



Noise Sources

Noise Complaints

Noise Monitoring

Track Keeping System

# Liverpool John Lennon Airport

## Annual Noise Report 2005

Runway Utilisation

Quota Count System

Sound Insulation Grant  
Scheme

Quiet Operations Procedure

## **Introduction**

This is Liverpool John Lennon Airport's Third Annual Noise Report. The annual reports have been updated, and reflect progress and developments at the airport over the last year.

The Airport Company recognises that in operating a successful Airport there will inevitably be some environmental impact on individuals, communities and businesses close to the Airport as well as aircraft approaching and departing.

Clearly, the operation and development of an Airport requires a careful balance, taking into account economic, social and environmental effects. The Airport Company is committed to sustainable growth, seeking to minimise and mitigate environmental effects wherever practicable and welcomes suggestions from individuals, the local community, airlines and other stakeholders on how this may be improved.

In partnership with the Local Authority and the Airport Consultative Committee and with the co-operation of the Airlines, the Airport Company has introduced measures to mitigate and minimise potential disturbance to those in the local environs.

It is envisaged that there will be increased numbers of European visitors attracted to Liverpool in the run up to the Capital of Culture 2008 and the leisure and commercial demand for air travel will continue to develop. The Airport Company aim is to meet this future demand by further developing aviation capacity.

## Past, Present and Future

Liverpool is one of the UK's oldest operational civil Airports having been officially opened on 1<sup>st</sup> July 1933.

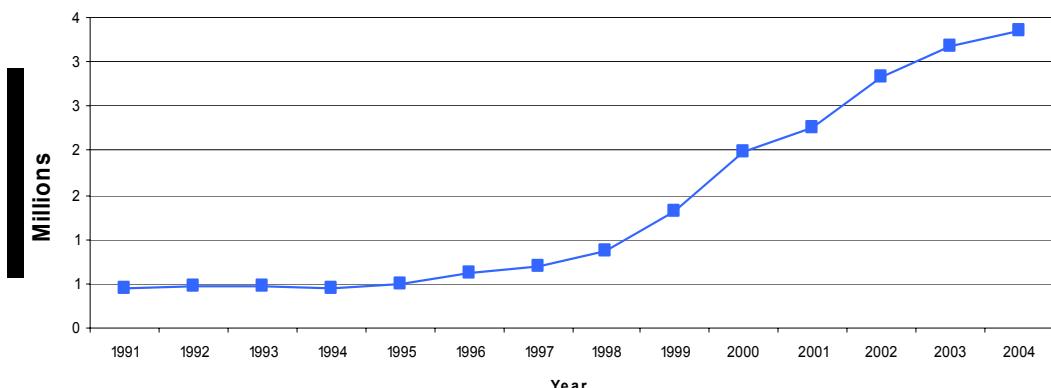
Situated some seven miles South East of Liverpool City Centre and adjacent to the River Mersey, the Airport location was chosen for three reasons which are still important benefits for the Airport today:

- Close proximity to the Centre of Liverpool and Merseyside conurbation.
- Ideal geography of the site for aircraft movements.
- Excellent year round weather record.

The current runway 09/27 was opened on 7 May 1966. However, the 1930's terminal (now the Marriott Hotel) continued to be used for passenger operations until 1982, after which the terminal moved to the present site. Today's new terminal was officially opened by Her Majesty the Queen on 25 July 2002.

**Figure 1.**

**Number of Passengers per Annum Between 1991 and 2004**



Today Liverpool John Lennon Airport is part of the Peel Airports Group which is a wholly owned subsidiary of Peel Holdings, the North West-based property and transportation company.

In 1994 Liverpool handled just 474,000 passengers compared with 3.32 million passengers that passed through the Airport in 2004. Over the period 1998-2003, Liverpool was the UK's fastest growing airport (source: CAA).

Liverpool is now the third largest regional airport in the UK for international scheduled passengers ahead of airports such as Newcastle, Glasgow, Edinburgh, Bristol and East Midlands, highlighting the progress made in recent years.

The Airport Company expects to handle some 4.5 million passengers in 2005 and 5.7 million passengers in 2006.

The Airport has an important regional role in transporting freight and has mail and has traditionally been one of the largest in the UK for cargo tonnage handled. The majority of the freight and mail is transported during the night. However, between 2001 and 2004 there has been a reduction in freight aircraft movements, mainly due to a reduction in the numbers and frequency of mail flights, following the Royal Mail's strategy to transport more rail by road.

