵ 10-1.3.14
³³²⁶ 10-1.3.15
³³²⁷ 10-1.3.19

began while another was withdrawn during the inquiry³³²⁸. Subsequently an agreement was reached between Thames Water and the remaining 3 objectors and I was informed of this in accordance with arrangements agreed during the inquiry. As a result these 3 remaining objections to the Order were withdrawn³³²⁹. One non-statutory objection from an agricultural tenant remains with a further 21 non-statutory objections³³³⁰.

- 33.2.10 Although I was originally appointed to hold Inquiries into 2 draft footpath orders, my appointment in relation to them was cancelled and I did not open Inquiries in relation to them. Eventually they were superseded by 2 draft Bridleway Orders (see Appendix E(ii)). These Orders did not come before me but I was advised that no objections had been received to them and that the Secretary of State would make the Orders if and when planning permission is granted for the development which requires them to be diverted³³³¹. They are part of the overall scheme.
- 33.2.11 The development plan as it applies to Iver South reflects the fact that the site was formerly in Buckinghamshire but was subsequently transferred into Berkshire. It comprises the Berkshire Structure Plan, the South Buckinghamshire Local Plan and the Berkshire Replacement Minerals Local Plan³³³². While there have been changes in the Green Belt policy for sewage disposal, the Berkshire Structure Plan is consistent with national policy in regarding such operations as inappropriate development unless they maintain openness and do not conflict with the purpose of including land in the Green Belt³³³³.
- 33.2.12 The Minerals Plan shows a Preferred Area for mineral extraction between the site and the M4 but the only part falling within the application site is a 10m buffer planting strip³³³⁴. Following the transfer of the site from Buckinghamshire, it now lies within Slough which has become a unitary authority following the abolition of Berkshire County Council. Slough is currently preparing its own local plan, a deposit draft having been published in January 1999. This seeks to strengthen the protection already offered to the gap between Slough and London which it defines as a Strategic Green Belt³³³⁵.
- 33.2.13 In terms of national sewage disposal policy, the Government announced in 1990 that the disposal of sewage sludge to sea would cease by 1998³³³⁶. This decision was in accordance with the deadline set by the Urban Waste Water Treatment Directive which also requires that sewage sludge should be re-used where appropriate. In this country recycling sludge to agricultural land is currently considered to be the Best Practicable Environmental Option in most circumstances³³³⁷.

³³²⁸ 10-1.3.22

³³²⁹ 10-1.3.23

³³³⁰ 10-1.3.24

³³³¹ 10-1.3.25

³³³² 10-1.4.1

³³³³ 10-1.4.4

³³³⁴ 10-1.4.5

³³³⁵ 10-1.4.6

³³³⁶ 10-1.4.7

³³³⁷ 10-1.4.8

33.3 THE IMPACT ON THE GREEN BELT

Thames Water's Case

- 33.3.1 Thames Water accepted that the proposed plant would be inappropriate development in the Green Belt and that the issue was whether there were very special circumstances to justify it³³³⁸. It was also necessary to see the extent to which it would compromise the purposes of including land in the Green Belt³³³⁹. They claimed that the proposed development would not lead to unrestricted sprawl on the periphery of London since it would be self-contained and away from urban areas. Nor would it give rise to a risk of merging neighbouring towns. Since it would be approved because of the very special circumstances of the need for Terminal 5 it would not set a precedent³³⁴⁰.
- 33.3.2 Only 1.3 hectares would be brought into the operational area with the remaining additional area (some 2.4 hectares) being planted. Buildings would occupy only some 5% of the operational site area. Consequently there would be no material encroachment into the countryside³³⁴¹. While there would be some loss of agricultural land, this would be balanced by an enhancement of the landscape and some nature conservation benefits. The development would, therefore, be neutral to favourable in terms of its contribution to the achievement of the objectives of the Green Belt³³⁴².

The County Councils' Case

- 33.3.3 The County Councils said that the proposed development would be contrary to the South Buckinghamshire Local Plan Policy GB1 concerning the Green Belt³³⁴³ and pointed out that the site had been described in the 1989 Environmental Study as having a rural setting. It was in one of the first green wedges encountered on leaving west London. Users of the motorways and the Colne Valley Way currently enjoyed open views across the site which contributed to the openness of the Green Belt³³⁴⁴. The proposed development would detract from that openness and encroach on the countryside. The Press House would be industrial in appearance and other features would be visible above the proposed tree screen. The site's rural or semi-rural character would be lost³³⁴⁵. The proposal would fail to achieve any of the objectives of the Green Belt and would cause real and substantial harm to it³³⁴⁶.

Other Cases

- 33.3.4 Colnbrook with Poyle Parish Council supported by the Chiltern Society³³⁴⁷ argued that the proposed development would be contrary to 4 of the 5 main purposes of the Green Belt. It would snip away open space, encroach on the buffer between Iver, Colnbrook and Richings Park and harm the setting of historic Colnbrook. The need for the sludge works should not outweigh Green Belt considerations³³⁴⁸.

³³³⁸ 10-2.2.1
³³³⁹ 10-2.2.2
³³⁴⁰ 10-2.2.3
³³⁴¹ 10-2.2.4
³³⁴² 10-2.2.5
³³⁴³ 10-4.3.2
³³⁴⁴ 10-4.2.2
³³⁴⁵ 10-4.2.3
³³⁴⁶ 10-4.2.4
³³⁴⁷ 10-5.1.2
³³⁴⁸ 10-5.1.3

- 33.3.5 Richings Park Residents Association said that if a sludge works were to be permitted in the Green Belt it should be located alongside development already permitted such as Terminal 5 or Waterside (formerly known as Prospect Park). A pistol was being held to the Secretary of State's head since Thames Water were saying "no Iver South – no Terminal 5"³³⁴⁹. Some of those making written representations also objected on Green Belt grounds³³⁵⁰.

My Conclusions

- 33.3.6 The proposed development at Iver South would be inappropriate development in the Green Belt as Thames Water recognised. I am also satisfied that it would have a substantially greater impact in visual terms than the existing low-key works. The Press House would be a substantial building and there would be extensive cake storage areas surmounted by gantries some 7.5m high. A new access road would also have to be constructed.
- 33.3.7 There would be a loss of openness caused not only by the Press House but also by the associated cake storage areas and lagoons. Even though the visual impact of the development would be softened in the long term, as the proposed planting becomes mature I do not accept that this would completely offset the loss of openness.
- 33.3.8 I also accept that the works would be sited in a relatively narrow gap between built-up areas and as a result would be seen an encroachment into the open countryside. The importance of maintaining the gap between west London and Slough has been recognised in the emerging Slough Local Plan which defines this area as a Strategic Green Belt Gap. While the weight attached to the emerging plan must be limited, I believe that in this particular respect it recognises the significance of the open gap in which Iver South lies.
- 33.3.9 I, therefore, consider that the proposed plant would cause substantial harm to the Green Belt. It would be contrary to national policies and the provisions of the development plan concerning the Green Belt. I have reached this conclusion even without taking into account other ways in which the proposed development would cause harm that could affect the Green Belt. These other impacts are covered in the next section of this Chapter and I shall take them into account when considering whether there are very special circumstances justifying this proposal.

33.4 OTHER IMPACTS ON THE SURROUNDING AREA INCLUDING THOSE ON THE COLNE VALLEY PARK

Thames Water's Case

- 33.4.1 Thames Water pointed out that the site fell within an area identified as damaged landscape in the South Buckinghamshire Local Plan. It was not unspoilt countryside although it did have countryside characteristics³³⁵¹. The application included landscape proposals designed to minimise views of the plant and storage areas while integrating the access road with existing vegetation, maintaining views for walkers and maintaining the semi-rural setting of Old Slade Lake³³⁵². The emergency lagoons would be placed close to the M4 embankment while perimeter

³³⁴⁹ 10-5.2.9

³³⁵⁰ 10-5.6.2

³³⁵¹ 10-2.3.1

³³⁵² 10-2.3.2

mounds would screen the works generally. The Press House would be well away from the Colne Valley Way and would have a dark coloured roof which would help to blend it into the landscape³³⁵³.

- 33.4.2 There would be extensive planting within and around the operational area, the aim being to create a dense spinney within which the works would be set³³⁵⁴. The widened bund across Orlitts Lake, which would carry the pipeline and road, would be planted on both sides in accordance with detailed plans which were being formulated in consultation with English Nature and other relevant bodies³³⁵⁵. Motorists on the M4 would see the planted lagoon embankment and the ridgeline of the Press House, although Thames Water argued that this would be virtually obscured within 10 years as the planting matured³³⁵⁶. Users of the Colne Valley Way would initially have views into the site from several places but these would soon be screened by the proposed planting³³⁵⁷.
- 33.4.3 Following criticisms of some of the photomontages submitted on their behalf, Thames Water had corrections made. They submitted, however, that the revised montages were not significantly different from the original versions³³⁵⁸.
- 33.4.4 Amongst other objections the Colne Valley Park Standing Conference had expressed concern over the effect of the proposals on users of the Colne Valley Way³³⁵⁹. Thames Water recognised that those using the Way would have to cross the new access road but pointed out there would be a maximum of 2 lorries an hour in each direction³³⁶⁰. The visual effect of the proposal would not be substantial as the planting matured. Views to the west would be less open but more heavily vegetated than at present and the proposals would not prejudice plans to convert the Way into a bridleway or to create a bridleway circuit³³⁶¹.
- 33.4.5 Thames Water argued that the proposed development would make the area less rural but would not constitute urbanisation. It would not prejudice the key objectives for the Colne Valley Park³³⁶².
- 33.4.6 They emphasised that no statutory body had objected on ecological grounds³³⁶³. Surveys had shown that the present sewage works contained no habitats or features of more than minor ecological value. There was a 0.3 hectare reed mace swamp in a disused lagoon which provided a breeding habitat for sedge warblers and reed warblers and a locally uncommon hoverfly was present. A kingfisher had been recorded but this species was unlikely to have bred on the site³³⁶⁴. As a result of its own surveys, Thames Water had objected to the inclusion of the application site in the proposed Tanhouse Pit Wildlife Heritage Site as defined in the Slough Local Plan Consultation Draft³³⁶⁵.

³³⁵³ 10-2.3.3
³³⁵⁴ 10-2.3.4
³³⁵⁵ 10-2.3.5
³³⁵⁶ 10-2.3.6
³³⁵⁷ 10-2.3.7
³³⁵⁸ 10-2.3.8
³³⁵⁹ 10-2.3.9
³³⁶⁰ 10-2.3.10
³³⁶¹ 10-2.3.11
³³⁶² 10-2.3.12
³³⁶³ 10-2.3.13
³³⁶⁴ 10-2.3.14
³³⁶⁵ 10-2.3.15

- 33.4.7 Although English Nature had identified an Area of Search for a potential Special Protection Area under the European Birds Directive, which included the application site, they had not objected to this proposal provided certain concerns could be met. The application site was most unlikely to be included within the eventual Special Protection Area³³⁶⁶.
- 33.4.8 The development would cause some disturbance but Thames Water argued that great weight should be given to the proposed mitigation measures. Furthermore the reed mace was on operational land and could be removed at any time by the applicants³³⁶⁷. The data relied on by objectors related to a much wider area and some of it predated the construction of the M25, gravel workings and the filling of Tanhouse Pit. More weight should be given to the material put together by Thames Water and English Nature in respect of the application site³³⁶⁸.
- 33.4.9 Thames Water asserted that the reed mace could be relocated easily as was proposed and said that the suggestion that it should be extended and enhanced would be considered at the design stage³³⁶⁹. In any event reed mace was common in the area and there were other colonies of reed and sedge warblers. This meant that the reduction in the area of reed mace on the site as a result of the development should not be regarded as significantly harmful³³⁷⁰. On balance, the loss of the existing lagoons would not be harmful³³⁷¹.
- 33.4.10 They accepted that the widening of the existing bund across Orlitts Lake to create the new access would disturb birds including rare species but the effect of construction work could be minimised and a condition designed to achieve this had been put forward. Disturbance by traffic using the access once it had been built would be unlikely to have significant effects bearing in mind the high levels of noise and visual interference already affecting the area³³⁷². This stretch of the Colne Brook was of minor ecological value and would be enhanced by the proposed planting on the margins of the bund. The 2 species of beetle present would not be affected³³⁷³.
- 33.4.11 Grazing land to the east of the existing works would be lost but there were other similar areas close by which would provide feeding grounds for birds. There were many other wetland, grassland, scrub and woodland sites in the area which were available to, and used by, birds found at Iver South³³⁷⁴. Whilst there would be change as a result of the proposed development Thames Water argued that it would not be seriously harmful. They also said that it might also be possible to incorporate some of the suggestions put forward by the Berkshire Bird Bulletin at the detailed design stage³³⁷⁵.
- 33.4.12 Thames Water recognised that the cake storage area, the Press House filters and the emergency lagoons might cause odours³³⁷⁶. They had modelled four different situations for the cake storage area and the filters³³⁷⁷. The situation with an

³³⁶⁶ 10-2.3.16

³³⁶⁷ 10-2.3.17

³³⁶⁸ 10-2.3.18

³³⁶⁹ 10-2.3.19

³³⁷⁰ 10-2.3.20

³³⁷¹ 10-2.3.21

³³⁷² 10-2.3.22

³³⁷³ 10-2.3.23

³³⁷⁴ 10-2.3.24

³³⁷⁵ 10-2.3.25

³³⁷⁶ 10-2.3.26

³³⁷⁷ 10-2.3.28

uncovered cake storage area would be unacceptable but, if a cover were used to reduce odour by 80%, no houses would be affected even if the storage area were to become full³³⁷⁸. Subsequent investigations revealed that several types of cover would reach the required standard. Thames Water was therefore satisfied that it would be technically feasible to cover the cake store and achieve the required odour reduction³³⁷⁹.

- 33.4.13 On the rare occasions that the emergency lagoons might be in use, odours might be detected in the vicinity but there would be no unacceptable consequences for amenity even assuming a worst case. This conclusion did not take into account either the masking effect of background odours such as those from the M4 or the effect of improvements at Mogden designed to reduce the odour of the sludge³³⁸⁰. Thames Water argued that there had been no expert challenge to their evidence on odours and that the proposed development would not be unacceptable on those grounds³³⁸¹.
- 33.4.14 They also argued that there had been no expert challenge to their evidence on noise and that there were no reasons related to noise which could properly justify refusal of planning permission³³⁸². The only noise likely to be audible at the nearest houses or industrial premises during construction would be that of percussive piling but contractors would be expected to follow the procedures set out in BS 5228³³⁸³. Noise from the actual operations would be likely to be below background levels although the loading of lorries might occasionally be audible from the Colne Valley Way and walkers would be aware of the conveyors if they were working the area immediately adjacent to the footpath³³⁸⁴.
- 33.4.15 Thames Water calculated that the proposed development would increase traffic on Lakeside Road at the A4 junction by no more than 3.3% while the proposed widening of the carriageway would assist flows³³⁸⁵. Whilst the accident rate on the Colnbrook Bypass was below the national average, over half of the recent accidents had occurred close to the junction with Lakeside Road. The proposed improvements which had been agreed with the Highways Agency should improve safety at this point³³⁸⁶. The objections from the Parish Council were unproven and not supported by the local highway authority³³⁸⁷.
- 33.4.16 The proposed development would not sterilise any mineral deposits and the original minerals objection had been withdrawn³³⁸⁸. Similarly there was no agricultural objection³³⁸⁹. While planning permission was not necessary for the pipeline extension to Iver South, they accepted that any possible environmental implications would be relevant. However, there were no grounds for concern over the environmental impact of this work³³⁹⁰.

³³⁷⁸ 10-2.3.29

³³⁷⁹ 10-2.3.32

³³⁸⁰ 10-2.3.30

³³⁸¹ 10-2.3.31

³³⁸² 10-2.3.36

³³⁸³ 10-2.3.34

³³⁸⁴ 10-2.3.35

³³⁸⁵ 10-2.3.38

³³⁸⁶ 10-2.3.39

³³⁸⁷ 10-2.3.40

³³⁸⁸ 10-2.3.42

³³⁸⁹ 10-2.3.43

³³⁹⁰ 10-2.3.44

The County Councils' Case

- 33.4.17 The County Councils pointed out that there was a strategy and a 5 year action plan for the Colne Valley Park the aims of which included safeguarding countryside from inappropriate development, maintaining and enhancing the landscape, protecting and managing nature conservation resources and providing accessible leisure facilities³³⁹¹. The proposed development would be contrary to the South Buckinghamshire Local Plan Policy R4 supporting the Colne Valley Park. It would risk the Park, which was at its narrowest here, being virtually separated into north and south parts³³⁹².
- 33.4.18 The proposal was contrary to the objectives of the strategy for the Park. It would intrude into open views to the west of the Colne Brook and would detract from the countryside character of the area³³⁹³.

The Parish Council's Case

- 33.4.19 Colnbrook with Poyle Parish Council argued that the land in this area was not damaged; it had merely been untended. It had intrinsic value and its amenity value should be further developed³³⁹⁴. Wildlife and ramblers would be disturbed by the proposed development³³⁹⁵. Furthermore, the proposed works would be more than twice the size of the existing plant and much more intensive. The proposed screening would not be in keeping with the existing character of the land³³⁹⁶. The access across Orlitts Lake would be particularly damaging³³⁹⁷.
- 33.4.20 The Parish Council were also concerned over the increased use of the Colnbrook Bypass. This would put greater pressure on Colnbrook High St which was already used as a rat-run³³⁹⁸. A more accurate traffic model was needed³³⁹⁹.

Richings Park Residents' Case

- 33.4.21 Richings Park Residents Association and Iver Parish Council were strongly opposed to the proposed works³⁴⁰⁰. It would be located on undamaged agricultural land and would set a precedent for other undesirable applications³⁴⁰¹. The site lay within 200m of the nearest house. Local residents had had experiences of the odour from the Slough Sewage Treatment Works and consequently were suspicious of assurances in relation to odour³⁴⁰². Moreover, Thames Water had based their assessment of the impact of odour on properties in Lakeside Road rather than those on Richings Park which were closer³⁴⁰³.
- 33.4.22 The residents believed that the works would have a considerable visual impact with the Press House being 9m and the gantries 8m high. Furthermore the project

³³⁹¹ 10-4.3.1

³³⁹² 10-4.3.2

³³⁹³ 10-4.3.3

³³⁹⁴ 10-5.1.4

³³⁹⁵ 10-5.1.5

³³⁹⁶ 10-5.1.6

³³⁹⁷ 10-5.1.7

³³⁹⁸ 10-5.1.8

³³⁹⁹ 10-5.1.9

³⁴⁰⁰ 10-5.2.1

³⁴⁰¹ 10-5.2.2

³⁴⁰² 10-5.2.3

³⁴⁰³ 10-5.2.4

depended on the continued acceptability of spreading sludge on agricultural land. If this became unacceptable the material would have to go to landfill or be incinerated³⁴⁰⁴. Noise levels were already high but should not be used as a cover for the noise generated by 24 hour operations at this site which would be totally unacceptable³⁴⁰⁵.

