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THE AIRPORTS RESPONSE TO ENVIRONMENTAL ISSUES

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INTRODUCTION

Whilst there are other contributors to pollution and environmental problems stemming from the development and operation of a modern international airport, the primary cause of complaint and opposition from the community is noise.

There are a number of responses available to reduce or remove noise pollution - some technical, some procedural, and others resulting from legislation. A number of these measures may be in the direct control of the airport, and others can be implemented using the influence of the airport. Some are totally outside its direct control, and rely on technological developments in aeronautical equipment or national and international legislation to achieve improvements.

The intention of this paper is to briefly discuss the main issues, and the responses available in each category using Birmingham Airport's own experiences as illustrations.

MEASURES BY THE AIRPORT

A Positive Noise Abatement Policy

A successful reduction in the adverse environmental factors firstly relies on a firm commitment by the management of the airport to introduce measures and procedures, and accept that this cannot be carried out without positive commitment of financial and staff resources.

Noise Insulation Scheme

Unlike the BAA owned airports, no direct powers exist at "non designated" (ie regional/municipal) airports for compensation awards. Therefore in 1977, a Private Parliamentary Bill gave the West Midlands County Council powers to insulate those houses most directly affected by aircraft noise. By the late 1980's, when the final scheme in a 10 year rolling programme has been completed, a total of over 4,000 private and council owned houses will have been treated at an estimated cost exceeding £4M. With the abolition of WMCC in April of 1986, these powers have been passed to the new West Midlands Districts Joint Airport Board, the new Airport controlling body.

Noise Monitor System

In both 1981 and 1984, detailed surveys of aircraft flight paths using time lapse films of radar tracks and noise levels in the area around the Airport were carried out by Planning Staff of the Airport, in conjunction with specialist noise consultants. From this work the requirement for a monitoring system in locations north and south of the Airport was developed. This will be more fully described in Dr Ollerhead's paper.

By the end of 1986, the Noise Monitoring System will be in full operation, allowing constant monitoring of noise levels from six stations located along

airport flight paths from the airport. The system will allow the immediate assessment of aircraft noise for use in response to complaints and to ensure strict operational procedures are followed by aircraft using the airport. In addition, the system will serve as a basis for the measurement of overall environmental noise levels and possible introduction of pricing policies based on noise performance by airlines than in future years.

Physical Facilities

As part of the £62 million Terminal development scheme, ground power systems were introduced to reduce the effects of aircraft on-board power units whilst on the apron.

Earth noise barriers some 12m high were constructed using 670 000m^3 of earth to shield operations on certain aprons and the new parallel taxiway. Independent tests by solihull District Council's environmental health staff showed that the noise reduction due to the earth barriers was effective, and considerably exceeded the reductions predicted and accepted at the airport public inquiry. A more detailed account will be given by Mr Gibson.

Operational Procedures

The Airport's rules of operation restrict the use of reverse thrust in the night period (2300-0700), unless non use would be detrimental to safe operation. The use of onboard auxiliary power units is also prohibited in this period. Engine tests and runups are on a "prior permission only basis" being strictly limited to essential maintenance checks during daytime, and prohibited at night.

Flight Routes

The Airport's rules of procedure lay down general flight paths for both landings and takeoffs designed to reduce the effect of aircraft operations on the surrounding residential areas to a minimum. With only a small number of aerial navigation aids immediately in the area, flight paths cannot presently be laid down to the same level of precision as Heathrow or Manchester, for example, who both have a number of airways merging to give a dense distribution of navigation beacons. Procedures are, however, constantly under review by Airport Operations and the Civil Aviation Authority, who operate the Airport's air traffic services. Future upgrading of radar and navigation aids in the next few years will allow the progressive introduction of improved flight routeing procedures.

In cooperation with the airlines, improved procedures designed to reduce noise on the ground are regularly assessed. For example, a change in takeoff speeds and power settings by a major 1-11 operator resulted in reduced noise levels overall, at the cost of a small increase immediately in the region at the end of the runway.

Land Compensation Act

From 4 April 1985 - one year after the opening of the new Terminal - a six year period for claims under the terms of the Land Compensation Act 1973 came into force. Compensation will be available to house owners who can demonstrate that a devaluation of property value occurred as a result of the airport terminal and apron development. The scheme is being administered in cooperation with the two District Valuers offices with interests adjacent to the Airport..

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Night Jet Movements

The level of jet aircraft movements at night has a direct bearing on the environmental impact of the airport on the local community. The airport has a 24 hour operating licence and therefore is open at all times to operators wishing to use the facilities. There are restrictions on training flights and the Airport discourages all other movements at night. The vast majority of movements are by international charter flights since the Inclusive Tour organisers, and the charter airlines serving them, find it necessary to operate at night in order to optimise aircraft utilisation, thereby keeping fares and holidaty costs as low as possible. In recent years the general increase in international charter traffic has resulted in an increase in night movements, but these represent only a very small proportion of overall movements.