In 2004, the Airport handled a total of 86,063 aircraft movements. Modern quieter aircraft make up the vast majority of the commercial passenger aircraft movements, whilst a significant proportion of the total movements relate to General Aviation (small private aircraft and flying schools), the majority of which operate during daylight hours.

The Airport provides and facilitates international travel for both leisure and business users and creates tourism opportunities on Merseyside and throughout the North West. The Airport is a major employer, creates economic benefit and promotes regeneration.

## **Charter Destinations 2005**

### **Thomson**

Malaga, Alicante, Corfu, Dalaman, Faro, Ibiza, Las Palmas, Mahon, Monastir, Paphos, Palma, Reus and Tenerife.

### **MyTravel**

Faro, Alicante, Malaga, Reus, Las Palmas, Arrecife, Palma, Mahon, Tenerife, Dalaman

### **Thomas Cook**

Las Palmas and Palma.

### **First Choice**

Alicante, Dalaman, Corfu, Palma.

### **Balkan Holidays**

Bourgas

## **Schedule Destinations 2005**

**Aer Arann** Knock

**Aer Lingus** Dublin (connections to New York)

**Air Wales** Aberdeen, Cardiff and Plymouth

**easyJet** Alicante, Amsterdam, Barcelona, Basle, Belfast International, Berlin, Cologne, Geneva, Madrid, Malaga, Nice, Palma and Paris

**Emerald Airways** Isle of Man

**Euromanx** Isle of Man

**Flybe** Belfast City, Edinburgh, Exeter, Glasgow, Jersey and Southampton

**Ryanair** Cork, Dublin, Gerona, Granada, Limoges, Milan, Murcia, Nimes, Pisa, Reus, Rome, Shannon, Venice

**VLM** London

**Wizz Air** Budapest, Katowice and Warsaw

## Peel Airports Group

Liverpool John Lennon Airport is now part of the Peel Airports Group which includes Sheffield, Durham Tees Valley and most recently Robin Hood Doncaster Sheffield Airport which is due to open in Spring 2005.



*to the furthest reaches of the sky*

## Noise Sources

**Airborne Aircraft Noise** is the noise that arises from an aircraft as it commences its take-off run on the runway, until it has reached such a height along the departure track that it does not contribute significantly to the Airport's noise contours. It also includes the noise of a landing aircraft as it descends to the Airport, especially during final approach when it is aligned with the runway, and as it lands and brakes to taxiing speed on the runway.

It should be noted that the area immediately west of the airport is one of the widest parts of the Mersey estuary (5.5 km) and the area east of the airport is sparsely populated, with the exception of Hale village.

## Measures to Minimise Airborne Aircraft Noise

The Airport Company has established a number of measures to minimise the noise impact of airborne aircraft noise. The impact of airborne aircraft noise is monitored at the two fixed Noise Monitoring Terminals (NMTs) at Eastham in Wirral to the west and Hale village to the east. The Airport operates a Quiet Operations Policy, which includes:-

- The operation of a Noise Monitoring and Track Keeping System.
- Maintaining a public noise complaint handling service.
- Maintaining a technical Noise Monitoring Sub Committee to consider noise issues related to the Airport.
- Having a Noise Manager at the Airport.

- Encouraging aircraft operators to adopt quiet operating procedures and to observe published noise abatement procedures.
- Operating a Sound Insulation Grant Scheme.
- The operation of night flying restrictions, generally in line with the Quota Count Scheme developed and operated at the Designated London Area Airports.
- The noisiest aircraft with Quota Count greater than 4 are not permitted to be scheduled at night.
- Runway utilisation (where practical) is optimised via the encouragement of a preferred runway, particularly at night to minimise local impacts.
- The production of a publicly available Annual Noise Report.
- Instrument Landing System (ILS) installation for runway 09 (Introduced during 2003).
- Higher descent point for the glide slope on runways 09 and 27 (Introduced during 2003).
- Regional airspace changes enabling aircraft to be kept higher for longer (Introduced during 2003).
- Establishment of a Chief Pilot, ATC and Environmental Briefing Group.

## **The UK Aeronautical Information Publication (UK AIP)**

The UK AIP is a manual containing information about UK airports and their standard flight procedures. The Airport Company has already placed an instruction in the AIP for every operator of aircraft using the aerodrome to ensure that at all times aircraft are operated in a manner calculated to cause the least disturbance practicable in areas surrounding the aerodrome. The AIP also has the following noise related controls:

- Restrictions on training flights of turbo-jet powered aircraft.
- Arriving aircraft must maintain a height of at least 1500 ft above aerodrome level before starting on the descent path. Aircraft not using the ILS or radar shall follow a descent path, which is no lower at any time than the approach path that would be followed using the ILS glide path (unless instructed differently by Air Traffic Control).