Friends of the Earth's Case

- 33.4.23 West London Friends of the Earth argued that the area around and including the application site was of high nature conservation value. The proposed development would cause both immediate and long-term damage³⁴⁰⁶. The area included a range of habitats and should be regarded as an indivisible complex particularly in respect of birds for which these habitats were complementary³⁴⁰⁷. Species recorded over the last 32 years included some which were in drastic decline nationally such as the tree sparrow, bullfinch, song thrush, skylark and linnet³⁴⁰⁸. Given the recent losses of farmland in the Colne Valley, the pasture rough grassland and scrub at Iver South were of crucial value³⁴⁰⁹.
- 33.4.24 The Orlitts Lakes together with Old Slade Lake were particularly secure for breeding birds including tufted duck, great crested grebe, kingfisher and reed bunting. These would suffer from the construction and subsequent use of the proposed access across Orlitts Lake³⁴¹⁰. Old Slade Lake still supported a range of breeding birds and large numbers of wintering wildfowl. The woodland on its western side had been managed by the Berkshire, Buckinghamshire and Oxfordshire Naturalists Trust until they had been forced by financial considerations to give it up in 1992³⁴¹¹.
- 33.4.25 Friends of the Earth claimed that the grazing land to the east of the existing sewage works was of great value to the area being widely used by finch flocks such as the linnet. This would be entirely lost to the proposed development³⁴¹². The grazing land to the west was one of the largest such areas in the Valley and supported a range of bird species in national decline including lapwing and skylarks³⁴¹³. The lagoons on the existing sewage works attracted wintering ducks and migrant waders³⁴¹⁴. Areas of reed also provided a breeding habitat for reed warbler, sedge warbler and reed bunting. Thames Water were wrong to suggest that the transfer of an area of reed mace would provide a replacement habitat for the 2 warblers and, in any event, the proposed area was too small³⁴¹⁵.
- 33.4.26 This part of the Colne Brook supported reed bunting, sedge warbler, kingfishers (which had bred in the vicinity in 1994), and dragonfly. The kingfishers were badly affected by disturbance and the use of the proposed bridge would result in their departure. Woodpeckers would also be disturbed³⁴¹⁶. The proposed development would intrude on areas of nature conservation value with an inevitable reduction in

³⁴⁰⁴ 10-5.2.5
³⁴⁰⁵ 10-5.2.6
³⁴⁰⁶ 10-5.3.1
³⁴⁰⁷ 10-5.3.2
³⁴⁰⁸ 10-5.3.3
³⁴⁰⁹ 10-5.3.4
³⁴¹⁰ 10-5.3.5
³⁴¹¹ 10-5.3.6
³⁴¹² 10-5.3.7
³⁴¹³ 10-5.3.8
³⁴¹⁴ 10-5.3.9
³⁴¹⁵ 10-5.3.10
³⁴¹⁶ 10-5.3.11

biodiversity that would be in breach of Government policy. While the proposed perimeter planting would be of some value it would be small consolation for the loss of the lagoons³⁴¹⁷. The fact that English Nature had not objected was not surprising given their lack of resources³⁴¹⁸.

- 33.4.27 Friends of the Earth also argued that the development would harm walkers, exposing them to increased noise and air pollution. The diverted footpath would run closer to the M4 while views from the Colne Valley Way to the west would be blocked³⁴¹⁹.

Other Cases

- 33.4.28 The Berkshire Bird Bulletin produced a monthly report on bird movements collected by some 100 local observers³⁴²⁰. They argued that this area attracted a wide range of species but pointed out that changes in sewage treatment had had a dramatic effect on species richness producing a decline in waders, tree sparrows and the reed species. The biggest threat from this proposal would be to waders which were entirely dependent on the lagoons³⁴²¹. Four species on the “Red List” of species in danger (tree sparrow, linnet, skylark and reed bunting) were found on existing works. No development which threatened any of these should be permitted³⁴²². Recent observations had confirmed that construction and operational traffic would disturb birds significantly³⁴²³.
- 33.4.29 If the development were permitted the area of reedbed should be extended³⁴²⁴. In addition land adjacent to the motorway could be developed as a partially flooded wetland catering for waders and a wader scrape could be provided at the edge of Old Slade Lake. A significant nest box scheme could be introduced catering for tree sparrows and other species and raised observation platforms could be created³⁴²⁵.
- 33.4.30 Written submissions on behalf of 4 wildlife trusts drew attention to the harm the development would cause and argued that the proposed mitigation package was inadequate³⁴²⁶. Similar arguments were put forward by the London Natural History Society³⁴²⁷.
- 33.4.31 English Nature submitted written representations but did not object to the proposed development. Although it would disturb birds at Orlitts Lake, they said that the harm from that disturbance could be mitigated³⁴²⁸. The widening of the bund across the lake would result in the loss of some open water and its construction would cause some disturbance which might be significant if carried out at unsuitable times of the year. The loss of short grassland and wetland would also be damaging³⁴²⁹. They suggested measures to minimise the impact of the development including restricting work on the bund to certain times of the year³⁴³⁰.

³⁴¹⁷ 10-5.3.12

³⁴¹⁸ 10-5.3.14

³⁴¹⁹ 10-5.3.13

³⁴²⁰ 10-5.4.1

³⁴²¹ 10-5.4.2

³⁴²² 10-5.4.3

³⁴²³ 10-5.4.4

³⁴²⁴ 10-5.4.5

³⁴²⁵ 10-5.4.6

³⁴²⁶ 10-5.5.5

³⁴²⁷ 10-5.5.6

³⁴²⁸ 10-5.5.1

³⁴²⁹ 10-5.5.3

³⁴³⁰ 10-5.5.4

- 33.4.32 Amongst other written representations the Colne Valley Park Standing Conference supported the argument of the County Councils that the development would constitute an urbanising threat and would be intrusive. They claimed that it would be many years before the plant would be screened by the proposed landscaping³⁴³¹.

My Conclusions

- 33.4.33 In setting out my conclusions on the impact of the proposed development on the surrounding area I shall first consider the effect on the Colne Valley Park itself before moving on to its more specific impacts in terms of odour, noise and traffic. Finally I shall deal with the implications of the proposal for the nature conservation interest of the area.
- 33.4.34 I am in no doubt that the proposed development would be contrary to the objectives of the Colne Valley Park and, as such, contrary to Policy R4 in the South Buckinghamshire Local Plan. It would be substantially larger than the existing sewage works and would be operated in a far more intensive manner. As I saw on my site inspection, the existing pump house, which is similar in scale to a domestic garage, is the only significant building on the site. The proposed Press House on the other hand would be 9m high, the walls around the cake store would be 3m in height and the gantries over the store would be 7.5m high. The site would also be visited regularly by lorries delivering sludge cake to farms.
- 33.4.35 Inevitably the proposed plant, including the cake store and gantries, would be visually intrusive particularly when viewed from the open land to the west which is crossed by a public right of way. While its impact would be reduced as the proposed planting matured, I consider that it would take at least 5 years for this to have a substantial effect. I am, therefore, satisfied that the proposal would damage this part of the Park and introduce a more urban character into it.
- 33.4.36 Furthermore there is no dispute but that the Park is at its narrowest in the area. Although I can understand why it is argued that this development could be seen as effectively separating it into 2 parts, I do not accept that this would be so since there would still be open land to the west. Nevertheless, I do recognise that this area is under severe pressure. BAA proposes the Colnbrook Logistics Centre which would lie to the east and which would operate for 10 years, while I also heard evidence elsewhere in the inquiry that a major freight depot has been proposed in the same area (para 31.2.12). I accept that approval of this proposal at Iver South would add to the potential erosion of this part of the Park.
- 33.4.37 However, it would be wrong to pretend that this is an area of unspoilt countryside. I have already considered the character of this part of the Colne Valley Park to the west of the M25 when assessing the impact of the Colnbrook Logistics Centre. Then I found that the area as a whole has little current landscape value (para 31.2.19). As I have already said it is fragmented by major and minor roads and contains many industrial and commercial developments. I also heard at an earlier stage of the inquiry criticisms of the lack of progress in improving the Park since it was established in 1969 with only 2 projects in the Heathrow area being partially completed by 1995 (paras 11.3.8 and 9). I do not believe that such criticism is so relevant to the area around Iver South where progress is now being made in the development of footpaths and bridleways. However, there is no evidence that this

³⁴³¹ 10-5.6.6

proposal would prevent or delay the implementation of proposals for footpaths and bridleways in this part of the Park.

- 33.4.38 I do, however, accept that the proposed development would change the character of the footpaths around the site and in some respects make them less pleasant. The path to the north would be moved slightly closer to the M4 and the embankments around the lagoons would restrict views from it. Furthermore, the additional screening to be planted would close the relatively open views to the west from the Colne Valley Way. In total it would have a significant visual impact on those using the adjoining footpaths and bridleways. People walking along the Way would inevitably be conscious of the presence of the plant particularly when the gantries were operating in that part of the cake store closest to the path or when lorries were being loaded.
- 33.4.39 In overall terms I consider that the proposed development would be contrary to the aims of the Colne Valley Park and that it would reduce the value of the footpaths around the perimeter of the site. The plant would be intrusive for at least 5 years, although the weight to be attached to the harm it would do must be tempered by the fact that the appearance of the area is already damaged.
- 33.4.40 As far as odour is concerned there was no expert evidence presented to counter that of Thames Water. In spite of the doubts raised by some local residents I am satisfied that their assessment gives a fair indication of the likely effect of odours. On that basis, I consider that odour from the cake store is unlikely to cause significant harm as long as the sludge cake is covered in such a manner as to reduce potential odour by 80%. While I accept that some odour would occur when the emergency lagoons were in use this would by definition be an unusual event and I do not consider that the harm caused would be material.
- 33.4.41 I am also satisfied that noise levels are likely to be below background levels for the most part and as such should cause no material harm. I do, however, accept, as I have already said, that people walking or riding horses beside the site on the Colne Valley Way would be able to hear the loading of lorries and the operations of the gantries when they were working close to the path. This is a factor which I have already taken into account in deciding that the proposal would harm the Colne Valley Park.
- 33.4.42 Again Thames Water's evidence in relation to traffic was not challenged by other expert evidence although the Colnbrook with Poyle Parish Council were not convinced that it was an accurate representation of the likely position. In the absence of any objection from either the Highways Agency or the local highway authority, there is little evidence to suggest that the Parish Council's concerns are well founded. I recognise that congestion is a problem during peak hours on many roads around Heathrow but no evidence presented at any time throughout the inquiry identified the Colnbrook Bypass as a cause for particular concern. I have no reason to doubt that this proposal would add no more than 3.3% to flows on Lakeside Road and note that this road is to be widened. Furthermore, the improvements to the junction of Lakeside Road with the A4 have been agreed by the Highways Agency and would in my view help reduce the number of accidents at this point. Consequently I find no traffic objection to this proposal.
- 33.4.43 Finally I turn to the impact on nature conservation interests. The lagoons on the existing sewage works support wintering ducks and migrant waders while the existing reedbeds provide a breeding habitat for reed and sedge warblers and reed

buntings. The eastern part of the application site is a paddock which is, in my view, less valuable although it does provide a feeding area for flocks of finches. Furthermore there is evidence that the application site forms part of a wider area which provides a variety of habitats, the overall value of which is greater than the sum of the parts. This area which includes Orlitts and Old Slade Lakes and the Colne Brook supports a wide range of bird species including some which are in decline nationally.

- 33.4.44 The application site is not part of any statutory nature conservation designation and the removal of its former designation as a Site of Special Scientific Interest appears to have ruled out its inclusion in a Special Protection Area. Although the emerging Slough Local Plan includes it in a proposed Wildlife Heritage Site, Thames Water has objected to this. I must also take into account the fact that English Heritage does not object to the proposed development. As they submitted written representations I cannot accept the suggestion that their failure to object simply represented a shortage of resources. Unfortunately their representations concentrated on the impact of the development on Orlitts Lake so I am unable to judge how far they took into account the wider ecological impacts to which I have referred.
- 33.4.45 I consider that the proposed plant would cause significant ecological harm. This would include not only the loss of the existing lagoons and reedbed on the site of the sewage works and the grassland to the east but also the impact of the widened bund across Orlitts Lake. I accept that the conditions suggested by English Nature would minimise the disturbance caused by the construction of the new access but I consider that the use of the road across the lake would inevitably cause long-term disturbance and reduce the value of the lake.
- 33.4.46 Thames Water have suggested a package of mitigation measures which go some way to mitigating the effects of the development but I do not believe that they would be sufficient to outweigh the harm it would cause. I was, however, impressed by the positive suggestions made by the Berkshire Bird Bulletin on this point. While Thames Water said that they might be able to take some of these forward at the detailed design stage I consider that some additional measures would be necessary if the proposal were permitted. I shall return to this point when considering possible conditions.
- 33.4.47 In the absence of more effective mitigation I conclude that the proposed development would cause material harm to the nature conservation interests of the area.

33.5 THE RETENTION OF THE SLUDGE WORKS AT PERRY OAKS

Thames Water's Case

- 33.5.1 Thames Water said that although they did not accept that its operation was necessarily an incongruous neighbour to an airport, they accepted the Government's position as set out in the 1985 White Paper. They had, therefore, sought a suitable new location³⁴³². Various studies had been carried out between 1986 and 1991 and 2 of these had identified the possibility of retaining the works at Perry Oaks. Thames Water did not however accept the assessment made in the first study that a

³⁴³² 10-2.1.1

site of only 5 hectares would be sufficient; in fact they firmly believed that an area of 9.2 hectares would be needed³⁴³³. Nevertheless, it was for BAA to substantiate the need for the whole of the Perry Oaks site for Terminal 5. Assuming that this was done the need for an alternative site for the sludge works was an inevitable consequence³⁴³⁴.

- 33.5.2 Thames Water also argued that, although BAA had examined 9 theoretical locations for a plant alongside Terminal 5, four of these would involve incineration. Thames Water believed that if incineration had to be pursued it should be located at Mogden rather than at Perry Oaks³⁴³⁵. All of the proposals for a sludge dewatering plant at Perry Oaks would be substantially more expensive to construct and operate than that at Iver South. Construction costs would be likely to be 2.5 times as great as those at Iver South while operating costs would be 40% higher³⁴³⁶. Cost was a very relevant consideration since it was relevant to the question of whether a site could be considered as reasonably suitable³⁴³⁷.
- 33.5.3 Although the County Councils had suggested that the size of the site at Perry Oaks could be reduced, Thames Water said they would not operate a site that was not large enough to make sufficient provision for emergency lagoons and sludge cake storage³⁴³⁸. They had a statutory duty to provide a sewerage system and could not discontinue treatment and disposal of sewage sludge³⁴³⁹.

BAA's Case

- 33.5.4 BAA argued that they needed the whole site at Perry Oaks for Terminal 5. The retention of a sludge works would conflict with their objectives of maximising the use of Perry Oaks and would have serious operational consequences. Furthermore the sludge works would be an unwelcome neighbour for the airport³⁴⁴⁰. Their proposals for Terminal 5 were consistent with national policy that the demand for air travel should be met where and when it arose³⁴⁴¹.
- 33.5.5 The 1985 White Paper clearly contemplated the removal of the entire sludge works and this view had not been retracted notwithstanding changes in technology which meant that the works could be accommodated on a smaller site³⁴⁴². Given the pressure of demand at Heathrow the Perry Oaks site had to be used to the fullest extent practicable. This required the relocation of the entire sludge works³⁴⁴³. Any reduction in area would be unacceptable on policy, operational and capacity grounds³⁴⁴⁴.
- 33.5.6 BAA had originally identified 8 options for the retention of the sludge dewatering operation at Perry Oaks. Four of these had involved mechanical dewatering on sites of about 9 hectares while the other 4 had involved incineration on sites of about 5 hectares and a chimney at least 40m high³⁴⁴⁵. These were the only possible sites

³⁴³³ 10-2.1.2
³⁴³⁴ 10-2.1.6
³⁴³⁵ 10-2.4.1
³⁴³⁶ 10-2.4.3
³⁴³⁷ 10-2.5.13
³⁴³⁸ 10-2.4.4
³⁴³⁹ 10-2.6.1
³⁴⁴⁰ 10-3.1.1
³⁴⁴¹ 10-3.2.1
³⁴⁴² 10-3.2.2
³⁴⁴³ 10-3.2.3
³⁴⁴⁴ 10-3.2.4
³⁴⁴⁵ 10-3.3.1

within Perry Oaks and it was extremely unlikely that a site could be found elsewhere on the airport³⁴⁴⁶. A site of 9.2 hectares would take up almost the entire landside area west of the core Terminal and even a 2.5 hectares site would have a devastating impact on the landside provisions. In any event it was absurd to suggest that a gateway to the country should have a sewage disposal works in front of it³⁴⁴⁷.

- 33.5.7 The County Councils had not pursued the incineration options at Perry Oaks in the light of Thames Water's views³⁴⁴⁸ but BAA had prepared a further option for mechanical dewatering. Although this was the least unattractive option it was still unacceptable. It would result in the loss of aircraft stands, the displacement of facilities and a significant increase in traffic. In all it would reduce the capacity of Terminal 5 by about 3 mppa or 10%³⁴⁴⁹.
- 33.5.8 It would cost an estimated £110m which was 2.5 times greater than the cost of the proposal at Iver South and would cost considerably more to maintain and operate. This would represent an intolerable financial burden on BAA and a huge misuse of resources³⁴⁵⁰. Furthermore, a refusal of permission for Iver South would cause considerable delay to Terminal 5 since it would involve finding and acquiring an alternative site and obtaining planning permission or redesigning Terminal 5 if the plant were to be accommodated at Perry Oaks. This delay should weigh heavily with the Secretary of State³⁴⁵¹. The inclusion of a sludge works at Perry Oaks would have a visual impact and could cause odour problems; even occasional use of sludge lagoons would be unacceptable³⁴⁵².
- 33.5.9 Even the loss of 2.5 hectares from the Perry Oaks site would be unacceptable to BAA since it would affect the ancillary facilities which were essential to the efficient operation of Terminal 5³⁴⁵³. The County Councils' proposal had numerous shortcomings and would be unacceptable in several respects³⁴⁵⁴. The use of closed tanks instead of lagoons would involve the use of expensive chemical odour control equipment and Thames Water doubted the ability to use roofs capable of carrying the weight of aircraft³⁴⁵⁵.
- 33.5.10 There was nothing in the agreement between BAA and Thames Water to force the latter to accept a 2.5 hectares site at Perry Oaks or a smaller site at Iver South. BAA could not compel Thames Water to relocate to Iver South; they had to have a suitable consent³⁴⁵⁶.
- 33.5.11 While BAA accepted that the reference to an incongruous neighbour in the 1985 White Paper referred to the sludge lagoons, the Perry Oaks plant served the whole of West London and was not related to the airport. There was no good reason to locate such a use within the airport³⁴⁵⁷. A replacement plant would be an incongruous neighbour to the new terminal. There would be an undesirable mixing of sludge vehicles and passenger traffic and a risk of smells but the real objection in

³⁴⁴⁶ 10-3.3.2

³⁴⁴⁷ 10-3.3.3

³⁴⁴⁸ Day 516 pp98-99

³⁴⁴⁹ 10-3.3.5

³⁴⁵⁰ 10-3.3.6

³⁴⁵¹ 10-3.3.7

³⁴⁵² 10-3.3.8

³⁴⁵³ 10-3.3.9 and 10

³⁴⁵⁴ 10-3.3.11

³⁴⁵⁵ 10-3.3.12

³⁴⁵⁶ 10-3.3.13

³⁴⁵⁷ 10-3.4.1

this regard was one of image. The presence of such a use was inconsistent with the position of Terminal 5 as a gateway to the United Kingdom³⁴⁵⁸.