Noise Contours

The Airport has developed and reviewed noise contours for the area on a number of occasions since 1974, which reflect the best assessments of individual aircraft types, noise characteristics, traffic mixture, flight routes and levels of activity in current and future forecast years.

As well as use as a guide for airport development proposals, the resulting Contours have been used as a basis for the eligibility rules of the Noise Insulation Scheme, and as one of the environmental indicators in rent and rating tribunal judgements and in the Land Compensation Act procedures. The Contours are also used in land use zoning assessments in the surrounding area.

Unit of Measurement

Like all other UK Airports, the Noise and Number Index measure has been used so far, although the next review of Contours which is planned this winter will also be calculated in Noise Equivalent Level - LEQ. This is in anticipation of a general change to this unit as suggested in the 1985 White Paper on Airports Policy (Cmnd 9542) and the recent Civil Aviation Authority discussion report DRS 8502.

Public Consultation

The formal Public Inquiry is not the only opportunity where the community can comment, and influence, the operation and development of an airport. At Birmingham, there is a formal Consultative Committee consisting of elected members, parish councils, residents groups, business, travel and airline representatives. This meets at regular intervals to discuss current environmental issues. The Airport also gives briefings and presentations to a wide variety of neighbourhood and other community groups, and answers and investigates individual noise complaints. Finally one purpose of the Noise Monitor system is to issue a regular "Noise News" to all interested parties.

AERONAUTICAL TECHNOLOGY DEVELOPMENTS

Aeroengines

In parallel with the applications of measures and procedures by the Airport, the development of the new generation of large turbofan jet engines will make an increasing contribution to noise reductions at airports. These new engines are not only significantly quieter than earlier models, but are extremely attractive to airlines because of the major reductions in fuel costs that are

possible.

Existing engines can also be silenced using "hush kits" to extend the useful life of existing earlier model aircraft. Alternatively some models have sufficient economic life remaining to justify refitting with newer generation power units.

Airframe Development

The airframe manufacturers are using new materials and techniques to create lighter aircraft for a given passenger load, in combination with the advantages that can be gained using the new engines. The result is a lighter, more powerful airliner capable of lifting more passengers and payload but with substantially reduced noise output.

There is also a trend to larger aircraft types, where older 100 seaters are being rapidly replaced by quieter, more economical models of 120-150 seat capacity. With the increasing use of widebody "jumbo" jets lifting 300 to 400 passengers, this means that the steady growth of passengers is not paralleled by a proportional growth in aircraft movements, The result therefore is a lower growth in movements, that are themselves much less noisy compared to the situation in the late 1970's.

LEGISLATION

Noise Certification

The introduction in America of the Federal Aviation Authority FAR 36 regulations, and the comparable Air Navigation (Noise Certification) Order 1984 introduced progressive stages of legislation that will effectively ban and remove from use early generation, noisy, airliners by the end of the 1980's by a major portion of the world's airlines, and perhaps 99.9% of those likely to use Birmingham Airport.

From 1 January 1986 older types such as 707, DC8, Trident and 1-11 were banned from use on the UK register unless engine silencers or newer engines were fitted. For many aircraft this resulted in the scrapheap, or sale to a third world airline. In future years the regulations will become tighter to cover early models of the newer airliners unless engineering work or refitting is carried out. In addition, although primarily aimed at turbojet aircraft, the future regulations will progressively cover the "heavy" propeller airliners also, unless modifications are made.

Land Use Planning

The UK formal land use planning system uses the Public Inquiry process as a form of Environmental Impact Assessment. Only after consideration of all technica and environmental matters is airport development or expansion permitted. Agreement is likely to be accompanied by requirements and restrictions, which may have a commercial impact on the airport and user airlines but are considered justified on environmental grounds.

The Airport has a role in advising the land use planning authorities on noise effects of the airport, which should be reflected in development control policies which match only appropriate development to the particular location, using DoE circular 10/73. This is the only guideline available, and are only recommendatio rather than statutory regulations, so that incompatible development can still take place in the area surrounding an airport.

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THE ENVIRONMENTAL MANAGEMENT PACKAGE

This paper has briefly highlighted the main factors that can influence and control noise generated by the operation of a civil airport in the UK. Individually, each item properly used can make a contribution towards easing noise impact. But to be successful, all these factors must be applied and coordinated for maximum effect.

Such measures are not without cost to airport management, who have to find the funds from trading activities, within a budget where there are likely to be considerable demands from other areas to be balanced within overall policies and priorities.

The time is well past, however, when an airport can ignore its effect on its neighbours. The measures outlined above, therefore, in concert with improved technology, and environmental control can, in an overall package, significantly reduce the adverse noise impact of a modern, responsible airport.

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