- Aircraft engine testing is only permitted between the hours of 0700 and 2300. It is only allowed outside these hours in an emergency.
- All aircraft on final approach to runway 27 should not join the glide path no later than 3 nm from the runway.
- Departure controls
  - A. Runway 27
    - (i) After take-off all aircraft of more than 5730 kgs shall climb straight ahead at maximum rate to an altitude of 1000 ft before turning.
  - B. Runway 09
    - (i) Between 2300 and 0700 (winter) and 2200 and 0600 (summer), runway 09 will only be available for take-off when over-riding operational considerations necessitate its use, e.g. aircraft performance requirements.
    - (ii) After take-off the initial turn onto an out bound heading shall be commenced as soon as practicable, but not below 500 ft and not before passing the end of the runway.
  - C. Power Settings Restriction
    - (i) After completion of the initial turn onto the outbound heading, all turbo-jet powered aircraft shall reduce power for noise abatement purposes so as to maintain a rate of climb of at least 500 ft per minute at a power setting which will ensure progressively decreasing noise levels at points on the ground under the flight path.

These measures have been introduced to reduce the noise impact of airborne aircraft operations.

## Aircraft Noise from Ground Operation

Aircraft noise from the ground includes the noise generated by aircraft whilst on the ground taxiing, manoeuvring or parked on stand.

The Airport Company has developed a comprehensive Environmental Management Strategy with operating restrictions to ensure that ground operations are carried out as quietly as practicable to minimise impact and includes the following:

- Encouraging the minimum use of reverse thrust by aircraft on landing consistent with safety constraints.
- Minimising the use of auxiliary power units by providing adequate alternatives and the discouragement of such activity especially at night.
- Except in emergencies engine tests shall be restricted to areas designated for that purpose.
- Except in emergencies engine testing shall not be permitted between 23.00 and 07.00 (this provision is already in place in the UK AIP).
- Providing suitable amelioration to protect existing residential properties in the vicinity of the airport where monitoring / predictions indicate that they may be exposed to ground noise levels greater than 55 dB L<sub>Aeq,16h</sub> on a regular basis.
- Restricting the use of part of the spur immediately south of Home Farm on the Speke Hall Estate for use as a taxiway, and restricting its use for the storage and parking of small aircraft.
- Construction of a seven metre high earth bund on the western boundary of the Airport adjacent to the Speke Hall estate.

## Ground Noise Survey 2004

The Airport Company commissioned independent acoustic consultants to measure and predict the ground noise at the Airport. The measurements demonstrated

that overall the current ground noise levels at the airport are no higher than those previously assessed and no noise sensitive residential properties are exposed to ground noise in excess of the  $L_{Aeq,t=16hours}$  threshold on a regular basis.

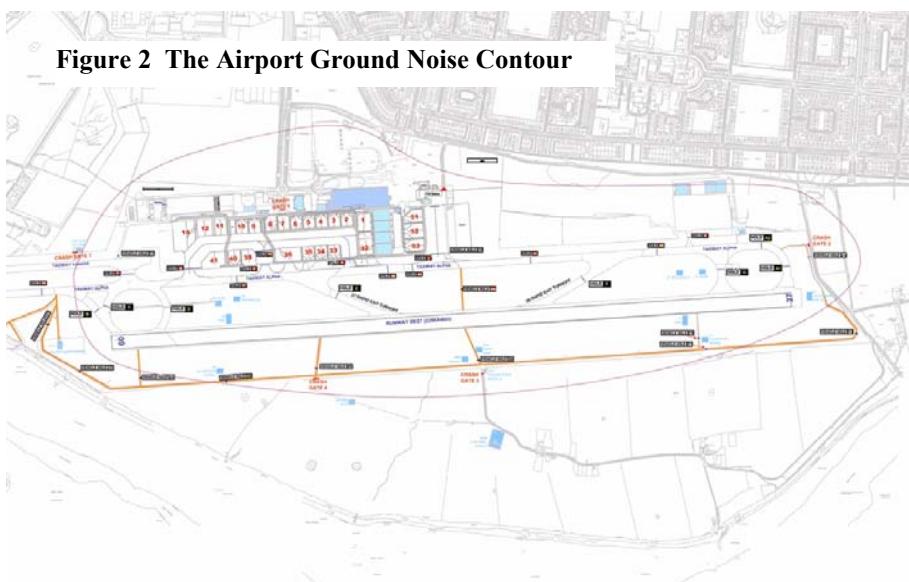


Figure two above shows the modelled 55dB(A) noise contour based on noise measures undertaken at Liverpool John Lennon Airport. The pink line represents the  $L_{Aeq,t=16hours}$  noise contour at which is the agreed trigger for suitable amelioration.