The County Councils' Case

- 33.5.12 The County Councils disputed the need for a site as large as that sought by Thames Water³⁴⁵⁹. The 7 months cake store proposed at Iver South was unnecessary³⁴⁶⁰. A site at Perry Oaks could operate with a smaller buffer store with the main bulk being stored on the farms³⁴⁶¹. The emergency lagoons could be located at Mogden³⁴⁶². If necessary they could be reduced by 50% and placed underground at Perry Oaks with their roofs possibly used as aircraft stands³⁴⁶³. This would enable Thames Water to discharge their statutory responsibilities³⁴⁶⁴.
- 33.5.13 Although Thames Water had readily agreed to move from Perry Oaks, the County Councils asserted that the company had not appreciated at the time that the proposed replacement works at Iver South would involve inappropriate development in the Green Belt³⁴⁶⁵. Remaining at Perry Oaks would offer substantial planning advantages in that it would avoid development in the Green Belt and the need for a crossing of Orlitts Lake. There would be no need for a pipeline extension and the environmental impact would be much lower³⁴⁶⁶.
- 33.5.14 They argued that BAA's wish to maximise the use of Perry Oaks was merely an internal policy objective. The references in the 1985 White Paper clearly related to the sludge lagoons rather than a modern dewatering plant and the study carried out by Balfours had contemplated the retention of a sludge treatment works at Perry Oaks³⁴⁶⁷. A modern plant would not be incongruous in an airport. It would produce less odour than that proposed at Iver South and would be masked by other airport smells. The cake store could be covered and traffic segregated while the development could meet exacting design standards³⁴⁶⁸.
- 33.5.15 While some ancillary facilities would be affected, the County Councils argued that this had to be weighed against the harm to the Green Belt arising from the proposal at Iver South³⁴⁶⁹. They also claimed that it was inconceivable that BAA would not wish to proceed with Terminal 5 if they had to surrender 3-5 hectares since they would still have substantially more than 100 hectares available. Any loss of passenger capacity would be of little consequence³⁴⁷⁰.

Other Cases

- 33.5.16 Colnbrook with Poyle Parish Council argued that Thames Water had no operational need to relocate and that a reduction in the capacity of Terminal 5 by 3-5 mppa would not be that great³⁴⁷¹. Thames Water had acknowledged that they did not

³⁴⁵⁸ 10-3.4.2
³⁴⁵⁹ 10-4.4.2
³⁴⁶⁰ 10-4.4.3-7
³⁴⁶¹ 10-4.4.7
³⁴⁶² 10-4.4.10
³⁴⁶³ 10-4.4.12
³⁴⁶⁴ 10-4.4.13
³⁴⁶⁵ 10-4.4.15
³⁴⁶⁶ 10-4.4.16
³⁴⁶⁷ 10-4.4.17
³⁴⁶⁸ 10-4.4.18
³⁴⁶⁹ 10-4.4.19
³⁴⁷⁰ 10-4.4.20
³⁴⁷¹ 10-5.1.10

necessarily regard their operation as an incongruous neighbour to an airport³⁴⁷². West London Friends of the Earth also supported the retention of the sludge operations at Perry Oaks even if Terminal 5 were permitted³⁴⁷³.

My Conclusions

- 33.5.17 As I have already pointed out Government policy still supports the principle of developing the Perry Oaks site for airport related uses (para 3.5.8). I readily accept that technology has changed since the publication of the White Paper in 1985 with the result that sludge treatment can now be carried out on much smaller sites and need not, in all circumstances, be an incongruous neighbour to an airport. Certainly if Perry Oaks were not developed to provide a new terminal a modern sludge works operating on a small part of the site might not be incongruous. Nevertheless, it remains important to bear in mind that Heathrow still operates on an exceptionally small site in comparison with other major international airports.
- 33.5.18 Although the decision as to whether Terminal 5 should be permitted involves a balance between a number of conflicting factors, the evidence of the whole inquiry (which was not disputed during this topic) is that there is very great demand for air travel at Heathrow. As I have already found, it is national policy that this demand should be met where and when it arises (para 3.6.2). I also concluded that I believe that Terminal 5 is needed if the objective of that policy is to be met (para 8.3.57). It must, therefore, follow that anything which reduces the capacity of Terminal 5 would be undesirable from a national policy perspective even if the actual capacity still exceeded the 80 mppa assumed by BAA. While the County Councils and others suggested that a reduction of 3-5 mppa would not be significant, I do not agree. Such a reduction would restrict the capacity of Heathrow to meet the demand for travel and would damage the competitive position of the airport and those British airlines operating from it. It would also have wider implications on the national economy. I am therefore firmly convinced that the retention of a sludge treatment works would be undesirable from a capacity point of view if Terminal 5 is permitted.
- 33.5.19 This view is based on the assumption that such a plant would occupy a site of at least 5 hectares. Although I note that Thames Water believe a site of 9.2 hectares would be required for a mechanical dewatering plant, I accept that it might be possible to reduce that by reducing the extent of the cake storage area – a point to which I shall return. I do not, however, accept that such a plant could be accommodated on a site as small as 2.5 hectares since this relies on a significant reduction in the capacity of the emergency lagoons at the plant. I do not consider this to be feasible or desirable. It also involves the use of chemical odour control equipment and underground storage with roofs capable of bearing the weight of aircraft. In my view, the evidence does not demonstrate that such solutions would be feasible particularly under circumstances as demanding as those at Heathrow. Even if the sludge works could be restricted to a site of no more than 2.5 hectares I believe that it would affect the efficient operation of Terminal 5. It would inevitably affect some of the ancillary facilities which would be essential to the new terminal.
- 33.5.20 The issue of the retention of the sludge works at Perry Oaks also raises wider issues. While I accept that the use of modern technology would make any treatment less

³⁴⁷² 10-5.1.11

³⁴⁷³ 10-5.3.14

intrusive than the original lagoons were, the risk of occasional smells would remain and traffic to and from the sludge works would inevitably use the same approach roads as passengers. Terminal 5 is intended to serve as a major gateway into this country. I agree with BAA that it would be “absurd” to locate a sludge treatment works on the same site as such a prestigious gateway³⁴⁷⁴. While a modern plant might not be an incongruous neighbour to some airport uses, I strongly believe that it would be incongruous next to Terminal 5.

33.5.21 Accordingly I do not consider that the sludge treatment operations could or should be retained on the Perry Oaks site. Assuming Terminal 5 is to proceed the sludge works should be moved elsewhere. The next issue is whether there is a reasonably suitable site other than that at Iver South.

33.5.22 The fact that a sludge works on Perry Oaks would be substantially more expensive to construct and operate has played no part in the reasoning leading to these conclusions but it is a factor which could properly be taken into account. Even if BAA were to pay all of the costs involved it would impose a significant financial burden on them and would not, in my view, be an effective use of resources.

33.6 THE AVAILABILITY OF OTHER SITES

Thames Water’s Case

33.6.1 Thames Water confirmed that their preference was to continue to producing sludge cake for disposal to agricultural land. This practice which was in accordance with both European Union requirements and the Government’s view that the recycling of sewage sludge to agricultural land was the best practical environmental option in most circumstances³⁴⁷⁵. They had carried out 2 site selection searches and the Iver South site that had emerged had then been subjected to further environmental assessment³⁴⁷⁶.

33.6.2 They claimed that although the County Councils had put forward 4 possible sites as alternatives, any replacement plant on at least 3 of these would have had to be fully enclosed. All would require access improvements and it was unlikely that planning permission would be granted for any of them³⁴⁷⁷. The availability of the sites was uncertain³⁴⁷⁸.

33.6.3 All seven sites put forward by the Richings Park Residents Association were in the Green Belt and further work carried out by Thames Water had shown that Iver South was the least constrained site³⁴⁷⁹. Slough Sewage Treatment Works was closer to housing and the proposed site there was on higher quality agricultural land. It would require a further 9.5km of pipeline and would be more expensive to build and operate³⁴⁸⁰.

33.6.4 The implications of using a site beyond the Green Belt had been explored by Thames Water using land adjoining Bracknell Sewage Treatment Works as a test site. They had found that this would involve some 25km of additional pipeline and

³⁴⁷⁴ Day 516 p126

³⁴⁷⁵ 10-1.4.8 and 10-2.5.1

³⁴⁷⁶ 10-2.5.2

³⁴⁷⁷ 10-2.5.3

³⁴⁷⁸ 10-2.5.4

³⁴⁷⁹ 10-2.5.5

³⁴⁸⁰ 10-2.5.6

2 booster stations. It would be substantially more expensive and would have operational disadvantages as well as causing significant environmental disturbance³⁴⁸¹.

- 33.6.5 Thames Water had also considered a switch to incineration but were reluctant to abandon their established disposal route³⁴⁸². If necessary an incinerator could be accommodated at Mogden but Thames Water would not wish to locate one at any other site³⁴⁸³. Although planning permission had been granted for incinerators in east London at Beckton and Crossness, both had been much further from the nearest housing than was Mogden. Furthermore there were 3 high rise blocks of flats close to Mogden. While an incinerator at Mogden was practicable in engineering terms it was less desirable than the Iver South proposal³⁴⁸⁴. Apart from the other considerations it would use valuable land on a constrained site³⁴⁸⁵. There was insufficient land for a mechanical plant at Mogden³⁴⁸⁶.
- 33.6.6 They had re-assessed the alternatives of incineration at Mogden and mechanical dewatering at Iver South in 1991 and had concluded that the latter was the Best Practicable Environmental Option. They had then commissioned an independent environmental assessment of the Iver South proposals which had included studies of alternative options³⁴⁸⁷. The resulting Environmental Statement concluded that the application of dewatered sludge to agricultural land was the preferred option. There was already an established market in the area while the fact that the sludge had already been digested meant that most of the potential for energy generation through incineration had already been exploited³⁴⁸⁸. The study had also considered 50 possible alternative sites for a dewatering plant of which 46 had been eliminated. All 4 of the remaining sites had been in the Green Belt and all compared unfavourably with Iver South³⁴⁸⁹.

The County Councils' Case

- 33.6.7 The County Councils argued that incineration at Mogden was a feasible option that would avoid the use of Green Belt land³⁴⁹⁰. The scale of the operation had been a significant factor in the decision to construct an incinerator at Beckton and Mogden was second only to Beckton in size in the Thames Water area. The choice of Iver South had been made at a time when it had not been appreciated that the development would be inappropriate in Green Belt terms. They said that that meant that the choice had been flawed³⁴⁹¹.
- 33.6.8 Incineration at Mogden remained an option. Land was available and it was well placed in relation to the strategic road network. Green energy could be recovered and the loss of recently incurred capital expenditure should be set against the savings of not developing Iver South³⁴⁹². Thames Water had shown that they could obtain acceptance of incineration at Beckton³⁴⁹³ and the delay that might arise was

³⁴⁸¹ 10-2.5.7
³⁴⁸² 10-2.5.8
³⁴⁸³ 10-2.5.10
³⁴⁸⁴ 10-2.5.9
³⁴⁸⁵ 10-2.5.15
³⁴⁸⁶ 10-2.5.11
³⁴⁸⁷ 10-2.1.3
³⁴⁸⁸ 10-2.1.4
³⁴⁸⁹ 10-2.1.5
³⁴⁹⁰ 10-4.5.1
³⁴⁹¹ 10-4.5.2
³⁴⁹² 10-4.5.3
³⁴⁹³ 10-4.5.4

the consequence of their original flawed decision. It should not be used as a basis for rejecting Mogden³⁴⁹⁴.

- 33.6.9 Four other possible sites were put forward by the County Councils, two of which would accommodate an operational area of the scale proposed at Iver South. All were in the urban area and suitable for industrial development³⁴⁹⁵. None was put forward as the alternative site but they showed that there was a reasonable prospect of a suitable alternative site being found³⁴⁹⁶. A site should not be excluded as an alternative on cost grounds without considering the full financial arrangements including the true value of land at Perry Oaks³⁴⁹⁷.

Other Cases

- 33.6.10 Colnbrook with Poyle Parish Council argued that Thames Water's decision not to promote incineration at Mogden had failed to take into account the possible benefits of incineration in term of producing energy. The assumption that there was a market for sludge cake was unproven since the product was virtually given away³⁴⁹⁸. Richings Park Residents Association argued that the works should stay at Perry Oaks or be located on land not in the Green Belt. At worst it should be sited on Green Belt land already spoiled by gravel extraction. They had put forward 7 possible sites. Although they accepted that all of these were in the Green Belt, they argued that Iver South was the least attractive. Although other sites had been the subject of landfilling, there was no technical reason why they should not be used even if the need for piling would increase costs³⁴⁹⁹.
- 33.6.11 Among those making written representations some argued that Thames Water should pursue incineration at Mogden or choose another site if the development could not be accommodated at Perry Oaks³⁵⁰⁰.

My Conclusions

- 33.6.12 While I accept that the sites identified by the County Councils were intended simply to demonstrate that there was a reasonable prospect of a suitable alternative site being found, I am not convinced by the evidence that such a prospect exists. It is clear that all of the sites they identified in the urban area were likely to be in demand for other uses. I do not find this surprising in view of the evidence submitted to the inquiry related to existing development pressures around Heathrow. I believe that it would be extremely difficult to find a site in the built up area of west London which could be used as a sludge treatment works.
- 33.6.13 While Richings Park Residents Association put forward other sites, these were without exception also in the Green Belt and I find no reason to believe that their development would be materially less damaging than the present proposal at Iver South. I am satisfied that Thames Water were the only party to carry out an extensive examination of potential sites and accept their conclusion that Iver South was the least constrained of the sites they examined including Slough. This is consistent with the results of the previous site selection processes all of which

³⁴⁹⁴ 10-4.5.5

³⁴⁹⁵ 10-4.5.6

³⁴⁹⁶ 10-4.5.7

³⁴⁹⁷ 10-4.5.8

³⁴⁹⁸ 10-5.1.12

³⁴⁹⁹ 10-5.2.7-8

³⁵⁰⁰ 10-5.6.3

identified Iver South as the most suitable site for a relocated mechanical treatment site. I am, therefore, satisfied that Iver South is in fact the most suitable site.

- 33.6.14 The evidence also demonstrates to me that there would be operational problems in locating the treatment works beyond the Green Belt. A long pipeline would have to be constructed and booster stations provided with possible environmental implications. Inevitably the costs of construction and operation would be increased. In the light of all the evidence I consider that there is no reasonable prospect of an alternative site emerging which would be more suitable (or less damaging) than that now proposed.
- 33.6.15 I recognise that Thames Water accepted that, in engineering terms, an incinerator could be operated at Mogden but I believe that there must be very considerable doubt whether such a plant would be granted planning permission. While incinerators have been permitted elsewhere there was no dispute that the Mogden site is much closer to housing than had been the case at Beckton and Crossness. Even if an incinerator at Mogden could be used to reclaim energy, I am far from convinced that it would be a preferable solution in planning terms. At the very least it would be likely to stimulate widespread opposition.
- 33.6.16 At the same time I accept that the disposal of sewage sludge by recycling it to agricultural land is in accordance with European and national policy being the best practical environmental option in most circumstances. I conclude that it is consistent with sustainable development principles and that Thames Water are right to prefer it to incineration. In this respect the comparison with Beckton and Crossness is unhelpful since both of these sites are in east London and I accept that the disposal of sludge to agricultural land would be less easy to achieve than it is here.
- 33.6.17 In my view, Thames Water have made all the efforts that could be reasonably expected to reach the right decision. They made a direct comparison between incineration at Mogden and mechanical dewatering at Iver South in 1991 and then commissioned an independent environmental assessment of Iver South that included a comparison of alternatives. In both cases the benefits of mechanical dewatering at Iver South were confirmed.
- 33.6.18 In reaching my conclusion that no reasonable or realistic alternative site is likely to become available either at Mogden or elsewhere I have not needed to place any weight on the problems caused by a potential delay in providing a replacement for the existing Perry Oaks plant. Nevertheless, I accept BAA's argument (para 33.5.8) that a refusal of permission for Iver South would inevitably delay the provision of Terminal 5. This would apply whatever alternative site were preferred including the replacement of the works on the Perry Oaks site itself and should, I believe, carry substantial weight if the Secretary of State took the view, in spite of all the evidence to the contrary that I have set out above, that such an alternative existed.

33.7 VERY SPECIAL CIRCUMSTANCES JUSTIFYING DEVELOPMENT IN THE GREEN BELT

Thames Water's Case

- 33.7.1 Thames Water argued that the very special circumstances justifying the development would arise from a decision by the Secretary of State that Terminal 5

was needed in the national interest and that there was no alternative site available³⁵⁰¹. While it would be possible for the mere desire to improve the airport to constitute very special circumstances, that would be for BAA to substantiate. Thames Water would not accept that there would be no room for a dewatering plant at Perry Oaks in the absence of Terminal 5 without proof from BAA. Nor did they accept that a modern plant would be an incongruous neighbour for some unspecified airport use³⁵⁰².

BAA's Case

- 33.7.2 BAA said that it would be logically possible to grant permission for the Iver South development while refusing permission for Terminal 5 outright but accepted that the case for this had not been made at the inquiry³⁵⁰³.

The County Councils' Case

- 33.7.3 The County Councils argued that it was for the applicants to demonstrate that there were very special circumstances to justify the proposed development. Even if there was a need, it was material to consider whether that need might be met elsewhere with fewer disadvantages particularly if a non Green Belt site could be identified. Such a site would not have to be more suitable for the applicants and it would be legitimate to conclude that the need could be met elsewhere without reference to a particular site³⁵⁰⁴. If the need could be met elsewhere the application should be refused even if this involved a delay³⁵⁰⁵. It might be possible for BAA to stage the implementation of Terminal 5 in such a way as to give Thames Water more time in which to relocate³⁵⁰⁶.
- 33.7.4 There would be no special circumstances to justify this proposal if permission were to be refused for Terminal 5 and a replacement modern works could not be described as incongruous³⁵⁰⁷. The most compelling case would have to be demonstrated to justify the proposed development at Iver South since it would cause real harm. It was unreasonable of Thames Water to insist that they needed all the emergency lagoons and 7 months cake storage³⁵⁰⁸.

My Conclusions

- 33.7.5 The central point in deciding whether very special circumstances apply in this case is the need for Terminal 5. I am in no doubt that if the Secretary of State decides that Terminal 5 is needed in the national interest, this would become a very powerful argument in favour of permitting Thames Water to relocate its sludge works to Iver South. I accept that this need might not be conclusive in deciding the application for this proposal if there was evidence that the sludge works could be accommodated elsewhere. I have, however, already considered this point and concluded that it could not be properly retained at Perry Oaks with Terminal 5. I have also concluded that it was unlikely that another site could be found, without or outwith the Green Belt, which would be less harmful than Iver South.

³⁵⁰¹ 10-2.6.2
³⁵⁰² 10-2.6.3
³⁵⁰³ Day 512 p82
³⁵⁰⁴ 10-4.6.1
³⁵⁰⁵ 10-4.6.2
³⁵⁰⁶ 10-4.6.3
³⁵⁰⁷ 10-4.6.4
³⁵⁰⁸ 10-4.6.5

- 33.7.6 In these circumstances I consider that if Terminal 5 were needed in the national interest that need would be sufficient to outweigh the harm caused by the proposed sludge works. This harm includes not only the impact on the Green Belt but also the damage to the ecology of the area which I have already identified. This means that very special circumstances would exist and that planning permission should be granted for this application. In reaching this conclusion I have assumed that the conditions I recommend below would be imposed
- 33.7.7 The position would be very different if permission were not to be granted for Terminal 5. I recognise that it remains Government policy that the Perry Oaks site should be released for airport related development but the force of this is arguably reduced by the fact that it is now accepted that a modern dewatering works could be accommodated on a site of less than 10 hectares. I also accept that such a works might not be an incongruous neighbour for some forms of airport-related development. While I am in no doubt that it should not be located immediately next to Terminal 5 for the reasons I have already given, the same arguments would not apply to all forms of development which might be associated with Heathrow.
- 33.7.8 Whilst this suggests that the Iver South development should not be permitted in the absence of Terminal 5, the evidence placed before me confirmed that Heathrow occupies a particularly small site for a major international airport and that there is likely to be pressure on land within and beyond the airport. Furthermore, the Hillingdon Structure Plan includes policies to prevent development not directly related to the airport within its boundaries and the clear implication of Government policy for Perry Oaks is that it should be considered as part of the airport. In these circumstances and notwithstanding the arguments of the County Councils, on the basis of all the evidence I heard at these inquiries, I am of the view that there is a sound and even strong case for permission to be granted for Iver South if permission were refused for Terminal 5. Such a permission would, of course be without prejudice to the need for any airport related development that might be proposed for the Perry Oaks site to be considered in relation to their environmental, policy and other implications.
- 33.7.9 However, BAA did not make the case for Iver South to be permitted if planning permission were refused outright for Terminal 5. Consequently other parties who might have wished to participate in the debate on this point did not do so and I had no opportunity to hear their views. Even the County Councils, who did make some comments, might have dealt with the point more fully if BAA had put their case differently. Having considered this point after the inquiry in the light of all the evidence and submissions, I believe that it would be neither fair nor proper for me to recommend that permission be granted for Iver South in the event of an outright refusal of permission for Terminal 5. This conclusion does not change the views I have expressed above on the merits of the case based upon the evidence that I did hear. Bearing in mind the provisions of the Hillingdon UDP and the history of Heathrow where previous decisions have been influenced by difficulties over the decommissioning of the Perry Oaks works, I remain of the view that there is much force in the argument that the time has come for a clear decision to be reached.

33.8 CONDITIONS

- 33.8.1 The main parties agreed that all but 2 of the 37 conditions set out by Thames Water in Document THW/66A should be imposed. I am satisfied that the agreed conditions should be adopted. Condition 4 put forward by the County Councils was the subject of some dispute with the County Councils seeking to ensure that the

proposed development would be carried out in general accordance with the proposals placed before the inquiry. Thames Water, on the other hand, argued that these proposals were purely illustrative and suggested an alternative condition requiring the detailed plans subsequently submitted to be generally in accordance with drawings placed before the inquiry³⁵⁰⁹.

- 33.8.2 The County Councils also put forward Condition 6 which sought to remove permitted development rights which they believed could cause significant harm to the Green Belt and the Colne Valley Park. Thames Water argued that the General Development order would provide adequate control³⁵¹⁰. The Environment Agency put forward a condition to prevent water pollution³⁵¹¹.
- 33.8.3 As far as the 2 conditions in dispute are concerned I believe that the County Councils' proposals would be too onerous. Thames Water's condition 4 would be less onerous but would still ensure that the proposed development was generally consistent with the plans placed before the inquiry. I believe this to be sufficient. Regarding Condition 6, I accept that some forms of development permitted under Part 16 of the General Permitted Development Order could have a significant impact. I am not convinced, however, that the circumstances of this case are so unusual as to justify an exception to the normal approach in this respect. Consequently I do not believe that condition 6 should be imposed.
- 33.8.4 I have drawn attention to the impact the proposed development would have on the surrounding area. In my view this could be reduced if the size of the proposed development were reduced. The County Councils argued that the emergency lagoons need not be provided at Iver South. They suggested that the proposed provision for emergency storage of sludge was excessive³⁵¹² and that it could be provided at Mogden³⁵¹³. Thames Water argued that the emergency lagoon capacity was needed to accommodate a catastrophic event³⁵¹⁴ and pointed to operational difficulties and environmental disadvantages in providing such capacity at Mogden³⁵¹⁵.
- 33.8.5 I accept that there would be occasions when emergency lagoons would be needed and that the consequences of not providing them could be severe in terms of potential pollution. I also agree with Thames Water that there would be practical difficulties if the emergency storage were located at Mogden. Consequently I see no prospect for reducing the scale of the proposed emergency lagoons at Iver South.
- 33.8.6 The position in relation to the proposed sludge cake storage areas is different. As I have already pointed out the County Councils argued that the 7 months capacity proposed by Thames Water was excessive. While I do not believe that this point affects the possibility of locating the works at Perry Oaks for the reasons I have already given (para 33.5.19), it could reduce the impact of the proposed development of the surrounding area.

³⁵⁰⁹ 10-6.4

³⁵¹⁰ 10-6.5

³⁵¹¹ 10-6.6

³⁵¹² 10-4.4.8 and 9

³⁵¹³ 10-4.4.10 and 11

³⁵¹⁴ 10-2.4.5

³⁵¹⁵ 10-2.4.7

- 33.8.7 The County Councils argued that only 24% of the proposed store would be used in a normal year rising to 36% if the weather was poor³⁵¹⁶. Furthermore Thames Water's own surveys had shown that farms within the catchment area had a storage capacity equivalent to 140% of Iver South's annual production³⁵¹⁷. Thames Water themselves said that some 95 days output had been in store at Perry Oaks in the summer of 1988 with a further 70 days production being stored on farms³⁵¹⁸. They argued that 7 months storage was necessary to fulfil their statutory duties and retain control at times of stress. The proposed store would offer capacity to cope with extreme winter conditions, agricultural restriction orders that could limit access to customers, contractor difficulties and possible adverse publicity³⁵¹⁹. They emphasised that they would not locate at a site which was not large enough to make sufficient provision for both emergency lagoons and cake storage. The provision proposed at Iver South was no larger than that elsewhere³⁵²⁰.
- 33.8.8 Unlike the position with the emergency sludge lagoons no significant potential pollution risks apply to the cake store. Although problems would arise if the store became full these would be operational rather than environmental. Although I accept that similar provision is made at other plants and that it is reasonable to allow for unforeseen circumstances, none of the evidence presented justified the specific provision proposed here. In my view Thames Water have understandably sought to make the maximum use of the site and this, rather than an objective and quantified assessment, has led to the cake store proposals. I recognise that 95 days output was being stored at Perry Oaks in the summer of 1998 and that the need for storage capacity could rise in the winter. Nevertheless, the availability of capacity for 140% of the annual production to be stored on farms suggests that the provision made at Iver South could be reduced significantly.
- 33.8.9 In correspondence after the evidence had been heard the possibility of a condition restricting the amount of storage capacity for sludge cake was raised. Thames Water stated in response that they needed the planned capacity and that sufficient landscaping had been proposed. They suggested that the imposition of a condition restricting the storage capacity would be a matter of law on which they did not comment.
- 33.8.10 While I believe that the size of the cake store could be reduced, I have already concluded that the need for Terminal 5 would outweigh the harm caused by the proposed plant. That conclusion was based on the scheme as proposed so I do not believe there would be any justification for refusing permission even if the cake store were not reduced. I have considered very seriously the imposition of a condition requiring the size of the cake store to be reduced by half in the detailed plans to be submitted for approval. This would reduce the impact of the development in some respects enabling the store to be kept further from the Colne Way and providing more space for landscaping and ecological mitigation. It would not however, remove the need for the 7.5m gantries, the most obtrusive feature of the store, although I recognise that fewer would be needed.
- 33.8.11 Bearing in mind that BAA cannot force Thames Water to move from Perry Oaks unless they have a suitable consent (para 33.5.10) and Thames Water's firm view that they need 7 months storage, there must be a risk that the imposition of such a

³⁵¹⁶ 10-4.4.4

³⁵¹⁷ 10-4.4.5

³⁵¹⁸ 10-2.1.12

³⁵¹⁹ 10-2.4.6

³⁵²⁰ 10-2.4.4

condition could delay or even frustrate BAA's plans. I do not, however, place great weight on this point since I assume that Thames Water as a responsible company would not lightly place obstacles in the path of a project which the Secretary of State would have found to be in the national interest.

- 33.8.12 On balance, however, I believe it would be wrong to impose a condition on any permission restricting the size of the cake store. In my view the right approach would be for the Secretary of State to draw their attention to the doubts over the need for 7 months storage capacity and ask them to reconsider this point in drawing up their detailed proposals. At the very least they should consider phasing their development in such a way that only half of the store would be provided at the outset. The opportunity to provide more landscaping would help reduce the impact that the development would otherwise have on the Green Belt and the Colne Valley Park and would be wholly appropriate.
- 33.8.13 I have also considered the possibility of imposing a condition requiring the odour reduction achieved by the cake store cover to be at least 80%. While this would be consistent with the approach taken by Thames Water at the inquiry, I do not believe such a specific requirement to be necessary. I would expect the local planning authority to seek such a reduction when considering the details plans submitted by the applicants.
- 33.8.14 I have already indicated that I believe Thames Water should incorporate the measures proposed by the Berkshire Bird Bulletin in their detailed plans. I consider that a condition should be imposed specifically requiring them to submit detailed plans of their ecological mitigation proposals for approval by the local planning authority. Any reduction in the size of the cake store would assist not only in providing more landscaping but also improved ecological mitigation.
- 33.8.15 I therefore consider that any permission granted for the Iver South proposal should include the conditions set out in the document THW/66A with the exception that Condition 4 should take the form proposed by Thames Water and Condition 6 should be deleted. A further condition requiring the submission and approval of detailed ecological mitigation proposal should also be imposed. The conditions should reflect the fact that the local planning authority is now Slough Borough Council and not Berkshire County Council.

33.9 THE COMPULSORY PURCHASE ORDER

- 33.9.1 I have already set out the background to the Compulsory Purchase Order (para 33.2.9) and have concluded that planning permission should be granted for the proposed development. While I have expressed some doubt as to the need for a cake store as large as that proposed by Thames Water this does not mean that the land included in the Order is not needed. Even if it would be possible to reduce the size of the cake store, I consider, for the reasons I have already given, that any land released as a result should be used for additional landscaping and nature conservation measures.
- 33.9.2 The order also includes land encompassing Lakeside Road and land needed for the widening of the bund across Orlitts Lake. Bearing in mind the need to provide satisfactory and secure access to the site when it becomes operational, I consider that this land should also be included in the order.

- 33.9.3 While it is apparent that Thames Water has made progress in reaching agreement with those who originally objected to the order, there is still a risk that difficulties in acquiring the necessary rights by agreement could cause delay. This would not only affect Thames Water's plans for Iver South but could also delay the implementation of Terminal 5. I, therefore, conclude that the order should be confirmed in its entirety.
- 33.9.4 The Order should also be confirmed even if permission is withheld for Terminal 5 as long as planning permission is granted for the Iver South development, since I do not consider that the permission could be implemented effectively without the Compulsory Purchase Order.

33.10 OVERALL CONCLUSIONS

- 33.10.1 I accept that the proposed sludge dewatering plant at Iver South would be inappropriate development in the Green Belt and would harm both the Green Belt the Colne Valley Park. It would also damage the nature conservation value of the area. On the other hand I am satisfied that the plant should be moved from Perry Oaks and that this need would outweigh the harm particularly if permission were granted for Terminal 5. Consequently there would be very special circumstances justifying this inappropriate development in the Green Belt. Any permission granted should be subject to the conditions I set out above.
- 33.10.2 In addition the Compulsory Purchase Order should be confirmed.

34 OVERALL CONCLUSIONS

34.1 THE APPROACH

- 34.1.1 Although the scale of the Terminal 5 development is exceptional and it raises issues of national significance, the approach to the decision as to whether it should be granted planning permission must be the same as that for any other planning application. By virtue of the provisions of Section 54A of the Town and Country Planning Act 1990, it should be determined in accordance with the statutory development plan unless material considerations indicate otherwise. Furthermore, since the site is within the Green Belt and I have already concluded that it represents inappropriate development, it is necessary to demonstrate that there are very special circumstances justifying the grant of planning permission for Terminal 5. Those circumstances will exist only if the benefits of the new terminal would outweigh the harm it would cause not only to the Green Belt but also in all other respects. The same overall approach applies to the developments associated with it, although in some cases the point relating to the Green Belt is not relevant.
- 34.1.2 In assessing the harm likely to be caused by Terminal 5, I have taken into account that caused by each of the developments associated with it, even where these are the subject of separate planning applications. I believe this to be both a cautious and the appropriate approach given the fact that most if not all of these developments must be permitted if Terminal 5 is to proceed and that none of them would be implemented if the new terminal were not built. The only exception to this is the downstream enhancements to the Twin Rivers which were promoted as independent proposals not necessary either as part of Terminal 5 or as mitigation for any harm it would cause. On the other hand, I have taken into account the harm that the relocated sludge dewatering plant would cause if constructed at Iver South since, in the absence of an alternative site, that is an inevitable consequence of Terminal 5.
- 34.1.3 Several of the applications were accompanied by Environmental Statements produced under the relevant Town and Country Planning (Assessment of Environmental Implications) Regulations. I have, of course, taken all of these Statements into account together with all of the other the evidence presented to the inquiry, much of which provided additional and more recent information on the environmental impacts of the proposed developments. I have also dealt with all of the mitigation measures that would be required to reduce or offset the major adverse effects of all the proposed developments particularly in Chapter 32 which covers Conditions and Agreements, but also in Chapter 33 as far as the Iver South proposal is concerned.
- 34.1.4 In drawing together my overall conclusions, I shall begin by setting out the policy context within which the Terminal 5 application should be determined. I shall then identify main benefits of Terminal 5 and the harm it would cause in the manner outlined above. Having completed this task, I shall be in a position to strike the balance between the benefits and the harm in order to conclude whether there are very special circumstances justifying the main Terminal 5 development in the Green Belt.

34.2 THE POLICY CONTEXT

- 34.2.1 I have already referred to the provisions of Section 54A. However, the application for Terminal 5 raises matters of national concern which, in my opinion, are not and cannot be fully covered by the provisions of the development plan (para 3.1.1). Insofar as there is conflict with the development plan, clearly national policy is a material consideration. As far as national aviation policies are concerned, the 1985 White Paper remains the most recent comprehensive statement. It has been affected in part by subsequent changes but the wish to meet the demand for air travel where and when it arises remains at the centre of Government policy (para 3.6.2). There has, however, been a growing recognition of the importance of sustainable development. This means that the environmental implications of any proposals for airport development must be subject to a full assessment. If these are unacceptable it could mean that the demand for air travel would not be met (para 3.6.3).
- 34.2.2 National policy also supports the concentration of airport development at existing sites and making the best use of existing facilities. This does not imply that the maximum use should be made of the theoretical capacity of any airport but equally there is no national policy that development at Heathrow should be restricted until all the available capacity at other airports in the South east is used up (para 3.6.4).
- 34.2.3 At a regional scale, the need for a change in the balance of general development between the eastern and western parts of the South East region is recognised (para 4.4.1). There is however, no evidence that this means growth at Gatwick or Stansted is to be preferred to development at Heathrow (para 4.4.2). The regional guidance for the South East (RPG 9) identifies the role of all 4 of the regional airports in improving economic performance and states that additional airport capacity should be provided where it is justified (para 4.4.3). The guidance for London (RPG 3) recognises the importance of Heathrow as an employment attraction and the contribution the airports serving Greater London make to the national and local economy (para 4.4.4).
- 34.2.4 The Hillingdon UDP is the statutory development plan for the main Terminal 5 application and for many of the associated developments. I believe that the Terminal 5 application is contrary to Policy A3A in this plan since the site is outside the airport boundary. The weight to be attached to this policy conflict is however reduced materially by the fact that the 1985 White Paper specifically recognises the benefits of releasing the Perry Oaks site to the airport. The UDP also acknowledges that an expansion of terminal capacity might be found to be justified in the national interest (para 5.4.1).
- 34.2.5 Policies 1.24A and A2 which seek to mitigate the environmental impacts of new airport development and to ensure the provision of appropriate public transport capacity are clearly relevant to Terminal 5 and I shall take them into account in assessing the impact it would have (para 5.4.2).
- 34.2.6 As I have already noted, Terminal 5 would clearly be inappropriate development in the Green Belt and would have to be justified by very special circumstances. On the other hand, as I have also pointed out, the 1985 White Paper recognises the benefits of releasing the Perry Oaks site for airport development and this needs to be borne in mind in assessing the harm that Terminal 5 would cause to the Green Belt (para 5.4.3). Other major ancillary developments that are clearly inappropriate in the

Green Belt are the M25 Spur Road, the Colnbrook Logistics Centre and the Forward Lorry Park (para 5.3.1) and the sludge treatment plant at Iver South (para 33.1.3).

34.3 THE BENEFITS OF TERMINAL 5

Meeting the Demand

- 34.3.1 It was common ground among the major parties that the demand for air travel will continue to grow and there is little evidence that this growth would be reduced significantly even if the cost of travelling by air were to be increased. While I recognise that there is an environmental case for increasing the cost of aviation fuel, even a 50% increase would reduce demand by only 4.5% in 2015 which represents just a single year's growth (para 7.2.5). At the same time the most recent forecasts of demand placed before the inquiry shortly before it closed by the CAA were significantly higher than those originally put forward by that Authority (para 7.2.2).
- 34.3.2 I accept without reservation that all forecasts and particularly those concerned with the demand for air travel are subject to uncertainties. Consequently, I have some sympathy with those parties who declined to produce their own forecasts of demand. Nevertheless, the evidence shows that BAA's own forecasts were the lowest placed before me. In this context I note that LAHT5 preferred to rely on the Department's estimates because of previous experience in their use (para 7.2.9). I welcome the recognition in national policy of the role of regional airports in meeting the demand for air travel at a national scale (para 3.2.4). There is, however, no convincing evidence that they are likely to be able to have a substantial impact on the demand for services at airports in the South East in general and at Heathrow in particular (para 7.3.21).
- 34.3.3 I have excluded the most recent, higher forecasts submitted by the CAA since they were submitted too late to be the subject of proper examination. This leaves a range of 167.6-184 mppa at 2015 and 173.1-190 mppa at 2016. In both cases the lowest forecasts are those relied upon by BAA (para 7.2.2 and Table 1). I have therefore adopted a range of 170-190 mppa as the most likely demand for air travel from airports in the South East in 2016 but with the proviso that this range is more likely to prove too low than too high (para 7.2.19). Moreover, I have actually tested the case for Terminal 5 on the basis of BAA's own forecast demand of 173.1 mppa which was the lowest presented. Even this represents a growth in demand of 75 mppa between 2000 and 2016 while the CAA's original forecasts represent a growth of 91 mppa over the same period (Table 1 following para 7.2.1).
- 34.3.4 Within the South East, BAA forecast that the demand at Heathrow in 2016 would be 118 mppa. This is well below the demand of 143 mppa predicted by the CAA based on their original forecasts for the South East. It is however close to that of 122 mppa put forward by IATA. BAA's forecasts for demand at Heathrow are also close to those of British Airways although these do not go beyond 2010 (para 7.3.12).
- 34.3.5 Although LAHT5 argued that BAA had failed to reflect fully the potential contribution of other airports, particularly Stansted (para 7.3.9), Hillingdon suggested that they had probably under-estimated the actual demand at Heathrow (para 7.3.8). I believe that BAA's assessment of likely demand at Gatwick in 2016 is a little low and prefer the 35 mppa forecast by the CAA (para 7.3.19). On the

other hand BAA may well have over-estimated the demand at Stansted by that date where their forecast of 20 mppa at 2016 is in marked contrast to that of 6 mppa by the CAA (Table 2 and para 7.3.20). Since I doubt that the demand at Luton or the regional airports is likely to have a material effect on Heathrow (para 7.3.21) and their forecasts for Gatwick and Stansted pull in opposite directions, there is no reason to believe that BAA have inflated the demand at Heathrow by under-estimating that at other airports (para 7.3.22).