This exercise will be repeated at regular intervals to ensure the Airport honours its commitment to provide suitable amelioration to existing residential properties in the vicinity of the airport if ground noise levels are greater than 55dB  $L_{Aeq,t=16hours}$  on a regular basis.

## Road Traffic Noise

Road vehicles used by passengers, staff and cargo operations at the Airport may affect the environment by virtue of noise, as vehicles travel along local roads. However, vehicles accessing the Airport predominantly use non-residential roads and HGVs visiting the site on a regular basis are instructed to use Speke Hall Avenue for ingress and egress to the Airport.

## Noise Complaints

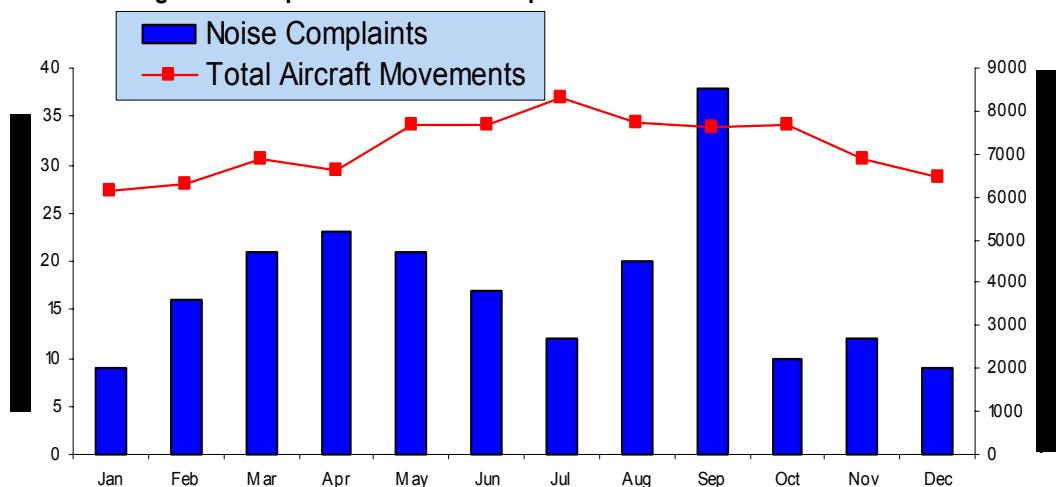
The Airport Company's Environment Department is responsible for responding to enquiries and complaints received from the local community. An enquiry can be made by telephone, letter, facsimile or email. The majority of the complaints and enquiries are received on the dedicated environmental telephone line. At other UK Airports an increasing proportion of the complaints are received via email.

All the noise complaints received by the Airport Company are collated and reported by the Environmental Department to the Noise Monitoring Sub Committee who's members are drawn from local councillors, councils and community representatives.

The Airport Company received 231 complaints in 2003, and 208 complaints in 2004. Some of the complaints were about individual aircraft movements, others related to general growth in aviation activity and others relating to non Liverpool John Lennon Airport based aircraft.

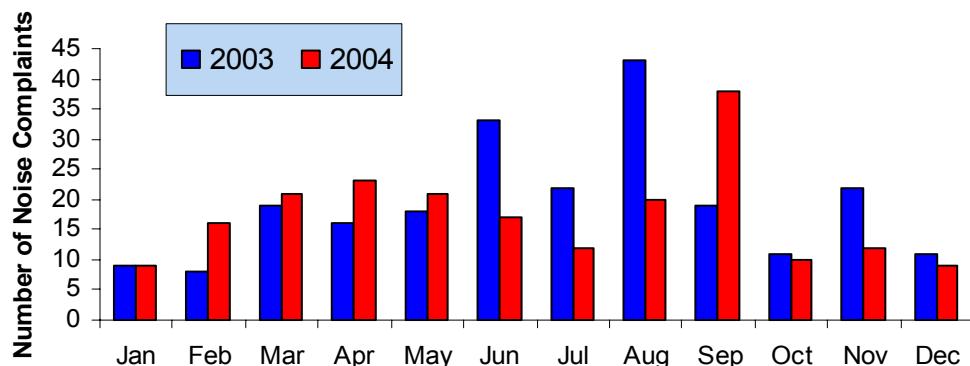
The Airport Company observed that there were 23 less complaints in 2004 than 2003. In 2003, the summer months of June to August had the most complaints. In 2004, September was the month in which most complaints were received. This is in spite of aircraft movement figures being very similar in 2003 and 2004; during 2004 there was slightly less commercial aircraft movements due to the reduction in night time freight