- 34.3.6 There were also arguments that landing charges were so low at Heathrow that they stimulated pressure for expansion when other airports were empty (para 7.3.10). While I accept that landing charges at Heathrow are lower than market forces would support, I have said that I do not believe this goes to the heart of the issue. In raising this point one of the leading objectors, HACAN, accepted the Heathrow would be filled irrespective of the level of landing charges even if Terminal 5 were built (para 7.3.16). Furthermore Luton Airport who also referred to the issue of landing charges (para 7.3.7) actually supported the construction of Terminal 5 subject to a reservation about timing which has now been overtaken by events (para 7.3.16).
- 34.3.7 On the basis of all the evidence placed before me, I have assumed that the demand at Heathrow in 2016 is likely to be within the range of 118-143 mppa although it could well be higher (para 7.3.25). Since I have tested and confirmed the need for Terminal 5 on the basis of a demand of only 118 mppa, this simply emphasises the need for the new terminal. Even with Terminal 5 the capacity of Heathrow would not meet the lowest level of demand (para 7.3.26).
- 34.3.8 The need for additional capacity at Heathrow is clear if the Government's policy objective of meeting demand where and when it arises is to be met. The provision of Terminal 5 would therefore, be consistent with national policy in this respect. Furthermore BAA's proposals are insufficient to meet the objectives of national policy since, even with Terminal 5, Heathrow would be unable to meet all of the predicted demand.
- 34.3.9 As far as the capacity of Heathrow is concerned, I do not accept the assumptions put forward by BAA. They predicted a capacity of 50 mppa in the long term without Terminal 5 rising to 80 mppa with the new terminal. These estimates were disputed by many at the inquiry and as the inquiry drew to a close it was already clear that Heathrow was handling more than 60 mppa (para 8.2.57). I accept that such levels might not be sustainable in the long term, particularly if the introduction of the NGLA caused a reduction in the number of aircraft stands. Nevertheless, I believe that it would be unwise to assume a long-term capacity of less than 60 mppa for Heathrow without Terminal 5 (para 8.2.58).
- 34.3.10 On that basis, the construction of Terminal 5 would be likely to increase capacity to some 90 mppa (para 8.2.55). There is evidence that the actual capacity of the new terminal itself would be more than 30 mppa but other constraints would come into play. BAA placed particular weight on the shortage of aircraft stands but I agree with Hillingdon that it is inconceivable that BAA would not respond to the demand at Heathrow by seeking additional stand capacity (para 8.2.52). I believe that the capacity of both terminals and stands could reach 95 mppa (para 8.2.53) and that this could exert pressure to extract the greatest possible capacity from the 2 existing main runways, for example by the introduction of mixed mode operations or even to construct an additional runway (para 8.5.17). Since I consider that either of these responses could have unacceptable environmental consequences, I have suggested a

limitation on the number of aircraft movements (para 32.5.41). On that basis I have worked on the assumption that the capacity of Heathrow with Terminal 5 would be 90 mppa but I do not rule out the possibility that it could exceed this level (para 8.6.3).

- 34.3.11 Even if Heathrow were to handle as many as 95 mppa with Terminal 5, the evidence does not show that it would damage the development of other airports in the South East (para 8.3.57). As I have already said Heathrow would be unable to handle all of the demand even with Terminal 5 so that both Gatwick and Stansted would have to accommodate some passengers who would have preferred to use Heathrow. Consequently I am in no doubt that the potential 40 mppa capacity of Gatwick would be fully used regardless of the decision on Terminal 5 (para 8.3.48).
- 34.3.12 The capacity of Stansted is only 15 mppa on the basis of the existing planning position and there would be substantial opposition to any increase above this level (paras 8.3.32-34). Consequently, there can be no justification for refusing permission for Terminal 5 on the grounds that it might stifle the growth of Stansted. Indeed BAA's own case for Terminal 5 assumes that Stansted will have a capacity of 40 mppa by 2016 (para 8.3.32). Even on this assumption, there would still be a need for Terminal 5. Assuming, as I must, that the capacity of Stansted would be no more than 15 mppa merely reinforces the case for Terminal 5.
- 34.3.13 If Luton handles 10 mppa, the total capacity of the 3 main airports in the South East other than Heathrow would be 65 mppa in 2016. Without Terminal 5, Heathrow would bring this figure up to 125 mppa while the addition of Terminal 5 would raise the capacity of the South East airports to 155 mppa. Since these forecasts of capacity compare with the lowest estimate of demand of 170 mppa, it is clear that even with Terminal 5 the region's airports will be unable to accommodate all of the demand (para 8.3.36). If, as I believe, the demand will be at the higher end of the range I identified, the shortfall in capacity would be some 35 mppa even with Terminal 5. Without Terminal 5, the shortfall would be 45-65 mppa. While all of these figures ignore the role of the City Airport, I heard no evidence that this would have a significant impact on the need for Terminal 5.
- 34.3.14 These figures demonstrate not only that there is an unanswerable case for Terminal 5 in capacity terms but that even if it is built further provision would have to be made if the demand for air travel through airports in the South East is to be met. Even adding 25 mppa to the capacity of Stansted would not be sufficient.

The Economic Case

- 34.3.15 Although I have concluded that the case for Terminal 5 in capacity terms is extremely strong, this is by no means the only significant element of the argument. Heathrow is the busiest airport in the world in terms of international passengers. While I do not attach great significance to this point in itself, it does give some indication of the importance of Heathrow as a factor in the economy of London and the UK. It is abundantly clear that neither Gatwick nor Stansted with their single runways can provide such a wide range of international services (para 8.4.16). At the same time the position of Heathrow is being challenged by a number of other European airports particularly Paris Charles de Gaulle, Amsterdam Schiphol and Frankfurt all of which have ambitious plans to expand their capacities and improve their services (para 8.4.18).

- 34.3.16 Of course the economic role of Heathrow is inextricably linked with its capacity. If this is restricted to 60 mppa, Heathrow will effectively stand still. Airlines based there will have no opportunity to increase the range or frequency of services. This would have a disproportionate impact on British airlines and could well affect the relative attractions of London and the UK as a location for international investment. Given the intensity of competition across Europe this is a factor that should not be under-estimated (para 8.4.19).
- 34.3.17 The failure of Heathrow to maintain its competitive edge combined with the inability of other airports in the South East to provide comparable services would mean that international passengers would elect to use the expanding airports at Paris, Amsterdam or Frankfurt. Furthermore passengers travelling to or from other regions in the UK would have to travel through the European hubs rather than through Heathrow. I do not believe that this would benefit the passengers concerned while it would certainly reduce the revenues of British airlines operating from Heathrow (para 8.4.21).
- 34.3.18 It is not for me to advance a case on behalf of particular companies, nor do I propose so to do, but national policy does take into account the effect of airport capacity on the national airline industry. This means that it is relevant that the effect of failing to expand Heathrow at the present time would bear particularly heavily on those UK airlines which rely on it as their main base. Both British Airways and British Midland gave evidence on this point emphasising that Heathrow was the only viable location for competitive services against established national carriers. My visits to other European airports confirmed that they gave a high priority to the needs of their respective national carriers (para 8.4.22). Terminal 5 would clearly make a valuable contribution to the national policy to foster a strong and competitive British airline industry by providing enough airport capacity where it is needed. Conversely, on the evidence placed before me, I hold the firm view that a failure to provide Terminal 5 would damage the British airline industry (para 8.4.23). I am supported in this view by the fact that Luton Airport emphasised the importance of Heathrow to the national airline industry and the need for Terminal 5 even though they would gain no direct benefit from it (para 9.2.17).
- 34.3.19 I was impressed by the high standards of comfort and convenience offered to passengers at other international airports I visited. Unfortunately Heathrow does not presently meet the same standards. This is partly because the way in which the Central Terminal Area has developed has resulted in the need for long walks along routes which often seem tortuous and unattractive. In addition some of its accommodation is now out-dated but many of the problems stem from the fact that its terminals are now under great pressure as a result of over-crowding (para 8.4.24). The provision of Terminal 5 would enable BAA to meet the highest standards in the new terminal. Furthermore it would ease the pressure on the existing terminals and, I believe, give an opportunity for them to be brought up to the highest international standards.
- 34.3.20 There was some limited disagreement about the scale of the contribution Heathrow makes to the national economy. LAHT5 suggested that it represented 0.8% of the GDP while BAA put the figure at 0.9%. In either case, Heathrow almost certainly makes a larger contribution than any other single site. It would be most unwise to place the competitive position of such a significant enterprise in doubt by refusing to permit fundamental investment, particularly when no viable alternative is available. Furthermore, LAHT5's figure for Heathrow's contribution to GDP under-estimates its significance since it does not include any recognition of its role

in improving productivity in other activities (para 9.2.16). Moreover they accepted that air transport is an expanding activity. Consequently I believe that Heathrow could play an increasingly significant role in the national economy.

- 34.3.21 I have already touched upon Heathrow's role in supporting the economy of London. While I do not believe that it is the dominant factor in London's role as the leading European financial centre, I do consider that it is a factor of considerable importance. Any decline in its relative position as compared with airports such as Charles de Gaulle, Schiphol or Frankfurt could only harm the prospects for London as a financial centre. This would be particularly unfortunate at a time when London is already facing strong competition especially from Frankfurt (para 9.2.18).
- 34.3.22 Heathrow has also played a significant role in attracting international investment into the UK. Any decline in its competitive position could only damage the prospects for future investment (paras 9.2.19-20).
- 34.3.23 While many people attempted to quantify the economic benefits of Terminal 5, it is simply not possible to add up the results to give a single estimate. I have real doubts as to the weight that should be attached to any of the specific figures presented but have been able to reach some clear conclusions. On the basis of the CAA's work, which I broadly accept, Terminal 5 would produce substantial benefits for passengers amounting to some £10-11bn over a 30 year period (para 9.3.34). It would also make a positive contribution to the national economy by enabling and encouraging foreign tourists to visit this country (para 9.3.35).
- 34.3.24 While I have some reservations about British Airways' estimates of increased costs for business travellers if Terminal 5 were not provided, I accept that these costs would be higher and that this would have a disproportionate impact on businesses based in the UK. Again this could only harm the national economy (para 9.3.37).
- 34.3.25 Even LAHT5 accepted that Terminal 5 would make a positive contribution to GDP although they believed that the extent of this would be very limited. I have concluded that they under-estimated the significance of Terminal 5 and that it would be difficult to envisage any other single project that would be likely to have such an impact on the national economy (para 9.3.40). In my view, the failure to provide Terminal 5 would almost certainly result in a substantial loss to the economy (para 9.23.42).

The Overall Benefits of Terminal 5

- 34.3.26 The evidence demonstrates that there is a very strong case for Terminal 5. It would provide much needed airport capacity and a range of services which cannot be provided elsewhere, particularly since no other airport in the South East has two runways. In providing this capacity Terminal 5 would ensure compliance with the objective of national aviation policy to meet the demand for air travel where and when it arises.
- 34.3.27 The provision of Terminal 5 would enable Heathrow to maintain its position as Europe's leading airport. With it, Heathrow will be able to offer a range and frequency of services comparable with the best airports in the world. It would enable British airlines based at Heathrow to compete with other airlines in Europe and around the world. Thus Terminal 5 would achieve the Government's policy to foster a strong and competitive airline industry. Without Terminal 5 I firmly

believe that this objective could not be met. The new terminal would also make a significant contribution to the national economy both directly and indirectly. It would support the role of London as a world financial centre and assist in attracting investment to the UK.

- 34.3.28 The significance of Terminal 5 for individual passengers should not be overlooked. Whether they are travelling on business or for leisure, Terminal 5 would not only ensure that Heathrow could offer the widest range of destinations and the most frequent services, it would also enable BAA and the airlines to offer standards of comfort and convenience comparable with the best airports in the world. As my visits to other airports have demonstrated, Heathrow does not currently meet the standards passengers are entitled to expect. In my view, the need to improve the quality of service for passengers is another powerful argument in favour of Terminal 5.

34.4 THE COSTS OF TERMINAL 5

Physical Impacts

- 34.4.1 Although many of the local authorities around Heathrow were concerned that Terminal 5 would generate development pressures that would cause great difficulties these fears were not shared by Hillingdon the authority most directly affected. I have examined the evidence for these fears with great care but agree with Hillingdon that any pressure arising from Terminal 5 could be resisted (para 10.6.4).
- 34.4.2 Terminal 5 would clearly be inappropriate development in the Green Belt. It would destroy the openness of Perry Oaks and result in an extension of the built-up area westwards to the A3044 (para 11.2.17). On the other hand, the site is surrounded on 3 sides by the airport and on the fourth by the Perimeter Road. In these circumstances I consider that the damage caused by the loss of openness would be very limited. In this respect, my own view echoes those of my distinguished predecessors Sir Iain Glidewell and Sir Graham Eyre each of whom considered that the impact on the Green Belt of developing the Perry Oaks site for airport related uses would be marginal (para 11.2.18).
- 34.4.3 Furthermore, the possibility of developing Perry Oaks for airport related purposes has been countenanced over many years and was encouraged in the 1985 White Paper. I find it inconceivable that this endorsement was included in the White Paper without recognising the fact that the site was in the Green Belt. I must, therefore, assume that the Government at that time believed that the release of Perry Oaks to the airport was highly desirable notwithstanding that it was in the Green Belt (para 11.2.19). The Department acknowledged that the statement in the White Paper (which had not been retracted) involved an acceptance that it would be appropriate to use Perry Oaks for some form of airport-related development notwithstanding the fact that it is in the Green Belt (para 11.2.20).
- 34.4.4 While I accept that the scale of the present proposals is much larger than those previously considered, I do not consider that this affects the fundamental issue of whether the Perry Oaks site should be released to the airport (para 11.2.21). I accept that Perry Oaks, as an open site, has a role in checking the unrestricted sprawl of large built-up areas but, as Hillingdon recognised, if an expansion of terminal facilities is necessary in the national interest, Perry Oaks is the logical site

to use. This would minimise the loss of Green Belt while the A3044 would provide a suitable Green Belt boundary for the future. I, therefore, firmly believe that the release of Perry Oaks for Terminal 5 should not result in any further erosion of the Green Belt beyond the A3044 which should be adopted as the clear boundary of Heathrow if the present proposals are accepted (para 11.2.23). Indeed I recommend that the Secretary of State should formally endorse his continued commitment to the Green Belt in this area if he approves Terminal 5 (para 32.3.6).

- 34.4.5 In summary, Terminal 5 would be inappropriate development in the Green Belt and would also cause harm due to the loss of openness and would be visually intrusive. Nevertheless, I firmly conclude that the harm to the Green Belt caused by the loss of Perry Oaks would be marginal.
- 34.4.6 Similarly the M25 Spur Road would be inappropriate development in the Green Belt and would have a substantial impact on this part of the Green Belt. It would run across the Colne Valley Park on an embankment carrying substantial volumes of traffic and would be marked by signs, gantries and lighting (para 19.2.64). However, I have also concluded that there is no preferable route for the link to the M25 and that such a link is essential to Terminal 5. In this respect, the Spur Road stands or falls with Terminal 5 itself, although all the harm it would cause must be weighed in the overall balance (para 19.2.84). I deal with the harm caused to the Green Belt by other developments later (paras 34.4.65 and 34.4.71-75).
- 34.4.7 Although Terminal 5 itself would not be in the Colne Valley Park it would be set immediately against it and would have an impact on the Park. Furthermore several associated developments, principally the M25 Spur Road but also Iver South, the Forward Lorry Park and the Colnbrook Logistics Centre would be within the Park itself. Even setting aside the impact of these developments, Terminal 5 would diminish to a material degree the rural character of this part of the Park while the Spur Road embankment would have a substantial impact (para 11.3.38). The landscape of this part of the Park remains undistinguished and I understand Hillingdon's desire to see a comprehensive strategy for enhancement as an essential part of any permission for Terminal 5 (paras 11.3.36-37). Nevertheless, I agree with BAA that compensation should be limited to measures necessary to offset the impact of Terminal 5 and its associated developments (para 11.3.37). They have proposed several improvements designed to compensate for the impact of Terminal 5 which I consider to represent a reasonable package of compensation (para 11.3.42).
- 34.4.8 I have also taken into account the impact of all the proposals affecting the Park. With regard to the construction of the Spur Road, I am satisfied that it would have a substantial impact on the Park (para 19.2.67). I accept that the improvements proposed by BAA and the landscaping measures put forward by the Highways Agency represent a reasonable package of compensation. Nevertheless, I do not believe that they would completely outweigh the harm caused by the Spur Road which would be contrary to the aims of the Colne Valley Park and the policies of the development plans. Consequently this must count against the Spur Road and Terminal 5 (para 19.2.69). I shall deal with Iver South separately.
- 34.4.9 As far as the main Terminal 5 development is concerned I have examined the argument that this would be too large for the Principal Site so that there would be insufficient room for landscaping. I concluded that a reduction in the scale and density of the development would be welcome (para 11.4.49). Nevertheless, I do not believe that it would be right to require a material reduction in the height of the

Core Terminal (para 11.4.51). A reduction in the overall size of the buildings, would, however, be beneficial if it could be achieved by BAA without affecting the capacity or design qualities of the buildings (para 11.4.58).

- 34.4.10 While I accept the advantages of providing the hotel and the need for the offices on the Principal Site (paras 11.4.59-60), I have concluded that there is scope to reduce the size of the car parks. This could be done by restricting car parking for employees which would be consistent with Government transport policies and would reduce the impact of traffic generated by Heathrow in the peak hours (para 11.4.61). This would offer the potential to reveal more of the main elevation of the Core Terminal and increase the area available for landscaping (para 11.5.41).
- 34.4.11 I would not wish to minimise the scale of this development and accept that even with the reduction in car parking I have proposed it would have a dramatic impact on the appearance of the western end of the airport. This impact must however be judged in the light of the undistinguished character of the landscape immediately to the west of the A3044 which remains dominated by reservoirs, the M25 and other urban fringe features (para 11.5.33). As far as views from the nearby settlements are concerned I do not consider that those from Longford would be harmed to any material degree (para 11.5.37). Views from the south and south west are further away and I do not believe Terminal 5 would cause material harm to them (para 11.5.38).
- 34.4.12 When the evidence on the visual impact of the proposed development was given the airport was not visible from many points to the west. The position has now changed in that the British Airways World Cargo Centre has already intruded into some of these views (para 11.5.39). Nevertheless, I accept that Terminal 5 would have a damaging visual impact on views from the west in that the Core Terminal and the buildings in front of it would be visible. When seen from this direction the multi-storey car parks would be seen in the foreground and would obscure much of the Core Terminal. I find it difficult to believe that the car parks would achieve the elegant lightness of the Core Terminal but believe that the reduction in the scale of parking provision would reveal more of the upper level of the Terminal and emphasise its floating roof. This in turn would reduce the bulk of the development and its visual impact (paras 11.5.40-41). Care would, of course, be needed to ensure that the benefits of this change are not offset by revealing the underside of the Departures forecourt (para 11.5.43).
- 34.4.13 On that basis and given the potential for further landscaping as a result of the reduced car parking, I conclude that the main development would be visually intrusive but that the extent of this would not be sufficient to constitute a substantial objection to Terminal 5.
- 34.4.14 I have given careful consideration to the impact Terminal 5 would have in ecological terms. The designation of the Perry Oaks site as a Site of Metropolitan Importance was fully justified before clearance began. Its loss is significant and is contrary to Policy EC1 of the Hillingdon UDP (para 12.2.20). While I do not accept that the site justified designation as a Site of Special Scientific Interest (para 12.2.22), its loss must be a material factor counting against Terminal 5 (para 12.2.29). On the other hand, the weight to be attached to the loss of the ecological interest of the Perry Oaks site must be judged in the light of the mitigation offered by BAA. I have concluded that their contribution to the wetland site being developed by the Wildlife and Wetlands trust at Barn Elms is likely to be substantial and should be given weight as compensation for the loss of Perry Oaks (para

12.3.12). As such it constitutes, in my view, sufficient compensation to offset the loss of the ecological interest of Perry Oaks. If I were wrong in treating Barn Elms as relevant compensation, that loss would remain a material objection to Terminal 5. I have considered whether that objection would be sufficient to affect the overall balance that I strike later. In my view it would not.

- 34.4.15 I have also taken into account the impact of the M25 Spur Road on the ecological value of the meadows which it would cross. There is no dispute but that the meadows identified as G28 and G29 contain a substantial variety of plants some of which are rare or scarce in London although there is no suggestion that they contain features of national significance (para 19.2.71). Almost half of field G28 would be lost and although the Highways Agency have put forward proposals for the translocation of turves to Orchard Farm the success of this is far from assured. In these circumstances the potential damage to the value of field G28 must count against the Spur Road and therefore against Terminal 5 (para 19.2.72).

Traffic

- 34.4.16 Throughout this report I have emphasised the relationship between public transport provision and road traffic. It is self-evident that Terminal 5 would generate a large increase in trips to and from Heathrow and that these could cause substantial problems on the surrounding road network. National policies no longer seek to increase road capacity to meet the full demand for car travel even though this means that levels of congestion will increase at least in the interim period before their policies to reduce that demand take full effect (para 15.1.5).
- 34.4.17 The 1998 White Paper on “A New Deal for Transport” puts more emphasis on improving rail access to airports and expects the aviation industry to contribute funding to such improvements (para 15.2.16). It seeks the setting of challenging targets for increasing the use of public transport at airports, the establishment of a strategy to achieve those targets and the implementation of that strategy (para 15.2.19). While I recognise that BAA have gone some way towards this new approach and have a vision that 50% of airport trips would be made by public transport (para 15.2.4), their only specific target is that 40% of terminating air passengers should use public transport. Even this does not meet the requirements of the White Paper in that it is not related to any particular date (para 15.2.20).
- 34.4.18 Even when judged on the basis of BAA’s own 40% target, their surface access proposals are inadequate. In their primary case, which relies heavily on the extension of the Heathrow Express to Terminal 5, only 38% of terminating passengers would use public transport in 2016 (para 15.3.20). The number of trips made by car and taxi would increase from 19.6 mppa in 1991 to 39.9 mppa in 2016 (para 15.3.22). The proportion of employees at Heathrow using public transport would fall from 13% in 1992 to 10% in 2016 (para 15.3.23). I do not consider these levels to be acceptable in the context of the 1998 White Paper.
- 34.4.19 There is however scope for further improvements to the public transport system serving Heathrow and BAA are pursuing many of these. I believe that there is a reasonable prospect of the Piccadilly Line being extended to Terminal 5. Indeed I was told that a deal had been agreed in principle (para 15.4.5). BAA in their final submissions said that they would inform me when the agreement had been completed (para 15.4.24). I have not however been so informed. The Gateway South Station seems likely to be open before the proposed new terminal would come into operation (para 15.4.17). Although there are more difficulties over the Gateway North Station and the St Pancras service, I consider that they are likely to

be implemented before Terminal 5 opens (paras 15.4.26-27). If all of these measures were in place in 2016, BAA would just meet their target for 40% of passengers to use public transport (para 15.4.16).

- 34.4.20 In my view, any approval of Terminal 5 should be based on a requirement that the both the Heathrow Express and the Piccadilly Line be extended to Terminal 5 before it opens. Furthermore BAA should be required to use its best endeavours to secure the opening of the St Pancras service and the Gateway North Station by the same time. I also believe that further rail improvements should be implemented linking Heathrow more directly to the national rail network. Unfortunately these last improvements are likely to be more difficult to achieve and I do not consider that they should be required as a condition on an approval for Terminal 5 (para 15.5.12). BAA have, however, made provision to safeguard the necessary connections. I have concluded that their safeguarding provisions are appropriate and should be accepted (para 15.5.15).
- 34.4.21 I appreciate that the successful implementation of these improvements depend on financial considerations but the White Paper is clear in its view that the aviation industry should contribute to public transport improvements. I believe this to be particularly important in the case of Heathrow where levels of road congestion are already high. Some doubts were expressed as to the likely attitude of airline to the use of landing charges to fund rail investment. Nevertheless, I consider that it would be unfortunate in the extreme if regulatory controls including the single till principle meant that BAA were unable to finance desirable public transport improvements (para 15.4.28). While the financial controls on BAA are not within my remit, I am in no doubt that the Government should do everything in its power to ensure that there are no unnecessary regulatory obstacles that could inhibit BAA's efforts to maximise improvements and additions to public transport facilities serving Heathrow. Apart from the general benefits such public transport improvements would bring about, they would be of particular value to airlines and their passengers, as well as those employed at the airport.
- 34.4.22 Although BAA proposed that parking provision should be limited to 46,000 spaces for the whole airport (para 15.6.5), I do not consider that this goes far enough in the light of current national policies to reduce the growth in demand for car travel. I accept that it would be very difficult to reduce the level of parking for passengers since many of those affected would be likely to switch to taxis with little benefit in terms of congestion (para 15.6.8). The position is however very different in relation to those working at the airport where BAA assume that some 80% would still be able to travel to work by car (para 15.6.9).
- 34.4.23 While I do not believe that the draconian controls proposed by the local authorities would be reasonable or even feasible, I do consider that the number of parking spaces for employees should be reduced as compared with present levels. This would be consistent with the approach set out in the 1998 White Paper on the need to tackle excessive workplace parking provision at existing developments and to reduce the amount of parking available at business premises (para 15.6.6). Bearing in mind that the number of employees is forecast by BAA to increase by only 2,100 if Terminal 5 is constructed, a parking provision of 17,500 would appear very reasonable when compared with the current provision of 20,500 spaces. This would imply a reduction in the total parking limit from 46,000 to 42,000 but with a specific restriction of 17,500 on staff parking (paras 15.6.10-12). In reaching this conclusion, I recognise that some 37% of employees travel outside normal hours (para 15.6.9).

- 34.4.24 I accept that the extension of the Heathrow Express would be likely to generate additional traffic around Paddington Station, although the extent of this increase would be reduced if the Piccadilly Line were also extended and the St Pancras service introduced. Even on the basis of 12.9 mppa using the Heathrow Express (which implies a total throughput of 100 mppa at Heathrow and no other public transport improvements), Westminster City Council conceded that conditions on the road network around Paddington would not be unacceptable (para 16.3.17). Since BAA are prepared to accept a requirement that the use of the Heathrow Express should not exceed 12.9 mppa without the approval of the City Council (para 16.3.5), I conclude that there is no material objection to Terminal 5 in relation to this point.
- 34.4.25 It is plain that many of the roads around Heathrow are already congested (para 17.4.19). The M25 between Junctions 12 and 15 is to be widened regardless of Terminal 5 to accommodate projected traffic growth at least until 2010. After this date the quality of service on the M25 is likely to decline slowly although this might be offset by improvements to public transport (para 17.5.2).
- 34.4.26 Even BAA accepted that their assessment showed that Terminal 5 would cause congestion to become worse, although they argued that the effect would be small (para 18.3.48). It would increase flows on the M25 by 7-10% (para 18.3.49) but I am satisfied that Terminal 5 and the Spur Road would not cause major new problems on the motorway. As I have already pointed out the Government accepts that the quality of service on the M25 is likely to decline after 2010 and the impact of Terminal 5 could well be reduced if public transport provision were improved as I have proposed. The new terminal would also increase delays on the M4 even with the proposed improvements to that motorway (para 18.3.54). Although concern was expressed over the impact on other roads, I found no evidence that the increases in congestion would be unacceptable (paras 18.3.55-58). On the other hand, the Agency accepted that the proposed highway schemes would claw back only 50% of the congestion effects of Terminal 5. This means that the trunk road network would be worse off with Terminal 5 than it would be in the four terminal case. I recognise, however, that the schemes required to get back to congestion levels in the four terminal case would be in conflict with the Government's policies relating to commuting into central London (para 18.3.66).
- 34.4.27 All of these conclusions are based on BAA's own assumptions about passenger throughputs which I believe to be too low. Since the actual throughput is likely to rise to 90 mppa or even more with Terminal 5 the volumes of traffic could also increase (para 18.3.60). A sensitivity test carried out by the Agency based on a throughput of 100 mppa forecast a 19% increase in total delays (para 18.3.61). This emphasises the need for improved public transport provision and limits on car parking for staff. The latter would be particularly valuable in reducing Heathrow traffic in the peak hours.
- 34.4.28 All the traffic assessments assumed that the demand for car travel would be limited by the capacity of the network. If drivers were more tolerant of congestion than the main parties assumed, flows would be higher particularly in the peak hours (para 18.2.32) and congestion would increase. I am, however, particularly concerned that drivers travelling to work at the airport every day would seek to avoid the worst congestion by using local roads. This may well be a general and inevitable outcome of the Government's policy of not meeting the full demand for car travel and would require the imposition of controls to limit the use of local roads where necessary (para 18.3.55). It also strengthens the case for limits on parking for staff at the airport.

- 34.4.29 On the basis of BAA's primary case with a throughput of only 80 mppa and assuming the implementation of the proposed road schemes, I conclude that traffic objections would not justify refusing planning permission for Terminal 5. While a higher throughput of 90 mppa or more would increase congestion, the effects of this would be offset by the improved public transport provision I have proposed and the imposition of a limit of 17,500 on parking for staff at the airport.
- 34.4.30 It was accepted that there needed to be a high quality link from the M25 to Terminal 5 although the form this should take was not agreed (para 18.4.1). In contrast the need for the M4 improvements was not accepted by all parties even if Terminal 5 were constructed (para 18.4.2). I am satisfied that the predicted traffic flows would justify the widening of the M4 and the improvements to Junctions 3 and 4 on the basis of the former "predict and provide" approach. However, the Government has now said this approach does not work and is seeking to reduce the demand for car travel (para 18.4.23). The need for the M4 improvements must be judged in the context of this new approach which is not fully reflected in the predicted traffic flows placed before the inquiry.
- 34.4.31 I am also satisfied that the need for the M4 works does not arise from the construction of Terminal 5. The Highways Agency said that traffic conditions already justified some improvements and that all of them would be justified by 2016 even if Terminal 5 were not built (para 18.4.12). On the other hand, there is no doubt that traffic generated by Terminal 5 would strengthen the case for improvements to the M4. The scale of this effect is however limited with only some 600 vehicles on the M4 travelling to or from Terminal 5 in the morning peak hour (para 18.4.25). I have concluded that widening the M4 between Junctions 4a and 3 would be likely to attract even more traffic through re-assignment. Furthermore, I believe there is a real possibility that more commuters would use the widened M4 as far as Junction 3 and then turn off to make use of other routes into west and central London. This would undermine efforts to reduce commuting by car into central London and increase congestion on other roads (para 18.4.27).
- 34.4.32 I have therefore reached the conclusion that the Orders relating to the widening of the M4 should not be confirmed. In my view the section of the M4 to which the Orders relate should not be widened unless and until it is clear that there is no alternative (para 18.4.28). At the very least the widening should be postponed until the Government has had the opportunity to assess the success or otherwise of its policies to restrict the growth in car traffic, to restrict commuting into central London and to increase the use of public transport. Many of the policies in relation to these matters have not yet been worked out in detail (para 18.4.33) and few, if any of the measures contemplated have been brought into operation. I am, moreover, concerned by the fact that the provision of increased capacity on the M4 would inevitably reduce the incentive to improve public transport links to Heathrow (para 18.4.30). Additionally I believe that the provision of additional public transport links to central London as I have proposed and the imposition of strict controls on parking would weaken the case for the widening. I am however, satisfied that the proposed improvements to Junctions 3 and 4 should be carried out, although they should not be the subject of a condition requiring their completion before the opening of the new terminal and I believe they are likely to require fresh orders (para 18.4.35).
- 34.4.33 As far as the draft Highway Orders are concerned I have already acknowledged that the M25 Spur Road would be inappropriate development and that it would harm the Green Belt. It would also damage the character of the Colne Valley Park and cause

significant ecological harm (para 19.2.71). On the other hand I found no evidence that the Spur Road would cause safety problems either in itself or in relation to its connections with the widened M25 (para 19.2.79). I am also satisfied that the Highways Agency have examined a number of possible alternative routes for a link with the M25 and that none of these is to be preferred (para 19.2.84).

- 34.4.34 The harm caused by the Spur Road must count against Terminal 5 in the overall balance. Nevertheless, I consider that, if the new terminal is found to be in the national interest, very special circumstances would apply and the construction of the Spur Road through the Green Belt would be justified (para 19.2.84).
- 34.4.35 The position in relation to the M4 improvements is different. I have already concluded that the widening should not take place but, if it is to be implemented, I consider that the draft Highway Orders with the modifications proposed by the Agency should be confirmed (para 19.3.33). I also support the landside roads proposed by BAA (paras 19.4.5-7).
- 34.4.36 In overall terms, I consider that BAA's proposals are inadequate in terms of their provisions for public transport and that they should be required to complete the extensions of both the Heathrow Express and the Piccadilly Line to Terminal 5 before the terminal opens. Furthermore they should be required to use their best endeavours to ensure that the St Pancras service is also implemented in advance and the Gateway North Station is opened. Car parking should be strictly controlled with only 17,500 spaces for employees. The M25 Spur Road should be provided and Junctions 3 and 4 on the M4 should be improved. The carriageway of the M4 should not, however, be widened at least until the success of policies to restrict traffic growth and increase the use of public transport has been assessed.
- 34.4.37 In the absence of all of the public transport and parking measures I believe that BAA's proposals would be in conflict with national and local transport policies. This would represent a real and substantial objection to Terminal 5.

Noise

- 34.4.38 The overwhelming cause of objections to Terminal 5 is the effect local residents believe it would have on aircraft noise. Efforts to examine this in the context of national policy were hampered by the difficulty I experienced in establishing current Government policy towards aircraft noise (para 21.2.18). I worked on the basis of the Department's closing submissions that the Government remains committed to doing everything practicable to ensure that the noise climate around Heathrow continues to improve even after the phasing out of Chapter 2 aircraft in 2002. The Government does, however, accept that it might not be possible to achieve continued improvements; it has therefore given a further commitment that it will take all practicable steps to avoid a subsequent deterioration in the aircraft noise climate around the airport (para 21.2.19).
- 34.4.39 I have said that I believe this adds little to the policy and that for the period beyond 2002 the policy objective appears to have been lowered without any added security for local residents (para 21.2.20). This approach also seems to be at odds with the increasing awareness of the principle of sustainable development that has influenced other aspects of aviation policy (para 21.2.21).
- 34.4.40 The policy for night noise is to protect local communities from excessive noise levels at night. This appears to include an acceptance that the noise climate might

deteriorate at night albeit in the context of the overall commitment to seek an improvement in the noise climate (para 21.2.23). Bearing in mind that noise at night was probably the single greatest cause for concern by local residents, I find it difficult to believe that any increase in noise at night could be outweighed by improvements during the day (para 15.2.25). I also find it difficult to see how the policy on noise at night can be applied fairly and openly in the absence of any definition of what constitutes excessive noise or even how this is to be assessed (para 21.2.24).

- 34.4.41 There is a further complication in relation to the control of noise at night since Government policy has consistently stressed the need to preserve a balance between aviation and environmental interests. In November 1998, the Government said that it sought to strike a balance between the need to protect local communities from excessive aircraft noise at night and that to provide for air services to operate at night where they are of benefit to the local, regional and national economy. It also recognised the significance of competitive factors and wider employment and economic implications (para 21.2.26). My interpretation of the policy there expressed is, therefore, that it would be permissible for noise at night to become excessive if the harm caused by this were outweighed by benefits to the competitive position of Heathrow and the airlines and the wider implications for employment and the economy (para 21.2.27). If my interpretation is not correct, the Government should consider whether at some point it should clarify its policy.
- 34.4.42 The measure of the noise climate used by the Government to test the success of its policy is the $LA_{eq\ 16hour}$ index. This was the subject of severe criticism much of which I consider to be well-founded. It does not reflect the operation of runway alternation which is a key feature of Heathrow (para 21.3.30) nor does it give any indication of the number of times activities are interrupted by passing aircraft (para 21.3.31). More significantly I believe that it fails to give adequate weight to the number of aircraft movements (para 21.3.34). Many local residents are unconvinced by the Government's argument that the noise climate has improved. They believe that it has become worse over the last 5-10 years and this appears to be a reflection of the substantial increase in movements over that period (para 21.3.34).
- 34.4.43 Even the Department recognised the deficiencies of the $LA_{eq\ system}$ (para 21.3.32-33). They also accepted that it is difficult to establish the true relationship between the noise of individual events and their number and that it would have been useful if further social surveys had been carried out (para 21.3.35). The survey on which the use of the $LA_{eq\ 16hour}$ is based was carried out in 1982 and the relationship between the LA_{eq} and community annoyance was statistically weak even at that time (para 21.3.32). Since then the number of aircraft movements at Heathrow have increased from some 220,000 a year to over 440,000. Moreover people's perceptions of and willingness to tolerate noise may well have changed (para 21.3.35). Whilst I have doubts as to the continued validity of the LA_{eq} as the sole index of the noise climate, I accept that it is a useful indicator particularly for comparing the differences between the 4 terminal case and that with Terminal 5 (para 21.3.37-38). Nevertheless I am indebted to the Department for accepting that it would be appropriate to take into account other factors when considering the noise implications of Terminal 5 (para 21.3.38).
- 34.4.44 Nevertheless the starting point must be the area covered by the 57 dB(A) $LA_{eq\ 16hour}$ contour which encloses the area within which annoyance is most likely to occur. I accept that, on BAA's assumptions, this area would fall from 175.5 sq km in 1994 to 95 sq km in 2016 if Terminal 5 were not built and to 128.5 sq km if it were

provided. Assuming that Concorde remained in service, the area affected with Terminal 5 would however increase to 182.8 sq km (para 21.3.40). This demonstrates that, if Terminal 5 were built, any improvement in the noise climate by 2016 would be entirely due to the removal of Concorde from the fleet. Even though BAA offered a contour cap, their suggestion would merely limit the area within the 57 dB(A) $LA_{eq\ 16hour}$ contour to the 175.5 sq km affected in 1994. Consequently it would not guarantee any improvement in the noise climate measured in this way (para 21.3.41).