**Figure 3 Comparison of Noise Complaints and Aircraft Movements in 2004**



During 2004, the Airport maintained a relatively high media profile with the Passenger Terminal Expansion Scheme (providing capacity to handle 4.5 million passengers per annum) planning permission announcement. The high media profile is essential to raise awareness of the facilities and services available

**Figure 4 Comparison of Monthly Noise Complaint Profile for 2003 and 2004**



from Liverpool John Lennon Airport.

However, the publicity can also elevate concerns and it would seem to increase the likelihood of people to complain about airport related noise.

The area around the Airport is overflowed by aircraft routing (and using navigation beacons in the region) between the UK mainland and Ireland, Isle of Man etc and internationally between Europe and the American Continent from other airports, including Manchester.

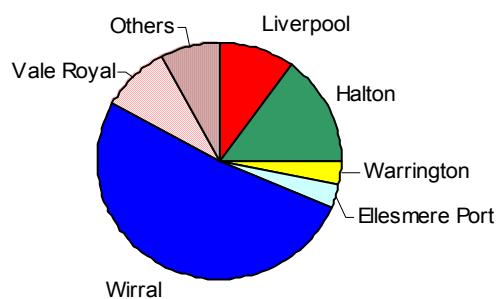
Aircraft used by the local Police Authorities also operate in the vicinity of the Airport. Therefore, not all aircraft that can be seen in the area are landing at or departing from Liverpool. Complaints received about non-Liverpool John Lennon Airport flights are included within the statistics used in this report.

The noise complaints from the residents of Wirral account for approximately 50% of all noise complaints; a high proportion of these complaints refer to aircraft on final approach for Runway 09, but seem to be from various areas of the Wirral peninsula.

The glide slope angle of arriving aircraft is less than the rate of climb of departing aircraft, therefore aircraft departing on Runway 27 will be noticeably higher as they fly over the Wirral peninsula than those approaching on Runway 09.

The selection of runway is primarily determined by the wind direction. Runway 09 was utilised for approximately 23% of all aircraft movements during 2004.

**Figure 5 Proportion of Noise Complaints Received by Local Authority Areas in 2004**



The relative overall low number of complaints means that single events or repeat complainants can skew or tilt the focus of the complaint statistics.

The period between 2002 and 2004 has seen an increase in the total number of aircraft movements in and out of Liverpool John Lennon Airport while there has been a slight rise year on year of the number of commercial passenger aircraft movements with a considerable drop in night time freight and mail aircraft movements. The number of noise complaints shows a drop from 2003 to 2004.

## Comparison with other Airports

It is difficult to make direct comparisons between Airports as there are subtle differences in the way the numbers of complaints are recorded and reported to their respective Airport Consultative Committees.

However, this brief sample does indicate complaint trends, which show that Liverpool is comparable with other airports and has a relatively low proportion of complaints per thousand aircraft movements. This perhaps demonstrates the general acceptance of the benefit a successful airport brings to the region, as well as the relatively moderate impact Liverpool John Lennon operations have as a result of favourable geographic considerations.

The Airport Company does not want the number of complaints to be the predominant factor in determining

**Figure 6 Comparison of Noise Complaints and Aircraft Movements received by other Airports in 2003 and 2004**

Airport	Total Number of Aircraft Movements		Number of Noise Complaints		Complaints per thousand Aircraft movements	
	2003	2004	2003	2004	2003	2004
Birmingham	128,704	121,368	661	718	5	6
Bristol	51,578	54,855	321	491	6	9
East Midlands	58,018	57,977	1,546	2,069	27	36
London City	46,807	52,280	24	25	0.5	0.5
Liverpool	85,185	86,064	264	208	3	2
Manchester	189,065	224,665	3,074	1,648	16	7

future mitigation measures, rather they will be determined on merit and practicalities. Complaint numbers and the area they come from do not reflect the level of actual exposure to airborne aircraft noise.

## Noise Monitoring and Track Keeping System

The Noise Monitoring and Track Keeping System (NM&TKS) enables the Airport Company to report objectively the altitude, position, aircraft type and noise generated by each aircraft movement.

**Figure 7 Photograph of an easyJet B737 passing over the Eastham NMT**



The NM&TKS collects information from three main sources:

- Noise data from the Noise Monitoring Terminals (NMT) at Hale, Eastham and the Mobile NMT. The noise data is correlated with aircraft track data to identify specific aircraft noise events.
- Secondary Surveillance Radar (SSR) from National Air Traffic Services (NATS) at St Anne's

provides information about the position, altitude and speed of aircraft in the vicinity of Liverpool John Lennon Airport. This enables the Airport Company to identify specific aircraft movements, its altitude and position at a given time; and correlate a noise event at one of the NMTs with a specific aircraft movement.

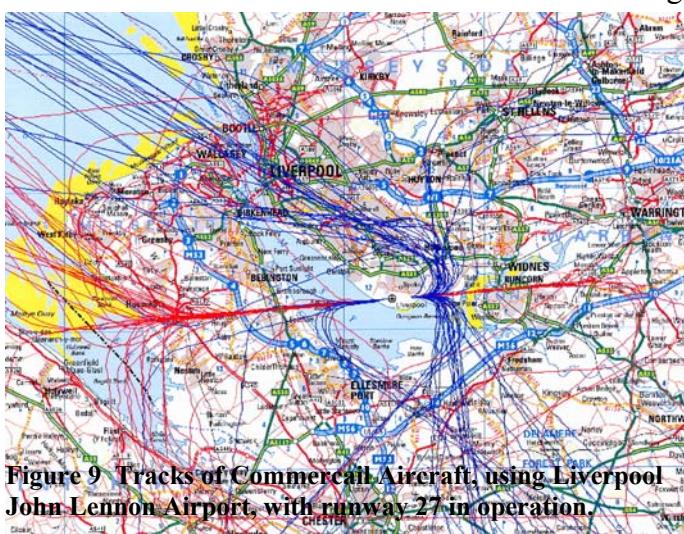
- The Airport's Operation Database (AMOSS) provides information about the aircraft using Liverpool John Lennon Airport such as the aircraft type, airline, origin or destination which can be correlated with the track data to make the information easier to interpret.

**Figure 8 Examples of Noise Monitoring Results from the Hale NMT for Aircraft arriving at Liverpool John Lennon Airport**

Aircraft Type	L <sub>MAX</sub>	SEL
<b>A319</b>	84.3	89.9
<b>HS748</b>	82.5	89.3
<b>B732</b>	89.2	94.6
<b>B737</b>	84.1	89.8
<b>B738</b>	86.0	91.7
<b>B752</b>	86.1	92.7
<b>F50</b>	84.9	90.9
<b>HAWK</b>	97.2	101.9
<b>L188</b>	87.2	92.0

The noise statistics above show the L<sub>MAX</sub> and SEL recorded at the Hale Noise Monitoring Terminals (NMT) for aircraft approaching runway 27 over the period September to December 2004 for aircraft types that regularly use the airport. The L<sub>MAX</sub> is the maximum noise level measured with fast time weighting and represents the highest level of environmental noise occurring during a correlated noise event.

The noise statistics above show the Boeing 737 200 series (B732) aircraft is by far the noisiest scheduled service aircraft using Liverpool John Lennon Airport.



**Figure 9 Tracks of Commercial Aircraft, using Liverpool John Lennon Airport, with runway 27 in operation.**

In November 2004, Ryanair released a press release with news that Ryanair will be phasing out the B737-200 series and replacing them with B737-800 series by the end of December 2005. The 800 series as can be seen above is a much quieter and more fuel efficient aircraft.

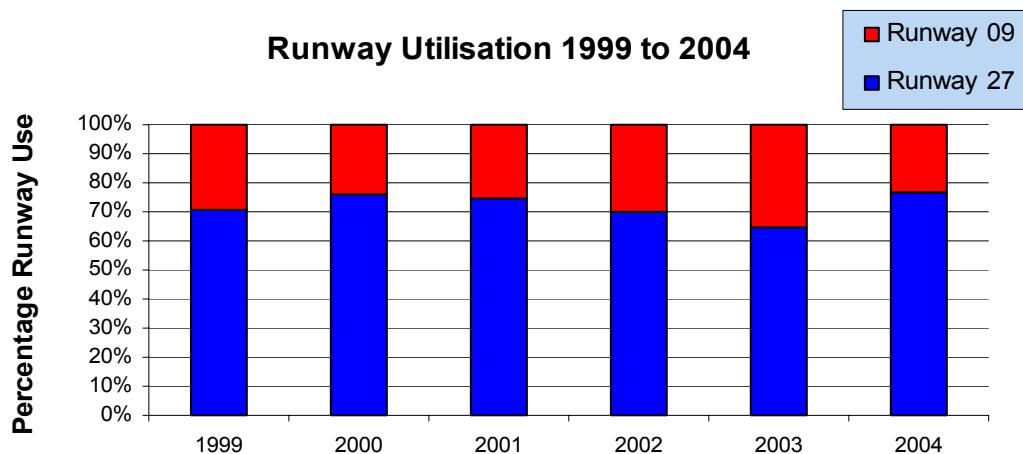
The noisiest aircraft visiting Liverpool during the above period were the RAF Hawks