- 34.4.45 On the basis of a total throughput of 90 mppa the area affected by the 57 dB(A) contour is likely to be some 130-135 sq km assuming that Concorde is no longer flying in 2016. This compares with an area of about 104 sq km for a throughput of 60 mppa without Terminal 5 (para 21.3.42). Consequently, the construction of Terminal 5 would reduce the improvement in the noise climate as measured by the Government's preferred measure, the 57 dB(A) contour, by 25-30 sq km or 24-29% (para 21.3.44).
- 34.4.46 In the above circumstances, while the Government's objective of achieving an improvement in the noise climate as measured solely by the 57 dB(A) contour would be met even if Terminal 5 were built, this would be entirely due to the removal of Concorde from the fleet. Furthermore the noise climate with Terminal 5 would be significantly worse than it would be with only 4 terminals. This must be a substantial objection to Terminal 5. If Concorde continues to fly, Terminal 5 would result in deterioration in the noise climate even on the basis of the Government's preferred measurement the 57 dB(A) $LA_{eq\ 16hour}$ contour. This would clearly be in conflict with the objective of Government policy (para 21.3.45). Similarly if the number of aircraft movements exceeds the 480,000 I have assumed with Terminal 5, the impact on the noise climate would rapidly become significantly greater particularly in view of the importance local residents attach to effect of more frequent flights (para 21.3.53).
- 34.4.47 I have already concluded that the assessment of the impact of Terminal 5 in terms of aircraft noise should not rest solely on the $LA_{eq\ 16hour}$ contour. One additional factor to which I now turn is its effect on noise at night. There is very widespread concern about the effect of night flights, particularly those arriving in the early morning. This is something that the Government recognises (para 21.4.4). I experienced for myself the effects of aircraft noise at night on a number of occasions and have every sympathy for those who argued that their sleep was interrupted regularly and that it was very difficult to get back to sleep (para 21.4.18). It is clear that the Sleep Disturbance Study on which the Department and BAA relied did not address these issues. Not did it attempt to measure annoyance (para 21.4.20). It also failed to exclude from the survey those who had connections with the airport (para 21.4.22). All of these factors reduce the weight that can properly be placed on the Study (para 21.4.24).
- 34.4.48 My conclusion on night noise, based on all of the evidence before me, is that noise from aircraft landing in the early hours causes substantial disturbance over a wide area and this leads to significant annoyance. For many people it causes genuine disturbance and very serious annoyance (para 21.4.18), albeit others sleep undisturbed (para 21.4.21).
- 34.4.49 There are already restrictions on the number of aircraft movements in the night quota period from 23.30 hours to 06.00 hours and I accept that the number of movements in that period is unlikely to increase significantly if Terminal 5 were

built. Indeed British Airways are willing to give an undertaking that, if Terminal 5 were constructed, they would not operate more flights in the night quota period than is presently the case. It is, however, likely that the aircraft used at night would become larger so that the potential for sleep disturbance and annoyance would be increased to some degree (paras 21.4.28-29).

- 34.4.50 The most significant impact of Terminal 5 is likely to be on arrivals between 06.00 hours and 07.00 hours. Even on British Airways' own figures there would be a further 8 movements in that hour if Terminal 5 were built (para 21.4.32). While I understand their argument that if Terminal 5 is not provided the shortage of terminal capacity could mean that these additional flights would have to be accommodated before 06.00 hours, I am not convinced that this would be the case. That would bring them into the existing night quota period and there can be no guarantee that the Government would accept the need for them (para 21.4.30). In any event, the additional arrivals referred to by British Airways as reaching the stands in the hour after 06.00 would touch down 15 minutes earlier and would, on most days, be flying over west London even before that. Inevitably some, if not all, would cause further sleep disturbance before 06.00 hours (para 21.4.33).
- 34.4.51 I have concluded that the balance of probability is that noise levels resulting from arrivals within the existing night quota period are unlikely to be significantly different whether Terminal 5 is built or not. However, it seems inevitable that Terminal 5 would result in a significant increase in arrivals soon after 06.00 hours and that this would cause a deterioration in the noise climate just before 06.00 hours. This must count significantly against its approval (para 21.4.34).
- 34.4.52 In the absence of any definition of what constitutes an excessive noise level at night, it is difficult to relate this increase to Government policy for that period. Assuming that the Government does not believe existing levels to be excessive, it is at least possible that the increases I have identified as a result of Terminal 5 could persuade Ministers that noise levels in the early morning had become excessive (para 21.4.40). Even then, this would not necessarily offend Government policy since this recognises the need to balance noise with aviation, employment and economic factors (para 21.4.41). On the other hand, I am, for my own part, satisfied that, for many people, noise levels particularly at night are already excessive (para 21.4.42). In accordance with my overall approach of examining the implications of all realistic forecasts, I have therefore assumed that Terminal 5 would indeed cause noise levels in the early morning that most people would reasonably judge to be excessive.
- 34.4.53 I have considered a wide range of measures that might reduce the impact of aircraft noise around Heathrow. Many of these are independent of Terminal 5 but are relevant since they could reduce the overall noise levels and possibly make the impact of Terminal 5 more acceptable. I believe that the continuation of westerly preference is not in the best interest of the population around Heathrow and that, indeed, there is much to be said for the introduction of an easterly preference at night (paras 21.5.6-8). In this context, it is worth recording that there has been very little improvement in the noise of landing aircraft in marked contrast to the reductions in that of those departing from Heathrow (para 21.2.4). Furthermore, the time might have come for a fundamental re-assessment of the Cranford Agreement (para 21.5.9).
- 34.4.54 I am also satisfied that a limit on the number of aircraft movements should be imposed by means of a planning condition if Terminal 5 is approved and that this

should be set at 480,000 air transport movements a year. I have already said that I believe it would be unwise to rely entirely on the evidence that no more than 480,000 movements could be accommodated without moving away from the present segregated mode of runway operation. The experience of the dramatic increase in the number of aircraft movements beyond that believed to be possible following the Eyre inquiry is a particularly powerful lesson in this respect. In these circumstances, and bearing in mind the potential consequences of an increase beyond 480,000 movements, I am convinced that, if Terminal 5 were approved, a limit on aircraft movements would be justified in principle (paras 21.5.11-12). A noise contour cap should also be imposed but this should be more rigorous than that proposed by BAA. I propose a 57 dB(A) $LA_{eq\ 16hour}$ contour cap of 145 sq km to take effect in 2016 (para 32.5.36).

- 34.4.55 I do not believe that a ban on night movements is realistic, at least in the short term (paras 21.5.14-15) but have proposed that the night quota period should be extended to cover the whole period from 23.00 hours to 07.00 hours (paras 32.5.43-44).
- 34.4.56 The construction of Terminal 5 together with the Forward Maintenance Unit would introduce significant new ground noise sources at the western end of the airport (para 22.2.20). In spite of differences between the parties, the overall picture is clear in that areas close to the western boundaries of the airport would experience a significant increase in ground noise (para 22.2.24). While the impact of this could be reduced by noise insulation, this would not solve the problem out of doors (para 22.2.25). Although the Ground Running Pen to be used for engine testing could be constructed in such a manner as to achieve a noise attenuation of 20dB (para 22.2.26), it would still result in more disturbance to those living close to it. At the same time the provision of the new Ground Running Pen would offer an opportunity to move towards the removal of the existing pen close to Waye Avenue (para 22.2.29).
- 34.4.57 Although the effects of Terminal 5 on ground noise must weigh in the balance against it I do not consider them to be as significant as its impact on air noise (para 22.2.31).
- 34.4.58 Similarly its effects on road noise are likely to be relatively small and should not have a significant effect on the overall balance (para 23.2.25).

Air Quality

- 34.4.59 Although there are real difficulties in assessing the impact of Terminal 5 there was general acceptance that air quality around Heathrow would be better in 2016 than it was in 1993, even if Terminal 5 were built. Nevertheless, the proposed new terminal would result in a slight deterioration in air quality. It would result in more breaches of the National Air Quality Strategy objectives and would increase the scale of those breaches that would have occurred in any event (para 25.2.75). This must be a factor weighing against Terminal 5 but cannot mean that planning permission must be refused for it (paras 25.2.80-81).
- 34.4.60 I do not wholly accept BAA's arguments concerning the health risks arising from Terminal 5 (para 25.3.16). Where the objectives of the National Air Quality Strategy are exceeded, there will be an increased risk to human health. On this basis, Terminal 5 is likely to have an adverse impact on health (para 25.3.17).

Although that impact is likely to be small, it must not be discounted. It must, however, be viewed against the background of the fact that levels of both NO₂ and PM₁₀ are likely to be substantially lower than those in 1993, even if Terminal 5 is built (para 25.3.21).

- 34.4.61 Although it was suggested that Terminal 5 would damage international attempts to reduce greenhouse gases (para 25.4.6), the Government's position remains clear. It takes the view that global warming is of very limited relevance to decisions on the capacity of UK airports (para 25.4.7). Nothing said in relation to air quality changes my conclusions on this point in relation to national aviation policies.

Public Safety

- 34.4.62 Turning to public safety, I accept that the model used on behalf of BAA is appropriate and produces acceptable estimates of the likely effects of Terminal 5 (para 26.2.44). The area exposed to an individual risk of greater than 10^{-4} would be increased but no people would be involved due to the Government's proposed policy of removing housing and other development from within that area. Some 1,900 more people would be exposed to an individual risk of more than 10^{-5} , while a person exposed to that risk in any event would experience an increase of 30% in their risk if Terminal 5 were built. In summary, the individual risk would remain very low but, within that context, the increase due to Terminal 5 would be significant (para 26.2.13). I do not accept the suggestion that there were no grounds based on third party risk to refuse Terminal 5 because the public safety zone policy could cater for it (para 26.2.39). Conversely, I do not consider that the increase of 1,900 in the number of persons exposed to a risk greater than 10^{-5} represents the sort of large increase the Department said in evidence would be capable of tipping the balance against Terminal 5 (para 26.2.13). It must, however, be a factor counting against the proposed development.
- 34.4.63 Were a large aircraft to crash while approaching or leaving Heathrow, it would clearly raise questions about the future role of the airport, particularly if it were to crash on a highly populated area. While this could happen without Terminal 5, it is reasonable to assume that the risk of such a crash (known as the societal risk) would rise in line with the increase in individual risk (para 26.2.50). Since the areas around both Gatwick and Stansted are not as intensively occupied, the societal risks associated with development there would be lower (para 26.2.51). The risk of a crash over the highly populated areas of London under the approach paths would be reduced if an easterly preference were introduced. In this regard it is important to note that crashes associated with landings are some 2.5 times more frequent than those associated with departures (para 26.2.52). This is a factor of some importance.
- 34.4.64 The evidence is that the Government and the CAA both believe that current procedures ensure that Heathrow and other UK airports operate safely (para 26.2.53). Terminal 5 would result in increases in both individual and societal risks which clearly represent a material objection to its approval (para 26.2.55). I do not however, consider that the risk of damage to property or harm to human safety caused by aircraft vortices is a material factor in the decision (para 26.3.9).

Other Applications

- 34.4.65 I have considered the 6 planning applications for permanent developments associated with Terminal 5 in Chapter 27. Although some involve development in the Green Belt, I am satisfied that all would be fully justified if permission were granted for Terminal 5 and that none would cause such harm as to have a material effect on the decision on whether to approve Terminal 5 itself.

Construction

- 34.4.66 The construction work required to complete Terminal 5 would be an enormous project with widespread impacts. It would generate substantial traffic which would cause increased delays at a few junctions. It would also increase the likelihood of delays and disruption due to bad weather, accidents or local events (para 28.2.49). Nevertheless, the impact of workers travelling by car could be reduced by limiting car parking and making better use of public transport (paras 28.2.51-52). Consequently the impact of construction traffic is unlikely to be sufficient to weigh against Terminal 5 to a material degree, particularly if parking for construction workers is limited as I propose (para 28.2.55).
- 34.4.67 In spite of the uncertainties involved in the prediction of noise levels, I am satisfied that the construction of Terminal 5 would cause some disturbance which would affect a small number of properties for lengthy periods (para 28.3.42). Overall the impact of construction noise would add materially to the case against Terminal 5 (para 28.3.44).
- 34.4.68 Similarly predictions of future dust levels are prone to error (para 28.4.44). Although the model suggests that there would be few areas subject to substantial problems, I am concerned that the potential for harm could be more widespread than BAA suggest (para 28.4.45). Problems would also occur with relation to PM₁₀ levels with the result that the National Air Quality Strategy objective would be breached (para 28.4.49). I accept that PM_{2.5} is a source of potential harm and that it should be monitored from the outset (para 28.4.51). The construction process would raise NO₂ levels by some degree (para 28.4.52).
- 34.4.69 Increases in PM₁₀ and NO₂ would result in a small but not negligible increase in the risk to human health (para 28.4.54). Although the effects of construction on air quality could be limited by the imposition of appropriate controls and working practices they would still add materially to the case against Terminal 5 (para 28.4.57). While I do not accept the complex set of controls suggested by Hillingdon relating to air quality, I believe that a significant number of the assurances offered by BAA should be imposed in the form of planning conditions (paras 32.10.3-5).
- 34.4.70 I do not believe that the absence of a comprehensive minerals and waste strategy constitutes a material objection to Terminal 5 (para 29.2.32). As I believe that BAA's proposals for the deposition of spoil would be appropriate development in the Green Belt and would enhance the landscape of the Colne Valley I do not consider they would cause harm that should count against Terminal 5 (para 30.2.35).
- 34.4.71 The Colnbrook Logistics Centre would be inappropriate, albeit temporary, development in the Green Belt (para 31.2.17). It would be visually intrusive and contribute to the urbanisation of a narrow and vulnerable part of the Green Belt and would be a major encroachment into the countryside (para 31.2.18). Furthermore it would cause noise and pollution. Although I consider that it should be approved if

Terminal 5 proceeds, the harm it would cause should be treated as an objection to the project as a whole even though it should not carry substantial weight bearing in mind the benefits it would bring to the construction process (para 31.2.26).

- 34.4.72 The Forward Lorry Park would also be inappropriate development in the Green Belt and would cause harm by reducing openness and contributing to urbanisation (para 31.3.13). It would also cause noise and pollution (para 31.3.15). I consider that the arguments for and against the Forward Lorry Park are finely balanced but that it should be permitted if Terminal 5 proceeds. Again the harm it would cause must count against Terminal 5 even though I believe that the smaller scale of the Forward Lorry Park means that it would be less damaging than the Colnbrook Logistics Centre (para 31.3.22).
- 34.4.73 I accept that the construction process would have significant impacts on Willowslea Kennels in spite of the measures proposed by BAA. This could affect the business of the Kennels and should attract some weight in the overall balance (para 28.3.40). In particular, there is a risk that the birds and animals might be affected by increased pollution (para 28.4.55). Nevertheless, I do not consider that the risk of harm is so great as to represent a substantial objection to Terminal 5.
- 34.4.74 I do not believe that the proposed Bailey Bridges raise substantial issues while the planning application to deposit spoil to form the M25 Spur Road embankment is a procedural matter.
- 34.4.75 Finally I have dealt with the planned relocation of the sludge works at Iver South separately in Chapter 33. While I am in no doubt that this should be permitted if Terminal 5 is to go ahead, it would be inappropriate development in the Green Belt and would cause significant harm. As such it should be taken into account as a further material objection to Terminal 5.

34.5 THE OVERALL BALANCE

- 34.5.1 In drawing the benefits and costs of Terminal 5 together to strike the overall balance some repetition is inevitable. I shall, however, concentrate on those matters that directly influence that balance to a significant degree. I shall also concentrate on the comparison of the position in 2016 with Terminal 5 as compared with that with only 4 terminals, since I believe that to be the best measure of the impact of the proposed development. In so doing, I do not however, overlook the feeling of many that their environment has already been irretrievably damaged by the uncontrolled growth of Heathrow. This reinforces the need for proper controls in the future whatever the fate of Terminal 5 and is a point to which I shall return.
- 34.5.2 I start however, by recording that there should be no doubt in anybody's mind but that Terminal 5, in itself, would be a massive development that would have dramatic impacts over a very wide area. Assuming that it handled 30 mppa, it would be the equivalent of the whole of Gatwick and as large as many international airports. It would, however, achieve this without the need for an additional runway.
- 34.5.3 The evidence is clear that the demand for air travel is continuing to grow and the extent of that growth is such that the airports in the South East will not be able to accommodate it. Even with Terminal 5 taking a further 30 mppa, the total capacity would increase to only 155 mppa compared to a total demand of at least 170 mppa.

- 34.5.4 The scale of the problem is actually greater than that suggested by the regional figures. Most of the demand in the South East is concentrated on Heathrow where the unconstrained demand is likely to reach 118 - 143 mppa by 2016. This compares with a capacity of 60 mppa without Terminal 5 and 90-95 mppa with it. The shortfall would be even greater if, as I believe, BAA have under-estimated the demand at Heathrow.
- 34.5.5 There is no realistic prospect of that demand being met at other airports in the UK. Gatwick is growing quickly but its capacity for scheduled services is limited by the strong presence of charter airlines. Stansted is also growing strongly but from a very low base. It is also developing a specific role as the base for low cost airlines and shows few signs of establishing the wide range of long and short haul services needed to support an international hub airport. In any event, the evidence demonstrates that no airport can develop the range of services essential to an international hub unless it has 2 runways. Consequently the lack of a second runway is a fundamental limit on both Gatwick and Stansted. While there is some evidence that Gatwick might be capable in the long term of serving as a second international hub a second runway is unlikely to be constructed in the short term. The position at Stansted is even less promising. The evidence shows that it is unlikely to develop as an international hub airport and the provision of a second runway would be very difficult to justify in economic terms even if it were environmentally acceptable.
- 34.5.6 If the national policy objective of meeting the demand for air travel where and when it arises is to be met, there is an urgent need for additional airport capacity. In current circumstances there is no way in which this can be achieved other than by increasing the capacity of Heathrow. Furthermore Terminal 5 would be consistent with the objective of fostering a strong and competitive British airline industry. I am in no doubt that the real beneficiaries if Terminal 5 is not provided will be the other major European airports, Charles de Gaulle, Schiphol and Frankfurt. Each of these has the capacity to expand and Heathrow can continue to compete with them only if it is able to offer the highest possible standards and the widest possible range of regular and frequent services. Inevitably restrictions on Heathrow will hinder British airlines as they seek to compete internationally. British Airways is already handicapped by having to operate from both Gatwick and Heathrow and I am convinced that it would be impossible for the airline to compete effectively if it were forced to use Stansted as a third base.
- 34.5.7 Finally Terminal 5 would enable the best use to be made of Heathrow's potential capacity and would achieve this without the need for a new runway or alterations to the current operating procedures. However, it would clearly enhance Heathrow and strengthen its position as the pre-eminent airport in the UK. There is a very real danger that in doing so it would merely increase the pressure for further growth to be concentrated at Heathrow. This could well lead to demands for the introduction of more intensive use of the runways or even the construction of a third main runway. Indeed there are already signs that some airlines would wish to explore this last possibility in spite of BAA's request that this be ruled out by the Secretary of State. I am in no doubt that the environmental costs of continued growth at Heathrow beyond 90 mppa would quickly become unacceptable but the only effective and conclusive means of protecting against the provision of such a runway would be through a legal agreement similar to that in force at Gatwick. In the absence of any such agreement I do not believe much weight can be attached to BAA's request as a means of excluding that possibility. I shall return to this point at the end of my conclusions.