The red lines on the figure 9 map overleaf represent the actual tracks of the aircraft as they approach Liverpool John Lennon Airport. This information comes from the National Air Traffic Services (NATS) secondary surveillance radar at St Anne's. The blue lines represent the tracks of the aircraft departing Liverpool John Lennon Airport. The above represents the aircraft movements for a day when Runway 27 is in predominant use, with aircraft departing towards the west and arriving from the east. This shows visually the frequency of use of the different departure routes. The most densely populated route is the Wallasey Standard Instrument Departure Route (SID), that aircraft enroute to Belfast, Dublin and the Isle of Man are most likely to use. This is not surprising as there are up to 12 flights per day to the Isle of Man, up to 7 to Belfast and up to 4 to Dublin.

Runway 27 is the preferred runway and was used for approximately 77% of all aircraft movements during 2004. There is a further explanation of the runway utilisation given later in this report.

## Runway Utilisation

At Liverpool John Lennon Airport there is one runway that can be used in two directions, i.e. the aircraft can approach from the east and depart towards the west (Runway 27) or diametrically opposed (Runway 09). The runways are identified as Runway 27 and 09, because when an aircraft is lined up ready to depart or is on final approach the compass bearing is approximately either 270° or 090°.



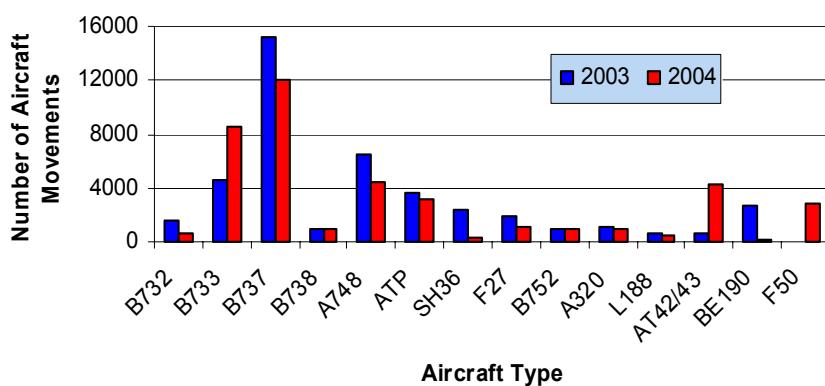
The orientation of runway use is selected by Air Traffic Control (ATC) based on wind speed and direction at the Airport to ensure safe, stable operations of aircraft as they approach or depart. When possible the preferred runway (runway 27) is used for departing aircraft to minimise noise impact.

When aircraft depart towards the Wirral peninsula on Runway 27, there is the advantage of natural noise mitigation as there are no properties within the first 5.8 kilometres of the aircraft flight, because of the large expanse of the River Mersey estuary.

## Aircraft Type

The chart below shows the numbers of different commercial aircraft that frequently use Liverpool John Lennon Airport. The easyJet Boeing 737-700 is the most frequent turbo fan aircraft used at Liverpool John Lennon Airport.

**Figure 11 Number of Frequent Commercial Aircraft Type Movements in 2003 & 2004**



When compared with the noise monitoring statistic in figure 8, the greatest frequency of aircraft movements tends to be from the considerably quieter Boeing 737 700 series aircraft. The less frequent older and noisier

Boeing 737 200 series, owned by Ryanair will be replaced by a new fleet of 800 series.

## Quota Count System (QCS)

The Liverpool John Lennon Airport Quota Count Scheme is based upon the night restrictions developed by the Government for Heathrow, Gatwick and Stansted Airports. The scheme classifies aircraft according to the noise they generate during arrival and departure. The restrictions apply to a specified "noise quota" period (23:30 to 06:00 hours) during which aircraft movements are restricted by noise quota.

Under the QCS, aircraft are grouped into QC bands between QC 0.5 to QC 16 from quietest modern aircraft to noisy larger aircraft respectively. Some of the very quietest types are classified as exempt and have a QC value of zero and no restriction applies.

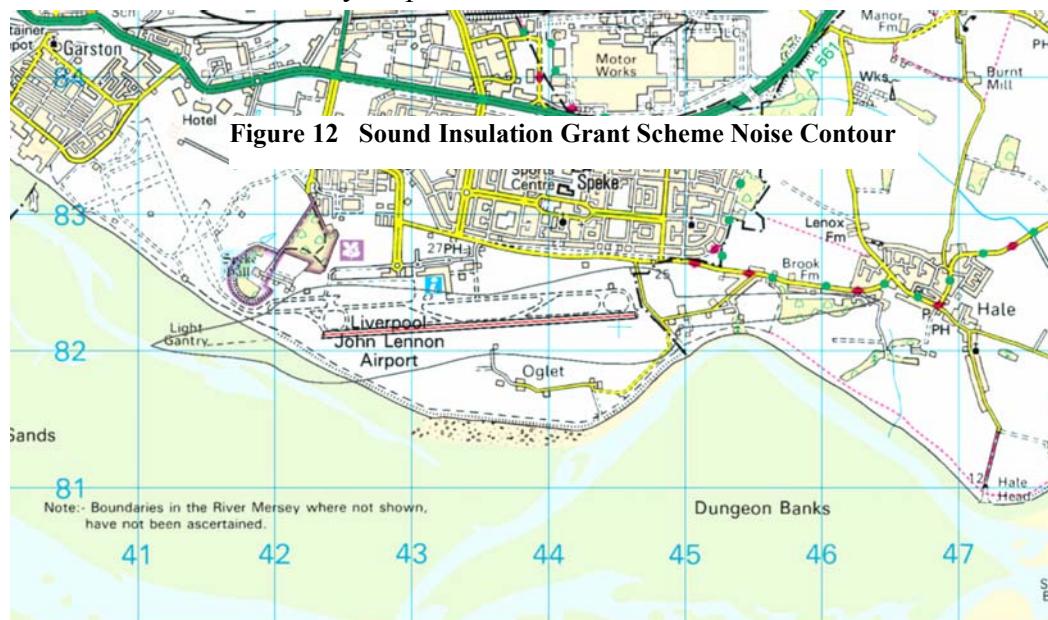
## Sound Insulation Grant Scheme (SIGs)

The Airport Company is committed to facilitate the sound insulation of those residential properties that are expected to fall within the modelled 62 dB(A)  $L_{Aeq}$ ,  $t=24\text{hours}$  noise contour in 2006.

Since the launch of the scheme last year, approximately 10% of the properties within the boundary have selected to participate in the scheme. These properties have taken advantage of the secondary glazing and acoustic double glazing available. The Airport Company expects more properties will take up the offer of a grant towards sound insulation in the next phase of the scheme.

### SIGS Contouring for 2006

The full details about the Sound Insulation Grant Scheme (SIGs) are detailed in the SIGs brochure and the revised scheme will be phased in over the next two year period.



The scheme boundary will be subject to review based on changes to the size and shape of the 62 dB(A)  $L_{Aeq}$ ,  $t=24\text{ hours}$  noise contour which may alter as the Airport's activity levels change or the type of aircraft using the airport changes significantly.

## **Reporting and Monitoring**

Progress in delivering and monitoring the Airport's Quiet Operations Policy is reported to the Noise Monitoring Sub-Committee (NMSC) of the Liverpool John Lennon Airport Consultative Committee. The NMSC is a technical sub committee established in January 2001 with wide ranging community and council membership. The Airport Company also attends meetings with local community and residential groups on an ad-hoc invitation basis.

## **Noise Complaints**

If you are disturbed by aircraft noise and want to contact the Airport Company to discuss it further this can be done by telephone, facsimile, email, post or via the website.

Tel. Nº	(0151) 907 1745 or 0870 7508484 and select option six.
Fax Nº	(0151) 907 1620
Email	<a href="mailto:environment@liverpoolairport.com">environment@liverpoolairport.com</a>
Post	Environment Department Liverpool Airport plc Liverpool John Lennon Airport Liverpool L24 1YD
Website	<a href="http://www.liverpooljohnlennonairport.com">www.liverpooljohnlennonairport.com</a>

## **Future Environmental Reports**

The next year will be an exciting period of growth at Liverpool John Lennon Airport. The challenge being to ensure that further growth is managed in a sustainable fashion with minimal disturbance to the Airport local neighbours. We will continue to employ measures to seek mitigation for noise impact and to respond to any noise complaints that are received.

In order to improve future Environmental Reports please send any comments you may have to :

Mr Andrew Dutton  
Environmental Manager  
Liverpool John Lennon Airport  
Liverpool L24 1YD.