- 34.5.8 Although Terminal 5 is, in my view, essential to the maintenance of a strong and competitive airline industry in this country, its economic benefits do not end there. Heathrow contributes some 1% to the national economy and is by far the most significant element in a sector of the economy that it likely to grow relatively quickly. I believe that it has also played a significant part in attracting investment to the UK. Unless Heathrow is able to maintain its competitive position there must be a substantial risk that London's success as a world city and financial centre would be threatened. By ensuring the continued success of Heathrow, Terminal 5 would make a major contribution to the national economy.
- 34.5.9 The provision of Terminal 5 would be consistent with national aviation policies concerned with meeting the demand for air travel, supporting a strong and competitive aviation industry and making the best use of existing facilities. It would also make a substantial contribution to the national economy, to the continued success of London as a financial centre and to the ability to attract investment to the UK. I am therefore satisfied that the construction of Terminal 5 would clearly be in the national interest. I consider that the economic benefits of Terminal 5 are so fundamental and wide-ranging that it would be in the national interest even if the simple objective of meeting the demand for air travel where and when it arises were to be set aside. It would also bring positive benefits to passengers not only by providing a terminal equal to the best in the world but also by relieving some of the pressure on the existing terminals and providing an opportunity for these to be brought up to the highest international standards of comfort and convenience.
- 34.5.10 I believe that it is also capable of being regarded as consistent with the thrust of the policies of the statutory development plan which recognises that the national interest might justify the provision of additional terminal capacity at Heathrow. The fact that Terminal 5 would be consistent with some elements of national and local policy does not, of course mean that it must be approved. National policy also requires a balance to be struck between the economic and other benefits of airport development and its environmental and other impacts. This approach is reflected in the Hillingdon UDP and other local plans.
- 34.5.11 The site of Terminal 5, Perry Oaks, is in the Green Belt and, as it would be inappropriate development, very special circumstances must apply before it can be approved. However, the Perry Oaks site is bounded on three sides by the airport. Furthermore I agree with Hillingdon that it would be the logical site for any extension of terminal facilities that are found to be necessary in the national interest and that the A3044 would make a suitable Green Belt boundary if Terminal 5 were built. I, therefore, conclude that the damage to the Green Belt would be limited, as did both Sir Iain Glidewell and Sir Graham Eyre. Moreover, national policy still recognises that it would be appropriate to use Perry Oaks for some form of airport-related development.
- 34.5.12 Other proposals associated with Terminal 5 would also be inappropriate development in the Green Belt and would require very special circumstances to justify them. I have dealt with each of these individually and in every case the need for Terminal 5 is fundamental to their determination.
- 34.5.13 Terminal 5 and its associated developments would inevitably change the character of this part of the Colne Valley Park. It would introduce additional urban features particularly during the period of construction. However the harm caused to the Park must be judged in the context of its existing character. The landscape of the Park

remains largely undistinguished and it includes poorly restored mineral workings and other urban fringe uses. It is also dominated by the M25 and embankments containing major reservoirs. Both BAA and the Highways Agency have undertaken to carry out landscape improvements and the spoil deposition proposals on Plots 1 and 9 would also help in screening the M25 and M25 Spur Road. Consequently, I do not consider that the impact on the character of the Colne Valley Park would be so great as to constitute a substantial objection to Terminal 5.

- 34.5.14 There would, however, be significant harm in ecological terms arising from the loss of the Perry Oaks site itself, the construction of the M25 Spur Road and the Iver South replacement sludge treatment works. Although some of this harm would be offset by BAA's contribution to Barn Elms, attempts to translocate turves from field G28 to Orchard Farm and measures undertaken by Thames Water at Iver South, I do not believe that these would offer complete compensation. The harm to the ecological interest of that area must therefore count against Terminal 5.
- 34.5.15 I have said a number of times that Terminal 5 would be a massive development that would certainly be visually intrusive. It would be seen from many points around and to the west of Heathrow. On the other hand, the terminal buildings themselves, particularly the Core Terminal would be well designed. They would be light elegant structures that would represent a national gateway of great architectural merit. While it would be very difficult to achieve the same standard in the design of the landside buildings, I believe that it would be possible to reduce the scale of the multi-storey car parks in such a way as to emphasise the Core Terminal and permit more landscaping. This would reduce the visual impact of the whole development. While Terminal 5 would still be intrusive, the fact that it would be sited in a largely undistinguished landscape combined with the quality of its design means that I do not believe its visual impact to be so great as to represent a material objection.
- 34.5.16 Similarly I do not consider that there would be a material objection to Terminal 5 in terms of surface access if the additional measures that I have proposed were required of BAA. The provision for public transport should be improved as a matter of principle, with the Piccadilly Line as well as the Heathrow Express extended to Terminal 5 and the St Pancras service implemented. Gateway stations should be provided to the north and south and provision should be made for further extensions to rail services.
- 34.5.17 Overall, I believe that the provision of Terminal 5 would provide a major stimulus to bring public transport at Heathrow up to the standards already enjoyed at other major European airports. However, if this opportunity is to be seized, as I believe it must be, steps will have to be taken to ensure that investment is not inhibited by inappropriate financial controls
- 34.5.18 While all of these provisions are essential if Heathrow is to meet the objectives of current transport policies in general as well as those related particularly to airports, they would also ease the problems on the roads. Bearing in mind that these problems would inevitably be greatest in the peak hours, employees should be encouraged to make greater use of public transport. The extra provisions I have just set out would play a part in this but I believe that a reduction in the provision of car parking for employees would also be essential.
- 34.5.19 On this basis, I consider that the road network could cater for Heathrow with Terminal 5. The direct link to the M25 proposed by BAA and the Highways Agency would, however, be essential and consistent with national policy for access to

airports. On the other hand, I conclude that the M4 should not be widened. Although this is justified on a predict and provide basis, in terms of presently forecast traffic levels, the need for it does not arise primarily from Terminal 5 and traffic associated with the new terminal would be a relatively small element of total flows. Furthermore, the forecast flows do not take full account of the emerging policies to reduce the growth in demand for car travel. If these are implemented successfully the justification for the M4 widening on even a predict and provide basis would be reduced and conceivably removed. This widening would, I believe, be contrary to the thrust of current Government policy. I consider that it would inevitably encourage more people to commute into west and central London and exacerbate the problems already caused by the restrictions on the capacity of the M4/A4 corridor at Chiswick. Since it is no longer Government policy to provide sufficient road capacity to meet the predicted demand, time should be given for its new policies to work before the M4 is widened. The success of the additional public transport links to central London and restrictions on car parking for employees would play their part in reducing the need for the M4 widening. I conclude that the improvements to the M4 should be limited to Junctions 3 and 4.

- 34.5.20 The position is very different with relation to noise. There can be no doubt that aircraft using Heathrow cause substantial disturbance and annoyance over a very wide area. Although the area enclosed by the $LA_{eq\ 16hour}$ 57 dB(A) contour has reduced, this is only part of the story. The very great increase in the number of aircraft has made the noise climate worse for many, particularly in the early morning. Although BAA claims that the noise climate will continue to improve, much of this would be due to the phasing out of Concorde. In any event, Terminal 5 would significantly reduce the extent of this improvement and would result in even more aircraft movements. I have grave doubts as to the validity of using the potential benefits of phasing out Concorde as a justification for permitting Terminal 5. Indeed I have come to the firm view that the proposed new terminal would cause substantial harm in noise terms. It would reduce the improvement in the noise climate as measured by the 57 dB(A) $LA_{eq\ 16hour}$ contour. It would also increase the impact on local residents by increasing the number of movements particularly those just before and just after 06.00 hours.
- 34.5.21 While I believe that the benefits of Terminal 5 would have to be very considerable to outweigh its impact in terms of noise, I do not consider that impact to be so great as to rule it out entirely. I do, however, believe that Terminal 5 should be approved only if it is subjected to clear and specific controls that would prevent any increase in the noise impact over and above that which I have taken into account. It is also essential that these are measures in which the public and the local authorities can have faith. Unless the total number of aircraft movements at Heathrow is strictly controlled and a realistic contour cap is imposed together with effective controls on movements at night, the impact of Terminal 5 would soon exceed that on which I have based my judgement. In short it would rapidly become unacceptable, whatever benefits it might bring. I have already commented on the continued value of westerly preference but I accept that this is not part of the Terminal 5 package (paras 21.5.6-9 and 32.5.46). It is, therefore, not appropriate to bring it into the overall balance.
- 34.5.22 Although I recognise that both ground noise and road noise cause problems, I do not believe that Terminal 5 would exacerbate these to such an extent as to constitute a material objection. I have based this view on the assumption that the conditions proposed by BAA and British Airways controlling aircraft operations on the ground, engine testing and the construction of the Ground Running Pen are imposed. I also

believe that there is a strong case for the use of a quieter road surface on the M4 even if it is not widened.

- 34.5.23 The position in relation to air quality is similar to that concerning aircraft noise. There is clear evidence that Terminal 5 would result in increased concentrations of pollutants around Heathrow as compared with the levels that would occur if it were not built. Although pollution would be less in 2016 even with Terminal 5 than it is now, the fact that it would reduce the potential improvement must count against Terminal 5. The weight attached to this factor should reflect the importance attached by the Government to achieving better air quality in accordance with the National Air Quality Strategy. It is also clear that Terminal 5 would cause a small increase in the risk to human health as a result of increased air pollution.
- 34.5.24 There are real difficulties in monitoring and controlling the contribution of Heathrow to overall air quality and these limit the conditions that could be imposed on any permission given for Terminal 5. In these circumstances the impact it would have on air quality represents a material objection.
- 34.5.25 Terminal 5 would also result in a significant increase in the risk to public safety when measured in terms of individual risk. This would be the result of a combination of the increased number of aircraft movements and the increased size of aircraft likely to operate with Terminal 5 in place. In spite of the fact that public policy would ensure that there would not be an increase in the number of people exposed to an intolerable risk, the fact that more people would be exposed to a material risk represents a real and substantial objection to Terminal 5. While it would not be possible to fully overcome this objection, steps should be taken to limit its scope. The number of aircraft movements should be limited and measures taken to restrict the number of landings that involve flying over the heavily developed areas of London, particularly those parts of west London that are overflowed on final approach.
- 34.5.26 Apart from the individual risk, I conclude that Terminal 5 would increase the risk of a major air crash involving many casualties on the ground which would raise questions about the future role of Heathrow. From this, and other public safety points of view, development at either Gatwick or Stansted would be preferable to that at Heathrow, since the approaches to both do not pass over extensive built-up areas. Consequently increased societal risk must be a factor weighing against Terminal 5.
- 34.5.27 I readily accept that the construction of Terminal 5 would involve major works extending over many years. It would undoubtedly have widespread impacts but I am satisfied that most of these could be controlled either by the imposition of appropriate conditions or by the assurances given by BAA. While I recognise that assurances are not enforceable in the same way that conditions would be, I believe that it is right to rely on assurances entered into publicly by a company of the standing of BAA. Accordingly I do not consider that the construction impacts of Terminal 5 weigh significantly against its approval.
- 34.5.28 In essence the decision on Terminal 5 comes down to a balance between its benefits to the national and local economy and to the travelling public as opposed to its environmental impacts. I have come to the clear conclusion that the benefits would substantially outweigh those impacts as long as its effects are properly controlled. In reaching this conclusion, I have taken into account all of the harm, identified at various points throughout the report including breaches of policy, that Terminal 5 as

well as its associated developments (including Iver South) would cause. On the same basis, I am also satisfied that very special circumstances do exist to justify the development of Terminal 5 in the Green Belt. I have also considered each of the other applications and orders before me individually and conclude that, with the exception of the widening of the M4, in each case their benefits outweigh the harm they would cause. Where they involve inappropriate development in the Green Belt I also conclude that, assuming Terminal 5 is permitted, very special circumstances would exist to justify their approval. In the event that Terminal 5 is not permitted, permission should not be granted for any of the other proposals, apart from the downstream enhancements of the Twin Rivers.

- 34.5.29 In the absence of effective controls the picture would be different and the balance in respect of Terminal 5 would become much more difficult. In this respect, I place particular weight on limiting the number of aircraft movements to 480,000 atms, the imposition of a $LA_{eq\ 16hour}$ 57 dB(A) contour cap of 145 km² and the introduction of stricter controls on movements at night particularly early morning arrivals. If these controls were not imposed the balance would, in my view, tilt against Terminal 5. While I recognise that all controls on operations at Heathrow, as at any airport, must be open to review if circumstances change dramatically, the imposition of the conditions I propose would provide a clear baseline against which the impact of such changes could be judged. The absence of a clear baseline, as proposed by Sir Iain Glidewell, caused great public concern in this Inquiry, as I have already pointed out.
- 34.5.30 The benefits of Terminal 5 reflect my view that neither Gatwick nor Stansted could meet the national need I have identified for a truly competitive international airport serving London, at least in any timescale relevant to the need for this proposal. At the same time I recognise that Terminal 5 would enhance the attractions of Heathrow still more and could make it more difficult to resist future proposals for development there. Nevertheless, I agree with BAA that the evidence placed before me demonstrates that a third main runway at Heathrow would have such severe and widespread impacts on the environment as to be totally unacceptable. However, as I have already said, I place only limited reliance on BAA's request that the Secretary of State rules out the prospect of an additional runway. I place more weight on the Government's commitment to undertake a review of national aviation policy after deciding the fate of Terminal 5. Although granting permission for Terminal 5 would not meet the demand for air travel up to 2016, I believe that it would provide sufficient breathing space for long term policies to be established as a result of the Government's planned review.
- 34.5.31 It was not the role of this inquiry to set out long-term aviation policies for the South East. I warmly welcome the Government's decision to bring forward such policies and hope that these would ensure that future decisions on major airport development are not influenced by short-term expedience. In the context of the Government's review, it should be assumed that no further major development would take place at Heathrow after Terminal 5. Terminal 5 itself should be accepted only if it is substantially subject to the controls I have set out and on the understanding that it is the means by which time would be provided for a new strategy to be identified.

35 RECOMMENDATIONS

35.1.1 I recommend as follows;

1. Planning permission should be granted for the construction of Terminal 5 at Heathrow (Applications 47853/93/246 and SP/93/0096 as amended [see Appendix D(ii)]) subject to Conditions A1-A132 set out in BAA/404R but with the following additions and modifications;
 - a) A condition should be imposed to limit aircraft movements to no more than 480,000 atm's,
 - b) A further condition should be imposed to limit the area enclosed by the 57 dBA $LA_{eq\ 16hour}$ to 145 km²,
 - c) Condition A79 should be amended to refer to 10 years,
 - d) Condition A84 should be amended by the deletion of reference to hotels,
 - e) Conditions should be imposed requiring the provision of both the Heathrow Express Extension and the Piccadilly Line Extension before the Core Terminal is opened,
 - f) Conditions should be imposed requiring BAA to use their best endeavours to secure the opening of the St Pancras service and Gateway North station before the opening of Terminal 5,
 - g) Condition A94 should be amended to limit overall car parking provision to 42,000 spaces of which no more than 17,500 should be for employees,
 - h) The conditions in BA/2102 concerning the Ground Running Pen should be imposed,
 - i) A condition should be imposed requiring BAA to produce and keep under review an Action Plan to minimise emissions from Heathrow,
 - j) A condition should be imposed as a substitute for Assurance 29 in BAA/404R but limiting the provision of parking for construction workers to 50% . This should be supplemented by a scheme to encourage the use of public transport to work by construction workers including the provision of shuttle buses linking car parks and bus and rail stations with construction sites.
 - k) Assurances 31-41, 43, 44, 48-57, 62, 64-68 and 74-77 in BAA/404R should be translated into appropriate conditions as proposed in paragraphs 32.10.3-32.10.5.
 - l) The Memorandum of Understanding referred to in Assurance 1 in BAA/404R should include an open-ended commitment,

- m) Stricter controls should be introduced on night flights as set out in paragraphs 32.5.43-46 and the continuation of westerly preference should be reviewed,
 - n) Provision should be made for the extension of the Noise insulation Scheme in the Stanwell and Stanwell Moor areas even if a replacement noise barrier is provided,
 - o) An Ombudsman should be appointed to deal with public complaints about the construction of Terminal 5.
- 2. Planning permission should be granted for the Colnbrook Logistics Centre (P/09924/005 [see also Bucks CC 39710C/97/2146]) subject to Conditions B1-B17 in BAA/404R with the following modification;
 - a) A condition on the lines of that proposed by Spelthorne limiting the use of the site to a period of 10 years should be substituted for that proposed by BAA (para 32.8.72).
- 3. Planning permission should be granted for the Forward Lorry Park at Robbs Nursery (49022/A/98/0029) subject to Conditions C1-C23 in BAA/404R with the following addition;
 - a) A condition should be imposed limiting the use of the site to that of a forward lorry park as described in the evidence.
- 4. Planning permission should be granted so as to permit the deposition of spoil on Plot 1 (47853/M/98/117) subject to Conditions D1-D24 in BAA/404R.
- 5. Planning permission should be granted so as to permit the deposition of spoil on Plot 9 (Applications 47853M/98/118 and N8/0077) subject to Conditions E1-E32 in BAA/404R subject to the following modification;
 - a) Condition E7 should be amended to refer to a period of 25 months rather than 30 months, and
 - b) A condition should be imposed requiring the cessation of the Horton Rd access as soon as the route using the Bailey Bridges becomes available.
- 6. Planning permission should be granted for the construction of a Bailey Bridge over the A3044 and the Western Perimeter Road (47853H/95/616) subject to Conditions F1-F16 in BAA/404R.
- 7. Planning permission should be granted for the deposition of spoil to form the M25 Spur Road embankment (47853G/95/615) subject to Conditions G1-G17 in BAA/404R subject to the following addition;

- a) A condition should be imposed to limit the spoil used to that arising from the Terminal 5 project.
8. Planning permission should be granted for the Terminal 5/Central Terminal Area Airside Road (47853C/94/1598 as amended [see Appendix D(ii)]) subject to Conditions H1-H9 in BAA/404R.
 9. Planning permission should be granted for the Terminal 5/World Cargo Centre Airside Road (47853D/94/1600 as amended [see Appendix D(ii)]) subject to Conditions I1-I12 in BAA/404R.
 10. Planning permission should be granted for the construction of services under the A3044 (47853E/94/1602) subject to Conditions J1-J7 in BAA/404R.
 11. Planning permission should be granted for the construction of the Fuel Farm (49470/A/95/1197) subject to Conditions K1-K12 in BAA/404R.
 12. Planning permission should be granted for the construction of the Stormwater Outfall Sewer (applications 47853A/94/1693 and 00287D/P50 as amended [see Appendix D(ii)]) subject to Conditions L1-L19 in BAA/404R.
 13. Planning permission should be granted for the construction of an Underground Transfer Baggage System (47853F/95/448) subject to Conditions M1-M8 in BAA/404R.
 14. Planning permission should be granted for the on Airport Single Channel diversion of the Duke of Northumberland's and Longford Rivers (47853R/98/873 as amended [see Appendix D(ii)]) subject to Conditions N1-N15 in BAA/404R.
 15. Planning permission should be granted for the enhancement of the Duke of Northumberland's and Longford Rivers between Oaks Rd and the A30, Great West Road (47853/97/1300), subject to Conditions O1-O13 in BAA/404R.
 16. Planning permission should be granted for the enhancement of the Longford River in Hanworth Park (00632/R/P1) subject to Conditions P1-P4 in BAA/404R.
 17. The Heathrow Express Extension Order (LRP/9/-/2/19 as amended [see Appendix D(ii)]) should be confirmed subject to the imposition of Condition Q1 in BAA/404R on the deemed planning consent.
 18. The Piccadilly Line Extension Order (LRP9/-/2/20 as amended [see Appendix D(ii)]) should be confirmed.

19. The Draft M25 Motorway Connecting Roads and Side Roads Orders and the associated Compulsory Purchase Order should be confirmed.
20. The Draft M4 (No.2) Connecting Roads and Side Roads Orders and the associated Compulsory Purchase Order should not be confirmed but that action should be taken to secure improvements to Junctions 3 and 4 of the M4.
21. The Heathrow Airport Terminal 5 Compulsory Purchase Orders (No.1) (APD/15/2/8 as amended [see Appendix D(ii)]), (No.2) (APD/15/2/96) and (No.3) (APD/15/2/97 as amended [see Appendix D(ii)]) should be confirmed.
22. The applications for rights under Section 44 of the Civil Aviation Act 1982 and Section 59 of the Airports Act 1986 (APD/3/13/5 as amended [see Appendix D(ii)], ADP/3/13/6 and ADP/3/13/7 as amended [see Appendix D(ii)]) should be granted.
23. Scheduled Ancient Monument Consent should be granted in respect of Application No. HSD9/2/980 subject to Conditions 1(i) and (ii) in BAA/404R.
24. Planning permission should be granted for the construction of a sludge dewatering plant at Iver South (applications SBD/8205/93 and SBD/8211/94) subject to the conditions set out in paragraphs 33.8.1-15 of the report.
25. The Thames Water Utilities Limited (Land at Colnbrook Iver South) Compulsory Purchase Order (WS/158/A9106/7/01) should be confirmed.